AO 120 (Rev. 08/10)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court For The Eastern District of Texas, Marshall Division on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2:17-cv-661	9/21/2017	For The Eastern District of Texas, Marshall Division

PLAINTIFF	DEFENDANT
INTELLECTUAL VENTURES II LLC	T-MOBILE USA, INC., T-MOBILE US, INC., ERICSSON INC., and TELEFONAKTIEBOLAGET LM ERICSSON

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	8,682,357	3/25/2014	INTELLECTUAL VENTURES II LLC
2	8,897,828	11/25/2014	INTELLECTUAL VENTURES II LLC
3	8,953,641	2/10/2015	INTELLECTUAL VENTURES II LLC
4	9,320,018	4/19/2016	INTELLECTUAL VENTURES II LLC
5	9,532,330	12/27/2016	INTELLECTUAL VENTURES II LLC

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

AO 120 (Rev. 08/10)

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DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2:17-cv-662	9/21/2017	For The Eastern District of Texas, Marshall Division

PLAINTIFF	DEFENDANT
INTELLECTUAL VENTURES II LLC	SPRINT SPECTRUM L.P., et al

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

ORDERED that Intellectual Ventures II LLC's claims and all defenses and/or counterclaims for relief asserted by Ericsson Inc. and Telefonaktiebolaget LM Ericsson, in the above-captioned actions are DISMISSED WITH PREJUDICE, and all defenses and/or counterclaims for relief asserted by T-Mobile USA, Inc., T-Mobile US, Inc., Sprint Spectrum L.P. and Nextel Operations, Inc., in the above-captioned actions are DISMISSED WITHOUT PREJUDICE.

CLERK	(BY) DEPUTY CLERK	DATE
David A. O'Toole	ch	6/24/19

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
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☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2:17-cv-662	9/21/2017	For The Eastern District of Texas, Marshall Division

PLAINTIFF	DEFENDANT
INTELLECTUAL VENTURES II LLC	SPRINT SPECTRUM L.P., et al

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	9,681,466	6/13/2017	INTELLECTUAL VENTURES II LLC
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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
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☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2:17-cv-661	9/21/2017	For The Eastern District of Texas, Marshall Division

PLAINTIFF	DEFENDANT
INTELLECTUAL VENTURES II LLC	T-MOBILE USA, INC., T-MOBILE US, INC., ERICSSON INC., and TELEFONAKTIEBOLAGET LM ERICSSON

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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2	8,897,828	11/25/2014	INTELLECTUAL VENTURES II LLC
3	8,953,641	2/10/2015	INTELLECTUAL VENTURES II LLC
4	9,320,018	4/19/2016	INTELLECTUAL VENTURES II LLC
5	9,532,330	12/27/2016	INTELLECTUAL VENTURES II LLC

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

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PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

ORDERED that Intellectual Ventures II LLC's claims and all defenses and/or counterclaims for relief asserted by Ericsson Inc. and Telefonaktiebolaget LM Ericsson, in the above-captioned actions are DISMISSED WITH PREJUDICE

CLERK	(BY) DEPUTY CLERK	DATE
David A. O'Toole	ch	6/24/19

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
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☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2:17-cv-661	9/21/2017	For The Eastern District of Texas, Marshall Division

PLAINTIFF	DEFENDANT
INTELLECTUAL VENTURES II LLC	T-MOBILE USA, INC., T-MOBILE US, INC., ERICSSON INC., and TELEFONAKTIEBOLAGET LM ERICSSON

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

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Trials@uspto.gov
Tel: 571-272-7822

Paper 13
Entered: July 2, 2019

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

T-MOBILE USA, INC., T-MOBILE US, INC.,
SPRINT SPECTRUM L.P., and SPRINTCOM, INC.,
Petitioner,

v.

INTELLECTUAL VENTURES II LLC,
Patent Owner.

Case IPR2018-01773
Patent 8,897,828 B2

Before KRISTEN L. DROESCH, MICHAEL W. KIM, and JASON W. MELVIN, *Administrative Patent Judges*.

MELVIN, *Administrative Patent Judge*.

ORDER
Granting Joint Motion to Terminate
Granting Joint Request to Keep Confidential and Separate
35 U.S.C. § 317; 37 C.F.R. §§ 42.72, 42.74

I. INTRODUCTION

Petitioner and Patent Owner (collectively referred to as "the Parties") have requested that the above-identified *inter partes* review proceeding be terminated. On June 25, 2019, we authorized the Parties to file a joint motion to terminate the above-identified proceeding. On June 25, 2019, the Parties filed the Joint Motion to Terminate ("Joint Motion"). Paper 11. Along with the Joint Motion, the Parties filed copies of two Patent License Agreements ("Settlement Agreements" (Exs. 1011, 1012)). The Parties also filed a Joint Request that the Settlement Agreements be Treated as Business Confidential Information pursuant to 35 U.S.C. § 317(b) and 37 C.F.R. § 42.74(c) ("Joint Request"). Paper 12.

II. DISCUSSION

In the Joint Motion, the Parties represent that they have reached an agreement to jointly seek termination of the above-identified *inter partes* review proceeding, that the filed Settlement Agreements are true and accurate copies, and that there are no other written or oral agreements. Paper 11, 1, 3–4.

We have not yet decided the merits of this proceeding, and a final written decision has not been entered. Notwithstanding that the proceeding has moved beyond the preliminary stage, the Parties have shown adequately that the termination of the above-identified proceeding is appropriate. Under these circumstances, we determine that good cause exists to terminate the above-identified proceeding.

Regarding the Parties Joint Request to treat the Settlement Agreements as business confidential information, we determine that good cause exists to treat the Settlement Agreements (Exs. 1011, 1012) between

Petitioner and Patent Owner as business confidential information pursuant to 35 U.S.C. § 317(b) and 37 C.F.R. § 42.74(c).

This Order does not constitute a final written decision pursuant to 35 U.S.C. § 318(a).

III. ORDER

Accordingly, for the reasons discussed above, it is:

ORDERED that the Joint Motion to Terminate (Paper 11) is *granted*, and IPR2018-01773 is *terminated*; and

FURTHER ORDERED that the Joint Request (Paper 12) to treat the Settlement Agreements (Exs. 1011, 1012) as business confidential information pursuant to 35 U.S.C. § 317(b) and 37 C.F.R. § 42.74(c) is *granted.*

PETITIONER:

Robert Hilton
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PATENT OWNER:

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James Hietala
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Russell Rigby
rrigby@intven.com

Tim Seeley
tims@intven.com

Trials@uspto.gov
Tel: 571-272-7822

Paper 16
Entered: June 17, 2019

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ERICSSON INC.,
Petitioner,

v.

INTELLECTUAL VENTURES II LLC,
Patent Owner.

Case IPR2018-01694
Patent 8,897,828 B2

Before KRISTEN L. DROESCH, MICHAEL W. KIM, and JASON W. MELVIN, *Administrative Patent Judges.*

MELVIN, Administrative Patent Judge.

ORDER
Granting Joint Motion to Terminate
Granting Joint Request to Keep Confidential and Separate
35 U.S.C. § 317; 37 C.F.R. §§ 42.72, 42.74

I. INTRODUCTION

Petitioner and Patent Owner (collectively referred to as "the Parties") have requested that the above-identified *inter partes* review proceeding be terminated pursuant to a settlement. On June 12, 2019, we authorized the Parties to file a joint motion to terminate the Petition in this proceeding. On June 13, 2019, the Parties filed a Joint Motion to Terminate this proceeding ("Joint Motion"). Paper 13. Along with the Joint Motion, the Parties filed a copy of a Confidential Settlement Agreement and Patent License Agreement ("Settlement Agreement").[1] Paper 14. The Parties also filed a Joint Request that the Settlement Agreement be Treated as Business Confidential Information and be Kept Separate pursuant to 37 C.F.R. § 42.74(c) ("Joint Request"). Paper 15.

II. DISCUSSION

In the Joint Motion, the Parties represent that they have reached an agreement to jointly seek termination of this *inter partes* review proceeding, that the filed Settlement Agreement is a true and accurate copy, and that there are no other written or oral agreements. Paper 13, 1, 3–4.

We have not yet decided the merits of this proceeding, and a final written decision has not been entered. Notwithstanding that the proceeding has moved beyond the preliminary stage, the Parties have shown adequately that the termination of this proceeding is appropriate. Under these

[1] The Parties filed the Settlement Agreement as a Paper. The Parties are reminded that settlement agreements should be filed as exhibits. *See* 37 C.F.R. § 42.63(a) ("Evidence consists of affidavits, transcripts of depositions, documents, and things. All evidence must be filed in the form of an exhibit.").

circumstances, we determine that good cause exists to terminate this proceeding.

The Parties also filed a Joint Request that the Settlement Agreement be treated as business confidential information and be kept separate from the files of the patent involved in this *inter partes* proceeding. Paper 15, 1. After reviewing the Settlement Agreement between Petitioner and Patent Owner, we find that the Settlement Agreement contains confidential business information regarding the terms of settlement. We determine that good cause exists to treat the Settlement Agreement between Petitioner and Patent Owner as business confidential information pursuant to 37 C.F.R. § 42.74(c).

This Order does not constitute a final written decision pursuant to 35 U.S.C. § 318(a).

III. ORDER

Accordingly, for the reasons discussed above, it is:

ORDERED that the Joint Motion to Terminate is *granted*, and IPR2018-01694 is *terminated*; and

FURTHER ORDERED that the Parties' Joint Request that the Settlement Agreement be Treated as Business Confidential Information and be Kept Separate is *granted*, and the Settlement Agreements shall be kept separate from the file of Patent 8,897,828 B2 and made available only to Federal Government agencies on written request, or to any person on a showing of good cause, pursuant to 37 C.F.R. § 42.74(c).

IPR2018-01694
Patent 8,897,828 B2

PETITIONER:

Chad Walters
Harrison Rich
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harrison.rich@bakerbotts.com

PATENT OWNER:

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Daniel Block
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STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
bpickard-ptab@sternekessler.com
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James Hietala Russell
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Trials@uspto.gov
571-272-7822

Paper No. 9
Entered: April 22, 2019

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

T-MOBILE USA, INC., T-MOBILE US, INC.,
SPRINT SPECTRUM L.P., and SPRINTCOM, INC.,
Petitioner,

v.

INTELLECTUAL VENTURES II LLC,
Patent Owner.

Case IPR2018-01773
Patent 8,897,828 B2

Before KRISTEN L. DROESCH, MICHAEL W. KIM, and JASON W. MELVIN, *Administrative Patent Judges*.

MELVIN, *Administrative Patent Judge*.

DECISION
Instituting *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Petitioner, T-Mobile USA, Inc., T-Mobile US, Inc., Sprint Spectrum L.P., and Sprintcom, Inc., filed a Petition (Paper 1, "Pet.") requesting *inter partes* review of claims 1, 2, 5, 6, 8, 9, 12, 13, 15, 16, 19, 20, 22, 23, 26, 27, 29, 30, 33, 34, 36, 37, 40, and 41 ("the challenged claims") of U.S. Patent No. 8,897,828 B2 (Ex. 1001, "the '828 patent"). Patent Owner, Intellectual Ventures II LLC, timely filed a Preliminary Response. Paper 7 ("Prelim. Resp."). Pursuant to 35 U.S.C. § 314 and 37 C.F.R. § 42.4(a), we have authority to determine whether to institute review.

An *inter partes* review may not be instituted unless "the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." 35 U.S.C. § 314(a). For the reasons set forth below, we conclude that Petitioner has shown a reasonable likelihood it will prevail in establishing the unpatentability of at least one challenged claim. We, therefore, institute *inter partes* review of the challenged claims of the '828 patent in this proceeding.

A. RELATED MATTERS

As required by 37 C.F.R. § 42.8(b)(2), each party identifies various judicial or administrative matters that would affect or be affected by a decision in this proceeding. Pet. 2–3; Paper 4 (Patent Owner's Mandatory Notices).

B. THE '828 PATENT

The '828 patent is titled "Power Control in a Wireless Communication System" and describes power-control systems that can operate in multiple

modes. Ex. 1001, (54), (57). In particular, the '828 patent describes open-loop power control, in which a user equipment (UE) can measure path loss and use it to determine the transmit power level. *Id.* at 2:5–16. The '828 patent also describes closed-loop power control, in which the network measures the "signal to noise-plus-interference ratio (SNIR)" and uses it to issue transmit power control (TPC) commands to the UE. *Id.* at 1:50–56, 2:17–32. The '828 patent discloses that a UE receiving TPC commands may accumulate the commands to determine the transmit power level. *Id.* at 6:39–46, 7:16–19. The UE may include both open- and closed-loop functionality so that it may respond to either TPC commands or to a change in the path loss. *Id.* at 8:5–7.

C. CHALLENGED CLAIMS

Challenged claims 1, 8, 15, 22, 29, and 36 are independent. Claim 15 is illustrative of the claimed subject matter and is reproduced below:

> 1. A method performed by user equipment (UE), the method comprising:
>
> [a] receiving, by the UE, an indication of whether accumulation of transmit power control (TPC) commands is enabled;
>
> [b] determining, by the UE, a path loss of a downlink channel;
>
> [c] receiving, on a single physical channel by the UE if accumulation is enabled, an allocation of a scheduled uplink resource and a TPC command, wherein the TPC command is accumulated with other received TPC commands;
>
> [d] calculating, by the UE if accumulation is enabled, transmit power in association with an uplink communication based on both the path loss and the accumulated TPC commands; and

> [e] receiving, on the single physical channel by the UE if accumulation is not enabled, an allocation of a scheduled uplink resource to transmit data at a power level calculated by the UE based on the path loss.

Ex. 1001, 13:37–55.[1]

D. Proposed Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability, each based on 35 U.S.C. § 103:

References	Claims
Zeira,[2] Krishnan,[3] and Khan[4]	1, 2, 5, 6, 8, 9, 12, 13, 15, 16, 19, 20, 22, 23, 26, 27, 29, 30, 33, 34, 36, 37, 40, and 41
Zeira, Krishnan, Khan, and Andersson[5]	2, 9, 16, 23, 30, and 37

Pet. 8. Petitioner also relies on the Declaration of Martin G. Walker, Ph.D. (Ex. 1002). *See generally* Pet. 1, 11, 16–67.

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[1] We add square-bracketed annotations to separate claim limitations as identified by Petitioner. *See* Pet. 24–43.

[2] U.S. Patent No. 6,600,772 B1 (filed Mar. 21, 2000; iss. July 29, 2003) (Ex. 1004).

[3] U.S. Patent No. 7,493,133 B2 (filed Feb. 5, 2004; iss. Feb. 17, 2009) (Ex. 1005).

[4] U.S. Patent App. Pub. No. 2004/0190485 A1 (filed Mar. 24, 2003) (Ex. 1006).

[5] U.S. Patent No. 6,334,047 B1 (filed Apr. 9, 1999; iss. Dec. 25, 2001) (Ex. 1007).

II. DISCUSSION

A. 35 U.S.C. § 325(D)

Patent Owner argues that we should deny institution because the Petition relies on Zeira, Krishnan, and Khan, which were "heavily considered during prosecution," and because "the Petition's arguments directly overlap with those considered during prosecution." Prelim. Resp. 16; *see also id.* at 13–21.

We consider multiple factors when determining whether to exercise our discretion not to institute under 35 U.S.C. § 325(d), potentially including:

> (a) the similarities and material differences between the asserted art and the prior art involved during examination; (b) the cumulative nature of the asserted art and the prior art evaluated during examination; (c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection; (d) the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art; (e) whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art; and (f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments.

Becton, Dickinson & Co. v. B. Braun Melsungen AG, Case IPR2017-01586, slip op. at 17–18 (PTAB Dec. 15, 2017) (Paper 8) (informative). As Patent Owner points out, Zeira was applied a number of times during prosecution. Prelim. Resp. 16–18. After the Board affirmed the Examiner's rejection over

a combination of Zeira[6] and two other references (Chen[7] and Van Lieshout[8]) (Ex. 1008, 120–127), the applicant amended the claims (*id.* at 91–107). The Examiner, in a statement of reasons for allowance, stated that Zeira teaches "receiving by the UE, an indication of whether accumulation of transmit power commands (TPC) is enabled" and "determining, by the UE, a path loss of a downlink channel." *Id.* at 16. According to the Examiner, however, none of the cited prior art, alone or in combination, teaches the remaining limitations of the independent claims. *Id.* at 17.

Petitioner discusses the prosecution history of the '828 patent, including the claim amendments made after the Examiner's rejection was affirmed by the Board. Pet. 11–16. Petitioner notes that the Examiner "did not substantively discuss the newly filed claims, including the added 'single physical channel' limitation, with reference to Zeira PCT, Krishnan, or any other prior art of record." *Id.* at 15; *see also id.* at 6 ("Although Khan was cited in an IDS by the applicant, it was not substantively considered during the original prosecution.").

Petitioner argues that, particularly when focusing on the limitations added after amendment, the allowed claims are unpatentable over Zeira, Krishnan, and Khan, and that the Office never considered the arguments presented by the Petition. *Id.* at 6 ("The combination of Khan with Zeira and Krishnan raises novel arguments regarding the patentability of the '828 patent that were not considered during the original prosecution of the

---

[6] The Examiner applied the international publication of Zeira, WO 00/57574. Ex. 1008, 935–65.

[7] Published U.S. Patent Application No. US 2005/0025056 A1.

[8] Published U.S. Patent Application No. US 2001/0036823 A1.

allowed claims. . . . Khan is particularly relevant in view of new limitations added by the patentee in the final set of claims."), 7 ("In view of Khan's bearing on this limitation [added after appeal], and the examiner's prior findings as to Zeira and Krishnan, the Board should decline to exercise its discretion under § 325(d).").

Thus, the art previously applied was extremely similar to the art now asserted. The Examiner, however, did not reject the amended claims based on prior art. *See* Ex. 1008, 74–78. Thus, we cannot compare how the Examiner applied the cited prior art references to the amended, and now issued, claims to contrast that with Petitioner's assertions. We recognize the similarities between the prior version of the claims, for which the Board affirmed the Examiner's rejection, and the amended claims the Examiner ultimately allowed.

In a statement of reasons for allowance, the Examiner stated that Zeira discloses certain limitations in the challenged claims, but that even a combination of the cited prior art did not disclose other limitations. Ex. 1008, 16–17. The Examiner's statement, however, does not appear consistent with Zeira's disclosures. For example, the Examiner stated that Zeira teaches "receiving, by the UE, an indication of whether accumulation of transmit power control (TPC) commands is enabled" and cited Zeira's summary section. *Id.* at 16 (citing *id.* at 940:17–941:8). But Zeira's summary does not provide a disclosure supporting that Zeira teaches that limitation. Thus, we have concerns with the Examiner's statements regarding Zeira. Although the Examiner stated that neither Zeira alone nor a combination of the cited references discloses other limitations of the challenged claims, our

review of Petitioner's contentions as discussed below indicates the Examiner erred.

In light of Petitioner's convincing presentation of unpatentability discussed below, we decline to exercise our discretion not to institute review in this proceeding. *See Becton, Dickinson*, slip op. at 18 (factors (e) and (f)).[9] We note additionally that our intervening, precedential *Schulhauser* case may provide additional reasons for a conclusion that departs from the Examiner's allowance. *See Ex parte Schulhauser*, Appeal 2013-007847, 2016 WL 6277792 (PTAB Apr. 28, 2016). As discussed below, our conclusion regarding *Schulhauser*'s applicability may affect our final decision in this case.

B. Claim Construction

In an *inter partes* review, the Board interprets claims of an unexpired patent using the broadest-reasonable construction in light of the specification of the patent.[10] 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016).

Petitioner proposes a construction for one term: "multilevel TPC command." Pet. 18–19. Patent Owner asserts no construction is required for

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[9] Similar § 325(d) facts and arguments were made in IPR2018-01641 and IPR2018-01694, each of which also involve the '828 patent. Our determination here is consistent with the determination made in those proceedings.

[10] The Petition was filed before the November 13, 2018, effective date of the amendment to 37 C.F.R. § 42.100 changing the claim-construction standard applied in *inter partes* reviews. Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (to be codified at 37 C.F.R. pt. 42).

any term. Prelim. Resp. 12. We conclude that, for the purpose of this Decision, there is no need to construe any term to resolve issues presented by the Petition and Preliminary Response. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017); *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

As noted above, however, our precedential *Schulhauser* case may affect the outcome in this case. In *Schulhauser*, we held that a method claim directed to two alternative outcomes based on a binary indicator is construed to cover two different methods, and that the broadest-reasonable construction encompasses either one of those methods. *Schulhauser*, 2016 WL 6277792, *4. Thus, an obviousness showing for such a claim need only address one of the two claimed methods. *Id.* Whether *Schulhauser* applies to the challenged claims does not depend on any conclusions about the prior art; rather, the prior art may only affect the *result* of applying *Schulhauser*. In their briefing, the parties should discuss the applicability of *Schulhauser* in addition to the result of applying it to the claims here.

Additionally, discussing Petitioner's contentions, Patent Owner argues that "if accumulation is not enabled, the claims recite 'receiving . . . an allocation of a scheduled uplink resource to transmit data at a power level calculated by the UE based on the path loss" ***without a TPC command***." Prelim. Resp. 34. That appears to be an argument by Patent Owner that the claims require that, if operating such that accumulation is not enabled, a UE cannot receive a TPC command. To the extent Patent Owner wishes to pursue such a claim construction in this proceeding, it should explain the basis for such a position in the Response.

C. Obviousness over Zeira, Krishnan, and Khan

Petitioner asserts that Zeira teaches a conditional open- and closed-loop power-control scheme and that Krishnan teaches a similar power-control technique and further discloses that "the receiving terminal enables closed-loop control by sending a feedback signal to the transmitting terminal." Pet. 21; *id.* at 19–22. Petitioner asserts Khan teaches sending scheduling allocations and power-control information over a single physical channel. *Id.* at 22–24.

Zeira discloses a system and method for controlling wireless transmission power using combined open- and closed-loop operation. Ex. 1004, 1:12–16, 2:57–59. In closed-loop operation, Zeira describes a receiving unit measuring signal interference and sending a power command to a transmitting unit. *Id.* at 3:65–4:13. Zeira also describes that a transmitting unit can measure path loss to implement open-loop control. *Id.* at 4:14–17, 5:33–37. Zeira's combined system applies weighting to the various factors for determining transmission power. *Id.* at 6:4–49, 7:13–20. That weighting factor, α, permits the network operator "to use solely open loop or solely closed loop power control" if desired. *Id.* at 7:23–27.

Krishnan discloses a system and method for configuring devices to enable or disable closed-loop power control. Ex. 1005, Abstract. Based on whether interference is detected, Krishnan's system sends a "feedback signal indicating the status of closed-loop power control, such as an enable/disable bit." *Id.* at 7:49–8:3.

Khan discloses "[a] method for transmitting control information in a wireless communication system." Ex. 1006, Abstract. Khan's transmitted information relates to "reverse link packet transmission," or uplink

transmissions from UEs to base stations. *Id.* ¶¶ 3, 11, 12. The information sent to a UE includes both a scheduling grant and TPC information. *Id.* ¶ 12. Khan's scheduling grant allows the system to manage resources for wireless units (UEs) to transmit information. *Id.* ¶¶ 33–35. Khan discloses sending information to a UE using a "Forward MAC Channel" composed of "Walsh Channels," each identified by a "MACIndex value." *Id.* ¶¶ 40, 47.

1. Power control process that depends on whether accumulation is enabled

Zeira discloses that, "[u]nder certain conditions, the network operator may desire to use solely open loop or solely closed loop power control," and that "the operator may use solely closed loop power control by setting α to zero." Ex. 1004, 1:60–65, 7:23–27. Petitioner asserts that because Zeira's second station (the UE) receives a plurality of power commands, a person of skill would have understood that it also receives an indication of whether accumulation of TPC commands is enabled. Pet. 25 (citing Ex. 1002 ¶¶ 107–108).

Krishnan discloses that "receiving terminal sends a feedback signal indicating the status of closed-loop power control, such as an enable/disable bit." Ex. 1005, 7:43–45. Petitioner submits that Krishnan's feedback signal "indicates that accumulation of TPC commands is enabled because such accumulation is inherent in closed-loop power control." Pet. 26 (citing Ex. 1002 ¶ 112); *see* Ex. 1002 ¶¶ 110–113.

Petitioner asserts that combining Krishnan's feedback signal with Zeira's power-control system would have amounted to using known, predictable elements according to their established functions. Pet. 26. Further, Petitioner asserts that causing Zeira's closed-loop factor to be weighted to zero would have ceased accumulation of TPC commands.

Pet. 27–28 (citing Ex. 1004, 7:20–22, 6:4; Ex. 1002 ¶ 117). That disclosure by Zeira, continues Petitioner, would have led skilled artisans to consider Krishnan's disclosures regarding how to use a feedback signal to enable or disable closed-loop and open-loop power control. *Id.* (citing Ex. 1002 ¶¶ 118–119). Petitioner argues further that implementing Zeira's power-control options "would require some way to communicate to devices on a wireless network what power control scheme is being implemented," and that using Krishnan's feedback signal "was one of a limited number of design choices to do this and was thus 'obvious to try' as a means of communicating the power control scheme being used per Zeira." Pet. 29 (citing Ex. 1002 ¶ 120).

Patent Owner argues "Zeira does not teach the claimed control process that depends on whether accumulation has been enabled." Prelim. Resp. 28. Patent Owner recognizes that Zeira discloses using the parameter α to operate in solely open-loop or solely closed-loop power control, but maintains that Zeira does not describe the claimed process. *Id.* at 29–30. But Patent Owner does not explain its position other than to assert that Zeira fails to disclose the claimed process and that "the Office has already determined that Zeira's iterative process does not teach the conditional control process."[11] *Id.* at 30–31. As discussed above, the Office's prior determination appears to have been in error.

[11] Patent Owner additionally points out that the Petition does not rely on Khan to teach the recited conditional control process. Prelim. Resp. 33–36. Petitioner relies on Zeira and Krishnan in this regard, so Patent Owner's argument regarding Khan is inapposite.

Patent Owner further argues that "Krishnan also does not teach the specific control process recited in the claims." *Id.* at 31–33. According to Patent Owner, "Krishnan describes controlling closed loop power and open loop power based on whether interference is detected not based on whether or not accumulation has been enabled as recited in the claims of the '828 patent." *Id.* at 31–32. That argument, however, ignores that the claims do not restrict how a system performing the claim decides when to send an "indication of whether accumulation of transmit power control (TPC) commands is enabled" or which operational mode the indication triggers when sent. Thus, that Krishnan discloses using detected interference to trigger an indication of open/closed-loop operation does not bear on the claim. Based on the present record, Petitioner shows that Krishnan uses an indication (its feedback signal) to inform a UE whether to operate with open- or closed-loop power control, as described above.

Patent Owner argues further that Krishnan's feedback signal controls open/closed-loop operation, but does not necessarily indicate whether accumulation of TPC commands is enabled, because "[c]losed-loop power controls may be configured in numerous ways and may not include the accumulation of TPC commands." *Id.* at 32. As an example, Patent Owner states that "a transmit power may be calculated after a single TPC command has been received." *Id.* at 32–33 (citing Ex. 1001, 2:25–28, 6:31–38). Patent Owner's argument fails for two reasons. First, Petitioner asserts a combination where Krishnan's feedback signal controls Zeira's operation, so whether the feedback signal necessarily controls accumulation of TPC commands in Krishnan is inapposite. Second, the example Patent Owner provides, in which the initial TPC command in closed-loop operation causes

transmit-power recalculation, does not mean that accumulation is not enabled. At most, Patent Owner's example states that "accumulation may not occur," which is not the same as accumulation not being enabled.

We determine that Petitioner has shown adequately, for purposes of institution, that Zeira teaches using its α parameter to selectively control operation in open-loop or closed-loop power control (and whether TPC commands are accumulated), that Krishnan teaches a feedback signal to control whether a UE operates in open- or closed-loop power control, and that skilled artisans would have had reason to combine the teachings of Krishnan and Zeira as asserted.

2. Single physical channel

The challenged claims require "a single physical channel" carry both "an allocation of a scheduled uplink resource and a TPC command." *E.g.*, Ex. 1001, 13:42–47.

Petitioner submits that Zeira teaches sending TPC commands in a "dedicated channel," and that skilled artisans would have understood that such a "dedicated channel" could have been a single physical channel. Pet. 34–35 (citing Ex. 1002 ¶ 131; Ex. 1004, 4:10–14, 4:31–34; Fig. 3).

Petitioner further relies on Khan disclosing "that a single physical downlink channel may include both TPC commands and such an allocation of a scheduled uplink resource." *Id.* at 35 (citing Ex. 1002 ¶¶ 138–140). In particular, Petitioner submits that skilled artisans "would recognize that 'scheduling grants' are an 'allocation of a scheduled uplink resource' because they designate a particular time or rate at which a UE may transmit on the uplink." *Id.* at 36 (citing Ex. 1002 ¶ 137; Ex. 1006 ¶¶ 33, 35). Further, Petitioner relies on Khan's disclosures that a UE may be allocated a

particular physical channel (a "Walsh channel" identified by a "MACIndex value") carrying a scheduling grant and a TPC bit. *Id.* at 36–38 (citing Ex. 1006 ¶¶ 40, 45, 47, Fig. 5; Ex. 1002 ¶¶ 138–141).

Finally, Petitioner submits that it would have been obvious to combine Khan's single physical channel, used to carry an allocation of a scheduled uplink resource and a TPC command, with Zeira's power-control system, because doing so would have been using predictable, known elements according to their established functions. *Id.* at 38. Petitioner notes that Zeira discloses that UE transmits "in the appropriate time slots and codes of the assigned resource units" but does not specify how such resource units are assigned to the UE. *Id.* at 38–39 (quoting ex. 1004, 2:62–63, 6:63–65). Zeira's reference to "assigned resource units" would have motivated skilled artisans to seek out Khan, according to Petitioner, by indicating "that Zeira contemplates some scheduling function located at the receiving station that allocates such resources for uplink transmission." *Id.* at 39 (citing Ex. 1002 ¶¶ 142; Ex. 1006, Abstract).

At this stage, Patent Owner does not contest Petitioner's contentions regarding the single physical channel. We determine that Petitioner has shown adequately, for purposes of institution, that the combination would satisfy the claims' requirement for using a single physical channel.

3. Conclusion

We have reviewed Petitioner's submissions and Patent Owner's arguments, and we determine that Petitioner has shown a reasonable likelihood of prevailing with respect to unpatentability over Zeira, Krishnan, and Khan.

D. OBVIOUSNESS OVER ZEIRA, KRISHNAN, KHAN, AND ANDERSSON

Petitioner asserts that a combination of Zeira, Krishnan, Khan, and Andersson renders obvious claims 2, 9, 16, 23, 30, and 37. Pet. 62–67. At this time Patent Owner does not contest Petitioner's assertions regarding Andersson. At this time and on this record, we are persuaded that a skilled artisan would have understood the benefit offered from using Andersson's teachings, and would have applied those teachings to the combination of Zeira, Krishnan, and Khan to achieve that benefit. Petitioner has shown a reasonable likelihood of prevailing with respect to the combination of Zeira, Krishnan, Khan, and Andersson.

III. CONCLUSION

We have addressed all of Patent Owner's arguments raised in the Preliminary Response. For the foregoing reasons, we determine the information presented in the Petition establishes a reasonable likelihood that Petitioner will prevail in showing the challenged claims unpatentable. Thus, based on the standard in 35 U.S.C. § 314(a), and our evaluation of the present record, we institute *inter partes* review.

IV. ORDER

Accordingly, it is:

ORDERED that pursuant to 35 U.S.C. § 314(a), *inter partes* review of the '828 patent is instituted of the challenged claims on the grounds identified in the Petition.

Case IPR2018-01773
Patent 8,897,828 B2

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Entered: March 20, 2019

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ERICSSON INC. AND
TELEFONAKTIEBOLAGET LM ERICSSON,
Petitioner,

v.

INTELLECTUAL VENTURES II LLC,
Patent Owner.

Case IPR2018-01694
Patent 8,897,828 B2

Before KRISTEN L. DROESCH, MICHAEL W. KIM, and JASON W. MELVIN, *Administrative Patent Judges*.

MELVIN, *Administrative Patent Judge*.

DECISION
Instituting *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Petitioner, Ericsson Inc. and Telefonaktiebolaget LM Ericsson, filed a Petition (Paper 2, "Pet.") requesting *inter partes* review of claims 1, 2, 5, 6, 8, 9, 12, 13, 15, 16, 19, 20, 22, 23, 26, 27, 29, 30, 33, 34, 36, 37, 40, and 41 of U.S. Patent No. 8,897,828 B2 (Ex. 1001, "the '828 patent"). Patent Owner, Intellectual Ventures II LLC, timely filed a Preliminary Response. Paper 6 ("Prelim. Resp."). Pursuant to 35 U.S.C. § 314 and 37 C.F.R. § 42.4(a), we have authority to determine whether to institute review.

An *inter partes* review may not be instituted unless "the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." 35 U.S.C. § 314(a). For the reasons set forth below, we conclude that Petitioner has shown a reasonable likelihood it will prevail in establishing the unpatentability of at least one challenged claim. We, therefore, institute *inter partes* review of the challenged claims of the '828 patent in this proceeding.

A. RELATED MATTERS

As required by 37 C.F.R. § 42.8(b)(2), each party identifies various judicial or administrative matters that would affect or be affected by a decision in this proceeding. Pet. 1–2; Paper 5 (Patent Owner's Mandatory Notices).

B. THE '828 PATENT

The '828 patent is titled "Power Control in a Wireless Communication System" and describes power-control systems that can operate in multiple modes. Ex. 1001, (54), (57). In particular, the '828 patent describes open-

loop power control, in which a user equipment (UE) can measure path loss and use it to determine the transmit power level. *Id.* at 2:5–16. The '828 patent also describes closed-loop power control, in which the network measures the "signal to noise-plus-interference ratio (SNIR)" and uses it to issue transmit power control (TPC) commands to the UE. *Id.* at 1:50–56, 2:17–32. The '828 patent discloses that a UE receiving TPC commands may accumulate the commands to determine the transmit power level. *Id.* at 6:39–46, 7:16–19. The UE may include both open- and closed-loop functionality so that it may respond to either TPC commands or to a change in the path loss. *Id.* at 8:5–7.

C. CHALLENGED CLAIMS

Challenged claims 1, 8, 15, 22, 29, and 36 are independent. Claim 15 is illustrative of the claimed subject matter and is reproduced below:

> 15[pre]. A method performed by a wireless network, the method comprising:
>
> [a] sending, by the wireless network, an indication of whether accumulation of transmit power control (TPC) commands is enabled;
>
> [b] determining, by a user equipment (UE), a path loss of a downlink channel;
>
> [c] receiving, on a single physical channel by the UE if accumulation is enabled, an allocation of a scheduled uplink resource and a TPC command, wherein the TPC command is accumulated with other received TPC commands;
>
> [d] calculating, by the UE if accumulation is enabled, transmit power in association with an uplink communication based on both the path loss and the accumulated TPC commands; and

> [e] receiving, on the single physical channel by the UE if accumulation is not enabled, an allocation of a scheduled uplink resource to transmit data to the wireless network at a power level calculated by the UE based on the path loss.

Ex. 1001, 14:41–61[1]

D. Proposed Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability, each based on 35 U.S.C. § 103:

References	Claims
Zeira,[2] Chen,[3] and Cheng[4]	1, 5, 8, 12, 15, 19, 22, 26, 29, 33, 36, and 40
Zeira, Chen, Cheng, and Tong[5]	2, 9, 16, 23, 30, and 37
Zeira, Chen, Cheng, and Shiu[6]	6, 13, 20, 27, 34, and 41

Pet. 1. Petitioner also relies on the Declaration of Dr. Wayne Stark (Ex. 1003). *See generally* Pet. 11–73.

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[1] We add square-bracketed annotations to separate claim limitations as identified by the parties. *See* Pet. 25–49.
[2] U.S. Patent No. 6,728,292 B2 (filed June 11, 2003; iss. Apr. 27, 2004) (Ex. 1004).
[3] U.S. Patent No. 7,532,572 B2 (filed May 14, 2004; iss. May 12, 2009) (Ex. 1006).
[4] U.S. Patent No. 6,411,817 B1 (filed Jan. 21, 2000; iss. June 25, 2002) (Ex. 1005).
[5] U.S. Patent No. 6,529,741 B1 (filed Apr. 16, 1999; iss. Mar. 4, 2003) (Ex. 1009).
[6] U.S. Patent. No. 6,983,166 B2 (filed Aug. 20, 2001; iss. Jan. 3, 2006) (Ex. 1008).

II. DISCUSSION

A. 35 U.S.C. § 325(D)

Patent Owner argues that we should deny institution because the Petition relies on Zeira and Chen, which were "heavily considered during prosecution," and because "the Petition's arguments directly overlap with those considered during prosecution." Prelim. Resp. 15–19.

We consider multiple factors when determining whether to exercise our discretion not to institute under 35 U.S.C. § 325(d), potentially including:

> (a) the similarities and material differences between the asserted art and the prior art involved during examination; (b) the cumulative nature of the asserted art and the prior art evaluated during examination; (c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection; (d) the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art; (e) whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art; and (f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments.

Becton, Dickinson & Co. v. B. Braun Melsungen AG, Case IPR2017-01586, slip op. at 17—18 (PTAB Dec. 15, 2017) (Paper 8) (informative). As Patent Owner points out, Zeira was applied a number of times during prosecution. Prelim. Resp. 15–17. After the Board affirmed the Examiner's rejection over

a combination of Zeira[7] and two other references (Chen[8] and Van Lieshout[9]) (Ex. 1010, 124–31), the applicant amended the claims (*id.* at 95–111). The Examiner, in a statement of reasons for allowance, stated that Zeira teaches "receiving by the IE, an indication of whether accumulation of transmit power commands (TPC) is enabled" and "determining, by the UE, a path loss of a downlink channel." *Id.* at 20. According to the Examiner, however, none of the cited prior art, alone or in combination, teaches the remaining limitations of the independent claims. *Id.* at 21.

Petitioner discusses the prosecution history of the '828 patent, in particular the claim amendments made after the Examiner's rejection was affirmed by the Board. Pet. 7–10. Petitioner argues that the limitations of the allowed claims were nonetheless patentable over art at issue during prosecution (Zeira and Chen) in combination with Cheng. *Compare* Ex. 1010, 129, *with* Pet. 25–49. Petitioner relies on Cheng as teaching sending an indication regarding accumulation of TPC commands. Pet. 9–10, 30–31.

Thus, the art previously applied was extremely similar to the art now asserted. The Examiner, however, did not reject the amended claims based on prior art. *See* Ex. 1010, 78–82. Thus, we cannot compare how the Examiner applied the cited prior art references to the amended and now issued claims to contrast that with Petitioner's assertions. We recognize the similarities between the prior version of the claims for which the Board

[7] The Examiner applied the international publication of Zeira, WO 20/57574. Ex. 10102, 939–69.
[8] The Examiner applied Chen's published U.S. Patent Application No. US 2005/0025056 A1. Ex. 1010, 126; *see* Ex. 1006, (65).
[9] Published U.S. Patent Application No. US 2001/0036823 A1.

affirmed the Examiner's rejection and the amended claims the Examiner ultimately allowed.

In a statement of reasons for allowance, the Examiner stated that Zeira discloses certain limitations in the challenged claims, but that even a combination of the cited prior art did not disclose other limitations. Ex. 1010, 20–21. The Examiner's statement, however, does not appear consistent with Zeira's disclosures. For example, the Examiner stated that Zeira teaches "receiving, by the IE, an indication of whether accumulation of transmit power control (TPC) commands is enabled" and cited Zeira's summary section. *Id.* at 20 (citing *id.* at 944:17–945:8). But Zeira's summary does not provide a disclosure supporting that Zeira teaches that limitation. Thus, we have concerns with the Examiner's statements regarding Zeira. Although the Examiner stated that neither Zeira alone nor a combination of the cited references discloses other limitations of the challenged claims, our review of Petitioner's contentions as discussed below indicates the Examiner erred.

In light of Petitioner's convincing presentation of unpatentability discussed below, we decline to exercise our discretion not to institute review in this proceeding. *See Becton, Dickinson*, slip op. at 18 (factors (e) and (f)). We note additionally that our intervening, precedential *Schulhauser* case may provide additional reasons for a conclusion that departs from the Examiner's allowance. *See Ex parte Schulhauser*, Appeal 2013-007847, 2016 WL 6277792 (PTAB Apr. 28, 2016). As discussed below, our conclusion regarding *Schulhauser*'s applicability may affect our final decision in this case.

B. Claim Construction

In an *inter partes* review, the Board interprets claims of an unexpired patent using the broadest-reasonable construction in light of the specification of the patent.[10] 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016).

Petitioner proposes constructions for two terms in the '828 patent: "accumulation of transmit power control (TPC) commands" and "multilevel TPC command." Pet. 17–20. Patent Owner asserts no construction is required for either term. Prelim. Resp. 12.

We conclude that, for the purpose of this Decision, there is no need to construe any term to resolve any issue presented by the Petition and Preliminary Response. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017); *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

As noted above, however, our precedential *Schulhauser* case may affect the outcome in this case. In *Schulhauser*, we held that a method claim directed to two alternative outcomes based on a binary indicator is construed to cover two different methods, and that the broadest-reasonable construction encompasses either one of those methods. *Schulhauser*, 2016 WL 6277792, *4. Thus, an obviousness showing for such a claim need only address one of the two claimed methods. *Id.* Although Patent Owner

[10] The Petition was filed before the November 13, 2018, effective date of the amendment to 37 C.F.R. § 42.100 changing the claim-construction standard applied in *inter partes* reviews. Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (to be codified at 37 C.F.R. pt. 42).

argues that *Schulhauser* is inapplicable to the '828 patent, that argument is based on the Examiner's statements during prosecution of the '828 patent. *See* Prelim. Resp. 12–13. As explained above, we are persuaded, at this stage of the proceeding, that at least some of the Examiner's statements were erroneous. Moreover, whether *Schulhauser* applies to the challenged claims does not depend on any conclusions about the prior art; rather, the prior art may only affect the *result* of applying *Schulhauser*. In their briefing, the parties should discuss the applicability of *Schulhauser* in addition to the result of applying it to the claims here.

C. Obviousness over Zeira, Chen, and Cheng

Petitioner asserts that Zeira teaches a conditional open- and closed-loop power-control scheme, that Chen teaches sending an allocation of a scheduled uplink resource to UEs, and that Cheng teaches sending an indication regarding power control to UEs. Pet. 20–49.

Zeira discloses a system and method for controlling wireless transmission power using combined open- and closed-loop operation. Ex. 1004, 1:12–16, 2:57–59. In closed-loop operation, Zeira describes a receiving unit measuring signal interference and sending a power command to a transmitting unit. *Id.* at 3:65–4:13. Zeira also describes that a transmitting unit can measure path loss to implement open-loop control. *Id.* at 4:14–17, 5:33–37. Zeira's combined system applies weighting to the various factors for determining transmission power. *Id.* at 6:4–49, 7:13–20. That weighting factor, α, permits the network operator "to use solely open loop or solely closed loop power control" if desired. *Id.* at 7:23–27.

Regarding Zeira's weighting factor (the α parameter), Petitioner submits that sending an indicator on the network "would have been a natural

and obvious mechanism for communicating the weighting factor to the UE." Pet. 23–24 (citing Ex. 1003 ¶ 82). Thus, Petitioner argues, "[t]o the extent that Zeira does not explicitly describe that the wireless network sends an indication of whether accumulation is enabled to the UE . . . , it would have been nevertheless obvious in view of Cheng." Pet. 30 (citing Ex. 1003 ¶ 95).

Cheng discloses a system and method for controlling wireless transmission power, in which a base station may command mobile stations (e.g., a UE) to use either "basic" or "enhanced dynamic power control" modes. Ex. 1005, 11:1–4. To instruct a mobile station to use a particular mode, the base station "sends a physical layer control message to the mobile stations." *Id.* at 11:9–19. Petitioner asserts also that sending an indicator to control Zeira's α parameter, as taught by Cheng, would have allowed skilled artisans "to ensure UE capability with the combined scheme taught by Zeira," and would have been "one obvious way to implement the network operators' desire to use solely open loop as an alternative to the combined scheme." Pet. 24 (citing Ex. 1003 ¶ 84).

Regarding the requirement to use a "single physical channel" for both "an allocation of a scheduled uplink resource and a TPC command," Petitioner asserts that "Zeira discloses that a TPC command 'is typically sent in a dedicated channel,' which is 'dedicated to the communication between the receiving station 50 and the transmitting station 52, step 40." Pet. 20–21 (quoting Ex. 1004, 4:31–34). Petitioner relies on Chen as disclosing "a base station that notifies the UE of allocated uplink resources on a dedicated control channel." Pet. 21 (citing Ex. 1006, 4:30–41). Chen discloses a scheduling method for packet communications between a mobile station and a base station. Ex. 1006, (57). Chen describes a "resource allocating unit" in

a base station, "configured to allocate a radio resource which is used in uplink packet communications with the mobile station." *Id.* at 4:29–32. Chen's base station further includes a "transmitting unit" that is "configured to notify the radio resources allocated by the resource allocating unit 14 to the mobile station via a downlink dedicated control channel (DCCH)." *Id.* at 4:38–41.

Petitioner asserts further that "Zeira and Chen both describe sending control information on a dedicated channel." Pet. 22 (citing Ex. 1003 ¶ 77). Petitioner also argues that a skilled artisan would have configured the combined system to use the same channel "so that the UE's transmit power could be adjusted before transmitting on the allocated resource." Pet. 23 (citing Ex. 1003 ¶ 80); *see also id.* at 22–23 ("Using the same dedicated channel for both the TPC commands and the resource allocation would have been a natural and obvious design choice." (citing Ex. 1003 ¶ 80)).

1. Power control process that depends on whether accumulation is enabled (all claims)

Zeira discloses that, "[u]nder certain conditions, the network operator may desire to use solely open loop or solely closed loop power control," and that "the operator may use solely closed loop power control by setting α to zero." Ex. 1004, 1:60–65, 7:23–27; *see* Pet. 27–28. Petitioner submits that because Zeira's closed-loop control uses the previous power-control factor when calculating the current power control factor, it includes a previous TPC command and, therefore, "TPC commands are 'accumulated'" as claimed. Pet. 27–28 (citing Ex. 1004, 5:48–50, 5:65–6:30; Ex. 1003 ¶¶ 89–90). Thus, because Zeira teaches that the network operator may use α to selectively use open- or closed-loop operation, Petitioner asserts that Zeira

teaches operating with closed-loop control when that accumulation is enabled. Pet. 27–29; *see also id.* at 30 ("A POSITA would understand that solely open loop is a mode in which accumulation is not enabled." (citing Ex. 1004, 7:23–25; Ex. 1003 ¶ 93)).

Patent Owner argues "Zeira does not teach the claimed control process that depends on whether accumulation has been enabled." Prelim. Resp. 24. Patent Owner recognizes that Zeira discloses using the parameter α to operate in solely open-loop or solely closed-loop power control, but maintains that Zeira does not describe the claimed process. *Id.* at 24–25. But Patent Owner does not explain its position other than to assert that Zeira fails to disclose the claimed process and that "the Office has already determined that Zeira's iterative process does not teach the conditional control process."[11] *Id.* at 25–26. As discussed above, the Office's prior determination appears to have been in error.

We determine that Petitioner has shown adequately for purposes of institution that Zeira teaches using its α parameter to selectively control operation in open-loop or closed-loop power control.

2. Single physical channel (all claims)

The challenged claims require "a single physical channel" carry both "an allocation of a scheduled uplink resource and a TPC command." *E.g.*, Ex. 1001, 13:42–47.

[11] Patent Owner additionally points out that the Petition does not rely on Cheng or Cheng to teach the recited conditional control process. Prelim. Resp. 26–27 (identifying "enablement of accumulation" as the relevant limitation). Petitioner relies on Zeira in this regard, so Patent Owner's argument regarding Chen and Cheng is inapposite.

Petitioner submits that Zeira teaches sending TPC commands in a "dedicated channel . . . dedicated to the communication between the receiving station 50 and transmitting station 52." Pet. 39 (quoting Ex. 1004, 4:31–34; citing Fig. 3). Petitioner asserts skilled artisans understood a dedicated channel as a "single physical channel" because it "would be transmitted on a physical radio channel" and because relevant specifications "describe that a dedicated channel is mapped onto (i.e., transmitted as) a dedicated physical channel (DPCH)." Pet. 39–40 (emphasis omitted) (citing Ex. 1003 ¶ 110; Ex. 1007, 354, Fig. 13.2).

Petitioner further relies on Chen disclosing a physical channel used to carry allocation and scheduling information from the base station to the remote receiver. To that end, Petitioner notes that the Board affirmed such a finding during prosecution. Pet. 41 (quoting Ex. 1010, 127, 129–30). Petitioner further identifies Chen's disclosures in support. Pet. 41–43 (citing Ex. 1006, 1:60–63, 3:5–8, 4:29–41; Ex. 1007, 354, Fig. 13.2; Ex. 1003 ¶¶ 111–112).

As to the combination of Zeira and Chen, Petitioner asserts:

> [I]t would have been manifestly obvious (and obvious to try) to use the same dedicated channel to send both pieces of information, as this would eliminate the need for additional, unnecessary physical channels to be established between the UE and base station, particularly in light of Zeira's suggestion that an additional "communication" can be sent with the TPC command on the same dedicated channel.

Pet. 43 (citing Ex. 1003 ¶ 112).

Patent Owner argues that the combination does not result in use of a "single physical channel" as claimed. Prelim. Resp. 27–28. To that end, Patent Owner argues that the Examiner and Board previously determined

Zeira does not disclose a "shared physical channel used to carry allocation and scheduling information from the base station to the remote transceiver." *Id.* at 27 (quoting Ex. 1010, 125, 128). Petitioner, however, notes that the claims before the Board required a "shared" channel, whereas the challenged claims do not. Pet. 41 n.13. Thus, a prior determination regarding a "shared physical channel" does not control the result for the challenged claims.

We determine that Petitioner has shown adequately for purposes of institution that the combination would satisfy the claims' requirement for using a single physical channel.

3. Actual transmission (claims 1 and 15)

In addition to the issues discussed above, claims 1 and 15 recite "receiving, by the UE" or "sending, by the wireless network" (respectively) "an indication of whether accumulation of TPC commands is enabled." *See* Ex. 1001, 13:39–41, 14:43–45. Patent Owner appears to distinguish those recitations as requiring actual transmissions, in contrast to other claims requiring the capability for such transmissions. *See* Prelim. Resp. 29. According to Patent Owner, neither setting Zeira's parameter α to a particular value nor measuring path loss of a channel equates to sending the claimed indication. *Id.* Similarly, because Cheng discloses only "basic" and "enhanced" power-control modes, Patent Owner argues that Cheng also fails to teach the claimed indication. *Id.* at 29–30. That argument, however, ignores that Petitioner relies on a combination of Zeira and Cheng, such that the indicator sent would represent the desired value for Zeira's α parameter. Pet. 29–35.

Moreover, in Zeira, the transmitting device implements the dual-mode, open-and-closed-loop controller using the α parameter (Ex. 1004,

7:8–20, Fig. 4), so it appears that the operator's action must cause α to be sent to the UE. The communication of the α parameter causes Zeira's network devices to operate using "solely open loop or solely closed loop power control," and because only closed-loop control involves the accumulation of TPC commands, using the α parameter to select open- versus closed-loop control means the α parameter is an indication of whether accumulation of TPC commands is enabled. *See* Pet. 27–35.

We determine that Petitioner has shown adequately for purposes of institution that the combination would satisfy the claims' requirement for "receiving, by the UE" or "sending, by the wireless network" "an indication of whether accumulation of TPC commands is enabled."

4. Conclusion

We have reviewed Petitioner's submissions and Patent Owner's arguments, and we determine that Petitioner has shown a reasonable likelihood of prevailing with respect to unpatentability over Zeira, Chen, and Cheng.

D. OBVIOUSNESS OVER ZEIRA, CHEN, CHENG, AND TONG

Petitioner asserts that a combination of Zeira, Chen, Cheng, and Tong renders obvious claims 2, 9, 16, 23, 30, and 37. Pet. 64–69. Petitioner relies on Tong as teaching "multilevel TPC commands," because "Tong discloses using more than one power control bit in the TPC command allows for additional step sizes." Pet. 16 (citing Ex. 1009, (57), 4:54–56, 5:15–25; *accord id.* at 64–65. Petitioner asserts skilled artisans would "include multilevel capability to TPC commands" because "Tong expressly teaches the benefits of additional step sizes, such as minimizing power overshoot

caused by power control command transmission delay." *Id.* at 66 (citing Ex. 1009, 2:13–45, 2:53–67; Ex. 1003 ¶ 163–164). Thus, Petitioner reasons, the combination would "support power control in dynamic environments without delay." *Id.*; *see also id.* at 66–68 (further arguing the combination would have been predictable and motivated by design incentives and market forces).

At this time Patent Owner does not contest Petitioner's assertions regarding Tong. At this time and on this record, we are persuaded that a skilled artisan would have understood the benefit offered from using Tong's teachings, and would have applied those teachings to the combination of Zeira, Chen, and Cheng to achieve that benefit. Petitioner has shown a reasonable likelihood of prevailing with respect to the combination of Zeira, Chen, Cheng, and Tong.

E. Obviousness over Zeira, Chen, Cheng, and Shiu

Petitioner asserts that a combination of Zeira, Chen, Cheng, and Shiu renders obvious claims 6, 13, 20, 27, 34, and 41. Pet. 69–74. Petitioner relies on Shiu as teaching "calculated transmit power is based on a selected transport format," because "Shiu discloses a power control method where calculated transmit power is based on a target SNIR that is chosen based on the selected transport format." Pet. 70 (citing Ex. 1008, 3:27–46). Petitioner reasons skilled artisans would have used Shiu's teachings with those of Zeira "in order to achieve the target signal to interference ratio." *Id.* (citing Ex. 1003 ¶ 176). Petitioner reasons further that, "[b]y minimizing the amount of transmit power while maintaining the target BLER, increased system capacity and reduced delays in serving users can be achieved." *Id.* at 71 (quoting Ex. 1008, 1:44–52); *see also id.* at 71–73 (further arguing the

combination would have been predictable and motivated by design incentives and market forces).

At this time Patent Owner does not contest Petitioner's assertions regarding Shiu. At this time and on this record, we are persuaded that a skilled artisan would have understood the benefit offered from using Shiu's teachings, and would have applied those teachings to the combination of Zeira, Chen, and Cheng to achieve that benefit. Petitioner has shown a reasonable likelihood of prevailing with respect to the combination of Zeira, Chen, Cheng, and Shiu.

III. CONCLUSION

We have addressed all of Patent Owner's arguments raised in the Preliminary Response. For the foregoing reasons, we determine the information presented in the Petition establishes a reasonable likelihood that Petitioner will prevail in showing the challenged claims unpatentable. Thus, based on the standard in 35 U.S.C. § 314(a), and our evaluation of the present record, we institute *inter partes* review.

IV. ORDER

Accordingly, it is:

ORDERED that pursuant to 35 U.S.C. § 314(a), *inter partes* review of the '828 patent is instituted of the challenged claims on the grounds identified in the Petition.

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NOKIA OF AMERICA CORPORATION,
Petitioner,

v.

INTELLECTUAL VENTURES II LLC,
Patent Owner.

Case IPR2018-01641
Patent 8,897,828 B2

Before KRISTEN L. DROESCH, MICHAEL W. KIM, and JASON W. MELVIN, *Administrative Patent Judges*.

MELVIN, *Administrative Patent Judge*.

DECISION
Instituting *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Petitioner, Nokia of America Corporation, filed a Petition (Paper 2, "Pet.") requesting *inter partes* review of claims 1, 2, 5, 6, 8, 9, 12, 13, 15, 16, 19, 20, 22, 23, 26, 27, 29, 30, 33, 34, 36, 37, 40, and 41 ("the challenged claims") of U.S. Patent No. 8,897,828 B2 (Ex. 1001, "the '828 patent"). Patent Owner, Intellectual Ventures II LLC, timely filed a Preliminary Response. Paper 6 ("Prelim. Resp."). Pursuant to 35 U.S.C. § 314 and 37 C.F.R. § 42.4(a), we have authority to determine whether to institute review.

An *inter partes* review may not be instituted unless "the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." 35 U.S.C. § 314(a). For the reasons set forth below, we conclude that Petitioner has shown a reasonable likelihood it will prevail in establishing the unpatentability of at least one challenged claim. We, therefore, institute *inter partes* review of the challenged claims of the '828 patent in this proceeding.

A. RELATED MATTERS

As required by 37 C.F.R. § 42.8(b)(2), each party identifies various judicial or administrative matters that would affect or be affected by a decision in this proceeding. Pet. 3; Paper 4 (Patent Owner's Mandatory Notices).

B. THE '828 PATENT

The '828 patent is titled "Power Control in a Wireless Communication System" and describes power-control systems that can operate in multiple

modes. Ex. 1001, (54), (57). In particular, the '828 patent describes open-loop power control, in which a user equipment (UE) can measure path loss and use it to determine the transmit power level. *Id.* at 2:5–16. The '828 patent also describes closed-loop power control, in which the network measures the "signal to noise-plus-interference ratio (SNIR)" and uses it to issue transmit power control (TPC) commands to the UE. *Id.* at 1:50–56, 2:17–32. The '828 patent discloses that a UE receiving TPC commands may accumulate the commands to determine the transmit power level. *Id.* at 6:39–46, 7:16–19. The UE may include both open- and closed-loop functionality so that it may respond to either TPC commands or to a change in the path loss. *Id.* at 8:5–7.

C. CHALLENGED CLAIMS

Challenged claims 1, 8, 15, 22, 29, and 36 are independent. Claim 1 is illustrative of the claimed subject matter and is reproduced below:

> 1. A method performed by user equipment (UE), the method comprising:
>
> [1.1] receiving, by the UE, an indication of whether accumulation of transmit power control (TPC) commands is enabled;
>
> [1.2] determining, by the UE, a path loss of a downlink channel;
>
> [1.3] receiving, on a single physical channel by the UE if accumulation is enabled, an allocation of a scheduled uplink resource and a TPC command, wherein the TPC command is accumulated with other received TPC commands;
>
> [1.4] calculating, by the UE if accumulation is enabled, transmit power in association with an uplink communication based on both the path loss and the accumulated TPC commands; and

[1.5] receiving, on the single physical channel by the UE if accumulation is not enabled, an allocation of a scheduled uplink resource to transmit data at a power level calculated by the UE based on the path loss.

Ex. 1001, 13:37–55.[1]

D. Proposed Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability, each based on 35 U.S.C. § 103:

References	Claims
Zeira[2] and Whinnett[3]	1, 5, 6, 8, 12, 13, 15, 19, 20, 22, 26, 27, 29, 33, 34, 36, 40 and 41
Zeira, Whinnett, and R1-99151[4]	2, 9, 16, 23, 30, and 37

Pet. 6. Petitioner also relies on the Declaration of Dr. Paul Min (Ex. 1003). *See generally* Pet. 15–60.

II. DISCUSSION

A. 35 U.S.C. § 325(d)

Patent Owner argues that we should deny institution because the Petition relies on Zeira, which was "extensively considered during

[1] We add square-bracketed annotations to separate claim limitations as identified by the parties. *See* Pet. 29–39.
[2] U.S. Patent No. 6,728,292 B2 (filed June 11, 2003; iss. Apr. 27, 2004) (Ex. 1005).
[3] U.S. Patent App. Pub. No. 2004/0219919 A1 (filed Apr. 30, 2003; pub. Nov. 4, 2004) (Ex. 1006).
[4] 3GPP TSG RAN WG1#3 TDoc R1-99151, "Adaptive Step Power Control (ASPC)", Panasonic (Matsushita Communication Industrial Co., Ltd.) (pub. March 24, 1999) (Ex. 1007).

prosecution," and relies on Zeira for the same limitations the Examiner determined are patentable over Zeira. Prelim. Resp. 13–22.

We consider multiple factors when determining whether to exercise our discretion not to institute under 35 U.S.C. § 325(d), potentially including:

> (a) the similarities and material differences between the asserted art and the prior art involved during examination; (b) the cumulative nature of the asserted art and the prior art evaluated during examination; (c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection; (d) the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art; (e) whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art; and (f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments.

Becton, Dickinson & Co. v. B. Braun Melsungen AG, Case IPR2017-01586, slip op. at 17–18 (PTAB Dec. 15, 2017) (Paper 8) (informative). As Patent Owner points out, Zeira was applied a number of times during prosecution. Prelim. Resp. 17–19. After the Board affirmed the Examiner's rejection over a combination of Zeira[5] and two other references (Chen[6] and Van Lieshout[7]) (Ex. 1002, 971–78), the applicant amended the claims (*id.* at 987–1003). The Examiner, in a statement of reasons for allowance, stated that Zeira teaches "receiving by the IE, an indication of whether accumulation of transmit

[5] The Examiner applied the international publication of Zeira, WO 20/57574. Ex. 1002, 227–57.
[6] Published U.S. Patent Application No. US 2005/0025056 A1.
[7] Published U.S. Patent Application No. US 2001/0036823 A1.

power commands (TPC) is enabled" and "determining, by the UE, a path loss of a downlink channel." *Id.* at 1073. According to the Examiner, however, none of the cited prior art, alone or in combination, teaches the remaining limitations of the independent claims. *Id.* at 1074.

Petitioner presents the prosecution history of the '828 patent, in particular showing the claim amendments made after the Examiner's rejection was affirmed by the Board. Pet. 11–14. As compared to those claims deemed unpatentable, Petitioner submits the challenged claims differ because

> (1) the Applicant amended the previously claimed "shared channel" to recite a "single physical channel" and (2) the Applicant added conditional limitations, specifically the UE receives "an indication of whether accumulation of transmit power control (TPC) commands is enabled . . . if accumulation is enabled, a transmit power in association with an uplink communication [is] based on both the path loss and the accumulated TPC commands; and . . . if accumulation is not enabled, . . . power level [is] calculated . . . based on the path loss.

Id. at 13–14 (quoting Ex. 1002, 1037–51) (alterations added by Petitioner). Petitioner submits that those "differences do not merit or rise to the level of patentability." *Id.* at 14. Petitioner's position, therefore, is that the Examiner made a mistake in allowing the claims. Petitioner argues also that, in light of *Ex parte Schulhauser*, Appeal 2013-007847, 2016 WL 6277792 (PTAB Apr. 28, 2016), the Examiner should not have allowed the claims to issue. Pet. 14–15.

In this proceeding, Petitioner asserts a combination of Zeira and Whinnett and applies Whinnett in a role similar to that of Chen as applied by the Examiner. *Compare* Ex. 1002, 976, *with* Pet. 29–42. Thus, the art

previously applied was very similar to the art now asserted. The Examiner, however, did not reject the amended claims based on prior art. *See* Ex. 1002, 1011–15. Thus, we cannot compare how the Examiner applied the cited prior art references to the amended and now issued claims to contrast that with Petitioner's assertions. We recognize the similarities between the prior version of the claims for which the Board affirmed the Examiner's rejection and the amended claims the Examiner ultimately allowed. *See* Pet. 13.

In a statement of reasons for allowance, the Examiner stated that Zeira discloses certain limitations in the challenged claims, but that even a combination of the cited prior art did not disclose other limitations. Ex. 1002, 1073–74. The Examiner's statement, however, does not appear consistent with Zeira's disclosures. For example, the Examiner stated that Zeira teaches "receiving, by the IE, an indication of whether accumulation of transmit power control (TPC) commands is enabled" and cited Zeira's summary section. *Id.* at 1073 (citing *id.* at 232:17–233:8). But Zeira's summary does not provide a disclosure supporting that Zeira teaches that limitation. Thus, we have concerns with the Examiner's statements regarding Zeira. Although the Examiner stated that neither Zeira alone nor a combination of the cited references discloses other limitations of the challenged claims, our review of Petitioner's contentions as discussed below indicates that the Examiner erred.

In light of Petitioner's analysis comparing the amended and now issued claims to the prior version of the claims rejected by the Examiner and affirmed by the Board, and in light of Petitioner's convincing presentation of unpatentability discussed below, we decline to exercise our discretion not to institute review in this proceeding. *See Becton, Dickinson*, slip op. at 18

(factors (e) and (f)). We note additionally that our intervening, precedential *Schulhauser* case may provide additional reasons for a conclusion that departs from the Examiner's allowance. As discussed below, our conclusion regarding *Schulhauser*'s applicability may affect our final decision in this case.

B. Claim Construction

In an *inter partes* review, the Board interprets claims of an unexpired patent using the broadest-reasonable construction in light of the specification of the patent.[8] 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016).

Both Petitioner and Patent Owner assert no construction is required for any term in the challenged claims. Pet. 16; Prelim. Resp. 12. Patent Owner further argues that *Schulhauser* is not applicable to the challenged claims, because the Examiner found both claimed methods were missing from the prior art. Prelim. Resp. 12–13.

We conclude that, for the purpose of this Decision, there is no need to construe any term to resolve any issue presented by the Petition and Preliminary Response. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017); *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

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[8] The Petition was filed before the November 13, 2018, effective date of the amendment to 37 C.F.R. § 42.100 changing the claim-construction standard applied in *inter partes* reviews. Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (to be codified at 37 C.F.R. pt. 42).

As noted above, however, our precedential *Schulhauser* case may affect the outcome in this case. In *Schulhauser*, we held that a method claim directed to two alternative outcomes based on a binary indicator is construed to cover two different methods, and that the broadest-reasonable construction encompasses either one of those methods. *Schulhauser*, 2016 WL 6277792, *4. Thus, an obviousness showing for such a claim need only address one of the two claimed methods. *Id.* Although Patent Owner argues that *Schulhauser* is inapplicable to the '828 patent, that argument is based on the Examiner's statements during prosecution of the '828 patent. *See* Prelim. Resp. 12–13. As explained above, we are persuaded, at this stage of the proceeding, that at least some of the Examiner's statements were erroneous. Moreover, whether *Schulhauser* applies to the challenged claims does not depend on any conclusions about the prior art; rather, the prior art may only affect the *result* of applying *Schulhauser*. In their briefing, the parties should discuss the applicability of *Schulhauser* in addition to the result of applying it to the claims here.

C. Obviousness over Zeira and Whinnett

Petitioner asserts that Zeira teaches a conditional open- and closed-loop power-control scheme, and that Whinnett teaches sending an allocation of a scheduled uplink resource to UEs. Pet. 29–55.

Zeira discloses a system and method for controlling wireless transmission power using combined open- and closed-loop operation. Ex. 1005, 1:12–16, 2:57–59. In closed-loop operation, Zeira describes a receiving unit measuring signal interference and sending a power command to a transmitting unit. *Id.* at 3:65–4:13. Zeira also describes that a transmitting unit can measure path loss to implement open-loop control.

Id. at 4:14–17, 5:33–37. Zeira's combined system applies weighting to the various factors for determining transmission power. *Id.* at 6:4–49, 7:13–20. That weighting parameter, α, permits the network operator "to use solely open loop or solely closed loop power control" if desired. *Id.* at 7:23–27.

Whinnett discloses a system and method for scheduling uplink transmissions in wireless communications. Ex. 1006 ¶¶ 40–41. Whinnett discloses that a "UE" ("any suitable wireless communication device") sends information to a "node B" ("base transceiver station") regarding the data to be transmitted and the capabilities of the UE. *Id.* ¶¶ 42, 44. Using a "downlink dedicated channel or a high speed shared control channel," the network device sends a "scheduling assignment message (SAM)" to the UE that "informs the UE of the allocated transmission time and also for example the maximum power that the UE is permitted to use for the uplink transmission." *Id.* ¶ 45. The UE uses the scheduled allocation to transmit data. *Id.* ¶ 46.

Petitioner asserts that, in Zeira, "power control is used to reduce undesired errors in received signals and minimize interference with other communications." Pet. 54 (citing Ex. 1005, 1:43–54). Petitioner asserts that Whinnett furthers Zeira's performance goals "by introducing explicit Node-B scheduling as a 'feature of the enhanced uplink . . . whereby the node B controls the timing and power of uplink transmissions in such a way as to maximize uplink through put, while maintaining interference at an acceptable level.'" Pet. 54–55 (quoting Ex. 1006 ¶ 10).

1. Power control process that depends on whether accumulation is enabled (all challenged claims)

Zeira discloses that, "[u]nder certain conditions, the network operator may desire to use solely open loop or solely closed loop power control" and that "the operator may use solely closed loop power control by setting α to zero." Ex. 1005, 1:60–65, 7:23–27; *see* Pet. 30. Petitioner submits that because Zeira's closed-loop control uses the previous power-control factor when calculating the current power control factor, it includes a previous TPC command and, therefore, "TPC commands are being accumulated as claimed." Pet. 31 (citing Ex. 1005, 6:22–29; Ex. 1002, 489–90, Ex. 1003 ¶¶ 85–86). Thus, because Zeira teaches that the network operator may use α to selectively use open- or closed-loop operation, Petitioner asserts that Zeira teaches the "indication of whether accumulation of transmit power control (TPC) commands is enabled" and operating with closed-loop control when that accumulation is enabled. Pet. 30–32.

Patent Owner argues "Zeira does not teach the claimed control process that depends on whether accumulation has been enabled." Prelim. Resp. 26. Patent Owner recognizes that Zeira discloses using the parameter α to operate in solely open-loop or solely closed-loop power control, but maintains that Zeira does not describe the claimed process. *Id.* at 27–28. But Patent Owner does not explain its position other than to assert that Zeira fails to disclose the claimed process and that "the Office has already determined that Zeira's iterative process does not teach the conditional control

process."[9] *Id.* at 28. As discussed above, the Office's prior determination appears to have been in error.

We determine that Petitioner has shown adequately for purposes of institution that Zeira teaches using its α parameter to selectively control operation in open-loop or closed-loop power control.

2. Single physical channel (all challenged claims)

The challenged claims require "a single physical channel" carry both "an allocation of a scheduled uplink resource and a TPC command." *E.g.*, Ex. 1001, 13:42–47.

Petitioner submits that Zeira teaches sending TPC commands in a dedicated channel, which is a type of physical channel, and that "TPC commands are only sent in a physical channel." Pet. 33 (citing Ex. 1005, 4:31–35; Ex. 1052, 13, 38–39, 57, 60; Ex. 1053 ¶¶ 82–83). Petitioner further relies on Whinnett disclosing a "scheduling assignment message (SAM)" sent to a UE to inform it of the allocated transmission time and maximum permitted transmit power. *Id.* at 35 (citing Ex. 1006 ¶¶ 44–45). Because Whinnett discloses sending its SAM as "layer 1 (L1) signaling" over a "downlink dedicated channel" (Ex. 1006 ¶ 40; Ex. 1052; Ex. 1053), and because Zeira operates as a TDD[10] system where layer 1 signaling such as

[9] Patent Owner additionally points out that the Petition does not rely on Whinnett to teach the recited conditional control process. Prelim. Resp. 29 (identifying "enablement of accumulation" as the relevant limitation). Petitioner relies on Zeira in this regard, so Patent Owner's argument regarding Whinnett is inapposite.

[10] "In Time Division Duplex (TDD) systems, both uplink and downlink share the same carrier frequency." Ex. 1001, 4:35–36; *accord* Ex. 1005, 1:11–12.

TPC commands are transmitted on a single dedicated physical channel ("DPCH") (Ex. 1052, 13, 38, 39, 57, 60), Petitioner asserts the combination of Zeira and Whinnett results in a system where an allocation of a scheduled uplink resource and a TPC command are received on a single physical channel, as claimed. Pet. 36–37 (additionally citing Ex. 1003 ¶¶ 82, 83, 88, 90; Ex. 1053, 19–20).

Patent Owner argues that the combination does not result in use of a "single physical channel" as claimed. Prelim. Resp. 29–31. To that end, Patent Owner argues that the Examiner and Board previously determined Zeira does not disclose a "shared physical channel used to carry allocation and scheduling information from the base station to the remote transceiver." *Id.* at 29–30 (quoting Ex. 1002, 975). Petitioner, however, submits that a "shared physical channel" is but one type of physical channel, and that a "single physical channel" is broader than a shared physical channel. Pet. 33–34 (citing Ex. 1052; Ex. 1003 ¶¶ 82–83). For the purposes of institution, we agree with that analysis, and, thus, a prior determination regarding a "shared physical channel" does not control the result for the challenged claims.

We determine that Petitioner has shown adequately for purposes of institution that the combination would satisfy the claims' requirement for using a single physical channel.

3. Actual transmission (claims 1 and 15)

In addition to the issues discussed above, claims 1 and 15 recite "receiving, by the UE" or "sending, by the wireless network" (respectively) "an indication of whether accumulation of TPC commands is enabled." *See* Ex. 1001, 13:39–41, 14:43–45. Patent Owner appears to distinguish those recitations as requiring actual transmissions, in contrast to other claims

requiring the capability for such transmissions. *See* Prelim. Resp. 31–32. According to Patent Owner, neither setting Zeira's parameter α to a particular value nor measuring path loss of a channel equates to sending the claimed indication. *Id.*

In Zeira, the transmitting device implements the dual-mode, open-and-closed-loop controller using the α parameter (Ex. 1005, 7:8–20, Fig. 4), so it appears that the operator's action must cause α to be sent to the UE. The communication of the α parameter causes Zeira's network devices to operate using "solely open loop or solely closed loop power control," and because only closed-loop control involves the accumulation of TPC commands, using the α parameter to select open- versus closed-loop control means the α parameter is an indication of whether accumulation of TPC commands is enabled. *See* Pet. 30–32.

We determine that Petitioner has shown adequately for purposes of institution that the combination would satisfy the claims' requirement for "receiving, by the UE" or "sending, by the wireless network" "an indication of whether accumulation of TPC commands is enabled."

4. Conclusion

We have reviewed Petitioner's submissions and Patent Owner's arguments, and we determine that Petitioner has shown a reasonable likelihood of prevailing with respect to unpatentability over Zeira and Whinnett.

D. OBVIOUSNESS OVER ZEIRA, WHINNETT, AND R1-99151

Petitioner asserts that a combination of Zeira, Whinnett, and R1-91511 renders obvious dependent claims 2, 9, 16, 23, 30, and 37. Pet. 55–60.

In particular, Petitioner asserts that R1-91511 teaches the claimed "multilevel TPC command" by disclosing "Adaptive Step Power Control," which uses a TPC command where "the step size is represented by the ratio of the amplitudes between the power control data and pilot symbol." Pet. 55–56 (quoting Ex. 1007, 1–2). Petitioner asserts that, "[b]y using Adaptive Step Power Control as recited in R1-99151, power control systems can achieve better performance under any condition such as fast or slow changing channel environments without any additional overhead." Pet. 58 (citing Ex. 1007, 1, 11).

At this time Patent Owner does not contest Petitioner's assertions regarding R1-99151. At this time and on this record, we are persuaded that a skilled artisan would have understood the benefit offered from using R1-99151's multilevel TPC command, and would have applied R1-99151's teachings to the combination of Zeira and Whinnett to achieve that benefit. Petitioner has shown a reasonable likelihood of prevailing with respect to the combination of Zeira, Whinnett, and R1-99151.

III. CONCLUSION

We have addressed all of Patent Owner's arguments raised in the Preliminary Response. For the foregoing reasons, we determine the information presented in the Petition establishes a reasonable likelihood that Petitioner will prevail in showing the challenged claim unpatentable. Thus, based on the standard in 35 U.S.C. § 314(a), and our evaluation of the present record, we institute *inter partes* review.

IV. ORDER

Accordingly, it is:

ORDERED that pursuant to 35 U.S.C. § 314(a), *inter partes* review of the '828 patent is instituted of the challenged claims on the grounds identified in the Petition.

PETITIONER:

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John Poulos
John McKee
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PATENT OWNER:

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AO 120 (Rev. 08/10)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court For The Eastern District of Texas, Marshall Division on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2:17-cv-662	9/21/2017	For The Eastern District of Texas, Marshall Division

PLAINTIFF	DEFENDANT
INTELLECTUAL VENTURES II LLC	SPRINT SPECTRUM L.P., et al

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	8,682,357	3/25/2014	INTELLECTUAL VENTURES II LLC
2	8,897,828	11/25/2014	INTELLECTUAL VENTURES II LLC
3	8,953,641	2/10/2015	INTELLECTUAL VENTURES II LLC
4	9,320,018	4/19/2016	INTELLECTUAL VENTURES II LLC
5	9,532,330	12/27/2016	INTELLECTUAL VENTURES II LLC

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
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3		
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

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AO 120 (Rev. 08/10)

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INTELLECTUAL VENTURES II LLC	SPRINT SPECTRUM L.P., et al

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	9,681,466	6/13/2017	INTELLECTUAL VENTURES II LLC
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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
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PLAINTIFF	DEFENDANT
INTELLECTUAL VENTURES II LLC	T-MOBILE USA, INC., T-MOBILE US, INC., ERICSSON INC., and TELEFONAKTIEBOLAGET LM ERICSSON

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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2	8,897,828	11/25/2014	INTELLECTUAL VENTURES II LLC
3	8,953,641	2/10/2015	INTELLECTUAL VENTURES II LLC
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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/917,968	11/25/2014	8897828	IPW2-USAP191629	3609

3624 7590 11/05/2014

VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 891 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Nicholas William Anderson, Bristol, UNITED KINGDOM;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	10917968
	Filing Date	2004-08-12
	First Named Inventor	Nicholas William Anderson
	Art Unit	2647
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	IPW2-USAP191629

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	1	20050073973	A1	2005-04-07	LaRoia et al.	

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

EFS Web 2.1.17 ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.R./

Receipt date: 09/23/2014	Application Number	10917968 10917968 - GAU: 2647
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)	Filing Date	2004-08-12
	First Named Inventor	Nicholas William Anderson
	Art Unit	2647
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	IPW2-USAP191629

	1		☐

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EXAMINER SIGNATURE

Examiner Signature	/Dominic Rego/	Date Considered	10/21/2014

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/917,968	08/12/2004	Nicholas William Anderson	IPW2-USAP191629	3609

3624 7590 10/27/2014

VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103

EXAMINER	
REGO, DOMINIC E	
ART UNIT	PAPER NUMBER
2647	

NOTIFICATION DATE	DELIVERY MODE
10/27/2014	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

eoffice@volpe-koenig.com

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U.S. Patent and Trademark Office
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Alexandria, Virginia 22313-1450

APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
10/917,968	12 August, 2004	ANDERSON, NICHOLAS WILLIAM	IPW2-USAP191629

VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103

EXAMINER	
DOMINIC E. REGO	
ART UNIT	PAPER
2647	20141021

DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner for Patents

IDS filed 09/23/2014 has been considered fully.

/DOMINIC E REGO/
Primary Examiner, Art Unit 2647

PTO-90C (Rev.04-03)

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
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Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

3624 7590 09/26/2014
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UNITED PLAZA
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/917,968	08/12/2004	Nicholas William Anderson	IPW2-USAP191629	3609

TITLE OF INVENTION: Power control in a wireless communication system

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	12/26/2014

EXAMINER	ART UNIT	CLASS-SUBCLASS
REGO, DOMINIC E	2647	455-522000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 Volpe and Koenig, P.C.
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Intellectual Ventures Holding 81 LLC
(B) RESIDENCE: (CITY and STATE OR COUNTRY): Las Vegas, Nevada

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
☒ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
☐ A check is enclosed.
☒ Payment by credit card. Form PTO-2038 is attached.
☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 22-0493 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
☐ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
☐ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
☐ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Harry Vartanian/ Date October 10, 2014
Typed or printed name Harry Vartanian Registration No. 56,787

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Electronic Patent Application Fee Transmittal

Application Number:	10917968
Filing Date:	12-Aug-2004
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Filer:	Harry Vartanian/Belinda Fields
Attorney Docket Number:	IPW2-USAP191629

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl Issue Fee	1501	1	960	960
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**960**

Electronic Acknowledgement Receipt	
EFS ID:	20385951
Application Number:	10917968
International Application Number:	
Confirmation Number:	3609
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Customer Number:	3624
Filer:	Harry Vartanian/Belinda Fields
Filer Authorized By:	Harry Vartanian
Attorney Docket Number:	IPW2-USAP191629
Receipt Date:	10-OCT-2014
Filing Date:	12-AUG-2004
Time Stamp:	16:28:52
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$960
RAM confirmation Number	2886
Deposit Account	220493
Authorized User	VARTANIAN, HARRY
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees) Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)					

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	IPW2_USAP191629_Issue_Fee_20141010.PDF	104727 41442b68dd3162bde68a4450be21d24582 28467d	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	29975 1b19796bbdd434f0dbe3379f514142942d9 0c776	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	134702		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

3624 7590 09/26/2014

VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103

EXAMINER
REGO, DOMINIC E

ART UNIT	PAPER NUMBER
2647	

DATE MAILED: 09/26/2014

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/917,968	08/12/2004	Nicholas William Anderson	IPW2-USAP191629	3609

TITLE OF INVENTION: Power control in a wireless communication system

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	12/26/2014

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PTOL-85 (Rev. 02/11)

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

3624 7590 09/26/2014
VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/917,968	08/12/2004	Nicholas William Anderson	IPW2-USAP191629	3609

TITLE OF INVENTION: Power control in a wireless communication system

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	12/26/2014

EXAMINER	ART UNIT	CLASS-SUBCLASS
REGO, DOMINIC E	2647	455-522000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/917,968	08/12/2004	Nicholas William Anderson	IPW2-USAP191629	3609

3624 7590 09/26/2014

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EXAMINER	
REGO, DOMINIC E	
ART UNIT	PAPER NUMBER
2647	

DATE MAILED: 09/26/2014

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 10/917,968	Applicant(s) ANDERSON, NICHOLAS WILLIAM	
	Examiner DOMINIC E. REGO	Art Unit 2647	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *09/18/2014*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *51-92*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☒ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

1. The present application is being examined under the pre-AIA first to invent provisions.

DETAILED ACTION

Allowable Subject Matter

2. Claims 51-92 are allowed.

3. The following is an examiner's statement of reasons for allowance:

Regarding claims 51, 58, 65, 72, 79, and 86, the prior art of record, specifically Zeira et al. (International Publication Number #WO 2000/57574) teaches a method performed by user equipment (UE), the method comprising:

receiving, by the UE, an indication of whether accumulation of transmit power control (TPC) commands is enabled (Page 4, line 17-Page 5, line 8);

determining, by the UE, a path loss of a downlink channel *(Page 4, line 18-Page 5, line 8, Zeira teaches the first station (base station) transmits power commands based on in part a reception quality of the received communications. The first station (base station) transmits a second communication (remote terminal) having a transmission power level in a first time slot. The second station receives the second communication and the power commands. A power level of the second communication as received is measured (calculated). A path loss estimate is determined based on in part the measured received second communication power level and the first communication power level)*).

However, as a whole, none of the prior art cited alone or in combination provides the motivation to teach receiving, on a single physical channel by the UE if accumulation is enabled, an allocation of a scheduled uplink resource and a TPC command, wherein the TPC command is accumulated with other received TPC commands;

calculating, by the UE if accumulation is enabled, transmit power in association with an uplink communication based on both the path loss and the accumulated TPC commands; and

receiving, on the single physical channel by the UE if accumulation is not enabled, an allocation of a scheduled uplink resource to transmit data at a power level calculated by the UE based on the path loss.

Dependent claims 52-57, 59-64, 66-71, 73-78, 80-85, and 87-92 are allowed for the same reason.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DOMINIC E. REGO whose telephone number is (571)272-8132. The examiner can normally be reached on Monday-Friday, 9:00 am-5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nay A. Maung can be reached on 571-272-7882. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DOMINIC E REGO/
Primary Examiner, Art Unit 2647
Tel 571-272-8132

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	262	(down$link forward$link forward near2 link) near5 (physical near2 channel) same resource near5 allocat$3 same (power near3 command$3 tpc)	US-PGPUB; USPAT	OR	ON	2014/09/23 09:03
L2	0	1 same enabl$3 same disabl$3	US-PGPUB; USPAT	OR	ON	2014/09/23 09:04
L3	9	1 same allocat$3 with schedul$3 with (up$link reverse) with resource same (power near2 command$3 tpc)	US-PGPUB; USPAT	OR	ON	2014/09/23 09:05
L4	34163	455/522,68-70,115.3,126,135,226.3,277.2,422.1,450-453,456.2,464,509,510.ccls. 370/318.ccls.	US-PGPUB; USPAT	OR	ON	2014/09/23 09:05
L5	0	3 and (@ad <= "20040812" @rlad <= "20040812" @pd <= "20040812")	US-PGPUB; USPAT	OR	ON	2014/09/23 09:06
L6	1	3 and 4	US-PGPUB; USPAT	OR	ON	2014/09/23 09:06
L7	1266	schedul$3 same (path$loss path near loss)	US-PGPUB; USPAT	OR	ON	2014/09/23 09:06
L8	90	7 same (power near2 command$3 tpc)	US-PGPUB; USPAT	OR	ON	2014/09/23 09:06
L9	18	8 same resource near2 allocat$3	US-PGPUB; USPAT	OR	ON	2014/09/23 09:07
L10	0	9 and (@ad <= "20040812" @rlad <= "20040812" @pd <= "20040812")	US-PGPUB; USPAT	OR	ON	2014/09/23 09:07
L11	1	3 and 9	US-PGPUB; USPAT	OR	ON	2014/09/23 09:08

9/23/2014 9:08:17 AM
C:\Users\drego\Documents\EAST\Workspaces\10917968b.wsp

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S24	156	(nicholas near2 anderson).in.	US-PGPUB; USPAT	OR	ON	2014/08/30 07:54
S25	96	(intellectual near2 ventures near2 holding).as.	US-PGPUB; USPAT	OR	ON	2014/08/30 07:54
S26	3	((down$link forward$link forward near2 link) with channel same resource near5 allocat$3 same (power with command$3 tpc) same (up$link reverse$link reverse near link) same (path$loss path near2 loss)).clm.	US-PGPUB; USPAT	OR	ON	2014/08/30 07:57
S27	2	S24 and S26	US-PGPUB; USPAT	OR	ON	2014/08/30 07:57
S28	2	S25 and S26	US-PGPUB; USPAT	OR	ON	2014/08/30 07:57
S29	6	(resource with allocat$3 same (power near3 command$3 tpc) same (path$loss path near2 loss)).clm.	US-PGPUB; USPAT	OR	ON	2014/08/30 07:58
S30	2	S25 and S27	US-PGPUB; USPAT	OR	ON	2014/08/30 07:59
S31	2	S24 and S27	US-PGPUB; USPAT	OR	ON	2014/08/30 07:59

9/22/2014 5:53:08 PM
C:\Users\drego\Documents\EAST\Workspaces\13726976.wsp

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S32	7	(down$link forward$link forward near2 link) with channel same resource near5 allocat$3 same (power with command$3 tpc) same (up$link reverse$link reverse near link) same (path$loss path near2 loss)	US-PGPUB; USPAT	OR	ON	2014/08/30 07:59
S33	33822	455/522,68-70,115.3,126,135,226.3,277.2,422.1,450-453,456.2,464,509,510.ccls. 370/318.ccls.	US-PGPUB; USPAT	OR	ON	2014/08/30 08:00
S34	0	S32 and S33	US-PGPUB; USPAT	OR	ON	2014/08/30 08:00
S35	77	resource with allocat$3 same (power near3 command$3 tpc) same (path$loss path near2 loss)	US-PGPUB; USPAT	OR	ON	2014/08/30 08:01
S36	28	S33 and S35	US-PGPUB; USPAT	OR	ON	2014/08/30 08:01
S37	0	S36 and (@ad <= "20040812" @rlad <= "20040812" @pd <= "20040812")	US-PGPUB; USPAT	OR	ON	2014/08/30 08:02
S38	23020	(transmi$6 send$3 forward$3 deliver$3 provid$3) with physical near2 channel	US-PGPUB; USPAT	OR	ON	2014/08/30 08:03
S39	1130	resourc$3 near3 allocat$3 with (power near3 command$3 tpc)	US-PGPUB; USPAT	OR	ON	2014/08/30 08:04
S40	1123	resourc$3 near3 allocat$3 with (power near3 commands tpc)	US-PGPUB; USPAT	OR	ON	2014/08/30 08:05
S41	124	S38 same S40	US-PGPUB; USPAT	OR	ON	2014/08/30 08:05
S42	710	resourc$3 near3 allocat$3 near3 information with (power near3 commands tpc)	US-PGPUB; USPAT	OR	ON	2014/08/30 08:05
S43	118	S38 same S42	US-PGPUB; USPAT	OR	ON	2014/08/30 08:05
S44	1	resourc$3 near3 allocat$3 near3 information with (power near3 commands tpc) with (path$loss path near2 loss) same format$3 near3 (uplink reverse) near2 signal	US-PGPUB; USPAT	OR	ON	2014/08/30 08:07
S45	2	resourc$3 near3 allocat$3 near3 information same (power near3 commands tpc) same (path$loss path near2 loss) same format$3 near3 (uplink reverse) near2 signal	US-PGPUB; USPAT	OR	ON	2014/08/30 08:08
S46	710	resourc$3 near3 allocat$3 near3 information with (power near3 commands tpc)	US-PGPUB;	OR	ON	2014/08/30 08:08

			USPAT			
S47	2	S46 same (path$loss path near2 loss) same format$3 near3 (uplink reverse) near2 signal	US-PGPUB; USPAT	OR	ON	2014/08/30 08:09
S48	700	(transmi$6 send$3 forward$3 deliver$3 provid$3) with resource$1 near3 allocat$3 near3 information with (power with command$3 tpc)	US-PGPUB; USPAT	OR	ON	2014/08/30 08:15
S49	6	S48 and (@ad <= "20040812" @rlad <= "20040812" @pd <= "20040812")	US-PGPUB; USPAT	OR	ON	2014/08/30 08:15

9/22/2014 6:05:47 PM
C:\Users\drego\Documents\EAST\Workspaces\13726976.wsp

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10917968	ANDERSON, NICHOLAS WILLIAM
	Examiner	**Art Unit**
	DOMINIC E REGO	2647

CPC						
Symbol					**Type**	**Version**
H04W		72	/	0473	F	2013-01-01
H04W		52	/	06	I	2013-01-01
H04W		52	/	24	I	2013-01-01
H04W		52	/	08	A	2013-01-01
H04W		52	/	10	A	2013-01-01
H04W		52	/	12	A	2013-01-01
H04W		52	/	221	A	2013-01-01
H04W		52	/	242	A	2013-01-01
H04W		52	/	243	A	2013-01-01
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			/			
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CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	42	
/DOMINIC E REGO/ Primary Examiner.Art Unit 2647	09/23/2014	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10917968	ANDERSON, NICHOLAS WILLIAM
	Examiner	**Art Unit**
	DOMINIC E REGO	2647

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION	
CLASS	SUBCLASS	CLAIMED	NON-CLAIMED
455	522	H 0 4 B 7 / 00 (2006.01.01)	

CROSS REFERENCE(S)					
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
455	68	69			

NONE		Total Claims Allowed:
(Assistant Examiner)	(Date)	42
/DOMINIC E REGO/ Primary Examiner.Art Unit 2647	09/23/2014	O.G. Print Claim(s): 1 / O.G. Print Figure: 1
(Primary Examiner)	(Date)	

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10917968	ANDERSON, NICHOLAS WILLIAM
	Examiner	**Art Unit**
	DOMINIC E REGO	2647

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☒ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		17		33		49	15	65	31	81				
	2		18		34		50	16	66	32	82				
	3		19		35	1	51	17	67	33	83				
	4		20		36	2	52	18	68	34	84				
	5		21		37	3	53	19	69	35	85				
	6		22		38	4	54	20	70	36	86				
	7		23		39	5	55	21	71	37	87				
	8		24		40	6	56	22	72	38	88				
	9		25		41	7	57	23	73	39	89				
	10		26		42	8	58	24	74	40	90				
	11		27		43	9	59	25	75	41	91				
	12		28		44	10	60	26	76	42	92				
	13		29		45	11	61	27	77						
	14		30		46	12	62	28	78						
	15		31		47	13	63	29	79						
	16		32		48	14	64	30	80						

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	42	
/DOMINIC E REGO/ Primary Examiner.Art Unit 2647	09/23/2014	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office Part of Paper No.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10917968	ANDERSON, NICHOLAS WILLIAM
	Examiner	Art Unit
	DOMINIC E REGO	2618

CPC- SEARCHED		
Symbol	Date	Examiner
H04W 72/0473	6/13/2014	DR
H04W 52/24	6/13/2014	DR
H04W 52/242	6/13/2014	DR
H04W 52/08	6/13/2014	DR
H04W 52/10	6/13/2014	DR
H04W 52/12	6/13/2014	DR
H04W 52/221	6/13/2014	DR
H04W 52/248	6/13/2014	DR

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
455	522,68,69,115.3,126,127.1,296,127.2,67.11,434,436,135 ,226.3,277.2	7/28/2008	DR
370	331,320,335,342,318,392,252,276,280	7/28/2008	DR
375	147,130	7/28/2008	DR

SEARCH NOTES		
Search Notes	Date	Examiner
Consulted SPE Duc Nguyen regarding Restriction requirement	3/13/08	DR
Updated East Search	7/28/2008	DR
Updated East, Google, Inventor, and NPL search	3/15/2009	DR
Updated East Search	12/31/2009	DR
Updated above search	6/13/2014	DR
Updated above search	9/23/2014	DR

INTERFERENCE SEARCH			
US Class/ CPC Symbol	**US Subclass / CPC Group**	**Date**	**Examiner**
	PGPUB Text Search-See Interference Search History	9/23/2014	DR

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	10917968
	Filing Date	08-12-2004
	First Named Inventor	Nicholas William Anderson
	Art Unit	2647
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	IPW2-USAP191629

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	8134994	B2	2012-03-13	Liu et al.	* Corresponds to JP 2004-248247

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20040190485	A1	2004-09-30	Khan	* Corresponds to JP 2004-289842

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.R./

Receipt date: 08/25/2014	Application Number	10917968 10917968 - GAU: 2647
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)	Filing Date	08-12-2004
	First Named Inventor	Nicholas William Anderson
	Art Unit	2647
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	IPW2-USAP191629

	1	NON-FINAL REJECTION, U.S. Patent Application No. 13/726,976, dated May 22, 2014.	☐
	2	NON-FINAL REJECTION, U.S. Patent Application No. 13/727,153, dated May 22, 2014.	☐
	3	OFFICE ACTION, Japanese Patent Application No. 2011-234218, dated December 6, 2012.	☐
	4	OFFICE ACTION, Japanese Patent Application No. 2011-234218, dated December 6, 2012.	☐

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature	/Dominic Rego/	Date Considered	09/22/2014

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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PTO/SB/08a (01-10)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	10917968
	Filing Date	2004-08-12
	First Named Inventor	Nicholas William Anderson
	Art Unit	2647
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	IPW2-USAP191629

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20050073973	A1	2005-04-07	LaRoia et al.	
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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] ¡	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	10917968
	Filing Date	2004-08-12
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	Art Unit	2647
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	IPW2-USAP191629

	1		☐

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Examiner Signature		Date Considered	

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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	Application Number	10917968
	Filing Date	2004-08-12
	First Named Inventor	Nicholas William Anderson
	Art Unit	2647
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	IPW2-USAP191629

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Harry Vartanian/	Date (YYYY-MM-DD)	2014-09-23
Name/Print	Harry Vartanian	Registration Number	56,787

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal	
Application Number:	10917968
Filing Date:	12-Aug-2004
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Filer:	Harry Vartanian/Carey Kulp
Attorney Docket Number:	IPW2-USAP191629
Filed as Large Entity	

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt

EFS ID:	20218540
Application Number:	10917968
International Application Number:	
Confirmation Number:	3609
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Customer Number:	3624
Filer:	Harry Vartanian/Carey Kulp
Filer Authorized By:	Harry Vartanian
Attorney Docket Number:	IPW2-USAP191629
Receipt Date:	23-SEP-2014
Filing Date:	12-AUG-2004
Time Stamp:	15:08:22
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$180
RAM confirmation Number	1485
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1	Information Disclosure Statement (IDS) Form (SB08)	SB08.pdf	631618 05ff38314de2dc4d9011f3ae21fb35d7bf7b230a	no	4
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30060 9e9c8b7c4d27956cf2e9047a7823a169f56a2f5d	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	661678	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
	10/917,968	ANDERSON, NICHOLAS WILLIAM	

Document Code - DISQ	**Internal Document – DO NOT MAIL**

TERMINAL DISCLAIMER	☒ APPROVED	☐ DISAPPROVED
Date Filed : 9/18/14	**This patent is subject to a Terminal Disclaimer**	

Approved/Disapproved by:

Janice Ford

U.S. Patent and Trademark Office

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the **PATENT APPLICATION** of:	
Nicholas William Anderson	
Application No.: 10/917,968	Our File: IPW2-USAP191629
Confirmation No.: 3609	Date: September 18, 2014
Filed: August 12, 2004	
For: POWER CONTROL IN A WIRELESS COMMUNICATION SYSTEM	
Group: 2647	
Examiner: Dominic E. Rego	

RESPONSE PURSUANT TO 37 C.F.R. §1.111

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

This Response and Terminal Disclaimer are being timely filed in response to the Non-Final Office Action dated June 18, 2014.

Please amend the application without prejudice or disclaimer as follows:

3174020-1

Amendments to the Claims:

This listing of the claims will replace all prior versions of the claims in the application:

1-50. (CANCELED)

51. (Currently Amended) A method performed by user equipment (UE), the method comprising:

receiving, by the UE, an indication of whether accumulation of transmit power control (TPC) commands is enabled;

determining, by the UE, a path loss of a downlink channel;

receiving, on a single physical channel by the UE if accumulation is enabled, an allocation of a scheduled uplink resource and a TPC command, wherein the TPC command is accumulated with other received TPC commands;

calculating, by the UE if accumulation is enabled, [[a]] transmit power ~~for~~ in association with an uplink communication based on both the path loss and the accumulated TPC commands; and

receiving, on the single physical channel by the UE if accumulation is not enabled, an allocation of a scheduled uplink resource to transmit data at a power level calculated by the UE based on the path loss.

52. (Previously Presented) The method of claim 51, wherein the TPC command is a multilevel TPC command.

53. (Previously Presented) The method of claim 51, wherein the UE is a code division multiple access (CDMA) UE.

54. (Previously Presented) The method of claim 51, wherein the UE is a time division duplex (TDD) UE.

55. (Previously Presented) The method of claim 51, wherein the determining the path loss further includes computing a difference between a signaled transmit power and a measured received power of the downlink channel.

56. (Previously Presented) The method of claim 51, wherein the calculated transmit power is based on a selected transport format.

57. (Previously Presented) The method of claim 51, wherein the downlink channel or the single physical channel is each associated with a spreading factor or a code division multiple access (CDMA) code.

58. (Currently Amended) A user equipment (UE) characterized in that ~~comprising~~:

circuitry is configured to receive, by the UE, an indication of whether accumulation of transmit power control (TPC) commands is enabled;

circuitry is configured to determine a path loss of a downlink channel;

the circuitry is further configured to receive, on a single physical channel if accumulation is enabled, an allocation of a scheduled uplink resource and a TPC command, wherein the TPC command is accumulated with other received TPC commands;

circuitry is configured to calculate, by the UE if accumulation is enabled, [[a]] transmit power ~~for~~ in association with an uplink communication based on both the path loss and the accumulated TPC commands; and

the circuitry is further configured to receive, on the single physical channel by the UE if accumulation is not enabled, an allocation of a scheduled uplink resource to transmit data at a power level calculated by the UE based on the path loss.

59. (Previously Presented) The UE of claim 58, wherein the TPC command is a multilevel TPC command.

60. (Previously Presented) The UE of claim 58, wherein the UE is a code division multiple access (CDMA) UE.

61. (Previously Presented) The UE of claim 58, wherein the UE is a time division duplex (TDD) UE.

62. (Previously Presented) The UE of claim 58, wherein the determination of the path loss further includes a computation of a difference between a signaled transmit power and a measured received power of the downlink channel.

63. (Previously Presented) The UE of claim 58, wherein the calculated transmit power is based on a selected transport format.

64. (Previously Presented) The UE of claim 58, wherein the downlink channel or the single physical channel is each associated with a spreading factor or a code division multiple access (CDMA) code.

65. (Currently Amended) A method performed by a wireless network, the method comprising:

sending, by the wireless network, an indication of whether accumulation of transmit power control (TPC) commands is enabled;

determining, by a user equipment (UE), a path loss of a downlink channel;

receiving, on a single physical channel by the UE if accumulation is enabled, an allocation of a scheduled uplink resource and a TPC command, wherein the TPC command is accumulated with other received TPC commands;

calculating, by the UE if accumulation is enabled, [[a]] transmit power ~~for~~ in association with an uplink communication based on both the path loss and the accumulated TPC commands; and

receiving, on the single physical channel by the UE if accumulation is not enabled, an allocation of a scheduled uplink resource to transmit data to the wireless network at a power level calculated by the UE based on the path loss.

66. (Previously Presented) The method of claim 65, wherein the TPC command is a multilevel TPC command.

67. (Previously Presented) The method of claim 65, wherein the UE is a code division multiple access (CDMA) UE.

68. (Previously Presented) The method of claim 65, wherein the UE is a time division duplex (TDD) UE.

69. (Previously Presented) The method of claim 65, wherein the determining the path loss further includes computing a difference between a signaled transmit power and a measured received power of the downlink channel.

70. (Previously Presented) The method of claim 65, wherein the calculated transmit power is based on a selected transport format.

71. (Previously Presented) The method of claim 65, wherein the downlink channel or the single physical channel is each associated with a spreading factor or a code division multiple access (CDMA) code.

72. (Currently Amended) A wireless network characterized in that ~~comprising~~:

the wireless network is configured to send an indication of whether accumulation of transmit power control (TPC) commands is enabled;

a user equipment (UE) characterized in that ~~comprising~~:

circuitry is configured to determine, by the UE, a path loss of a downlink channel;

circuitry is configured to receive, on a single physical channel if accumulation is enabled, an allocation of a scheduled uplink resource and a

TPC command, wherein the TPC command is accumulated with other received TPC commands;

circuitry is configured to calculate, by the UE if accumulation is enabled, [[a]] transmit power ~~for~~ in association with an uplink communication based on both the path loss and the accumulated TPC commands; and

the circuitry is further configured to receive, on the single physical channel by the UE if accumulation is not enabled, an allocation of a scheduled uplink resource to transmit data to the wireless network at a power level calculated by the UE based on the path loss.

73. (Previously Presented) The wireless network of claim 72, wherein the TPC command is a multilevel TPC command.

74. (Previously Presented) The wireless network of claim 72, wherein the UE is a code division multiple access (CDMA) UE.

75. (Previously Presented) The wireless network of claim 72, wherein the UE is a time division duplex (TDD) UE.

76. (Previously Presented) The wireless network of claim 72, wherein the determination of the path loss further includes a computation of a difference between a signaled transmit power and a measured received power of the downlink channel.

77. (Previously Presented) The wireless network of claim 72, wherein the calculated transmit power is based on a selected transport format.

78. (Previously Presented) The wireless network of claim 72, wherein the downlink channel or the single physical channel is each associated with a spreading factor or a code division multiple access (CDMA) code.

79. (Previously Presented) A method performed by a network device, the method comprising:

sending, by the network device, an indication of whether accumulation of transmit power control (TPC) commands is enabled;

sending, on a single physical channel by the network device if accumulation is enabled, an allocation of a scheduled uplink resource and a TPC command to be accumulated with other received TPC commands at a user equipment (UE);

receiving, by the network device if accumulation is enabled, uplink communication at a transmit power, wherein the transmit power is calculated at

the UE based on both a determined path loss of a downlink channel and the accumulated TPC commands; and

sending, on the single physical channel to the UE if accumulation is not enabled, an allocation of a scheduled uplink resource to transmit data to the network device at a power level calculated at the UE based on the path loss.

80. (Previously Presented) The method of claim 79, wherein the TPC command is a multilevel TPC command.

81. (Previously Presented) The method of claim 79, wherein the network device is a code division multiple access (CDMA) network device.

82. (Previously Presented) The method of claim 79, wherein the network device is a time division duplex (TDD) network device.

83. (Previously Presented) The method of claim 79, wherein the determined path loss further includes computing a difference between a signaled transmit power and a measured received power of the downlink channel.

84. (Previously Presented) The method of claim 79, wherein the calculated transmit power is based on a selected transport format.

85. (Previously Presented) The method of claim 79, wherein the downlink channel or the single physical channel is each associated with a spreading factor or a code division multiple access (CDMA) code.

86. (Currently Amended) A network device characterized in that ~~comprising~~:

circuitry is configured to send, by the network device, an indication of whether accumulation of transmit power control (TPC) commands is enabled;

the circuitry is further configured to send, on a single physical channel if accumulation is enabled, an allocation of a scheduled uplink resource and a TPC command to be accumulated with other received TPC commands at a user equipment (UE);

circuitry is configured to receive, if accumulation is enabled, uplink communication at a transmit power, wherein the transmit power is calculated at the UE based on both a determined path loss of a downlink channel and the accumulated TPC commands; and

the circuitry is further configured to send, on the single physical channel if accumulation is not enabled, an allocation of a scheduled uplink resource to transmit data to the network device at a power level calculated at the UE based on the path loss.

87. (Previously Presented) The network device of claim 86, wherein the TPC command is a multilevel TPC command.

88. (Previously Presented) The network device of claim 86, wherein the network device is a code division multiple access (CDMA) network device.

89. (Previously Presented) The network device of claim 86, wherein the network device is a time division duplex (TDD) network device.

90. (Previously Presented) The network device of claim 86, wherein the determined path loss further includes a computation of a difference between a signaled transmit power and a measured received power of the downlink channel.

91. (Previously Presented) The network device of claim 86, wherein the calculated transmit power is based on a selected transport format.

92. (Previously Presented) The network device of claim 86, wherein the downlink channel or the single physical channel is each associated with a spreading factor or a code division multiple access (CDMA) code.

REMARKS/ARGUMENTS

After the foregoing Amendment, claims 51-92 are currently pending in this application. Claims 1-50 are canceled. Claims 51, 58, 65, 72, and 86 are amended.

Request for a Discussion

If any of the claims submitted herewith will be rejected by the Examiner, the Applicant respectfully requests the Examiner to contact the undersigned.

Double Patenting Rejection

Claims 51-92 are rejected under non-statutory double patenting as being unpatentable over claims 1-18 of U.S. Patent Application No. 13/726,976 and claims 1-10 of U.S. Patent Application No. 13/727,153. A Terminal Disclaimer is submitted herewith to overcome the rejection. Accordingly, withdrawal of the non-statutory double patenting rejection is respectfully requested.

Claim Rejections - 35 U.S.C. § 112

Claims 51, 58, 65, 72, 79, and 86 are rejected under 35 U.S.C. § 112(a) or 35 U.S.C. § 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement. Applicant respectfully disagrees with the rejection. With respect to claim 51, support may **at least be found** in U.S. Pat. Publication No. 2006/0035660 (pre-grant publication of the present application):

- figure 3, in particular items 314, 316, 318, 320, 322, 300, 302, or 304;

- paragraph [0087] "...a Node-B or RNC may be implemented with a new parameter, either included in a signaling command or a broadcast message, where the new parameter instructs a UE to enable or disable the setting of uplink transmit power level based on both the path loss estimation and the TPC commands. A parameter may indicate whether a UE is to use open loop power control, closed loop power control or a combined scheme;"

- paragraph [0014] "...determining a path loss of a radio channel between a base station and a remote transceiver; receiving a transmit power control (TPC) command transmitted to the remote transceiver from the base station;"

- paragraph [0015] "...power control in a radio communications system, the method comprising: receiving a signal at a second transceiver transmitted from a first transceiver; measuring a power level of the received signal; receiving a transmit power control (TPC) command at the second transceiver transmitted from the first transceiver;"

- paragraph [0086] "[i]n a system using the combined power control scheme, a new physical channel on the downlink may be used to carry fast allocation and scheduling information to a user, thereby informing the UE of the uplink resources that it may use. This new physical channel could also be used as the feedback channel for the combined power control scheme. For example, an allocation/scheduling channel could carry TPC commands;"

- paragraph [0061] "[t]hus, for the current frame k, the UE may calculate the transmit power $P_{Tx}(k)$ as shown below where K is the initial frame number determined when the power control process begins; TPCi is -1 for a down TPC command, +1 for an up TPC command and 0 if no TPC command is received; and step is the magnitude of the amount added to an accumulator upon receipt of each TPC command. The transmit power $P_{Tx}(k)$ may be updated for every frame period. Alternatively, the transmit power $P_{Tx}(k)$ may be updated each time a new TPC command is received. Alternatively, the transmit power $P_{Tx}(k)$ may be updated only when either a TPC command or a new power level is received from the network.

$$P_{Tx}(k) = P_{open(k)} + \text{step} \cdot \sum_{i=k-K}^{k} TPC_i + y_{SF} + \beta_{TFC}$$

;" and

- paragraph [0057] "an open loop component may be located in the UE and driven by measured beacon received power levels and path loss calculations;"

The support above is roughly given in the order of claim elements expressed in claim 51. Current claims 58, 65, 72, 79, and 86 are also supported at least by the above paragraphs and figure 3. Based on the arguments presented above, withdrawal of the 35 U.S.C. § 112 rejection of claims 51, 58, 65, 72, 79, and 86 is respectfully requested.

Conclusion

It should also be noted that although arguments have been presented with respect to certain claims herein, the recited subject matter as well as various other subject matter and/or combinations of subject matter may be patentable for other reasons. Further, the failure to address any statement by the Examiner herein should not be interpreted as acquiescence or agreement with such statement. The Applicant expressly reserves the right to set forth additional and/or alternative reasons for patentability and/or allowance with the present application or in any other future proceeding, and to rebut any statement presented by the Examiner in this or other papers during prosecution of the present application.

If the Examiner believes that any additional minor formal matters need to be addressed in order to place this application in condition for allowance, or that a telephonic interview will help to materially advance the prosecution of this application, the Examiner is invited to contact the undersigned by telephone at the Examiner's convenience.

In view of the foregoing, Applicant respectfully submits that the present application, including claims 51-92, is in condition for allowance and a notice to that effect is respectfully requested.

Respectfully submitted,

Nicholas William Anderson

By: /Harry Vartanian/
Harry Vartanian
Registration No. 56,787

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HV/eam

Electronic Patent Application Fee Transmittal	
Application Number:	10917968
Filing Date:	12-Aug-2004
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Filer:	Harry Vartanian/Elizabeth McGinty
Attorney Docket Number:	IPW2-USAP191629
Filed as Large Entity	

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Statutory or Terminal Disclaimer	1814	1	160	160
		Total in USD ($)		**160**

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EFS ID:	20179979
Application Number:	10917968
International Application Number:	
Confirmation Number:	3609
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Customer Number:	3624
Filer:	Harry Vartanian/Elizabeth McGinty
Filer Authorized By:	Harry Vartanian
Attorney Docket Number:	IPW2-USAP191629
Receipt Date:	18-SEP-2014
Filing Date:	12-AUG-2004
Time Stamp:	17:12:36
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$160
RAM confirmation Number	3911
Deposit Account	220493
Authorized User	VARTANIAN, HARRY
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Terminal Disclaimer Filed	IPW2-USAP191629-TerminalDisclaimer-20140918.PDF	342764 946ec42daeffa7947b5950bb45754da46a841cd0	no	2
Warnings:					
Information:					
2		IPW2-USAP191629-NonFinalResponse-20140918.PDF	101301 1759e7adb441f6a249d4cf565782ff43747d0048	yes	16

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	12
	Applicant Arguments/Remarks Made in an Amendment	13	16

Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30035 d96a694bbd8879564aa8fa3fc17d3d9de0cc3748	no	2
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TERMINAL DISCLAIMER TO OBVIATE A PROVISIONAL DOUBLE PATENTING REJECTION OVER A PENDING "REFERENCE" APPLICATION	Docket Number (Optional) IPW2-USAP191629

In re Application of: Nicholas William Anderson

Application No.: 10/917,968

Filed: August 12, 2014

For: POWER CONTROL IN A WIRELESS COMMUNICATION SYSTEM

The owner*, Intellectual Ventures Holding 81 LLC, of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of any patent granted on pending **reference** Application Number 13726976 & 13727153, filed 12/26/12 & 12/26/12, as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and any patent granted on the **reference** application are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term of any patent granted on said **reference** application, "as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application," in the event that: any such patent: granted on the pending **reference** application: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as shortened by any terminal disclaimer filed prior to its grant.

Check either box 1 or 2 below, if appropriate.

1. ☐ For submissions on behalf of a business/organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the business/organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. ☑ The undersigned is an attorney or agent of record. Reg. No. 56,787

/Harry Vartanian/ — Signature
September 18, 2014 — Date

Harry Vartanian — Typed or printed name

215-568-6400 — Telephone Number

☑ Terminal disclaimer fee under 37 CFR 1.20(d) is included.

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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
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	Application Number	10917968
	Filing Date	08-12-2004
	First Named Inventor	Nicholas William Anderson
	Art Unit	2647
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	IPW2-USAP191629

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	10917968
	Filing Date	08-12-2004
	First Named Inventor	Nicholas William Anderson
	Art Unit	2647
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	IPW2-USAP191629

	1	NON-FINAL REJECTION, U.S. Patent Application No. 13/726,976, dated May 22, 2014.	☐
	2	NON-FINAL REJECTION, U.S. Patent Application No. 13/727,153, dated May 22, 2014.	☐
	3	OFFICE ACTION, Japanese Patent Application No. 2011-234218, dated December 6, 2012.	☐
	4	OFFICE ACTION, Japanese Patent Application No. 2011-234218, dated December 6, 2012.	☐

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	10917968
	Filing Date	08-12-2004
	First Named Inventor	Nicholas William Anderson
	Art Unit	2647
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	IPW2-USAP191629

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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☐ See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Harry Vartanian/	Date (YYYY-MM-DD)	2014-08-25
Name/Print	Harry Vartanian	Registration Number	56,787

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the **PATENT APPLICATION** of:	
Nicholas William Anderson	
Application No.: 10/917,968	
Confirmation No.: 3609	
Filed: August 12, 2004	
For: POWER CONTROL IN A WIRELESS COMMUNICATION SYSTEM	
Group: 2647	
Examiner: Dominic E. Rego	

Our File: IPW2-USAP191629

Date: August 25, 2014

INFORMATION DISCLOSURE STATEMENT

Mail Stop Amendment (via EFS)
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Further to Applicant's Duty of Disclosure pursuant to 37 C.F.R. §1.56, Applicant wishes to bring to the Examiner's attention the material cited on the enclosed SB-08 Form.

Copies of the newly cited documents are enclosed. Pursuant to 37 C.F.R. §1.98(a)(2)(ii), copies of the newly cited U.S. publications and/or patent documents have not been included.

Applicant would like to bring the following Applications to the Examiner's attention: U.S. Patent Application No. 13/727,153, filed December 26, 2012 and U.S. Patent Application No. 13/726,976, filed December 26, 2012.

It is respectfully requested that the Examiner consider these documents and return an initialed copy of the SB-08 Form indicating consideration of the cited materials.

Respectfully submitted,

Nicholas William Anderson

By /Harry Vartanian/
Harry Vartanian
Registration No. 56,787
(215) 568-6400

Volpe and Koenig, P.C.
United Plaza, Suite 1800
30 South 17th Street
Philadelphia, PA 19103

HV/PCK
Enclosures (5)

Electronic Patent Application Fee Transmittal	
Application Number:	10917968
Filing Date:	12-Aug-2004
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Filer:	Harry Vartanian/Carey Kulp
Attorney Docket Number:	IPW2-USAP191629
Filed as Large Entity	

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt

EFS ID:	19934133
Application Number:	10917968
International Application Number:	
Confirmation Number:	3609
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Customer Number:	3624
Filer:	Harry Vartanian/Carey Kulp
Filer Authorized By:	Harry Vartanian
Attorney Docket Number:	IPW2-USAP191629
Receipt Date:	25-AUG-2014
Filing Date:	12-AUG-2004
Time Stamp:	15:27:52
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$180
RAM confirmation Number	1825
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1	Other Reference-Patent/App/Search documents	196552_May2014.pdf	261516 e43137a4b6141a06fb2619b53ae9185fba2bd2cf	no	7
Warnings:					
Information:					
2	Other Reference-Patent/App/Search documents	196553_May2014.pdf	259627 047bbd6e5f867b10d8f25c22408a158939740d26	no	7
Warnings:					
Information:					
3	Other Reference-Patent/App/Search documents	JP_OA.pdf	127789 540f7fd5d20285f479a3eee14d3557bea2e95df1	no	4
Warnings:					
Information:					
4	Other Reference-Patent/App/Search documents	JP_OA_May2013.pdf	68717 f0aa45652974953e1bbcad5cff63298178086ab7	no	1
Warnings:					
Information:					
5	Information Disclosure Statement (IDS) Form (SB08)	SB08.pdf	641315 39d57e310bd49a0676d8e97eb4ed711ccc4bed1a	no	4
Warnings:					
Information:					
6	Transmittal Letter	IDS.pdf	60057 834263ce3c92253274ca59ede2b1748f4b5e5c1e	no	2
Warnings:					
Information:					
7	Fee Worksheet (SB06)	fee-info.pdf	30061 2048cea8b69d2cdc478bf21de5e41b4a2168c1af	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	1449082	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/917,968	08/12/2004	Nicholas William Anderson	IPW2-USAP191629	3609

3624 7590 06/18/2014

VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103

EXAMINER	
REGO, DOMINIC E	
ART UNIT	PAPER NUMBER
2647	

NOTIFICATION DATE	DELIVERY MODE
06/18/2014	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

eoffice@volpe-koenig.com

Office Action Summary	Application No. 10/917,968	Applicant(s) ANDERSON, NICHOLAS WILLIAM	
	Examiner DOMINIC E. REGO	Art Unit 2647	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08/12/2014*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *51-92* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *51-92* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *08/12/2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

1. The present application is being examined under the pre-AIA first to invent provisions.

DETAILED ACTION

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112(a):

> (a) IN GENERAL.—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

The following is a quotation of the first paragraph of pre-AIA 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 51, 58, 65, 72, 79, and 86 are rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for pre-AIA the inventor(s), at the time the application was filed, had possession of the claimed invention. In above claims, Applicant recites the limitations " receiving, by the UE, an indication of whether accumulation of transmit power control (TPC) commands is enabled, determining, by the UE, a path loss of a downlink channel, receiving, on a single physical channel by the UE if accumulation is enabled, an allocation of a scheduled uplink resource and a TPC command, wherein

the TPC command is accumulated with other received TPC commands, calculating, by the UE if accumulation is enabled, a transmit power for an uplink communication based on both the path loss and the accumulated TPC commands, and receiving, on the single physical channel by the UE if accumulation is not enabled, an allocation of a scheduled uplink resource to transmit data at a power level calculated by the UE based on the path loss". The Examiner states that above underlying parts are not found in the specification.

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the claims at issue are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the reference application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO internet Web site contains terminal disclaimer forms which may be used. Please visit http://www.uspto.gov/forms/. The filing date of the application will determine what form should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to http://www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

5. Claims 51-92 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-18 of co-pending application #13/726976 and 1-10 of co-pending application 13/727153. Although the conflicting claims are not identical, they are not patentably distinct from each other.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DOMINIC E. REGO whose telephone number is

(571)272-8132. The examiner can normally be reached on Monday-Friday, 9:00 am-5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nay A. Maung can be reached on 571-272-7882. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DOMINIC E REGO/
Primary Examiner, Art Unit 2647
Tel 571-272-8132

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10917968	ANDERSON, NICHOLAS WILLIAM
	Examiner	Art Unit
	DOMINIC E REGO	2618

CPC- SEARCHED		
Symbol	Date	Examiner
H04W 72/0473	6/13/2014	DR
H04W 52/24	6/13/2014	DR
H04W 52/242	6/13/2014	DR
H04W 52/08	6/13/2014	DR
H04W 52/10	6/13/2014	DR
H04W 52/12	6/13/2014	DR
H04W 52/221	6/13/2014	DR
H04W 52/248	6/13/2014	DR

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
455	522,68,69,115.3,126,127.1,296,127.2,67.11,434,436,135 ,226.3,277.2	7/28/2008	DR
370	331,320,335,342,318,392,252,276,280	7/28/2008	DR
375	147,130	7/28/2008	DR

SEARCH NOTES		
Search Notes	Date	Examiner
Consulted SPE Duc Nguyen regarding Restriction requirement	3/13/08	DR
Updated East Search	7/28/2008	DR
Updated East, Google, Inventor, and NPL search	3/15/2009	DR
Updated East Search	12/31/2009	DR
Updated above search	6/13/2014	DR

INTERFERENCE SEARCH	

US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L5	489	(tpc power near control$4 near command$3) same (path$loss path near loss)	US-PGPUB; USPAT	OR	ON	2014/06/13 23:46
L6	11	(tpc power near control$4 near command$3) with enabl$3 same (path$loss path near loss)	US-PGPUB; USPAT	OR	ON	2014/06/13 23:47
L7	3	6 and (@ad <= "20040812" @rlad <= "20040812" @pd <= "20040812")	US-PGPUB; USPAT	OR	ON	2014/06/13 23:48
S4	149	(nicholas near2 anderson).in.	US-PGPUB; USPAT	OR	ON	2014/05/18 08:27
S5	88	(intellectual near2 ventures near2 holding).as.	US-PGPUB; USPAT	OR	ON	2014/05/18 08:27
S6	2	((down$link forward$link forward near2 link) near5 (physical near2 channel) same resource near5 allocat$3 same power with command$3 same (up$link reverse$link reverse near link) with power near2 level same (path$loss path near2 loss)).clm.	US-PGPUB; USPAT	OR	ON	2014/05/18 08:41
S7	2	((down$link forward$link forward near2 link) with channel same resource near5 allocat$3 same power with command$3 same (up$link reverse$link reverse near link) same power near2 level same (path$loss path near2 loss)).clm.	US-PGPUB; USPAT	OR	ON	2014/05/18 08:42
S8	2	(resource with allocat$3 same power with command$3 same power with level same (path$loss path near2 loss)).clm.	US-PGPUB; USPAT	OR	ON	2014/05/18 08:44
S9	2	S8 AND ((H04W52/06 OR H04W52/08 OR H04W52/10 OR H04W52/12 OR H04W52/221 OR H04W52/24 OR H04W52/242 OR H04W52/243 OR H04W72/0473).CPC.)	US-PGPUB; USPAT	OR	ON	2014/05/18 08:44
S10	2	(down$link forward$link forward near2 link) near5 (physical near2 channel) same resource near5 allocat$3 same power with command$3 same (up$link reverse$link reverse near link) with power near2 level same (path$loss path near2 loss)	US-PGPUB; USPAT	OR	ON	2014/05/18 09:01
S11	2	(down$link forward$link forward near2 link) with channel same resource near5 allocat$3 same power with command$3 same (up$link reverse$link reverse near link) same power near2 level same (path$loss path near2 loss)	US-PGPUB; USPAT	OR	ON	2014/05/18 09:01
S12	32556	455/522,68-70,115.3,126,135,226.3,277.2,422.1,450-453,456.2,464,509,510.ccls. 370/318.ccls.	US-PGPUB; USPAT	OR	ON	2014/05/18 09:02

S13	8530	(down$link forward$link forward near2 link) near5 (physical near2 channel)	US-PGPUB; USPAT	OR	ON	2014/05/18 09:03
S14	1419	S13 same resource near5 allocat$3	US-PGPUB; USPAT	OR	ON	2014/05/18 09:04
S15	211	S14 same (power near3 command$3 tpc)	US-PGPUB; USPAT	OR	ON	2014/05/18 09:04
S16	2	S15 same (up$link reverse$link reverse near link) with power near2 level	US-PGPUB; USPAT	OR	ON	2014/05/18 09:05
S17	2	S15 same power near2 level	US-PGPUB; USPAT	OR	ON	2014/05/18 09:05
S18	46085	(physical near2 channel)	US-PGPUB; USPAT	OR	ON	2014/05/18 09:15
S19	1106	S18 same (up$link reverse$link reverse near link) with resource near3 allocat$3	US-PGPUB; USPAT	OR	ON	2014/05/18 09:16
S20	169	S19 same (power near3 command$3 tpc)	US-PGPUB; USPAT	OR	ON	2014/05/18 09:16
S21	2	S20 same power near2 level	US-PGPUB; USPAT	OR	ON	2014/05/18 09:17
S22	4	S20 same (path$loss path near2 loss)	US-PGPUB; USPAT	OR	ON	2014/05/18 09:17

6/ 13/ 2014 11:49:11 PM
C:\ Users\ drego\ Documents\ EAST\ Workspaces\ 10917968b.wsp

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	10917968
	Filing Date	2004-08-12
	First Named Inventor	Nicholas William Anderson
	Art Unit	2618
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	IPW2-USAP191629

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7277721		2007-10-02	Okumura et al.	Corresponds to WO 03/010903

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2004-040187	JP		2004-02-05	Kazuyuki et al.	English abstract provided	☒
	2	2003010903	WO		2003-02-06	Okumura et al.		☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.R./

Receipt date: 06/13/2012	Application Number	10917968 10917968 - GAU: 2647
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2004-08-12
(Not for submission under 37 CFR 1.99)	First Named Inventor	Nicholas William Anderson
	Art Unit	2618
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	IPW2-USAP191629

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Office Action for Japanese Application No. 2007-525302, issued March 13, 2012 (A copy of the office action and its English machine translation have been provided)	☐
	2	THIRD GENERATION PARTNERSHIP PROJECT, Technical Specification Group Radio Access Network; Feasibility Study on Uplink Enhancements for UTRA TDD; (Release 6); 3GPP TR 25.804 V6.0.0 (2005-03)	☐

If you wish to add additional non-patent literature document citation information please click the Add button **Add**

EXAMINER SIGNATURE

Examiner Signature	/Dominic Rego/	Date Considered	06/13/2014

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.R./

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10917968	ANDERSON, NICHOLAS WILLIAM
	Examiner	**Art Unit**
	DOMINIC E REGO	2618

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
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	3	✓	÷	✓	✓	✓	-			
	4	✓	÷	✓	✓	✓	-			
	5	✓	÷	-	-	-	-			
	6	✓	÷	-	-	-	-			
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	24		÷	✓	-	-	-			
	25		÷	✓	-	-	-			
	26		÷	✓	✓	✓	-			
	27		÷	✓	-	-	-			
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	31		÷	✓	✓	✓	-			
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	33		÷	✓	✓	✓	-			
	34		÷	✓	✓	✓	-			
	35		÷	✓	-	-	-			

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10917968	ANDERSON, NICHOLAS WILLIAM
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CLAIM		DATE								
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	42		÷	N	-	-	-			
	43		÷	✓	✓	✓	-			
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	68						✓			
	69						✓			
	70						✓			

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10917968	ANDERSON, NICHOLAS WILLIAM
	Examiner	**Art Unit**
	DOMINIC E REGO	2618

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	06/14/2007	03/13/2008	07/28/2008	03/15/2009	01/01/2010	06/13/2014			
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	73						✓			
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	80						✓			
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	82						✓			
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	87						✓			
	88						✓			
	89						✓			
	90						✓			
	91						✓			
	92						✓			

Doc code: RCEX
Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	10917968	Filing Date	2004-08-12	Docket Number (if applicable)	IPW2-USAP191629	Art Unit	2647
First Named Inventor	Nicholas William Anderson			Examiner Name	Dominic E. Rego		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☒ Enclosed

- ☒ Amendment/Reply
- ☐ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____ (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

☒ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 220493

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Signature of Registered U.S. Patent Practitioner			
Signature	/Harry Vartanian/	Date (YYYY-MM-DD)	2014-04-30
Name	Harry Vartanian	Registration Number	56787

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the **PATENT APPLICATION** of:	
Nicholas William Anderson	
Application No.: 10/917,968	
Confirmation No.: 3609	
Filed: August 12, 2004	
For: Power control in a wireless communication system	
Group: 2647	
Examiner: Dominic E. Rego	

Our File: IPW2-USAP191629
Date: April 30, 2014

REPLY PURSUANT TO 37 C.F.R. §1.114

Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

This Reply is being timely filed in response to the Board Decision dated March 3, 2014. A Request for Continued Examination (RCE) is filed concurrently herewith.

Please amend the application without prejudice or disclaimer as follows:

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-50. (CANCELED)

51. (NEW) A method performed by user equipment (UE), the method comprising:

receiving, by the UE, an indication of whether accumulation of transmit power control (TPC) commands is enabled;

determining, by the UE, a path loss of a downlink channel;

receiving, on a single physical channel by the UE if accumulation is enabled, an allocation of a scheduled uplink resource and a TPC command, wherein the TPC command is accumulated with other received TPC commands;

calculating, by the UE if accumulation is enabled, a transmit power for an uplink communication based on both the path loss and the accumulated TPC commands; and

receiving, on the single physical channel by the UE if accumulation is not enabled, an allocation of a scheduled uplink resource to transmit data at a power level calculated by the UE based on the path loss.

52. (NEW) The method of claim 51, wherein the TPC command is a multilevel TPC command.

53. (NEW) The method of claim 51, wherein the UE is a code division multiple access (CDMA) UE.

54. (NEW) The method of claim 51, wherein the UE is a time division duplex (TDD) UE.

55. (NEW) The method of claim 51, wherein the determining the path loss further includes computing a difference between a signaled transmit power and a measured received power of the downlink channel.

56. (NEW) The method of claim 51, wherein the calculated transmit power is based on a selected transport format.

57. (NEW) The method of claim 51, wherein the downlink channel or the single physical channel is each associated with a spreading factor or a code division multiple access (CDMA) code.

58. (NEW) A user equipment (UE) comprising:

circuitry configured to receive, by the UE, an indication of whether accumulation of transmit power control (TPC) commands is enabled;

circuitry to determine a path loss of a downlink channel;

the circuitry is further configured to receive, on a single physical channel if accumulation is enabled, an allocation of a scheduled uplink resource and a TPC command, wherein the TPC command is accumulated with other received TPC commands;

circuitry configured to calculate, by the UE if accumulation is enabled, a transmit power for an uplink communication based on both the path loss and the accumulated TPC commands; and

the circuitry is further configured to receive, on the single physical channel by the UE if accumulation is not enabled, an allocation of a scheduled uplink resource to transmit data at a power level calculated by the UE based on the path loss.

59. (NEW) The UE of claim 58, wherein the TPC command is a multilevel TPC command.

60. (NEW) The UE of claim 58, wherein the UE is a code division multiple access (CDMA) UE.

61. (NEW) The UE of claim 58, wherein the UE is a time division duplex (TDD) UE.

62. (NEW) The UE of claim 58, wherein the determination of the path loss further includes a computation of a difference between a signaled transmit power and a measured received power of the downlink channel.

63. (NEW) The UE of claim 58, wherein the calculated transmit power is based on a selected transport format.

64. (NEW) The UE of claim 58, wherein the downlink channel or the single physical channel is each associated with a spreading factor or a code division multiple access (CDMA) code.

65. (NEW) A method performed by a wireless network, the method comprising:

sending, by the wireless network, an indication of whether accumulation of transmit power control (TPC) commands is enabled;

determining, by a user equipment (UE), a path loss of a downlink channel;

receiving, on a single physical channel by the UE if accumulation is enabled, an allocation of a scheduled uplink resource and a TPC command, wherein the TPC command is accumulated with other received TPC commands;

calculating, by the UE if accumulation is enabled, a transmit power for an uplink communication based on both the path loss and the accumulated TPC commands; and

receiving, on the single physical channel by the UE if accumulation is not enabled, an allocation of a scheduled uplink resource to transmit data to the wireless network at a power level calculated by the UE based on the path loss.

66. (NEW) The method of claim 65, wherein the TPC command is a multilevel TPC command.

67. (NEW) The method of claim 65, wherein the UE is a code division multiple access (CDMA) UE.

68. (NEW) The method of claim 65, wherein the UE is a time division duplex (TDD) UE.

69. (NEW) The method of claim 65, wherein the determining the path loss further includes computing a difference between a signaled transmit power and a measured received power of the downlink channel.

70. (NEW) The method of claim 65, wherein the calculated transmit power is based on a selected transport format.

71. (NEW) The method of claim 65, wherein the downlink channel or the single physical channel is each associated with a spreading factor or a code division multiple access (CDMA) code.

72. (NEW) A wireless network comprising:

the wireless network configured to send an indication of whether accumulation of transmit power control (TPC) commands is enabled;

a user equipment (UE) comprising:

circuitry configured to determine, by the UE, a path loss of a downlink channel;

circuitry configured to receive, on a single physical channel if accumulation is enabled, an allocation of a scheduled uplink resource and a TPC command, wherein the TPC command is accumulated with other received TPC commands;

circuitry configured to calculate, by the UE if accumulation is enabled, a transmit power for an uplink communication based on both the path loss and the accumulated TPC commands; and

the circuitry is further configured to receive, on the single physical channel by the UE if accumulation is not enabled, an allocation of a scheduled uplink resource to transmit data to the wireless network at a power level calculated by the UE based on the path loss.

73. (NEW) The wireless network of claim 72, wherein the TPC command is a multilevel TPC command.

74. (NEW) The wireless network of claim 72, wherein the UE is a code division multiple access (CDMA) UE.

75. (NEW) The wireless network of claim 72, wherein the UE is a time division duplex (TDD) UE.

76. (NEW) The wireless network of claim 72, wherein the determination of the path loss further includes a computation of a difference between a signaled transmit power and a measured received power of the downlink channel.

77. (NEW) The wireless network of claim 72, wherein the calculated transmit power is based on a selected transport format.

78. (NEW) The wireless network of claim 72, wherein the downlink channel or the single physical channel is each associated with a spreading factor or a code division multiple access (CDMA) code.

79. (NEW) A method performed by a network device, the method comprising:

sending, by the network device, an indication of whether accumulation of transmit power control (TPC) commands is enabled;

sending, on a single physical channel by the network device if accumulation is enabled, an allocation of a scheduled uplink resource and a TPC command to be accumulated with other received TPC commands at a user equipment (UE);

receiving, by the network device if accumulation is enabled, uplink communication at a transmit power, wherein the transmit power is calculated at the UE based on both a determined path loss of a downlink channel and the accumulated TPC commands; and

sending, on the single physical channel to the UE if accumulation is not enabled, an allocation of a scheduled uplink resource to transmit data to the network device at a power level calculated at the UE based on the path loss.

80. (NEW) The method of claim 79, wherein the TPC command is a multilevel TPC command.

81. (NEW) The method of claim 79, wherein the network device is a code division multiple access (CDMA) network device.

82. (NEW) The method of claim 79, wherein the network device is a time division duplex (TDD) network device.

83. (NEW) The method of claim 79, wherein the determined path loss further includes computing a difference between a signaled transmit power and a measured received power of the downlink channel.

84. (NEW) The method of claim 79, wherein the calculated transmit power is based on a selected transport format.

85. (NEW) The method of claim 79, wherein the downlink channel or the single physical channel is each associated with a spreading factor or a code division multiple access (CDMA) code.

86. (NEW) A network device comprising:

circuitry configured to send, by the network device, an indication of whether accumulation of transmit power control (TPC) commands is enabled;

the circuitry is further configured to send, on a single physical channel if accumulation is enabled, an allocation of a scheduled uplink resource and a TPC command to be accumulated with other received TPC commands at a user equipment (UE);

circuitry configured to receive, if accumulation is enabled, uplink communication at a transmit power, wherein the transmit power is calculated at the UE based on both a determined path loss of a downlink channel and the accumulated TPC commands; and

the circuitry is further configured to send, on the single physical channel if accumulation is not enabled, an allocation of a scheduled uplink resource to transmit data to the network device at a power level calculated at the UE based on the path loss.

87. (NEW) The network device of claim 86, wherein the TPC command is a multilevel TPC command.

88. (NEW) The network device of claim 86, wherein the network device is a code division multiple access (CDMA) network device.

89. (NEW) The network device of claim 86, wherein the network device is a time division duplex (TDD) network device.

90. (NEW) The network device of claim 86, wherein the determined path loss further includes a computation of a difference between a signaled transmit power and a measured received power of the downlink channel.

91. (NEW) The network device of claim 86, wherein the calculated transmit power is based on a selected transport format.

92. (NEW) The network device of claim 86, wherein the downlink channel or the single physical channel is each associated with a spreading factor or a code division multiple access (CDMA) code.

Amendments to the Specification:

Please replace paragraph [0025] of the originally filed application with the following amended paragraph:

[0025] FIGURE 1 shows a block diagram of a wireless communication system. A network 100 may include one or more base station controllers [[120]] 110, such as a radio network controller (RNC), and one or more base stations [[110,]] 120, 130 such as a Node-B, wherein each Node-B is connected to an RNC. The network 100 communicates with one or more users 140, 150 through a channel 160, also referred to as a radio link, created between a base station and a user.

Please substitute the Abstract with the following new Abstract:

ABSTRACT

Power control in a wireless network is disclosed. Transmit power control (TPC) commands may be accumulated by a user equipment (UE). If accumulation is enabled, the UE may receive on a single physical channel an allocation of a scheduled uplink resource and a TPC command. The TPC command may be accumulated with other received TPC commands. A transmit power for an uplink communication based on both the path loss and the accumulated TPC commands may then be calculated by the UE. If accumulation is not enabled, the UE may receive an allocation of a scheduled uplink resource to transmit data at a calculated power level.

REMARKS/ARGUMENTS

After the foregoing Amendment, claims 51-92 are currently pending in this application. Claims 1-50 are canceled. New claims 51-92 are added. In the specification, paragraph [0025] is amended. No new matter is added by any of these amendments.

New Claims Added in Response to Board Decision

A Board Decision on March 3, 2014 affirmed rejections of some of claims 1-50. Applicant respectfully disagrees with the Board's decision. However, rejected claims 1-50 are canceled and new claims 51-92 added in response to the decision. New claims 51-92 are allowable over the art used in the rejection of canceled claims 1-50. However, new claims 51-92 are within the same scope of search of canceled claims 1-50.

Conclusion

It should also be noted that although arguments have been presented with respect to certain claims herein, the recited subject matter as well as various other subject matter and/or combinations of subject matter may be patentable for other reasons. Further, the failure to address any statement by the Examiner herein should not be interpreted as acquiescence or agreement with such statement. The Applicants expressly reserve the right to set forth additional and/or alternative reasons for patentability and/or allowance with the present Application or in any other future proceeding, and to rebut any statement presented by the Examiner in this or other papers during prosecution of the present Application.

If the Examiner believes that any additional minor formal matters need to be addressed in order to place this application in condition for allowance, or that a telephonic interview will help to materially advance the prosecution of this application, the Examiner is invited to contact the undersigned by telephone at the Examiner's convenience.

In view of the foregoing, Applicant respectfully submits that the present application is in condition for allowance and a notice to that effect is respectfully requested.

Respectfully submitted,

Nicholas William Anderson

By /Harry Vartanian/
Harry Vartanian
Registration No. 56,787

Volpe and Koenig, P.C.
United Plaza
30 South 17th Street
Philadelphia, PA 19103-4009
Telephone: (215) 568-6400
Facsimile: (215) 568-6499

HV/eam

Electronic Patent Application Fee Transmittal	
Application Number:	10917968
Filing Date:	12-Aug-2004
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Filer:	Harry Vartanian/Elizabeth McGinty
Attorney Docket Number:	IPW2-USAP191629
Filed as Large Entity	

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
RCE - 2nd and Subsequent Request	1820	1	1700	1700
		Total in USD ($)		**1700**

Electronic Acknowledgement Receipt

EFS ID:	18908196
Application Number:	10917968
International Application Number:	
Confirmation Number:	3609
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Customer Number:	3624
Filer:	Harry Vartanian/Elizabeth McGinty
Filer Authorized By:	Harry Vartanian
Attorney Docket Number:	IPW2-USAP191629
Receipt Date:	30-APR-2014
Filing Date:	12-AUG-2004
Time Stamp:	17:11:02
Application Type:	Utility under 35 USC 111(a)

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Document Number	**Document Description**	**File Name**	**File Size(Bytes)/ Message Digest**	**Multi Part /.zip**	**Pages (if appl.)**
1	Request for Continued Examination (RCE)	IPW2-USAP191629-RCETransmittal.PDF	705749 db392895ae249641fcbce7c9bf4dff5937be8407	no	3
Warnings:					
Information:					
2		IPW2-USAP191629-RCE-Reply.PDF	92682 eea994b2dbf6f2834bae9d288c7c1d3d5438953b	yes	17
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Amendment Submitted/Entered with Filing of CPA/RCE		1	1	
	Claims		2	12	
	Specification		13	13	
	Abstract		14	14	
	Applicant Arguments/Remarks Made in an Amendment		15	17	
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30124 d3ba7ce79b1a0bc7134858778eb9fecdf6316b88	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	828555		

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National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 10/917,968	Filing Date 08/12/2004	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	04/30/2014	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 42	Minus	** 46	= 0	X $80 =	0
	Independent (37 CFR 1.16(h))	* 6	Minus	***10	= 0	X $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
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This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/917,968	08/12/2004	Nicholas William Anderson	IPW2-USAP191629	3609

3624 7590 04/23/2014

VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103

EXAMINER	
REGO, DOMINIC E	

ART UNIT	PAPER NUMBER
2647	

NOTIFICATION DATE	DELIVERY MODE
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APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
10/917,968	12 August, 2004	ANDERSON, NICHOLAS WILLIAM	IPW2-USAP191629

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UNITED PLAZA
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103

EXAMINER	
DOMINIC E. REGO	
ART UNIT	PAPER
2647	20140417

DATE MAILED:

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Commissioner for Patents

A notice of abandonment was sent on 4/16/ 2014 has been withdrawn. After Patent Board Decision, at least 2 months should given to Applicant for reconsideration.

/DOMINIC E REGO/
Primary Examiner, Art Unit 2647

PTO-90C (Rev.04-03)

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/917,968	08/12/2004	Nicholas William Anderson	IPW2-USAP191629	3609

3624 7590 04/16/2014

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UNITED PLAZA
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103

EXAMINER	
REGO, DOMINIC E	
ART UNIT	PAPER NUMBER
2647	

NOTIFICATION DATE	DELIVERY MODE
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Notice of Abandonment	Application No.	Applicant(s)
	10/917,968	ANDERSON, NICHOLAS WILLIAM
	Examiner	Art Unit
	DOMINIC E. REGO	2647

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

This application is abandoned in view of:

1. ☒ Applicant's failure to timely file a proper reply to the Office letter mailed on *03 March 2014*.
   (a) ☐ A reply was received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the period for reply (including a total extension of time of _____ month(s)) which expired on _____.
   (b) ☐ A proposed reply was received on _____, but it does not constitute a proper reply under 37 CFR 1.113 to the final rejection.
   (A proper reply under 37 CFR 1.113 to a final rejection consists only of: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114).
   (c) ☐ A reply was received on _____ but it does not constitute a proper reply, or a bona fide attempt at a proper reply, to the non-final rejection. See 37 CFR 1.85(a) and 1.111. (See explanation in box 7 below).
   (d) ☒ No reply has been received.

2. ☐ Applicant's failure to timely pay the required issue fee and publication fee, if applicable, within the statutory period of three months from the mailing date of the Notice of Allowance (PTOL-85).
   (a) ☐ The issue fee and publication fee, if applicable, was received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the statutory period for payment of the issue fee (and publication fee) set in the Notice of Allowance (PTOL-85).
   (b) ☐ The submitted fee of $_____ is insufficient. A balance of $_____ is due.
   The issue fee required by 37 CFR 1.18 is $_____. The publication fee, if required by 37 CFR 1.18(d), is $_____.
   (c) ☐ The issue fee and publication fee, if applicable, has not been received.

3. ☐ Applicant's failure to timely file corrected drawings as required by, and within the three-month period set in, the Notice of Allowability (PTO-37).
   (a) ☐ Proposed corrected drawings were received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the period for reply.
   (b) ☐ No corrected drawings have been received.

4. ☐ The letter of express abandonment which is signed by the attorney or agent of record or other party authorized under 37 CFR 1.33(b). See 37 CFR 1.138(b).

5. ☐ The letter of express abandonment which is signed by an attorney or agent (acting in a representative capacity under 37 CFR 1.34) upon the filing of a continuing application.

6. ☐ The decision by the Board of Patent Appeals and Interference rendered on _____ and because the period for seeking court review of the decision has expired and there are no allowed claims.

7. ☒ The reason(s) below:

An Appeal Brief for this case was filed on 12/17/2010 and the Examiner answer to Appeal Brief was mailed on 03/29/2011. Patent Board Decision--"Examier Affirmed" was made on 03/03/2014. There is no reply filed within a month after Patent Board Decision. Therefore, the Application is abandoned.

	/DOMINIC E REGO/ Primary Examiner, Art Unit 2647

Petitions to revive under 37 CFR 1.137, or requests to withdraw the holding of abandonment under 37 CFR 1.181, should be promptly filed to minimize any negative effects on patent term.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/917,968	08/12/2004	Nicholas William Anderson	IPW2-USAP191629	3609

3624 7590 03/03/2014

VOLPE AND KOENIG, P.C.
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EXAMINER	
REGO, DOMINIC E	
ART UNIT	**PAPER NUMBER**
2647	

NOTIFICATION DATE	DELIVERY MODE
03/03/2014	ELECTRONIC

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte NICHOLAS WILLIAM ANDERSON

Appeal 2011-010366
Application 10/917,968
Technology Center 2600

Before JOSEPH L. DIXON, HUNG H. BUI, and DANIEL N. FISHMAN, *Administrative Patent Judges*.

BUI, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant[1] seeks our review under 35 U.S.C. § 134(a) of the Examiner's final rejections of claims 1-4, 7, 8, 15-17, 26, 28, 30-34, and 43-50. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.[2]

---

[1] The Real Party in Interest is Wireless Technology Solutions LLC.

STATEMENT OF THE CASE

Appellant's Invention

Appellant's invention relates to a method and system of controlling power levels in a wireless communication system. A method includes measuring a power level of a received signal, receiving a transmit power control (TPC) command, and calculating a transmit power level based on the power level of the received signal and the TPC command. Abstract.

Claims on Appeal

Claims 1, 26, 43, 46, 49, and 50 are the independent claims on appeal. Claim 1 is representative of the Appellant's invention, as reproduced with disputed limitations emphasized below:

> 1. A method of power control in a radio communication system, the method comprising, at a remote transceiver:
>
> determining a path loss for a radio channel between a base station and the remote transceiver; and
>
> on a *shared physical channel* used to carry allocation and scheduling information from the base station to the remote transceiver, receiving an allocation of a scheduled uplink transmission resource and transmit power control (TPC) command; and
>
> calculating at the remote transceiver, a transmit power level for transmission by the remote transceiver on the scheduled uplink transmission resource based upon the path loss and the TPC command.

---

[2] Our decision refers to Appellant's Appeal Brief filed December 17, 2010 ("App. Br."); Reply Brief filed May 31, 2011 ("Reply Br."); Examiner's Answer mailed March 29, 2011 ("Ans."); Final Office Action mailed January 8, 2010 ("Final Rej."); and the original Specification filed August 12, 2004 ("Spec.").

Evidence Considered

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Zeira	WO 00/57574	Sep. 28, 2000
Chen	US 2005/0025056 A1	Feb. 3, 2005
Van Lieshout	US 2001/0036823 A1	Nov. 1, 2001
Shiu	US 6,983,166 B2	Jan. 3, 2006
Krishnan	US 2005/0176455 A1	Aug. 11, 2005

Examiner's Rejections[3]

(1) Claims 1-4, 7, 15, 26, 28, 32, 33, 43, 46, 49, and 50 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Zeira, Chen, and Van Lieshout. Ans. 3-18.

(2) Claims 8 and 34 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Zeira, Chen, Van Lieshout, and Shiu. Ans. 18-19.

(3) Claims 16, 17, 30, 31, 44, 45, 47, and 48 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Zeira, Chen, Van Lieshout, Shiu, and Krishna. Ans. 19-21.

ISSUE

Based on Appellant's arguments, the issue on appeal is whether the Examiner erred in rejecting claims 1-4, 7, 15, 26, 28, 32, 33, 43, 46, 49, and 50 under 35 U.S.C. §103(a) as being unpatentable over Zeira, Chen, and Van

[3] Claims 26, 28, 30-34, and 46-48 were also rejected under 35 U.S.C. § 101 and under 35 U.S.C. § 112, first paragraph. *See* App. Br. 8. However, the rejections of these claims have been withdrawn as per Ans. 21.

Lieshout. In particular, the appeal turns on whether the Examiner's combination of Zeira, Chen, and Van Lieshout discloses or suggests the limitation "on a shared physical channel used to carry allocation and scheduling information from the base station to the remote transceiver, receiving an allocation of a scheduled uplink transmission resource and transmit power control (TPC) command," as recited in independent claims 1 and 26, and similarly recited in independent claims 43, 46, 49, and 50. App. Br. 13-15.

ANALYSIS

The Examiner finds Zeira discloses a similar system power control in a radio communications and a similar method determining a path loss of a wireless radio channel between a base station and a remote transceiver, receiving a transmit power control (TPC) command, and calculating at the remote transceiver a transmit power level for transmission by the remote transceiver on the scheduled uplink transmission resource based upon the path loss and the TPC command. Ans. 4 and 21-22 (citing Zeira, p. 2, ll. 14-21; p. 4, ll. 17-18; p. 5, ll. 8; FIG. 4 and Abstract).

FIG. 4 of Zeira is reproduced below.

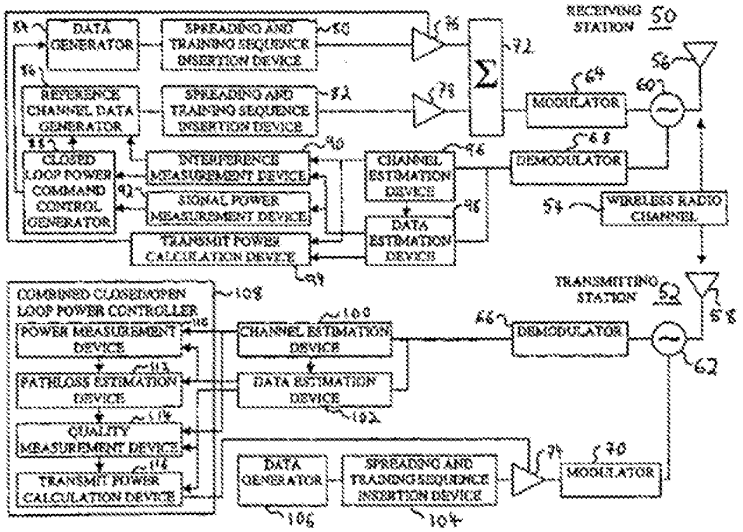


FIG. 4 of Zeira shows a receiving station 50 as Appellant's claimed "base station" and a transmitting station 52 as Appellant's claimed "remote transceiver"

The Examiner acknowledges that Zeira discloses a wireless radio channel 54, shown in FIG. 4, but does not explicitly disclose "a shared physical channel used to carry allocation and scheduling information from the base station to the remote transceiver". *Id.* at 4-5 and 22. The Examiner then finds Chen discloses using a dedicated control channel to carry allocation and scheduling information from the base station to the remote transceiver and receiving an allocation of a scheduled uplink transmission resource. *Id.* at 5 and 22 (citing Chen, ¶¶ [0012], [0052]-[0057]). The Examiner acknowledges that Chen does not specifically disclose "a shared physical channel". However, the Examiner finds Van Lieshout discloses explicitly a shared physical channel used to carry information. *Id.* at 6 and 23 (citing Van Lieshout, ¶ [0006]).

Based on these disclosures and their same field of endeavor, the Examiner concludes that:

> [i]t would have been obvious … to combine the methods of determining a path loss of a radio channel between a base station and the remote transceiver, receiving a transmit power control (TPC) command, and calculating at the remote transceiver a transmit power level for transmission by the remote transceiver on the scheduled uplink transmission resource based upon the path loss and the TPC command of Zeira with the receiving an allocation of a scheduled uplink transmission resource on a dedicated control channel to carry allocation and scheduling information from the base station to the remote transceiver method step of Chen in order to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications (**Chen, par.12)…** to combine … with the shared physical channel used to carry information of Van Lieshout so that the mobile unit can find out the available resources that it can use from the base station.

Id. at 6.

Appellant disputes the Examiner's findings regarding Van Lieshout, and raises several arguments based on a premise that Van Lieshout does not disclose the missing feature "a shared physical channel" used to convey allocation and scheduling information. App. Br. 14. In particular, Appellant argues that Van Lieshout discloses a shared radio channel (i.e., shared physical channel, shown in FIG. 3 of Van Lieshout) to transport data between a remote device and a base station, but that shared radio channel does not convey allocation and scheduling information. *Id.* at 14-15. According to Appellant, Van Lieshout uses a non-shared downlink channel instead to convey downlink (not uplink) resources and, as a result, fails to teach sending uplink allocation and scheduling information on a shared

physical channel as recited in Appellant's independent claims 1, 26, 43, 49, and 50. *Id.*

We do not find Appellant's arguments persuasive. Contrary to Appellant's contentions, we find Van Lieshout discloses the missing feature of Zeira and Chen, as correctly found by the Examiner. Ans. 6 and 21-23. The combination of Zeira and Chen discloses all the features specified by the claims except for a "shared" physical channel. Van Lieshout discloses this missing feature, i.e., a shared radio channel used to transmit data between a remote device and a base station. Ans. 23 (citing Van Lieshout, Abstract and FIGS. 3-4). Van Lieshout alone may not suggest conveying allocation and scheduling data over a shared radio channel, but with the combination of Chen and Van Lieshout discloses conveying allocation and scheduling data over a shared radio channel.

When a claimed invention "'simply arranges old elements with each performing the same function it had been known to perform' and yields no more than one would expect from such an arrangement, the combination is obvious." *KSR International Co. v. Teleflex, Inc.*, 550 U.S. 398, 417 (2007) (quoting *Sakraida v. Ag Pro, Inc.*, 425 U.S. 273, 282 (1976)). We find that the mere combining of Zeira, Chen, and Van Lieshout would have been obvious to one skilled in the art.

For the reasons set forth above, Appellant's contentions have not persuaded us of any error in the Examiner's position. Accordingly, we sustain the Examiner's obviousness rejection of independent claims 1, 26, 43, 46, 49, and 50 based on Zeira, Chen, and Van Lieshout.

Appellant presents no separate patentability arguments with respect to dependent claims 2-4, 7, 8, 15-17, 28, 30-34, 44-45, and 47-48. For the

same reasons discussed, we also sustain the Examiner's obviousness rejection of claims 2-4, 7, 8, 15-17, 28, 30-34, 44-45, and 47-48.

CONCLUSION

On the record before us and arguments presented by Appellant, we conclude that the Examiner has not erred in rejecting claims 1-4, 7, 8, 15-17, 26, 28, 30-34, and 43-50 under 35 U.S.C. § 103(a).

DECISION

As such, we AFFIRM the Examiner's final rejection of claims 1-4, 7, 8, 15-17, 26, 28, 30-34, and 43-50.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a) (1) (iv).

AFFIRMED

sld

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the **PATENT APPLICATION** of:	
	Nicholas W. Anderson
Application No.:	10/917,968
Confirmation No.:	3609
Filed:	August 12, 2004
For: POWER CONTROL IN A WIRELESS COMMUNICATION SYSTEM	
Group:	2647
Examiner:	Dominic E. Rego

Our File: IPW2-USAP191629

Date: June 3, 2013

COMMUNICATION RE APPEAL BOARD DECISION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Applicant respectfully requests notification of the status of the above-identified application. More than twenty-one months have passed since the Advisory Action was received and applicant has not received any substantive action. Applicant respectfully requests a timeline for an Appeal Board decision.

Respectfully submitted,

Nicholas W. Anderson

By /Harry Vartanian/
Harry Vartanian
Registration No. 56787
(215) 568-6400

Volpe and Koenig, P.C.
United Plaza
30 South 17th Street
Philadelphia, PA 19103-4009

HV/eam

Electronic Acknowledgement Receipt	
EFS ID:	15933420
Application Number:	10917968
International Application Number:	
Confirmation Number:	3609
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Customer Number:	3624
Filer:	Harry Vartanian/Elizabeth McGinty
Filer Authorized By:	Harry Vartanian
Attorney Docket Number:	IPW2-USAP191629
Receipt Date:	03-JUN-2013
Filing Date:	12-AUG-2004
Time Stamp:	16:32:03
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	IPW2-USAP191629_StatusRequest.PDF	52715 5a9814108b21b4dcc3a2540ccfe836fcb6c1f78b	no	1
Warnings:					
Information:					

Total Files Size (in bytes):	52715

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If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
10/917,968	08/12/2004	Nicholas William Anderson	9010-96606-US

CONFIRMATION NO. 3609

3624
VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103

POA ACCEPTANCE LETTER

OC000000055427763

Date Mailed: 07/23/2012

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 07/14/2012.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/tnnguyen/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
10/917,968	08/12/2004	Nicholas William Anderson	9010-96606-US

CONFIRMATION NO. 3609

22242
FITCH EVEN TABIN & FLANNERY, LLP
120 SOUTH LASALLE STREET
SUITE 1600
CHICAGO, IL 60603-3406

POWER OF ATTORNEY NOTICE

OC000000055427740

Date Mailed: 07/23/2012

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 07/14/2012.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/tnnguyen/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

PTO/SB/80 (11-08)
Approved for use through 11/30/2011. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

[X] Practitioners associated with the Customer Number: **3624**

OR

[ ] Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

[X] The address associated with Customer Number: **3624**

OR

[ ] Firm or Individual Name					
Address					
City		State		Zip	
Country		Telephone		Email	

Assignee Name and Address:

Intellectual Ventures Holding 81 LLC
7251 W. Lake Mead Blvd.
Suite 300
Las Vegas, NV 89128

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date	24 May 2012
Name	Jeremy Sanders	Telephone	
Title	Authorized Person for Intellectual Ventures Holding 81 LLC		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

DECLARATION REGARDING AUTHORITY TO SIGN ON BEHALF OF A LEGAL ENTITY
(37 C.F.R. 3.73(b)(2)(i))

I, Jeremy Sanders (whose title is supplied below), hereby declare that I am authorized to sign on behalf of Intellectual Ventures Holding 81 LLC.

Jeremy Sanders, Authorized Person for Intellectual Ventures Holding 81 LLC

24 May 2012
[date]

PTO/SB/96 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Intellectual Ventures Holding 81 LLC

Application No./Patent No.: 10/917,968 Filed/Issue Date: August 12, 2004

Titled: POWER CONTROL IN A WIRELESS COMMUNICATION SYSTEM

INTELLECTUAL VENTURES HOLDING 81 LLC , a LIMITED LIABILITY COMPANY

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.

states that it is:

1. ☒ the assignee of the entire right, title, and interest in;

2. ☐ an assignee of less than the entire right, title, and interest in (The extent (by percentage) of its ownership interest is _____ %); or

3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy therefore is attached.

OR

B. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: NICHOLAS WILLIAM ANDERSON To: IPWIRELESS, INC.

The document was recorded in the United States Patent and Trademark Office at Reel 015474 , Frame 0248 , or for which a copy thereof is attached.

2. From: IPWIRELESS, INC. To: NORTHROP GRUMMAN INFORMATION TEC

The document was recorded in the United States Patent and Trademark Office at Reel 022102 , Frame 0891 , or for which a copy thereof is attached.

3. From: NORTHROP GRUMMAN INFORMATION TEC To: IPWIRELESS, INC.

The document was recorded in the United States Patent and Trademark Office at Reel 024006 , Frame 0144 , or for which a copy thereof is attached.

☒ Additional documents in the chain of title are listed on a supplemental sheet(s).

☒ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Jeremy Sanders/ May 24, 2012

Signature Date

Jeremy Sanders Authorized Person IVH81LLC

Printed or Typed Name Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

STATEMENT UNDER 37 CFR 3.73(b) CONTINUED

Applicant/Patent Owner: Intellectual Ventures Holding 81 LLC

Application No./Patent No.: 10/917,968

Filed/Issue Date: August 12, 2004

Titled: POWER CONTROL IN A WIRELESS COMMUNICATION SYSTEM

4. **From:** IP WIRELESS, INC. **To:** WIRELESS TECHNOLOGY SOLUTIONS LLC

The document was recorded in the United States Patent and Trademark Office at Reel 024305 **, Frame** 0492

5. **From:** WIRELESS TECHNOLOGY SOLUTIONS LLC **To:** IPWIRELESS, INC.

The document was recorded in the United States Patent and Trademark Office at Reel 027910 **, Frame** 0649

6. **From:** IPWIRELESS, INC. **To:** INTELLECTUAL VENTURES HOLDING 81 LLC

The document was recorded in the United States Patent and Trademark Office at Reel 028175 **, Frame** 0237

1999628-1

Electronic Acknowledgement Receipt

EFS ID:	13251267
Application Number:	10917968
International Application Number:	
Confirmation Number:	3609
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Customer Number:	22242
Filer:	Harry Vartanian
Filer Authorized By:	
Attorney Docket Number:	9010-96606-US
Receipt Date:	14-JUL-2012
Filing Date:	12-AUG-2004
Time Stamp:	11:00:23
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	IPW2_USAP191629_POA.PDF	911781 69cff9b09771e28471c033f443d31dfef1f4d8c3	no	1

Warnings:	
Information:	

2	Assignee showing of ownership per 37 CFR 3.73(b).	IPW2_USAP191629_3_73b_Authorization.PDF	208010 fc97659ff2f6d1a5020cec38c4160d94c6cfec36	no	1
Warnings:					
Information:					
3	Assignee showing of ownership per 37 CFR 3.73(b).	IPW2_USAP191629_3_73b_Statement.PDF	561873 f6085eca706753395079c4196cb86cbf69bc2108	no	2
Warnings:					
Information:					
4	Assignee showing of ownership per 37 CFR 3.73(b).	IPW2_USAP191629_3_73b_Continued.PDF	65074 c63adf4824ce141c3ce44c24db8f41dfc0df119f	no	1
Warnings:					
Information:					
			Total Files Size (in bytes):	1746738	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	10917968
	Filing Date	2004-08-12
	First Named Inventor	Nicholas William Anderson
	Art Unit	2618
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	IPW2-USAP191629

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7277721		2007-10-02	Okumura et al.	Corresponds to WO 03/010903

If you wish to add additional U.S. Patent citation information please click the Add button. Add

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] ¡	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2004-040187	JP		2004-02-05	Kazuyuki et al.	English abstract provided	☒
	2	2003010903	WO		2003-02-06	Okumura et al.		☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	10917968
	Filing Date	2004-08-12
	First Named Inventor	Nicholas William Anderson
	Art Unit	2618
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	IPW2-USAP191629

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Office Action for Japanese Application No. 2007-525302, issued March 13, 2012 (A copy of the office action and its English machine translation have been provided)	☐
	2	THIRD GENERATION PARTNERSHIP PROJECT, Technical Specification Group Radio Access Network; Feasibility Study on Uplink Enhancements for UTRA TDD; (Release 6); 3GPP TR 25.804 V6.0.0 (2005-03)	☐

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	10917968
	Filing Date	2004-08-12
	First Named Inventor	Nicholas William Anderson
	Art Unit	2618
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	IPW2-USAP191629

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☒ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Harry Vartanian/	Date (YYYY-MM-DD)	2012-06-13
Name/Print	Harry Vartanian	Registration Number	56,787

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal	
Application Number:	10917968
Filing Date:	12-Aug-2004
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Filer:	Harry Vartanian
Attorney Docket Number:	9010-96606-US
Filed as Large Entity	

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt	
EFS ID:	13002092
Application Number:	10917968
International Application Number:	
Confirmation Number:	3609
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Customer Number:	22242
Filer:	Harry Vartanian
Filer Authorized By:	
Attorney Docket Number:	9010-96606-US
Receipt Date:	13-JUN-2012
Filing Date:	12-AUG-2004
Time Stamp:	13:22:34
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$180
RAM confirmation Number	11001
Deposit Account	220493
Authorized User	VARTANIAN,HARRY
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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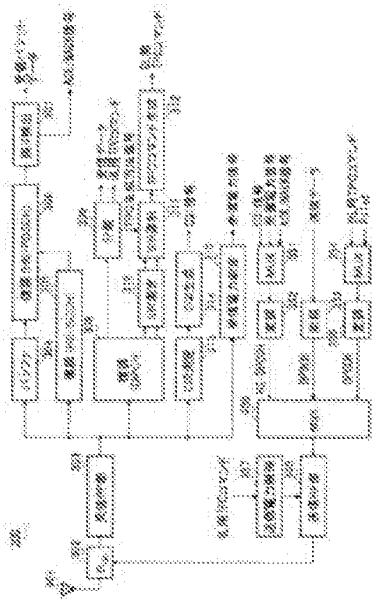
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(54) TRANSMISSION POWER CONTROL METHOD, SIGNALING METHOD, COMMUNICATION TERMINAL, AND BASE STATION APPARATUS

(57)Abstract:
PROBLEM TO BE SOLVED: To improve a system throughput by properly controlling transmission power of an A-DPCH in a radio communication system performing HSDPA services.
SOLUTION: An SIR measurement section 310 measures a received SIR of a downlink channel for each base station apparatus to be connected. An SIR selection section 311 receives a TPC generating method signal demodulated by a demodulation section 308 and demultiplexed from a data by a demultiplexer section 309, and outputs the composite value of the received SIR to a TPC command generating section 312 when the TPC generating method signal indicates a TPC command generating method of a composite value reference. The SIR selection section 311 outputs, on the other hand, only the received SIR of a signal transmitted from a primary base station apparatus to the TPC command generating section 312 when the TPC generating method signal indicates a TPC command generating method of a primary reference. The TPC command generating section 312 generates a TPC command for DL on the basis of the magnitude relation between the received SIR outputted from the SIR selection section 311 and the target SIR.



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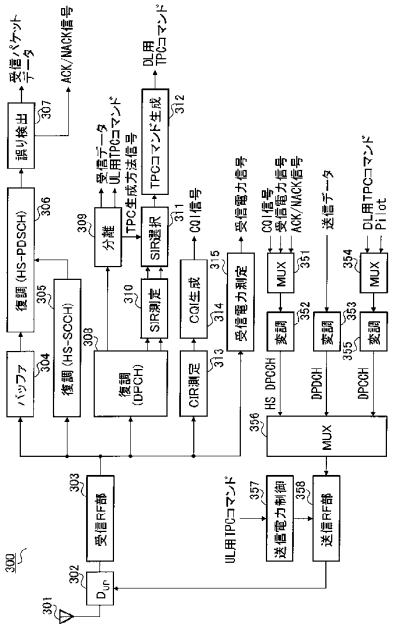
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(54)【発明の名称】送信電力制御方法、シグナリング方法、通信端末装置及び基地局装置

(57)【要約】
【課題】ＨＳＤＰＡサービスを行う無線通信システムにおいてＡ－ＤＰＣＨの送信電力を適正に制御し、システムスループットの向上を図ること。
【解決手段】ＳＩＲ測定部３１０は、下り回線の受信ＳＩＲを、接続する基地局装置毎に測定する。ＳＩＲ選択部３１１は、復調部３０８で復調され、分離部３０９でデータと分離されたＴＰＣ生成方法信号を入力し、ＴＰＣ生成方法信号が合成値基準のＴＰＣコマンド生成方法を示す場合、受信ＳＩＲの合成値をＴＰＣコマンド生成部３１２に出力する。一方、ＳＩＲ選択部３１１は、ＴＰＣ生成方法信号がプライマリ基準のＴＰＣコマンド生成方法を示す場合、プライマリ基地局装置から送信された信号の受信ＳＩＲのみをＴＰＣコマンド生成部３１２に出力する。ＴＰＣコマンド生成部３１２は、ＳＩＲ選択部３１１から出力された受信ＳＩＲと目標ＳＩＲとの大小関係によりＤＬ用ＴＰＣコマンドを生成する。
【選択図】　図４



【特許請求の範囲】
【請求項１】
ＨＳ－ＳＣＣＨで信号を送信する第１基地局装置が、ＨＳＤＰＡサービスを受ける通信端末装置に対して、ＨＳ－ＰＤＳＣＨにて信号を送信する際に自局のＡ－ＤＰＣＨの受信ＳＩＲと目標ＳＩＲとの比較結果に基づいて下り回線用のＴＰＣコマンドを生成することを指示し、前記通信端末装置から送信されたＴＰＣコマンドに基づいてＡ－ＤＰＣＨの送信電力を制御することを特徴とする送信電力制御方法。
【請求項２】
ＨＳＤＰＡサービスを受ける通信端末装置が、制御局装置から送信された第１信号によりＨＳ－ＳＣＣＨで信号を送信する第１基地局装置のＡ－ＤＰＣＨの受信ＳＩＲと目標ＳＩＲとの比較結果に基づく第１のＴＰＣコマンド生成方法を指示された場合、前記第１の基地局装置から送信されたＴＰＣコマンド生成方法の切り替えを指示する第２信号に基づいてＴＰＣコマンドを生成し、前記第１の基地局装置が、前記通信端末装置から送信されたＴＰＣコマンドに基づいてＡ－ＤＰＣＨの送信電力を制御することを特徴とする送信電力制御方法。
【請求項３】
第１基地局装置が、ＨＳ－ＰＤＳＣＨにて信号を送信する際に、自局のＡ－ＤＰＣＨの受信ＳＩＲと目標ＳＩＲとの比較結果に基づいて下り回線用のＴＰＣコマンドを生成することを指示し、ＨＳ－ＰＤＳＣＨにて信号を送信しない際には、接続する基地局装置のＡ－ＤＰＣＨの受信ＳＩＲの合成値と目標ＳＩＲとの比較結果に基づいて下り回線用のＴＰＣコマンドを生成することを指示する第２信号を生成することを特徴とする請求項２記載の送信電力制御方法。
【請求項４】
制御局装置が、ＨＳ－ＳＣＣＨで信号を送信する第１基地局装置のＡ－ＤＰＣＨの受信ＳＩＲと目標ＳＩＲとの比較結果に基づく第１のＴＰＣコマンド生成方法、あるいは、接続する基地局装置のＡ－ＤＰＣＨの受信ＳＩＲの合成値と目標ＳＩＲとの比較結果に基づく第２のＴＰＣコマンド生成方法のどちらかを指示する第１信号を生成し、基地局装置が、ＨＳ－ＰＤＳＣＨで送信する信号の有無に基づいて前記第１のＴＰＣコマンド生成方法あるいは前記第２のＴＰＣコマンド生成方法のどちらかを指示する第２信号を生成し、通信端末装置が、受信した前記第１信号及び前記第２信号の指示に基づいてＴＰＣコマンド生成方法を選択することを特徴とするシグナリング方法。
【請求項５】
制御局装置が、ＨＳＤＰＡサービスを受ける通信端末装置の中でハンドオーバ状態にあるものに対して、第１のＴＰＣコマンド生成方法を指示する第１信号を生成することを特徴とする請求項４記載のシグナリング方法。
【請求項６】
基地局装置が、ＨＳ－ＰＤＳＣＨにて信号を送信する際に第１のＴＰＣコマンド生成方法を指示し、ＨＳ－ＰＤＳＣＨにて信号を送信しない際には、接続する基地局装置のＡ－ＤＰＣＨの受信ＳＩＲの合成値と目標ＳＩＲとの比較結果に基づいて下り回線用のＴＰＣコマンドを生成することを指示する第２信号を生成することを特徴とする請求項４又は請求項５記載のシグナリング方法。
【請求項７】
通信端末装置が、第１信号及び第２信号が第１のＴＰＣコマンド生成方法を指示する場合のみ、ＨＳ－ＳＣＣＨで信号を送信する第１基地局装置のＡ－ＤＰＣＨの受信ＳＩＲと目標ＳＩＲとの比較結果に基づいてＴＰＣコマンドを生成することを特徴とする請求項６記載のシグナリング方法。
【請求項８】
接続する基地局装置のＤＰＣＨの受信ＳＩＲを測定するＳＩＲ測定手段と、ＨＳ－ＳＣＣＨで信号を送信する第１基地局装置のＡ－ＤＰＣＨの受信ＳＩＲあるいは測定された受信ＳＩＲの合成値のいずれかを制御局装置にて生成された第１信号及び基地局装置にて生成

された第２信号の指示に基づいて選択するＳＩＲ選択手段と、このＳＩＲ選択手段に選択された値と目標ＳＩＲとの比較結果に基づいて下り回線用のＴＰＣコマンドを生成するＴＰＣ生成手段とを具備することを特徴とする通信端末装置。

【請求項９】

ＳＩＲ選択手段は、第１信号及び第２信号が第１基地局装置のＡ－ＤＰＣＨの受信ＳＩＲの選択を指示する場合のみ、第１基地局装置のＡ－ＤＰＣＨの受信ＳＩＲを選択することを特徴とする請求項８記載の通信端末装置。

【請求項１０】

請求項８又は請求項９記載の通信端末装置にＨＳ－ＰＤＳＣＨにて送信するパケット信号を蓄積するバッファと、前記バッファにパケット信号が蓄積されているか否かに基づいて第２信号を生成する切替手段とを具備することを特徴とする基地局装置。

【請求項１１】

切替手段は、バッファにパケット信号が蓄積されている際に、自局のＡ－ＤＰＣＨの受信ＳＩＲの選択を指示する第２信号を生成することを特徴とする請求項１０記載の基地局装置。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】

本発明は、下り回線で高速パケット伝送を行う無線通信システムに使用される送信電力制御方法、シグナリング方法、通信端末装置及び基地局装置に関し、特に、Ｗ－ＣＤＭＡ方式におけるＨＳＤＰＡに適用するに好適である。

【０００２】

【従来の技術】

無線通信システムの分野において、高速大容量な下りチャネルを複数の通信端末装置が共有し、下り回線で高速パケット伝送を行うＨＳＤＰＡ（Ｈｉｇｈ Ｓｐｅｅｄ Ｄｏｗｎｌｉｎｋ Ｐａｃｋｅｔ Ａｃｃｅｓｓ）が提案されている。ＨＳＤＰＡでは、ＨＳ－ＰＤＳＣＨ（Ｈｉｇｈ Ｓｐｅｅｄ － Ｐｈｙｓｉｃａｌ Ｄｏｗｎｌｉｎｋ Ｓｈａｒｅｄ Ｃｈａｎｎｅｌ）、ＨＳ－ＳＣＣＨ（Ｓｈａｒｅｄ Ｃｏｎｔｒｏｌ Ｃｈａｎｎｅｌ ｏｆ ＨＳ－ＰＤＳＣＨ）、Ａ－ＤＰＣＨ（Ａｓｓｏｃｉａｔｅｄ－Ｄｅｄｉｃａｔｅｄ Ｐｈｙｓｉｃａｌ Ｃｈａｎｎｅｌ ｆｏｒ ＨＳ－ＰＤＳＣＨ）等の複数のチャネルが用いられる。なお、Ａ－ＤＰＣＨはＨＳＤＰＡ伝送を行う際に付随チャネルとして使用するために設けられたＤＰＣＨチャネルであり、そのチャネル構成やハンドオーバ制御等はＤＰＣＨとかわらない。

【０００３】

ＨＳ－ＰＤＳＣＨは、パケットの伝送に使用される下り方向の共有チャネルでる。ＨＳ－ＳＣＣＨは、下り方向の共有チャネルであり、リソース割り当てに関する情報（ＴＦＲＩ：Ｔｒａｎｓｐｏｒｔ－ｆｏｒｍａｔ ａｎｄ Ｒｅｓｏｕｒｃｅ ｒｅｌａｔｅｄ Ｉｎｆｏｒｍａｔｉｏｎ）、Ｈ－ＡＲＱ（Ｈｙｂｒｉｄ－Ａｕｔｏｍａｔｉｃ Ｒｅｐｅａｔ Ｒｅｑｕｅｓｔ）制御に関する情報等が伝送される。

【０００４】

Ａ－ＤＰＣＨは、上り方向及び下り方向の個別付随チャネルであり、パイロット信号、ＴＰＣコマンド等が伝送され、上り方向では、これらに加えてＡＣＫ信号あるいはＮＡＣＫ信号、ＣＱＩ（Ｃｈａｎｎｅｌ Ｑｕａｌｉｔｙ Ｉｎｄｉｃａｔｏｒ）信号が伝達される。なお、ＡＣＫ信号とは、基地局装置から送信されたＨＳ－ＰＤＳＣＨ上の高速パケットが、通信端末装置において正しく復調できたことを示す信号であり、ＮＡＣＫ信号とは、基地局装置から送信されたＨＳ－ＰＤＳＣＨ上の高速パケットが、通信端末装置において正しく復調できなかったことを示す信号である。また、ＣＱＩは、当該各通信端末装置において復調可能なパケットデータの変調方式及び符号化率を示す信号である。

【０００５】

以下、Ａ－ＤＰＣＨとＨＳ－ＳＣＣＨとの受信ＳＩＲ（Ｓｉｇｎａｌ ｔｏ Ｉｎｔｅｒ

ｆｅｒｅｎｃｅ　Ｒａｔｉｏ）の関係について図１２、図１３を用いて説明する。図１２は、ＨＯ（Ｈａｎｄ　Ｏｖｅｒ）状態ではない場合を示し、図１３は、ＨＯ状態の場合を示す。ここでＨＯ状態とは、複数の基地局またはセクタと同時に通信回線を接続している状態を示し、一般的に良く知られているソフトハンドオーバ（ＳＨＯ）状態であることを示す。

【０００６】

図１２に示すように、Ａ－ＤＰＣＨの送信電力１１は、一般的に良く知られているクローズドループ送信電力制御方法によって、Ａ－ＤＰＣＨの受信ＳＩＲ１２が目標ＳＩＲ１３となるように制御される。

【０００７】

ＨＳ－ＳＣＣＨの送信電力２１は、ＨＳ－ＳＣＣＨの所要ＳＩＲ２３がＡ－ＤＰＣＨの目標ＳＩＲ１３と異なるため、Ａ－ＤＰＣＨの送信電力１１にオフセットをつけて設定される。これにより、ＨＯ状態ではない場合には、ＨＳ－ＳＣＣＨの受信ＳＩＲ２２がほぼ所要ＳＩＲ２３に保たれる。

【０００８】

ここで、ＤＰＣＨは、ＨＯ状態時には複数の受信信号を合成したＳＩＲが目標ＳＩＲとなるように送信電力が制御される。これにより、ダイバーシチゲインによりＨＯ状態でない場合に比較して送信電力を低減することができる。従来方式では、Ａ－ＤＰＣＨの送信電力も、ＤＰＣＨと同様に、ＨＯ状態時には、複数の受信信号を合成した後の品質が所要品質を満足するように制御している。

【０００９】

一方、ＨＳ－ＰＤＳＣＨ及びＨＳ－ＳＣＣＨは、伝搬路状態に応じた適応的なＭＣＳ（Ｍｏｄｕｌａｔｉｏｎ　ａｎｄ　Ｃｏｄｉｎｇ　Ｓｃｈｅｍｅ：変調方式と誤り訂正符号の組み合わせ）選択、Ｈ－ＡＲＱ制御が行われるためＳＨＯ（Ｓｏｆｔ　Ｈａｎｄ　Ｏｖｅｒ）状態にはならずにＨＨＯ（Ｈａｒｄ　Ｈａｎｄ　Ｏｖｅｒ）が適用され、常に、１つの基地局装置から信号が送信される（以下、ＨＳ－ＳＣＣＨで信号を送信する基地局装置を「プライマリ基地局装置」という）。

【００１０】

したがって、ＨＯ状態にないＡ－ＤＰＣＨの送信電力に基づいて上記電力オフセット値を設定すると、Ａ－ＤＰＣＨがＨＯ状態にある場合においてＨＳ－ＳＣＣＨの受信ＳＩＲが所要ＳＩＲに届かず、受信品質が劣化してしまい、再送回数が増大してシステムスループットが劣化してしまう。

【００１１】

例えば、図１３において、通信端末装置が基地局装置Ａ及び基地局装置Ｂと接続しているとすると、通信端末装置は、基地局装置ＡのＡ－ＤＰＣＨの受信ＳＩＲ３１と基地局装置ＢのＡ－ＤＰＣＨの受信ＳＩＲ３２を合成したＳＩＲ３３が目標ＳＩＲ３４となるようにＴＰＣコマンドを生成する。したがって、基地局装置ＡのＡ－ＤＰＣＨの受信ＳＩＲ３１は目標ＳＩＲ３４よりも低くなる。

【００１２】

このとき、基地局装置Ａがプライマリ基地局装置であるとすると、ＨＳ－ＳＣＣＨの送信電力は、基地局装置ＡのＡ－ＤＰＣＨの送信電力にオフセットつけて設定されるので、ＨＯ状態ではＨＳ－ＳＣＣＨの受信ＳＩＲ４１が所要ＳＩＲ４２を満たさなくなる。

【００１３】

【発明が解決しようとする課題】

しかしながら、ＨＯ状態においてもＨＳ－ＳＣＣＨの受信ＳＩＲが所要ＳＩＲを満たすように上記電力オフセット値を大きく設定すると、Ａ－ＤＰＣＨがＨＯ状態にない場合においてＨＳ－ＳＣＣＨの送信電力が過剰となり、有限な無線リソースである送信電力を余計に消費してしまい、システムスループットが低下してしまうという問題がある。

【００１４】

本発明はかかる点に鑑みてなされたものであり、ＨＳＤＰＡサービスを行う無線通信シス

テムにおいてシステムスループットの向上を図ることができる送信電力制御方法、シグナリング方法、通信端末装置及び基地局装置を提供することを目的とする。

【００１５】

【課題を解決するための手段】

本発明の送信電力制御方法は、ＨＳ－ＳＣＣＨで信号を送信する第１基地局装置が、ＨＳＤＰＡサービスを受ける通信端末装置に対して、ＨＳ－ＰＤＳＣＨにて信号を送信する際に自局のＡ－ＤＰＣＨの受信ＳＩＲと目標ＳＩＲとの比較結果に基づいて下り回線用のＴＰＣコマンドを生成することを指示し、前記通信端末装置から送信されたＴＰＣコマンドに基づいてＡ－ＤＰＣＨの送信電力を制御する方法をとる。

【００１６】

本発明の送信電力制御方法は、ＨＳＤＰＡサービスを受ける通信端末装置が、制御局装置から送信された第１信号によりＨＳ－ＳＣＣＨで信号を送信する第１基地局装置のＡ－ＤＰＣＨの受信ＳＩＲと目標ＳＩＲとの比較結果に基づく第１のＴＰＣコマンド生成方法を指示された場合、前記第１の基地局装置から送信されたＴＰＣコマンド生成方法の切り替えを指示する第２信号に基づいてＴＰＣコマンドを生成し、前記第１の基地局装置が、前記通信端末装置から送信されたＴＰＣコマンドに基づいてＡ－ＤＰＣＨの送信電力を制御する方法をとる。

【００１７】

本発明の送信電力制御方法は、第１基地局装置が、ＨＳ－ＰＤＳＣＨにて信号を送信する際に、自局のＡ－ＤＰＣＨの受信ＳＩＲと目標ＳＩＲとの比較結果に基づいて下り回線用のＴＰＣコマンドを生成することを指示し、ＨＳ－ＰＤＳＣＨにて信号を送信しない際には、接続する基地局装置のＡ－ＤＰＣＨの受信ＳＩＲの合成値と目標ＳＩＲとの比較結果に基づいて下り回線用のＴＰＣコマンドを生成することを指示する第２信号を生成する方法をとる。

【００１８】

これらの方法により、ＨＳ－ＳＣＣＨで信号を送信する基地局装置のＡ－ＤＰＣＨの送信電力を抑えることができるので、システム容量の減少を防止することができる。

【００１９】

本発明のシグナリング方法は、制御局装置が、ＨＳ－ＳＣＣＨで信号を送信する第１基地局装置のＡ－ＤＰＣＨの受信ＳＩＲと目標ＳＩＲとの比較結果に基づく第１のＴＰＣコマンド生成方法、あるいは、接続する基地局装置のＡ－ＤＰＣＨの受信ＳＩＲの合成値と目標ＳＩＲとの比較結果に基づく第２のＴＰＣコマンド生成方法のどちらかを指示する第１信号を生成し、基地局装置が、ＨＳ－ＰＤＳＣＨで送信する信号の有無に基づいて前記第１のＴＰＣコマンド生成方法あるいは前記第２のＴＰＣコマンド生成方法のどちらかを指示する第２信号を生成し、通信端末装置が、受信した前記第１信号及び前記第２信号の指示に基づいてＴＰＣコマンド生成方法を選択する方法をとる。

【００２０】

本発明のシグナリング方法は、制御局装置が、ＨＳＤＰＡサービスを受ける通信端末装置の中でハンドオーバ状態にあるものに対して、第１のＴＰＣコマンド生成方法を指示する第１信号を生成する方法をとる。

【００２１】

本発明のシグナリング方法は、基地局装置が、ＨＳ－ＰＤＳＣＨにて信号を送信する際に第１のＴＰＣコマンド生成方法を指示し、ＨＳ－ＰＤＳＣＨにて信号を送信しない際には、接続する基地局装置のＡ－ＤＰＣＨの受信ＳＩＲの合成値と目標ＳＩＲとの比較結果に基づいて下り回線用のＴＰＣコマンドを生成することを指示する第２信号を生成する方法をとる。

【００２２】

本発明のシグナリング方法は、通信端末装置が、第１信号及び第２信号が第１のＴＰＣコマンド生成方法を指示する場合のみ、ＨＳ－ＳＣＣＨで信号を送信する第１基地局装置のＡ－ＤＰＣＨの受信ＳＩＲと目標ＳＩＲとの比較結果に基づいてＴＰＣコマンドを生成す

る方法をとる。

【００２３】

これらの方法により、ＨＳ－ＳＣＣＨで信号を送信する基地局装置のＡ－ＤＰＣＨの送信電力を抑えることができるので、システム容量の減少を防止することができる。

【００２４】

本発明の通信端末装置は、接続する基地局装置のＤＰＣＨの受信ＳＩＲを測定するＳＩＲ測定手段と、ＨＳ－ＳＣＣＨで信号を送信する第１基地局装置のＡ－ＤＰＣＨの受信ＳＩＲあるいは測定された受信ＳＩＲの合成値のいずれかを制御局装置にて生成された第１信号及び基地局装置にて生成された第２信号の指示に基づいて選択するＳＩＲ選択手段と、このＳＩＲ選択手段に選択された値と目標ＳＩＲとの比較結果に基づいて下り回線用のＴＰＣコマンドを生成するＴＰＣ生成手段とを具備する構成をとる。

【００２５】

本発明の通信端末装置におけるＳＩＲ選択手段は、第１信号及び第２信号が第１基地局装置のＡ－ＤＰＣＨの受信ＳＩＲの選択を指示する場合のみ、第１基地局装置のＡ－ＤＰＣＨの受信ＳＩＲを選択する構成をとる。

【００２６】

本発明の基地局装置は、上記の通信端末装置にＨＳ－ＰＤＳＣＨにて送信するパケット信号を蓄積するバッファと、前記バッファにパケット信号が蓄積されているか否かに基づいて第２信号を生成する切替手段とを具備する構成をとる。

【００２７】

本発明の基地局装置における切替手段は、バッファにパケット信号が蓄積されている際に、自局のＡ－ＤＰＣＨの受信ＳＩＲの選択を指示する第２信号を生成する構成をとる。

【００２８】

これらの構成により、ＨＳ－ＳＣＣＨで信号を送信する基地局装置のＡ－ＤＰＣＨの送信電力を抑えることができるので、システム容量の減少を防止することができる。

【００２９】

【発明の実施の形態】

本発明の骨子は、ＨＳＤＰＡサービスを受ける通信端末装置において、少なくともＨＯ状態である場合には、プライマリ基地局装置のＡ－ＤＰＣＨの受信ＳＩＲが目標ＳＩＲとなるようにＴＰＣコマンドを生成することである。なお、本発明において、ＨＳＤＰＡサービスとは、ＨＳＤＰＡ伝送によって実現されるパケット通信サービスのことをいうものとする。

【００３０】

以下、本発明の実施の形態について、添付図面を参照して詳細に説明する。

【００３１】

（実施の形態１）

図１は、本発明の実施の形態１のシステム構成図である。

【００３２】

図１において、制御局（ＲＮＣ）１００は、複数の基地局装置（ＮｏｄｅＢ）２００と有線接続し、各基地局装置２００は、複数の通信端末装置（ＵＥ）３００と無線通信を行う。なお、以下の説明では、制御局装置１００が２つの基地局装置２００と有線接続し、各基地局装置２００が３つの通信端末装置３００と無線通信を行う場合を想定する。

【００３３】

次に、制御局装置１００の構成について図２のブロック図を用いて説明する。

【００３４】

信号処理部１０１は、接続する基地局装置の数だけ用意され、通信端末装置３００から送信され、基地局装置２００にて復号された信号を入力し、この信号をネットワーク網で伝送するに適した状態に処理し、分離部１０２に出力する。

【００３５】

分離部１０２は、接続する基地局装置の数だけ用意され、信号処理部１０１の出力信号か

らデータと制御信号を分離する。データは、ネットワーク網に出力される。分離部１０２にてデータと分離された制御信号の中には、通信端末装置３００が測定した周辺基地局装置の共通制御チャネルの受信電力を示す信号（以下、「受信電力信号」という）等が含まれる。

【００３６】

ハンドオーバ制御部１０３は、受信電力信号に基づいて各通信端末装置についてＨＯ状態にあるか否か、すなわち、セルエッジに存在するか否かを判定し、判定結果を示す信号（以下、「ＨＯ端末信号」という）をＴＰＣ生成方法選択部１０４に出力する。

【００３７】

ＴＰＣ生成方法選択部１０４は、接続する基地局装置の数だけ用意され、ＨＳＤＰＡサービスを受ける通信端末装置であって、かつ、ＨＯ状態であるものに対して、プライマリ基地局装置のＡ－ＤＰＣＨの受信ＳＩＲが目標ＳＩＲとなるようにＴＰＣコマンドを生成する方法（以下、「プライマリ基準のＴＰＣコマンド生成方法」という）を選択する。一方、ＨＳＤＰＡサービスを受ける通信端末装置であって、かつ、ＨＯ状態にないものに対して、接続する基地局装置のＤＰＣＨあるいはＡ－ＤＰＣＨの受信ＳＩＲの合成値が目標ＳＩＲとなるようにＴＰＣコマンドを生成する方法（以下、「合成値基準のＴＰＣコマンド生成方法」という）を選択する。そして、ＴＰＣ生成方法選択部１０４は、選択したＴＰＣコマンド生成方法を示す信号（以下、「ＴＰＣ生成方法信号」という）を多重部（ＭＵＸ）１０５に出力する。

【００３８】

多重部１０５は、接続する基地局装置の数だけ用意され、ネットワーク網からの入力信号にＴＰＣ生成方法信号を多重して、信号処理部１０６に出力する。信号処理部１０６は、接続する基地局装置の数だけ用意され、多重部１０５の出力信号を基地局装置で伝送するに適した状態に処理し、多重部１０７に出力する。

【００３９】

多重部１０７は、接続する基地局装置の数だけ用意され、信号処理部１０６の出力信号にパケット伝送用制御信号及びＨＳ－ＳＣＣＨのＡ－ＤＰＣＨに対する送信電力のオフセット値を示すオフセット信号等を多重して基地局装置２００に出力する。

【００４０】

次に、基地局装置２００の構成について図３のブロック図を用いて説明する。基地局装置２００は、各端末装置に送信するための個別データ、パケットデータ、パケット伝送用制御信号及びオフセット信号を制御局装置１００から入力する。また、基地局装置２００は、接続中の通信端末装置から無線送信された信号を受信する。

【００４１】

共用器２０２は、アンテナ２０１に受信された信号を受信ＲＦ部２０３に出力する。また、共用器２０２は、送信ＲＦ部２６６から出力された信号をアンテナ２０１から無線送信する。

【００４２】

受信ＲＦ部２０３は、共用器２０２から出力された無線周波数の受信信号をベースバンドのディジタル信号に変換し、復調部２０４に出力する。

【００４３】

復調部２０４は、無線通信を行う通信端末装置の数だけ用意され、受信ベースバンド信号に対して逆拡散、ＲＡＫＥ合成、誤り訂正復号等の復調処理を行い、分離部２０５に出力する。

【００４４】

分離部２０５は、復調部２０４の出力信号をデータと制御信号とに分離する。分離部２０５にて分離された制御信号には、ＤＬ（Ｄｏｗｎ　Ｌｉｎｋ）用ＴＰＣコマンド、ＣＱＩ信号、ＡＣＫ／ＮＡＣＫ信号、受信電力信号等が含まれる。ＣＱＩ信号及びＡＣＫ／ＮＡＣＫ信号はスケジューラ２５１に出力され、ＤＬ用ＴＰＣコマンドは送信電力制御部２５８に出力され、データ及び受信電力信号は制御局装置１００に出力される。

【００４５】
ＳＩＲ測定部２０６は、無線通信を行う通信端末装置の数だけ用意され、復調の過程で測定される希望波レベル及び干渉波レベルによって上り回線の受信ＳＩＲを測定し、ＳＩＲを示す信号をＴＰＣコマンド生成部２０７に出力する。
【００４６】
ＴＰＣコマンド生成部２０７は、無線通信を行う通信端末装置の数だけ用意され、上り回線の受信ＳＩＲと目標ＳＩＲとの大小関係により、上り回線の送信電力の増減を指示するＵＬ（Ｕｐ　Ｌｉｎｋ）用ＴＰＣコマンドを生成する。
【００４７】
スケジューラ２５１は、各通信端末装置からのＣＱＩ信号及びパケット伝送用制御信号等に基づいてパケットを送信する通信端末装置（以下、「送信先装置」という）を決定し、送信先装置を示す情報をバッファ（Ｑｕｅｕｅ）２５２に出力する。その際、スケジューラ２５１は、ＡＣＫ信号を入力した場合には新しいデータを送信するように、ＮＡＣＫ信号を入力した場合には前回送信したデータを再送するようにバッファ２５２に指示する。また、スケジューラ２５１は、送信先装置のＣＱＩ信号に基づいて変調方式及び符号化率を決定し、変調部２５３に指示する。また、スケジューラ２５１は、パケットデータの送信電力を決定する際に参照となる信号を送信電力制御部２５４に出力する。なお、本発明においてはパケットデータの送信電力制御方法に制限はなく、パケットデータの送信電力制御を行わなくとも良い。また、スケジューラ２５１は、ＨＳ－ＳＣＣＨによって送信先装置に送信する信号（以下、「ＨＳ－ＳＣＣＨ用信号」という）を増幅部２６１に出力する。ＨＳ－ＳＣＣＨ用信号には、パケットデータを送信するタイミング、パケットデータの符号化率及び変調方式等を示す情報（ＴＦＲＩ）が含まれる。
【００４８】
バッファ２５２は、スケジューラ２５１に指示された送信先装置に対するパケットデータを変調部２５３に出力する。
【００４９】
変調部２５３は、スケジューラ２５１の指示に従ってパケットデータに対して誤り訂正符号化、変調及び拡散を行って増幅部２５５に出力する。
【００５０】
送信電力制御部２５４は、増幅部２５５の増幅量を制御することにより、変調部２５３の出力信号の送信電力を制御する。増幅部２５５の出力信号は、ＨＳ－ＰＤＳＣＨで送信される信号であって、多重部２６５に出力される。
【００５１】
多重部２５６は、無線通信を行う通信端末装置の数だけ用意され、各通信端末装置に送信する個別データ（制御信号も含む）にパイロット信号及びＵＬ用ＴＰＣコマンドを多重して変調部２５７に出力する。
【００５２】
変調部２５７は、無線通信を行う通信端末装置の数だけ用意され、多重部２５６の出力信号に対して誤り訂正符号化、変調及び拡散を行って増幅部２５９に出力する。
【００５３】
送信電力制御部２５８は、無線通信を行う通信端末装置の数だけ用意され、ＤＬ用ＴＰＣコマンドに従って増幅部２５９の増幅量を制御することにより、変調部２５７の出力信号の送信電力を制御する。また、送信電力制御部２５８は、送信電力値を示す信号を送信電力制御部２６０に出力する。増幅部２５９にて増幅された信号は、ＤＰＣＨ（Ａ－ＤＰＣＨを含む）で送信される信号であって、多重部２６５に出力される。
【００５４】
送信電力制御部２６０は、送信電力制御部２５８の送信電力値にオフセットをつけた値で増幅部２６１の増幅量を制御することにより、スケジューラ２５１から出力されたＨＳ－ＳＣＣＨ用信号の送信電力を制御する。増幅部２６１にて増幅された信号は、ＨＳ－ＳＣＣＨで送信される信号であって、多重部２６５に出力される。なお、送信電力制御部２６

０は、再送状態等によりオフセット値を補正してもよい。

【００５５】

変調部２６２は、共通制御データに対して誤り訂正符号化、変調及び拡散を行って増幅部２６４に出力する。送信電力制御部２６３は、増幅部２６４の増幅量を制御することにより、変調部２６２の出力信号の送信電力を制御する。増幅部２６４の出力信号は、ＣＰＩＣＨ等で送信される信号であって、多重部２６５に出力される。

【００５６】

多重部２６５は、増幅部２５５、増幅部２５９、増幅部２６１及び増幅部２６４の各出力信号を多重し、送信ＲＦ部２６６に出力する。

【００５７】

送信ＲＦ部２６６は、多重部２６５から出力されたベースバンドのディジタル信号を無線周波数の信号に変換して共用器２０２に出力する。

【００５８】

次に、通信端末装置３００の構成について図４のブロック図を用いて説明する。通信端末装置３００は、基地局装置２００から個別データ、共通制御データ、パケットデータ、ＨＳ－ＳＣＣＨ用信号を受信する。

【００５９】

共用器３０２は、アンテナ３０１に受信された信号を受信ＲＦ部３０３に出力する。また、共用器３０２は、送信ＲＦ部３５８から出力された信号をアンテナ３０１から無線送信する。

【００６０】

受信ＲＦ部３０３は、共用器３０２から出力された無線周波数の受信信号をベースバンドのディジタル信号に変換し、ＨＳ－ＰＤＳＣＨの信号をバッファ３０４に出力し、ＨＳ－ＳＣＣＨ用信号を復調部３０５に出力し、ＤＰＣＨの信号を復調部３０８に出力し、共通制御チャネルの信号をＣＩＲ（Ｃａｒｒｉｅｒ ｔｏ Ｉｎｔｅｒｆｅｒｅｎｃｅ Ｒａｔｉｏ）測定部３１３にする。

【００６１】

バッファ３０４は、ＨＳ－ＰＤＳＣＨの信号を一時的に保存して復調部３０６に出力する。

【００６２】

復調部３０５は、ＨＳ－ＳＣＣＨ用信号に対して逆拡散、ＲＡＫＥ合成、誤り訂正復号等の復調処理を行い、自局宛パケットデータの到来タイミング、当該パケットデータの符号化率及び変調方式等、パケットデータの復調に必要な情報を取得して復調部３０６に出力する。

【００６３】

復調部３０６は、復調部３０５にて取得された情報に基づいてバッファに保存されているＨＳ－ＰＤＳＣＨの信号に対して逆拡散、ＲＡＫＥ合成、誤り訂正復号等の復調処理を行い、復調処理によって得られたパケットデータを誤り検出部３０７に出力する。

【００６４】

誤り検出部３０７は、復調部３０６から出力されたパケットデータに対して誤り検出を行い、誤りが検出されなかった場合にはＡＣＫ信号を、誤りが検出されなかった場合にはＮＡＣＫ信号を多重部３５１に出力する。

【００６５】

復調部３０８は、ＤＰＣＨの信号に対して逆拡散、ＲＡＫＥ合成、誤り訂正復号等の復調処理を行い、分離部３０９に出力する。

【００６６】

分離部３０９は、復調部３０８の出力信号をデータと制御信号とに分離する。分離部３０９にて分離された制御信号には、ＵＬ用ＴＰＣコマンド、ＴＰＣ生成方法信号等が含まれる。ＵＬ用ＴＰＣコマンドは送信電力制御部３５７に出力され、ＴＰＣ生成方法信号はＳＩＲ選択部３１１に出力される。

【００６７】
ＳＩＲ測定部３１０は、復調の過程で測定される希望波レベル及び干渉波レベルによって下り回線の受信ＳＩＲを、接続する基地局装置毎に測定し、測定した全ての受信ＳＩＲをＳＩＲ選択部３１１に出力する。
【００６８】
ＳＩＲ選択部３１１は、ＴＰＣ生成方法信号が合成値基準のＴＰＣコマンド生成方法を示す場合、受信ＳＩＲの合成値をＴＰＣコマンド生成部３１２に出力する。一方、ＳＩＲ選択部３１１は、ＴＰＣ生成方法信号がプライマリ基準のＴＰＣコマンド生成方法を示す場合、プライマリ基地局装置から送信された信号の受信ＳＩＲのみをＴＰＣコマンド生成部３１２に出力する。
【００６９】
ＴＰＣコマンド生成部３１２は、ＳＩＲ選択部３１１から出力された受信ＳＩＲと目標ＳＩＲとの大小関係によりＤＬ用ＴＰＣコマンドを生成し、多重部３５４に出力する。
【００７０】
ＣＩＲ測定部３１３は、プライマリ基地局装置からの共通制御チャネルの信号を用いてＣＩＲを測定し、測定結果をＣＱＩ生成部３１４に出力する。ＣＱＩ生成部３１４は、プライマリ基地局装置から送信された信号のＣＩＲに基づくＣＱＩ信号を生成して多重部３５１に出力する。
【００７１】
受信電力測定部３１５は、プライマリ基地局装置以外の周辺基地局装置からの共通制御チャネルの受信電力を示す受信電力を測定して、受信電力信号を多重部３５１に出力する。
【００７２】
多重部３５１は、ＣＱＩ信号、受信電力信号及びＡＣＫ／ＮＡＣＫ信号を多重して変調部３５２に出力する。変調部３５２は、多重部３５１の出力信号に対して誤り訂正符号化、変調及び拡散を行って多重部３５６に出力する。
【００７３】
変調部３５３は、基地局装置２００に送信するデータに対して誤り訂正符号化、変調及び拡散を行って多重部３５６に出力する。
【００７４】
多重部３５４は、ＤＬ用ＴＰＣコマンド、パイロット信号を多重して変調部３５５に出力する。変調部３５５は、多重部３５４の出力信号に対して誤り訂正符号化、変調及び拡散を行って多重部３５６に出力する。
【００７５】
多重部３５６は、変調部３５２、変調部３５３及び変調部３５５の各出力信号を多重し、送信ＲＦ部３５８に出力する。
【００７６】
送信電力制御部３５７は、ＵＬ用ＴＰＣコマンドに従って送信ＲＦ部３５８の増幅量を制御することにより、多重部３５６の出力信号の送信電力を制御する。なお、複数の基地局装置と接続している場合、送信電力制御部３５７は、全てのＵＬ用ＴＰＣコマンドが送信電力の上昇を指示する場合のみ送信電力を上昇させる制御を行う。
【００７７】
送信ＲＦ部３５８は、多重部３５６から出力されたベースバンドのディジタル信号を増幅し、無線周波数の信号に変換して共用器３０２に出力する。
【００７８】
次に、本実施の形態に係るハンドオーバ時のＴＰＣコマンド生成方法について、図５及び図６を用いて詳細に説明する。図５は通信端末装置がＨＳＤＰＡサービスを受けない場合を示し、図６は通信端末装置がＨＳＤＰＡサービスを受ける場合を示す。なお、図５及び図６において、合成値基準を示すＴＰＣ生成方法信号を「０」、プライマリ基準を示すＴＰＣ生成方法信号を「１」とする。
【００７９】

図５（ａ）～（ｃ）に示すように、通常、制御局装置５０１は、ＨＳＤＰＡサービスを受けない通信端末装置に対して、常に合成値基準を示すＴＰＣ生成方法を指示する。

【００８０】

図５（ａ）は、通信端末装置５０４が、基地局装置５０２と無線通信を行っている状態を示している。この場合、制御局装置５０１は基地局装置５０２に信号「０」を出力し、基地局装置５０２はＤＰＣＨで信号「０」を通信端末装置５０４に送信する。この結果、通信端末装置５０４は、基地局装置５０２のＤＰＣＨの受信ＳＩＲと目標ＳＩＲとの大小関係によりＤＬ用ＴＰＣコマンドを作成する。

【００８１】

その後、図５（ｂ）に示すように、通信端末装置５０４が、基地局装置５０２のセルと基地局装置５０３のセルとが重なる部分に移動し、ＨＯ状態になったとする。この場合、制御局装置５０１は基地局装置５０２及び基地局装置５０３に信号「０」を出力し、基地局装置５０２及び基地局装置５０３はそれぞれＤＰＣＨで信号「０」を通信端末装置５０４に送信する。この結果、通信端末装置５０４は、基地局装置５０２及び基地局装置５０３のＤＰＣＨの受信ＳＩＲの合成値と目標ＳＩＲとの大小関係によりＤＬ用ＴＰＣコマンドを作成する。

【００８２】

その後、図５（ｃ）に示すように、通信端末装置５０４が、基地局装置５０３のセルに移動し、ＨＯではない状態になったとする。この場合、制御局装置５０１は基地局装置５０３に信号「０」を出力し、基地局装置５０３はＤＰＣＨで信号「０」を通信端末装置５０４に送信する。この結果、通信端末装置５０４は、基地局装置５０３のＤＰＣＨの受信ＳＩＲと目標ＳＩＲとの大小関係によりＤＬ用ＴＰＣコマンドを作成する。

【００８３】

図６（ａ）は、通信端末装置６０４が、基地局装置６０２と無線通信を行い、ＨＳＤＰＡサービスを受けている状態を示している。この場合、図５（ａ）と同様に、制御局装置６０１は基地局装置６０２に信号「０」を出力し、基地局装置６０２はＡ－ＤＰＣＨで信号「０」を通信端末装置６０４に送信する。この結果、通信端末装置６０４は、基地局装置６０２のＡ－ＤＰＣＨの受信ＳＩＲと目標ＳＩＲとの大小関係によりＤＬ用ＴＰＣコマンドを作成する。

【００８４】

その後、図６（ｂ）、（ｃ）に示すように、通信端末装置６０４が、基地局装置６０２のセルと基地局装置６０３のセルとが重なる部分に移動し、ＨＯ状態になったとする。この場合、制御局装置６０１は基地局装置６０２及び基地局装置６０３に信号「１」を出力し、基地局装置６０２及び基地局装置６０３はそれぞれＡ－ＤＰＣＨで信号「１」を通信端末装置６０４に送信する。この結果、通信端末装置６０４は、プライマリ基地局装置となる基地局装置６０２あるいは基地局装置６０３のいずれかのＡ－ＤＰＣＨの受信ＳＩＲと目標ＳＩＲとの大小関係によりＤＬ用ＴＰＣコマンドを作成する。なお、図６（ｂ）はプライマリ基地局装置が基地局装置６０２である場合を示し、図６（ｃ）はプライマリ基地局装置が基地局装置６０３である場合を示す。

【００８５】

その後、図６（ｄ）に示すように、通信端末装置６０４が、基地局装置６０３のセルに移動し、ＨＯではない状態になったとする。この場合、図５（ｃ）と同様に、制御局装置６０１は基地局装置６０３に信号「０」を出力し、基地局装置６０３はＡ－ＤＰＣＨで信号「０」を通信端末装置６０４に送信する。この結果、通信端末装置６０４は、基地局装置６０３のＤＰＣＨの受信ＳＩＲと目標ＳＩＲとの大小関係によりＤＬ用ＴＰＣコマンドを作成する。

【００８６】

なお、本実施の形態では、制御局装置が、ＨＳＤＰＡサービスを受ける通信端末装置がＨＯ状態にあるか否かを判断し、ＨＯ状態にある通信端末装置に対してプライマリ基準を示すＴＰＣ生成方法信号を送信する場合について説明したが、本発明では、制御局装置が、

ＨＳＤＰＡサービスを受ける通信端末装置に対して、常にプライマリ基準を示すＴＰＣ生成方法信号を送信してもよい。

【００８７】

このように、ＨＳＤＰＡサービスを受ける通信端末装置において、少なくともＨＯ状態である場合には、プライマリ基地局装置のＡ－ＤＰＣＨの受信ＳＩＲが目標ＳＩＲとなるようにＴＰＣコマンドを生成することにより、プライマリ基地局装置においてＨＳ－ＳＣＣＨの送信電力をＡ－ＤＰＣＨの送信電力に所定のオフセット値を加えて設定すれば、常に、ＨＳ－ＳＣＣＨの受信電力を所要のＳＩＲとすることができるので、ＨＳＤＰＡサービスを行う無線通信システムにおいてシステムスループットの向上を図ることができる。

【００８８】

（実施の形態２）

実施の形態１において、ＨＳＤＰＡサービスを受ける通信端末装置がＨＯ状態の場合、プライマリ基地局装置以外の基地局装置からもＡ－ＤＰＣＨの信号が送信される。そして、通信端末装置は、プライマリ基地局装置のＡ－ＤＰＣＨの受信ＳＩＲが目標ＳＩＲとなるようにＴＰＣコマンドを生成する。したがって、プライマリ基地局装置以外の基地局装置から送信されるＡ－ＤＰＣＨの信号は、当該通信端末装置において過剰品質となり、他の通信端末装置にとっては与干渉となる。ゆえに、プライマリ基地局装置以外の基地局装置から送信されるＡ－ＤＰＣＨの送信電力を、ＴＰＣコマンドによらずに制御しなければ、システム容量が減少してしまう。実施の形態２は、この点に鑑みてなされたものである。

【００８９】

図７は、本発明の実施の形態２に係る制御局装置の構成を示すブロック図である。なお、図７に示す制御局装置７００において、図２に示した制御局装置１００と共通する構成部分には、図２と同一符号を付して説明を省略する。

【００９０】

図７に示す制御局装置７００は、図２の制御局装置１００に対してプライマリ選択部７０１を追加した構成を採る。

【００９１】

プライマリ選択部７０１は、ＨＯ端末信号を参照して、プライマリ基地局装置を示す信号（以下、「プライマリ信号」という）を生成する。

【００９２】

多重部１０７は、信号処理部１０６の出力信号にプライマリ信号を含むパケット伝送用制御信号及びオフセット信号等を多重して基地局装置２００に出力する。

【００９３】

図８は、本発明の実施の形態２に係る基地局装置の構成を示すブロック図である。なお、図８に示す基地局装置８００において、図３に示した基地局装置２００と共通する構成部分には、図３と同一符号を付して説明を省略する。

【００９４】

図８に示す基地局装置８００は、スケジューラ８０１及び送信電力制御部８０２の作用が、図３のスケジューラ２５１及び送信電力制御部２５８と異なる。

【００９５】

スケジューラ８０１は、図３に示したスケジューラ２５１の作用に加えて、プライマリ信号に基づいて自局が各通信端末装置に対してプライマリ基地局装置であるか否かを判定し、判定結果を送信電力制御部８０２に出力する。

【００９６】

送信電力制御部８０２は、自局がプライマリ基地局装置である場合には、ＤＬ用ＴＰＣコマンドに従って増幅部２５９の増幅量を制御する。

【００９７】

一方、自局がプライマリ基地局装置でない場合には、ＤＬ用ＴＰＣコマンドによらずに増幅部２５９の増幅量を制御する。例えば、送信電力を変化させないために、送信電力増加および減少を交互に繰り返す制御を行う。あるいは、他移動局への干渉を低減するために

、送信電力を徐々に減少させる制御を行う。

【００９８】

このように、ＨＯ状態において、プライマリ基地局装置以外の基地局装置のＡ－ＤＰＣＨの送信電力をＴＰＣコマンドによらずに制御することにより、Ａ－ＤＰＣＨの送信電力の過剰な増加を抑えて、システム容量の減少を防止することができる。

【００９９】

（実施の形態３）

実施の形態３は、実施の形態２と同様にＡ－ＤＰＣＨの送信電力を抑えて、システム容量の減少を防止することを目的とし、実施の形態２とは異なる方法で実現するものである。具体的には、プライマリ基地局装置が、ＨＳＤＰＡサービスを受ける通信端末装置に対して、ＨＳ－ＰＤＳＣＨにて信号を送信する場合にはプライマリ基準のＴＰＣコマンド生成方法を、他の場合には合成値基準のＴＰＣコマンド生成方法を選択するように指示することである。これは、パケットデータは間欠的に送信され、パケットデータを送信しない時間においてはＨＳ－ＳＣＣＨの送信電力を制御する必要がなく、プライマリ基地局装置のＡ－ＤＰＣＨの送信電力を低くしても問題が生じないことによるものである。

【０１００】

図９は、本発明の実施の形態３に係る基地局装置の構成を示すブロック図である。なお、図９に示す基地局装置９００において、図８に示した基地局装置８００と共通する構成部分には、図８と同一符号を付して説明を省略する。

【０１０１】

図９に示す基地局装置９００は、図８に示した基地局装置に対して切替制御部９０１及び補正値設定部９０２を追加した構成を採る。

【０１０２】

切替制御部９０１は、各通信端末装置のパケットデータがバッファ２５２に蓄積されているか否かを監視し、監視結果に基づいてＴＰＣコマンド生成方法の切り替えを指示する信号（以下、「切替信号」という）を多重部２５６に出力する。具体的には、切替制御部９０１は、バッファ２５２にパケットデータが蓄積されている場合にはプライマリ基準のＴＰＣコマンド生成方法に切り替える旨を指示する切替信号を出力し、バッファ２５２にパケットデータが蓄積されていない場合には合成値基準のＴＰＣコマンド生成方法に切り替える旨を指示する切替信号を出力する。

【０１０３】

多重部２５６は、無線通信を行う通信端末装置の数だけ用意され、各通信端末装置に送信する個別データにパイロット信号及びＵＬ用ＴＰＣコマンド、切替信号を多重して変調部２５７に出力する。

【０１０４】

ＨＳＤＰＡサービスでないときは、ＴＰＣコマンド生成方法信号及び切替信号が不要であるので、図１０（ａ）のＡ－ＤＰＣＨのフレームフォーマットに示すように、各スロットにパイロット信号（ＰＬ）、ＵＬ用ＴＰＣコマンド（ＴＰＣ）及びデータ（ｄａｔａ１、ｄａｔａ２）が配置されるフレーム構成となる。

【０１０５】

一方、ＨＳＤＰＡサービスの際には、ＴＰＣコマンド生成方法信号及び切替信号を送信する必要がある。そこで、図１０（ｂ）のＡ－ＤＰＣＨのフレームフォーマットに示すように、データ部の一部をパンクチャリングしてＴＰＣコマンド生成方法信号及び切替信号を多重するフレーム構成をとることにする。

【０１０６】

通信端末装置は、ＨＳＤＰＡサービスを受けているか否かで、どちらのフレーム構成かを判断することが可能であり、ＨＳＤＰＡサービスを受けている場合には、上記パンクチャドにより多重された切替信号を見て、ＴＰＣコマンド生成方法を切替える。なお、ＨＳＤＰＡサービスを受けていない場合は、従来どおりデータ部として復調する。

【０１０７】

これにより、従来どおりの基本的なフレーム構成案を踏襲したままで切替信号の伝送が可能になり、信号伝送の効率化を図ることができる。

【０１０８】

補正値設定部９０２は、再送状態及びＡＣＫ／ＮＡＣＫ信号に基づいてＨＳ－ＳＣＣＨの送信電力の補正値を設定し、送信電力制御部２６０に出力する。

【０１０９】

送信電力制御部２６０は、再送時に、補正値設定部９０２からの補正値を加えることにより、ＨＳ－ＳＣＣＨの送信電力を初回送信に比べて高く設定することが考えられる。また、ある通信端末装置あてにＨＳ－ＳＣＣＨを送信したにも関わらず、ＡＣＫ／ＮＡＣＫ信号が受信できずに、再送状態になった場合には、ＨＳ－ＳＣＣＨが正しく受信できない可能性が高いと判断し、その場合にのみ、再送時のＨＳ－ＳＣＣＨの送信電力を初回送信に比べて高く設定する。さらに、再送回数が増えるほど補正値を高く設定する。これらにより、ＨＳ－ＳＣＣＨが正しく受信できないことによって発生する再送回数を低減することが可能になる。

【０１１０】

さらに、送信電力制御部２６０は、設定した送信電力に補正値設定部９０２から入力した補正値を加算することによりアウターループ制御を行う。送信電力制御部２６０が、送信電力をアウターループ制御することにより、再送時だけでなく初回送信も含めたＨＳ－ＳＣＣＨの送信電力を補正することが可能になり、再送回数を減らしてスループットの向上を図ることができる。

【０１１１】

ただし、補正値設定部９０２は、再送情報だけでは、通信端末装置においてＨＳ－ＳＣＣＨを正しく受信することができたにも関わらず、パケットデータであるＨＳ－ＰＤＳＣＨを正しく受信することができなかったため、ＮＡＣＫ信号により再送になったのか、または、ＨＳ－ＳＣＣＨを正しく受信することができなかったために、ＨＳ－ＰＤＳＣＨも受信することができずに再送になったかを見分けることはできない。よって、初回の送信電力も含めたＨＳ－ＳＣＣＨの送信電力に関するアウターループ制御には、再送情報だけでは不十分である。例えば、ある端末あてにＨＳ－ＳＣＣＨを送信したにも関わらず、ＡＣＫ／ＮＡＣＫ信号が受信できずに、再送状態になった場合には、その端末がＨＳ－ＳＣＣＨを正しく受信できないために発生した可能性が高いと判断される。よって、その発生頻度が高い場合は、補正値設定部９０２は、ＣＱＩ信号の内容（報告値）から設定するＨＳ－ＳＣＣＨの送信電力をそれまでよりも高い補正値に設定する。これにより、初回の送信電力も含めたＨＳ－ＳＣＣＨの送信電力に関するアウターループ制御が可能になる。また、補正値設定部９０２は、再送回数が増えるほど補正値を高く設定する。

【０１１２】

なお、アウターループ制御として、通信端末装置毎に行う方法と全体で一括して行う方法の２通りが考えられる。通信端末装置毎に行う方法では、各通信端末装置での回線状態（マルチパス状態や移動速度など）に応じた制御ができるため、各端末とのスループットの向上を最大限に図ることができる。一方、全体で一括して行う方法の場合には、基地局装置の設置場所などに固有な回線条件（マルチパス数など）による補正が可能であり、さらに通信端末装置毎に行う方法に比べてアウターループ制御に必要な処理量の削減を図ることができる。

【０１１３】

次に、送信電力制御部２６０におけるアウターループ制御の送信電力の算出方法について具体的に説明する。

【０１１４】

送信電力制御部２６１は、以下の式（１）によりＨＳ－ＳＣＣＨの送信電力を算出する。

$$P_{HS-SCCH} = P_{A-DPCH} + offset\ value + (adjustment\ value\ 1) + (adjustment\ value\ 2) \cdots (1)$$

ただし、式（１）において、
$P_{HS-SCCH}$　：ＨＳ－ＳＣＣＨの送信電力
P_{A-DPCH}　：　各端末のＡ－ＤＰＣＨの送信電力
ｏｆｆｓｅｔ　ｖａｌｕｅ：　上位装置より指定されたＡ－ＤＰＣＨの送信電力に対するオフセット値
ａｄｊｕｓｔｍｅｎｔ　ｖａｌｕｅ１：　アウターループ制御により補正された値（ユーザごとの補正または全体での補正の２通りがある。）
ａｄｊｕｓｔｍｅｎｔ　ｖａｌｕｅ　２：　再送制御により補正された値

【０１１５】
なお、P_{A-DPCH}が１スロット毎に変化するため、$P_{HS-SCCH}$も１スロット毎に変化する。

【０１１６】
図１１は、本発明の実施の形態３に係る通信端末装置の構成を示すブロック図である。なお、図１１に示す通信端末装置１１００において、図４に示した通信端末装置４００と共通する構成部分には、図４と同一符号を付して説明を省略する。

【０１１７】
図１１に示す通信端末装置１１００は、ＳＩＲ選択部１１０１の作用が、図４のＳＩＲ選択部３１１と異なる。

【０１１８】
分離部３０９にて分離された制御信号には、ＵＬ用ＴＰＣコマンド、ＴＰＣ生成方法信号、切替信号等が含まれる。ＵＬ用ＴＰＣコマンドは送信電力制御部３５７に出力され、ＴＰＣ生成方法信号及び切替信号はＳＩＲ選択部１１０１に出力される。

【０１１９】
ＳＩＲ選択部１１０１は、ＴＰＣ生成方法信号が合成値基準のＴＰＣコマンド生成方法を示す場合、受信ＳＩＲの合成値をＴＰＣコマンド生成部３１２に出力する。一方、ＳＩＲ選択部１１０１は、ＴＰＣ生成方法信号がプライマリ基準のＴＰＣコマンド生成方法を示す場合、切替信号の内容を判断する。その結果、切替信号が、合成値基準のＴＰＣコマンド生成方法を示す場合、受信ＳＩＲの合成値をＴＰＣコマンド生成部３１２に出力し、プライマリ基準のＴＰＣコマンド生成方法を示す場合、プライマリ基地局装置から送信された信号の受信ＳＩＲのみをＴＰＣコマンド生成部３１２に出力する。

【０１２０】
このように、プライマリ基地局装置が、ＨＳＤＰＡサービスを受ける通信端末装置に対して、ＨＳ－ＰＤＳＣＨで信号を送信しない場合には合成値基準のＴＰＣコマンド生成方法を選択することを指示することにより、ＨＳ－ＰＤＳＣＨにて信号を送信しない時間においてＡ－ＤＰＣＨの送信電力を抑えることができ、システム容量またはシステムスループットの減少を防止することができる。

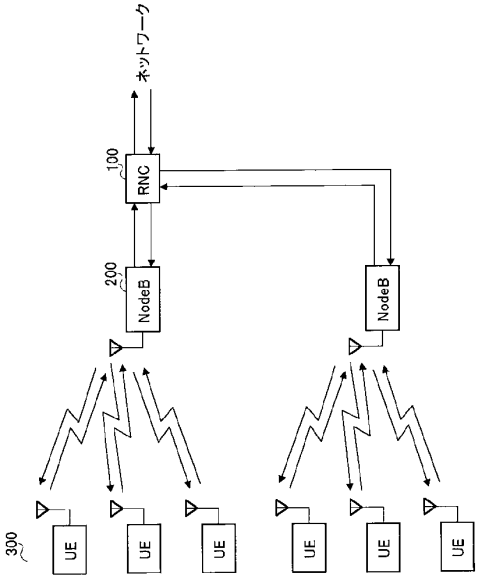
【０１２１】
なお、上記の説明では、便宜上、Ｗ－ＣＤＭＡシステムに使用されるチャネルの名称を使用しているが、本発明は、Ｗ－ＣＤＭＡシステムに限らず、下り回線でパケット伝送を行う他システムにも適用することができる。さらに，本発明は上記のチャネルに限らず、一般にＳＨＯを適用するチャネルとＨＨＯを適用するチャネルが混在する場合に、ＳＨＯを適用するチャネルのＴＰＣコマンド生成方法を切り替えるよう適用可能である。

【０１２２】
【発明の効果】
以上説明したように、本発明によれば、常に、ＨＳ－ＳＣＣＨの受信電力を所要のＳＩＲとすることができるので、ＨＳＤＰＡサービスを行う無線通信システムにおいてシステムスループットの向上を図ることができる。

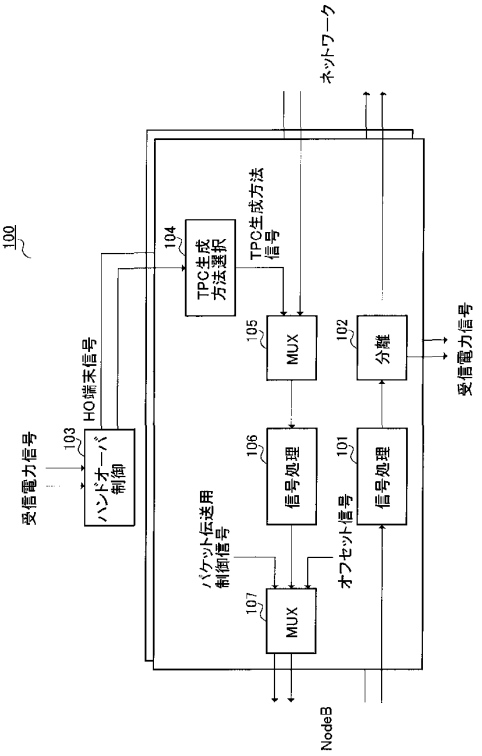
【図面の簡単な説明】
【図１】本発明の実施の形態１のシステム構成図
【図２】上記実施の形態に係る制御局装置の構成を示すブロック図

【図３】上記実施の形態に係る基地局装置の構成を示すブロック図
【図４】上記実施の形態に係る通信端末装置の構成を示すブロック図
【図５】上記実施の形態に係るＴＰＣコマンド生成方法を説明する図
【図６】上記実施の形態に係るＴＰＣコマンド生成方法を説明する図
【図７】本発明の実施の形態２に係る制御局装置の構成を示すブロック図
【図８】上記実施の形態に係る基地局装置の構成を示すブロック図
【図９】本発明の実施の形態３に係る基地局装置の構成を示すブロック図
【図１０】切替信号の伝送方法を説明するための図
【図１１】上記実施の形態に係る通信端末装置の構成を示すブロック図
【図１２】Ａ－ＤＰＣＨとＨＳ－ＳＣＣＨとの受信ＳＩＲの関係を説明する図
【図１３】Ａ－ＤＰＣＨとＨＳ－ＳＣＣＨとの受信ＳＩＲの関係を説明する図
【符号の説明】
１０３　ハンドオーバ制御部
１０４　ＴＰＣ生成方法選択部
２５１、８０１　スケジューラ
２５２　バッファ
２５３、２５７、２６２　変調部
２５４、２５８、２６０、２６３、８０２　送信電力制御部
２５５、２５９、２６１、２６４　増幅部
２５６、２６５　多重部
３０４　バッファ
３０５、３０６、３０８　復調部
３０７　誤り検出部
３１０　ＳＩＲ測定部
３１１　ＳＩＲ選択部
３１２　ＴＰＣコマンド生成部
７０１　プライマリ選択部
９０１　切替制御部
９０２　補正値設定部

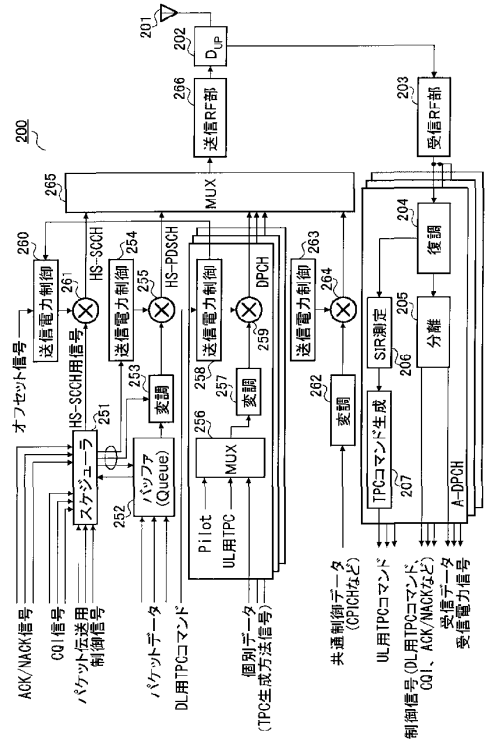
【図１】


ネットワーク
RNC
NodeB
NodeB
UE
UE
UE
UE
UE
UE

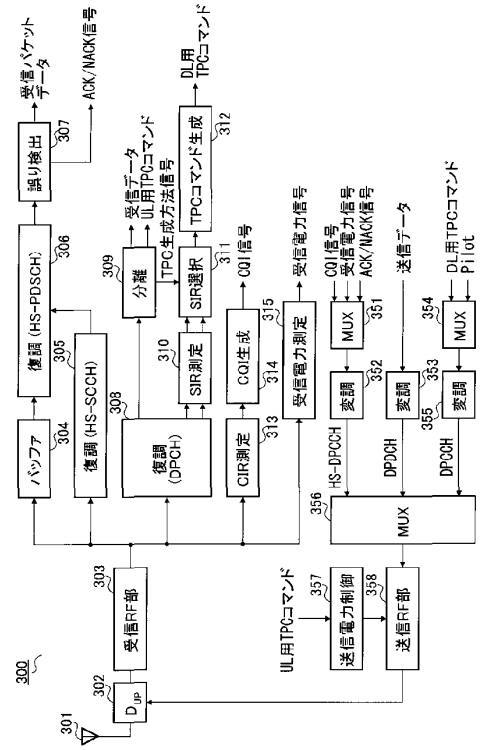
【図２】


ネットワーク
TPC生成方法選択
TPC生成方法信号
MUX
分離
受信電力信号
HO端末信号
ハンドオーバ制御
信号処理
信号処理
パケット伝送用制御信号
オフセット信号
MUX
NodeB

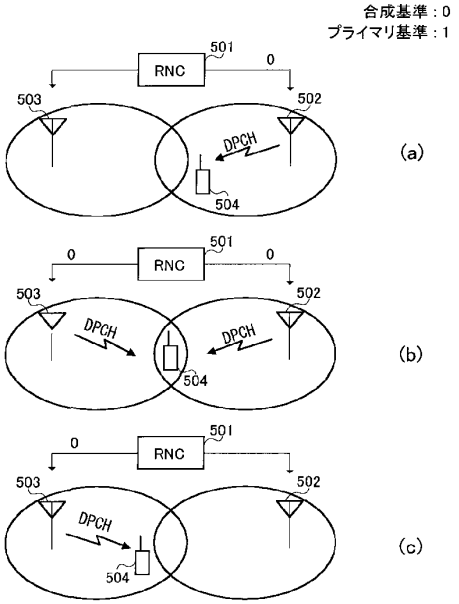
【図３】


送信RF部
受信RF部
MUX
スケジューラ
バッファ
(Queue)
MUX
変調
変調
変調
変調
復調
分離
SIR測定
TPCコマンド生成
A-DPCH
送信電力制御
HS-SCCH
HS-PDSCH
DPCH
Pilot
UL用TPC
オフセット信号
HS-SCCH用信号
ACK/NACK信号
CQI信号
パケット伝送用制御信号
パケットデータ
DL用TPCコマンド
個別データ
(TPC生成方法信号)
共通制御データ
(CPICHなど)
UL用TPCコマンド
制御信号(DL用TPCコマンド、CQI、ACK/NACKなど)
受信データ
受信電力信号

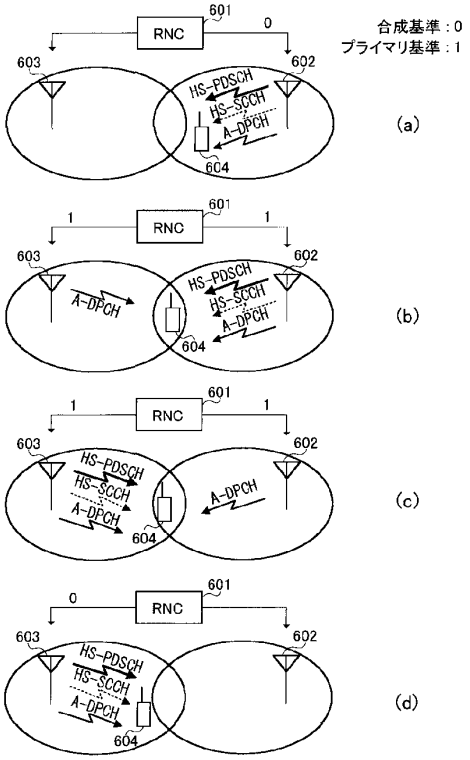
【図４】


受信パケットデータ
ACK/NACK信号
誤り検出
復調 (HS-PDSCH)
復調 (HS-SCCH)
復調 (DPCH)
バッファ
分離
SIR選択
SIR測定
CQI生成
CIR測定
受信電力測定
TPCコマンド生成
DL用TPCコマンド
受信データ
UL用TPC生成方法信号
CQI信号
受信電力信号
CQI信号
受信電力信号
ACK/NACK信号
送信データ
DL用TPCコマンド
Pilot
MUX
変調
変調
変調
送信電力制御
送信RF部
受信RF部
UL用TPCコマンド
HS-DPCCH
DPCH
DPCH

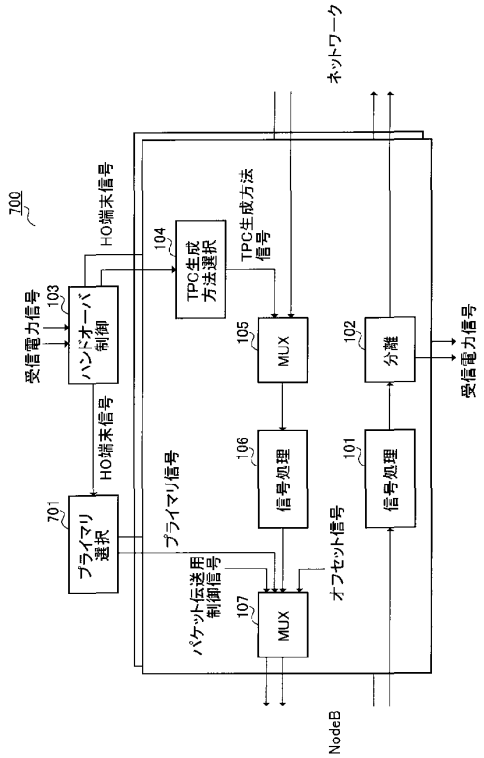
【図５】


合成基準：0
プライマリ基準：1
RNC
501
0
503
502
DPCH
504
(a)
(b)
(c)

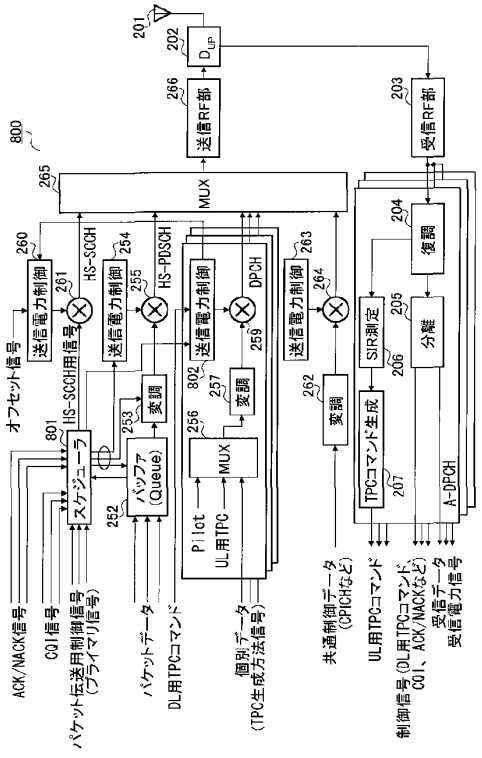
【図６】


合成基準：0
プライマリ基準：1
RNC
601
603
602
HS-PDSCH
HS-SCCH
A-DPCH
604
(a)
(b)
(c)
(d)

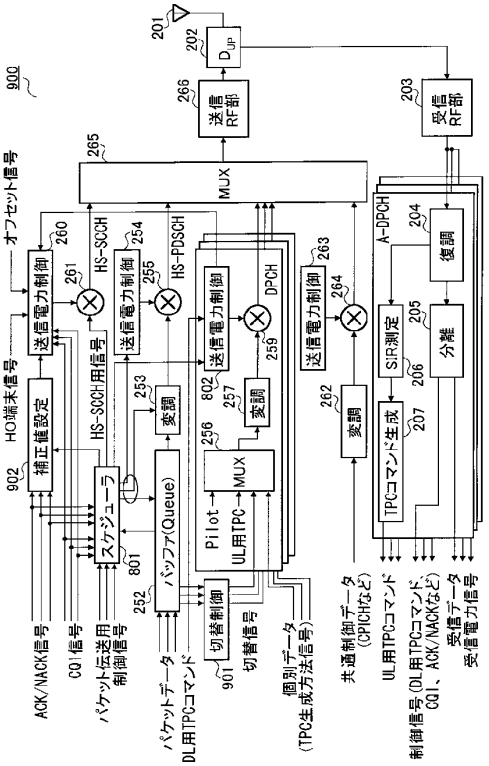
【図７】


ネットワーク
700
HO端末信号
受信電力信号
103
ハンドオーバ制御
104
TPC生成方法選択
TPC生成方法信号
105
MUX
102
分離
受信電力信号
106
信号処理
101
信号処理
701
プライマリ選択
プライマリ信号
パケット伝送用制御信号
107
MUX
オフセット信号
NodeB

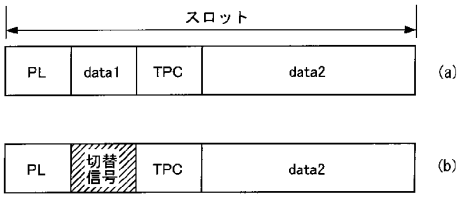
【図８】


201
202
D_UP
266
送信RF部
203
受信RF部
800
265
MUX
260
送信電力制御
261
HS-SCCH
264
255
HS-PDSCH
263
DPCH
259
204
複調
205
分離
SIR測定
206
TPCコマンド生成
207
A-DPCH
オフセット信号
HS-SCCH用信号
801
スケジューラ
252
253
変調
バッファ (Queue)
802
257
変調
256
MUX
Pilot
UL用TPC
262
変調
ACK/NACK信号
CQI信号
パケット伝送用制御信号 (プライマリ信号)
パケットデータ
DL用TPCコマンド
個別データ (TPC生成方法信号)
共通制御データ (CPICHなど)
UL用TPCコマンド
制御信号 (DL用TPCコマンド、CQI、ACK/NACKなど)
受信データ
受信電力信号

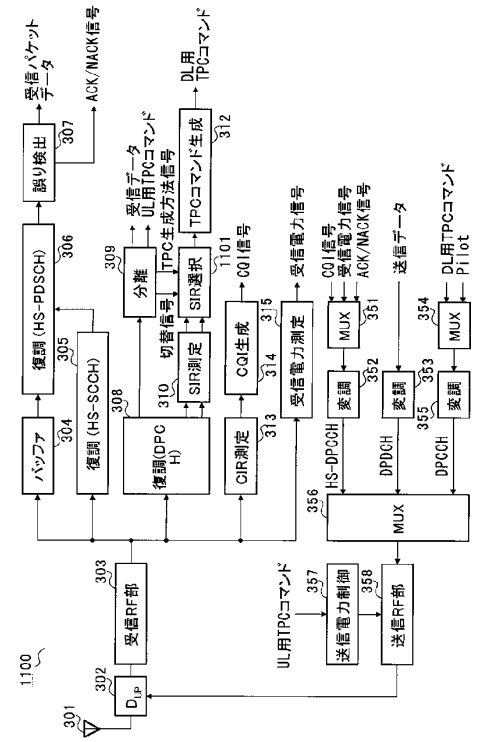
【図９】



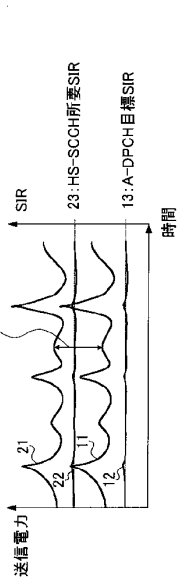
【図１０】



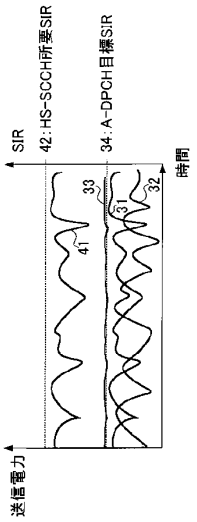
【図１１】



【図１２】



【図１３】



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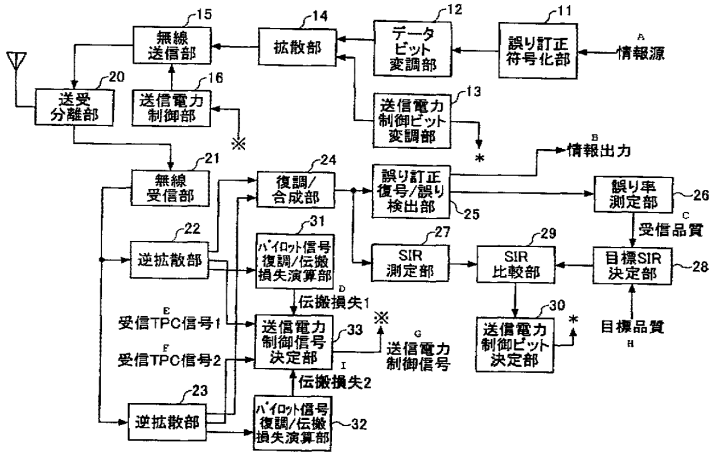
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(54) Title: TRANSMISSION POWER CONTROL APPARATUS AND METHOD IN A MOBILE COMMUNICATION SYSTEM, MOBILE STATION, AND COMMUNICATION APPARATUS

(54) 発明の名称: 移動通信システムにおける送信電力制御装置及び方法並びに移動局及び通信装置



15...RADIO TRANSMISSION UNIT
14...SPREADING UNIT
12...DATA BIT MODULATION UNIT
11...ERROR CORRECTION ENCODING UNIT
A...INFORMATION SOURCE
20...TRANSMISSION/RECEPTION ISOLATING UNIT
16...TRANSMISSION POWER CONTROL UNIT
13...TRANSMISSION POWER CONTROL BIT MODULATION UNIT
21...RADIO RECEPTION UNIT
24...DEMODULATION/SYNTHESIS UNIT
25 ..ERROR CORRECTION DEMODULATION/ERROR DETECTION UNIT
B...INFORMATION OUTPUT
26...ERROR RATIO MEASUREMENT UNIT
C...RECEPTION QUALITY
22...DESPREADING UNIT
31...PILOT SIGNAL DEMODULATION/PROPAGATION LOSS CALCULATION UNIT
27...SIR MEASUREMENT UNIT
29...SIR COMPARISON UNIT
28...TARGET SIR DECISION UNIT
D...PROPAGATION LOSS 1
E...RECEPTION TPC SIGNAL 1
F...RECEPTION TPC SIGNAL 2
33...TRANSMISSION POWER CONTROL SIGNAL DECISION UNIT
G...TRANSMISSION POWER CONTROL SIGNAL
30...TRANSMISSION POWER CONTROL BIT DECISION UNIT
H...TARGET QUALITY
I...PROPAGATION LOSS 2
23...DESPREADING UNIT
32...PILOT SIGNAL DEMODULATION/PROPAGATION LOSS CALCULATION

(57) Abstract: A transmission power control apparatus includes propagation loss calculation means for calculating propagation loss in a radio wave propagation path between a mobile station and each of base stations. Transmission power control information to be used for transmission power control of a mobile station is decided according to

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transmission power control information from a base station obtained at a mobile station and the propagation loss of the radio wave propagation path between each base station and a mobile station. When a reception signal quality is decided to have been lowered than a predetermined quality, an autonomous control procedure functions so that the transmission power is increased according to a predetermined characteristic independently of transmission power control information from another communication apparatus. After synchronization is established in a mobile station for a signal from a base station, the transmission power is controlled from the initial value according to a predetermined characteristic independently of the transmission power control information from the base station.

(57) 要約:

本発明は、移動局と各基地局との間の電波伝送路での伝搬損失を演算する伝搬損失演算手段と、移動局にて得られる各基地局からの送信電力制御情報と、上記伝搬損失演算手段にて演算された各基地局と移動局との間の電波伝送路の伝搬損失とに基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定し、受信信号品質が所定の品質より低下したと判定されたときには、送信電力を、他の通信装置からの送信電力制御情報にかかわらず、当該判定時の送信電力値から所定の特性に従って上昇させる自律制御手順を有し、基地局からの信号に対する移動局での同期が確立された後に、基地局からの送信電力制御情報に係わらず、送信電力を、初期値から所定の特性に従って上昇させるように制御することである。

明　細　書

移動通信システムにおける送信電力制御装置及び方法並びに移動局及び通信装置

技術分野

本発明は、移動通信システムにおける送信電力制御装置及び方法並びに移動局及び通信装置に係り、詳しくは、移動通信システムにおける複数の基地局と無線通信を行う移動局の送信電力制御を行う送信電力制御装置及び方法並びに移動局及び通信装置、あるいは、他の通信装置と信号の無線送受信を行い、受信信号品質に基づいて決定した上記他の通信装置での送信電力制御に用いられるべき送信電力制御情報を送信する通信装置での送信電力を制御する送信電力制御方法及び装置に関する。

背景技術

従来、例えば、特開平 9-312609 には、ＣＤＭＡ方式の移動通信システムにおいて、移動局が複数の基地局と無線通信を行ってソフトハンドオーバを行う際の送信電力制御方法が開示されている。

この送信電力制御方法では、ソフトハンドオーバに際して、移動局からの信号を受信する２つの基地局のそれぞれは、受信信号に対して希望波対干渉波及び雑音電力比（以下、受信ＳＩＲ（SIR：Signal to Interference plus noise power Ratio）という）を測定し、その受信ＳＩＲが目標ＳＩＲに近づくように送信電力制御ビット（電力増加または電力減少を表す）を生成する。そして、その生成された送信電力制御ビットが各基地局から移動局に伝送される。移動局は、当該２つの基地局のそれぞれからの信号に対する受信ＳＩＲを測定し、その各基地局の受信ＳＩＲを対応する基地局からの送信電力制御ビットの信頼度として考慮しつつ、各基地局からの送信電力制御ビットに基づいて送信電力制御（電力増加、電力減少または電力維持）を行う。

具体的には、一方の基地局の受信ＳＩＲが所定の基準値以下である場合には、その基地局からの送信電力制御ビットは信頼度が低いとして無視され、他方の基

地局からの送信電力ビットに基づいて送信電力制御（電力増加または電力減少）がなされる。また、双方の基地局の受信ＳＩＲが所定の基準値以下である場合には、双方の基地局からの送信電力制御ビットの信頼度が低いものとして、そられの送信電力制御ビットにかかわらず、現在の送信電力が維持される。更に、双方の基地局の受信ＳＩＲが所定の基準値より大きくなる場合、送信電力がより小さくなるように選択された送信電力制御ビット（電力減少を表す）に基づいて送信電力制御がなされる。

このような移動局での送信電力制御によれば、各基地局から受信される複数の送信電力制御ビットのうちより信頼性の高い送信電力制御ビットに基づいてより送信電力が小さくなるように移動局での送信電力制御がなされるので、安定した通信品質を維持しつつ無駄のない送信電力制御が可能となる。

なお、移動局は、複数の基地局について上記のように測定した各受信ＳＩＲを最大比合成し、その合成にて得られたＳＩＲに基づいて送信電力制御ビットを生成する。そして、その生成された送信電力制御ビットが移動局から各基地局に伝送され、各基地局は、移動局から受信される送信電力制御ビットに基づいて送信電力制御を行う。

上述した移動通信システムにおける移動局での送信電力制御では、各基地局についての受信ＳＩＲを対応する基地局からの送信電力制御ビットの信頼度として扱っている。しかし、その受信ＳＩＲは、移動局での信号受信品質（上記合成ＳＩＲ）があるレベルになるように各基地局にて送信電力制御がなされつつ送信された信号に基づいて当該移動局にて測定されるため、常に移動局と各基地局との間の電波伝送路の状態（フェージングの状態、距離など）を忠実に反映したものになっているとは限らない。ソフトハンドオーバに際しては移動する移動局と各基地局との間の電波伝送路の状態（特に、距離）が時々刻々と変化するため、そのような電波伝送路の状態をより忠実に考慮しつつ移動局の送信電力制御を行うことが所望の通信品質を満たしながら移動局の送信電力を低減させるうえで好ましい。

また、従来、ＣＤＭＡ方式の移動通信システムにおいて相互に信号の無線送受信を行う移動局と基地局のそれぞれは、次のようにして送信電力制御を行ってい

る。

移動局は、基地局からの受信信号に対する希望波対干渉波及び雑音電力比（以下、受信ＳＩＲ（Signal to Interference plus noise power ratio）を受信信号品質として測定し、その受信ＳＩＲと目標ＳＩＲとの差に基づいて送信電力制御ビット（電力増加または送信電力減少を表す）を生成する。そして、移動局は、その送信電力制御ビット（送信電力制御情報）を基地局に送信する。

基地局は、移動局からの送信電力制御ビットに基づいて送信電力を制御する一方、移動局からの受信信号に対する受信ＳＩＲを測定し、その受信ＳＩＲと目標ＳＩＲとの差に基づいて送信電力制御ビットを生成する。そして、基地局は、その送信電力制御ビットを移動局に送信する。

移動局は、上述したように基地局に送信すべき送信電力制御ビットを生成すると共に、基地局からの送信電力制御ビットに基づいて自局における送信電力を制御する。

上記のような移動局及び基地局での送信電力制御により、移動局では、基地局での受信ＳＩＲが目標ＳＩＲに近づくように送信電力の制御がなされる。また、基地局でも、同様に、移動局での受信ＳＩＲが目標ＳＩＲに近づくように送信電力制御がなされる。このような送信電力制御により、移動局と基地局との間の電波伝送路の状態（距離、フェージングの状態等）が変動しても、移動局及び基地局は、受信信号品質が安定した状態で無駄のない送信電力にて信号の送受信を行うことが可能となる。

移動局及び基地局において上述した送信電力制御が正常になされている場合、移動局及び基地局では、例えば、図２０の正常で示す領域のように、受信ＳＩＲが目標ＳＩＲを挟む比較的狭い範囲を推移するようになる。しかし、上述したような送信電力制御を行っていても、例えば、図２０の異常で示す領域のように、受信ＳＩＲが目標ＳＩＲに近づくことなく順次低下してしまうことがある。このような現象は、次のような理由に基づくものであると考えられる。

移動局での受信ＳＩＲが上記のように低下してしまう場合を例にすると、これは、移動局にて生成された送信電力制御ビットに基づいた基地局での送信電力制御が正常になされていないことである。その理由の一つとして、移動局から上り

リンクで伝送される送信電力制御ビットの基地局での受信品質が十分ではなく、移動局で生成された送信電力制御ビットの値と異なった値にて基地局での送信電力制御がなされていることが考えられる。このような状況は、移動局から送信電力制御ビットを送信する際の送信電力制御がその送信電力制御ビットの基地局での受信品質を所定レベルに維持できるように必ずしもなされていないことによるものである。

即ち、上記のような状況では、移動局での受信ＳＩＲの低下に起因して基地局からの送信電力制御ビットの移動局での受信品質が低下して当該移動局での送信電力制御が正常に行なわれなくなり、その正常でない送信電力制御に起因して移動局からの送信電力制御ビットの基地局での受信品質が低下してしまう。そして、更に、その基地局での送信電力制御ビットの受信品質の低下により基地局での送信電力制御が正常に行なわれなくなって、移動局での受信ＳＩＲが益々低下してしまう。このような状況が続くと、移動局と基地局との間の通信が切断される事態に至ってしまうおそれがある。

また、従来、ＣＤＭＡ方式の移動通信システムにおいて、基地局と移動局との間で情報データの伝送を開始する前に、基地局と移動局は、共通制御チャネルを用いて種々の情報（使用する固有拡散符号に関する情報、個別チャネルの信号フォーマットに関する情報等）の送受信を行い、その後、上記各種の情報に基づいて決められた個別チャネルを用いて所定フォーマットによる信号の送受信を行って、双方の局での信号同期をとるようにしている。その同期をとるための処理は、例えば、図２１に示す手順に従って行われる。

図２１において、基地局２００が所定フォーマットによる信号の送信（下り送信）を開始する（①）。この下り送信される信号は、所定のパターンとなる送信電力制御ビット（電力増加または電力減少を表す送信電力制御情報）が含まれる。移動局１００は、受信される基地局２００からの信号の同期引き込み処理を行う（②）。この同期引き込みの処理により同期が確立（下り同期確立）したことが判定されると（③）、移動局１００は、受信される上記所定パターンの送信電力制御ビットに従って送信電力制御を行いつつ所定フォーマットによる信号の送信（上り送信）を開始する（④）。

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基地局２００は、受信される移動局１００からの信号の同期引き込み処理を行う（⑤）。この同期引き込み処理により、当該基地局２００での同期が確立される（上り同期確立）（⑥）。基地局２００が信号の送信を開始（①）してから当該基地局２００での上り同期確立（⑥）がなされるまで、有限の時間を要する。

上述したような同期をとるための処理の過程で、移動局１００の送信電力制御は、例えば、図２２に示すようになされる。

基地局２００は、当初、移動局１００からの信号を受信していない状態で、下り送信を開始しなければならないので（図２１の①参照）、例えば、常に電力増加を表すパターン（例えば、全て「１」のパターン）の送信電力制御ビットを当該信号と共に送信する。移動局１００は、下り同期確立（図２１における③）の判定を行った後に、図２２に示すように、上り送信開始（図２１における④）の時刻ｔ１ から、送信電力を上記のような送信電力制御ビット（1,1,1,1,…）に従って、例えば、伝搬損失等に基づいて決められた初期値Ｐ０から順次上昇させる。

上記送信電力制御ビットに従った送信電力制御周期は、上記移動局１００と基地局２００にて同期確立がなされるまでに要する時間より非常に短い。そのため、上記送信電力制御ビットに従った送信電力制御により、送信電力値が上昇して最大値Ｐmax に達すると、送信電力がその最大値Ｐmax に維持される。

このようにして移動局１００が最大値Ｐmax となるように送信電力制御を行いつつ信号を送信する過程で、その信号の基地局２００での同期引き込みにより上り同期が確立すると（時刻ｔ２）、それ以後、基地局２００は、移動局１００からの信号に対する希望波対干渉波及び雑音電力比（以下、受信ＳＩＲ（Signal to Interference plus noise power ratio）という）を受信信号品質として測定し、その受信ＳＩＲと別に定められた目標ＳＩＲとの差に基づいて送信電力制御ビット（電力増加または電力減少を表す）を生成する。そして、基地局２００は、そのように生成された送信電力制御ビットを移動局１００に送信（下り送信）する。

上記のように基地局２００での上り同期が確立した時点（時刻ｔ２）では、移動局１００は最大値Ｐmax となるように送信電力制御を行っているので、当該移動局１００からの受信ＳＩＲは目標ＳＩＲより非常に大きな値となっており（過剰品質）、その上り同期が確立した直後においては、通常、連続的に電力減少を

表す送信電力制御ビット（例えば、「０」）が生成される。

上記のように基地局２００での上り同期確立がなされた以後（時刻ｔ２ 以後）、移動局１００は、上記のようにして基地局２００にて生成される送信電力制御ビットに基づいて送信電力制御（閉ループ制御）を行いつつ信号の送信を行う（上り送信）。その結果、移動局１００の送信電力は、基地局２００での受信ＳＩＲが目標ＳＩＲに維持され得る適正な値に制御される。このような状態において、所定のタイミングにて、移動局１００は、情報データを含めた信号を開始する。

上記のような基地局２００と移動局１００との間で情報データの伝送を開始する前における移動局１００での送信電力制御方法では、基地局２００からの信号の移動局１００での下り同期が確立した後（図２２における時刻ｔ１ 後）において、移動局１００は、基地局２００からの連続的に電力増加を表す送信電力制御ビット（1,1,1,1,…）に基づいて送信電力を急速に上昇させるように制御しつつ信号の送信を行う。このような送信電力制御により、基地局２００における移動局１００からの信号の受信品質が急速に向上する。このため、基地局２００での下り同期確立をより早期に実現することができるようになる。

しかし、基地局２００と移動局１００との信号の送受信において、移動局１００での送信電力は、基地局２００での受信信号品質（例えば、受信ＳＩＲ）が目標品質（例えば、目標ＳＩＲ）に維持されるものであれば十分である（図２２における時刻ｔ２ 以降の送信電力値参照）。このように基地局２００での受信信号品質が目標品質に維持されるように移動局１００での送信電力を制御すれば足りるにもかかわらず、前述したように、移動局１００での送信電力を最大値Ｐmax に制御したり、その最大値Ｐmax に近い値に制御すると、基地局２００と移動局１００との間で情報データの伝送が開始される直前において移動局１００の送信電力が一時的に過剰な値になり、上り回線における無駄な電力消費がなされると共に、基地局２００にて無線リソースが無駄に費やされてしまう。

発明の開示

そこで、本発明の第一の課題は、移動局が複数の基地局と無線通信を行うに際

して、移動局と各基地局との間の電波伝送路の状態をより忠実に考慮して移動局の送信電力制御を可能にする送信電力制御装置を提供することである。そして、本発明の第二の課題は、そのような送信電力制御装置にて送信電力制御のなされる移動局を提供することである。

また、本発明の第三の課題は、他の通信装置と信号の無線送受信を行い、受信信号品質に基づいて決定した上記他の通信装置での送信電力制御に用いられるべき送信電力制御情報を送信する通信装置において上記受信信号品質が連続して所定の品質より低下することを防止できるようにした送信電力制御方法及び装置を提供することである。本発明の第四の課題は、そのような送信電力制御装置を備えた通信装置を提供することである。

更に、本発明の第五の課題は、移動局と基地局との間で情報データの伝送が開始される前に、できるだけ早期に同期確立がなされると共に、より無駄のない移動局での送信電力となるように制御が可能な送信電力制御方法及び装置を提供することである。本発明の第六の課題は、そのような送信電力制御方法に従って送信電力の制御がなされる移動局を提供することである。

上記第一の課題を解決するため、本発明は、請求項１に記載されるように、移動通信システムにおいて移動局と無線接続される複数の基地局のそれぞれが受信信号品質に基づいて決定した送信電力制御情報を移動局に送信した際に移動局にて得られる各基地局からの送信電力制御情報に基づいて移動局の送信電力を制御する送信電力制御装置において、各基地局から固定的な送信電力にて送信される所定の信号に基づいて移動局と各基地局との間の電波伝送路での伝搬損失を演算する伝搬損失演算手段と、移動局にて得られる各基地局からの送信電力制御情報と、上記伝搬損失演算手段にて演算された各基地局と移動局との間の電波伝送路の伝搬損失とに基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定する送信電力制御情報決定手段とを有するように構成される。

このような送信電力制御装置では、移動局と各基地局との間の電波伝送路の伝搬損失を演算する際の基礎となる各基地局からの所定の信号が固定的な送信電力にて送信されるので、その演算される伝搬損失は、対応する移動局と基地局との間の電波伝送路の状態（距離、フェージング状態など）をより忠実に表す。そし

て、このような各基地局と移動局との間の電波伝送路の伝搬損失と、移動局にて得られる各基地局からの送信電力制御情報とに基づいて移動局の送信電力制御に用いられるべき送信電力制御情報が決定される。

送信電力制御情報を決定する際に、各基地局と移動局との間の電波伝送路の状態を、各状態に応じた重みを付けて考慮するという観点から、本発明は、請求項２に記載されるように、上記送信電力制御装置において、上記送信電力制御情報決定手段は、移動局との間の電波伝送路の伝搬損失がより小さい基地局からの送信電力制御情報に対する重みがより大きくなるように、移動局にて得られる各基地局からの送信電力制御情報に対して重み付けを行って重み補正制御情報を生成する重み補正手段と、該重み補正手段にて得られた各基地局からの送信電力制御情報に対応した重み付け補正情報を合成して合成送信電力制御情報を生成する合成手段とを有し、該合成手段にて得られた合成送信電力制御情報に基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定するように構成することができる。

上記各基地局から送信される送信電力制御情報は、電力増加の制御状態を表す第一の値及び電力減少の制御状態を表す第二の値を取り得る情報であると共に、移動局が各基地局からの送信電力制御情報を軟判定値として取得する場合、上記送信電力制御情報決定手段は、請求項３に記載されるように、上記合成手段にて得られた合成送信電力制御情報の値を所定の閾値を用いて硬判定する硬判定手段を有し、その硬判定結果に基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定するように構成することができる。

また、できるだけ無駄のない送信電力制御が可能となるという観点から、本発明は、請求項４に記載されるように、上記送信電力制御装置において、上記硬判定手段にて用いられる上記所定の閾値は、各基地局から送信される送信電力制御情報が取り得る第一の値と第二の値との中間値より所定量だけ第一の値寄りの値となるように構成することができる。

このような送信電力制御装置では、上記所定の閾値が所定量だけ電力増加の制御状態を表す第一の値寄りになっているので、合成送信電力制御情報の値は、その閾値を用いた硬判定により、電力増加の制御状態でないと判定され易くなる。

その結果、より低電力での送信電力制御が可能となる。

上記各基地局から送信される送信電力制御情報は、電力増加の制御状態を表す第一の値及び電力減少の制御状態を表す第二の値を取り得る情報であると共に、移動局が各基地局からの送信電力制御情報を軟判定値として取得する場合、より細かい送信電力制御が可能となるという観点から、上記送信電力制御情報決定手段は、請求項５に記載されるように、上記合成手段にて得られた合成送信電力情報の値を第一の閾値を用いて硬判定する第一の硬判定手段と、上記合成送信電力制御情報の値を上記第一の閾値と異なる第二の閾値を用いて硬判定する第二の硬判定手段と、上記第一の硬判定手段での判定結果及び上記第二の硬判定手段での判定結果に基づいて、電力増加の制御状態を表す第一の制御情報、電力減少の制御状態を表す第二の制御情報及び電力維持の制御状態を表す第三の制御情報のいずれかを生成する制御情報生成手段とを有し、該制御情報生成手段にて生成された制御情報を移動局の送信電力制御に用いられるべき送信電力制御情報として決定するように構成することができる。

このような送信電力制御装置では、合成送信電力制御情報の値は、第一及び第二の閾値の双方より大きくなる場合、その双方より小さくなる場合、第一の閾値と第二の閾値の間の値となる場合がある。それらの場合を上記第一の制御状態、第二の制御状態及び第三の制御状態に対応付けることができる。

移動局との間の電波伝送路の状態が特に良好でない基地局からの送信電力制御情報を移動局の送信電力制御に用いるべき送信電力制御情報を決定する際に考慮しないようにできるという観点から、本発明は、請求項６に記載されるように、上記送信電力制御装置において、上記送信電力制御情報決定手段は、移動局にて得られる各基地局からの送信電力制御情報から、上記伝搬損失演算手段にて演算された移動局との間の電波伝送路の伝搬損失が最小となる基地局からの送信電力制御情報を選択する選択手段を有し、該選択手段にて選択された送信電力制御情報に基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定するように構成することができる。

請求項３乃至５と同様に、上記送信電力制御情報決定手段は、請求項７乃至９に記載されるように構成することができる。

また、無駄のない送信電力制御が可能となるという観点から、本発明は、請求項１０に記載されるように、上記送信電力制御装置において、上記送信電力制御情報決定手段は、移動局との間の電波伝送路の伝搬損失がより小さい基地局からの送信電力制御情報に対する重みがより大きくなるように、移動局にて得られる各基地局からの送信電力制御情報に対して重み付けを行って重み補正制御情報を生成する重み補正手段と、重み補正手段にて得られた各基地局からの送信電力制御情報に対応した該重み補正制御情報のうちから電力減少の制御状態を表す送信電力制御情報により近い補正情報が優先されるように決められた重み補正制御情報に基づいて制御情報を生成する制御情報生成手段とを有し、該制御情報生成手段にて生成された制御情報を移動局の送信電力制御に用いられるべき送信電力制御情報として決定するように構成することができる。

また、上記各基地局から送信される送信電力制御情報は、電力増加の制御状態を表す第一の値及び電力減少の制御状態を表す第二の値を取り得る情報であると共に、移動局が各基地局からの送信電力制御情報を軟判定値として取得する場合、上記制御情報生成手段は、請求項１１に記載されるように、上記重み補正手段にて得られた各基地局からの送信電力制御情報に対応した重み補正制御情報の値を所定の閾値を用いて硬判定する硬判定手段と、各基地局からの送信電力制御情報に対応した硬判定結果のいずれかを電力減少の制御状態を表す硬判定結果が優先されるように選択する選択手段とを有し、該選択手段にて選択された硬判定結果に基づいて制御情報を生成するように構成することができる。

上述したように、移動局との間の電波伝送路の良好な基地局からの送信電力制御情報を優先的に考慮すると共に、無駄のない送信電力を可能にするという観点から、本発明は、請求項１２に記載されるように、上記送信電力制御装置において、上記送信電力制御決定手段は、上記伝搬損失演算手段にて演算された各伝搬損失が所定の伝搬損失より小さいか否かを判定する伝搬損失判定手段と、該伝搬損失判定手段にて上記所定の伝搬損失より小さいと判定された伝搬損失が１つである場合、その判定された伝搬損失に対応した基地局からの送信電力制御情報に基づいて制御情報を生成し、上記伝搬損失判定手段にて上記所定の伝搬損失より小さいと判定された伝搬損失が複数となる場合、その複数の伝搬損失に対応した

各基地局からの送信電力制御情報のうちから電力減少の制御状態を表す送信電力制御情報により近い送信電力制御情報が優先されるように決められた送信電力制御情報に基づいて制御情報を生成し、更に、上記伝搬損失判定手段にて全ての伝搬損失が上記所定の伝搬損失より小さくないと判定された場合、各基地局からの送信電力制御情報のうちから電力減少の制御状態を表す送信電力制御情報により近い送信電力制御情報が優先されるように決められた送信電力制御情報に基づいて制御情報を生成する制御情報生成手段とを有し、該制御情報生成手段にて生成された制御情報を移動局の送信電力制御に用いられるべき送信電力制御情報として決定するように構成することができる。

上記第一の課題を解決するため、本発明は、請求項１３に記載されるように、移動通信システムにおいて移動局と無線接続される複数の基地局のそれぞれが受信信号品質に基づいて決定した送信電力制御情報を移動局に送信した際に移動局にて得られる各基地局からの送信電力制御情報に基づいて移動局の送信電力を制御する送信電力制御装置において、各基地局から固定的な送信電力にて送信される所定の信号に基づいて移動局と各基地局との間の電波伝送路での伝搬損失を演算する伝搬損失演算手段と、移動局でのフェージングの状態を測定するフェージング測定手段と、該フェージング測定手段にて測定された移動局でのフェージングの状態が所定の状態より良好であるか否かを判定するフェージング状態判定手段と、該フェージング状態判定手段にて移動局でのフェージングの状態が所定の状態より良好であると判定されたときに第一の送信電力制御情報決定手段を有効にし、該フェージング状態判定手段にて移動局でのフェージングの状態が所定の状態より良好でないと判定されたときに第二の送信電力制御情報決定手段を有効にする切換え制御手段とを有し、上記第一の送信電力制御情報決定手段は、移動局との間の電波伝送路の伝搬損失がより小さい基地局からの送信電力制御情報に対する重みがより大きくなるように、移動局にて得られる各基地局からの送信電力制御情報に対してを重み付けを行って重み補正制御情報を生成する重み補正手段と、該重み補正手段にて得られた各基地局からの送信電力制御情報に対応した該重み補正制御情報を合成して合成送信電力制御情報を生成する合成手段とを有し、該合成手段にて得られた合成送信電力制御情報に基づいて移動局の送信電力

制御に用いられるべき送信電力制御情報を決定するようにし、上記第二の送信電力制御情報決定手段は、移動局にて得られる各基地局からの送信電力制御情報から、上記伝搬損失演算手段にて演算された移動局との間の電波伝送路の伝搬損失が最小となる基地局からの送信電力制御情報を選択する選択手段を有し、該選択手段にて選択された送信電力制御情報に基づいて移動局での送信電力制御に用いられるべき送信電力制御情報を決定するように構成される。

このような送信電力制御装置では、移動局でのフェージングの状態が所定の状態より良好な場合、各基地局と移動局との間の電波伝送路の状態をより忠実に表す伝搬損失と、移動局にて得られる各基地局からの送信電力制御情報とに基づいて移動局の送信電力制御に用いられるべき送信電力制御情報が決定される。一方、移動局でのフェージングの状態が所定の状態より良好でない場合、移動局との間の電波伝送路での伝搬損失が最小となる基地局からの送信電力制御情報に基づいて移動局での送信電力制御に用いられるべき送信電力制御情報が決定されるので、移動局との間の電波伝送路の状態が特に良好でない基地局からの送信電力制御情報は、移動局の送信電力制御に用いるべき送信電力制御情報を決定する際に考慮されなくなる。

更に、上記第一の課題を解決するため、本発明は、請求項１４に記載されるように、移動通信システムにおいて移動局と無線接続される複数の基地局のそれぞれが受信信号品質に基づいて決定した送信電力制御情報を移動局に送信した際に移動局にて得られる各基地局からの送信電力制御情報に基づいて移動局の送信電力を制御する送信電力制御装置において、各基地局から固定的な送信電力にて送信される所定の信号に基づいて移動局が無線接続すべき基地局を決定するために用いられる移動局と各基地局との間の伝送路品質を測定する伝送路品質測定手段と、移動局にて得られる各基地局からの送信電力制御情報と、上記伝送路品質測定手段にて得られた移動局と各基地局との間の伝送路品質とに基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定する送信電力制御情報決定手段とを有するように構成される。

このような送信電力制御装置では、各基地局と移動局との間の電波伝送路の状態をより忠実に表す伝送路品質と、移動局にて得られる各基地局からの送信電力

制御情報とに基づいて移動局の送信電力制御に用いられるべき送信電力制御情報が決定される。更に、上記のように測定される移動局と各基地局との間の伝送路品質は、もともと移動局が無線接続すべき基地局を決定するために用いられるものであり、当該送信電力制御装置の構成を簡略化することが可能となる。

上記各基地局から固定的な送信電力にて送信される所定の信号に基づいて測定される伝送路品質は、移動局と各基地局間の距離、フェージングの状態などを表し得るものであって、移動局が無線接続すべき基地局を決定するために用いられるものであれば特に限定されず、例えば、伝搬損失、移動局での該所定の信号の受信レベル及び該所定の信号に基づいて測定される希望波対干渉波及び雑音電力比（受信ＳＩＲ（SIR：Signal to Interference plus noise power Ratio））のいずれであってもよい。

また、上記第一の課題を解決するため、本発明は、請求項１５に記載されるように、移動通信システムにおいて移動局と無線接続される複数の基地局のそれぞれが受信信号品質に基づいて決定した電力増加の制御状態を表す第一の値及び電力減少の制御状態を表す第二の値を取り得る情報となる送信電力制御情報を移動局に送信した際に移動局にて得られる各基地局からの送信電力制御情報の軟判定値に基づいて移動局の送信電力を制御する送信電力制御装置において、各基地局から固定的な送信電力にて送信される所定の信号に基づいて移動局と各基地局との間の伝送路品質を測定する伝送路品質測定手段と、移動局にて得られる各基地局からの送信電力制御情報の軟判定値と、上記伝送路品質測定手段にて測定された各基地局と移動局との間の伝送路品質に基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定する送信電力制御情報決定手段とを有し、該送信電力制御手段は、移動局との間の伝送路品質がより良好な基地局からの送信電力制御情報に対する重みがより大きくなるように、移動局にて得られる各基地局からの送信電力制御情報の軟判定値に対して重み付けを行って重み補正制御情報を生成する重み補正手段と、該重み補正手段にて得られた各基地局からの送信電力制御情報に対応した該重み補正制御情報を合成して合成送信電力制御情報を生成する合成手段と、該合成手段にて得られた合成送信電力制御情報の値を、各基地局から送信される送信電力制御情報が取り得る第一の値と第二の値との中間

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値より所定量だけ第一の値寄りの値となる閾値を用いて硬判定する硬判定手段とを有し、その硬判定結果に基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定するように構成される。

上記各基地局から固定的な送信電力にて送信される所定の信号に基づいて測定される移動局と各基地局との間の伝送路品質は、移動局と各基地局間の距離、フェージングの状態などを表し得るものであれば特に限定されず、例えば、伝搬損失、移動局での該所定の信号の受信レベル及び該所定の信号に基づいて測定される希望波対干渉波及び雑音電力比（受信ＳＩＲ（SIR：Signal to Interference plus noise power Ratio））のいずれであってもよい。

更に、上記第一の課題を解決するため、本発明は、請求項１６に記載されるように、移動通信システムにおいて移動局と無線接続される複数の基地局のそれぞれが受信信号品質に基づいて決定した電力増加の制御状態を表す第一の値及び電力減少の制御状態を表す第二の値を取り得る情報となる送信電力制御情報を移動局に送信した際に移動局にて得られる各基地局からの送信電力制御情報の軟判定値に基づいて移動局の送信電力を制御する送信電力制御装置において、

各基地局から固定的な送信電力にて送信される所定の信号に基づいて移動局と各基地局との間の伝送路品質を測定する伝送路品質測定手段と、移動局にて得られる各基地局からの送信電力制御情報の軟判定値と、上記伝送路品質測定手段にて測定された各基地局と移動局との間の伝送路品質に基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定する送信電力制御情報決定手段とを有し、該送信電力制御手段は、移動局との間の伝送路品質がより良好な基地局からの送信電力制御情報に対する重みがより大きくなるように、移動局にて得られる各基地局からの送信電力制御情報の軟判定値に対して重み付けを行って重み補正制御情報を生成する重み補正手段と、該重み補正手段にて得られた各基地局からの送信電力制御情報に対応した該重み補正制御情報を合成して合成送信電力制御情報を生成する合成手段と、該合成手段にて得られた合成送信電力制御情報の値を第一の閾値を用いて硬判定する第一の硬判定手段と、上記合成送信制御情報の値を上記第一の閾値と異なる第二の閾値を用いて硬判定する第二の硬判定手段と、上記第一の硬判定手段での判定結果及び第二の硬判定手段での判定手段に

基づいて、電力増加の制御情報を表す第一の制御情報、電力減少の制御状態を表す第二の制御情報及び電力維持の制御状態を表す第三の制御情報のいずれかを生成する制御情報生成手段とを有し、該制御情報生成手段にて生成された制御情報を移動局の送信電力制御に用いられるべき送信電力制御情報として決定するように構成される。

また、上記第一の課題を解決するため、本発明は、請求項１７に記載されるように、移動通信システムにおいて移動局と無線接続される複数の基地局のそれぞれが受信信号品質に基づいて決定した送信電力制御情報を移動局に送信した際に移動局にて得られる各基地局からの送信電力制御情報に基づいて移動局の送信電力を制御する送信電力制御装置において、各基地局から固定的な送信電力にて送信される所定の信号に基づいて移動局と各基地局との間の伝送路品質を測定する伝送路品質測定手段と、移動局でのフェージングの状態を測定するフェージング測定手段と、該フェージング測定手段にて測定された移動局でのフェージングの状態が所定の状態より良好であるか否かを判定するフェージング状態判定手段と、該フェージング状態判定手段にて移動局でのフェージングの状態が所定の状態より良好であると判定されたときに第一の送信電力制御情報決定手段を有効にし、該フェージング状態判定手段にて移動局でのフェージングの状態が所定の状態より良好でないと判定されたときに第二の送信電力制御情報決定手段を有効にする切換え制御手段とを有し、上記第一の送信電力制御情報決定手段は、移動局との間の伝送路品質がより良好な基地局からの送信電力制御情報に対する重みがより大きくなるように、移動局にて得られる各基地局からの送信電力制御情報に対して重み付けを行って重み補正制御情報を生成する重み補正手段と、該重み補正手段にて得られた各基地局からの送信電力制御情報に対応した該重み補正制御情報を合成して合成送信電力制御情報を生成する合成手段とを有し、該合成手段にて得られた合成送信電力制御情報に基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定するようにし、上記第二の送信電力制御情報決定手段は、移動局にて得られる各基地局からの送信電力制御情報から、上記伝送路品質測定手段にて測定された移動局との間の伝送路品質が最良となる基地局からの送信電力制御情報を選択する選択手段を有し、該選択手段にて選択された送信電

力制御情報に基づいて移動局での送信電力制御に用いられるべき送信電力制御情報を決定するように構成される。

上記第二の課題を解決するため、本発明は、請求項１８に記載されるように、移動通信システムにおいて複数の基地局と無線接続され得る移動局において、複数の基地局からの信号を合成する信号合成手段と、該信号合成手段にて得られた合成信号から下り伝送情報を復元する情報復元手段と、上記信号合成手段にて得られた合成信号の受信品質を演算する受信品質演算手段と、該受信品質演算手段にて演算された受信品質に基づいて各基地局の送信電力を制御するための送信電力制御情報を生成する送信電力制御情報生成手段と、該送信電力制御情報生成手段にて生成された送信電力制御情報を各基地局に送信する送信電力制御情報送信手段と、前述した送信電力制御装置のいずれかとを有するように構成される。

上記第三の課題を解決するため、本発明は、請求項２５に記載されるように、他の通信装置と信号の無線送受信を行い、受信信号品質に基づいて決定した上記他の通信装置での送信電力制御に用いられるべき送信電力制御情報を送信する通信装置での送信電力を上記他の通信装置からの所定の情報に基づいて制御する送信電力制御方法において、上記受信信号品質が所定の品質より低下したか否かを判定する品質判定手順と、該品質判定手順により当該受信信号品質が所定の品質より低下したと判定されたときに、送信電力を、上記他の通信装置からの所定の情報にかかわらず、当該判定時の送信電力値から所定の特性に従って上昇させる自律制御手順とを有するように構成される。

このような送信電力制御方法では、通信装置での受信信号品質が所定の品質より低下すると、当該通信装置において送信電力が、上記他の通信装置からの所定の情報にかかわらず、所定の特性に従って自律的に上昇させられる。

このように当該通信装置での送信電力が上昇されることにより、受信信号品質に基づいて決定される他の通信装置での送信電力制御に用いられるべき送信電力制御情報を送信した際に、当該送信電力制御情報の上記他の通信装置での受信品質が改善される。その結果、上記他の通信装置は、その品質の改善された送信電力制御情報に基づいて送信電力制御を行えるようになる。

上記受信信号品質は、他の通信装置から送信制御がなされつつ送信される信号

の当該通信装置での受信品質を表すものであれば、どのような情報によっても表すことができ、例えば、その信号の受信レベルであっても、その信号と干渉波として作用する他の信号や雑音との比を表すＳＩＲ（Signal to Interference plus noise power ratio）であってもよい。

また、上記送信電力を上昇させるための所定の特性は、上記判定時の送信電力値より低下しなければ、どのような特性であってもよく、ある傾きをもって徐々に上昇する特性であっても、ある値までステップ状に上昇させた後に、その値を維持するような特性であってもよい。更に、徐々に上昇させる過程で一時的に電力値が低下しても、その低下後の電力値が上記判定時の電力値より小さくならなければよい。

当該通信装置の送信電力制御に用いられる上記他の通信装置からの所定の情報は、上記他の通信装置から当該通信装置の送信電力制御に用いられる情報として伝送される情報であれば特に限定されず、上記他の通信装置にて測定された当該通信装置からの信号の受信品質に基づいて作成した送信電力制御情報であっても、上記他の通信装置において測定された当該通信装置からの信号の受信品質に関する情報であっても、更に、他の情報であってもよい。

上記通信装置が、受信信号品質値が目標受信品質値に近づくように決定した送信電力制御情報を他の通信装置に送信するものである場合、容易に受信品質の状態を判定できるという観点から、請求項２６に記載されるように、上記品質判定手順は、上記受信信号品質値が第一の閾値より低下したか否かを判定する第一の閾値判定手順を有し、上記第一の閾値判定手順にて上記受信信号品質値が上記第一の閾値より低下していると判定されたときに、上記受信信号品質が所定の品質より低下したと判定するように構成することができる。

また、同様の観点から、請求項２７に記載されるように、上記品質判定手順は、上記目標受信品質値から上記受信品質値を減算して差分値を演算する差分値演算手順と、上記差分値演算手順にて演算された当該差分値が第二の閾値以上となるか否かを判定する第二の閾値判定手順とを有し、上記第二の閾値判定手順にて上記差分値が上記第二の閾値以上となると判定されたときに、上記受信信号品質が所定の品質より低下したと判定するように構成することができる。

更に、上記通信装置が、受信信号品質値が所定のパラメータに従って制御される目標受信品質値に近づくよう決定した送信電力制御情報を他の通信装置に送信するものである場合、上記と同様の観点から、請求項２８に記載されるように、上記品質判定手順は、上記受信信号品質値が第一の閾値より低下したか否かを判定する第一の閾値判定手順と、上記目標受信品質値から上記受信品質値を減算して差分値を演算する差分値演算手順と、上記差分値演算手順にて演算された当該差分値が第二の閾値以上となるか否かを判定する第二の閾値判定手順と、上記第一の閾値判定手順にて上記受信信号品質値が上記第一の閾値より低下していると判定されたとき、または、上記第二の閾値判定手順にて上記差分値が上記第二の閾値以上であると判定されたときに、上記受信信号品質が所定の品質より低下したと判定するように構成することができる。

上記目標受信品質値の制御の基礎となる所定のパラメータは、特に限定されず、目標受信品質値が固定値ではなくその制御により変化する場合に、上記構成は有効となる。上記所定のパラメータは、例えば、通信装置にて得られる受信信号に含められた伝送情報の誤り率などを用いることができる。

上記自律制御手順は、例えば、請求項２９に記載されるように、上記所定の特性に従って送信電力を上昇させる自律送信電力制御情報を生成する手順と、上記品質判定手順により上記受信信号品質が所定の品質より低下したと判定されたときに、上記他の通信装置からの送信電力制御情報に基づいた送信電力制御から上記自律送信電力制御情報に基づいた送信電力制御に切換える制御切換え手順とを有するように構成することができる。

受信信号品質の改善がなされないまま無駄な送信電力上昇制御が行なわれることを防止するという観点から、本発明は、請求項３０に記載されるように、上記各送信電力制御方法において、上記自律制御手順は、上記所定の特性に従って送信電力を上昇させる過程で、その送信電力の上昇量が所定量に達したか否かを判定する判定手順と、該判定手順にてその送信電力の上昇量が所定量に達したと判定されたときに、上記所定の特性に従って送信電力を上昇させることを停止させる自律制御停止手順とを有するように構成することができる。

上記第三の課題を解決するため、本発明は、請求項３１に記載されるように、

他の通信装置と信号の無線送受信を行い、受信信号品質に基づいて決定した上記他の通信装置での送信電力制御に用いられるべき送信電力制御情報を送信する通信装置での送信電力を上記他の通信装置からの所定の情報に基づいて制御する送信電力制御装置において、上記受信信号品質が所定の品質より低下したか否かを判定する品質判定手段と、該品質判定手段により当該受信信号品質が所定の品質より低下したと判定されたときに、送信電力を、上記他の通信装置からの所定の情報にかかわらず、当該判定時の送信電力値から所定の特性に従って上昇させる自律制御手段とを有するように構成される。

また、上記第四の課題は、請求項３７に記載されるように、他の通信装置と信号の無線送受信を行い、受信信号品質に基づいて決定した上記他の通信装置での送信電力制御に用いられるべき送信電力制御情報を送信する送信電力制御情報送信手段と、

上記他の通信装置からの所定の情報に基づいて送信電力を制御する制御手段と、

請求項３１乃至３６いずれか記載の送信電力制御装置を有する通信装置にて解決される。

更に、上記第五の課題を解決するため、本発明は、請求項３９に記載されるように、移動通信システムにおける基地局と移動局との間で情報データの伝送が開始される前において、基地局から移動局での送信電力制御に用いられるべき送信電力制御情報を送信すると共に基地局と移動局との間で信号を送受信して同期をとるための処理がなされる際に移動局での送信電力を制御する送信電力制御方法において、基地局からの信号に対する移動局での同期が確立された後に、基地局からの送信電力制御情報に係わらず、送信電力を、初期値から所定の特性に従って上昇させるように制御する自律制御手順を有するように構成される。

このような送信電力制御方法では、移動局と基地局との間で情報データの伝送が開始される前において、基地局と移動局との間で信号を送受信して同期をとるための処理がなされる際に、移動局では、基地局からの送信電力制御情報に係わらず、送信電力が初期値から所定の特性に従って上昇するように制御される。

上記所定の特性は、基地局からの送信電力制ｆ１御情報が急激に送信電力を上

昇させる特性を表すものであったとしても、その送信電力制御情報と関係なく、同期確立がより早期に行えると共に、より無駄のない送信電力制御が行えるという観点から決めることができる。この所定の特性は、上記初期値より送信電力が低下することがなければ、上記観点に従って任意に決めることができ、徐々に上昇する特性であっても、ある値までステップ状に上昇させた後に、その値を維持するような特性であってもよい。

特に、本発明は，請求項４０に記載されるように、上記送信電力制御方法において、上記自律制御手順は、上記基地局からの送信電力制御情報に基づいた送信電力制御による送信電力の変化より緩やかに変化する特性に従って送信電力を上昇させるように制御するように構成することができる。

上記自律制御手順に従った送信電力制御の停止時期にて送信電力制御の切換えをスムーズに行うようにするという観点から、本発明は、請求項４１に記載されるように、上記送信電力制御方法において、上記自律制御手順による送信電力の制御が開始された後に、当該自律制御手順による送信電力の制御を停止させるべき所定の条件が満足されたか否かを判定する自律制御停止条件判定手順と、該自律制御停止条件判定手順によって上記所定の条件が満足されたと判定されたときに、上記自律制御手順による送信電力の制御から上記基地局からの送信電力制御情報に基づいた送信電力の制御に切換える制御切換え手順とを有するように構成することができる。

上記のような送信電力制御方法では、上記所定の条件が満足されたとの判定時に、自律制御手順に従った送信電力の制御から基地局からの送信電力制御情報に基づいた送信電力の制御に切替わる。

上記自律制御手順による送信電力の制御を停止させるべき所定の条件は、基地局からの情報に係わりなく移動局にて判断できる条件であっても、基地局からの情報に基づいて移動局にて判断できる条件であってもよい。

前者の場合、より簡易にその停止時期を判定できるという観点から、本発明は、請求項４２に記載されるように、上記送信電力制御方法において、上記自律制御停止条件判定手順は、上記自律制御手順による送信電力の制御が開始されてから所定時間が経過したか否かを判定し、上記自律制御手順による送信電力の制御

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が開始されてから上記所定時間が経過したとの判定を上記所定の条件が満足されたとの判定とするように構成することができる。

また、後者の場合、本発明は、請求項４３に記載されるように、上記送信電力制御方法において、上記基地局は、当該基地局での同期が確立される前では、所定の送信電力制御情報を送信し、上記移動局からの信号に基づいて当該基地局での同期が確立された後では、移動局から送信される信号の受信品質に基づいて決められる閉ループ送信電力制御情報を送信するようにし、上記自律制御停止条件判定手順は、上記基地局から受信される送信電力制御情報が、上記所定の送信電力制御情報から閉ループ送信電力制御情報に変わったか否かを判定する制御情報変更判定手順を有し、該制御情報変更判定手順にてなされる上記基地局から受信される送信電力制御情報が上記所定の送信電力制御情報から閉ループ送信電力制御情報に変わったとの判定を上記所定の条件が満足されたとの判定とするように構成することができる。

基地局から送信される所定の送信電力制御情報が正しく移動局にて受信されない場合に、基地局からの送信電力制御情報が閉ループ送信電力制御情報に変わったと誤って判定される可能性を低減するという観点から、本発明は、請求項４４に記載されるように、上記送信電力制御方法において、上記自律制御停止条件判定手順は、上記自律制御手順による送信電力制御が開始されたから所定時間が経過したか否かを判定する開始タイミング判定手順を有し、該開始タイミング判定手順にて上記自律制御手順による送信電力制御が開始されてから上記所定時間が経過したと判定されたときに、上記制御情報変更判定手順に従った判定を開始するように構成することができる。

このような送信電力制御方法では、上記自律制御手順による送信電力制御が開始されてから少なくとも上記所定時間は、基地局からの送信電力制御情報が閉ループ送信電力制御であると判定されることはない。

上記第五の課題を解決するため、本発明は、請求項４５に記載されるように、移動通信システムにおける基地局と移動局との間で情報データの伝送が開始される前において、基地局から移動局での送信電力制御に用いられるべき送信電力制御情報を送信すると共に基地局と移動局との間で信号を送受信して同期をとるた

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めの処理がなされる際に移動局での送信電力を制御する送信電力制御方法において、基地局からの信号に対する移動局での同期が確立された後に、該基地局からの送信電力制御情報に基づいて生成される当該送信電力制御情報に基づいた送信電力制御による送信電力の変化より緩やかに変化する特性に従って送信電力を制御するための緩特性送信電力制御情報に基づいて送信電力を制御する緩特性送信電力制御手順を有するように構成される。

このような送信電力制御方法では、移動局と基地局との間で情報データの伝送が開始される前において、基地局と移動局との間で信号を送受信して同期をとるための処理がなされている際に、移動局では、基地局からの送信電力制御情報に基づいて生成される緩特性送信電力制御情報に基づいて送信電力の制御がなされる。これにより、基地局からの送信電力制御情報が急激に送信電力を変化させる特性を表すものであったとしても、その特性より緩やかに変化する特性にて移動局での送信電力を制御することができる。

上記緩特性送信電力制御情報は、基地局からの送信電力制御情報に基づいて生成されたものであれば特に限定されず、例えば、その送信電力制御情報から部分的に抽出された情報に基づいて作成されたものであっても、また、その送信電力制御情報を細分化して得られる各部分の平均的な情報に基づいて作成されたものであってもよい。

また、上記緩特性送信電力制御手順に従った送信電力制御の停止時期にて送信電力制御の切換えをスムーズに行うようにするという観点から、本発明は、請求項４６に記載されるように、上記送信電力制御方法において、上記緩特性送信電力制御手順による送信電力制御が開始された後に、当該緩特性送信電力制御手順による送信電力の制御を停止させるべき所定の条件が満足されたか否かを判定する緩特性送信電力制御停止判定手順と、該緩特性送信電力制御停止判定手順によって上記所定の条件が満足されたと判定されたときに、上記緩特性送信電力制御手順による送信電力の制御から上記基地局からの送信電力制御に基づいた送信電力の制御に切換える制御切換え手順とを有するように構成することができる。

更に、上記第一の課題を解決するため、本発明は、請求項４７に記載されるように、移動通信システムにおける基地局と移動局との間で情報データの伝送が開

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始される前において、基地局から移動局での送信電力制御に用いられるべき送信電力制御情報を送信すると共に基地局と移動局との間で信号を送受信して同期をとるための処理がなされる際に移動局での送信電力を制御する送信電力制御装置において、基地局からの信号に対する移動局での同期が確立された後に、基地局からの送信電力制御情報に係わらず、送信電力を、初期値から所定の特性に従って上昇させるように制御する自律制御手段を有するように構成される。

また、上記第五の課題を解決するため、本発明は、請求項５３に記載されるように、移動通信システムにおける基地局と移動局との間で情報データの伝送が開始される前において、基地局から移動局での送信電力制御に用いられるべき送信電力制御情報を送信すると共に基地局と移動局との間で信号を送受信して同期をとるための処理がなされる際に移動局での送信電力を制御する送信電力制御装置において、基地局からの信号に対する移動局での同期が確立された後に、該基地局からの送信電力制御情報に基づいて生成される当該送信電力制御情報に基づいた送信電力制御による送信電力の変化より緩やかに変化する特性に従って送信電力を制御するための緩特性送信電力制御情報に基づいて送信電力を制御する緩特性送信電力制御手段を有するように構成される。

上記第六の課題を解決するため、本発明は、請求項５５に記載されるように、送信電力制御に用いられるべき送信電力制御情報を送信する基地局に対して情報データの伝送を行う前において、基地局との間で信号を送信して同期をとるための処理がなされる際に送信電力を制御する送信電力制御装置を有する移動局において、上記送信電力制御装置は、基地局からの信号に対する当該移動局での同期が確立された後に、基地局からの送信電力制御情報に係わらず、送信電力を、初期値から所定の特性に従って上昇させるように制御する自律制御手段を有するように構成される。

更に、上記第六の課題を解決するため、本発明は、請求項５７に記載されるように、送信電力制御に用いられるべき送信電力制御情報を送信する基地局に対して情報データの伝送を行う前において、基地局との間で信号を送信して同期をとるための処理がなされる際に送信電力を制御する送信電力制御装置を有する移動局において、上記送信電力制御装置は、基地局からの信号に対する移動局での同

期が確立された後に、該基地局からの送信電力制御情報に基づいて生成される当該送信電力制御情報に基づいた送信電力制御による送信電力の変化より緩やかに変化する特性に従って送信電力を制御するための緩特性送信電力制御情報に基づいて送信電力を制御する緩特性送信電力制御手段を有するように構成される。

なお、本発明の他の目的、特徴、利点は、添付図面と共になされる以下の詳細な説明にて、明らかにされる。

図面の簡単な説明

図１は、本発明の実施の形態に係る送信電力制御方法が適用される移動通信システムにおけるソフトハンドオーバのモデル例を示す図である。

図２は、本発明の実施の形態に係る送信電力制御方法に従って送信電力制御のなされる移動局の構成例を示すブロック図である。

図３は、図２に示す移動局における送信電力制御信号決定部の第一の構成例を示すブロック図である。

図４は、硬判定部の構成例を示すブロック図である。

図５は、図４に示す演算部での演算論理の一例を示す図である。

図６は、図２に示す移動局における送信電力制御信号決定部の第二の構成例を示すブロック図である。

図７は、図２に示す移動局における送信電力制御信号決定部の第三の構成例を示すブロック図である。

図８は、図２に示す移動局における送信電力制御信号決定部の第四の構成例を示すブロック図である。

図９は、図２に示す移動局における送信電力制御信号決定部の第五の構成例を示すブロック図である。

図１０は、本発明の実施の一形態に係る送信電力制御方法が適用される移動通信システムの構成例を示すブロック図である。

図１１は、図１０に示す移動局における送受信装置の構成例を示すブロック図である。

図１２は、図１１に示す送受信装置におけるＳＩＲ監視部の構成例を示す図である。

図１３は、移動局での受信ＳＩＲの状態例と、それに基づいた送信電力制御の状態例を示す図である。

図１４は、移動局の送受信装置の構成例を示すブロック図である。

図１５は、移動局における送信電力の第一の制御例を示す図である。

図１６は、送受信装置における閉ループ制御開始タイミング決定部での処理手順の一例を示すフローチャートである。

図１７は、移動局における送信電力の第二の制御例を示す図である。

図１８は、移動局の送受信装置の他の構成例を示すブロック図である。

図１９は、移動局における送信電力の第三の制御例を示す図である。

図２０は、従来の送信電力制御に基づいた受信ＳＩＲの状態例を示す図である。

図２１は、移動局と基地局との間で同期をとるための手順の一例を示す図である。

図２２は、従来の送信電力制御方法に従った移動局における送信電力の制御例を示す図である。

発明を実施するための最良の形態

以下、本発明の実施の形態を図面に基づいて説明する。

（請求の範囲１～２４の実施例）

本発明の実施の一形態に係る送信電力制御方法が適用されるＣＤＭＡ方式の移動通信システムにおけるソフトハンドオーバの一般的なモデルが図１に示される。

図１において、ソフトハンドオーバでは、移動局ＭＳは、基地局ＢＳ１のサービスエリアから基地局ＢＳ２のサービスエリアへの移動中に、それらのサービスエリアの境界領域において、双方の基地局ＢＳ１、ＢＳ２と無線接続される。この状態で、移動局ＭＳは、各基地局ＢＳ１、ＢＳ２から受信した信号を合成し、その合成信号から伝送情報を取得する。また、各基地局ＢＳ１、ＢＳ２は、移動

局ＭＳから送信される信号を受信し、それらの受信信号が、例えば、上位局にて合成され、その合成信号から移動局ＭＳからの伝送情報が得られる。

上記移動局ＭＳと各基地局ＢＳ１、ＢＳ２とが無線接続された状態で、移動局ＭＳ及び各基地局ＢＳ１、ＢＳ２は、それぞれ通信相手局から伝送される送信電力制御ビットに基づいて送信電力制御を行う。

上記移動局ＭＳは、例えば、図２に示すように構成される。

図２において、移動局ＭＳは、送受分離部２０を有すると共に、送信系として、誤り訂正符号化部１１、データビット変調部１２、送信電力制御ビット変調部１３、拡散部１４、無線送信部１５及び送信電力制御部１６を有する。

情報源（音声処理部、データ処理部など）からのデータに対して、所定の処理、例えば、CRC（cycle redundancy check）の手法に従って誤り検出用のパリティビットをフレーム単位に付加するなどの処理がなされる。誤り訂正符号化部１１は、上記のような処理により得られたフレーム単位のパリティビット付きデータの符号化を行う。データビット変調部１２は、誤り訂正符号化部１１からのフレーム単位の符号化データに基づいてデータ変調信号を生成する。

送信電力制御ビット変調部１３は、後述するように生成される基地局の送信電力を制御するための送信電力制御ビットに基づいて制御ビット変調信号を生成する。この制御ビット変調信号は、例えば、送信電力制御ビット「１」（電力増加を表す）に対応した値「＋１」及び送信電力制御ビット「０」（電力低減を表す）に対応した値「－１」のいずれかの値を表す。

拡散部１４は、上記データビット変調部１２にて生成されたデータ変調信号及び送信電力制御ビット変調部１３にて生成された制御ビット変調信号を多重化し、移動局ＭＳ固有の拡散コードを用いてその多重化された信号の拡散処理を行う。この拡散部１４にて得られた拡散信号は、所定の周波数の信号として無線送信部１５から送受分離部２０を介して送信される。

送信電力制御部１６は、後述するように生成される送信電力制御信号に基づいて無線送信部１５での送信電力を制御する。上記送信電力制御信号は、例えば、送信電力増加、送信電力低減及び送信電力維持のいずれかの制御動作を表し得る。送信電力制御部１６は、その送信電力制御信号が表す制御動作に従って、無線

送信部１５での送信電力を所定量（dB）だけ増加または低減させ、あるいは現在の送信電力を維持させる。

なお、各基地局ＢＳ１、ＢＳ２は、上記移動局ＭＳの送信系と略同様の構成となる送信系を有している。これにより、各基地局ＢＳ１、ＢＳ２は、データと移動局ＭＳでの送信電力を制御するための送信電力制御ビットとを多重化し、その多重化された信号を固有の拡散コードを用いて送信する。

また、移動局ＭＳは、受信系として、無線受信部２１、２つの逆拡散部２２、２３、復調／合成部２４、誤り訂正復号／誤り検出部２５、誤り測定部２６、ＳＩＲ測定部２７、目標ＳＩＲ決定部２８、ＳＩＲ比較部２９及び送信電力制御ビット決定部３０を有している。

ソフトハンドオーバに際して各基地局ＢＳ１、ＢＳ２から送信されるデータ及び送信電力制御ビットが多重化された拡散信号が送受分離部２０を介して無線受信部２１にて受信されると、その受信信号が逆拡散部２２及び２３に供給される。逆拡散部２２は、基地局ＢＳ１固有の拡散コードを用いてその受信信号の逆拡散処理を行う。この逆拡散処理にて、基地局ＢＳ１から伝送されるデータ及び送信電力制御ビットに対応した受信データ信号及び受信送信電力制御ビット信号（以下、受信 TPC 信号１という）が得られる。逆拡散部２３は、基地局ＢＳ２固有の拡散コードを用いてその受信信号の逆拡散処理を行う。この逆拡散処理にて、基地局ＢＳ２から伝送されるデータ及び送信電力制御ビットに対応した受信データ信号及び受信送信電力制御ビット信号（以下、受信 TPC 信号２という）が得られる。

復調／合成部２４は、逆拡散部２２及び２３にて得られた各受信データ信号を復調して合成し、合成ベースバンド信号を生成する。その合成ベースバンド信号は、誤り訂正復号／誤り検出部２５に供給され、フレーム単位に誤り訂正復号がなされると共に、CRC の手法に従って伝送誤りの有無の検出がなされる。その復号結果が情報出力として当該移動局ＭＳの信号処理部（図示略）に供給される。この誤り訂正復号／誤り検出部２５は、更に、フレーム単位毎に上記誤りの有無を表す誤り検出結果を出力する。

誤り率測定部２６は、上記誤り訂正復号／誤り検出部２５からの誤り検出結果

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に基づいて、例えば、フレーム誤り率（FER：Frame Error Rate）を受信信号（希望波）から復元した情報の受信品質として演算する。

ＳＩＲ測定部２７は、復調／合成部２４からの合成ベースバンド信号に基づいて受信ＳＩＲ（希望波対干渉波及び雑音電力比）を演算する。目標ＳＩＲ決定部２８は、誤り率測定部２６から出力される情報の受信品質（FER）が目標品質となるように、目標ＳＩＲを決定する（アウターループ制御）。ＳＩＲ比較部２９は、上記ＳＩＲ測定部２７からの受信ＳＩＲと目標ＳＩＲ決定部２８からの目標ＳＩＲとを比較し、その比較結果を出力する。

送信電力制御ビット決定部３０は、ＳＩＲ比較部２９からの比較結果に基づいて送信電力制御ビットの値を決定する（インナーループ制御）。具体的には、受信ＳＩＲが目標ＳＩＲより小さい場合、希望波の受信レベルが低いとして、送信電力制御ビットが送信電力を増加させるべき値「１」に決定される。一方、受信ＳＩＲが目標ＳＩＲ以上となる場合、希望波受信レベルが高いとして、送信電力制御ビットが送信電力を低減させるべき値「０」に決定される。このように値の決定される送信電力制御ビットは、前述したような送信電力制御ビット変調部１３に供給される。これにより、この送信電力制御ビットは、各基地局ＢＳ１、ＢＳ２に伝送され、各基地局ＢＳ１、ＢＳ２は、その送信電力制御ビットに基づいて送信電力制御を行う。

なお、各基地局ＢＳ１、ＢＳ２は、上記移動局ＭＳの受信系と同様に、上記のように送信電力制御のなされる移動局からの信号の受信ＳＩＲを測定し、その受信ＳＩＲが目標ＳＩＲに近づくように送信電力制御ビットを決定している。

また、各基地局ＢＳ１、ＢＳ２は、上記データ及び送信電力制御ビットの伝送に用いられる拡散コードとは異なる拡散コードで拡散されたパイロットチャネルにてパイロット信号を常時固定電力値にて送信している。各基地局から送信されるパイロット信号は、移動局ＭＳがソフトハンドオーバに際して無線接続すべき基地局を決定するために用いられる。即ち、移動局ＭＳは、各基地局からのパイロット信号を受信し、そのパイロット信号の受信レベルまたは受信ＳＩＲ、あるいは、これらの値と基地局から別途通知されているパイロット信号の送信レベルとを用いて求めた基地局及び移動局間の伝搬損失に基づいて無線接続すべき基地

局を決定する。

ここで、パイロット信号の送信レベルは、各基地局のアンテナから送信されるパイロット信号の送信レベルを報知情報として移動局ＭＳに通知されている値である。このパイロット信号の送信レベル（dBm）から移動局ＭＳで測定された受信レベル（dBm）を減算した値が伝搬損失（dB）となる。伝播損失値を求める際に用いる受信レベルは、電波伝送路の状態の瞬時変動（フェージング変動）分の影響を受けない程度に平均化を施すことで距離変動分をより忠実に表すことができる。

移動局ＭＳは、受信系として、更に、２つのパイロット信号復調／伝搬損失演算部３１、３２及び送信電力制御信号決定部３３を有する。各パイロット信号復調／伝搬損失演算部３１、３２は、前述したように、移動局ＭＳが無線接続すべき基地局を決定するために用いられる伝搬損失を演算する。具体的には、次のような処理がなされる。

ソフトハンドオーバに際して無線接続される基地局として決定された上記各基地局ＢＳ１、ＢＳ２から上記パイロットチャネルにて送信されるパイロット信号が送受分離部２０を介して無線受信部２１にて受信されると、その受信信号が逆拡散部２２及び２３に供給される。逆拡散部２２は、基地局ＢＳ１のパイロットチャネルの拡散コードを用いてその受信信号の逆拡散処理を行う。この逆拡散処理にて、基地局ＢＳ１から伝送されるパイロット信号に対応した受信パイロット信号が得られる。また、逆拡散部２３は、基地局ＢＳ２のパイロットチャネルの拡散コードを用いてその受信信号の逆拡散処理を行う。この逆拡散処理にて、基地局ＢＳ２から伝送されるパイロット信号に対応した受信パイロット信号が得られる。

逆拡散部２２にて得られた受信パイロット信号は、パイロット信号復調／伝搬送信演算部３１に供給される。パイロット信号復調／伝搬損失演算部３１は、供給される受信パイロット信号を復調し、その復調信号からパイロット信号の受信レベル（dBm）を演算する。そして、このパイロット信号の受信レベル（dBm）と上述したようにネットワーク側から報知情報として通知されるパイロット信号の送信レベル（dBm）とを用いて移動局ＭＳと基地局ＢＳ１との間の電波伝送路

での伝搬損失１が演算される。具体的には、パイロット信号の送信レベル（dBm）とパイロット信号の受信レベル（dBm）との差分が伝搬損失１（dB）として演算される。

上記逆拡散部２３にて得られた受信パイロット信号は、パイロット信号復調／伝搬損失演算部３２に供給される。パイロット信号復調／伝搬損失演算部３２は、供給される受信パイロット信号を復調し、その復調信号からパイロット信号の受信レベル（dBm）を演算する。そして、上記パイロット信号復調／伝搬損失演算部３１と同様に、そのパイロット信号の送信レベル（dBm）と報知情報として通知されたパイロット信号の受信レベル（dBm）との差分が、移動局ＭＳと基地局ＢＳ２との間の電波伝送路での伝搬損失２（dB）として演算される。

上述したように逆拡散部２２にて得られた基地局ＢＳ１から送信される送信電力制御ビットに対応した受信 TPC 信号１、逆拡散部２３にて得られた基地局ＢＳ２から送信される送信電力制御ビットに対応した受信 TPC 信号２、及び上記パイロット信号復調／伝搬損失演算部３１にて得られた移動局ＭＳと基地局ＢＳ１との間の電波伝送路での伝搬損失１、上記パイロット信号復調／伝搬損失演算部３２にて得られた移動局ＭＳと基地局ＢＳ２との間の電波伝送路での伝搬損失２が送信電力制御信号決定部３３に供給される。

送信電力制御信号決定部３３は、移動局ＭＳと無線接続された各基地局ＢＳ１、ＢＳ２から伝送される２つの送信電力制御ビットの情報に基づいて当該移動局ＭＳでの送信電力制御信号を決定するもので、上記受信 TPC 信号１、受信 TPC 信号２、伝搬損失１及び伝搬損失２に基づいて送信電力制御信号を決定する。この送信電力制御信号を決定するに際して、上記伝搬損失１及び伝搬損失２は、上記受信 TPC 信号１及び受信 TPC 信号２の信頼度として考慮される。

図３を参照して送信電力制御信号決定部３３の第一の構成例について説明する。

図３において、送信電力制御信号決定部３３は、２つの TPC 復調部３０１、３０２、TPC 軟判定値重み合成部３０３及び硬判定部３０４を有している。TPC 軟判定値重み合成部３０３は、重み係数決定部３１０、２つの重み補正部３１１、３１２及び合成部３１３を有する。

上記 TPC 復調部３０１は、上記逆拡散部２２からの受信 TPC 信号１を復調し、その復調信号のレベル値を基地局ＢＳ１からの送信電力制御ビットの軟判定値 TPC-SS1 として出力する。上記 TPC 復調部３０２は、上記逆拡散部２３からの受信 TPC 信号２を復調し、その復調信号のレベル値を基地局ＢＳ２からの送信電力制御ビットの軟判定値 TPC-SS2 として出力する。これらの軟判定値 TPC-SS1 及び TPC-SS2 は、移動局ＭＳと各基地局ＢＳ１、ＢＳ２との間の電波伝送路の状態を反映しており、例えば、上述したように、送信電力制御ビットが「＋１」、「－１」の値に変調されて伝送される場合、理想的な伝送路の状態では、「＋１」または「－１」となる。

TPC 軟判定値重み合成部３０３の重み係数決定部３１０は、伝搬損失１と伝搬損失２とに基づいて上記軟判定値 TPC-SS1 及び軟判定値 TPC-SS2 に対する重み係数を決定する。この重み係数決定部３１０は、より小さい伝搬損失に対してより大きい重み係数となるようにその重み係数を決定する。例えば、各伝搬損失１、２の逆数に基づいた重み係数が決定される。

重み補正部３１１は、上記送信電力制御ビットの軟判定値 TPC-SS1 に上記伝搬損失１に対応した重み係数を乗じ、その補正値を出力する。また、重み補正部３１２は、上記送信電力制御ビットの軟判定値 TPC-SS2 に上記伝搬損失２に対応した重み係数を乗じ、その補正値を出力する。これにより、上記伝搬損失１及び２が、上記送信電力制御ビットの軟判定値 TPC-SS1 及び TPC-SS2 の信頼度として考慮されることになる。即ち、伝搬損失が小さく、より信頼度が高いと見込まれる軟判定値 TPC-SS1 または TPC-SS2 に対してより大きな重み係数が乗ぜられることになる。

合成部３１３は、各重み補正部３１１、３１２から出力される各軟判定値 TPC-SS1、TPC-SS2 の補正値を最大比合成（MRC：Maximum Ration Combining）する。具体的には、各補正値が加算され、合成部３１３から TPC 合成軟判定値が出力される。

基地局ＢＳ１からの送信電力制御ビット（０，０，０，０，０，…）の軟判定値 TPC-SS1 が、例えば、

-0.2, -03, 0.1, -0.3, -06, …

のように得られ、基地局ＢＳ２からの送信電力制御ビット（１，１，１，１，１，…）の軟判定値 TPC-SS2 が、例えば、

0.6, 0.3, 0.4, 0.2, -0.1, …

のように得られ、更に、例えば、伝搬損失１に対応した重み係数が 1.1、伝搬損失２に対応した重み係数が 0.9 とそれぞれ得られた場合、TPC 合成軟判定値は、

0.32, -0.06, 0.47, -0.15, -0.75, …

となる。

上記のようにして得られた TPC 合成軟判定値は硬判定部３０４に供給される。この硬判定部３０４は、供給される TPC 合成軟判定値が所定の閾値以上であるか及びその閾値より小さいかのいずれかであるかを判定し、その判定結果を送信電力制御信号として出力する。この所定の閾値が、例えば、「０」で、TPC 合成軟判定値が、例えば、上述したように、

0.32, -0.06, 0.47, -0.15, -0.75, …

となる場合、

１，０，１，０，０，…

となる送信電力制御信号が出力される。

そして、この送信電力制御信号に基づいて上述した送信電力制御部１６が無線送信部１５での送信電力を所定量だけ増加（送信電力制御信号＝１）またはその送信電力を所定量だけ減少（送信電力制御信号＝０）させる。

上述したように、移動局ＭＳでは、各基地局ＢＳ１、ＢＳ２から伝送される送信電力制御ビットの軟判定値 TPC-SS1 及び TPC-SS2 が、送信電力制御のなされない（固定送信電力にて送信される）パイロット信号の送信レベル及び受信レベルに基づいて求められた移動局ＭＳと各基地局ＢＳ１、ＢＳ２との間の伝送路での伝搬損失が信頼度として考慮されるように重み合成される。そして、その重み合成の結果得られた TPC 合成軟判定値を硬判定した結果が送信電力制御信号として決定される。このようにして決定された送信電力制御信号に基づいて移動局ＭＳでの送信電力制御がなされることにより、移動局ＭＳと各基地局ＢＳ１、ＢＳ２との間の伝送路の状態をより忠実に考慮して移動局ＭＳの送信電力制御が

可能となる。

上記例では、上記硬判定部３０４での閾値が、例えば、各基地局ＢＳ１とＢＳ２から送信される送信電力制御ビットの変調信号の取り得る値「＋１」と「－１」の中心値「０」に設定される。無駄のない送信電力制御を可能にするという観点から、上記閾値を僅かに「＋１」寄りの値に決めることもできる。この場合、上記 TPC 重み合成値が送信電力を低減することを表す「０」に硬判定され易くなり、比較的低電力での送信電力制御がなされる。硬判定部３０４での閾値は、移動通信システムにおいて常に移動局と基地局間での通信が適正になされる範囲で適当に設定することができる。

また、上記硬判定部３０４は、例えば、図４に示すように構成することもできる。この硬判定部３０４は、２つの閾値 Th1、Th2 を用いている。

図４において、この硬判定決定部３０４は、第一の硬判定部３２１、第二の硬判定部３２２及び演算部３２３を有する。第一の硬判定部３２１は、TPC 軟判定値重み合成部３０３からの TPC 合成軟判定値を第一の閾値 Th1 を用いて硬判定する。即ち、TPC 合成軟判定値が上記第一の閾値 Th1 以上か、及び上記第一の閾値より小さいかのいずれであるかを判定し、その判定結果を出力する。また、第二の硬判定部３２２は、上記 TPC 合成軟判定値を上記第一の閾値 Th1 より小さい第二の閾値 Th2（Th2＜Th1）を用いて硬判定する。即ち、TPC 合成軟判定値が上記第二の閾値 Th2 以上か、及び上記第二の閾値 Th2 より小さいかのいずれであるかを判定し、その判定結果を出力する。

演算部３２３は、上記第一の硬判定部３２１からの判定値Ａ及び第二の硬判定部３２２からの判定値Ｂに基づいて得られる演算結果Ｃを送信電力制御信号として出力する。その演算論理は、例えば、図５に示すようになっている。即ち、判定値Ａが「１」（TPC 合成軟判定値が第一の閾値 Th1 以上であることを表す）で、かつ、判定値Ｂが「１」（TPC 合成軟判定値が第二の閾値 Th2 以上であることを表す）である場合、演算結果Ｃ＝「１」が送信電力を所定量（dB）だけ増加させることを表す送信電力制御信号として出力される。また、判定値Ａが「０」（TPC 合成軟判定値が第一の閾値 Th1 より小さいことを表す）で、かつ、判定値Ｂが「０」（TPC 合成軟判定値が第二の閾値 Th2 より小さいことを表す

）である場合、演算結果Ｃ＝「０」が送信電力を所定量（dB）だけ減少させることを表す送信電力制御信号として出力される。

更に、判定値Ａが「０」で、判定値Ｂが「１」である場合、即ち、TPC 合成軟判定値が第一の閾値 Th1 より小さく、第二の閾値 Th2 以上である場合、演算結果Ｃ＝「維持」が現在の送信電力を維持することを表す送信電力制御信号として出力される。なお、判定値Ａが「１」で、判定値Ｂが「０」である状況は、第一の閾値 Th1 及び第二の閾値 Th2 の大小関係（Th1＞Th2）から論理的にありえない。

このような硬判定部３０４の構成により、TPC 合成軟判定合成値が、電力増大、電力減少を明確に表しうる値とならない場合（第一の閾値 Th1 より小さく、第二の閾値 Th2 以上)、現在の送信電力が維持されるようになるので、誤って送信電力を増大させたり、減少させたりする制御を防止することができる。

次に、図６を参照して上記送信電力制御信号決定部３３の第二の構成例について説明する。なお、図６において、図３に示す部分と同様の部分については同一の参照符号が付されている。

図６において、この送信電力制御信号決定部３３は、２つの TPC 復調部３０１、３０２、比較部３０５、選択部３０６及び硬判定部３０７を有している。前述した例（図３参照）と同様に、TPC 復調部３０１、３０２は、上記逆拡散部２２、２３からの受信 TPC 信号１及び受信 TPC 信号２を復調し、その復調信号のレベル値を基地局ＢＳ１及びＢＳ２からの送信電力制御ビットの軟判定値 TPC-SS1、TPC-SS2 として出力する。

比較部３０５は、パイロット信号復調／伝搬損失演算部３１にて演算された伝搬損失１と、パイロット信号復調／伝搬損失演算部３２にて演算された伝搬損失２とを比較し、その比較結果を出力する。選択部３０６は、比較部３０５からの比較結果を選択制御信号として入力し、その選択制御信号に基づいて基地局ＢＳ１からの送信電力制御ビットの軟判定値 TPC-SS1 となる TPC 復調部３０１からの出力及び基地局ＢＳ２からの送信電力制御ビットの軟判定値 TPC-SS2 となる TPC 復調部３０２からの出力のいずれかを選択する。

比較部３０５から伝搬損失１が伝搬損失２より小さいという比較結果に基づい

た選択制御信号が選択部３０６に入力されると、選択部３０６は、TPC 復調部３０１からの出力を選択する。また、比較部３０５から伝搬損失２が伝搬損失１より小さいという比較結果に基づいた選択制御信号が選択部３０６に入力されると、選択部３０６は、TPC 復調部３０２からの出力を選択する。

硬判定部３０７は、上記のようにして選択された送信電力制御ビットの軟判定値 TPC-SS1 または TPC-SS2 は、所定の閾値を用いて硬判定し、その硬判定結果を送信電力制御信号として出力する。なお、硬判定部３０７は、前述した硬判定部３０４（図３参照）と同様の処理にて軟判定値 TPC-SS1 または TPC-SS2 の硬判定を行うことができる。

上記のような送信電力制御信号決定部３３の構成により、移動局ＭＳと各基地局ＢＳ１、ＢＳ２との間の電波伝送路のうち伝搬損失が最小となる電波伝送路を通って伝送される送信電力制御ビットの軟判定値（TPC-SS1 または TPC-SS2）に基づいて送信電力制御信号が決定される。従って、移動局ＭＳと各基地局ＢＳ１、ＢＳ２との間の伝送路の状態を考慮した移動局ＭＳの送信電力制御が可能となる。

なお、上記構成例（図６参照）の送信電力制御信号決定部３３にて決定された送信電力制御信号に基づいた移動機ＭＳの送信電力制御は、移動局ＭＳと各基地局との間の伝送路での伝搬損失に大きな差がある場合に、より適正な送信電力制御が可能になるという点で、好ましい。

次に、図７を参照して上記送信電力制御信号決定部３３の第三の構成例について説明する。なお、図７において、図３に示す部分と同様の部分については同一の参照符号が付されている。

図７において、この送信電力制御信号決定部３３は、２つの TPC 復調部３０１、３０２、重み係数決定部３１０、２つの重み補正部３１１、３１２、２つの硬判定部３１４、３１５及び最小値選択部３１６を有している。

上述した第一の構成例（図３参照）と同様に、重み係数決定部３１０が伝搬損失１及び伝搬損失２に対応した重み係数を決定し、重み補正部３１１、３１２が、基地局ＢＳ１、ＢＳ２からの送信電力制御ビットの軟判定値 TCP-SS1、TPC-SS2 となる TPC 復調部３０１、３０２の出力に対してその伝搬損失１、伝搬損

失２に対応する重み係数を乗じて、その補正値を出力する。

硬判定部３１４は、所定の閾値を用いて重み補正部３１１から出力される軟判定値 TPC-SS1 の補正値の硬判定を行う。また、硬判定部３１５は、所定の閾値を用いて重み補正部３１２から出力される軟判定値 TPC-SS2 の補正値の硬判定を行う。硬判定部３１４からの硬判定出力は、基地局ＢＳ１から伝送される送信電力制御ビットに対応したものとなり、硬判定部３１５からの硬判定出力は、基地局ＢＳ２から伝送される送信電力制御ビットに対応したものとなる。

最小値選択部３１６は、硬判定部３１４、３１５からの両硬判定出力の値が同じ場合（送信電力増加を表す「１」または送信電力減少を表す「０」である場合）、その硬判定出力の値を送信電力制御信号として出力する。一方、最小値選択部３１６は、硬判定部３１４、３１５からの両硬判定出力の値が異なる場合（送信電力増加を表す「１」及び送信電力減少を表す「０」の場合)、そのうちの小さい値「０」を送信電力制御信号として出力する。

硬判定部３１４からの硬判定出力値が、例えば、

１、０、１、０、０、…

となり、硬判定部３１５からの硬判定出力値が、例えば、

１、１、１、１、１、…

となる場合、最小値選択部３１６は、

１、０、１、０、０、…

を送信電力制御信号として出力する。

上記のような送信電力制御信号決定部３３の構成により、移動局ＭＳでは、各基地局ＢＳ１、ＢＳ２との間の伝送路での伝搬損失が信頼度として考慮され、各基地局ＢＳ１、ＢＳ２から伝送される送信電力制御ビットの軟判定値 TPC-SS1、TPC-SS2 が重み補正される。そして、その重み補正された値の硬判定結果が異なる場合に、より小さい硬判定結果が送信電力制御信号として決定される。そのように決定される送信電力制御信号に基づいて移動局ＭＳの送信電力制御を行うことにより、移動局ＭＳと各基地局ＢＳ１、ＢＳ２との間の伝送路の状態をより忠実に考慮して移動局ＭＳの無駄のない送信電力制御が可能となる。

次に、図８を参照して上記送信電力制御信号決定部３３の第四の構成例につい

て説明する。なお、図８において、図３に示す部分と同様の部分については同一の参照符号が付されている。

図８において、この送信電力制御信号決定部３３は、２つの TPC 復調部３０１、３０２、４つの硬判定部３１７、３１８、３３１、３３２、最小値選択部３１９及び選択部３３３を有する。上述した各例と同様に、TPC 復調部３０１、３０２は、上記逆拡散部２２、２３（図２参照）からの受信 TPC 信号１及び受信 TPC 信号２を復調し、その復調信号のレベル値を基地局ＢＳ１及びＢＳ２からの送信電力制御ビットの軟判定値 TPC-SS1、TPC-SS2 として出力する。

硬判定部３１７は、所定の閾値を用いて上記 TPC 復調部３０１からの軟判定値 TPC-SS1 の硬判定を行う。この硬判定部３１７からの硬判定出力は、基地局ＢＳ１から伝送される送信電力制御ビットに対応したものとなる。また、硬判定部３１８は、所定の閾値を用いて上記 TPC 復調部３０２からの軟判定値 TPC-SS2 の硬判定を行う。この硬判定部３１８からの硬判定出力は、基地局ＢＳ２から伝送される送信電力制御ビットに対応したものとなる

最小値選択部３１９は、硬判定部３１７、３１８からの両硬判定出力の値が同じ場合、その硬判定出力の値を出力する。一方、硬判定部３１７、３１８からの硬判定出力の値が異なる場合（「０」と「１」の場合）、そのうち小さい値「０」を送信電力制御信号として出力する。

硬判定部３３１は、パイロット信号復調／伝搬損失演算部３１にて演算された伝搬損失１が所定の閾値以上か、及び所定の閾値より小さいかのいずれかの判定結果を硬判定結果として出力する。硬判定部３３２は、パイロット信号復調／伝搬損失演算部３２にて演算された伝搬損失が上記所定の閾値以上か、及び所定の閾値より小さいかのいずれかの判定結果を硬判定結果として出力する。そして、各硬判定部３３１、３３２からの硬判定結果が選択制御信号として選択部３３３に供給される。

選択部３３３は、上記選択制御信号に基づいて基地局ＢＳ１から伝送される送信電力制御ビットに対応した硬判定部３１７の硬判定出力値Ａ、最小選択部３１９からの出力値 MIN 及び基地局ＢＳ２から伝送される送信電力制御ビットに対応した硬判定部３１８の硬判定出力値Ｂのいずれかを選択する。

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例えば、伝搬損失１が所定の閾値より小さく、伝搬損失２が所定の閾値以上の場合、硬判定部３３１、３３２から出力される硬判定結果に基づいた選択制御信号により、選択部３３３は、硬判定部３１７の硬判定出力値Ａを選択して送信電力制御信号として出力する。また、伝搬損失１が所定の閾値以上で、伝搬損失２が所定の閾値より小さい場合、硬判定部３３１、３３２から出力される硬判定結果に基づいた選択制御信号により、選択部３３３は、硬判定部３１８の硬判定出力Ｂを選択して送信電力制御信号として出力する。更に、伝搬損失１及び伝搬損失２の双方が所定の閾値より小さい場合、または、その双方が所定の閾値以上の場合、硬判定部３３１、３３２から出力される硬判定結果に基づいた選択制御信号により、選択部３３３は、最小選択部３１９からの出力値 MIN を選択して送信電力制御信号として出力する。

上記のような送信電力制御信号決定部３３の構成により、移動局 ＭＳと各基地局ＢＳ１、ＢＳ２との間の電波伝送路のうち伝搬損失がより小さい値となる電波伝送路を通って伝送される送信電力制御ビットの軟判定値の硬判定結果が送信電力制御信号として決定される。また、移動局ＭＳと各基地局ＢＳ１、ＢＳ２との間の電波伝送路の伝搬損失が同じように所定の閾値以上、または同じように所定の閾値より小さい場合、基地局ＢＳ１、ＢＳ２から伝送される送信電力制御ビットの軟判定値 TPC-SS1、TPC-SS2 は、同程度の信頼性がある（同程度の信頼性しかない）として、それらの硬判定結果のうち小さい値（「０」）が送信電力制御信号として決定される。

従って、移動局ＭＳと各基地局ＢＳ１、ＢＳ２との間の伝送路の状態を考慮した無駄のない送信電力制御が可能となる。

次に、図９を参照して上記送信電力制御信号決定部３３の第五の構成例について説明する。なお、図９において、図３及び図６に示す部分と同様の部分については同一の参照符号が付されている。

図９において、送信電力制御信号決定部３３は、図３に示す構成例と同様に、２つの TPC 復調部３０１、３０２、TPC 軟判定値重み合成部３０３及び硬判定部３０４を有している。また、この送信電力制御信号決定部３３は、図６に示す構成例と同様に、２つの TPC 復調部３０１、３０２からの軟判定値 TPC-SS1

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、TPC-SS21 のいずれかを選択する選択部３０６、伝搬損失１と伝搬損失２とを比較し、その比較結果を選択制御信号として選択部３０６に供給する比較部３０５及び硬判定部３０７を有している。更に、この送信電力制御信号決定部３３は、硬判定部３０４からの硬判定出力値及び硬判定部３０７からの硬判定出力値のいずれかを選択する選択部３３４を有している。

また、この移動局ＭＳは、フェージング周波数測定部４０及びフェージング判定部４１を有している。フェージング周波数測定部４０は、受信信号のフェージング周波数を測定する。このフェージング周波数は、例えば、復調／合成部２４からの出力信号（合成復調信号）のレベル変動に基づいて測定することができる。また、各拡散チャネルでのパイロット信号の復調信号のレベル変動に基づいて各拡散チャネル毎のフェージング周波数を求めることができる（例えば、本願出願人が既に出願している特願 2000-082929 参照）。この拡散チャネル毎のフェージング周波数の平均値や、その各フェージング周波数のうちでより大きいフェージング周波数をフェージング周波数の測定値として用いることもできる。更に、フェージングによって希望波のレベルが低下すると、受信ＳＩＲが低下し、その受信ＳＩＲを目標ＳＩＲに近づけるように送信電力制御ビットが決定される。従って、このように決定される送信電力制御ビットの変動状況に基づいてフェージング周波数を測定することもできる。

フェージング判定部４１は、上記のようにしてフェージング周波数測定部４０にて測定されたフェージング周波数が基準値以上であるか否かを判定し、その判定結果を選択制御信号として出力する。選択部３３４は、フェージング判定部４１からフェージング周波数の測定値が基準値より小さいとする判定結果に対応した選択制御信号を入力すると、硬判定部３０４からの硬判定出力値を選択して送信電力制御信号として出力する。一方、選択部３３４は、フェージング判定部４１からフェージング周波数の測定値が基準値以上であるとする判定結果に対応した選択制御信号を入力すると、硬判定部３０７からの硬判定出力値を選択して送信電力制御信号として出力する。

このような送信電力制御信号決定部３３の構成により、移動局ＭＳの移動速度が比較的小さく、移動局ＭＳでのフェージング周波数が比較的小さい場合には、

図３に示す例と同様に、各基地局ＢＳ１、ＢＳ２から伝送される送信電力制御ビットの軟判定値 TPC-SS1、TPC-SS2 が、移動局ＭＳと各基地局ＢＳ１、ＢＳ２との間の電波伝送路での伝搬損失１、２に基づいて重み合成され、その重み合成の結果得られた TPC 合成軟判定値を硬判定した結果が送信電力制御信号として決定される。一方、移動局ＭＳの移動速度が比較的大きく、移動局ＭＳでのフェージング周波数が比較的大きい場合には、図６に示す例と同様に、移動局ＭＳと各基地局ＢＳ１、ＢＳ２との間の電波伝送路のうち伝搬損失が最小となる電波伝送路を通って伝送される送信電力制御ビットの軟判定値に基づいて送信電力制御信号が決定される。

従って、移動局ＭＳと各基地局ＢＳ１、ＢＳ２との間の伝送路の状態が比較的良好なとき（フェージング周波数が比較的小さいとき）には、各基地局ＢＳ１、ＢＳ２から伝送される双方の送信電力制御ビットに基づいて移動局ＭＳでの送信電力制御信号が決定される。また、移動局ＭＳと各基地局ＢＳ１、ＢＳ２との間の伝送路の状態があまり良くないとき（フェージング周波数が比較的大きいとき）には、最も良好な（伝搬損失が最小となる）伝送路を通って伝送される送信電力制御ビットだけに基づいて移動局ＭＳでの送信電力制御信号が決定されることになる。その結果、移動局ＭＳと各基地局ＢＳ１、ＢＳ２との間のより良い伝送路の状態を考慮した移動局ＭＳでの送信電力制御が可能となる。

なお、上記例では、図６に示す構成にて得られる送信電力制御信号と、図３に示す構成にて得られる送信電力制御信号とを、フェージング周波数に基づいて切換えるようにしたが、その図６に示す構成にて得られる送信電力制御信号に代えて、図７または図８に示す構成にて得られる送信電力制御信号を用いることもできる。

なお、上記各例では、移動局ＭＳが２つの基地局ＢＳ１、ＢＳ２と無線接続される場合について説明したが、移動局ＭＳが３つ以上の基地局と無線接続される場合についても、同様の処理を行うことにより、移動局ＭＳの送信電力制御を行うことができる。

また、上記各例では、移動局ＭＳと各基地局ＢＳ１、ＢＳ２との間の電波伝送路の伝搬損失を考慮して移動局ＭＳにて得られる各基地局からの送信電力制御情

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報から送信電力制御に用いられるべき送信電力制御情報を決定している。本発明はこれに限定されず、上記伝搬損失に代えて、各基地局から送信されるパイロット信号に基づいて測定される移動局ＭＳと各基地局ＢＳ１、ＢＳ２との間の伝送路品質を表す情報となるパイロット信号の受信レベルや該パイロット信号から演算される受信ＳＩＲ等を用いることも可能である。その伝送品質を表す情報は、移動局ＭＳが無線接続されるべき基地局を決定するために使用されるものであることが、装置の構成を簡略化できるという観点から好ましい。

上記各例において、パイロット信号復調／伝搬損失演算部３１、３２は、伝搬損失演算手段、伝送路品質測定手段に対応し、送信電力制御信号決定部３３は、送信ン電力制御情報決定手段に対応する。

また、重み係数決定部３１０、重み補正部３１１、３１２は、重み補正手段に対応し、合成部３１３は合成手段に対応し、図９に示す選択部３３４は、選択手段に対応する。

次に、請求の範囲２５～３８の実施例について説明する。

（請求の範囲２５～３８の実施例）

以下、本発明の実施の一形態を図面に基づいて説明する。

本発明の実施の一形態に係る送信電力制御方法が適用される無線通信システムは、例えば、図１０に示すように構成される。この無線通信システムは、移動局と基地局との間で信号の送受信がなされるＣＤＭＡ方式の移動通信システムである。

図１０において、移動局１００と基地局２００とが、ＣＤＭＡ方式に従って信号（パケット、制御信号、音声信号など）の送受信を行う。移動局１００は、送受信装置１１０、信号処理部１５０及びユーザインタフェース１６０を有する。また、基地局２００は、送受信装置２１０及び信号処理部２２０を有する。

移動局１００のユーザインタフェース１６０にてユーザから入力された情報（音声、文書、画像等）は、信号処理部１５０にて所定の形式の信号となるように処理される。信号処理部１５０からの信号は、送受信装置１１０に供給され、符号化処理、変調処理等の所定の処理が施される。そして、その処理により得られた信号が送受信装置１１０から基地局２００に送信される。

移動局１００からの信号を受信した基地局２００の送受信装置２１０は、その受信信号に対して復調処理、復号処理等の所定の処理を施す。そして、送受信装置２１０にて生成された信号が信号処理部２２０にてネットワーク上を伝送可能な形式に変換され、その信号が信号処理部２２０からネットワークを介して通信相手の端末に送信される。

基地局２００において、ネットワークから供給される信号は、信号処理部２２０にて所定の形式となるように処理される。この信号処理部２２０からの信号は、送受信装置２１０に供給され、符号化処理、変調処理等の所定の処理が施される。その処理により得られた信号が送受信装置２１０から移動局１００に送信される。

基地局２００からの信号を受信した移動局１００の送受信装置１１０は、その受信信号に対して復調処理、復号処理等の所定の処理を施す。そして、送受信装置１１０で生成された信号が信号処理部１５０にてユーザインタフェース１６０で処理可能な形式に変換され、その信号に基づいてユーザインタフェース１６０からユーザに対して情報（音声、文書（メール）、画像等）の提示がなされる。

移動局１００の送受信装置１１０は、基地局２００から送信される送信電力制御ビット（電力増加または電力減少を表す送信電力制御情報）に基づいて送信電力制御（上り回線送信電力制御）を行う。基地局２００の送受信装置２１０も、移動局１００から送信される送信電力制御ビットに基づいて送信電力制御（下り回線送信電力制御）を行う。従って、移動局１００及び基地局２００の送受信装置１１０及び２１０は、送信電力制御に関して略同様の構成となっている。以下、上り回線送信電力制御について説明する。

移動局１００の送受信装置１１０は、例えば、図１１に示すように構成される。

図１１において、この送受信装置１１０は、送受分離部１１１を共用した送信系と受信系とを有している。受信系は、無線受信部１１２、誤り訂正符号／誤り検出部１１３、誤り率測定部１１４、ＳＩＲ測定部１１５、ＳＩＲ比較部１１６、目標ＳＩＲ決定部１１７、送信電力制御ビット決定部１１８及び送信電力制御ビット抽出部１１９を有している。

基地局２００から送信される信号が送受分離部１１１を介して無線受信部１１２に供給される。この無線受信部１１２は、送受分離部１１１から供給される受信信号に対して逆拡散処理及び復調処理を施してベースバンド信号を生成する。後述するように、上記受信信号は、基地局２００から送信されるデータに対応したデータ信号と送信電力制御ビットに対応した制御信号とを含んでおり、その制御信号に対する復調処理にて得られたベースバンド信号は、送信電力制御ビット抽出部１１９に供給される。送信電力制御ビット抽出部１１９は、そのベースバンド信号から送信電力制御ビットを復元する。

無線受信部１１２による上記データ信号に対する復調処理にて得られたベースバンド信号は、誤り訂正復号／誤り検出部１１３に供給され、フレーム単位に誤り訂正復号がなされると共に、例えば、CRC（cycle redundancy check）の手法に従って伝送誤りの有無の検出がなされる。その復号結果が情報出力として当該送受信装置１１０から信号処理部１５０（図１０参照）に供給される。この誤り訂正復号／誤り検出部１１３は、更に、フレーム単位毎に上記伝送誤りの有無を表す誤り検出結果を出力する。

誤り率測定部１１４は、上記誤り訂正復号／誤り検出部１１３からの誤り検出結果に基づいて、フレーム誤り率（FER：Frame Error Rate）を受信信号（希望波）から復元した情報の受信品質として演算する。

ＳＩＲ測定部１１５は、無線受信部１１２にて得られた受信信号に基づいて受信ＳＩＲ（希望波対干渉波及び雑音電力比）を演算する。この演算周期は、データのフレーム周期より短い。目標ＳＩＲ決定部１１７は、誤り測定部１１４から出力される情報の受信品質（FER）が目標品質となるように、目標ＳＩＲを決定する。具体的には、この目標ＳＩＲ決定部１１７は、情報の受信品質が目標品質より低ければ、目標ＳＩＲの値を高くし、情報の受信品質が目標品質より高ければ、目標ＳＩＲの値を低くするような制御（アウターループ制御）を行う。ＳＩＲ比較部１１６は、上記ＳＩＲ測定部１１５からの受信ＳＩＲと目標ＳＩＲ決定部１１７からの目標ＳＩＲとを比較し、その比較結果を出力する。

送信電力制御ビット決定部１１８は、ＳＩＲ比較部１１６からの比較結果に基づいて、基地局２００での送信電力制御に用いられるべき送信電力制御ビットを

決定する（インナーループ制御）。受信ＳＩＲが目標ＳＩＲより小さい場合、希望波の受信レベルが低いとして、送信電力制御ビットが送信電力を増加させるべき値（例えば、「１」）に決定される。一方、受信ＳＩＲが目標ＳＩＲより大きい場合、希望波の受信レベルが高いとして、送信電力制御ビットが送信電力を低減させるべき値（例えば、「０」）に決定される。このように値の決定された送信電力制御ビットは、送信電力制御ビット決定部１１８から後述するような送信系の無線送信部１２２に供給され、基地局２００に伝送される。

移動局１００の送信系では、前述したように信号処理部１５０（図１０参照）から供給される情報に対して所定の処理、例えば、CRC の手法に従って誤り検出用のパリティビットをフレーム単位に付加する処理、このような処理により得られたフレーム単位のパリティ付きデータの誤り訂正符号化を行う処理等がなされる。この符号化データは、無線送信部１２２に供給される。

無線送信部１２２は、上記のように供給される符号化データに対して変調処理を行ってデータ変調信号を生成する。また、無線送信部１２２は、前述したように送信電力制御ビット決定部１１８から供給される送信電力制御ビットに対して変調処理を行って制御ビット変調信号を生成し、この制御ビット変調信号と上記データ変調信号とを多重化する。そして、所定の拡散コードを用いてその多重化された信号の拡散処理がなされる。無線送信部１２２は、その拡散処理にて得られた信号を、送受分離部１１１を介して送信する。

この移動局１００の送信系は、更に、送信電力制御部１２３、ＳＩＲ監視部１２４、徐々上げビットパターン生成部１２５及びスイッチ１２６を有している。

上記受信系における送信電力制御ビット抽出部１１９からの送信電力制御ビットは、スイッチ１２６を介して送信電力制御部１２３に供給される。この場合、送信電力制御部１２３は、上記基地局２００からの送信電力制御ビットに基づいて無線送信部１２２での送信電力を制御する。このような制御により、基地局２００での受信ＳＩＲが目標ＳＩＲに近づくように、移動局１００における無線送信部１２２での送信電力制御がなされる。

ＳＩＲ監視部１２４は、前述したＳＩＲ測定部１１５にて測定された受信ＳＩＲ及び目標ＳＩＲ決定部１１７にて決定された目標ＳＩＲを入力し、予め設定さ

れた第一の閾値Th_A及び第二の閾値Th_Bを用いて上記受信ＳＩＲが正常な状態にあるか否かを監視する。そして、このＳＩＲ監視部１２４は、受信ＳＩＲが正常な状態であると判定すると、第一の状態（例えば、ローレベル）の制御信号を出力する一方、受信ＳＩＲが異常な状態であると判定すると、第二の状態（例えば、ハイレベル）となる制御信号を出力する。

上記ＳＩＲ監視部１２４から第一の状態となる制御信号が出力される場合（受信ＳＩＲが正常な状態)、その制御信号に基づいて上記スイッチ１２６は、送信電力制御ビット抽出部１１９を送信電力制御部１２３に接続する状態となる。その結果、上述したように、送信電力制御ビット抽出部１１９からの送信電力制御ビットが送信電力制御部１２３に供給される。

一方、上記ＳＩＲ監視部１２４から第二の状態となる制御信号が出力される場合（受信ＳＩＲが異常な状態)、その制御信号に基づいて徐々上げビットパターン生成部１２５が起動される。この徐々上げビットパターン生成部１２５は、送信電力が徐々に上昇するように作用する送信電力制御ビット列に対応したビットパターン（以下、徐々上げビットパターンという）を生成する。また、その制御信号に基づいて上記スイッチ１２６は、徐々上げビットパターン生成部１２５を送信電力制御部１２３に接続する状態となる。その結果、徐々上げビットパターン生成部１２５にて生成される徐々上げビットパターンが送信電力制御部１２３に供給される。

上記ＳＩＲ監視部１２４は、例えば、図１２に示すように構成される。

図１２において、ＳＩＲ監視部１２４は、受信ＳＩＲと第一の閾値Th_Aとを比較する比較器１３１、目標ＳＩＲから受信ＳＩＲを減算してＳＩＲ差分値Δ_{SIR}を出力する減算器１３２、減算器１３２から出力されるＳＩＲ差分値Δ_{SIR}と第二の閾値Th_Bとを比較する比較器１３３を有している。上記比較器１３１は、受信ＳＩＲが第一の閾値Th_Aより小さくなるときに、例えば、ハイレベルとなる信号を出力し、受信ＳＩＲが第一の閾値Th_A以上となるときに、例えば、ローレベルとなる信号を出力する。上記比較器１３３は、上記ＳＩＲ差分値Δ_{SIR}が第二の閾値Th_B以上となるときに、例えば、ハイレベルとなる信号を出力し、上記ＳＩＲ差分値Δ_{SIR}が第二の閾値Th_Bより小さくなるときに、例えば、

ローレベルとなる信号を出力する。

また、このＳＩＲ監視部１２４は、オアゲート１３４、アップ／ダウンカウンタ１３５及びアンドゲート１３６を有する。上記比較器１３１及び１３３の出力信号がオアゲート１３４に入力され、このオアゲート１３４からの出力信号がアップ／ダウンカウンタ１３５のスタート端子（Ｓ）及びリセット端子（Ｒ）に入力すると共にアンドゲート１３６に入力されている。また、前述した徐々上げビットパターン生成部１２５にて生成される徐々上げビットパターンがアップ／ダウンカウンタ１３５の計数端子（Ｃ）に入力されている。

アップ／ダウンカウンタ１３５は、オアゲート１３４からの出力信号がハイレベルに立ち上がると、リセットされてスタートし、その出力信号をハイレベルに立ち上げる。このアップ／ダウンカウンタ１３５は、徐々上げビットパターンの電力増加を表すビット（例えば、「１」）が入力されると＋１だけアップカウントし、電力減少を表すビット（例えば、「０」）が入力されると－１だけダウンカウントする。そして、その計数値が所定値Ｎに達するとアップ／ダウンカウンタ１３５は、その出力信号をローレベルに立ち下げる。このアップ／ダウンカウンタ１３５の出力信号は上記オアゲート１３４の出力と共にアンドゲート１３６に入力される。このアンドゲート１３６の出力がＳＩＲ監視部１２４の出力となる。

上記徐々上げビットパターンの各ビットの値に応じてアップカウント及びダウンカウントを行うアップ／ダウンカウンタ１３５でのカウント値は、その徐々上げビットパターンにて制御される送信電力の上昇量に対応する。このアップ／ダウンカウンタ１３５に設定される上記所定値Ｎは、徐々上げビットパターンにて制御される送信電力の上昇量の上限に対応したものとなる。

上記のような構成となる移動局１００では、例えば、図１３に示すような送信電力制御（上り回線送信電力制御）がなされる。

図１３において、受信ＳＩＲが目標ＳＩＲを挟む比較的狭い範囲を推移している状態（時刻ｔ１ までの期間）では、受信ＳＩＲは第一の閾値Th_A以上の値となり、目標ＳＩＲと受信ＳＩＲとの差を表すＳＩＲ差分値Δ_{SIR}は第二の閾値Th_Bより小さい値となる。従って、ＳＩＲ監視部１２４における比較器１３１及び１３３の出力は共にローレベルとなって、このＳＩＲ監視部１２４から出力さ

れる制御信号は第一の状態（ローレベル）となる。この制御信号により、スイッチ２６は送信電力制御ビット抽出部１１９を送信電力制御部１２３に接続する状態となり、この送信電力制御ビット抽出部１１９にて抽出される基地局２００からの送信電力制御ビット（…１１１００００１１１１０００）に基づいて送信電力制御部１２３が無線送信部１２２の送信電力制御を行う。この状態は、正常な状態であり、移動局１００での送信電力制御は、基地局２００での受信ＳＩＲが目標ＳＩＲに近づくようになされる。

ここで、何らかの原因で、基地局２００からの受信信号の品質が低下して受信ＳＩＲが低下する（時刻ｔ1 から時刻ｔ2 までの間）。この状態では、受信ＳＩＲと目標ＳＩＲとの関係に基づいて、送信電力制御ビット決定部１１８は、基地局２００の送信電力を上昇させるための送信電力制御ビットを生成し、その送信電力制御ビットが移動局１００から基地局２００に送信されている。それにも係わらず、基地局２００からの受信信号の品質が低下して受信ＳＩＲが第一の閾値Th_Aより小さくなると（時刻ｔ2）、ＳＩＲ監視部１２４における比較器１３１の出力がハイレベルとなり、それに伴って、アップ／ダウンカウンタ１３５が起動され、アップ／ダウンカウンタ１３５の出力信号がハイレベルとなる。その結果、アンドゲート１３６、即ち、ＳＩＲ監視部１２４から第二の状態（ハイレベル）となる制御信号が出力される。

このようにＳＩＲ監視部１２４から出力される制御信号が第二の状態となると、徐々上げビットパターン生成部１２５が起動されると共に、スイッチ１２６がこの徐々上げビットパターン生成部１２５を送信電力制御部１２３に接続する状態に切換わる。それにより、送信電力制御部１２３は、徐々上げビットパターン生成部１２５からの徐々上げビットパターンに基づいて無線送信部１２２の送信電力制御を行う。

上記徐々上げビットパターンが、例えば、（１１１０１１１０１１１）となる場合、所定周期で３回の所定量（例えば、１dB）増加と１回の所定量減少とが交互になされることによって、送信電力は徐々に上昇する。その過程で、移動局１００から送信される送信電力制御ビットの基地局２００での受信品質が改善されると、基地局２００では、移動局１００にて生成された送信電力制御ビットに

基づいた正常な送信電力制御を行うようになる。

このように移動局１００において、基地局２００からの送信電力制御ビットに係わらず、徐々上げビットパターンに基づいた送信電力の自律的な制御がなされることにより、移動局１００のＳＩＲ測定部１１５で測定される受信ＳＩＲが、図１３の点線で示すように更に低下する異常な挙動を示すことなく、徐々に上昇し、時刻ｔ３ で上記第一の閾値Th_A以上になると、ＳＩＲ監視部１２４における比較器１３１の出力がローレベルに立ち下がる。それにより、ＳＩＲ監視部１２４からの制御信号が第一の状態（ローレベル）に切換わる。すると、スイッチ１２６が送信電力制御ビット抽出部１１９を送信電力制御部１２３に接続する状態に切換わり、送信電力制御部１２３は、上述した正常時と同様に、送信電力制御ビット抽出部１１９にて抽出された基地局２００から送信される送信電力制御ビット（００１１１０００１１…）に基づいて無線送信部１２２の送信電力制御を行う。

移動局１００では、目標ＳＩＲが受信される情報の品質（FER）に基づいて制御されている（アウターループ制御）。このため、受信ＳＩＲの絶対値だけを監視していても、必ずしもその受信ＳＩＲの異常を検出することができない。このため、この例では、更に、目標ＳＩＲから受信ＳＩＲを減算して得られるＳＩＲ差分値Δ_{SIR}と第二の閾値Th_Bと比較し、その比較結果に基づいて、送信電力制御を行っている。

即ち、受信ＳＩＲが第一の閾値Th_A以上となる状態であっても、ＳＩＲ差分値Δ_{SIR}が第二の閾値Th_B以上になると、ＳＩＲ監視部１２４の比較器１３２の出力がハイレベルとなり、前述したのと同様に、ＳＩＲ監視部１２４から第二の状態（ハイレベル）となる制御信号が出力される。この第二の状態となる制御信号により、上述したのと同様に、徐々上げビットパターンに基づいた送信電力の自律的な制御がなされる。

また、上記のように徐々上げビットパターンに基づいた送信電力の自律的な制御がなされている過程で、受信ＳＩＲがなかなか改善されない場合、当該受信ＳＩＲが第一の閾値Th_A以上となる前にＳＩＲ監視部１２４におけるアップ／ダウンカウンタ１３５の計数値が所定値Ｎに達してしまう。即ち、送信電力の上昇

量が上限に達してしまう。すると、アップ／ダウンカウンタ１３５からの出力信号がローレベルに立下り、ＳＩＲ監視部１２４からの制御信号が第一の状態に切換わる。これにより、上記のような徐々上げビットパターンに基づいた送信電力の自律的な制御が中断され、基地局２００からの送信電力制御ビットに基づいた通常の送信電力制御が行なわれるようになる。

このように、徐々上げビットパターンの各ビットの値に応じてアップカウント及びダウンカウントを行うアップ／ダウンカウンタ１３５の計数値が所定値Ｎに達したときに、その徐々上げビットパターンに基づいた送信電力の自律的な制御を中断することにより、受信ＳＩＲの改善の見込みがない状態での無駄な送信電力の上昇を防止することができる。

上述したような移動局１００での送信電力制御によれば、受信ＳＩＲに基づいて生成される送信電力制御ビットを基地局２００に送信していいるにも係わらず、その受信ＳＩＲの改善がなされない場合に、移動局１００での送信電力を徐々に上昇させるようにしているので、基地局２００にて受信される送信電力制御ビットの品質を改善することができるようになる。その基地局２００での受信送信電力制御ビットの品質の改善により、基地局２００での送信電力制御が正常に行なわれるようになり、移動局１００にて測定される受信ＳＩＲが連続して所定の品質（目標ＳＩＲ）より低下することが防止されるようになる。

上述した第一の閾値Th_A及び第二の閾値TH_Bは、移動通信システムにおける実際の通信状況等に基づいて実験的に求められた適当な値に設定される。また、アップ／ダウンカウンタ１３５に設定される送信電力の上昇量の上限に対応した所定値Ｎは、受信ＳＩＲの改善特性や無駄のない電力制御などの兼ね合いなどに基づいて定められる。

なお、上記例では、受信ＳＩＲと第一の閾値Th_Aとの比較結果及びＳＩＲ差分値Δ_{SIR}と第二の閾値Th_Bとの比較結果に基づいて受信ＳＩＲが正常であるか否かを判定しているが、いずれか一方の比較結果に基づいて受信ＳＩＲが正常か否かを判定することもできる。特に、目標ＳＩＲを固定値として送信電力制御を行う場合、上記両比較結果のいずれか一方に基づいて受信ＳＩＲの正常性を判定すればよい。

閾値を用いて受信ＳＩＲの正常性を判定する手法は、上述した例に限られず、正常から異常に移行する際の閾値と、異常から正常に復帰する際の閾値を別にすることもできる。また、閾値で区別される状態（正常状態または異常状態）が所定時間継続したときに、その状態であることの最終判定を行うようにしてもよい。更に、閾値を用いた他の一般的な判定手法を用いることができる。

上記の例では、徐々上げビットパターンにより、電力増加及び電力減少を組み合わせて送信電力が徐々に上昇するようにしているが、電力増加と電力を維持するという制御状態を用いて、送信電力を徐々に上昇させることもできる。

上記例では、受信ＳＩＲが改善されるまで送信電力を徐々に上昇させるようにしているが、受信ＳＩＲが異常であると判定されたときに、送信電力を所定量だけ一気に上昇させ、その状態を維持して受信ＳＩＲが所定時間内に改善されるか否かを判定することもできる。この場合、その所定時間内に受信ＳＩＲがある状態まで改善された場合は、通常の送信電力制御に戻す。なお、この場合、受信ＳＩＲが改善されないまま比較的高い送信電力値を維持することによる無駄な制御が行なわれることを防止するという観点から、受信ＳＩＲがある状態まで改善されないまま上記所定時間が経過した場合には、通常の送信電力制御に戻すこともできる。

また、上記例では、徐々上げビットパターンに基づいた送信電力の自律的な制御を行っている過程で、その上昇量が上限に達したとき（アップ／ダウンカウンタ１３５の計数値が所定値Ｎに達したとき）に送信電力制御ビットに基づいた通常の送信電力制御に戻すようにしているが、その時点での送信電力値に固定するようにすることもできる。

上記ＳＩＲ監視部１２４にて用いられる受信ＳＩＲは、上記例では、例えば、各スロット毎に測定される値を用いたが、複数スロットに渡って平均化した値を用いることもできる。

また、移動局１００がソフトハンドオーバにより複数の基地局と無線接続される場合、各基地局から受信信号を合成した合成受信信号に対する受信ＳＩＲに基づいて上述した送信電力制御を行うことができる。

上述した送信電力制御は移動局１００でなされるようにしたが、基地局１００

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でなされるようにしてもよい。

上記例において、ＳＩＲ監視部１２４は、品質判定手順（手段）に対応し、徐々上げビットパターン生成部１２５及びスイッチ１２６は、自律制御手順（手段）に対応する。

図１２に示す比較器１３１は、第一の閾値判定手順（手段）に対応し、減算器１３２は差分値演算手順（手段）に対応し、比較器１３３は、第二の閾値判定手順（手段）に対応する。

徐々上げビットパターン生成部１２５は、自律送信電力制御情報を生成する手順（手段）に対応し、スイッチ１２６は、制御切換え手順（手段）に対応する。また、図１２に示すアップ／ダウンカウンタ１３５は、判定手順（手段）に対応し、アンドゲート１３６は、自律制御停止手順（手段）に対応する。

次に、請求の範囲３９～５８の実施例について説明する。

（請求の範囲３９～５８の実施例）

以下、本発明の実施の形態を図面に基づいて説明する。

本発明の実施の一形態に係る送信電力制御方法が適用される移動通信システムは、前述した移動通信システムと同様、図１０に示すように構成される。

図１０において、移動局１００と基地局２００とが、ＣＤＭＡ方式に従って信号（パケット、制御信号、音声信号など）の送受信を行う。移動局１００は、送受信装置１１０、信号処理部１５０及びユーザインタフェース１６０を有する。また、基地局２００は、送受信装置２１０及び信号処理部２２０を有する。

移動局１００のユーザインタフェース１６０にてユーザから入力された情報（音声、文書、画像等）は、信号処理部１５０にて所定の形式の信号となるように処理される。信号処理部１５０からの信号は、送受信装置１１０に供給され、符号化処理、変調処理等の所定の処理が施される。そして、その処理により得られた信号が送受信装置１１０から基地局２００に送信される。

移動局１００からの信号を受信した基地局２００の送受信装置２１０は、その受信信号に対して復調処理、復号処理等の所定の処理を施す。そして、送受信装置２１０にて生成された信号が信号処理部２２０にてネットワーク上を伝送可能な形式に変換され、その信号が信号処理部２２０からネットワークを介して通信

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相手の端末に送信される。

基地局２００において、ネットワークから供給される信号は、信号処理部２２０にて所定の形式となるように処理される。この信号処理部２２０からの信号は、送受信装置２１０に供給され、符号化処理、変調処理等の所定の処理が施される。その処理により得られた信号が送受信装置２１０から移動局１００に送信される。

基地局２００からの信号を受信した移動局１００の送受信装置１１０は、その受信信号に対して復調処理、復号処理等の所定の処理を施す。そして、送受信装置１１０で生成された信号が信号処理部１５０にてユーザインタフェース１６０で処理可能な形式に変換され、その信号に基づいてユーザインタフェース１６０からユーザに対して情報（音声、文書（メール）、画像等）の提示がなされる。

移動局１００の送受信装置１１０は、通常、基地局２００から送信される送信電力制御ビット（電力増加または電力減少を表す送信電力制御情報）に基づいて送信電力制御（上り回線送信電力制御）を行う。基地局２００の送受信装置２１０も、移動局１００から送信される送信電力制御ビットに基づいて送信電力制御（下り回線送信電力制御）を行う。

移動局１００の送受信装置１１０は、例えば、図１４に示すように構成される。

図１４において、この送受信装置１１０は、送受分離部１１１を共用した送信系と受信系とを有している。受信系は、無線受信部１１２、誤り訂正復号／誤り検出部１１３、誤り率測定部１１４、ＳＩＲ測定部１１５、ＳＩＲ比較部１１６、目標ＳＩＲ決定部１１７、送信電力制御ビット決定部１１８及び送信電力制御ビット抽出部１１９を有している。

基地局２００から送信される信号が送受分離部１１１を介して無線受信部１１２に供給される。この無線受信部１１２は、送受分離部１１１から供給される受信信号に対して逆拡散処理及び復調処理を施してベースバンド信号を生成する。後述するように、上記受信信号は、基地局２００から送信される情報データに対応したデータ信号と送信電力制御ビットに対応した制御信号とを含んでおり、その制御信号に対する復調処理にて得られたベースバンド信号は、送信電力制御ビ

ット抽出部１１９に供給される。送信電力制御ビット抽出部１１９は、そのベースバンド信号から送信電力制御ビットを復元する。

無線受信部１１２による上記データ信号に対する復調処理にて得られたベースバンド信号は、誤り訂正復号／誤り検出部１１３に供給され、フレーム単位に誤り訂正復号がなされると共に、例えば、CRC（cycle redundancy check）の手法に従って伝送誤りの有無の検出がなされる。その復号結果が情報出力として当該送受信装置１１０から信号処理部１５０（図１０参照）に供給される。この誤り訂正復号／誤り検出部１１３は、更に、フレーム単位毎に上記伝送誤りの有無を表す誤り検出結果を出力する。

誤り率測定部１１４は、上記誤り訂正復号／誤り検出部１１３からの誤り検出結果に基づいて、フレーム誤り率（FER：Frame Error Rate）を受信信号（希望波）から復元した情報の受信品質として演算する。

ＳＩＲ測定部１１５は、無線受信部１１２にて得られた受信信号に基づいて受信ＳＩＲ（希望波対干渉波及び雑音電力比）を演算する。この演算周期は、データのフレーム周期より短い。目標ＳＩＲ決定部１１７は、誤り率測定部１１４から出力される情報の受信品質（FER）が目標品質となるように、目標ＳＩＲを決定する。具体的には、この目標ＳＩＲ決定部１１７は、情報の受信品質が目標品質より低ければ、目標ＳＩＲの値を高くし、情報の受信品質が目標品質より高ければ、目標ＳＩＲの値を低くするような制御（アウターループ制御）を行う。ＳＩＲ比較部１１６は、上記ＳＩＲ測定部１１５からの受信ＳＩＲと目標ＳＩＲ決定部１１７からの目標ＳＩＲとを比較し、その比較結果を出力する。

送信電力制御ビット決定部１１８は、ＳＩＲ比較部１１６からの比較結果に基づいて、基地局２００での送信電力制御に用いられるべき送信電力制御ビットを決定する（インナーループ制御）。受信ＳＩＲが目標ＳＩＲより小さい場合、希望波の受信レベルが低いとして、送信電力制御ビットが送信電力を増加させるべき値（例えば、「１」）に決定される。一方、受信ＳＩＲが目標ＳＩＲより大きい場合、希望波の受信レベルが高いとして、送信電力制御ビットが送信電力を低減させるべき値（例えば、「０」）に決定される。このように値の決定された送信電力制御ビットは、送信電力制御ビット決定部１１８から後述するような送信

系の無線送信部１２２に供給され、基地局２００に伝送される。

上記のような構成の受信系は、更に、同期状態判定部１３０及び閉ループ制御開始タイミング決定部１３５を有している。

移動局１００は、基地局２００に伝送すべきデータを送信するための実質的な上り回線通信を開始する前に、基地局２００との間で所定のフォーマットとなる信号の送受信を行って同期をとるための処理を行う。この同期をとるための処理では、無線受信部１１２は、基地局２００からの信号に基づいて同期引き込みを行い、その同期引き込みにより同期を確立させる。

上記同期状態判定部１３０は、無線受信部１１２での同期引き込みの状態を監視し、同期（上り同期）が確立されたか否かを判定する。この同期が確立されたことが判定されると、同期状態判定部１３０は、同期確立信号を出力する。また、上記閉ループ制御開始タイミング決定部１３５は、タイマ機能を有し、上記同期をとるための処理の過程で、当該送受信装置１１０の送信電力制御を行うために用いられるべき送信電力制御情報を切換えるための切換え制御信号を出力する。なお、この閉ループ制御開始タイミング決定部１３５の機能の詳細は、後述する。

移動局１００の送信系では、前述したように信号処理部１５０（図１０参照）から供給される情報に対して所定の処理、例えば、CRC の手法に従って誤り検出用のパリティビットをフレーム単位に付加する処理、このような処理により得られたフレーム単位のパリティ付きデータの誤り訂正符号化を行う処理等がなされる。このようにして得られた符号化データは、無線送信部１２２に供給される。

無線送信部１２２は、上記のように供給される符号化データに対して変調処理を行ってデータ変調信号を生成する。また、無線送信部１２２は、前述したように送信電力制御ビット決定部１１８から供給される送信電力制御ビットに対して変調処理を行って制御ビット変調信号を生成し、この制御ビット変調信号と上記データ変調信号とを多重化する。そして、所定の拡散コードを用いてその多重化された信号の拡散処理がなされる。無線送信部１２２は、その拡散処理にて得られた信号を、送受分離部１１１を介して送信する。

この移動局１００における送受信装置１１０の送信系は、更に、送信電力制御部１２３、徐々上げビットパターン生成部１２５、スイッチ１２６及び送信開始／停止制御部１２７を有している。

送信電力制御部１２３は、スイッチ１２６を介して供給される送信電力制御ビット抽出部１１９にて抽出された基地局２００からの送信電力制御ビットまたは徐々上げビットパターン生成部１２５にて生成される送信電力制御ビット（以下、徐々上げビットパターンという）に基づいて無線送信部１２２での送信電力を制御する。徐々上げビットパターン生成部１２５にて生成される徐々上げビットパターンは、連続して電力増加を表す送信電力制御ビット（1,1,1,1,…）に基づいて制御される送信電力の変化より緩やかに変化する特性にて送信電力を上昇させるように制御するための送信電力制御ビットとなる。この徐々上げビットパターンは、例えば、電力増加を表す連続した２つのビット「１」と電力減少を表す１つのビット「０」が繰り返し配列されるパターン（1,1,0,1,1,0,1,1,0,…）となる。

前述したように、同期状態判定部１３０から同期確立信号が出力されると、送信開始／停止制御部１２７は、無線送信部１２２に基地局１００での同期処理に必要な所定フォーマットの信号の送信を開始させる。送信開始／停止制御部１２７は、無線送信部１２２に上記所定フォーマットの信号の送信を開始させる際に、送信開始信号①を出力する。閉ループ制御開始タイミング決定部１３５は、送信開始／停止制御部１２７からの送信開始信号①により起動されるタイマを有している。この閉ループ制御開始タイミング決定部１３５は、上記タイマでの計測時間が所定時間に達したか否かを判定し、その計測時間が所定時間に達すると、切換え制御信号を出力する。

当該移動局１００が基地局２００に対する情報データの伝送を開始する前では、スイッチ１２６は、通常、送信電力制御部１２３を徐々上げビットパターン生成部１２５に接続する状態となる。この状態において、電力制御部１２３は、徐々上げビットパターン生成部１２５からの徐々上げビットパターンに基づいて無線送信部１２２の送信電力制御を行う。上記閉ループ制御開始タイミング決定部１３５から切換え制御信号が出力されると、スイッチ１２６は、送信電力制御部１２３を送信電力制御ビット抽出部１１９に接続する状態に切替わる。この状態

において、電力制御部１２３は、送信電力制御ビット抽出部１１９にて抽出される基地局２００からの送信電力制御ビットに基づいて無線送信部１２２の送信電力制御を行う（閉ループ制御）。

なお、基地局２００の送受信装置２１０は、移動局１００の送受信装置１１０と同様に、移動局１００からの受信信号に対する受信ＳＩＲに基づいて送信電力制御ビットを決定し、その送信電力制御ビットを移動局１００に送信する。また、基地局２００の送受信装置２１０は、移動局１００からの送信電力制御ビットに従って送信電力の制御を行う。

上記のような構成の移動通信システムにおいて、基地局２００と移動局１００との間で情報データの伝送が開始される前に、従来のシステムと同様に、基地局２００と移動局１００は、共通制御チャネルを用いて種々の情報の送受信を行い、その後、上記各種の情報に基づいて決められた個別チャネル（拡散符号チャネル）を用いて所定フォーマットとなる信号の送受信を行って、同期をとるための処理を行う。この同期をとるための処理の基本的な手順は、図２１に示すものと同様である。

このような同期をとるための処理の過程で、移動局１００での同期が確立すると（図２１に示す③）、送受信装置１１０の同期状態判定部１３０から出力される同期確立信号に基づいた送信開始／停止制御部１２７の制御により、無線送信部１２２から所定フォーマットの信号の送信が開始される（図２１に示す④）。そして、その信号に対する送信電力制御が、例えば、図１５に示すようになされる。この送信電力制御の開始と同時に、上記同期状態判定部１３０からの送信開始信号①により閉ループ制御開始タイミング決定部１３５のタイマが起動される。

なお、基地局２００は、当初、移動局１００からの送信を受信していない状態で、下り送信を開始しなければならないので（図２１に示す①参照）、例えば、従来のシステムと同様に、連続的に電力増加を表すパターンの送信電力制御ビット（1,1,1,1,…）を送信する。

図１５において、移動局１００での同期が確立して、時刻ｔ１から所定フォーマットの信号が無線送信部１２２から送信される際に、徐々上げビットパターン

生成部１２５からの徐々上げビットパターン（1,1,01,1,0,…）がスイッチ１２６を介して送信電力制御部１２３に供給される。送信電力制御部１２３は、その徐々上げビットパターンに従って、無線送信部１２２の送信電力を、例えば、伝搬損失等に基づいて決められた初期値Ｐ0 から順次上昇させる。この場合、送信電力の上昇特性は、基地局２００からの送信電力制御ビット（1,1,1,1,…）に従った送信電力の変化（二点鎖線参照）より緩やかに変化するものである。

このように送信電力が徐々に上昇されつつ無線送信部１２２から上記所定の信号が送信される過程で、その信号に基づいて基地局２００で同期引き込みがなされ（図２１に示す⑤）、例えば、時刻ｔ21 において基地局２００での同期が確立すると、基地局２００は、上記のような連続的な電力増加を表す送信電力制御ビット（1,1,1,1,…）に代えて、移動局１００からの信号に対する受信ＳＩＲに基づいて決定される送信電力制御ビットの出力を開始する。

上記基地局２００での同期が確立する時刻ｔ21 では、まだ、閉ループ制御開始タイミング決定部１３５は、タイマでの計測時間が所定時間（自律制御期間Ｔs）に達したと判定しないので、電力制御部１２３は、徐々上げビットパターンに従った送信電力制御を継続する。そして、時刻ｔ3 において、閉ループ制御開始タイミング決定部１３５にてタイマでの計測時間が所定時間に達したと判定されると、閉ループ制御開始タイミング決定部１３５から切換え制御信号が出力される。この切換え制御信号により、スイッチ１２６が、送信電力制御部１２３を送信電力制御ビット抽出部１１９に接続する状態に切替わる。以後、当該移動局１００からの信号の受信ＳＩＲに基づいて決定される基地局２００からの送信電力制御ビットに従って無線送信部１２２の送信電力制御（閉ループ制御）がなされる。

このような基地局２００からの送信電力制御ビットに従って無線送信部１２２の送信電力が制御されることにより、上記時刻ｔ3 以後の送信電力は、徐々に低下し、基地局２００での受信ＳＩＲが目標ＳＩＲに維持され得る適正な値に維持されるようになる。このような状態において、所定のタイミングにて、移動局１００の送受信装置１１０は、伝送すべきデータを含めた信号を送信するための実質的な上り回線通信を開始する。

上述したような基地局２００と移動局１００との間で情報データの伝送が開始される前における移動局１００での送信電力制御によれば、移動局１００での同期が確立した後に、当該移動局１００から信号を送信する際に徐々上げビットパターン（1,1,0,1,1,0,…）に従って送信電力の制御がなされるので、送信電力が、従来のシステムのように急激に上昇することが防止される。また、このような徐々上げビットパターンに従った送信電力制御であっても、基地局２００での受信品質（受信ＳＩＲ）が所望の品質（目標ＳＩＲ）に維持できる程度の送信電力値には比較的早期に達するので、基地局２００での同期も比較的早期に確立することができる。

上記閉ループ制御開始タイミング決定部１３５のタイマに設定される所定時間は、上記徐々上げビットに従った送信電力制御がなされつつ移動局１００から送信される信号に基づいて基地局２００で同期の確立に要すると予想される時間に基づいて決められる。通常、その所定時間は、その予想される時間より僅かに長い時間に設定される。しかし、移動局１００と基地局２００との間の伝送路の状態によっては、基地局２００での同期の確立に上記所定時間より長い時間を要してしまう場合がある。

このような場合、図１５に示すように、徐々上げビットパターンに従った送信電力制御から基地局２００からの送信電力制御ビットに従った送信電力に切換えられる時刻ｔ3 から基地局２００での同期が実際に確立される時刻ｔ22 までの間は、基地局２００からの連続して電力増加を表す送信電力制御ビット（1,1,1,1,…）に従って送信電力制御がなされる。この場合、時刻ｔ3 から時刻ｔ22 まで、送信電力は上昇するが、通常は、時刻ｔ3 と時刻ｔ22 との間の時間は僅かであるので、移動局１００で費やされる送信電力の増分も比較的少なくて済む（図１５における点線で示す特性参照）。

一方、時刻ｔ3 から時刻ｔ22 との間の時間が長くなる場合は、基地局１００と移動局２００との間の伝送路の状態が極めて良くない状態である。このような状態では、基地局２００での同期を確立するために、本来、移動局１００の送信電力を十分大きな値に制御しなければならないので、この時刻ｔ3 と時刻ｔ22 の間でなされる連続して電力増加を表す送信電力制御ビットに従った送信電力制

御は、無駄なものではない。

上記閉ループ制御開始タイミング決定部１３５は、例えば、図１６に示す手順に従って送信電力制御を切換えるための切換え制御信号を出力することもできる。この例では、図１４に示すように、閉ループ制御開始タイミング決定部１３５は、上記送信開始／停止制御部１２７からの送信開始信号①と共に、送信電力制御ビット抽出部１１９にて抽出される基地局２００からの送信電力制御ビット②の状態に基づいて送信電力制御の切換えタイミングを決定している。

また、閉ループ制御開始タイミング決定部１３５による図１６に示す手順に従った処理により、移動局２００の無線送信部１２２の送信電力は、例えば、図１７に示すように変化する。

図１６において、上記送信開始信号①に基づいて無線送信部１２２から基地局２００での同期を確立するために用いられる信号の送信の開始（上り送信開始：図２１に示す④参照）が認識されると（Ｓ１）、タイマＴが起動される（Ｓ２）。そして、そのタイマＴでの計測時間が所定時間Ｔ0 に達したか否かが判定される（Ｓ３）。このタイマＴの計測時間が所定時間Ｔ0 に達していない状態（Ｓ３でＮＯ）では、前述した例と同様に、送信電力制御部１２３は、徐々上げビットパターン生成部１２５からの徐々上げビットパターンに従って無線送信部１２２の送信電力を制御する。その結果、無線送信部１２２の送信電力は、上記徐々上げビットパターンに従って比較的緩やかな特性にて徐々に上昇する。

このような状態で、例えば、図１７に示す時刻ｔ2 において、上記タイマＴの計測時間が所定時間Ｔ0 に達すると、カウンタｎがゼロにリセットされ（Ｓ４）、その後、そのカウンタｎが＋１だけインクリメントされる（Ｓ５）。そして、閉ループ制御開始タイミング決定部１３５は、送信電力制御ビット抽出部１１９にて抽出された基地局２００からの単一の送信電力制御ビットの値Ｂｎ（１または０であり、以下、TPC ビット値という）を取得する（Ｓ６）。そして、そのTPC ビット値Ｂｎを用いて、移動平均値Ａｎが

【数１】

$$A_n = \frac{1}{n_0}\{(n_0 - 1)A_{n-1} + B_n\} \qquad \cdots (1)$$

に従って演算される（Ｓ８）。

カウンタ値ｎが所定値ｎ0 に達するまで（Ｓ８参照）、カウンタｎのインクリメント（Ｓ５）、TPC ビット値Ｂn の取得（Ｓ６）、移動平均値An の演算（Ｓ７）が繰り返し実行される。そして、カウンタ値ｎが所定値ｎ0 に達すると（Ｓ８でＹＥＳ）、その時点で得られる移動平均値Ａn は、連続するｎ0 個の TPC ビット値Ｂ1～Ｂn0 の平均値となる。TPC ビット値は、１または０であり、その移動平均値Ａn は、その平均値演算（上記式（１）参照）に供される１となる TPC ビット値の数と０となる TPC ビット値の数の割合を反映させた値となる。

即ち、基地局２００で同期が確立していない状態では、全て「１」となる送信電力制御ビットが基地局２００から出力されるので、その移動平均値Ａn は、理想的には１となる。一方、基地局２００での同期が確立した直後では、移動局２００からの信号の受信品質（受信ＳＩＲ）に基づいて決定される送信電力制御ビットが基地局２００から出力されるので、TPC ビット値Ｂn は０となる割合が高くなり、その移動平均値Ａn は、１より小さくなる。

従って、上記のようにカウンタ値ｎが所定値ｎ0 を超えると、TPC ビット値Ｂn の移動平均値Ａn が基準値α（０＜α＜１）以下であるか否かが判定される（Ｓ９）。そして、その移動平均値Ａn がその基準値α以下となるまで、取得される TPC ビット値Ｂn を用いて移動平均値Ａn が演算される（Ｓ６、Ｓ７）。

そのような処理（Ｓ５、Ｓ６、Ｓ７、Ｓ８、Ｓ９）を繰り返し実行する過程で、例えば、図１７に示す時刻ｔ3 で基地局２００での同期が確立すると、それ以後、基地局２００から０となる送信電力制御ビットが送信される頻度が高くなり

、図１７に示す時刻ｔ４で、その移動平均値Ａｎが基準値α以下になると（Ｓ９でＹＥＳ）、閉ループ制御開始タイミング決定部１３５は、切換え制御信号を出力する（Ｓ１０）。

この切換え制御信号によりスイッチ１２６は、送信電力制御部１２３に送信電力制御ビット抽出部１１９を接続する状態となり、送信電力制御部１２３は、送信電力制御ビット抽出部１１９にて抽出される基地局２００からの送信電力制御ビットに基づいて無線送信部１２２の送信電力制御を行う。従って、図１７に示す時刻ｔ４以降では、無線送信部１２２の送信電力は順次低下し、移動局１００の基地局２００での受信ＳＩＲが目標ＳＩＲに維持できる程度の送信電力値に制御されるようになる。

上記の例では、基地局２００での同期が確立する前には、当該基地局２００から全て「１」となる送信電力制御ビットが送信され、同期が確立した後には、当該基地局２００から移動局１００からの信号の受信品質（受信ＳＩＲ）に基づいて決定された送信電力制御ビット（閉ループ送信電力制御ビット）が送信されることを利用し、閉ループ制御開始タイミング決定部１３５が基地局２００での同期が確立したか否かを判定している。即ち、閉ループ制御開始タイミング決定部１３５は、基地局２００から送信される送信電力制御ビットが、全て「１」となるパターンから「０」と「１」が混在するパターンに変わったことを検出することにより、基地局２００での同期が確立したことを検出する。

また、上記のように基地局２００から１となる送信電力制御ビットの数と０となる送信電力制御ビットの数との割合に基づいて、徐々上げパターンに従った送信電力の終了タイミングを判定するだけでなく、０となる送信電力制御ビットの所定の期間の累計値に基づいて判定することもできる。

なお、図１７において、時刻ｔ２から時刻ｔ４までの時間が、図１６に示すＳ５～Ｓ９の処理を繰り返し実行している期間（監視期間Ｔｗ）となる。この監視期間Ｔｗでは、基地局２００からの送信電力制御ビットが監視されると共に、徐々上げビットパターンに従って無線送信機１２２の送信電力制御が行なわれる。

また、上記基地局２００からの送信電力制御ビットの監視は、移動局１００か

らの信号の送信が開始された時刻ｔ2 から開始することもできる。しかし、上記例では、移動局１００からの信号の送信が開始された時刻ｔ2 から所定時間Ｔ0は、上述したような送信電力制御の監視がなされない。このため、この期間で、送信電力制御ビットの受信誤りがあっても、その誤りビットは上記監視の対象にはならない。送信電力制御ビットのパターンの変化が見込まれる期間だけ当該送信電力ビットの監視を行えばよいので、移動局１００での処理の負担が低減される。

移動局１００の送受信装置１１０は、例えば、図１８に示すように構成することもできる。この例では、移動局１００での同期が確立して当該移動局１００から所定フォーマットの信号を基地局２００に送信する際に、基地局２００から送信される送信電力制御ビットに基づいてこの送信電力制御ビットによる送信電力の変化より緩やかに変化する特性に従って送信電力を制御するための送信電力制御情報（以下、1/N 送信電力制御ビットという）を生成する。そして、その 1/N 送信電力制御ビットに従って移動局１００の送信電力を制御するようにしている。なお、図１８において、図１４と同様の部位には同じ参照番号が付されている。

図１８において、この送受信装置１１０は、前述した例と同様に、送受分離部１１１を共用する受信系及び送信系を有する。当該受信系は、前述した例と同様に、無線受信部１１２、誤り訂正復号／誤り検出部１１３、誤り率測定部１１４、ＳＩＲ測定部１１５、ＳＩＲ比較部１１６、目標ＳＩＲ決定部１１７、送信電力制御ビット決定部１１８、送信電力制御ビット抽出部１１９及び同期状態判定部１３０を有している。また、上記送信系は、前述した例と同様に、無線送信部１２２及び送信開始／停止制御部１２７を有している。

送信系は、更に、送信電力制御部１２３ａ、1/N 送信電力制御部１２３ｂ、制御切換えスイッチ１２８を有している。制御切換えスイッチ１２８は、所定の制御部（図示略）からの切換え制御信号によって、無線送信部１２２を 1/N 送信電力制御部１２３ｂに接続する状態から、無線送信部１２２を送信電力制御部１２３ａに接続する状態に切替わる。送信電力制御部１２３ａは、送信電力制御ビット抽出部１１９にて抽出される基地局２００からの送信電力制御ビットがスイ

ッチ１２８を介して供給されると、その送信電力制御ビットに基づいて無線送信部１２２の電力制御を行う。各送信電力制御ビットは、１スロットに割当てられており、送信電力制御部１２３ａは、その送信電力制御ビットに従って、無線送信部１２２の送信電力をスロット毎に更新する。

1/N 送信電力制御部１２３ｂは、送信電力制御ビット抽出部１１９にて抽出される基地局２００からの送信電力制御ビットをＮビット（例えば、３ビット）ずつ走査し、その中で最も多い値となる代表ビット（以下、1/N 送信電力制御ビットという）を決める。そして、1/N 送信電力制御部１２３ｂは、その 1/N 送信電力制御ビットに従ってＮスロット毎に無線送信部の送信電力を更新する。

例えば、図１９に示すように、移動局１００での同期が確立し、無線送信部１２２から所定フォーマットの信号の送信が時刻ｔ1 で開始されると、1/N 送信電力制御部１２３ｂが、送信電力制御ビットから生成される 1/N 送信電力制御ビットに基づいて無線送信部１２２の送信電力を初期値から、３スロット（Ｎ＝３）毎に更新する。

例えば、図１９に示すように、送信電力制御ビットが、

１１１１１１０１１１１０１１１１０００００００１１１００１１

となる場合、

1/N 送信電力制御ビットは、

・１・・１・・１・・１・・１・・１・・０・・０・・０・・１・・１…

となる。

このような 1/N 送信電力制御ビットに基づいて３スロット毎に更新されるように制御される送信電力は、元の送信電力制御ビットに基づいて各スロット毎に更新されるように制御される送信電力より緩やかに変化する（図１９における点線の特性、及び実線の特性参照）。従って、無駄な電力消費を行うことなく、基地局２００での同期を確立させることができるようになる。

このように送信電力制御がなされつつ移動局１００から送信される信号に基づいて、例えば、図１９に示す時刻ｔ2 において、基地局２００での同期が確立すると、以後、基地局２００は、移動局１００からの信号の受信品質（受信ＳＩＲ）に基づいて決められる送信電力制御ビットを送信する。

移動局１００では、1/N 送信電力制御部１２３ｂが、送信電力制御ビット抽出部１１９にて抽出される上記送信電力制御ビットから前述した手法に従って 1/N 送信電力制御ビットを決定し、その 1/N 送信電力制御ビットに基づいて上記と同様の送信電力制御を継続する。そして、予め定めた所定のタイミングになると（図１９における時刻ｔ3)、所定の制御部からの切換え制御信号により、制御切換えスイッチ１２８は、無線送信部１２２を送信電力制御部１２３ａに接続する状態に切替わる。

それにより、送信電力制御部１２３ａは、送信電力制御ビット抽出部１１９にて抽出される基地局２００からの送信電力制御ビットに基づいて無線送信部１２２の送信電力をスロット毎に更新する。

基地局２００での同期が確立した後（時刻ｔ2 以後)、移動局１００からの信号の基地局２００での受信品質（受信ＳＩＲ）が安定してくると、その受信信号品質と目標品質との差に基づいて決定される送信電力制御ビットに従った送信電力制御後の送信電力の変動幅は比較的小さいものとなる。このような状態では、基地局２００からの送信電力制御ビットに基づいて各スロット毎に更新される送信電力の変動と、1/N 送信電力制御ビットに基づいて３スロット毎に更新される送信電力の変動との差は大きくならない(図１９における時刻ｔ2 以降の実線及び破線の変動参照)。従って、上記 1/N 送信電力制御ビットに基づいた送信電力制御から元の送信電力制御ビットに基づいた送信電力制御への切換えタイミング（時刻ｔ3）は、比較的ラフに、かつ遅目に設定することができる。

上記例では、送信電力制御ビットをＮビットずつ走査して、その中で最も多い値となるビットを 1/N 送信電力制御ビットとして決めているが、そのＮビット毎の平均値等に基づいて決めることもできる。

上記各例において、徐々上げビットパターンに従った送信電力制御は、自律制御手順（手段）に対応し、閉ループ制御開始タイミング決定部１３５は、自律制御停止条件判定手順（手段）に対応し、スイッチ１２６は、制御切換え手順（手段）に対応する。

また、図１８に示す 1/N 送信電力制御部１２３ｂは、緩特性送信電力制御手順（手段）に対応し、図１８に示す切換え制御信号を出力する所定の制御部は、

緩特性送信電力制御停止判定手順（手段）に対応し、図１８に示す制御切換えスイッチ１２８は、制御切換え手順（手段）に対応する。

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請 求 の 範 囲

１． 移動通信システムにおいて移動局と無線接続される複数の基地局のそれぞれが受信信号品質に基づいて決定した送信電力制御情報を移動局に送信した際に移動局にて得られる各基地局からの送信電力制御情報に基づいて移動局の送信電力を制御する送信電力制御装置において、

各基地局から固定的な送信電力にて送信される所定の信号に基づいて移動局と各基地局との間の電波伝送路での伝搬損失を演算する伝搬損失演算手段と、

移動局にて得られる各基地局からの送信電力制御情報と、上記伝搬損失演算手段にて演算された各基地局と移動局との間の電波伝送路の伝搬損失とに基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定する送信電力制御情報決定手段とを有する送信電力制御装置。

２．請求項１記載の送信電力制御装置において、

上記送信電力制御情報決定手段は、移動局との間の電波伝送路の伝搬損失がより小さい基地局からの送信電力制御情報に対する重みがより大きくなるように、移動局にて得られる各基地局からの送信電力制御情報に対して重み付けを行って重み補正制御情報を生成する重み補正手段と、

該重み補正手段にて得られた各基地局からの送信電力制御情報に対応した該重み補正制御情報を合成して合成送信電力制御情報を生成する合成手段とを有し、

該合成手段にて得られた合成送信電力制御情報に基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定するようにした送信電力制御装置。

３．請求項２記載の送信電力制御装置において、

上記各基地局から送信される送信電力制御情報は、電力増加の制御状態を表す第一の値及び電力減少の制御状態を表す第二の値を取り得る情報であると共に、移動局が各基地局からの送信電力制御情報を軟判定値として取得し、

上記送信電力制御情報決定手段は、上記合成手段にて得られた合成送信電力制御情報の値を所定の閾値を用いて硬判定する硬判定手段を有し、その硬判定結果

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に基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定するようにした送信電力制御装置。

４．請求項３記載の送信電力制御装置において、

上記硬判定手段にて用いられる上記所定の閾値は、各基地局から送信される送信電力制御情報が取り得る第一の値と第二の値との中間値より所定量だけ第一の値寄りの値となる送信電力制御装置。

５．請求項２記載の送信電力制御装置において、

上記各基地局から送信される送信電力制御情報は、電力増加の制御状態を表す第一の値及び電力減少の制御状態を表す第二の値を取り得る情報であると共に、移動局が各基地局からの送信電力制御情報を軟判定値として取得し、

上記送信電力制御情報決定手段は、上記合成手段にて得られた合成送信電力情報の値を第一の閾値を用いて硬判定する第一の硬判定手段と、

上記合成送信電力制御情報の値を上記第一の閾値と異なる第二の閾値を用いて硬判定する第二の硬判定手段と、

上記第一の硬判定手段での判定結果及び上記第二の硬判定手段での判定結果に基づいて、電力増加の制御状態を表す第一の制御情報、電力減少の制御状態を表す第二の制御情報及び電力維持の制御状態を表す第三の制御情報のいずれかを生成する制御情報生成手段とを有し、

該制御情報生成手段にて生成された制御情報を移動局の送信電力制御に用いられるべき送信電力制御情報として決定するようにした送信電力制御装置。

６．請求項１記載の送信電力制御装置において、

上記送信電力制御情報決定手段は、移動局にて得られる各基地局からの送信電力制御情報から、上記伝搬損失演算手段にて演算された移動局との間の電波伝送路の伝搬損失が最小となる基地局からの送信電力制御情報を選択する選択手段を有し、

該選択手段にて選択された送信電力制御情報に基づいて移動局の送信電力制御

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に用いられるべき送信電力制御情報を決定するようにした送信電力制御装置。

７．請求項６記載の送信電力制御装置において、

上記各基地局から送信される送信電力制御情報は、電力増加の制御状態を表す第一の値及び電力減少の制御状態の第二の値を取り得る情報であると共に、移動局が各基地局からの送信電力制御情報を上記値の軟判定値として取得し、

上記送信電力制御情報決定手段は、上記選択手段にて選択された送信電力制御情報の値を所定の閾値を用いて硬判定する硬判定手段を有し、その硬判定結果に基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定するようにした送信電力制御装置。

８．請求項７記載の送信電力制御装置において、

上記硬判定手段にて用いられる上記所定の閾値は、各基地局から送信される送信電力制御情報が取り得る第一の値と第二の値との中間値より所定量だけ第一の値寄りの値となる送信電力制御装置。

９．請求項６記載の送信電力制御装置において、

上記各基地局から送信される送信電力制御情報は、電力増加の制御状態を表す第一の値及び電力減少の制御状態を表す第二の値を取り得る情報であると共に、移動局が各基地局からの送信電力制御情報を軟判定値として取得し、

上記送信電力制御情報決定手段は、上記選択手段にて選択された送信電力情報の値を第一の閾値を用いて硬判定する第一の硬判定手段と、

上記選択された送信電力制御情報の値を上記第一の閾値と異なる第二の閾値を用いて硬判定する第二の硬判定手段と、

上記第一の硬判定手段での判定結果及び上記第二の硬判定手段での判定結果に基づいて、電力増加の制御状態を表す第一の制御情報、電力減少の制御状態を表す第二の制御情報及び電力維持の制御状態を表す第三の制御情報のいずれかを生成する制御情報生成手段とを有し、

該制御情報生成手段にて生成された制御情報を移動局の送信電力制御に用いら

れるべき送信電力制御情報として決定する送信電力制御装置。

１０．請求項１記載の送信電力制御装置において、

上記送信電力制御情報決定手段は、移動局との間の電波伝送路の伝搬損失がより小さい基地局からの送信電力制御情報に対する重みがより大きくなるように、移動局にて得られる各基地局からの送信電力制御情報に対して重み付けを行って重み補正制御情報を生成する重み補正手段と、

重み補正手段にて得られた各基地局からの送信電力制御情報に対応した該重み補正制御情報のうちから電力減少の制御状態を表す送信電力制御情報により近い補正情報が優先されるように決められた重み補正制御情報に基づいて制御情報を生成する制御情報生成手段とを有し、

該制御情報生成手段にて生成された制御情報を移動局の送信電力制御に用いられるべき送信電力制御情報として決定するようにした送信電力制御装置。

１１．請求項１０記載の送信電力制御装置において、

上記各基地局から送信される送信電力制御情報は、電力増加の制御状態を表す第一の値及び電力減少の制御状態を表す第二の値を取り得る情報であると共に、移動局が各基地局からの送信電力制御情報を軟判定値として取得し、

上記制御情報生成手段は、上記重み補正手段にて得られた各基地局からの送信電力制御情報に対応した該重み補正制御情報の値を所定の閾値を用いて硬判定する硬判定手段と、

各基地局からの送信電力制御情報に対応した硬判定結果のいずれかを電力減少の制御状態を表す硬判定結果が優先されるように選択する選択手段とを有し、該選択手段にて選択された硬判定結果に基づいて制御情報を生成するようにした送信電力制御装置。

１２．請求項１記載の送信電力制御装置において、

上記送信電力制御決定手段は、上記伝搬損失演算手段にて演算された各伝搬損失が所定の伝搬損失より小さいか否かを判定する伝搬損失判定手段と、

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該伝搬損失判定手段にて上記所定の伝搬損失より小さいと判定された伝搬損失が１つである場合、その判定された伝搬損失に対応した基地局からの送信電力制御情報に基づいて制御情報を生成し、上記伝搬損失判定手段にて上記所定の伝搬損失より小さいと判定された伝搬損失が複数となる場合、その複数の伝搬損失に対応した各基地局からの送信電力制御情報のうちから電力減少の制御状態を表す送信電力制御情報により近い送信電力制御情報が優先されるように決められた送信電力制御情報に基づいて制御情報を生成し、更に、上記伝搬損失判定手段にて全ての伝搬損失が上記所定の伝搬損失より小さくないと判定された場合、各基地局からの送信電力制御情報のうちから電力減少の制御状態を表す送信電力制御情報により近い送信電力制御情報が優先されるように決められた送信電力制御情報に基づいて制御情報を生成する制御情報生成手段とを有し、

該制御情報生成手段にて生成された制御情報を移動局の送信電力制御に用いられるべき送信電力制御情報として決定するようにした送信電力制御装置。

１３．移動通信システムにおいて移動局と無線接続される複数の基地局のそれぞれが受信信号品質に基づいて決定した送信電力制御情報を移動局に送信した際に移動局にて得られる各基地局からの送信電力制御情報に基づいて移動局の送信電力を制御する送信電力制御装置において、

各基地局から固定的な送信電力にて送信される所定の信号に基づいて移動局と各基地局との間の電波伝送路での伝搬損失を演算する伝搬損失演算手段と、

移動局でのフェージングの状態を測定するフェージング測定手段と、

該フェージング測定手段にて測定された移動局でのフェージングの状態が所定の状態より良好であるか否かを判定するフェージング状態判定手段と、

該フェージング状態判定手段にて移動局でのフェージングの状態が所定の状態より良好であると判定されたときに第一の送信電力制御情報決定手段を有効にし、該フェージング状態判定手段にて移動局でのフェージングの状態が所定の状態より良好でないと判定されたときに第二の送信電力制御情報決定手段を有効にする切換え制御手段とを有し、

上記第一の送信電力制御情報決定手段は、移動局との間の電波伝送路の伝搬損

失がより小さい基地局からの送信電力制御情報に対する重みがより大きくなるように、移動局にて得られる各基地局からの送信電力制御情報に対して重み付けを行って重み補正制御情報を生成する重み補正手段と、

該重み補正手段にて得られた各基地局からの送信電力制御情報に対応した該重み補正制御情報を合成して合成送信電力制御情報を生成する合成手段とを有し、

該合成手段にて得られた合成送信電力制御情報に基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定するようにし、

上記第二の送信電力制御情報決定手段は、移動局にて得られる各基地局からの送信電力制御情報から、上記伝搬損失演算手段にて演算された移動局との間の電波伝送路の伝搬損失が最小となる基地局からの送信電力制御情報を選択する選択手段を有し、

該選択手段にて選択された送信電力制御情報に基づいて移動局での送信電力制御に用いられるべき送信電力制御情報を決定するようにした送信電力制御装置。

１４．移動通信システムにおいて移動局と無線接続される複数の基地局のそれぞれが受信信号品質に基づいて決定した送信電力制御情報を移動局に送信した際に移動局にて得られる各基地局からの送信電力制御情報に基づいて移動局の送信電力を制御する送信電力制御装置において、

各基地局から固定的な送信電力にて送信される所定の信号に基づいて移動局が無線接続すべき基地局を決定するために用いられる移動局と各基地局との間の伝送路品質を測定する伝送路品質測定手段と、

移動局にて得られる各基地局からの送信電力制御情報と、上記伝送路品質測定手段にて得られた移動局と各基地局との間の伝送路品質とに基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定する送信電力制御情報決定手段とを有する送信電力制御装置。

１５．移動通信システムにおいて移動局と無線接続される複数の基地局のそれぞれが受信信号品質に基づいて決定した電力増加の制御状態を表す第一の値及び電力減少の制御状態を表す第二の値を取り得る情報となる送信電力制御情報を移動

局に送信した際に移動局にて得られる各基地局からの送信電力制御情報の軟判定値に基づいて移動局の送信電力を制御する送信電力制御装置において、

各基地局から固定的な送信電力にて送信される所定の信号に基づいて移動局と各基地局との間の伝送路品質を測定する伝送路品質測定手段と、

移動局にて得られる各基地局からの送信電力制御情報の軟判定値と、上記伝送路品質測定手段にて測定された各基地局と移動局との間の伝送路品質に基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定する送信電力制御情報決定手段とを有し、

該送信電力制御手段は、移動局との間の伝送路品質がより良好な基地局からの送信電力制御情報に対する重みがより大きくなるように、移動局にて得られる各基地局からの送信電力制御情報の軟判定値に対して重み付けを行って重み補正制御情報を生成する重み補正手段と、

該重み補正手段にて得られた各基地局からの送信電力制御情報に対応した該重み補正制御情報を合成して合成送信電力制御情報を生成する合成手段と、

該合成手段にて得られた合成送信電力制御情報の値を、各基地局から送信される送信電力制御情報が取り得る第一の値と第二の値との中間値より所定量だけ第一の値寄りの値となる閾値を用いて硬判定する硬判定手段とを有し、

その硬判定結果に基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定するようにした送信電力制御装置。

１６．移動通信システムにおいて移動局と無線接続される複数の基地局のそれぞれが受信信号品質に基づいて決定した電力増加の制御状態を表す第一の値及び電力減少の制御状態を表す第二の値を取り得る情報となる送信電力制御情報を移動局に送信した際に移動局にて得られる各基地局からの送信電力制御情報の軟判定値に基づいて移動局の送信電力を制御する送信電力制御装置において、

各基地局から固定的な送信電力にて送信される所定の信号に基づいて移動局と各基地局との間の伝送路品質を測定する伝送路品質測定手段と、

移動局にて得られる各基地局からの送信電力制御情報の軟判定値と、上記伝送路品質測定手段にて測定された各基地局と移動局との間の伝送路品質に基づいて

移動局の送信電力制御に用いられるべき送信電力制御情報を決定する送信電力制御情報決定手段とを有し、

該送信電力制御手段は、移動局との間の伝送路品質がより良好な基地局からの送信電力制御情報に対する重みがより大きくなるように、移動局にて得られる各基地局からの送信電力制御情報の軟判定値に対して重み付けを行って重み補正制御情報を生成する重み補正手段と、

該重み補正手段にて得られた各基地局からの送信電力制御情報に対応した該重み補正制御情報を合成して合成送信電力制御情報を生成する合成手段と、

該合成手段にて得られた合成送信電力制御情報の値を第一の閾値を用いて硬判定する第一の硬判定手段と、

上記合成送信制御情報の値を上記第一の閾値と異なる第二の閾値を用いて硬判定する第二の硬判定手段と、

上記第一の硬判定手段での判定結果及び第二の硬判定手段での判定手段に基づいて、電力増加の制御情報を表す第一の制御情報、電力減少の制御状態を表す第二の制御情報及び電力維持の制御状態を表す第三の制御情報のいずれかを生成する制御情報生成手段とを有し、

該制御情報生成手段にて生成された制御情報を移動局の送信電力制御に用いられるべき送信電力制御情報として決定するようにした送信電力制御装置。

１７．移動通信システムにおいて移動局と無線接続される複数の基地局のそれぞれが受信信号品質に基づいて決定した送信電力制御情報を移動局に送信した際に移動局にて得られる各基地局からの送信電力制御情報に基づいて移動局の送信電力を制御する送信電力制御装置において、

各基地局から固定的な送信電力にて送信される所定の信号に基づいて移動局と各基地局との間の伝送路品質を測定する伝送路品質測定手段と、

移動局でのフェージングの状態を測定するフェージング測定手段と、

該フェージング測定手段にて測定された移動局でのフェージングの状態が所定の状態より良好であるか否かを判定するフェージング状態判定手段と、

該フェージング状態判定手段にて移動局でのフェージングの状態が所定の状態

より良好であると判定されたときに第一の送信電力制御情報決定手段を有効にし、該フェージング状態判定手段にて移動局でのフェージングの状態が所定の状態より良好でないと判定されたときに第二の送信電力制御情報決定手段を有効にする切換え制御手段とを有し、

上記第一の送信電力制御情報決定手段は、移動局との間の伝送路品質がより良好な基地局からの送信電力制御情報に対する重みがより大きくなるように、移動局にて得られる各基地局からの送信電力制御情報に対して重み付けを行って重み補正制御情報を生成する重み補正手段と、

該重み補正手段にて得られた各基地局からの送信電力制御情報に対応した該重み補正制御情報を合成して合成送信電力制御情報を生成する合成手段とを有し、

該合成手段にて得られた合成送信電力制御情報に基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定するようにし、

上記第二の送信電力制御情報決定手段は、移動局にて得られる各基地局からの送信電力制御情報から、上記伝送路品質測定手段にて測定された移動局との間の伝送路品質が最良となる基地局からの送信電力制御情報を選択する選択手段を有し、

該選択手段にて選択された送信電力制御情報に基づいて移動局での送信電力制御に用いられるべき送信電力制御情報を決定するようにした送信電力制御装置。

１８．移動通信システムにおいて移動局と無線接続される複数の基地局のそれぞれが受信信号品質に基づいて決定した送信電力制御情報を移動局に送信した際に移動局にて得られる各基地局からの送信電力制御情報に基づいて移動局の送信電力を制御する送信電力制御方法において、

各基地局から固定的な送信電力にて送信される所定の信号に基づいて移動局と各基地局との間の電波伝送路での伝搬損失を演算する伝搬損失演算手順と、

移動局にて得られる各基地局からの送信電力制御情報と、上記伝搬損失演算手順にて演算された各基地局と移動局との間の電波伝送路の伝搬損失とに基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定する送信電力制御情報決定手順とを有する送信電力制御方法。

１９．移動通信システムにおいて移動局と無線接続される複数の基地局のそれぞれが受信信号品質に基づいて決定した送信電力制御情報を移動局に送信した際に移動局にて得られる各基地局からの送信電力制御情報に基づいて移動局の送信電力を制御する送信電力制御方法において、

各基地局から固定的な送信電力にて送信される所定の信号に基づいて移動局と各基地局との間の電波伝送路での伝搬損失を演算する伝搬損失演算手順と、

移動局でのフェージングの状態を測定するフェージング測定手順と、

該フェージング測定手段にて測定された移動局でのフェージングの状態が所定の状態より良好であるか否かを判定するフェージング状態判定手順と、

該フェージング状態判定手段にて移動局でのフェージングの状態が所定の状態より良好であると判定されたときに第一の送信電力制御情報決定手順を有効にし、該フェージング状態判定手段にて移動局でのフェージングの状態が所定の状態より良好でないと判定されたときに第二の送信電力制御情報決定手順を有効にする切換え制御手順とを有し、

上記第一の送信電力制御情報決定手順は、移動局との間の電波伝送路の伝搬損失がより小さい基地局からの送信電力制御情報に対する重みがより大きくなるように、移動局にて得られる各基地局からの送信電力制御情報に対して重み付けを行って重み補正制御情報を生成する重み補正手順と、

該重み補正手順にて得られた各基地局からの送信電力制御情報に対応した該重み補正制御情報を合成して合成送信電力制御情報を生成する合成手順とを有し、

該合成手段にて得られた合成送信電力制御情報に基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定するようにし、

上記第二の送信電力制御情報決定手順は、移動局にて得られる各基地局からの送信電力制御情報から、上記伝搬損失演算手順にて演算された移動局との間の電波伝送路の伝搬損失が最小となる基地局からの送信電力制御情報を選択する選択手順を有し、

該選択手順にて選択された送信電力制御情報に基づいて移動局での送信電力制御に用いられるべき送信電力制御情報を決定するようにした送信電力制御方法。

２０．移動通信システムにおいて移動局と無線接続される複数の基地局のそれぞれが受信信号品質に基づいて決定した送信電力制御情報を移動局に送信した際に移動局にて得られる各基地局からの送信電力制御情報に基づいて移動局の送信電力を制御する送信電力制御方法において、

各基地局から固定的な送信電力にて送信される所定の信号に基づいて移動局が無線接続すべき基地局を決定するために用いられる移動局と各基地局との間の伝送路品質を測定する伝送路品質測定手順と、

移動局にて得られる各基地局からの送信電力制御情報と、上記伝送路品質測定手順にて得られた移動局と各基地局との間の伝送路品質とに基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定する送信電力制御情報決定手順とを有する送信電力制御方法。

２１．移動通信システムにおいて移動局と無線接続される複数の基地局のそれぞれが受信信号品質に基づいて決定した電力増加の制御状態を表す第一の値及び電力減少の制御状態を表す第二の値を取り得る情報となる送信電力制御情報を移動局に送信した際に移動局にて得られる各基地局からの送信電力制御情報の軟判定値に基づいて移動局の送信電力を制御する送信電力制御方法において、

各基地局から固定的な送信電力にて送信される所定の信号に基づいて移動局と各基地局との間の伝送路品質を測定する伝送路品質測定手順と、

移動局にて得られる各基地局からの送信電力制御情報の軟判定値と、上記伝送路品質測定手順にて測定された各基地局と移動局との間の伝送路品質に基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定する送信電力制御情報決定手順とを有し、

該送信電力制御手順は、移動局との間の伝送路品質がより良好な基地局からの送信電力制御情報に対する重みがより大きくなるように、移動局にて得られる各基地局からの送信電力制御情報の軟判定値に対して重み付けを行って重み補正制御情報を生成する重み補正手順と、

該重み補正手順にて得られた各基地局からの送信電力制御情報に対応した該重

み補正制御情報を合成して合成送信電力制御情報を生成する合成手順と、

該合成手順にて得られた合成送信電力制御情報の値を、各基地局から送信される送信電力制御情報が取り得る第一の値と第二の値との中間値より所定量だけ第一の値寄りの値となる閾値を用いて硬判定する硬判定手順とを有し、

その硬判定結果に基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定するようにした送信電力制御方法。

２２．移動通信システムにおいて移動局と無線接続される複数の基地局のそれぞれが受信信号品質に基づいて決定した電力増加の制御状態を表す第一の値及び電力減少の制御状態を表す第二の値を取り得る情報となる送信電力制御情報を移動局に送信した際に移動局にて得られる各基地局からの送信電力制御情報の軟判定値に基づいて移動局の送信電力を制御する送信電力制御方法において、

各基地局から固定的な送信電力にて送信される所定の信号に基づいて移動局と各基地局との間の伝送路品質を測定する伝送路品質測定手順と、

移動局にて得られる各基地局からの送信電力制御情報の軟判定値と、上記伝送路品質測定手順にて測定された各基地局と移動局との間の伝送路品質に基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定する送信電力制御情報決定手順とを有し、

該送信電力制御手順は、移動局との間の伝送路品質がより良好な基地局からの送信電力制御情報に対する重みがより大きくなるように、移動局にて得られる各基地局からの送信電力制御情報の軟判定値に対して重み付けを行って重み補正制御情報を生成する重み補正手順と、

該重み補正手順にて得られた各基地局からの送信電力制御情報に対応した該重み補正制御情報を合成して合成送信電力制御情報を生成する合成手順と、

該合成手順にて得られた合成送信電力制御情報の値を第一の閾値を用いて硬判定する第一の硬判定手順と、

上記合成送信制御情報の値を上記第一の閾値と異なる第二の閾値を用いて硬判定する第二の硬判定手順と、

上記第一の硬判定手段での判定結果及び第二の硬判定手段での判定手段に基づ

いて、電力増加の制御情報を表す第一の制御情報、電力減少の制御状態を表す第二の制御情報及び電力維持の制御状態を表す第三の制御情報のいずれかを生成する制御情報生成手順とを有し、

該制御情報生成手順にて生成された制御情報を移動局の送信電力制御に用いられるべき送信電力制御情報として決定するようにした送信電力制御方法。

２３．移動通信システムにおいて移動局と無線接続される複数の基地局のそれぞれが受信信号品質に基づいて決定した送信電力制御情報を移動局に送信した際に移動局にて得られる各基地局からの送信電力制御情報に基づいて移動局の送信電力を制御する送信電力制御方法において、

各基地局から固定的な送信電力にて送信される所定の信号に基づいて移動局と各基地局との間の伝送路品質を測定する伝送路品質測定手順と、

移動局でのフェージングの状態を測定するフェージング測定手順と、

該フェージング測定手段にて測定された移動局でのフェージングの状態が所定の状態より良好であるか否かを判定するフェージング状態判定手順と、

該フェージング状態判定手順にて移動局でのフェージングの状態が所定の状態より良好であると判定されたときに第一の送信電力制御情報決定手順を有効にし、該フェージング状態判定手順にて移動局でのフェージングの状態が所定の状態より良好でないと判定されたときに第二の送信電力制御情報決定手順を有効にする切換え制御手順を有し、

上記第一の送信電力制御情報決定手順は、移動局との間の伝送路品質がより良好な基地局からの送信電力制御情報に対する重みがより大きくなるように、移動局にて得られる各基地局からの送信電力制御情報に対して重み付けを行って重み補正制御情報を生成する重み補正手順と、

該重み補正手順にて得られた各基地局からの送信電力制御情報に対応した該重み補正制御情報を合成して合成送信電力制御情報を生成する合成手順とを有し、

該合成手順にて得られた合成送信電力制御情報に基づいて移動局の送信電力制御に用いられるべき送信電力制御情報を決定するようにし、

上記第二の送信電力制御情報決定手順は、移動局にて得られる各基地局からの

送信電力制御情報から、上記伝送路品質測定手順にて測定された移動局との間の伝送路品質が最良となる基地局からの送信電力制御情報を選択する選択手順を有し、

該選択手順にて選択された送信電力制御情報に基づいて移動局での送信電力制御に用いられるべき送信電力制御情報を決定するようにした送信電力制御方法。

２４．移動通信システムにおいて複数の基地局と無線接続され得る移動局において、

複数の基地局からの信号を合成する信号合成手段と、

該信号合成手段にて得られた合成信号から下り伝送情報を復元する情報復元手段と、

上記信号合成手段にて得られた合成信号の受信品質を演算する受信品質演算手段と、

該受信品質演算手段にて演算された受信品質に基づいて各基地局の送信電力を制御するための送信電力制御情報を生成する送信電力制御情報生成手段と、

該送信電力制御情報生成手段にて生成された送信電力制御情報を各基地局に送信する送信電力制御情報送信手段と、

請求項１乃至１７いずれか記載の送信電力制御装置とを有する移動局。

２５．他の通信装置と信号の無線送受信を行い、受信信号品質に基づいて決定した上記他の通信装置での送信電力制御に用いられるべき送信電力制御情報を送信する通信装置での送信電力を上記他の通信装置からの所定の情報に基づいて制御する送信電力制御方法において、

上記受信信号品質が所定の品質より低下したか否かを判定する品質判定手順と、

該品質判定手順により当該受信信号品質が所定の品質より低下したと判定されたときに、送信電力を、上記他の通信装置からの所定の情報にかかわらず、当該判定時の送信電力値から所定の特性に従って上昇させる自律制御手順とを有する送信電力制御方法。

２６．請求項２５記載の送信電力制御方法において、

上記通信装置は、受信信号品質値が目標受信品質値に近づくように決定した送信電力制御情報を他の通信装置に送信するものであって、

上記品質判定手順は、上記受信信号品質値が第一の閾値より低下したか否かを判定する第一の閾値判定手順を有し、

上記第一の閾値判定手順にて上記受信信号品質値が上記第一の閾値より低下していると判定されたときに、上記受信信号品質が所定の品質より低下したと判定する送信電力制御方法。

２７．請求項２５記載の送信電力制御方法において、

上記通信装置は、受信信号品質値が目標受信品質値に近づくように決定した送信電力制御情報を他の通信装置に送信するものであって、

上記品質判定手順は、上記目標受信品質値から上記受信品質値を減算して差分値を演算する差分値演算手順と、

上記差分値演算手順にて演算された当該差分値が第二の閾値以上となるか否かを判定する第二の閾値判定手順とを有し、

上記第二の閾値判定手順にて上記差分値が上記第二の閾値以上となると判定されたときに、上記受信信号品質が所定の品質より低下したと判定する送信電力制御方法。

２８．請求項２５記載の送信電力制御方法において、

上記通信装置は、受信信号品質値が所定のパラメータに従って制御される目標受信品質値に近づくよう決定した送信電力制御情報を他の通信装置に送信するものであって、

上記品質判定手順は、上記受信信号品質値が第一の閾値より低下したか否かを判定する第一の閾値判定手順と、

上記目標受信品質値から上記受信品質値を減算して差分値を演算する差分値演算手順と、

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上記差分値演算手順にて演算された当該差分値が第二の閾値以上となるか否かを判定する第二の閾値判定手順と、

上記第一の閾値判定手順にて上記受信信号品質値が上記第一の閾値より低下していると判定されたとき、または、上記第二の閾値判定手順にて上記差分値が上記第二の閾値以上であると判定されたときに、上記受信信号品質が所定の品質より低下したと判定する送信電力制御方法。

２９．請求項２５乃至２８いずれか記載の送信電力制御方法において、

上記自律制御手順は、上記所定の特性に従って送信電力を上昇させる自律送信電力制御情報を生成する手順と、

上記品質判定手順により上記受信信号品質が所定の品質より低下したと判定されたときに、上記他の通信装置からの送信電力制御情報に基づいた送信電力制御から上記自律送信電力制御情報に基づいた送信電力制御に切換える制御切換え手順とを有する送信電力制御方法。

３０．請求項２５乃至２９いずれか記載の送信電力制御方法において、

上記自律制御手順は、上記所定の特性に従って送信電力を上昇させる過程で、その送信電力の上昇量が所定量に達したか否かを判定する判定手順と、

該判定手順にてその送信電力の上昇量が所定量に達したと判定されたときに、上記所定の特性に従って送信電力を上昇させることを停止させる自律制御停止手順とを有する送信電力制御方法。

３１．他の通信装置と信号の無線送受信を行い、受信信号品質に基づいて決定した上記他の通信装置での送信電力制御に用いられるべき送信電力制御情報を送信する通信装置での送信電力を上記他の通信装置からの所定の情報に基づいて制御する送信電力制御装置において、

上記受信信号品質が所定の品質より低下したか否かを判定する品質判定手段と、

該品質判定手段により当該受信信号品質が所定の品質より低下したと判定され

たときに、送信電力を、上記他の通信装置からの所定の情報にかかわらず、当該判定時の送信電力値から所定の特性に従って上昇させる自律制御手段とを有する送信電力制御装置。

３２．請求項３１記載の送信電力制御装置において、

上記通信装置は、受信信号品質値が目標受信品質値に近づくように決定した送信電力制御情報を他の通信装置に送信するものであって、

上記品質判定手段は、上記受信信号品質値が第一の閾値より低下したか否かを判定する第一の閾値判定手段を有し、

上記第一の閾値判定手段にて上記受信信号品質値が上記第一の閾値より低下していると判定されたときに、上記受信信号品質が所定の品質より低下したと判定するようにした送信電力制御装置。

３３．請求項３１記載の送信電力制御装において、

上記通信装置は、受信信号品質値が目標受信品質値に近づくように決定した送信電力制御情報を他の通信装置に送信するものであって、

上記品質判定手段は、上記目標受信品質値から上記受信品質値を減算して差分値を演算する差分値演算手段と、

上記差分値演算手段にて演算された当該差分値が第二の閾値以上となるか否かを判定する第二の閾値判定手段とを有し、

上記第二の閾値判定手段にて上記差分値が上記第二の閾値以上となると判定されたときに、上記受信信号品質が所定の品質より低下したと判定するようにした送信電力制御装置。

３４．請求項３１記載の送信電力制御装置において、

上記通信装置は、受信信号品質値が所定のパラメータに従って制御される目標受信品質値に近づくよう決定した送信電力制御情報を他の通信装置に送信するものであって、

上記品質判定手段は、上記受信信号品質値が第一の閾値より低下したか否かを

判定する第一の閾値判定手段と、

上記目標受信品質値から上記受信品質値を減算して差分値を演算する差分値演算手段と、

上記差分値演算手段にて演算された当該差分値が第二の閾値以上となるか否かを判定する第二の閾値判定手段と、

上記第一の閾値判定手段にて上記受信信号品質値が上記第一の閾値より低下していると判定されたとき、または、上記第二の閾値判定手段にて上記差分値が上記第二の閾値以上であると判定されたときに、上記受信信号品質が所定の品質より低下したと判定するようにした送信電力制御装置。

３５．請求項３１乃至３４いずれか記載の送信電力制御装置において、

上記自律制御手段は、上記所定の特性に従って送信電力を上昇させる自律送信電力制御情報を生成する手段と、

上記品質判定手段により上記受信信号品質が所定の品質より低下したと判定されたときに、上記他の通信装置からの送信電力制御情報に基づいた送信電力制御から上記自律送信電力情報情報に基づいた送信電力制御に切換える制御切換え手段とを有する送信電力制御装置。

３６．請求項３１乃至３５いずれか記載の送信電力制御装置において、

上記自律制御手段は、上記所定の特性に従って送信電力を上昇させる過程で、その送信電力の上昇量が所定量に達したか否かを判定する判定手段と、

該判定手段にてその送信電力の上昇量が所定量に達したと判定されたときに、上記所定の特性に従って送信電力を上昇させることを停止させる自律制御停止手段とを有する送信電力制御装置。

３７．他の通信装置と信号の無線送受信を行い、受信信号品質に基づいて決定した上記他の通信装置での送信電力制御に用いられるべき送信電力制御情報を送信する送信電力制御情報送信手段と、

上記他の通信装置からの所定の情報に基づいて送信電力を制御する制御手段と

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請求項３１乃至３６いずれか記載の送信電力制御装置を有する通信装置。

３８．符号多元接続方式の移動通信システムに用いられる移動局となる請求項３７記載の通信装置。

３９．移動通信システムにおける基地局と移動局との間で情報データの伝送が開始される前において、基地局から移動局の送信電力制御に用いられるべき送信電力制御情報を送信すると共に基地局と移動局との間で信号を送受信して同期をとるための処理がなされる際に移動局での送信電力を制御する送信電力制御方法において、

基地局からの信号に対する移動局での同期が確立された後に、基地局からの送信電力制御情報に係わらず、送信電力を、初期値から所定の特性に従って上昇させるように制御する自律制御手順を有する送信電力制御方法。

４０．請求項４０記載の送信電力制御方法において、

上記自律制御手順は、上記基地局からの送信電力制御情報に基づいた送信電力制御による送信電力の変化より緩やかに変化する特性に従って送信電力を上昇させるように制御する送信電力制御方法。

４１．請求項３９または４０記載の送信電力制御方法において、

上記自律制御手順による送信電力の制御が開始された後に、当該自律制御手順による送信電力の制御を停止させるべき所定の条件が満足されたか否かを判定する自律制御停止条件判定手順と、

該自律制御停止条件判定手順によって上記所定の条件が満足されたと判定されたときに、上記自律制御手順による送信電力の制御から上記基地局からの送信電力制御情報に基づいた送信電力の制御に切換える制御切換え手順とを有する送信電力制御方法。

４２．請求項４１記載の送信電力制御方法において、

上記自律制御停止条件判定手順は、上記自律制御手順による送信電力の制御が開始されてから所定時間が経過したか否かを判定し、上記自律制御手順による送信電力の制御が開始されてから上記所定時間が経過したとの判定を上記所定の条件が満足されたとの判定とする送信電力制御方法。

４３．請求項４１記載の送信電力制御方法において、

上記基地局は、当該基地局での同期が確立される前では、所定の送信電力制御情報を送信し、上記移動局からの信号に基づいて当該基地局での同期が確立された後では、移動局から送信される信号の受信品質に基づいて決められる閉ループ送信電力制御情報を送信するようにし、

上記自律制御停止条件判定手順は、上記基地局から受信される送信電力制御情報が、上記所定の送信電力制御情報から閉ループ送信電力制御情報に変わったか否かを判定する制御情報変更判定手順を有し、

該制御情報変更判定手順にてなされる上記基地局から受信される送信電力制御情報が上記所定の送信電力制御情報から閉ループ送信電力制御情報に変わったとの判定を上記所定の条件が満足されたとの判定とする送信電力制御方法。

４４．請求項４３記載の送信電力制御方法において、

上記自律制御停止条件判定手順は、上記自律制御手順による送信電力制御が開始されてから所定時間が経過したか否かを判定する開始タイミング判定手順を有し、

該開始タイミング判定手順にて上記自律制御手順による送信電力制御が開始されてから上記所定時間が経過したと判定されたときに、上記制御情報変更判定手順に従った判定を開始する送信電力制御方法。

４５．移動通信システムにおける基地局と移動局との間で情報データの伝送が開始される前において、基地局から移動局の送信電力制御に用いられるべき送信電力制御情報を送信すると共に基地局と移動局との間で信号を送受信して同期をと

るための処理がなされる際に移動局での送信電力を制御する送信電力制御方法において、

基地局からの信号に対する移動局での同期が確立された後に、該基地局からの送信電力制御情報に基づいて生成される当該送信電力制御情報に基づいた送信電力制御による送信電力の変化より緩やかに変化する特性に従って送信電力を制御するための緩特性送信電力制御情報に基づいて送信電力を制御する緩特性送信電力制御手順を有する送信電力制御方法。

４６．請求項４５記載の送信電力制御方法において、

上記緩特性送信電力制御手順による送信電力制御が開始された後に、当該緩特性送信電力制御手順による送信電力の制御を停止させるべき所定の条件が満足されたか否かを判定する緩特性送信電力制御停止判定手順と、

該緩特性送信電力制御停止判定手順によって上記所定の条件が満足されたと判定されたときに、上記緩特性送信電力制御手順による送信電力の制御から上記基地局からの送信電力制御に基づいた送信電力の制御に切換える制御切換え手順とを有する送信電力制御方法。

４７．移動通信システムにおける基地局と移動局との間で情報データの伝送が開始される前において、基地局から移動局の送信電力制御に用いられるべき送信電力制御情報を送信すると共に基地局と移動局との間で信号を送受信して同期をとるための処理がなされる際に移動局での送信電力を制御する送信電力制御装置において、

基地局からの信号に対する移動局での同期が確立された後に、基地局からの送信電力制御情報に係わらず、送信電力を、初期値から所定の特性に従って上昇させるように制御する自律制御手段を有する送信電力制御装置。

４８．請求項４７記載の送信電力制御装置において、

上記自律制御手段は、上記基地局からの送信電力制御情報に基づいた送信電力制御による送信電力の変化より緩やかに変化する特性に従って送信電力を上昇さ

せるように制御する送信電力制御装置。

４９．請求項４７または４８記載の送信電力制御装置において、

上記自律制御手段による送信電力の制御が開始された後に、当該自律制御手段による送信電力の制御を停止させるべき所定の条件が満足されたか否かを判定する自律制御停止条件判定手段と、

該自律制御停止条件判定手段によって上記所定の条件が満足されたと判定されたときに、上記自律制御手段による送信電力の制御から上記基地局からの送信電力制御情報に基づいた送信電力の制御に切換える制御切換え手段とを有する送信電力制御装置。

５０．請求項４９記載の送信電力制御装置において、

上記自律制御停止条件判定手段は、上記自律制御手段による送信電力の制御が開始されてから所定時間が経過したか否かを判定するようにし、上記自律制御手段による送信電力の制御が開始されてから上記所定時間が経過したとの判定を上記所定の条件が満足されたとの判定とした送信電力制御装置。

５１．請求項４９記載の送信電力制御装置において、

上記基地局は、当該基地局での同期が確立される前では、所定の送信電力制御情報を送信し、上記移動局からの信号に基づいて当該基地局での同期が確立された後では、移動局から送信される信号の受信品質に基づいて決められる閉ループ送信電力制御情報を送信するようにし、

上記自律制御停止条件判定手段は、上記基地局から受信される送信電力制御情報が、上記所定の送信電力制御情報から閉ループ送信電力制御情報に変わったか否かを判定する制御情報変更判定手段を有し、

該制御情報変更判定手段にてなされる上記基地局から受信される送信電力制御情報が上記所定の送信電力制御情報から閉ループ送信電力制御情報に変わったと判定を上記所定の条件が満足されたとの判定とした送信電力制御装置。

５２．請求項５１記載の送信電力制御装置において、

上記自律制御停止条件判定手段は、上記自律制御手段による送信電力制御が開始されたから所定時間が経過したか否かを判定する開始タイミング判定手段を有し、

該開始タイミング判定手段にて上記自律制御手段による送信電力制御が開始されてから上記所定時間が経過したと判定されたときに、上記制御情報変更判定手段による判定を開始するようにした送信電力制御装置。

５３．移動通信システムにおける基地局と移動局との間で情報データの伝送が開始される前において、基地局から移動局の送信電力制御に用いられるべき送信電力制御情報を送信すると共に基地局と移動局との間で信号を送受信して同期をとるための処理がなされる際に移動局での送信電力を制御する送信電力制御装置において、

基地局からの信号に対する移動局での同期が確立された後に、該基地局からの送信電力制御情報に基づいて生成される当該送信電力制御情報に基づいた送信電力制御による送信電力の変化より緩やかに変化する特性に従って送信電力を制御するための緩特性送信電力制御情報に基づいて送信電力を制御する緩特性送信電力制御手段を有する送信電力制御装置。

５４．請求項５３記載の送信電力制御装置において、

上記緩特性送信電力制御手段による送信電力制御が開始された後に、当該緩特性送信電力制御手段による送信電力の制御を停止させるべき所定の条件が満足されたか否かを判定する緩特性送信電力制御停止判定手段と、

該緩特性送信電力制御停止判定手段によって上記所定の条件が満足されたと判定されたときに、上記緩特性送信電力制御手段による送信電力の制御から上記基地局からの送信電力制御に基づいた送信電力の制御に切換える制御切換え手段とを有する送信電力制御方法。

５５．送信電力制御に用いられるべき送信電力制御情報を送信する基地局に対し

て情報データの伝送を行う前において、基地局との間で信号を送信して同期をとるための処理がなされる際に送信電力を制御する送信電力制御装置を有する移動局において、

上記送信電力制御装置は、基地局からの信号に対する当該移動局での同期が確立された後に、基地局からの送信電力制御情報に係わらず、送信電力を、初期値から所定の特性に従って上昇させるように制御する自律制御手段を有する移動局。

５６．請求項５５記載の移動局において、

上記送信電力制御装置は、更に、上記自律制御手段による送信電力の制御が開始された後に、当該自律制御手段による送信電力の制御を停止させるべき所定の条件が満足されたか否かを判定する自律制御停止条件判定手段と、

該自律制御停止条件判定手段によって上記所定の条件が満足されたと判定されたときに、上記自律制御手段による送信電力の制御から上記基地局からの送信電力制御情報に基づいた送信電力の制御に切換える制御切換え手段とを有する移動局。

５７．送信電力制御に用いられるべき送信電力制御情報を送信する基地局に対して情報データの伝送信を行う前において、基地局との間で信号を送信して同期をとるための処理がなされる際に送信電力を制御する送信電力制御装置を有する移動局において、

上記送信電力制御装置は、基地局からの信号に対する移動局での同期が確立された後に、該基地局からの送信電力制御情報に基づいて生成される当該送信電力制御情報に基づいた送信電力制御による送信電力の変化より緩やかに変化する特性に従って送信電力を制御するための緩特性送信電力制御情報に基づいて送信電力を制御する緩特性送信電力制御手段を有する移動局。

５８．請求項５７記載の移動局において、

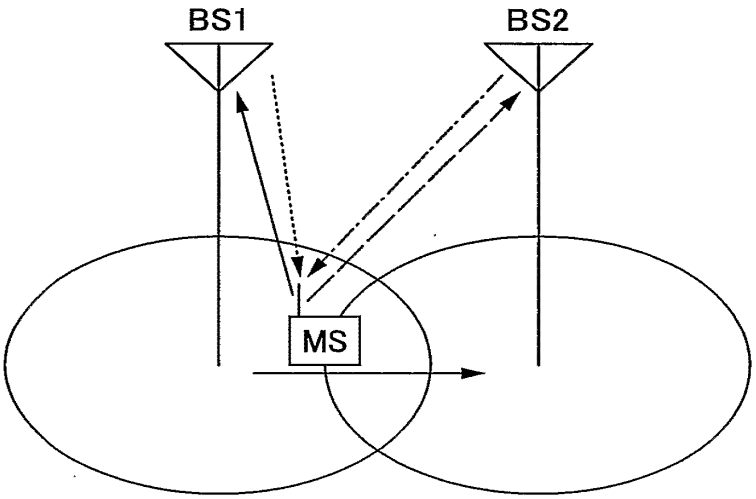
上記送信電力制御装置は、更に、上記緩特性送信電力制御手段による送信電力

制御が開始された後に、当該緩特性送信電力制御手段による送信電力の制御を停止させるべき所定の条件が満足されたか否かを判定する緩特性送信電力制御停止判定手段と、

該緩特性送信電力制御停止判定手段によって上記所定の条件が満足されたと判定されたときに、上記緩特性送信電力制御手段による送信電力の制御から上記基地局からの送信電力制御に基づいた送信電力の制御に切換える制御切換え手段とを有する移動局。

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FIG. 1



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FIG. 2

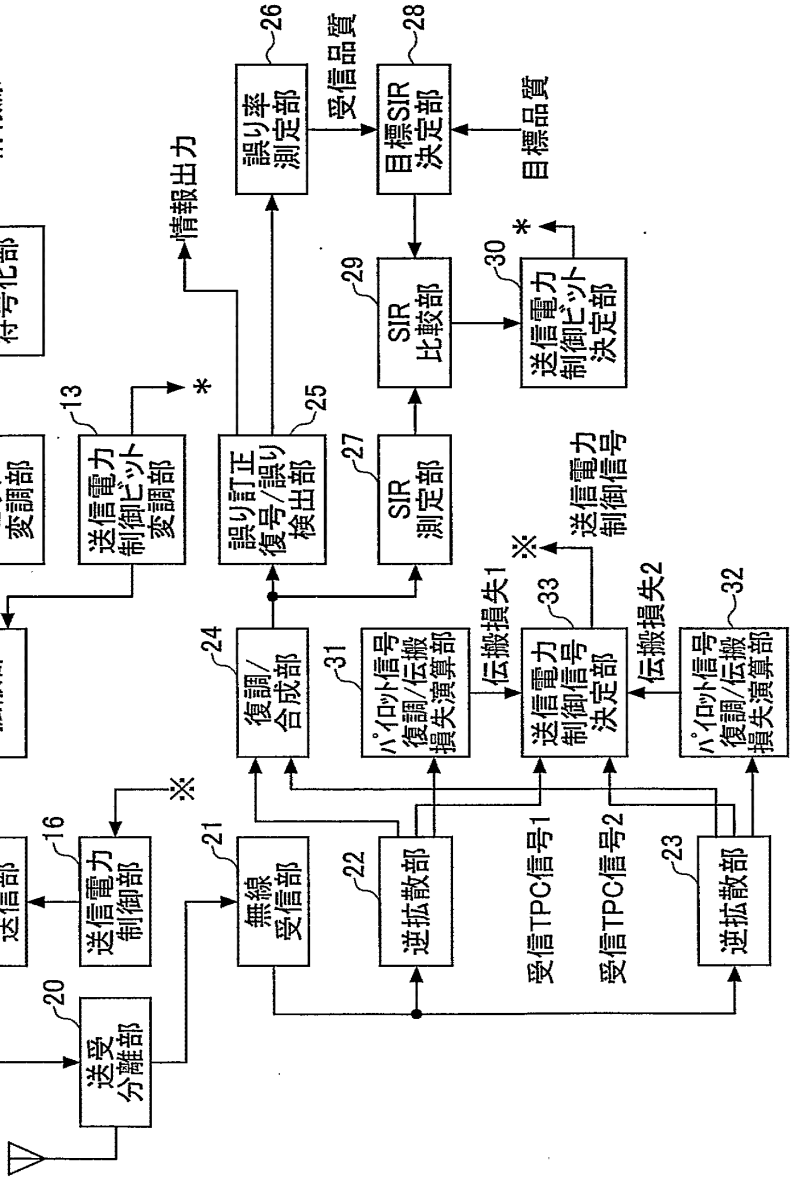

情報源
誤り訂正符号化部
データビット変調部
送信電力制御ビット変調部
拡散部
無線送信部
送信電力制御部
送受分離部
無線受信部
逆拡散部
復調/合成部
パイロット信号復調/伝搬損失演算部
送信電力制御信号決定部
逆拡散部
パイロット信号復調/伝搬損失演算部
誤り訂正復号/誤り検出部
SIR測定部
SIR比較部
送信電力制御ビット決定部
誤り率測定部
目標SIR決定部
情報出力
受信品質
目標品質
送信電力制御信号
伝搬損失1
伝搬損失2
受信TPC信号1
受信TPC信号2
11
12
13
14
15
16
20
21
22
23
24
25
26
27
28
29
30
31
32
33

FIG. 3

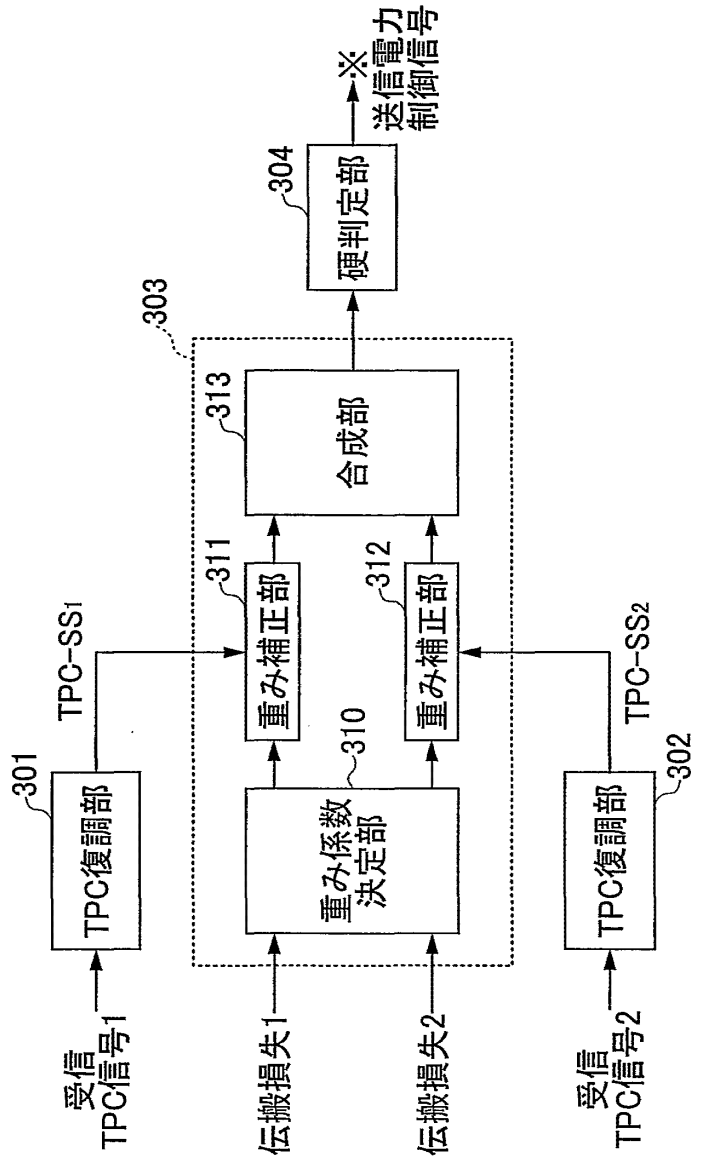

受信
TPC信号1
TPC復調部
301
TPC-SS1
伝搬損失1
重み係数
決定部
310
伝搬損失2
重み補正部
311
重み補正部
312
TPC-SS2
TPC復調部
302
受信
TPC信号2
303
合成部
313
硬判定部
304
※
送信電力
制御信号

FIG. 4

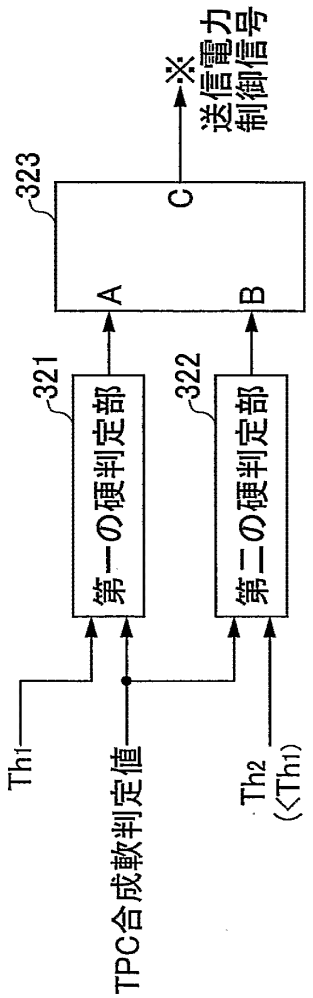

※
送信電力
制御信号
323
C
A
B
321
第一の硬判定部
322
第二の硬判定部
Th1
TPC合成軟判定値
Th2
(<Th1)

FIG. 5

A	B	C
1	1	1
1	0	—
0	1	維持
0	0	0

FIG. 6

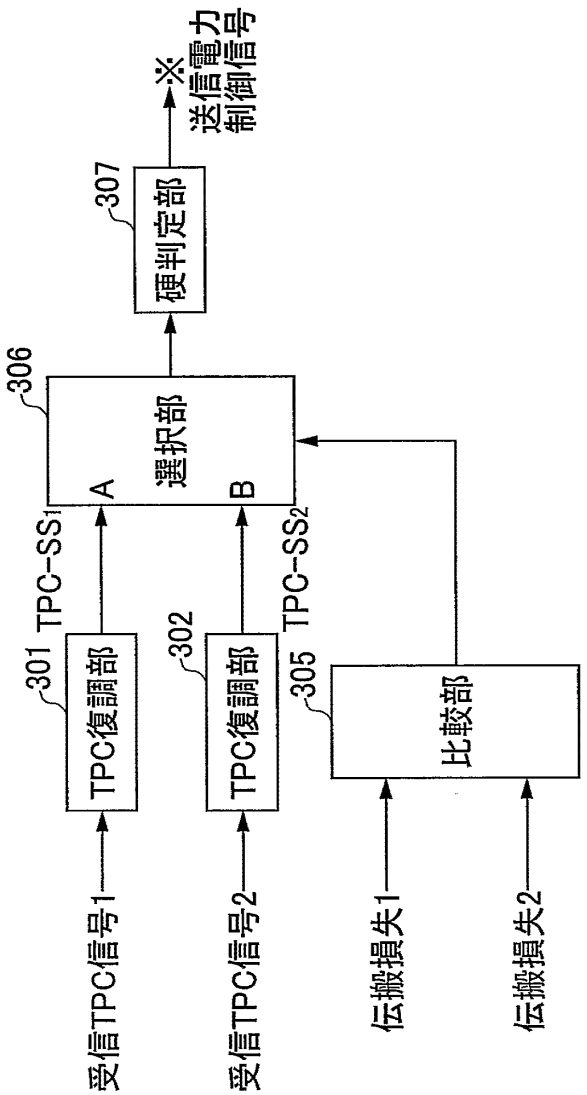

※
送信電力
制御信号
307
硬判定部
306
選択部
A
B
TPC-SS1
TPC-SS2
301
TPC復調部
302
TPC復調部
305
比較部
受信TPC信号1
受信TPC信号2
伝搬損失1
伝搬損失2

FIG. 7

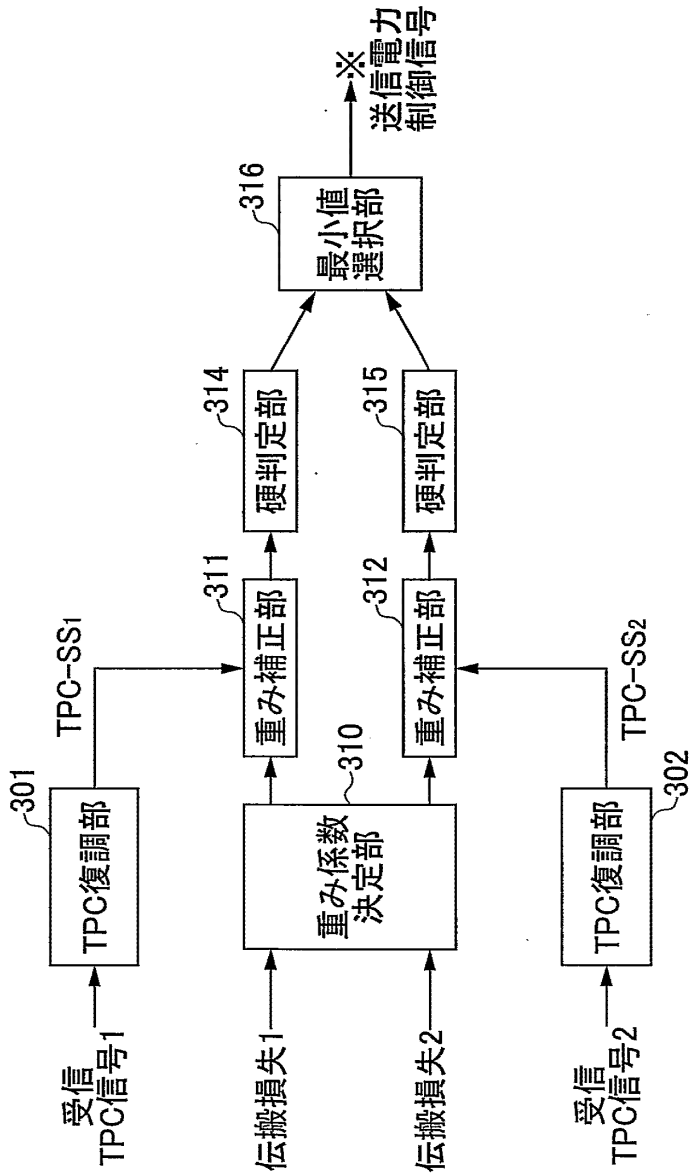

受信
TPC信号1
TPC復調部
301
TPC-SS1
伝搬損失1
重み係数
決定部
310
伝搬損失2
TPC-SS2
受信
TPC信号2
TPC復調部
302
重み補正部
311
重み補正部
312
硬判定部
314
硬判定部
315
最小値
選択部
316
※
送信電力
制御信号

FIG. 8

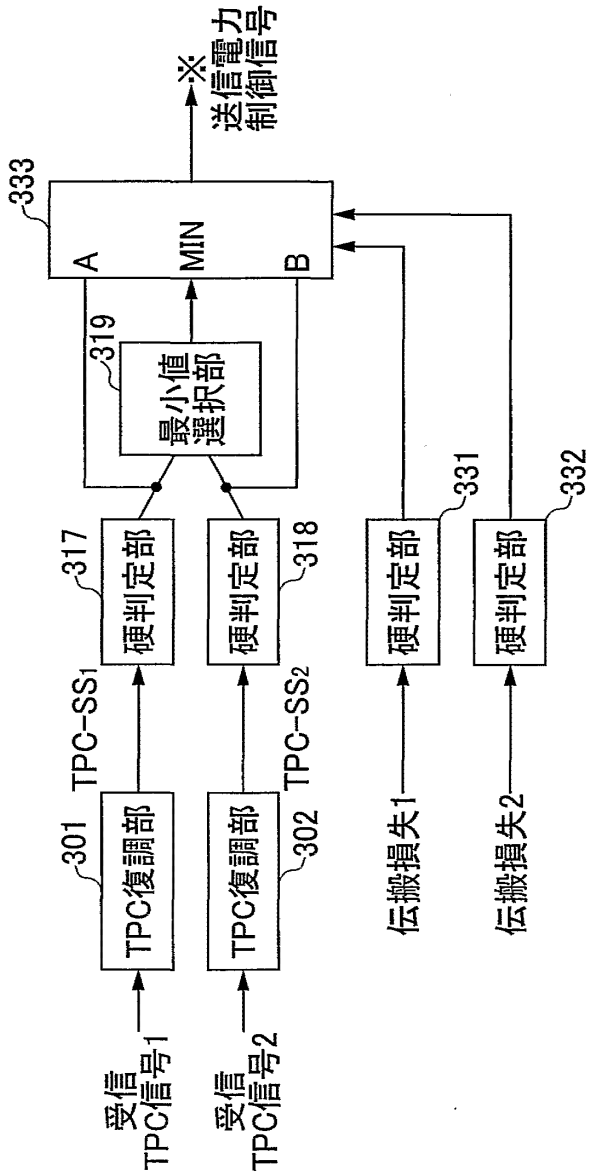

受信TPC信号1
受信TPC信号2
TPC復調部
301
302
TPC-SS1
TPC-SS2
硬判定部
317
318
伝搬損失1
伝搬損失2
331
332
最小値選択部
319
A
MIN
B
333
※送信電力制御信号

FIG. 9

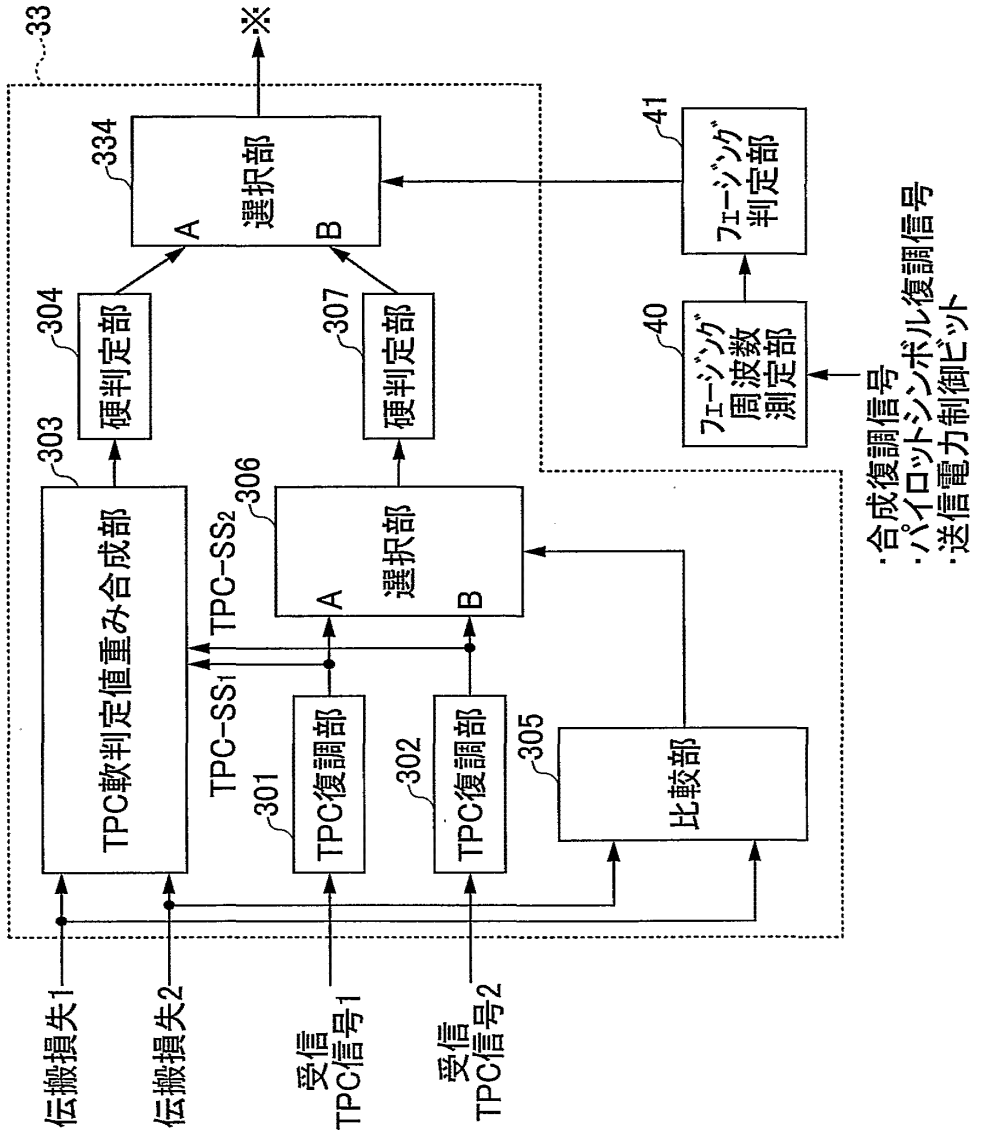

33
※
334
選択部
A
B
41
ﾌｪｰｼﾞﾝｸﾞ判定部
304
硬判定部
307
硬判定部
40
ﾌｪｰｼﾞﾝｸﾞ周波数測定部
303
TPC軟判定値重み合成部
306
選択部
A
B
TPC-SS2
TPC-SS1
301
TPC復調部
302
TPC復調部
305
比較部
伝搬損失1
伝搬損失2
受信TPC信号1
受信TPC信号2
・合成復調信号
・パイロットシンボル復調信号
・送信電力制御ビット

FIG. 10

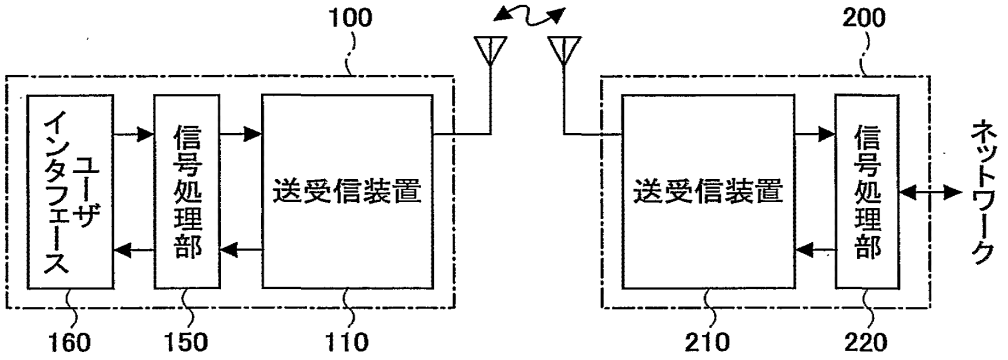

100
200
ユーザインタフェース
信号処理部
送受信装置
送受信装置
信号処理部
ネットワーク
160
150
110
210
220

FIG. 11

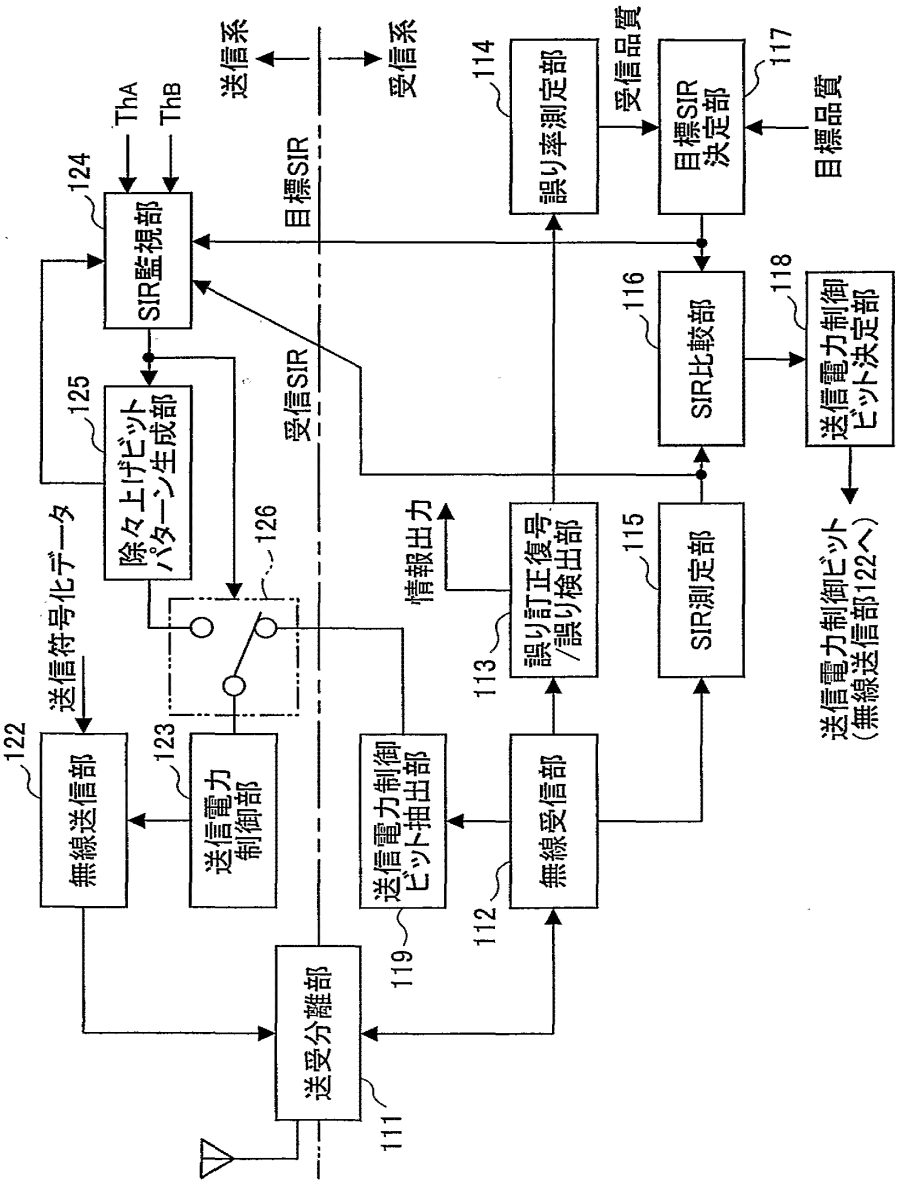

送信系
受信系
ThA
ThB
目標SIR
受信SIR
124
SIR監視部
125
除々上げビット
パターン生成部
126
122
無線送信部
123
送信電力
制御部
送信符号化データ
送受分離部
111
119
送信電力制御
ビット抽出部
112
無線受信部
113
誤り訂正復号
/誤り検出部
情報出力
114
誤り率測定部
受信品質
115
SIR測定部
116
SIR比較部
117
目標SIR
決定部
目標品質
118
送信電力制御
ビット決定部
送信電力制御ビット
(無線送信部122へ)

FIG. 12

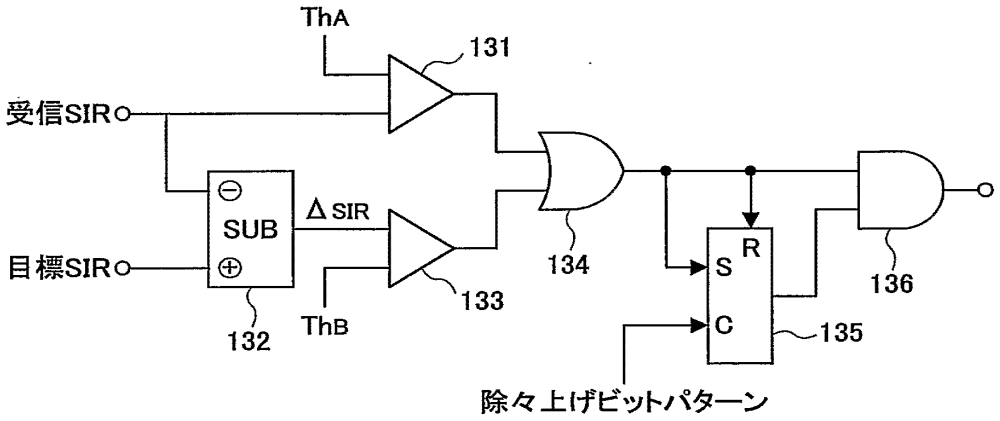

ThA
131
受信SIR
SUB
ΔSIR
目標SIR
132
ThB
133
134
R
S
C
135
136
除々上げビットパターン

FIG. 13

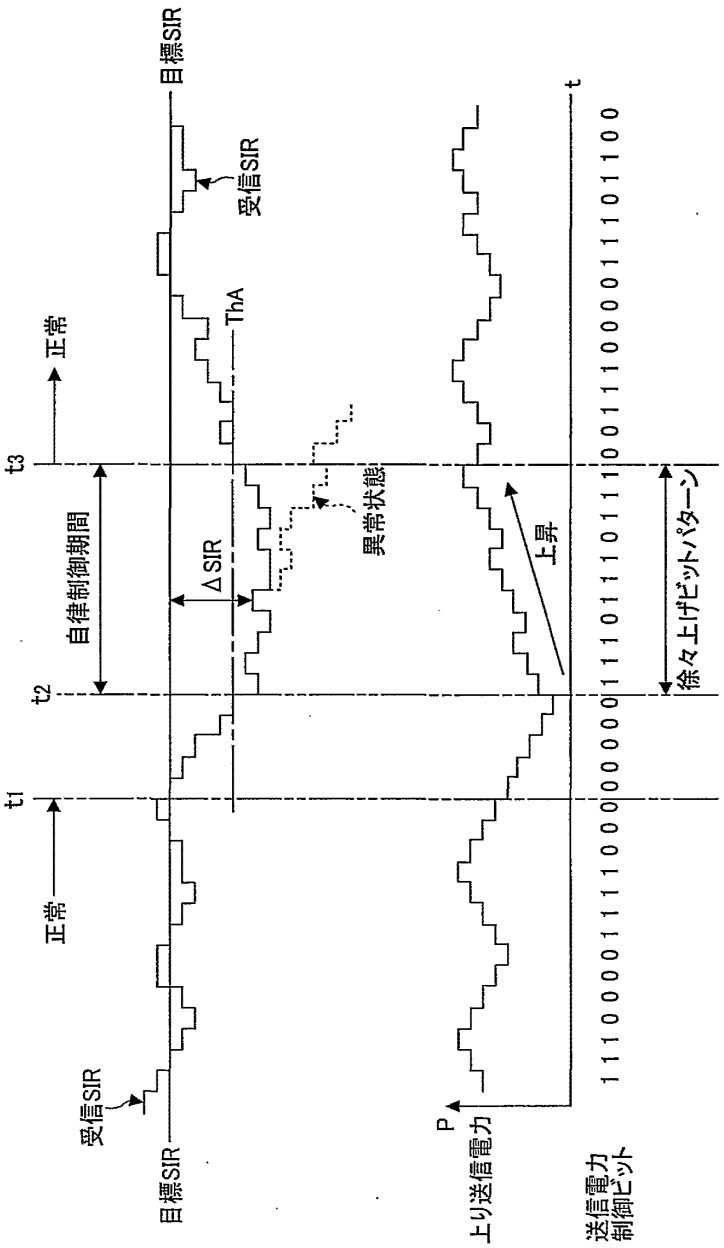

目標SIR
受信SIR
ThA
正常
t3
t2
t1
自律制御期間
ΔSIR
異常状態
上昇
徐々上げビットパターン
正常
受信SIR
目標SIR
P
上り送信電力
送信電力制御ビット
t
1 1 1 0 0 0 0 1 1 1 1 0 0 0 0 0 0 0 0 0 1 1 1 0 1 1 1 0 1 1 1 1 0 0 1 1 1 0 0 0 0 1 1 1 0 1 1 0 0

FIG. 14

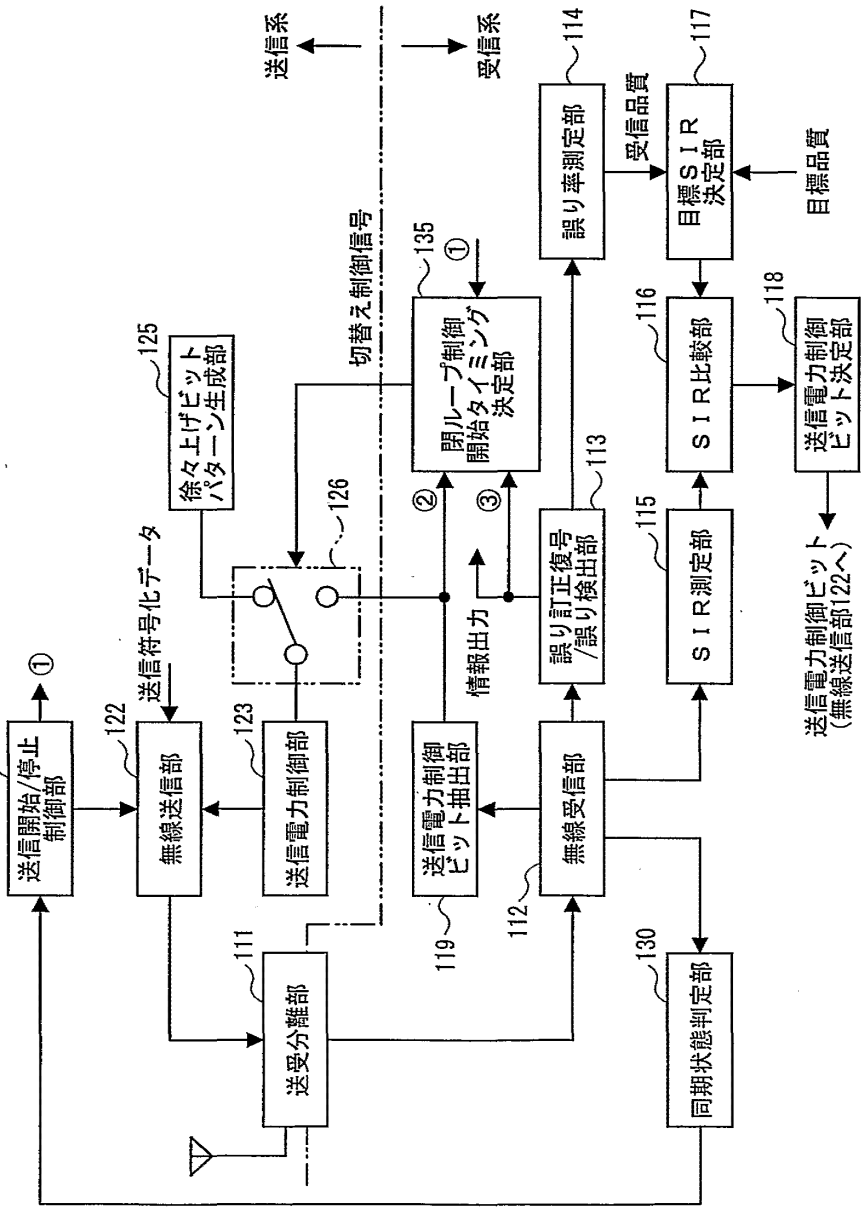

送信系
受信系
切替え制御信号
送信符号化データ
情報出力
受信品質
目標品質
送信電力制御ビット
(無線送信部122へ)
127
122
123
125
126
135
119
112
111
114
117
116
118
115
130
送信開始/停止制御部
無線送信部
送信電力制御部
徐々上げビットパターン生成部
閉ループ制御開始タイミング決定部
送信電力制御ビット抽出部
無線受信部
誤り訂正復号/誤り検出部
誤り率測定部
目標SIR決定部
SIR比較部
送信電力制御ビット決定部
SIR測定部
送受分離部
同期状態判定部

FIG. 15

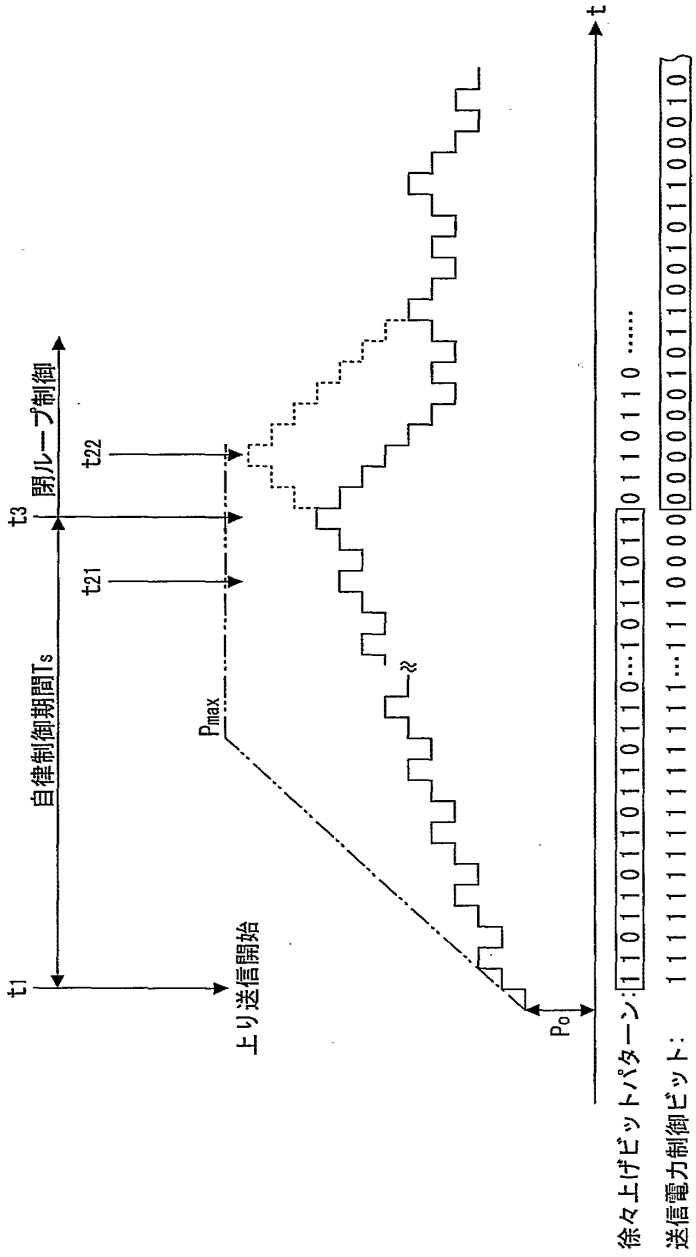

t1
上り送信開始
自律制御期間Ts
t21
t22
t3
閉ループ制御
Pmax
Po
t
徐々上げビットパターン:1101101101101101…1011011 0110110 ……
送信電力制御ビット: 1111111111111111…1110000 0000001011001101100010

FIG. 16

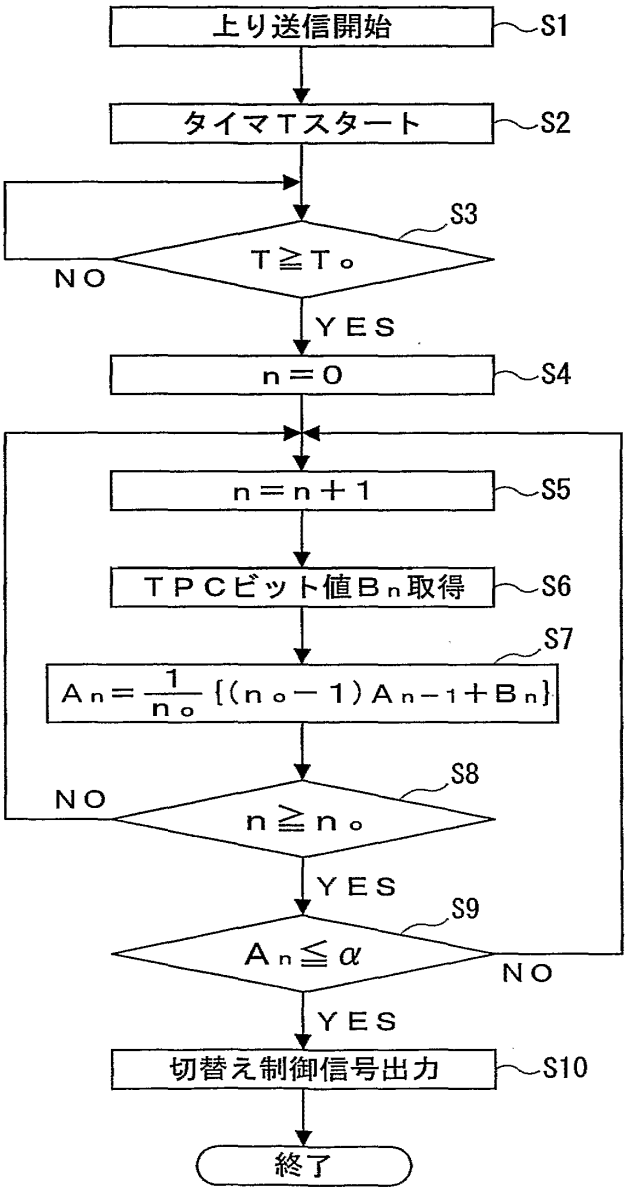
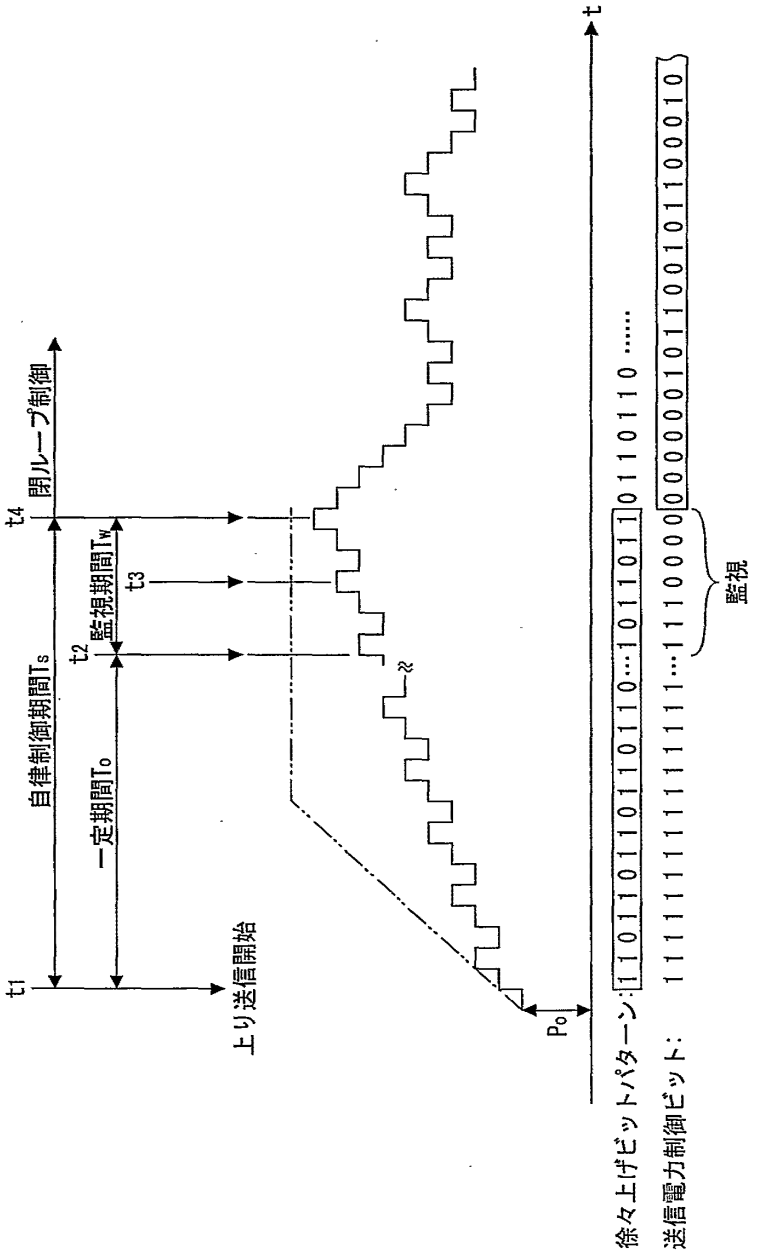

上り送信開始
S1
タイマTスタート
S2
S3
T≧To
NO
YES
n＝0
S4
n＝n＋1
S5
TPCビット値Bn取得
S6
S7
An＝1/no {(no－1)An－1＋Bn}
S8
NO
n≧no
YES
S9
An≦α
NO
YES
切替え制御信号出力
S10
終了

FIG. 17



Ex.1011 / Page 349 of 1166
TESLA, INC.

FIG. 18

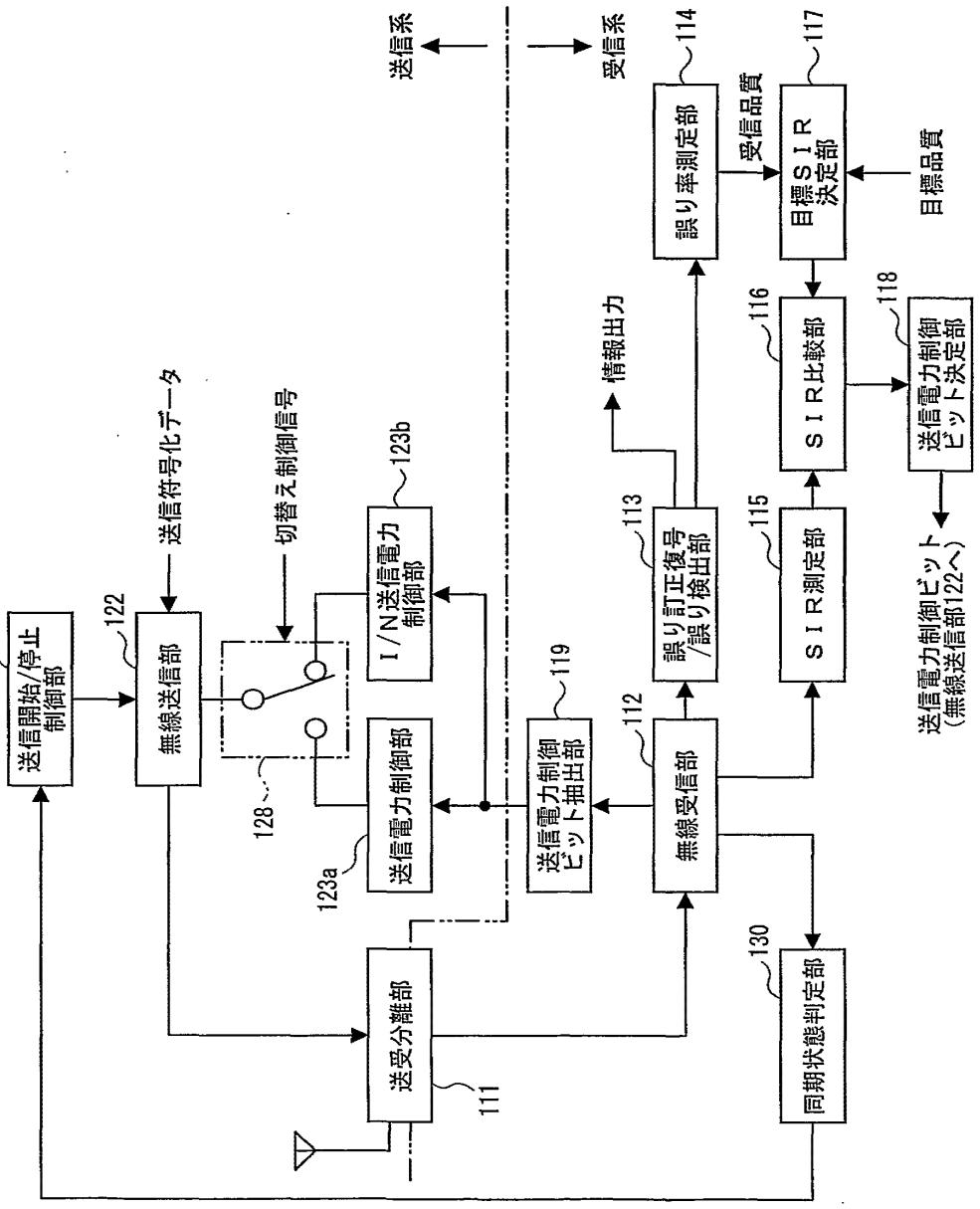

送信系
受信系
127
送信開始/停止制御部
122
無線送信部
送信符号化データ
切替え制御信号
128
123a
送信電力制御部
123b
I/N送信電力制御部
119
送信電力制御ビット抽出部
112
無線受信部
113
誤り訂正復号/誤り検出部
情報出力
114
誤り率測定部
受信品質
115
SIR測定部
116
SIR比較部
117
目標SIR決定部
目標品質
118
送信電力制御ビット決定部
送信電力制御ビット
(無線送信部122へ)
111
送受分離部
130
同期状態判定部

FIG. 19

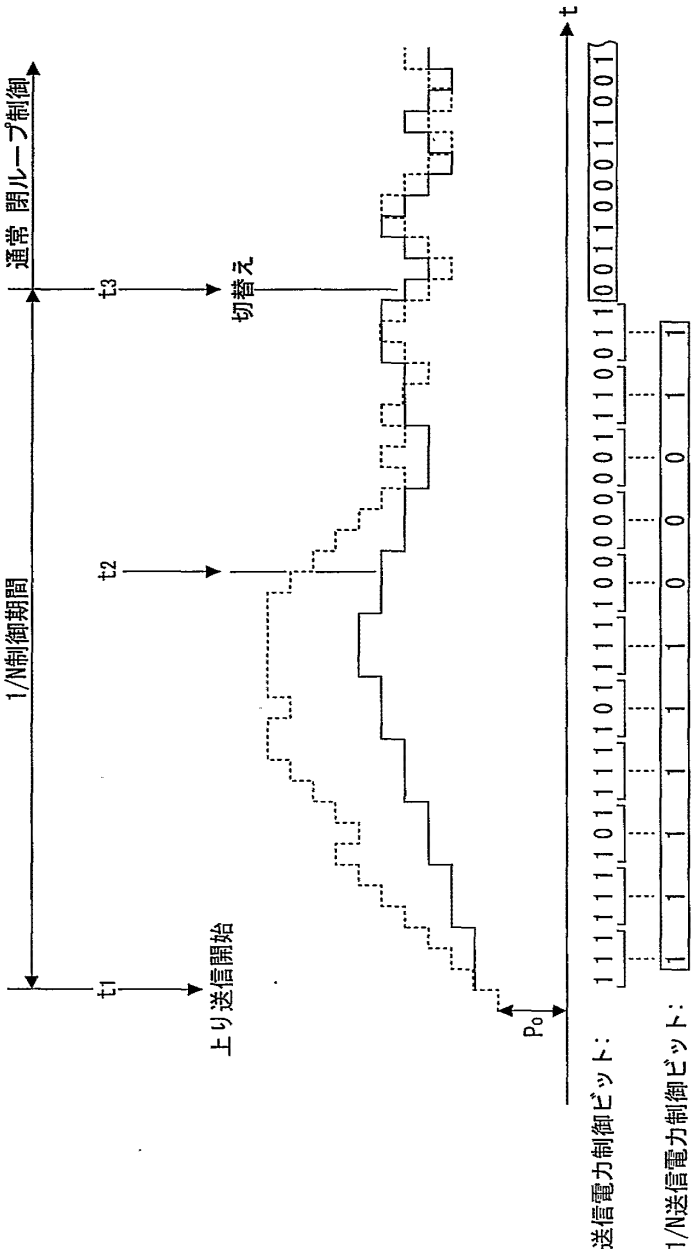

通常 閉ループ制御
1/N制御期間
t1
上り送信開始
t2
t3
切替え
P0
t
送信電力制御ビット:
1/N送信電力制御ビット:

FIG. 20

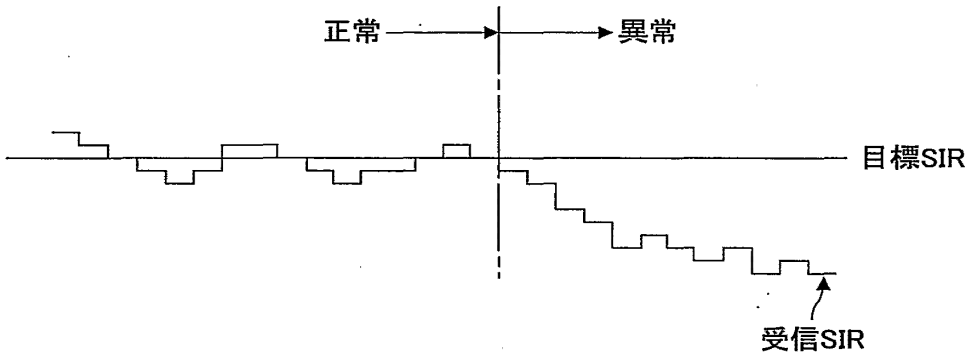


FIG. 21

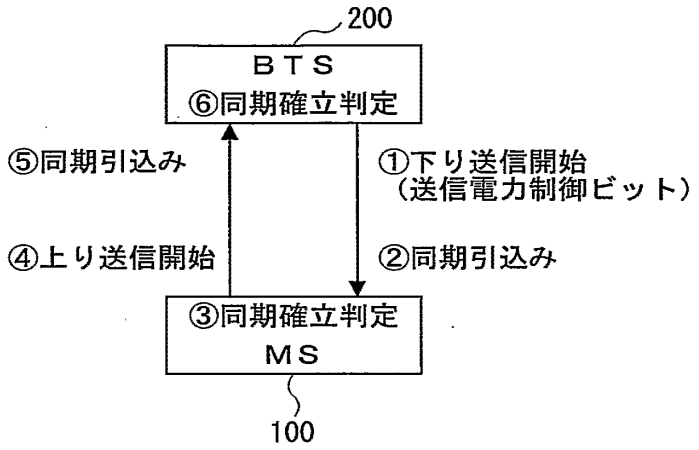
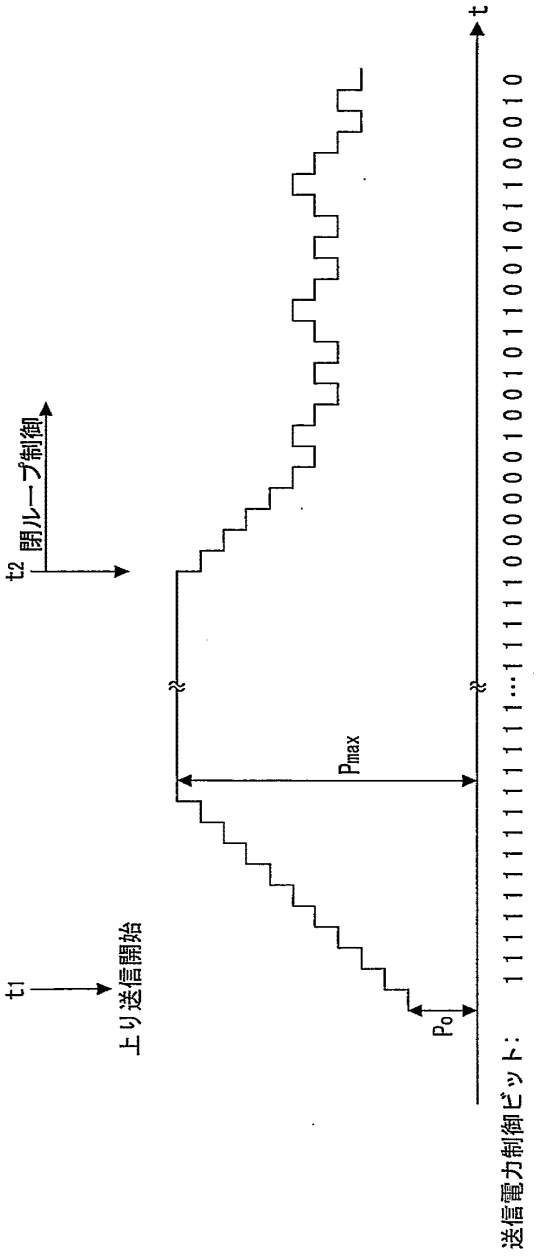

200
ＢＴＳ
⑥同期確立判定
⑤同期引込み
①下り送信開始
（送信電力制御ビット）
④上り送信開始
②同期引込み
③同期確立判定
ＭＳ
100

FIG. 22


t
送信電力制御ビット: 1111111111111111…1111100000010010110011010110000010
Pmax
Po
t1
上り送信開始
t2
閉ループ制御

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP02/07453

A. CLASSIFICATION OF SUBJECT MATTER
Int.Cl[7] H04B7/26

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
Int.Cl[7] H04Q7/00-7/38, H04B7/24-7/26

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1922-1996	Toroku Jitsuyo Shinan Koho	1994-2002
Kokai Jitsuyo Shinan Koho	1971-2002	Jitsuyo Shinan Toroku Koho	1996-2002

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	JP 11-122167 A (NEC Corp.), 30 April, 1999 (30.04.99), Abstract & EP 0897225 A2 & CA 2239201 A & US 2001/0055968 A1 & US 6418320 A	1,14,18, 24-38 2-13,15-17, 19-23
X	WO 00/36762 A1 (Nortel Networks Corp.), 22 June, 2000 (22.06.00), Abstract; Claim 1 & US 6220965 A & US 6269239 A & BR 9916066 A & EP 1135869 A1 & US 6330456 A	25-38

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
22 October, 2002 (22.10.02)	12 November, 2002 (12.11.02)
Name and mailing address of the ISA/ Japanese Patent Office Facsimile No.	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 1998)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP02/07453

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 8-32514 A (NTT Mobile Communications Network Inc.), 02 February, 1996 (02.02.96), Abstract & EP 0682419 A2 & CA 2149096 A & US 5590409 A & CN 1126929 A	25-38
X	JP 9-312609 A (NTT Mobile Communications Network Inc.), 02 December, 1997 (02.12.97), Abstract (Family: none)	25-38
A	WO 99/37111 A (NTT Mobile Communications Network Inc.), 22 July, 1999 (22.07.99), Abstract & EP 0975185 A1 & US 6343218 A	1-24
A	JP 11-220774 A (Fujitsu Ltd.), 10 August, 1999 (10.08.99), Abstract & CN 1225529 A & US 6456827 A	12,17,19,23
A	JP 2001-177470 A (Matsushita Electric Industrial Co., Ltd.), 29 June, 2001 (29.06.01), Abstract (Family: none)	1-24
A	JP 2001-177471 A (NEC Saitama, Ltd.), 29 June, 2001 (29.06.01), Abstract & US 2001/0004374 A1 & EP 1111810 A2 & BR 200006538 A & CN 1301092 A	39-58
A	JP 2000-513557 A (Samsung Electronics Co., Ltd.), 10 October, 2000 (10.10.00), Fig. 14 & WO 99/56405 A1 & AU 9934437 A & EP 0995275 A1 & BR 9906378 A & CN 1266562 A	39-58
A	JP 2000-151500 A (NEC Saitama, Ltd.), 30 May, 2000 (30.05.00), Abstract & EP 0999657 A2 & CN 1253429 A & BR 9905499 A	39-58

Form PCT/ISA/210 (continuation of second sheet) (July 1998)

国際調査報告

国際出願番号　ＰＣＴ／ＪＰ０２／０７４５３

Ａ．　発明の属する分野の分類（国際特許分類（ＩＰＣ））
Ｉｎｔ．Ｃｌ⁷　Ｈ０４Ｂ７／２６

Ｂ．　調査を行った分野

調査を行った最小限資料（国際特許分類（ＩＰＣ））
Ｉｎｔ．Ｃｌ⁷　Ｈ０４Ｑ７／００－７／３８
Ｈ０４Ｂ７／２４－７／２６

最小限資料以外の資料で調査を行った分野に含まれるもの
日本国実用新案公報　１９２２－１９９６年
日本国公開実用新案公報　１９７１－２００２年
日本国登録実用新案公報　１９９４－２００２年
日本国実用新案登録公報　１９９６－２００２年

国際調査で使用した電子データベース（データベースの名称、調査に使用した用語）

Ｃ．　関連すると認められる文献

引用文献のカテゴリー＊	引用文献名　及び一部の箇所が関連するときは、その関連する箇所の表示	関連する請求の範囲の番号
Ｘ	ＪＰ　１１－１２２１６７　Ａ（日本電気株式会社） １９９９．０４．３０	1, 14, 18, 24-38
Ａ	要約 ＆　ＥＰ　０８９７２２５　Ａ２＆　ＣＡ　２２３９２０１　Ａ ＆　ＵＳ　２００１／００５５９６８　Ａ１ ＆　ＵＳ　６４１８３２０　Ａ	2-13, 15-17, 19-23

☒ Ｃ欄の続きにも文献が列挙されている。　☐ パテントファミリーに関する別紙を参照。

＊　引用文献のカテゴリー
「Ａ」特に関連のある文献ではなく、一般的技術水準を示すもの
「Ｅ」国際出願日前の出願または特許であるが、国際出願日以後に公表されたもの
「Ｌ」優先権主張に疑義を提起する文献又は他の文献の発行日若しくは他の特別な理由を確立するために引用する文献（理由を付す）
「Ｏ」口頭による開示、使用、展示等に言及する文献
「Ｐ」国際出願日前で、かつ優先権の主張の基礎となる出願の日の後に公表された文献
「Ｔ」国際出願日又は優先日後に公表された文献であって出願と矛盾するものではなく、発明の原理又は理論の理解のために引用するもの
「Ｘ」特に関連のある文献であって、当該文献のみで発明の新規性又は進歩性がないと考えられるもの
「Ｙ」特に関連のある文献であって、当該文献と他の１以上の文献との、当業者にとって自明である組合せによって進歩性がないと考えられるもの
「＆」同一パテントファミリー文献

国際調査を完了した日	国際調査報告の発送日
２２．１０．０２	12.11.02

国際調査機関の名称及びあて先	特許庁審査官（権限のある職員）	
日本国特許庁（ＩＳＡ／ＪＰ） 郵便番号１００－８９１５ 東京都千代田区霞が関三丁目４番３号	青木　健	５Ｊ　９５７１
	電話番号　０３－３５８１－１１０１　内線　３５３４	

様式ＰＣＴ／ＩＳＡ／２１０（第２ページ）（１９９８年７月）

Ｃ（続き）．　関連すると認められる文献

引用文献のカテゴリー＊	引用文献名　及び一部の箇所が関連するときは、その関連する箇所の表示	関連する請求の範囲の番号
Ｘ	ＷＯ　００／３６７６２　Ａ１（ＮＯＲＴＥＬ　ＮＥＴＷＯＲＫＳ　ＣＯＲＰＯＲＡＴＩＯＮ）　２０００．０６．２２ 要約，請求項１ ＆　ＵＳ　６２２０９６５　Ａ　＆　ＵＳ　６２６９２３９　Ａ ＆　ＢＲ　９９１６０６６　Ａ　＆　ＥＰ　１１３５８６９　Ａ１ ＆　ＵＳ　６３３０４５６　Ａ	25-38
Ｘ	ＪＰ　８－３２５１４　Ａ（エヌ・ティ・ティ移動通信網株式会社）　１９９６．０２．０２ 要約 ＆　ＥＰ　０６８２４１９　Ａ２＆　ＣＡ　２１４９０９６　Ａ ＆　ＵＳ　５５９０４０９　Ａ　＆　ＣＮ　１１２６９２９　Ａ	25-38
Ｘ	ＪＰ　９－３１２６０９　Ａ（エヌ・ティ・ティ移動通信網株式会社）　１９９７．１２．０２ 要約　（ファミリーなし）	25-38
Ａ	ＷＯ　９９／３７１１１　Ａ（エヌ・ティ・ティ移動通信網株式会社）　１９９９．０７．２２ 要約 ＆　ＥＰ　０９７５１８５　Ａ１＆　ＵＳ　６３４３２１８　Ａ	1-24
Ａ	ＪＰ　１１－２２０７７４　Ａ（富士通株式会社）　１９９９．０８．１０ 要約 ＆　ＣＮ　１２２５５２９　Ａ　＆　ＵＳ　６４５６８２７　Ａ	12, 17, 19, 23
Ａ	ＪＰ　２００１－１７７４７０　Ａ（松下電器産業雄株式会社）　２００１．０６．２９ 要約　（ファミリーなし）	1-24
Ａ	ＪＰ　２００１－１７７４７１　Ａ（埼玉日本電気株式会社）　２００１．０６．２９ 要約 ＆　ＵＳ　２００１／０００４３７４　Ａ１ ＆　ＥＰ　１１１１８１０　Ａ２ ＆　ＢＲ　２０００００６５３８　Ａ ＆　ＣＮ　１３０１０９２　Ａ	39-58
Ａ	ＪＰ　２０００－５１３５５７　Ａ（サムスン　エレクトロニクス　カンパニー　リミテッド）　２０００．１０．１０ 図１４ ＆　ＷＯ　９９／５６４０５　Ａ１ ＆　ＡＵ　９９３４４３７　Ａ　＆　ＥＰ　０９９５２７５　Ａ１ ＆　ＢＲ　９９０６３７８　Ａ　＆　ＣＮ　１２６６５６２　Ａ	39-58

国際調査報告

国際出願番号　ＰＣＴ／ＪＰ０２／０７４５３

Ｃ（続き）．　関連すると認められる文献

引用文献のカテゴリー＊	引用文献名　及び一部の箇所が関連するときは、その関連する箇所の表示	関連する請求の範囲の番号
Ａ	ＪＰ　２０００－１５１５００　Ａ（埼玉日本電気株式会社） ２０００．０５．３０ 要約 ＆　ＥＰ　０９９９６５７　Ａ２＆　ＣＮ　１２５３４２９　Ａ ＆　ＢＲ　９９０５４９９　Ａ	39-58

様式ＰＣＴ／ＩＳＡ／２１０（第２ページの続き）（１９９８年７月）

Final rejection

P.1

February 29, 2012 Patent Application No. 2007-525302 drafting date of the patent application number
Closed loop / open-complex type of the title of the invention in a wireless communication system Masatoshi Ishida, 4446 5W00 Patent Office examiner
Power control
Wireless Technology Solutions, LLC applicant for a patent
(Two outside) Tadahiko Ito agent

For this application, by the three reasons stated in the notice of reasons for refusal dated 20 July FY2011, is to be refused.
Although we considered the contents of the amendments and procedures written opinion, Ru enough evidence to overturn the reasons for refusal can not be Miidase.

Remarks about the claims 1 to 24

Applicant, and the submission of a written amendment, written opinion dated October 25, Heisei 23
, Argues that as follows.

"The present invention is, as described in claim 1, after correction" resource allocation and uplink transmissions are scheduled Ru pail, was sent to the mobile terminal from the base station in the downlink channel of said downlink channel transmission power control (TPC
The one of the features that you will "and receive) command. Features include other similar claims.
Be sent or received TPC commands and downlink channel assignment and transmission resources in this way, in a citation has not been described or suggested.
According to the present invention, the TPC command to communicate with a relatively low signaling overhead will be possible.
Therefore, the present invention, but not identical, to the invention has been described in a citation, cited
Nor does it easily can be conceived from 1. "

However, the above can not claim to adopt the following reasons.

Page 18 line 27 of a citation P.2 - in Figure 3 and the first 25 lines of page 31,
A method of power control in a wireless communication system and a "(. Equivalent to" mobile terminal) MS base station and mobile station ",
In said mobile station (MS), "the path loss of radio channel" (propagation loss between the base station and said mobile station MS
Equivalent to. TPC signal to determine), was sent to said mobile station (MS) from the base station in the downlink channel

http://www6.ipdl.inpit.go.jp/JP/application/P/2007-525302/content.aipn?fn=/763/13.03.20 ...

2012/05/24

Transmission of MS and the mobile station based on the TPC signal and said received and propagation loss, the above issue has been determined (. Equivalent to "(TPC) transmission power control commands")
Transmit power levels to set the power level was set above, a power control method to send a signal
"Have been described.
In mobile communications, to send information about resource allocation in the downlink channel uplink transmission, uplink transmission is performed based on the information in question is well known in the art, for example, JP-A No. 2004-40187 open the art (especially The following are described in the paragraph.) called "a well-known literature" in the [0003].
Invention has been described in a literature known from belonging to the technical field of mobile communications, both in power control method that is described in Patent Document 1, up has been described in a literature well-known "in the downlink channel and a citation said base Tet allocation of resources for the uplink transmission "to apply the technology," to send information about the resource allocation link transmission, do the uplink transmission on the basis of such information is scheduled in the downlink channel, the downlink channel above Set the transmit power level of the mobile terminal based on the TPC and command and said pathloss received and (TPC) power control command is sent, has been determined above, is set above was sent to the mobile terminal from the station transmit power level, to try to "send a signal in the uplink transmission resources are scheduled above is that a person skilled in the art can easily conceived.

In addition to the above-mentioned study, in the setting of the transmit power level, remove and select to incorporate the parameters of the diffusion rate
Incorporating the parameters of the transport format is well known in the art, the art, for example 3GPP TR 25.804 V6.0.0 (2005-03) (hereinafter referred to as "two well-known literature"
. That are described in the formula of page 26). To set the transmit power level based on the accumulation of TPC command is also conventional means.

Accordingly, the invention according to 24, those skilled in the art is conceived easily obtained from well-known technology and cited one of claims 1 to the present.

The above, to adopt the applicant's claim can not be.

(Such as references)
Literature cited
No. 2003/010903, International Publication No. 1.

Well-known literature and
-Open Patent Publication No. 2004-40187 1.
2.3rd Generation Partnership Project; Technical Specification Group Radi o Access Network; Feasibility Study on Uplink Enhancements for UTRA TDD; (Release 6)
The present, 3GPP TR 25.804 V6.0.0 (2005-03), the 3GPP Organiz
March, 2005 ational Partners' Publications Offices, page 26
You may not all be sent or part of the non-patent literature, etc. Due to limitations in the contract, law or presented (note).

——————————————————————————————————————— she is dissatisfied with this assessment, a certified copy of this assessment within three months from the date of delivery was
(In the case of overseas resident, within the last 4) that, for the Commissioner of the Patent Office, a request for a trial

(Paragraph 1 of Article 121 of the Patent Law) can.
For this assessment (the teachings in accordance with paragraph 2 of Article 46 of the Administrative Case Litigation Act) must be filed a lawsuit can not cancel.
About this assessment
(Section 6 of Article 178 of the Patent Law), you can only bring an action against the decision regarding the cancellation of the hearing request.

Assistant examiner examiner / distributor of chief examiner / distributor of general manager
Keisuke Ishida, Masatoshi Sato, Hiroyuki Ohama
9196 4181 4446

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/917,968	08/12/2004	Nicholas William Anderson	9147-96606-US	3609

22242 7590 09/01/2011

FITCH EVEN TABIN & FLANNERY
120 SOUTH LASALLE STREET
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CHICAGO, IL 60603-3406

EXAMINER	
REGO, DOMINIC E	
ART UNIT	PAPER NUMBER
2618	
MAIL DATE	DELIVERY MODE
09/01/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Advisory Action Before the Filing of an Appeal Brief	**Application No.** 10/917,968	**Applicant(s)** ANDERSON, NICHOLAS WILLIAM
	Examiner DOMINIC E. REGO	**Art Unit** 2618

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 03 December 2010 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:
   a) ☒ The period for reply expires *3* months from the mailing date of the final rejection.
   b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

   Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☐ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   (a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);
   (b) ☐ They raise the issue of new matter (see NOTE below);
   (c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   (d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

   NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☒ For purposes of appeal, the proposed amendment(s): a) ☐ will not be entered, or b) ☒ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.
   The status of the claim(s) is (or will be) as follows:
   Claim(s) allowed: _____.
   Claim(s) objected to: _____.
   Claim(s) rejected: *1-4,8,15-17,26,28,30-34 and 43-50*.
   Claim(s) withdrawn from consideration: _____.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing a good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. ☐ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: _____.
12. ☐ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). _____
13. ☒ Other: See Continuation Sheet.

/DOMINIC E REGO/
Primary Examiner, Art Unit 2618

Continuation of 13. Other: After Final rejection was issued on 01/08/2010 with the 35 U.S.C. 101 rejection, Applicant filed Appeal Brief on 12/03/2010. Further, beside that Appeal Brief, Applicant also filed separate claim set by amending claim 26. After consulting with SPEs, 35 USC 101 rejection was withdrawn, but 35 U.S.C. 103(a) rejection is still stand. Therefore, after Final Amendment filed on 12/03/2010 is entered and considered by the Examiner .

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/917,968	08/12/2004	Nicholas William Anderson	9147-96606-US	3609

22242 7590 06/27/2011

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ART UNIT	PAPER NUMBER
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MAIL DATE	DELIVERY MODE
06/27/2011	PAPER

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The time period for reply, if any, is set in the attached communication.

Advisory Action Before the Filing of an Appeal Brief	**Application No.** 10/917,968	**Applicant(s)** ANDERSON, NICHOLAS WILLIAM	
	Examiner DOMINIC E. REGO	**Art Unit** 2618	

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 03 December 2010 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:
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   Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

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3. ☒ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   (a) ☒ They raise new issues that would require further consideration and/or search (see NOTE below);
   (b) ☐ They raise the issue of new matter (see NOTE below);
   (c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   (d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

   NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☒ For purposes of appeal, the proposed amendment(s): a) ☒ will not be entered, or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.
   The status of the claim(s) is (or will be) as follows:
   Claim(s) allowed: _____.
   Claim(s) objected to: _____.
   Claim(s) rejected: *1-4, 7, 8, 15-17, 26, 28, 30-34, and 43-50*.
   Claim(s) withdrawn from consideration: _____.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
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REQUEST FOR RECONSIDERATION/OTHER

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12. ☐ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). _____
13. ☐ Other: _____.

/DOMINIC E REGO/
Primary Examiner, Art Unit 2618

Please, do not enter
DR

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.	10/917,968
Filed:	August 12, 2004
Applicants:	Nicholas William Anderson
Title:	**POWER CONTROL IN A WIRELESS COMMUNICATION SYSTEM**
Art Unit:	2618
Examiner:	Dominic E. Rego
Attorney Docket:	9147-96606 (04-0108) S05B4005US00
Customer No.:	22242

Confirmation No.3609

This Amendment B And Response was electronically filed on December 3, 2010 using EFS-Web.

Mail Stop AMENDMENT
Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

AMENDMENT B AND RESPONSE

Sir:

Applicants hereby petition under 37 CFR § 1.136(a) for a three-month extension of time in the above-identified application, up to and including December 3, 2010, to make this reply timely.

Please amend the above-identified patent application as follows:

Amendments to the Claims are reflected in the listing of claims beginning on page 2 of this paper; and

Remarks begin on page 8 of this paper.

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22242 7590 06/27/2011

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EXAMINER	
REGO, DOMINIC E	
ART UNIT	PAPER NUMBER
2618	
MAIL DATE	DELIVERY MODE
06/27/2011	PAPER

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CHICAGO, IL 60603-3406

Appeal No: 2011-010366
Application: 10/917,968
Appellant: Nicholas William Anderson

Board of Patent Appeals and Interferences
Docketing Notice

Application 10/917,968 was received from the Technology Center at the Board on June 20, 2011 and has been assigned Appeal No: 2011-010366.

In all future communications regarding this appeal, please include both the application number and the appeal number.

The mailing address for the Board is:

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ALEXANDRIA, VIRGINIA 22313-1450

The facsimile number of the Board is 571-273-0052. Because of the heightened security in the Washington D.C. area, facsimile communications are recommended. Telephone inquiries can be made by calling 571-272-9797 and referencing the appeal number listed above.

By order of the Board of Patent Appeals and Interferences.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/917,968	08/12/2004	Nicholas William Anderson	9147-96606-US	3609

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CHICAGO, IL 60603-3406

Appeal No: 2011-009759
Application: 10/917,968
Appellant: Nicholas William Anderson

Board of Patent Appeals and Interferences
Docketing Notice

Application 10/917,968 was received from the Technology Center at the Board on June 13, 2011 and has been assigned Appeal No: 2011-009759.

In all future communications regarding this appeal, please include both the application number and the appeal number.

The mailing address for the Board is:

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ALEXANDRIA, VIRGINIA 22313-1450

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By order of the Board of Patent Appeals and Interferences.

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte NICHOLAS WILLIAM ANDERSON

Appeal 2011-009759
Application 10/917,968
Technology Center 2600

Before STEVEN J. BARTLETT, *Support Division 2 Manager.*

ORDER REMANDING APPEAL TO EXAMINER

This application was electronically received by the Board of Patent Appeals and Interferences on June 13, 2011. A Docketing Notice was mailed on June 14, 2011. Upon review of the application, it has been determined that a remand to the Examiner is necessary to consider the following issues and to take necessary corrective action.

AMENDMENT AFTER FINAL NOT CONSIDERED

An After Final Amendment was filed in this application on December 3, 2010. There is no indication in the record that the After Final Amendment was considered by the Examiner. The Examiner needs to determine if the After Final Amendment will or will not be entered, and notify appellant of said entry or non-entry.

Accordingly, it is ordered that the application is remanded to the Examiner:

1) to consider the Amendment After Final filed December 3, 2010;

2) to notify appellant of the entry or non-entry of the Amendment After Final filed December 3, 2010; and

3) for further action as may be appropriate.

If there are any questions pertaining to this Order, please contact the Board of Patent Appeals and Interferences at 571-272-9797.

babc

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/917,968	08/12/2004	Nicholas William Anderson	9147-96606-US	3609

22242 7590 06/13/2011

FITCH EVEN TABIN & FLANNERY
120 SOUTH LASALLE STREET
SUITE 1600
CHICAGO, IL 60603-3406

EXAMINER	
REGO, DOMINIC E	
ART UNIT	PAPER NUMBER
2618	
MAIL DATE	DELIVERY MODE
06/13/2011	PAPER

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APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
10/917,968	12 August 2004	ANDERSON, NICHOLAS WILLIAM	9147-96606-US

FITCH EVEN TABIN & FLANNERY
120 SOUTH LASALLE STREET
SUITE 1600
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EXAMINER	
DOMINIC E. REGO	
ART UNIT	**PAPER**
2618	20110609

DATE MAILED:

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Commissioner for Patents

Reply brief filed on 05/31/2011 has been noted and made of record

/DOMINIC E REGO/
Primary Examiner, Art Unit 2618

PTO-90C (Rev.04-03)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application No. 10/917,968	***Confirmation No. 3609***
Filed: August 12, 2004	
Applicants: Nicholas William Anderson	This Reply Brief was electronically filed on May 31, 2011 using EFS-Web.
Title: **POWER CONTROL IN A WIRELESS COMMUNICATION SYSTEM**	
Art Unit: 2618	
Examiner: Dominic E. Rego	
Attorney Docket: 9147-96606-US	
Customer No.: 22242	

REPLY BRIEF UNDER 37 C.F.R. § 41.41

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Pursuant to 37 C.F.R. § 41.41, the applicants hereby respectfully submit the following Reply Brief in response to the Examiner's Answer of March 29, 2011.

For the most part, the Examiner has not raised new arguments in his Answer and hence the contents of the earlier-submitted Appeal Brief remain relevant and largely without need for supplementation. The Examiner did offer, however, certain points of specificity that, by their degree of precision, are suitable to address here.

(1) Withdrawn rejections

First, we hereby acknowledge with thanks that the Examiner has withdrawn the earlier rejections under 35 U.S.C. 101 and 35 U.S.C. 112. This leaves only the rejections under 35 U.S.C. 103(a) that the Examiner continues to defend.

(2) Rejections under 35 U.S.C. 103(a)

The substantive bulk of the Examiner's Answer is a word-for-word copy of the Final Rejection with the exception of the section entitled "Response to Argument" that begins on page 21 of the Examiner's Answer. In this section, the Examiner provides helpful clarification regarding his reliance on Van Lieshout as teaching the use of a "shared physical channel" to "carry allocation and scheduling information." We say "helpful" because the Examiner's specificity now makes clear the source of the Examiner's error in his interpretation of Van Lieshout.

In particular, the Examiner relies on paragraph 0006 of Van Lieshout and emphasizes a particular portion thereof as follows[1]:

> For example, since the DRNC is in charge of **scheduling how data is multiplexed in a frame on the shared radio channel and allocating particular radio resources**, such as channelization codes and associated spreading factors, the DRNC can convey to the mobile radio, using the transport format indicator, these types of specific details to allow the mobile radio unit to decode information sent over the **shared radio channel**.

The Examiner is interpreting this language as saying that Van Lieshout transmits allocation and scheduling information to the mobile radio over a "shared radio channel." This, however, is an incorrect interpretation of Van Lieshout's sentence and represents instead a grammatically-inappropriate twisting of these words.

In fact, Van Lieshout refers here to a "shared radio channel" *not* as the channel by which the DRNC *conveys* the data multiplexing scheme, channelization codes, and spreading factors to the mobile radio unit but rather as the channel to which the data multiplexing

1 *Examiner's Answer* at page 23, emphasis appearing in the original.

scheme, channelization codes, and spreading factors *apply*. Van Lieshout's words are unambiguous in this regard – "[The DRNC can convey these types of specific details] to allow the mobile radio unit to decode information over the shared radio channel."

Therefore, contrary to the Examiner's position, Van Lieshout does not teach using a shared radio channel to convey allocation and scheduling information. Instead, Van Lieshout only teaches conveying information that a receiving device can then use to decode information that is later and otherwise received over a shared radio channel. Since there is nothing is Van Lieshout that suggests conveying allocation and scheduling information over a shared radio channel, there is nothing in Van Lieshout that can fairly be utilized to backfill the admitted deficiencies with the other references being relied upon for this rejection under 35 U.S.C. 103(a).

We therefore continue to respectfully request that the Board reverse the Examiner's rejection of the claims under 35 U.S.C. 103(a).

Respectfully submitted,

Date: May 31, 2011

By: _____
Steven G. Parmelee
Registration No. 28,790

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Electronic Acknowledgement Receipt	
EFS ID:	10197510
Application Number:	10917968
International Application Number:	
Confirmation Number:	3609
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Customer Number:	22242
Filer:	Steven Glen Parmelee/Helen Donegan
Filer Authorized By:	Steven Glen Parmelee
Attorney Docket Number:	9147-96606-US
Receipt Date:	31-MAY-2011
Filing Date:	12-AUG-2004
Time Stamp:	16:04:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Reply Brief Filed	96606_Reply_Brief.pdf	147887 74e698e15f52e0f66d1191afa920c84fadd61207	no	3

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10/917,968	08/12/2004	Nicholas William Anderson	9147-96606-US	3609

22242 7590 04/18/2011
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REGO, DOMINIC E	
ART UNIT	PAPER NUMBER
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04/18/2011	PAPER

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APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
10917968	8/12/2004	ANDERSON, NICHOLAS WILLIAM	9147-96606-US

FITCH EVEN TABIN & FLANNERY
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EXAMINER	
DOMINIC E . REGO	
ART UNIT	**PAPER**
2618	20110407

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Commissioner for Patents

IDS filed on 01/27/2011 has been considered and entered.

/Dominic E Rego/
Primary Examiner, Art Unit 2618

PTO-90C (Rev.04-03)

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	10917968
Filing Date	2004-08-12
First Named Inventor	Nicholas William Anderson
Art Unit	2618
Examiner Name	Dominic E. Rego
Attorney Docket Number	9147-96606-US (04-0108)

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6512931		2003-01-28	Kim et al.	

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	1	EP 1 367 740 A1	EP		2003-12-03	Interdigital Technology Corporation		☐
	2	WO 01/84740 A2	WO		2001-11-08	Interdigital Technology Corporation		☐

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Receipt date: 01/27/2011	Application Number	10917968 10917968 - GAU: 2618
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)	Filing Date	2004-08-12
	First Named Inventor	Nicholas William Anderson
	Art Unit	2618
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	9147-96606-US (04-0108)

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	European Search Report Dated December 2, 2010 from European Application No. 10185576.5 - 1246.	☐

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Examiner Signature	/Dominic Rego/	Date Considered	04/08/2011

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	Application Number	10917968
	Filing Date	2004-08-12
	First Named Inventor	Nicholas William Anderson
	Art Unit	2618
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	9010/96606 (04-0108)

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Receipt date: 02/24/2010	Application Number	10917968 10917968 - GAU: 2618
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)	Filing Date	2004-08-12
	First Named Inventor	Nicholas William Anderson
	Art Unit	2618
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	9010/96606 (04-0108)

	1	Communication pursuant to Article 94(3) EPC from European Patent Application No. 05 801 370.7-1246 dated December 30, 2009	☐

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. 10/917,968

Filed: August 12, 2004

Applicant: Nicholas William Anderson

Title: **POWER CONTROL IN A WIRELESS COMMUNICATION SYSTEM**

Art Unit: 2618

Examiner: Dominic E. Rego

Attorney Docket: 9147-96606-US

Customer No.: 22242

Confirmation No. 3609

This Second Change in Entity Status to Large was electronically filed on March 31, 2011 using the USPTO's EFS-Web.

Commissioner for Patents
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CHANGE IN ENTITY STATUS TO LARGE

Sir:

In accordance with 37 C.F.R. §1.28(b), written notification is hereby provided to the U.S. Patent and Trademark Office that the assertion of small entity status is no longer claimed in the above-identified patent. The Assignee of the present patent is a large entity under 37 C.F.R. §1.27(a)(3) and hereby requests that the record show that large entity status. A copy of the face page of said patent is attached for your convenience.

Respectfully submitted,

FITCH, EVEN, TABIN & FLANNERY

Dated: March 31, 2011

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Registration No. 28,790

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Electronic Acknowledgement Receipt

EFS ID:	9785099
Application Number:	10917968
International Application Number:	
Confirmation Number:	3609
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Customer Number:	22242
Filer:	Steven Glen Parmelee/Helen Donegan
Filer Authorized By:	Steven Glen Parmelee
Attorney Docket Number:	9147-96606-US (04-0108)
Receipt Date:	31-MAR-2011
Filing Date:	12-AUG-2004
Time Stamp:	16:47:37
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	96606_Change_in_Entity_Status_to_Large_1.PDF	37376 8e89f542d8fb494dae3f0ea6381041c68632 2b37	no	1
Warnings:					
Information:					

Total Files Size (in bytes):	37376

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New International Application Filed with the USPTO as a Receiving Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/917,968	08/12/2004	Nicholas William Anderson	9147-96606-US (04-0108)	3609

22242 7590 03/29/2011

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CHICAGO, IL 60603-3406

EXAMINER	
REGO, DOMINIC E	

ART UNIT	PAPER NUMBER
2618	

MAIL DATE	DELIVERY MODE
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/917,968
Filing Date: August 12, 2004
Appellant(s): ANDERSON, NICHOLAS WILLIAM

Steven G. Parmelee
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 12/17/2010 appealing from the Office action mailed 08/03/2010.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interference, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

WO 00/57574	Zeira et al.	03-2000
US 2005/0025056 A1	Chen et al.	05-2004
US 2001/0036823 A1	Van Lieshout et al.	05-2001
US 6,983,166 B2	Shiu et al.	08-2001
US 2005/0176455 A1	Krishnan et al.	02-2004

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-4,7,15,26,28,32,33,43,46,49 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zeira et al. (International Publication Number #WO

00/57574) in view of Chen et al. (US Pub. No. 2005/0025056) and further in view of Van Lieshout et al. (US Pub. No. 2001/0036823).

Regarding claim 1, Zeira teaches a method of power control in a radio communications system (See Abstract), the method comprising, at a remote transceiver:

determining a path loss of a radio channel between a base station and the remote transceiver (Page 2, lines 14- 21; Page 4, line 17-Page 5, line 8);

receiving a transmit power control (TPC) command (Page 4, line 17-Page 5, line 8);

calculating, at the remote transceiver, a transmit power level for transmission by the remote transceiver on the scheduled uplink transmission resource based upon the path loss and the TPC command *(Page 4, line 18-Page 5, line 8, Zeira teaches the first station (base station) transmits power commands based on in part a reception quality of the received communications. The first station (base station) transmits a second communication (remote terminal) having a transmission power level in a first time slot. The second station receives the second communication and the power commands. A power level of the second communication as received is measured (calculated). A path loss estimate is determined based on in part the measured received second communication power level and the first communication power level),* except on a shared physical channel used to carry allocation and scheduling information from the

base station to the remote transceiver, receiving an allocation of a scheduled uplink transmission resource.

However, in related art, Chen teaches on a downlink dedicated control channel (DCCH) channel used to carry allocation and scheduling information from the base station to the remote transceiver, receiving an allocation of a scheduled uplink transmission resource *(Paragraphs 0012,0052-0057, especially, paragraph 0012, Chen teaches it is an object of the present invention to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method. Paragraph 0054, Chen teaches the transmitting unit 15 is configured to notify the radio resources allocated by the resource allocating 14 to the mobile station via a downlink dedicated control channel (DCCH). Paragraph 0052, Chen teaches the resource allocating unit 14 is configured to allocate a radio resource which is used in uplink packet communications with the mobile station, by referring to the virtual buffer corresponding to the mobile station 30).*Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Chen to Zeira in order to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method (Chen, paragraph 0012).

Chen, further, teaches downlink dedicated control channel (DCCH) used to carry allocation and scheduling information (Paragraphs 0012,0052, and 0054, see above), but does not specifically teach on a shared physical channel used to carry allocation and scheduling information.

However, Van Lieshout teaches on a shared physical channel (shared radio channel) used to carry allocation and scheduling information (*Para. 0006, Van Lieshout teaches since the DRNC is in charge of scheduling how data is multiplexed in a frame on the shared radio channel and allocating particular radio resources, such as channelization codes and associated spreading factors, the DRNC can convey to the mobile radio, using the transport format indicator, these types of specific details to allow the mobile radio unit to decode information sent over the shared radio channel).* Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of van Lieshout to Zeira and Chen so that the mobile unit can find out the available resources that it can use from the base station.

Regarding claims 2 and 32, the combination of Zeira, Chen, and Van Lieshout teach all the claimed elements in claims 1 and 26. In addition, Zeira teaches the method of power control, the method further comprising transmitting an uplink signal at a calculated transmit power level (Page 5, lines 4-8).

Regarding claims 3 and 28, the combination of Zeira, Chen, and Van Lieshout teach all the claimed elements in claims 1 and 26. In addition, Zeira teaches the method of power control, wherein determining the path loss includes: receiving a downlink signal transmitted from the base station, wherein the downlink signal signals a transmitted power level of the downlink signal; and measuring a received power level of the downlink signal (Page 2, lines 14-21; Page 4, lines 17-page 8).

Regarding claim 4, the combination of Zeira, Chen, and Van Lieshout teach all the claimed elements in claim 1. In addition, Zeira teaches the method of power control,

wherein determining the path loss further includes computing a difference between the signaled transmit power level and the measured received power level (Page 2, lines 1-lines 21; Page 5, lines 2-lines 4).

Regarding claims 7 and 33, the combination of Zeira, Chen, and Van Lieshout teach all the claimed elements in claim 1. In addition, Zeira teaches the method of power control, wherein the calculated the transmit power level is based on a spreading factor parameter (Page 13, lines 2-15).

Regarding claim 15, the combination of Zeira, Chen, and Van Lieshout teach all the claimed elements in claim 1. In addition, Zeira teaches the power control method, further comprising calculating a transmit power level for transmission by the remote transceiver on the scheduled uplink transmission resource based on the path loss and an accumulated TPC command (Page 4, line 17-Page 5, line 8).

Regarding claim 26, Zeira teaches a remote transceiver for a cellular communication system, the remote transceiver having a computer program for controlling power in a radio communication system, the computer program comprising instructions for:

determining a path loss for a radio channel between a base station and the remote transceiver (Page 2, lines 14- 21; Page 4, line 17-Page 5, line 8);

and

receiving a transmit power control (TPC) command (Page 4, line 17-Page 5, line 8);

calculating a transmit power level for the remote transceiver based on the path loss and an accumulated TPC command *(Page 4, line 18-Page 5, line 8, Zeira teaches the first station (base station) transmits power commands based on in part a reception quality of the received communications. The first station (base station) transmits a second communication (remote terminal) having a transmission power level in a first time slot. The second station receives the second communication and the power commands. A power level of the second communication as received is measured (calculated). A path loss estimate is determined based on in part the measured received second communication power level and the first communication power level),* except

However, in related art, Chen teaches on a downlink dedicated control channel (DCCH) channel used to carry allocation and scheduling information from the base station to the remote transceiver, receiving an allocation of a scheduled uplink transmission resource *(Paragraphs 0012,0052-0057, especially, paragraph 0012, Chen teaches it is an object of the present invention to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method. Paragraph 0054, Chen teaches the transmitting unit 15 is configured to notify the radio resources allocated by the resource allocating 14 to the mobile station via a downlink dedicated control channel (DCCH). Paragraph 0052, Chen teaches the resource allocating unit 14 is configured to allocate a radio resource which is used in uplink packet communications with the mobile station, by referring to the virtual buffer corresponding to the mobile station 30).*Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above

teaching of Chen to Zeira in order to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method (Chen, paragraph 0012).

Chen, further, teaches downlink dedicated control channel (DCCH) used to carry allocation and scheduling information (Paragraphs 0012,0052, and 0054, see above), but does not specifically teach on a shared physical channel used to carry allocation and scheduling information.

However, Van Lieshout teaches on a shared physical channel (shared radio channel) used to carry allocation and scheduling information (*Para. 0006, Van Lieshout teaches since the DRNC is in charge of scheduling how data is multiplexed in a frame on the shared radio channel and allocating particular radio resources, such as channelization codes and associated spreading factors, the DRNC can convey to the mobile radio, using the transport format indicator, these types of specific details to allow the mobile radio unit to decode information sent over the shared radio channel).* Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of van Lieshout to Zeira and Chen so that the mobile unit can find out the available resources that it can use from the base station.

Regarding claim 43, Zeira teaches a method of power control in a radio communications system (See Abstract), the method comprising, at a base station:

sending transmit power control (TPC) commands (Page 4, line 17-Page 5, line 8); and

receiving an uplink signal from the remote transceiver at a calculated transmit

power level based on a path loss and the TPC command *(Page 4, line 18-Page 5, line 8, Zeira teaches the first station (base station) transmits power commands based on in part a reception quality of the received communications. The first station (base station) transmits a second communication (remote terminal) having a transmission power level in a first time slot. The second station receives the second communication and the power commands. A power level of the second communication as received is measured (calculated). A path loss estimate is determined based on in part the measured received second communication power level and the first communication power level),* except on a shared physical channel used to carry allocation and scheduling information from the base station to a remote transceiver, sending an allocation of a scheduled uplink transmission resource.

However, in related art, Chen teaches on a downlink dedicated control channel (DCCH) channel used to carry allocation and scheduling information from the base station to the remote transceiver, sending an allocation of a scheduled uplink transmission resource *(Paragraphs 0012,0052-0057, especially, paragraph 0012, Chen teaches it is an object of the present invention to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method. Paragraph 0054, Chen teaches the transmitting unit 15 is configured to notify the radio resources allocated by the resource allocating 14 to the mobile station via a downlink dedicated control channel (DCCH). Paragraph 0052, Chen teaches the resource allocating unit 14 is configured to allocate a radio resource which is used in uplink packet communications with the mobile station, by referring to the*

*virtual buffer corresponding to the mobile station 30).*Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Chen to Zeira in order to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method (Chen, paragraph 0012).

Chen, further, teaches downlink dedicated control channel (DCCH) used to carry allocation and scheduling information (Paragraphs 0012,0052, and 0054, see above), but does not specifically teach on a shared physical channel used to carry allocation and scheduling information.

However, Van Lieshout teaches on a shared physical channel (shared radio channel) used to carry allocation and scheduling information (*Para. 0006, Van Lieshout teaches since the DRNC is in charge of scheduling how data is multiplexed in a frame on the shared radio channel and allocating particular radio resources, such as channelization codes and associated spreading factors, the DRNC can convey to the mobile radio, using the transport format indicator, these types of specific details to allow the mobile radio unit to decode information sent over the shared radio channel).* Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of van Lieshout to Zeira and Chen so that the mobile unit can find out the available resources that it can use from the base station.

Regarding claim 46, Zeira teaches a base station for a cellular communication system, the base station having a computer program stored therein and further for controlling power in a radio communication system (See Abstract), the computer

program comprising instructions for:

sending a transmit power control (TPC) command (Page 4, line 17-Page 5, line 8);

receiving an uplink signal from the remote transceiver at a calculated transmit power level based on a path loss and the TPC command *(Page 4, line 18-Page 5, line 8, Zeira teaches the first station (base station) transmits power commands based on in part a reception quality of the received communications. The first station (base station) transmits a second communication (remote terminal) having a transmission power level in a first time slot. The second station receives the second communication and the power commands. A power level of the second communication as received is measured (calculated). A path loss estimate is determined based on in part the measured received second communication power level and the first communication power level)*, but fails to teach on a shared physical channel used to carry allocation and scheduling information from the base station to the remote transceiver, sending an allocation of a scheduled uplink transmission resource.

However, in related art, Chen teaches on a downlink dedicated control channel (DCCH) channel used to carry allocation and scheduling information from the base station to the remote transceiver, sending an allocation of a scheduled uplink transmission resource *(Paragraphs 0012,0052-0057, especially, paragraph 0012, Chen teaches it is an object of the present invention to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method. Paragraph 0054, Chen teaches the transmitting unit 15 is*

*configured to notify the radio resources allocated by the resource allocating 14 to the mobile station via a downlink dedicated control channel (DCCH). Paragraph 0052, Chen teaches the resource allocating unit 14 is configured to allocate a radio resource which is used in uplink packet communications with the mobile station, by referring to the virtual buffer corresponding to the mobile station 30).*Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Chen to Zeira in order to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method (Chen, paragraph 0012).

Chen, further, teaches downlink dedicated control channel (DCCH) used to carry allocation and scheduling information (Paragraphs 0012,0052, and 0054, see above), but does not specifically teach on a shared physical channel used to carry allocation and scheduling information.

However, Van Lieshout teaches on a shared physical channel (shared radio channel) used to carry allocation and scheduling information (*Para. 0006, Van Lieshout teaches since the DRNC is in charge of scheduling how data is multiplexed in a frame on the shared radio channel and allocating particular radio resources, such as channelization codes and associated spreading factors, the DRNC can convey to the mobile radio, using the transport format indicator, these types of specific details to allow the mobile radio unit to decode information sent over the shared radio channel).* Therefore, it would have been obvious to one of ordinary skill in the art at the time of the

invention to provide the above teaching of van Lieshout to Zeira and Chen so that the mobile unit can find out the available resources that it can use from the base station.

Regarding claim 49, Zeira teaches a remote transceiver for supporting power control in a radio communication system, the remote transceiver comprising:

a signal processor for determining a path loss for a radio channel between a base station and the remote transceiver (Page 2, lines 14- 21; Page 4, line 17-Page 5, line 8); and

a receiver arranged to receive transmit power control (TPC) command *(Page 4, line 18-Page 5, line 8, Zeira teaches the first station (base station) transmits power commands based on in part a reception quality of the received communications. The first station (base station) transmits a second communication (remote terminal) having a transmission power level in a first time slot. The second station receives the second communication and the power commands. A power level of the second communication as received is measured (calculated). A path loss estimate is determined based on in part the measured received second communication power level and the first communication power level*;

wherein the signal processor is arranged to calculate a transmit power level for transmission by the remote transceiver on the scheduled uplink transmission resource based upon the path loss and the TPC command *(Page 4, line 18-Page 5, line 8, Zeira teaches the first station (base station) transmits power commands based on in part a reception quality of the received communications. The first station (base station) transmits a second communication (remote terminal) having a transmission power level*

in a first time slot. The second station receives the second communication and the power commands. A power level of the second communication as received is measured (calculated). A path loss estimate is determined based on in part the measured received second communication power level and the first communication power level), except on a shared physical channel used to carry allocation and scheduling information from the base station and an allocation of a scheduled uplink transmission resource.

However, in related art, Chen teaches on a downlink dedicated control channel (DCCH) channel used to carry allocation and scheduling information from the base station and an allocation of a scheduled uplink transmission resource *(Paragraphs 0012,0052-0057, especially, paragraph 0012, Chen teaches it is an object of the present invention to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method. Paragraph 0054, Chen teaches the transmitting unit 15 is configured to notify the radio resources allocated by the resource allocating 14 to the mobile station via a downlink dedicated control channel (DCCH). Paragraph 0052, Chen teaches the resource allocating unit 14 is configured to allocate a radio resource which is used in uplink packet communications with the mobile station, by referring to the virtual buffer corresponding to the mobile station 30).*Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Chen to Zeira in order to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method (Chen, paragraph 0012).

Chen, further, teaches downlink dedicated control channel (DCCH) used to carry allocation and scheduling information (Paragraphs 0012,0052, and 0054, see above), but does not specifically teach on a shared physical channel used to carry allocation and scheduling information.

However, Van Lieshout teaches on a shared physical channel (shared radio channel) used to carry allocation and scheduling information (*Para. 0006, Van Lieshout teaches since the DRNC is in charge of scheduling how data is multiplexed in a frame on the shared radio channel and allocating particular radio resources, such as channelization codes and associated spreading factors, the DRNC can convey to the mobile radio, using the transport format indicator, these types of specific details to allow the mobile radio unit to decode information sent over the shared radio channel).* Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of van Lieshout to Zeira and Chen so that the mobile unit can find out the available resources that it can use from the base station.

Regarding claim 50, Zeira teaches a base station for supporting power control in a radio communication system, the base station comprising:

a transmitter arranged to transmit to a remote transceiver and transmit power control (TPC) command *(Page 4, line 18-Page 5, line 8, Zeira teaches the first station (base station) transmits power commands based on in part a reception quality of the received communications. The first station (base station) transmits a second communication (remote terminal) having a transmission power level in a first time slot. The second station receives the second communication and the power commands. A*

power level of the second communication as received is measured (calculated). A path loss estimate is determined based on in part the measured received second communication power level and the first communication power level); and

a receiver arranged to receive an uplink signal from the remote transceiver at a calculated transmit power level based on a path loss and the TPC command (Page 2, lines 14- 21; Page 4, line 17-Page 5, line 8), except for on a shared physical channel used to carry allocation and scheduling information and an allocation of a scheduled uplink transmission resource.

However, in related art, Chen teaches on a downlink dedicated control channel (DCCH) channel used to carry allocation and scheduling information and an allocation of a scheduled uplink transmission resource *(Paragraphs 0012,0052-0057, especially, paragraph 0012, Chen teaches it is an object of the present invention to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method. Paragraph 0054, Chen teaches the transmitting unit 15 is configured to notify the radio resources allocated by the resource allocating 14 to the mobile station via a downlink dedicated control channel (DCCH). Paragraph 0052, Chen teaches the resource allocating unit 14 is configured to allocate a radio resource which is used in uplink packet communications with the mobile station, by referring to the virtual buffer corresponding to the mobile station 30).*Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Chen to Zeira in order to perform the efficient scheduling

processing and to allocate radio resources efficiently in the uplink high-speed packet communications method (Chen, paragraph 0012).

Chen, further, teaches downlink dedicated control channel (DCCH) used to carry allocation and scheduling information (Paragraphs 0012,0052, and 0054, see above), but does not specifically teach on a shared physical channel used to carry allocation and scheduling information.

However, Van Lieshout teaches on a shared physical channel (shared radio channel) used to carry allocation and scheduling information (*Para. 0006, Van Lieshout teaches since the DRNC is in charge of scheduling how data is multiplexed in a frame on the shared radio channel and allocating particular radio resources, such as channelization codes and associated spreading factors, the DRNC can convey to the mobile radio, using the transport format indicator, these types of specific details to allow the mobile radio unit to decode information sent over the shared radio channel).* Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of van Lieshout to Zeira and Chen so that the mobile unit can find out the available resources that it can use from the base station.

3. Claims 8 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zeira et al. (International Publication Number #WO 00/57574) in view of Chen et al. (US Pub. No. 2005/0025056) in view of Van Lieshout et al. (US Pub. No. 2001/0036823) and further in view of Shiu et al. (US Patent #6,983,166).

Regarding claims 8 and 34, the combination of Zeira, Chen, and Van Lieshout fails to teach the method of power control, wherein the calculated transmit power level is based on parameter associated with a selected transport format.

However, in related art, Shiu teaches the method of power control, wherein the calculated transmit power level is based on parameter associated with a selected transport format. (Col 3, lines 27-41).Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Shiu to Zeira, Chen, and Van Lieshout in order to adjust transmit power and achieve target block error rate (BLERs) (See Shiu, Col 3, line 31).

4. Claims 16,17,30,31,44,45,47, and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zeira et al. (International Publication Number #WO 00/57574) in view of Chen et al. (US Pub. No. 2005/0025056) in view of Van Lieshout et al. (US Pub. No. 2001/0036823) and further in view of Krishnan et al. (US Pub. No. 2005/0176455).

Regarding claims 16,30,44, and 47, the combination of Zeira, Chen, and Van Lieshout fail to teach the power control method, further comprising receiving a signal from the base station for instructing the remote transmitter to utilize only the accumulated TPC commands when deriving the calculated transmit power level, thereby disabling use of open loop power control and enabling use of closed loop power control only.

However, in related art, Krishnan teaches the power control method, further comprising receiving a signal from the base station for instructing the remote transmitter to utilize only the accumulated TPC commands when deriving the calculated transmit power level, thereby disabling use of open loop power control and enabling use of closed loop power control only (Paragraphs 0047-0050, especially, Paragraphs 0049-0050). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Krishnan to Zeira, Chen, and Van Lieshout in order to provide the transmitting terminal feedback regarding the power of signals received at the receiving terminal.

Regarding claim 17,31,45, and 48, the combination of Zeira, Chen, and Van Lieshout fail to teach the power control method, further comprising receiving a signal from the base station for instructing the remote transmitter to disregard the accumulated TPC command when deriving the calculated transmit power level, thereby enabling use of open loop power control only and disabling use of closed loop power control.

However, in related art, Krishnan teaches the power control method, further comprising receiving a signal from the base station for instructing the remote transmitter to disregard the accumulated TPC command when deriving the calculated transmit power level, thereby enabling use of open loop power control only and disabling use of closed loop power control (Paragraphs 0047-0050, especially, Paragraphs 0049-0050).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Krishnan to Zeira, Chen, and Van

Lieshout in order to provide the transmitting terminal feedback regarding the power of signals received at the receiving terminal.

(10) Response to Argument

5. Appellant's arguments, see pages 10-12, filed 12/03/2010, with respect to the rejection(s) of claim(s) 26,28,30-34 and 46-48 under 35 U.S.C. 101 and 112 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, Appellant's arguments with respect to claims 1-4,7,8,15-17,26,28,30-34, and 43-50 under 35 U.S.C. 103(a) have been fully considered but they are not persuasive.

Claims 1,26,43,46,49, and 50

(A) The Appellant argued that Van Lieshout does not teach allocating a scheduled uplink transmission resource and TCP command on a shared physical channel that is also used to carry allocation and scheduling information from a base station to a remote transceiver (See pages 13, after Rejections under 35 U.S.C. 103 (a), first to third paragraphs, lines 1-11).

In response to the argument (A), the examiner respectfully disagrees with the appellant's argument. First of all, the Examiner points to Zeira, page 2, lines 14-21 and page 4, line 17-page 5, line 8, teaches determining a path loss of a radio channel between a base station and the remote transceiver, receiving a transmit power control (TPC) command, calculating, at the remote transceiver, a transmit power level for

transmission by the remote transceiver on the scheduled uplink transmission resource based upon the path loss and the TPC command *(Page 4, line 18-Page 5, line 8, Zeira teaches the first station (base station) transmits power commands based on in part a reception quality of the received communications. The first station (base station) transmits a second communication (remote terminal) having a transmission power level in a first time slot. The second station receives the second communication and the power commands. A power level of the second communication as received is measured (calculated). A path loss estimate is determined based on in part the measured received second communication power level and the first communication power level).*

Further, the Examiner draws attention to paragraph [0012] , [0052], and [0054] of Chen et al., which states:

[0012] It is an object of the present invention to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method.

[0052] the resource allocating unit 14 is configured to allocate a radio resource which is used in uplink packet communications with the mobile station, by referring to the virtual buffer corresponding to the mobile station 30.

[0054] The transmitting unit 15 is configured to notify the radio resources allocated by the resource allocating 14 to the mobile station via a downlink dedicated control channel (DCCH).

As indicated by Chen et al. in paragraphs [0052] and [0054] that downlink dedicated control channel (DCCH) used to carry allocation and scheduling information

and receiving an allocation of a scheduled uplink transmission resource, but does not teach shared physical channel used to …….

On the other hand, the Examiner draws attentions to Paragraph [0006] of Van Lieshout et al. which states:

[0006] In one example implementation of the present invention, a computer-generated data signal, (e.g., generated in a computer in the DRNC), is transported on a separate transport bearer between the DRNC and the base station having a particular format. A frame number field includes a specific frame number identifying a frame on the shared radio channel. A transport format indicator field includes information relating to a particular radio channel resource in the corresponding frame. In one example implementation, the transport format indicator field includes an index to a transport format table previously stored in the mobile radio unit. In other words, the index addresses particular entries in the look-up table so the mobile can retrieve certain information that will allow it to receive and decode information intended for that mobile radio unit on the shared radio channel. For example, since the DRNC is in charge of **scheduling how data is multiplexed in a frame on the shared radio channel and allocating particular radio resources**, such as channelization codes and associated spreading factors, the DRNC can convey to the mobile radio, using the transport format indicator, these types of specific details to allow the mobile radio unit to decode information sent over the **shared radio channel**.

As indicated by the Van Lieshout et al. in paragraph [0006] of underlying part that on a shared physical channel (shared radio channel) used to carry allocation and scheduling information. Therefore, combining both, Chen et al. and Van Lieshout et al., teach the limitations “allocating a scheduled uplink transmission resource and TCP command on a shared physical channel that is also used to carry allocation and scheduling information from a base station to a remote transceiver”.

Therefore, the Examiner respectfully submits that the rejection of claims 1-4,7-8,15-17,26,28,30-34, and 43-50 under 35 U.S.C. 103(a) is proper.

(11) Related Proceeding(s) Appendix

6. No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Dominic E Rego/
Primary Examiner, Art Unit 2618

Conferees:

/DUC NGUYEN/
Supervisory Patent Examiner, Art Unit 2618

/Edward Urban/
Supervisory Patent Examiner, Art Unit 2618

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	Application Number	10917968
	Filing Date	2004-08-12
	First Named Inventor	Nicholas William Anderson
	Art Unit	2618
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	9147-96606-US (04-0108)

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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	Art Unit	2618
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	9147-96606-US (04-0108)

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☒ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ None

SIGNATURE

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Signature	/Steven G. Parmelee/	Date (YYYY-MM-DD)	2011-01-27
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(54) Outer loop/weighted open loop power control in a time division duplex communication system

(57) Outer loop/weighted open loop power control controls transmission power levels in a spread spectrum time division duplex communication station. A first communication station (110) transmits a communication to a second communication station including target adjustment information generated at the first station on the basis of measured error rates of communications from the second station to the first station. The second station receives the communication and measures its received power level. Bases on in part the received communication's power level and the communication's transmission power level, a path loss estimate is determined. A quality of the path loss estimate is also determined. The transmission power level for a communication from the second station to the first stations is based on in part weighting the path loss estimate in response to the estimate's quality and based on the receive target adjusted by the target adjustment information transmitted from the first station.

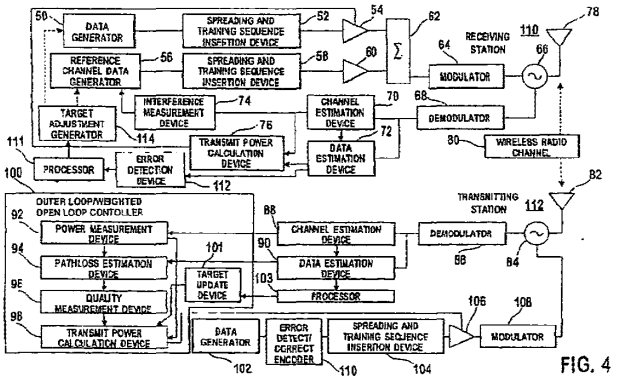


FIG. 4

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Description

BACKGROUND

[0001] This invention generally relates to spread spectrum time division duplex (TDD) communication systems. More particularly; the present invention relates to a system and method for controlling transmission power within TDD communication systems.

[0002] **Figure 1** depicts a wireless spread spectrum time division duplex (TDD) communication system. The system has a plurality of base stations $\mathbf{30_1}$-$\mathbf{30_7}$. Each base station $\mathbf{30_1}$ communicates with user equipment (UEs) $\mathbf{32_1}$-$\mathbf{32_3}$ in its operating area. Communications transmitted from a base station $\mathbf{30_1}$ to a UE $\mathbf{32_1}$ are referred to as downlink communications and communications transmitted from a UE $\mathbf{32_1}$ to a base station $\mathbf{30_1}$ are referred to as uplink communications.

[0003] In addition to communicating over different frequency spectrums, spread spectrum TDD systems carry multiple communications over the same spectrum. The multiple signals are distinguished by their respective chip code sequences (codes). Also, to more efficiently use the spread spectrum, TDD systems as illustrated in **Figure 2** use repeating frames **34** divided into a number of time slots $\mathbf{36_1}$-$\mathbf{36_n}$, such as sixteen time slots. In such systems, a communication is sent in selected time slots $\mathbf{36_1}$-$\mathbf{36_n}$ using selected codes. Accordingly, one frame **34** is capable of carrying multiple communications distinguished by both time slot and code. The combination of a single code in a single time slot is referred to as a resource unit. Based on the bandwidth required to support a communication, one or multiple resource units are assigned to that communication.

[0004] Most TDD systems adaptively control transmission power levels. In a TDD system, many communications may share the same time slot and spectrum. When a UE $\mathbf{32_1}$ or base station $\mathbf{30_1}$ is receiving a specific communication, all the other communications using the same time slot and spectrum cause interference to the specific communication. Increasing the transmission power level of one communication degrades the signal quality of all other communications within that time slot and spectrum. However, reducing the transmission power level too far results in undesirable signal to noise ratios (SNRs) and bit error rates (BERs) at the receivers. To maintain both the signal quality of communications and low transmission power levels, transmission power control is used.

[0005] One approach using transmission power control in a code division multiple access (CDMA) communication system is described in U.S. Patent No. 5,056,109 (Gilhousen et al.). A transmitter sends a communication to a particular receiver. Upon reception, the received signal power is measured. The received signal power is compared to a desired received signal power. Based on the comparison, a control bit is sent to the transmitter either increasing or decreasing transmission power by a fixed amount. Since the receiver sends a control signal to the transmitter to control the transmitter's power level, such power control techniques are commonly referred to as closed loop.

[0006] Under certain conditions, the performance of closed loop systems degrades. For instance, if communications sent between a UE and a base station are in a highly dynamic environment, such as due to the UE moving, such systems may not be able to adapt fast enough to compensate for the changes. The update rate of closed loop power control in TDD is typically 100 cycles per second which is not sufficient for fast fading channels. Accordingly, there is a need for alternate approaches to maintain signal quality and low transmission power levels.

SUMMARY

[0007] Outer loop/weighted open loop power control controls transmission power levels in a spread spectrum time division duplex communication system. At a first communication station, errors are measured in a received communication from a second communication station. Based on in part the measured errors, an adjustment in a target level is determined. The first station transmits a communication and the target adjustment to the second station. The second station measures the first station's communication's received power level. Based on in part the received power level, a path loss is determined. The target level is adjusted in response to receiving the target adjustment. The quality of the path loss is determined with respect to a subsequent communication to be transmitted from the second station. The second station's transmission power level for the subsequent communication is adjusted based on in part the determined path loss, the determined quality and the adjusted target level.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008]

Figure 1 illustrates a prior art TDD system.
Figure 2 illustrates time slots in repeating frames of a TDD system.
Figure 3 is a flow chart of outer loop/weighted open loop power control.
Figure 4 is a diagram of components of two communication stations using outer loop/weighted open loop power

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control.

Figure 5 is a graph of the performance of outer loop/weighted open loop, weighted open loop and closed loop power control systems.

Figure 6 is a graph of the three systems performance in terms of Block Error Rate (BLER).

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0009] The preferred embodiments will be described with reference to the drawing figures where like numerals represent like elements throughout. Outer loop/weighted open loop power control will be explained using the flow chart of **Figure 3** and the components of two simplified communication stations **110,112** as shown in **Figure 4.** For the following discussion, the communication station having its transmitter's power controlled is referred to as the transmitting station **112** and the communication station receiving power controlled communications is referred to as the receiving station **110**. Since outer loop/weighted open loop power control may be used for uplink, downlink or both types of communications, the transmitter having its power controlled may be associated with the base station $\mathbf{30_1}$, UE $\mathbf{32_1}$ or both. Accordingly, if both uplink and downlink power control are used, the receiving and transmitting station's components are associated with both the base station $\mathbf{30_1}$ and UE $\mathbf{32_1}$.

[0010] The receiving station **110** receives various radio frequency signals including communications from the transmitting station **112** using an antenna **78**, or alternately, an antenna array, **step 38**. The received signals are passed thorough an isolator **66** to a demodulator **68** to produce a baseband signal. The baseband signal is processed, such as by a channel estimation device **70** and a data estimation device **72,** in the time slots and with the appropriate codes assigned to the transmitting station's communication. The channel estimation device **70** commonly uses the training sequence component in the baseband signal to provide channel information, such as channel impulse responses. The channel information is used by the data estimation device **72,** the interference measurement device **74,** and the transmit power calculation device **76.** The data estimation device **72** recovers data from the channel by estimating soft symbols using the channel information.

[0011] Prior to transmission of the communication from the transmitting station **112,** the data signal of the communication is error encoded using an error detection/correction encoder **110.** The error encoding scheme is typically a circular redundancy code (CRC) followed by a forward error correction encoding, although other types of error encoding schemes may be used.

[0012] Using the soft symbols produced by the data estimation device **72,** an error detection device **112** detects errors in the soft symbols. A processor **111** analyzes the detected error and determines an error rate for the received communication, step 39. Based on the error rate, the processor **111** determines the amount, if any, a target level, such as a target signal to interference ration (SIR_{TARGET}),needs to be changed at the transmitting station **112**, **step 40.** Based on the determined amount, a target adjustment signal is generated by the target adjustment generator **114**. The target adjustment is subsequently sent to the transmitting station, **step 41**. The target adjustment is signaled to the transmitting station **112**, such as using a dedicated or a reference channel as shown in **Figure 4, step 41.**

[0013] One technique to determine the amount of adjustment in the target level uses an upper and lower threshold. If the determined error rate exceeds an upper threshold, the target level is set at an unacceptably low level and needs to be increased. A target level adjustment signal is sent indicating an increase in the target level. If the determined error rate is below a second threshold, the target level is set at an unnecessarily high level and the target level can be decreased. By reducing the target level, the transmitting station's power level is decreased reducing interference to other communications using the same time slot and spectrum. To improve performance, as soon as the error rate exceeds the upper limit, a target adjustment is sent. As a result, high error rates are improved quickly and lower error rates are adjusted slowly, such as once per 10 seconds. If the error rate is between the thresholds, a target adjustment is not sent maintaining the same target level.

[0014] Applying the above technique to a system using CRC and FEC encoding follows. Each CRC block is checked for an error. Each time a frame is determined to have an error, a counter is incremented. As soon as the counter exceeds an upper threshold, such as 1.5 to 2 times the desired block error rate (BLER), a target adjustment is sent increasing the target level. To adjust the SIR_{TARGET} at the transmitting station **112,** the increase in the SIR_{TARGET} is sent (SIR_{INC}), which is typically in a range of 0.25 dB to 4 dB. If the number of CRC frames encountered exceeds a predetermined limit, such as 1000 blocks, the value of the counter is compared to a lower threshold, such as 0.2 to 0.6 times the desired BLER. If the number of counted block errors is below the lower threshold, a target adjustment signal is sent decreasing the target level, SIR_{DEC}. A typical range of SIR_{DEC} is 0.25 to 4 dB. The value of SIR_{DEC}may be based on $SIR_{INC}$and a target block error rate, $BLER_{TARGET}$.The $BLER_{TARGET}$is based on the type of service. A typical range for the $BLER_{TARGET}$is 0.1% to 10%. **Equation 1** illustrates one such approach for determining SIR_{DEC}.

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$$SIR_{DEC} = SIR_{INC} \times BLER_{TARGET}/(1 - BLER_{TARGET}) \quad \text{Equation 1}$$

[0015] If the count is between the thresholds for the predetermined block limit, a target adjustment signal is not sent.

[0016] Alternately, a single threshold may be used. If the error rate exceeds the threshold, the target level is increased. If the error rate is below the threshold, the target is decreased. Additionally, the target level adjustment signal may have several adjustment levels, such as from 0 dB to ±4 dB in 0.25 dB increments based on the difference between the determined error rate and the desired error rate.

[0017] The interference measurement device **74** of the receiving station **110** determines the interference level in dB, I_{RS}, within the channel, based on either the channel information, or the soft symbols generated by the data estimation device **72**, or both. Using the soft symbols and channel information, the transmit power calculation device **76** controls the receiving station's transmission power level by controlling the gain of an amplifier **54.**

[0018] For use in estimating the pathloss between the receiving and transmitting stations **110,112** and sending data, the receiving station **110** sends a communication to the transmitting station **112, step 41**. The communication may be sent on any one of the various channels. Typically, in a TDD system, the channels used for estimating pathloss are referred to as reference channels, although other channels may be used. If the receiving station **110** is a base station **30_1**, the communication is preferably sent over a downlink common channel or a common control physical channel (CCPCH). Data to be communicated to the transmitting station **112** over the reference channel is referred to as reference channel data. The reference data may include, as shown, the interference level, I_{RS}, multiplexed with other reference data, such as the transmission power level, T_{RS}. The interference level, I_{RS}, and reference channel power level, I_{RS}, may be sent in other channels, such as a signaling channel.

[0019] The reference channel data is generated by a reference channel data generator **56.** The reference data is assigned one or multiple resource units based on the communication's bandwidth requirements. A spreading and training sequence insertion device **58** spreads the reference channel data and makes the spread reference data time-multiplexed with a training sequence in the appropriate time slots and codes of the assigned resource units. The resulting sequence is referred to as a communication burst. The communication burst is subsequently amplified by an amplifier **60.** The amplified communication burst may be summed by a sum device **62** with any other communication burst created through devices, such as a data generator **50,** spreading and training sequence insertion device **52** and amplifier **54.**

[0020] The summed communication bursts are modulated by a modulator **64.** The modulated signal is passed thorough an isolator **66** and radiated by an antenna **78** as shown or, alternately, through an antenna array. The radiated signal is passed through a wireless radio channel **80** to an antenna **82** of the transmitting station **112.** The type of modulation used for the transmitted communication can be any of those known to those skilled in the art, such as direct phase shift keying (DPSK) or quadrature phase shift keying (QPSK).

[0021] The antenna **82** or, alternately, antenna array of the transmitting station **112** receives various radio frequency signals including the target adjustments. The received signals are passed through an isolator **84** to a demodulator **86** to produce a baseband signal. The baseband signal is processed, such as by a channel estimation device **88** and a data estimation device **90,** in the time slots and with the appropriate codes assigned to the communication burst of the receiving station **110.** The channel estimation device **88** commonly uses the training sequence component in the baseband signal to provide channel information, such as channel impulse responses. The channel information is used by the data estimation device **90** and a power measurement device **92.**

[0022] The power level of the processed communication corresponding to the reference channel, R_{TS}, is measured by the power measurement device **92** and sent to a pathloss estimation device **94, step 42.** Both the channel estimation device **88** and the data estimation device **90** are capable of separating the reference channel from all other channels. If an automatic gain control device or amplifier is used for processing the received signals, the measured power level is adjusted to correct for the gain of these devices at either the power measurement device **92** or pathloss estimation device **94.** The power measurement device is a component of an outer loop/weighted open loop controller **100.** As shown in **Figure 4,** the outer loop/weighted open loop controller **100** comprises the power measurement device **92,** pathloss estimation device **94,** quality measurement device **94,** target update device **101,** and transmit power calculation device **98.**

[0023] To determine the path loss, L, the transmitting station **112** also requires the communication's transmitted power level, T_{RS}. The communication's transmitted power level, T_{RS}, may be sent along with the communication's data or in a signaling channel. If the power level, T_{RS}, is sent along with the communication's data, the data estimation device **90** interprets the power level and sends the interpreted power level to the pathloss estimation device **94.** If the receiving station **110** is a base station **30_1**, preferably the transmitted power level, T_{RS}, is sent via the broadcast channel (BCH) from the base station **30_1**. By subtracting the received communication's power level, R_{TS}, from the sent communication's transmitted power level, T_{RS}, the pathloss estimation device **94** estimates the path loss, L, between the

two stations **110,112, step 43.** Additionally, a long term average of the pathloss, L_0, is updated, **step 44.** The long term average of the pathloss, L_0, is an average of the pathloss estimates. In certain situations, instead of transmitting the transmitted power level, T_{RS}, the receiving station **110** may transmit a reference for the transmitted power level. In that case, the pathloss estimation device **94** provides reference levels for the pathloss, L.

[0024] Since TDD systems transmit downlink and uplink communications in the same frequency spectrum, the conditions these communications experience are similar. This phenomenon is referred to as reciprocity. Due to reciprocity, the path loss experienced for the downlink will also be experienced for the uplink and vice versa. By adding the estimated path loss to a target level, a transmission power level for a communication from the transmitting station **112** to the receiving station **110** is determined.

[0025] If a time delay exists between the estimated path loss and the transmitted communication, the path loss experienced by the transmitted communication may differ from the calculated loss. In TDD where communications are sent in differing time slots $\mathbf{36_1}$-$\mathbf{36_n}$, the time slot delay between received and transmitted communications may degrade the performance of an open loop power control system. To overcome these drawbacks, weighted open loop power control determines the quality of the estimated path loss using a quality measurement device **96, step 45,** and weights the estimated path loss accordingly, L, and long term average of the pathloss, L_0.

[0026] To enhance performance further in outer loop/weighted open loop, a target level is adjusted. A processor **103** converts the soft symbols produced by the data estimation device **90** to bits and extracts the target adjustment information, such as a SIR_{TARGET} adjustment. A target update device **101** adjusts the target level using the target adjustments, **step 46.** The target level may be a SIR_{TARGET} or a target received power level at the receiving station **110**.

[0027] The transmit power calculation device **98** combines the adjusted target level with the weighted path loss estimate, L, and long term average of the pathloss estimate, L_0, to determine the transmission power level of the transmitting station, **step 47**.

[0028] Data to be transmitted in a communication from the transmitting station **112** is produced by data generator **102**. The data is error detection/correction encoded by error detection/correction encoder **110.** The error encoded data is spread and time-multiplexed with a training sequence by the training sequence insertion device **104** in the appropriate time slots and codes of the assigned resource units producing a communication burst. The spread signal is amplified by an amplifier **106** and modulated by modulator **108** to radio frequency. The gain of the amplifier is controlled by the transmit power calculation device **98** to achieve the determined transmission power level. The power controlled communication burst is passed through the isolator **84** and radiated by the antenna **82.**

[0029] The following is one outer loop/weighted open loop power control algorithm. The transmitting stations's transmission power level in decibels, P_{TS}, is determined using **Equation 2.**

$$P_{TS} = SIR_{TARGET} + I_{RS} + \alpha(L-L_0) + L_0 + \text{CONSTANT VALUE} \qquad \text{Equation 2}$$

[0030] The SIR_{TARGET} has an adjusted value based on the received target adjustment signals. For the downlink, the initial value of SIR_{TARGET} is known at the transmitting station **112.** For uplink power control, SIR_{TARGET} is signaled from the receiving station **110** to the transmitting station **112.** Additionally, a maximum and minimum value for an adjusted SIR_{TARGET} may also be signaled. The adjusted SIR_{TARGET} is limited to the maximum and minimum values. I_{RS} is the measure of the interference power level at the receiving station **110.**

[0031] L is the path loss estimate in decibels, $T_{RS} - R_{TS}$, for the most recent time slot $\mathbf{36_1}$-$\mathbf{36_n}$ that the path loss was estimated. L_0, the long term average of the path loss in decibels, is the running average of the pathloss estimate, L. The CONSTANT VALUE is a correction term. The CONSTANT VALUE corrects for differences in the uplink and downlink channels, such as to compensate for differences in uplink and downlink gain. Additionally, the CONSTANT VALUE may provide correction if the transmit power reference level of the receiving station is transmitted, instead of the actual transmit power, T_{RS}. If the receiving station **110** is a base station, the CONSTANT VALUE is preferably sent via a Layer 3 message.

[0032] The weighting value, α, is a measure of the quality of the estimated path loss and is, preferably, based on the number of time slots $\mathbf{36_1}$-$\mathbf{36_n}$ between the time slot, n, of the last path loss estimate and the first time slot of the communication transmitted by the transmitting station **112.** The value of α is between zero and one. Generally, if the time difference between the time slots is small, the recent path loss estimate will be fairly accurate and α is set at a value close to one. By contrast, if the time difference is large, the path loss estimate may not be accurate and the long term average path loss measurement is most likely a better estimate for the path loss. Accordingly, α is set at a value closer to one.

[0033] **Equations 3** and **4** are equations for determining α.

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$$\alpha = 1 - (D - 1)/(D_{max}-1) \quad \text{Equation 3}$$

$$\alpha = \max \{ 1-(D-1)/(D_{max\text{-}allowed} -1), 0\} \quad \text{Equation 4}$$

The value, D, is the number of time slots $\mathbf{36_1}$-$\mathbf{36_n}$ between the time slot of the last path loss estimate and the first time slot of the transmitted communication which will be referred to as the time slot delay. If the delay is one time slot, α is one. D_{max} is the maximum possible delay. A typical value for a frame having fifteen time slots is seven. If the delay is D_{max}, α is zero $D_{max\text{-}allowed}$ is the maximum allowed time slot delay for using open loop power control. If the delay exceeds $D_{max\text{-}allowed}$, open loop power control is effectively turned off by setting $\alpha = 0$. Using the transmit power level, P_{TS}, determined by a transmit power calculation device **98** the transmit power of the transmitted communication is set.

[0034] **Figures 5** and **6** compare the performance of the weighted outer loop/open loop, open loop and closed loop systems. The simulations in **Figures 5** and **6** were performed for a slightly different version of the outer loop/weighted open loop algorithm. In this version, the target SIR is updated every block. A SIR_{TARGET} is increased if a block error was detected and decreased if no block error was detected. The outer loop/weighted open loop system used **Equation 2. Equation 3** was used to calculate α. The simulations compared the performance of the systems controlling a UE's $\mathbf{32_1}$ transmission power level. For the simulations, 16 CRC bits were padded every block. In the simulation, each block was 4 frames. A block error was declared when at least two raw bit errors occur over a block. The uplink communication channel is assigned one time slot per frame. The target for the block error rate is 10%. The SIR_{TARGET} is updated every 4 frames. The simulations address the performance of these systems for a UE $\mathbf{32_1}$ traveling at 30 kilometers per hour. The simulated base station used two antenna diversity for reception with each antenna having a three finger RAKE receiver. The simulation approximated a realistic channel and SIR estimation based on a midamble sequence of burst type 1 field in the presence of additive white Gaussian noise (AWGN). The simulation used an International Telecommunication Union (ITU) Pedestrian B type channel and QPSK modulation. Interference levels were assumed to have no uncertainty. Channel coding schemes were not considered. L_0 was set at 0 db.

[0035] Graph **120** of **Figure 5** shows the performance as expected in terms of the required E_S/N_O for a BLER of 10^{-1} as a function of time delay between the uplink time slot and the most recent downlink time slot. The delay is expressed by the number of time slots. E_s is the energy of the complex symbol. **Figure 5** demonstrates that, when gain/interference uncertainties are ignored, the performance of the combined system is almost identical to that of weighted open loop system. The combined system outperforms the closed loop system for all delays.

[0036] In the presence of gain and interference uncertainties, the transmitted power level of the open loop system is either too high or too low of the nominal value. In graph **122** of **Figure 6**, a gain uncertainty of -2 dB was used. **Figure 6** shows the BLER as a function of the delay. The initial reference SIR_{TARGET} for each system was set to its corresponding nominal value obtained from **Figure 5**, in order to achieve a BLER of 10^{-1}. **Figure 6** shows that, in the presence of gain uncertainty, both the combined and closed loop systems achieve the desired BLER. The performance of the weighted open loop system severely degrades.

Claims

1. A spread spectrum time division duplex user equipment communicating using frames with time slots for communication, comprising:

   means (82, 88, 92) for receiving, in a first time slot, a first communication having a transmit power level and measuring a power level of said communication;
   means (94) for determining a path loss estimate based in part on said measured power level and said received power level; the user equipment

   characterized by:

   means (96, 98 106) for setting a transmission power level for transmission of a second communication in a second time slot based in part on the path loss estimate weighted by a first factor and a long term path loss estimate weighted by a second factor, said first and second factors being a function of a time separation of the first and second time slots; and
   means (108, 82) for transmitting the second communication in the second time slot at the set transmission power level.

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2. The user equipment of claim 1 further **characterized by** comprising:

means (98) for determining the long term path loss estimate based at least in part upon an average of path loss estimates of communications received by the user equipment.

3. The user equipment of claim 2 further **characterized by** comprising:

means (96) for determining a quality, α, of the path loss estimate which is based in part on a number of slots, D, between the first and second time slot; and

wherein the first factor is $\alpha$and teh second factor is 1-α.

4. The user equipment of claim 3 further **characterized by** a maximum time slot delay is D_{max} and $\alpha$is determined by:

$$\alpha = 1 - (D - 1)/(D_{max}-1).$$

5. The user equipment of claim 3 further **characterized by** maximum allowed time slot delay is $D_{max\text{-}allowed}$and the determined quality, α, is determined by:

$$\alpha = \max \{1-(D-1)/(D_{max\text{-}allowed}-1), 0\}.$$

6. A spread spectrum time division duplex user equipment using frames with time slots for communication, comprising:

an antenna (82) for receiving a first communication in a first time slot and transmitting an amplified second communication in a second time slot;
a channel estimation device (88) having an input receiving said first communication for producing channel information;
a data estimation device (90) responsive to said first communication and said channel information for producing interpreted data;
a power measurement device (92) responsive to said channel information for determining a received power level of the first communication;
a path loss estimation device (94) responsive to said measured power level for producing a path loss estimate of the first communication; the user equipment

characterized by comprising:

a quality measurement device (96) for producing a quality measurement based at least in part upon a time separation of the first time slot and a second time slot;
a transmit power calculation device (98) responsive to said path loss estimate and said quality measurement for producing a power control signal based at least in part upon said path loss estimate weighted by a first factor and a long term path loss estimate weighted by a second factor, wherein the first and second factors are based in part on the quality measurement; and
an amplifier (106) receiving the power control signal and a second communication to be transmitted in the second time slot for amplifying the second communication responsive to the power control signal to produce the amplified second communication for transmission by the antenna.

7. The user equipment of claim 6 further comprising:

a data generator (102) for producing communication data;
a spreading and training sequence insertion device (104) having an input receiving the communication data for producing the second communication in the second time slot; and
a modulator (108) having an input receiving the amplified second communication for modulating the amplified second communication to radio frequency prior to transmission.

8. The user equipment of claim 6 further comprising:

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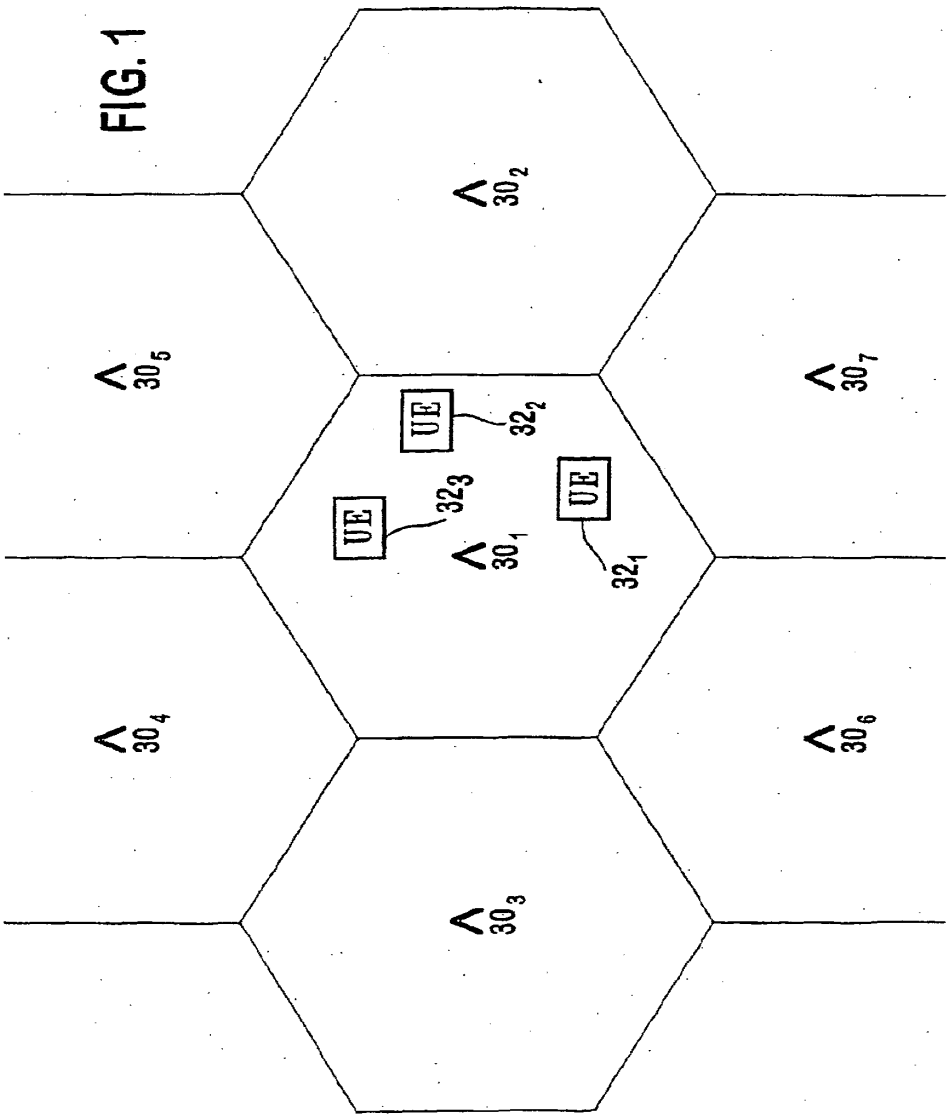
a demodulator (86) having an input receiving the received first communication for producing a baseband signal; and

wherein the channel estimation device (88) and the data estimation device (90) each have an input receiving the baseband signal.

9. The user equipment of claim 6 further **characterized by** the quality measurement is in the range of zero to one and the first factor is the quality measurement and the second factor is one minus the quality measurement.

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FIG. 1



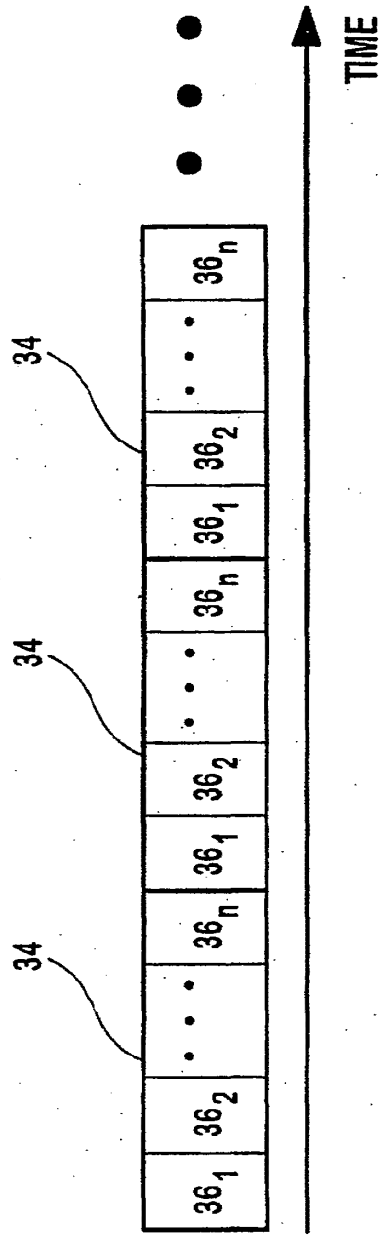
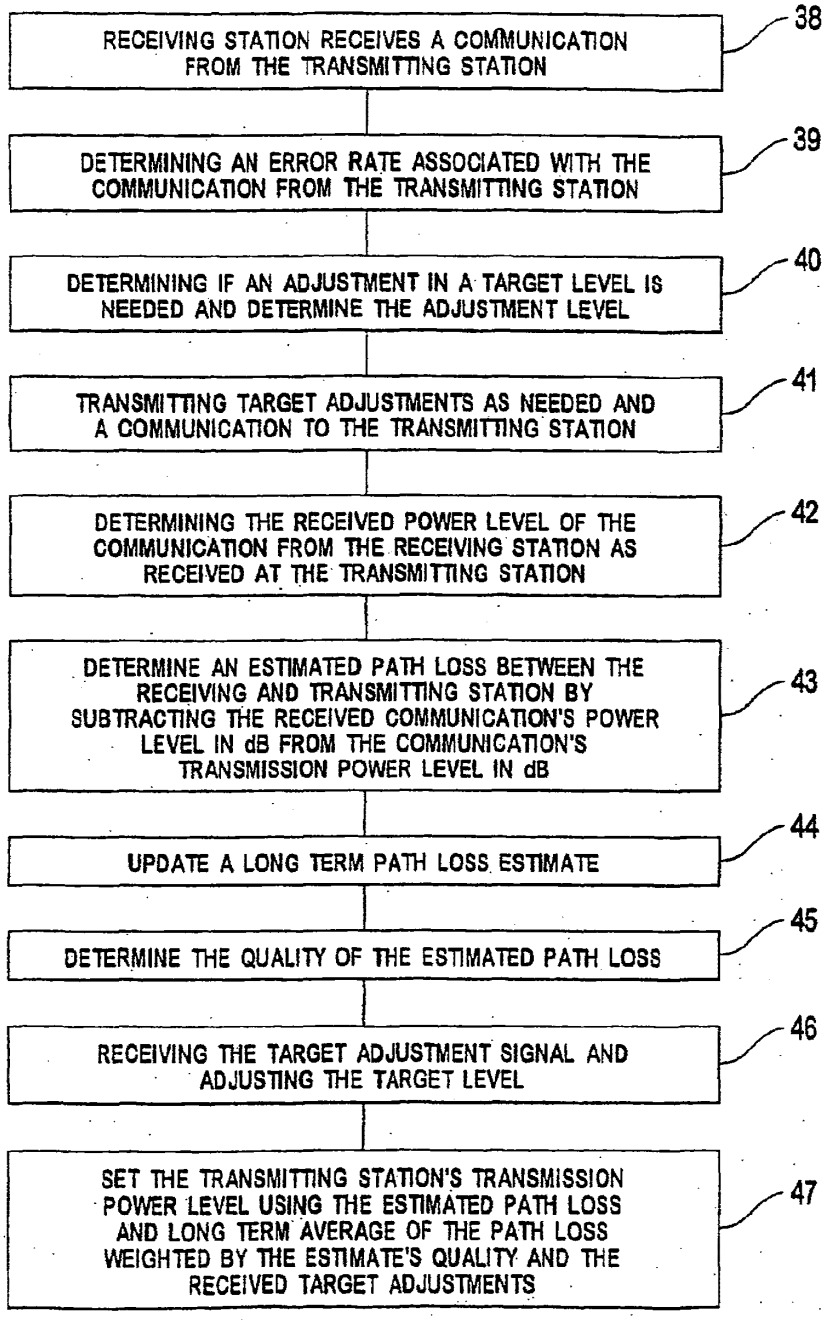


FIG. 2

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FIG. 3



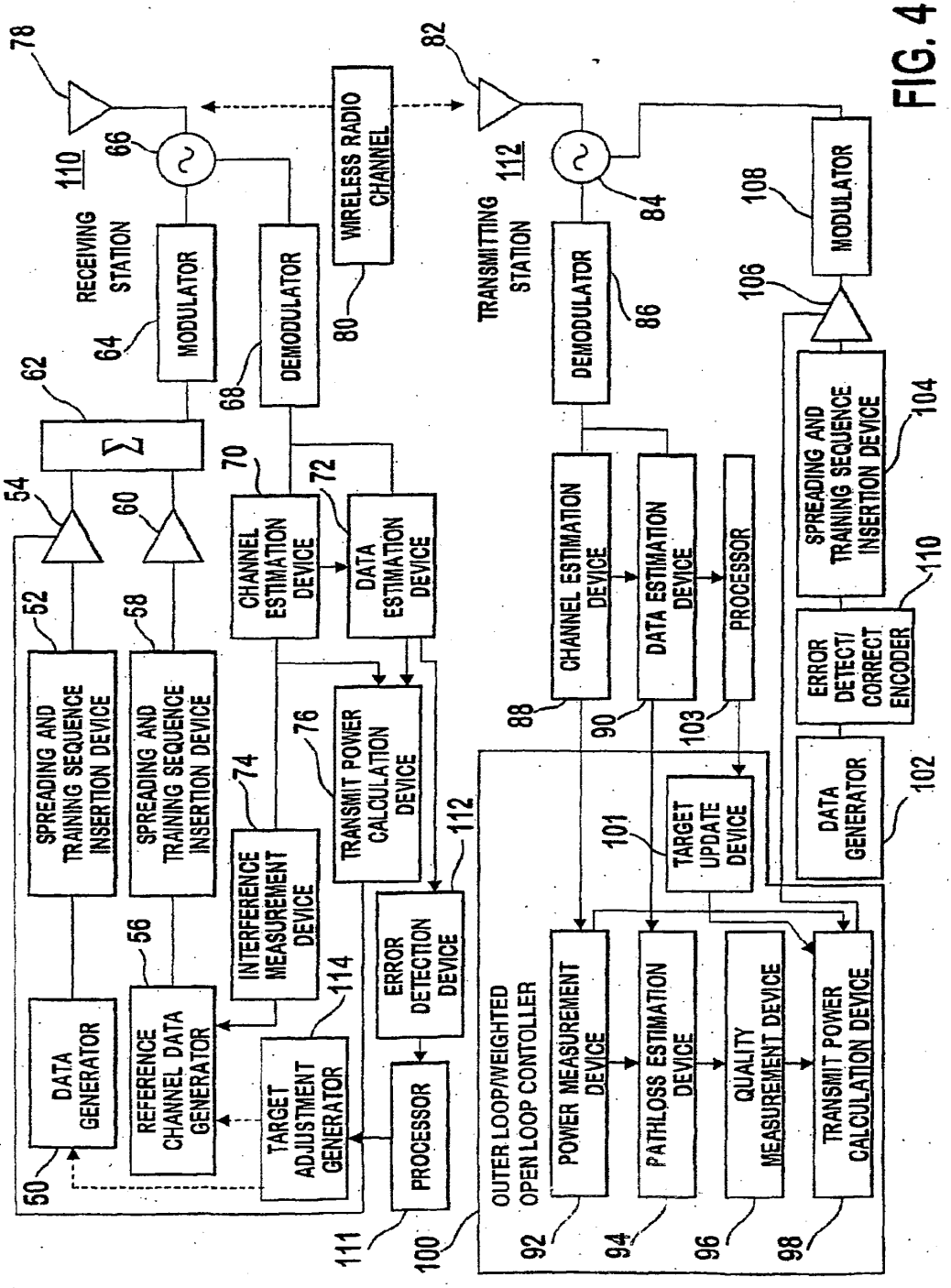


FIG. 4

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FIG. 5

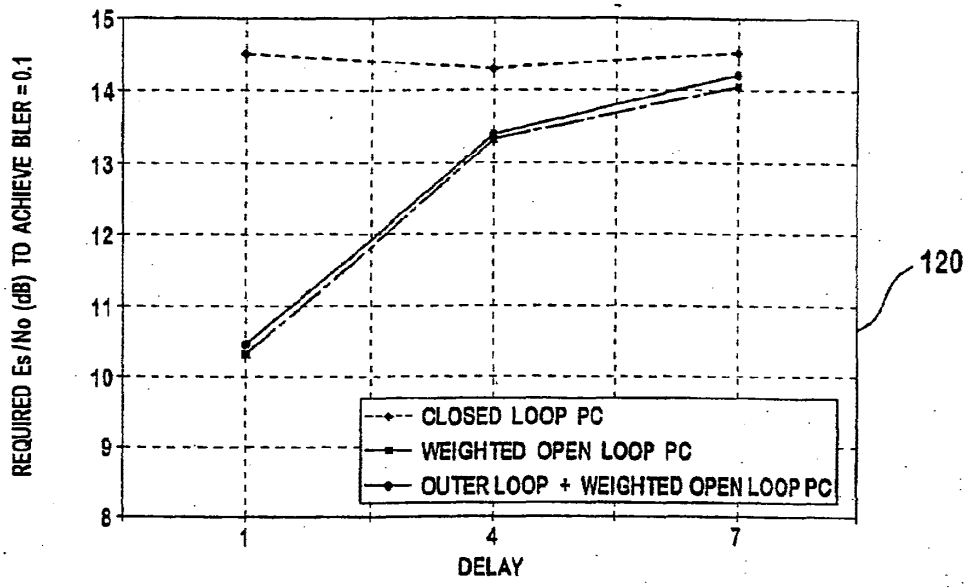
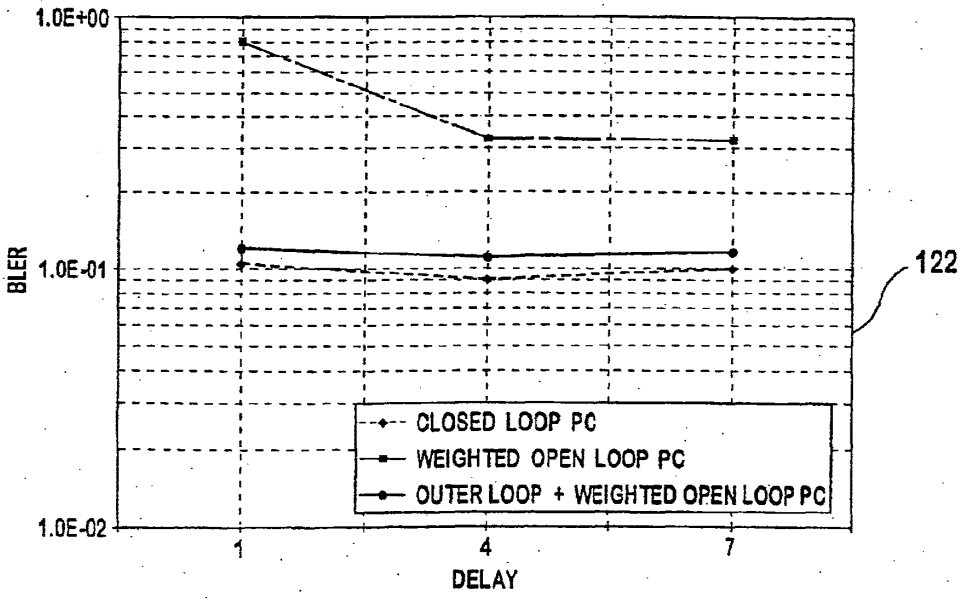

REQUIRED Es/No (dB) TO ACHIEVE BLER = 0.1
15
14
13
12
11
10
9
8
1
4
7
DELAY
CLOSED LOOP PC
WEIGHTED OPEN LOOP PC
OUTER LOOP + WEIGHTED OPEN LOOP PC
120

FIG. 6


BLER
1.0E+00
1.0E-01
1.0E-02
1
4
7
DELAY
CLOSED LOOP PC
WEIGHTED OPEN LOOP PC
OUTER LOOP + WEIGHTED OPEN LOOP PC
122

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 01 9004

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A	WO 97 49197 A (HONKASALO ZHICHUN ;NOKIA MOBILE PHONES LTD (FI); JOKINEN HARRI (FI)) 24 December 1997 (1997-12-24) * abstract; figure 1 * * page 4, line 21 - page 5, line 11 * * page 6, line 13 - page 7, line 3 * * page 7, line 18 - line 29 * * page 11, line 18 - page 12, line 16 *	1-9	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	8 October 2003	Sieben, S

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X : particularly relevant if taken alone
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A : technological background
O : non-written disclosure
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E : earlier patent document, but published on, or after the filing date
D : document cited in the application
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EPO FORM 1503 03.82 (P04C01)

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 03 01 9004

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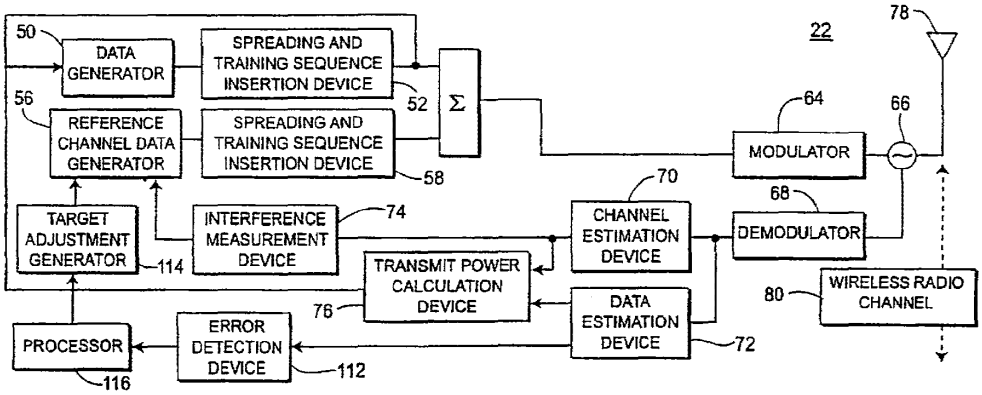
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Published:
— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: DOWNLINK POWER CONTROL FOR MULTIPLE DOWNLINK TIME SLOTS IN TDD COMMUNICATION SYSTEMS



(57) Abstract: The present invention is a method and system for controlling downlink transmission power levels in a spread spectrum time division communications system having frames with time slots for communication, which receives at a user equipment (UE) a downlink communication from a base station and determines an error rate of the received communication. The UE then produces power level adjustments for each of the time slots based in part on the error rate and transmits an uplink communication to the base station which includes the power level. In response to the power level adjustments and(or) other information, transmission power level is set for each time slot in the downlink communication.

WO 01/84740 A2

[0001] DOWNLINK POWER CONTROL FOR MULTIPLE DOWNLINK TIME SLOTS IN TDD COMMUNICATION SYSTEMS

[0002] BACKGROUND

[0003] This invention generally relates to spread spectrum time division duplex (TDD) communication systems. More particularly, the present invention relates to a system and method for controlling downlink transmission power within TDD communication systems.

[0004] Spread spectrum TDD systems carry multiple communications over the same spectrum. The multiple signals are distinguished by their respective chip code sequences (codes). Referring to Figure 1, TDD systems use repeating frames 34 divided into a number of time slots 37_1-37_n, such as fifteen time slots. In such systems, a communication is sent in a selected time slot out of the plurality of time slots 37_1-37_n using selected codes. Accordingly, one frame 34 is capable of carrying multiple communications distinguished by both time slot and code. The combination of a single code in a single time slot is referred to as a physical channel. Based on the bandwidth required to support a communication, one or multiple physical channels are assigned to that communication.

[0005] Most TDD systems adaptively control transmission power levels. In a TDD system, many communications may share the same time slot and spectrum. While user equipment (UE) 22 is receiving a downlink transmission from a base station, all the other communications using the same time slot and spectrum cause

interference to the specific communication. Increasing the transmission power level of one communication degrades the signal quality of all other communications within that time slot and spectrum. However, reducing the transmission power level too far results in undesirable signal to noise ratios (SNRs) and bit error rates (BERs) at the receivers. To maintain both the signal quality of communications and low transmission power levels, transmission power control is used.

[0006] The standard approach to TDD downlink power control is a combination of inner and outer loop control. In this standard solution, the UE transmits physical layer transmit power control (TPC) commands to adjust the base station transmission power. A base station sends a transmission to a particular UE. Upon receipt, the UE measures the signal interference ratio (SIR) in all time slots and compares this measured value to a SIR_{TARGET}. This SIR_{TARGET} is generated from the Block Error Rate (BLER) signaled from the base station.

[0007] As a result of the comparison of the measured SIR value with the SIR_{TARGET}, the UE transmits a TPC command to the base station. The standard approach provides for a TPC command per coded composite transport channel (CCTrCH). The CCTrCH is a physical channel which comprises the combined units of data for transmission over the radio interface to and from the UE or base station. This TPC command indicates to the base station to adjust the transmission power level of the downlink communication. The base station, which is set at an initial transmission power level, receives the TPC command and adjusts the transmit power level in all time slots associated with the CCTrCH in unison.

[0008] This approach to TDD downlink power control works well as long as the interference in each time slot is the same. Unfortunately, in most cases, the interference in each time slot is different. A small difference may be acceptable due to the averaging effect of the interleaving, but larger differences cause degradation due to thresholding effects in the receiver. This requires the receiver to have a wider dynamic range and unnecessarily high transmit power in some time slots. An adjustment made to the base station SIR_{TARGET} for all time slots based on the error value may create an unbalanced increase or decrease of the power level. In other words, those time slots where the power level was lower than the initial value of the base station will be adjusted even lower when the calculated error value was higher than the SIR_{TARGET}. These low level power time slots may then be eliminated from detection, thereby the transmission will be degraded. The same is true for those time slots in which the power level was higher than the SIR_{TARGET} of the base station. When the detected error rate is lower than the SIR_{TARGET}, the higher power level time slots will be increased, thereby creating interference with other channels on the system.

[0009] Accordingly, there is a need to have an approach to TDD downlink power control which adjusts the power level of each slot individually.

[0010] SUMMARY

[0011] The present invention is a method and system for controlling downlink transmission power levels in a spread spectrum time division communication system having frames with time slots for communication, which receives at a user equipment

(UE) a downlink communication from a base station and determines an error rate of the received communication. The UE then produces power level adjustments for each of the time slots based in part on the error rate and transmits an uplink communication to the base station which includes the power level adjustment for each of the time slots. In response to the power level adjustments transmission power level is set for each time slot in the downlink communication.

[0012] BRIEF DESCRIPTION OF THE DRAWING(S)

[0013] Figure 1 illustrates time slots in repeating frames of a TDD system.

[0014] Figure 2 illustrates a simplified wireless TDD system.

[0015] Figures 3A and 3B illustrate block diagrams of a UE and base station, respectively.

[0016] Figure 4 illustrates a flow diagram of a first embodiment.

[0017] Figure 5 illustrates a flow diagram of a second embodiment.

[0018] Figure 6 illustrates a block diagram of the base station made in accordance with the second embodiment.

[0019] Figure 7 illustrates a flow diagram of a third embodiment.

[0020] Figure 8 illustrates a flow diagram of a fourth embodiment.

[0021] Figure 9 illustrates a flow diagram of a fifth embodiment.

[0022] Figure 10 illustrates a flow diagram of a sixth embodiment.

[0023] Figure 11 illustrates a flow diagram of a seventh embodiment.

[0024] DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

[0025] The preferred embodiments will be described with reference to the drawing figures where like numerals represent like elements throughout.

[0026] Figure 2 illustrates a simplified wireless spread spectrum code division multiple access (CDMA) or time division duplex (TDD) communication system 18. The system 18 comprises a plurality of node Bs 26, 32, 34, a plurality of radio network controllers (RNC), 36, 38, 40, a plurality of UEs 20, 22, 24 and a core network 46. The plurality of node Bs 26, 32, 34 are connected to a plurality RNCs 36, 38, 40, which are, in turn, connected to the core network 46. Each Node B, such as Node B 26, communicates with its associated user equipment 20-24 (UE). The Node B 26 has a single site controller (SC) associated with either a single base station 30_1, or multiple base stations $30_1...30_n$.

[0027] Although the present invention is intended to work with one or more UEs, Node Bs and RNCs, for simplicity of explanation, reference will be made hereinafter to the operation of a single UE in conjunction with its associated Node B and RNC.

[0028] Referring to Figure 3A, the UE 22 comprises an antenna 78, an isolator or switch 66, a modulator 64, a demodulator 68, a channel estimation device 70, data estimation device 72, a transmit power calculation device 76, an interference measurement device 74, an error detection device 112, a processor 111, a target adjustment generator 114, a reference channel data generator 56, a data generator 50, and two spreading and training sequence insertion devices 52, 58.

[0029] The UE 22 receives various radio frequency (RF) signals including communications from the base station 30_1 over the wireless radio channel using an antenna 78, or alternatively an antenna array. The received signals are passed through a T/R switch 66 to a demodulator 68 to produce a baseband signal. The baseband signal is processed, such as by a channel estimation device 70 and a data estimation device 72, in the time slots and with the appropriate codes assigned to the UEs 22 communication. The channel estimation device 70 commonly uses the training sequence component in the baseband signal to provide channel information, such as channel impulse responses. The channel information is used by the data estimation device 72, the interference measurement device 74 and the transmit power calculation device 76. The data estimation device 72 recovers data from the channel by estimating soft symbols using the channel information.

[0030] Prior to transmission of the communication from the base station 30_1, the data signal of the communication is error encoded using an error detection/correction encoder 112. The error encoding scheme is typically a cyclic redundancy code (CRC) followed by a forward error correction encoding, although other types of error encoding schemes may be used. As those skilled in the art know, the data is typically interleaved over all of the time slots and all codes.

[0031] Using the soft symbols produced by the data estimation device 72, the error detection device 112 detects errors in the frame. Each time a frame is determined to have an error, a counter is incremented. This counter value becomes the block error rate (BLER). A processor 111 in the UE 22 typically determines a target signal to

interference ratio SIR value based on the measured BLER and determines a signal to interference ratio SIR_{UE} for all time slots. Based on the SIR_{UE}, the processor 111 determines the adjustment of the base station transmit power by comparing the SIR_{UE} with the SIR_{TARGET}. Based on this comparison, a TPC command is generated by the target adjustment generator 114 for each time slot. Each TPC command is subsequently sent to the base station.

[0032] In a first embodiment of the present invention, the target adjustment generator 114 in the UE 22 generates and transmits TPC commands in each time slot of the CCTrCH. The TPC command in each time slot indicates to the base station 30_1 to adjust the downlink transmission power level for each time slot. The uplink physical channel comprises these TPC commands for each slot associated with the CCTrCH, and is communicated to the base station for processing. These TPC commands may be transmitted in a single uplink physical channel, or spread over several uplink physical channels.

[0033] Referring to Figure 3B, a base station made in accordance with the first embodiment of the present invention is illustrated. The antenna 82 or, alternately, antenna array of the base station 30_1 receives various RF signals including the TPC commands. The received signals are passed via a switch 84 to a demodulator 86 to produce a baseband signal. Alternatively separate antennas may be used for transmit or receive functions. The baseband signal is processed, such as by a channel estimation device 88 and a data estimation device 90, in the time slots and with the appropriate codes assigned to the communication burst of the UE 22. The channel

estimation device 88 commonly uses the training sequence component in the baseband signal to provide channel information, such as channel impulse responses. The channel information is used by the data estimation device 90. The data information is provided to the transmit power calculation device 98 by processor 103.

[0034] Processor 103 converts the soft symbols produced by the data estimation device 90 to bits and extracts the TPC commands for each time slot associated with the CCTrCH. The transmit power calculation device 98 combines the TPC commands with the SIR_{target} to determine the transmission power for each time slot associated with the CCTrCH.

[0035] Data to be transmitted from the base station 30_1 is produced by data generator 102. The data is error detection/correction encoded by error detection/correction encoder 110. The error encoded data is spread and time-multiplexed with a training sequence by the training sequence insertion device 104 in the appropriate time slot(s) and code(s) of the assigned physical channels, producing a communication burst(s). The spread signal is amplified by an amplifier 106 and modulated by modulator 108 to radio frequency. The gain of the amplifier is controlled by the transmit power calculation device 98 to achieve the determined transmission power level for each time slot. The power controlled communication burst(s) is passed through the isolator 84 and radiated by the antenna 82.

[0036] A flow diagram illustrating the method of downlink power control in accordance with the first embodiment of the present invention is shown in Figure 4. The UE 22 receives a downlink signal from the base station 30_1, (step 401), which is

then processed by the UE 22 (step 402). The UE 22 then determines the SIR for each time slot of the CCTrCH and compares it to the SIR_{target} (step 403). The UE then generates a TPC command for each time slot (step 404). The TPC commands are transmitted to the base station 30_1 associated with the UE 22, (step 405), which adjusts the transmission power per time slot of the CCTrCH (step 406).

[0037] The use of TPC commands for every time slot provides the communication system with a simple method of equalizing the signal to interference ratio (SIR) in all downlink slots. Since the interference level in different time slots is generally different, this method of the first embodiment of the present invention accounts for this difference and generates a separate TPC command for each time slot to adjust the power level of each time slot in the downlink signal.

[0038] A second embodiment of the present invention presents an alternative approach for balancing the adjustment to the power level individually in each time slot, during downlink transmission by utilizing the time slot interference data from each time slot, a measured downlink interference signal code power (ISCP). This ISCP measurement is made by the UE 22 from time to time, determined by interference rate of change and the amount of interference difference that can be tolerated by the UE 22 without degradation.

[0039] This second embodiment utilizes the time slot interference data from each time slot to equalize the SIR in different slots to counter the fact that the interference is different in each slot. As will be explained in greater detail hereinafter, a TPC command per CCTrCH along with interference information for each slot are

used to adjust the transmission power. The difference between the interference in different time slots modifies the values that are obtained from the TPC commands. Therefore, although the interference in each time slot may be different, use of the ISCP information maintains approximately the same SIR in all time slots.

[0040] The UE 22, at each frame, sends a TPC command that corresponds to the average SIR in all time slots that belong to the same CCTrCH. The base station 30_1, then constructs an average transmit power per CCTrCH based on the received TPC commands. As will be explained in greater detail hereinafter, the base station 30_1, then modifies the average power to obtain the transmit power for each time slot for the CCTrCH, based on the relevant interference data and the time slot mapping used. It should be noted that this alternate approach allows the use of multiple spreading factors.

[0041] Referring to Figure 6, a base station made in accordance with this second embodiment is illustrated. The transmit power calculation device 698 within the base station 30_1 initializes the downlink power control approach of the second embodiment by combining the interference and spreading code information to estimate equivalent power obtained from the TPC commands P.

$$\bar{P} = (F/N) \sum_j I_j \sum_k 1/S_{jk} \qquad \text{Equation 1}$$

where j and k refer to time slot and physical channel respectively; N is the total number of physical channels at spreading factor of 16 in one slot. I_j represents the interference in time slot j, j = 1,...N; F is a scaling factor and $1/S_{jk}$ is the spreading factor.

[0042] The transmit power calculation device 698 then, using the interference per time slot and the mapping information stored in the base station data base 696, calculates the scaling factor F in accordance with the following equation:

$$F = NP/(\sum_j I_j \sum_k 1/S_{jk}) \qquad \text{Equation 2}$$

and the transmit power for all physical channels P_{jk} according to Equation 3:

$$P_{jk} = FI_j/1/S_{jk} \qquad \text{Equation 3}$$

The power per time slot is defined as:

$$P_j = FI_j \sum_k 1/S_k \qquad \text{Equation 4}$$

During steady state operation, the transmit power calculation device 698 updates the scaling factor F for each physical channel whenever new downlink interference signal code power (ISCP) measurements I for each time slot associated with the particular downlink CCTrCH are available. In order for the transmit power calculation device 698 to calculate the scaling factor F, the spreading factor for each physical channel is

used. The transmit power calculation device 698 calculates the transmit power using the ISCP measurement I which is made available to the transmit power calculation device 698 either periodically or whenever new interference information warrants an update.

[0043] When a new ISCP measurement I is made, the measurement is transferred to the base station 30_1 for calculation of the transmit power for each physical channel. If a new ISCP measurement I is not available, the TPC command from the UE 22 is used to modify

P in the standard way, and the transmit power for all physical channels P_{jk} is calculated therefrom.

[0044] Referring to Figure 5, a flow diagram of downlink power control in accordance with this second embodiment is illustrated. The UE 22 receives a downlink communication from the base station 30_1 (step 501). If the UE 22 determines an updated ISCP measurement is required, the UE 22 makes an ISCP measurement for each time slot in the downlink communication and forwards the new ISCP measurements to the base station 30_1 (step 502). Otherwise the UE 22 generates a TPC command and forwards it to the base station (step 503). The base station 30_1 calculates the scaling factor for all physical channels (step 504) using the TPC command or ISCP measurement from the UE 22. The transmission power level for each time slot is then calculated by the base station 30_1 (step 505) and the downlink signal updated accordingly (step 506).

[0045] It should be noted that even though the second embodiment has been described with the base station storing all required information and conducting all calculations on its own, the Node B 26 and RNC 36 may perform this function instead. Referring to Figure 6, a flow diagram illustrates a third embodiment downlink power control system wherein the Node B 26 and RNC 36 are involved. The UE 22 receives a downlink communication from the base station 30_1 (step 701). If the UE 22 determines an updated ISCP measurement is required, the UE 22 makes an ISCP measurement for each time slot in the downlink communication and forwards the new ISCP measurements to the RNC 36 (step 702). Otherwise the UE 22 generates a TPC command and forwards it to the base station RNC 36 (step 703). If the downlink power control system is set up to have the RNC 36 calculate the transmit power, the transmit power for each time slot is calculated by the RNC 36 (step 704) and then forwarded to the Node B 26 in order to update the base station 30_1 downlink signal (step 706). If the Node B 26 is setup to calculate the transmit power, the RNC 36 transmits the ISCP or TPC connected to the Node B 26 (step 705) where the transmit power for each time slot is calculated (step 706).

[0046] A fourth embodiment for downlink power level control utilizes time slot interference data similar to that disclosed in the second embodiment above. In this approach though, time slot interference is calculated from knowledge of the allocated downlink physical channels by the base station 30_1, and loading information and path loss from all neighbor base stations to the UE 22, rather than requiring explicit ISCP measurements from the UE 22. Each base station, such as base station 30_1, knows all

allocated channel configurations for the UE's 22 specific base station 30_1, as well as other neighbor base stations $30_2 \ldots 30_n$. Obviously, if there is only one base station 30_1, no additional information from other base stations is required. The base station 30_1 must also know the load and path loss information of all neighboring base stations from the neighboring base stations to the UE 22.

[0047] When there are multiple base stations, the UE 22 typically measures the primary common control physical channel (PCCPCH) power of base stations under the control of its base station's Node B 26 and all other base stations. The base station 30_1 uses the known PCCPCH transmission power and the power measurement of same as received by the UE to estimate the path loss between the UE and each of the neighbor base stations.

[0048] Referring again to Figure 6, the base station database 696 has stored therein the loading information which specifies the physical channels in the neighbor base station by time slot. This loading information is combined with the PCCPCH. The received signal code power (RSCP) for the particular base station is used to estimate the interference effect of the neighboring base station. From these calculations, the interference at the UE 22 can be calculated. For a non-multiple user detection (MUD) UE, the interference of its associated base station and the interference of the neighboring base stations are used to calculate this value. For a MUD UE, interference generated by the UE's associated base station is excluded from the UE interference value.

[0049] The estimated interference, I(n), using known loading information is calculated by the transmit power calculation device 698 as:

$$I(n) = \sum P_j(n) L_j(n) \qquad \text{Equation 5}$$

Applying this estimated interference value to Equations 1 through 4, the transmit power calculation device 698 calculates the transmit power for each time slot.

[0050] Referring to Figure 8, a flow diagram of downlink power control in accordance with this fourth embodiment is illustrated. The base station 30_1 calculates the estimated interference I for each time slot (step 801) and then calculates the transmission power level for each time slot (step 802) using Equations 1 thru 5 above, which updates the base station downlink signal is updated (step 803).

[0051] Again it should be noted that the node B 26 and RNC 36 may also conduct the function of storing all required information and calculating the estimated interference and the transmit power for each time slot. Referring to Figure 9, a flow diagram of downlink power control in accordance with this fifth embodiment is illustrated. The RNC 16 calculates an estimated interference I for each time slot (step 901). If the system is configured such that the node B 26 calculates the transmit power, the RNC 36 forwards the estimated interference I to the node B 26 (step 902) where the transmit power for all physical channels is calculated (step 903), and the base station downlink signal updated (step 904). Otherwise the RNC 36 calculates the transmission power for each the slot (step 903).

[0052] Since physical channels are allocated by the RNC in advance of actual physical transmission, it is possible for a Node B to calculate the expected UE interference for the frame being transmitted in real time. The real time interference calculation allows for the correct transmission power for each time slot for the frame being transmitted.

[0053] A sixth embodiment of the present invention utilizes the combination of the measured and estimated interference approaches disclosed above to control downlink power. In this approach, the base station 30_1 combines weighted interference values for both the estimated interference and measured interference to calculate the transmission power per time slot of the CCTrCH. For MUD UE, the relevant interference (that affects detection performance) in each slot is denoted as:

$$I_D(n) = \sum_{allj \neq 0} P_j(n)L_j(n) \qquad \text{Equation 5}$$

where $P_j(n)$ is the transmission power of base station j at time n in a certain slot, P_0, being the transmission power of the UE's base station 30_1. $L_j(n)$ denoting the corresponding path loss. For a non-MUD UE, the relevant interference is denoted as:

$$I_D(n) = \sum_{all\ j} P_j(n)L_j(n) \qquad \text{Equation 6}$$

The measured interference $I_D(n)$, though, will be reported by the UE as an ISCP measurement. Equations 5 and 6 are merely illustrative of this interference present in the communication system:

[0054] The estimated interference is denoted as:

$$I(n) = \sum P_j(n) L_j(n) \qquad \text{Equation 7}$$

Where the summation is carried over all known interferers whose load and path loss to the UE are known. Similar to the fifth embodiment, load information is known by the base station 30_1 for all j. Any interference from a load UE not known is designated as the residual interference $I_j(n)$, $I_f(n) = I(n) - I_D(n)$. From each of these interference values, the transmission power device 698 combines them to generate a more accurate interference power value to be used in the estimation of the downlink transmission power for each time slot, defined by Equations 1 thru 4. The combined interference power value is defined as:

$$I = \alpha I_f + \beta I + \gamma I_D, \alpha + \beta + \gamma = 1 \qquad \text{Equation 8}$$

where coefficients α, β and γ are determined per system or even per slot according to measurement delays or existence of foreign base stations.

[0055] Illustrated in Figure 10 is a flow diagram of the downlink power control system in accordance with the sixth embodiment. The base station 30_1 receives a

communication from the UE_{22} including an ISCP interference measurement I_D for each time slot (step 1001). The transmission power calculation device 698 then calculates an estimated interference value I using information stored in the base station database 698 (step 1002). A residual interference value I_F is then calculated by the transmission power calculation (step 1003). The transmission power calculation device then combines the three interference values I_D, I, I_F (step 1004) and calculates the transmission power for each time slot of the downlink communication (step 1005).

[0056] Similar to the previous embodiments, the RNC 36 and Node B 26 may calculate the transmission power for each time slot as described above in a seventh embodiment. Referring to Figure 11, a flow diagram of this embodiment is illustrated. The RNC 36 receives a communication from the UE 22 including an ISCP interference measurement I_D for each time slot. (step 1101) The RNC 36 then calculates an estimated interference value $\hat{I}$ using information stored in the RNC 36 (step 1102) and a residual interference value I_F (step 1103). The RNC 36 then combines the three interference values I_D, $\hat{I}$, I_F (step 1104) and calculates the transmission power for each time slot of the downlink communication using Equations 1 thru 4 (step 1106) and forwards them to the base station 30_1 by way of the node B 26. (step 1107) If the downlink power control system is set up to allow the node B 26 to calculate the transmission power for each time slot, the RNC 36 forwards the combined interference value I to the node B 26 (step 1105), which calculates the transmission power for each time slot (step 1106) and forwards them to the base station (step 1107).

[0057] The benefit of providing a system which utilizes a measured ISCP value and an estimated interference value to calculate the transmission power for each time slot of the downlink communication is two fold : 1) the system provides flexibility to the calculation of transmission power in a case where the required information is not known; and 2) the system provides a more accurate estimate of the interference present in the communication system.

* * *

CLAIMS

What is claimed is:

1. A method for controlling downlink transmission power levels in a spread spectrum time division communication system having frames with time slots for communication, the method comprising:

a) receiving at a user equipment (UE) a downlink communication from a base station and determining an error rate of the received communication,

b) producing power level adjustments for each of said time slots based in part on the error rate,

c) transmitting an uplink communication from the UE to the base station including the power level adjustments for each of said time slots; and

d) setting a transmission power level for each time slot in said downlink communication in response to said power level adjustments.

2. The method of claim 1 further comprising:

f) generating a signal to interference ratio (SIR) based on the error rate determined at step.

3. The method of claim 2 further comprising:

g) comparing the SIR obtained in step f) with a target level, a result of comparison in step g) being used to determine the power level adjustment of step b).

4. A downlink power control system for use in a spread spectrum time division communication system having frames with time slots for communication, comprising:

a user equipment for determining an error rate of a downlink communication and producing power level adjustments in response to said error rate for each of said time slots of said downlink communication; and

a base station for transmitting said downlink communication and setting a transmission power level for each of said time slots in said downlink communication responsive to power level adjustments received from said UE.

5. A method for controlling downlink transmission power levels in a spread spectrum time division duplex communication system having time slots for communication, the method comprising:

a) receiving a downlink communication from a base station and determining an interference power measurement for each of said time slot used by the downlink communication at a UE;

b) transmitting an uplink communication having said interference power measurement for each of said time slots from the UE; and

c) setting a transmission power level at the base station for the UE for each of said time slots in said downlink communication in response to said interference power measurement for each of said time slots.

6. The method of claim 5 further comprising the steps of:

determining an error rate of the downlink communications; and

generating a power level adjustment based in part on the error rate.

7. The method of claim 6 wherein step c includes modifying said power level adjustment using said interference power measurement for each downlink communication time slot.

8. A downlink power control system for use in a spread spectrum time division communication system having time slots for communication comprising:

a user equipment for receiving a downlink communication and transmitting interference power measurement for each downlink communication time slot to a transmitting station; and

said station setting a transmission power level for each downlink communication time slot in response to said interference power measurement for each downlink communication time slot.

9. The downlink power control system of claim 8 wherein said station is a base station.

10. The downlink power control system of claim 8 wherein said station is a node B.

11. The system of claim 9 wherein a radio network controller receives said interference power measurements for each of said slots and forwards them to said base station.

12. The downlink power control system of claim 8 wherein said station is a radio network controller.

13. A method for controlling downlink transmission power levels in a spread spectrum time division duplex communication system having time slots for communication, the method comprising:

a) calculating an estimated interference power measurement for each downlink communication of said time slot; and

b) setting a transmission power level for each downlink communication time slot in response to said estimated interference power level for each downlink communication time slot.

14. A downlink power control system for use in a spread spectrum time division duplex communication system having time slots for communication comprising:

a user equipment for receiving a downlink communication; and

a station for calculating an estimated interference power level for each downlink communication time slot and setting a transmission power level for each downlink communication time in response to said estimated interference power level in each downlink communication time slot.

15. The system of claim 14 wherein said station is a node B.

16. The system of claim 15 wherein said node B further forwards said transmission power level for each of said time slots to a base station.

17. The system of claim 14 wherein said station is a radio network controller (RNC).

18. The system of claim 17 further comprising a node B for receiving said transmission power level for each of said time slots from said RNC and forwarding said transmission power level for each of said time slots to a base station.

19. A method for controlling downlink transmission power levels in a spread spectrum time division duplex communication system having time slots for communication, the method comprising:

receiving a downlink communication and determining an interference power measurement for each downlink communication time slot;

transmitting an uplink communication having said interference power measurement for each downlink communication time slot; and

calculating an estimated interference power measurement for each time slot in a downlink communication; and

setting a transmission power level for each downlink communication time slot in response to said interference power measurement and said estimated interference power for each downlink communication time slot.

20. The method of claim 19 further comprising the steps of:

determining a residual interference power;

generating weights for weighing said residual interference, said interference power measurement and said estimated interference power;

combining residual interference power with said interference power measurement and said estimated interference power according to said weights.

21. A method for controlling downlink transmission power levels in a spread spectrum time division duplex communication system, wherein said communication

system supports multiple concurrent communications over a common bandwidth, having multiple time slots and codes for distinguishing between communications, the method comprising:

a) calculating an estimated interference power measurement for each time slot based upon the power of each of said multiple communications communicated in said time slot; and

b) setting a transmission power level for each downlink communication time slot in response to said estimated interference power level for each downlink communication time slot.

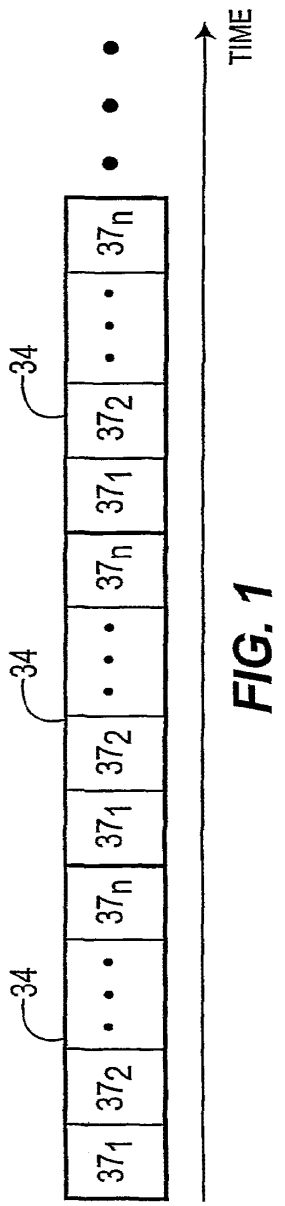

TIME
34
37_1
37_2
37_n

FIG. 1

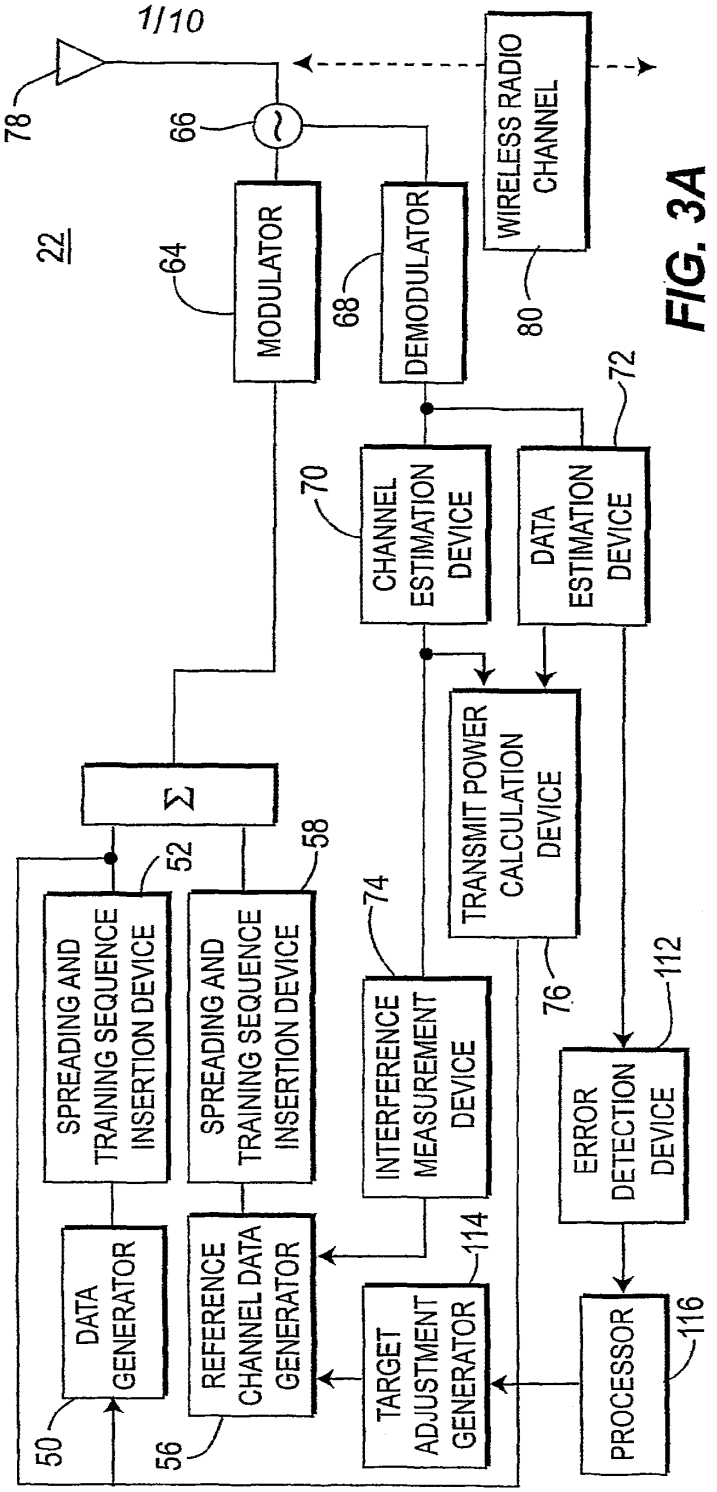

1/10
78
66
22
64
MODULATOR
68
DEMODULATOR
WIRELESS RADIO CHANNEL
80
70
CHANNEL ESTIMATION DEVICE
72
DATA ESTIMATION DEVICE
Σ
52
SPREADING AND TRAINING SEQUENCE INSERTION DEVICE
58
SPREADING AND TRAINING SEQUENCE INSERTION DEVICE
74
INTERFERENCE MEASUREMENT DEVICE
TRANSMIT POWER CALCULATION DEVICE
76
112
ERROR DETECTION DEVICE
50
DATA GENERATOR
56
REFERENCE CHANNEL DATA GENERATOR
114
TARGET ADJUSTMENT GENERATOR
PROCESSOR
116

FIG. 3A

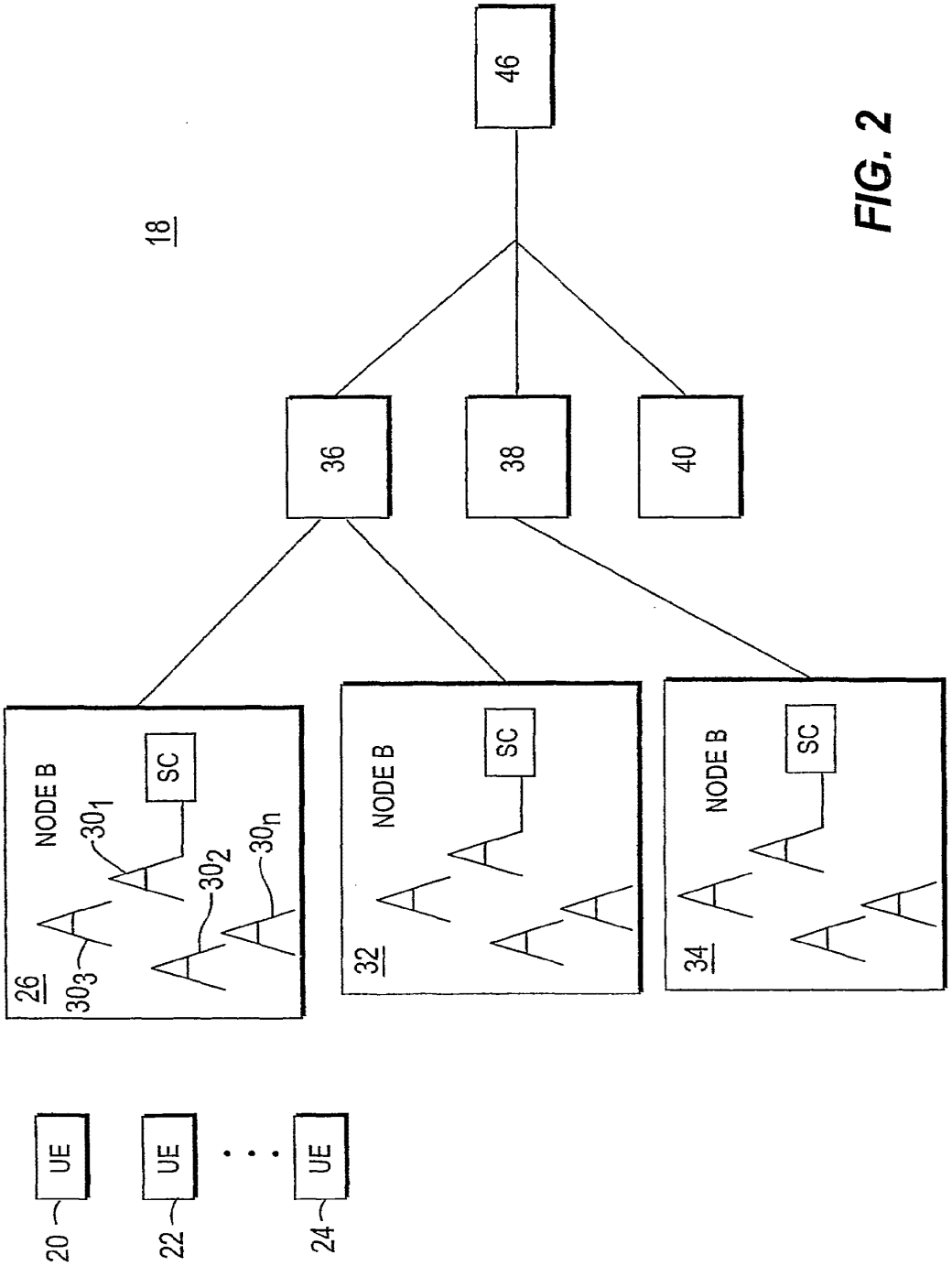


FIG. 2

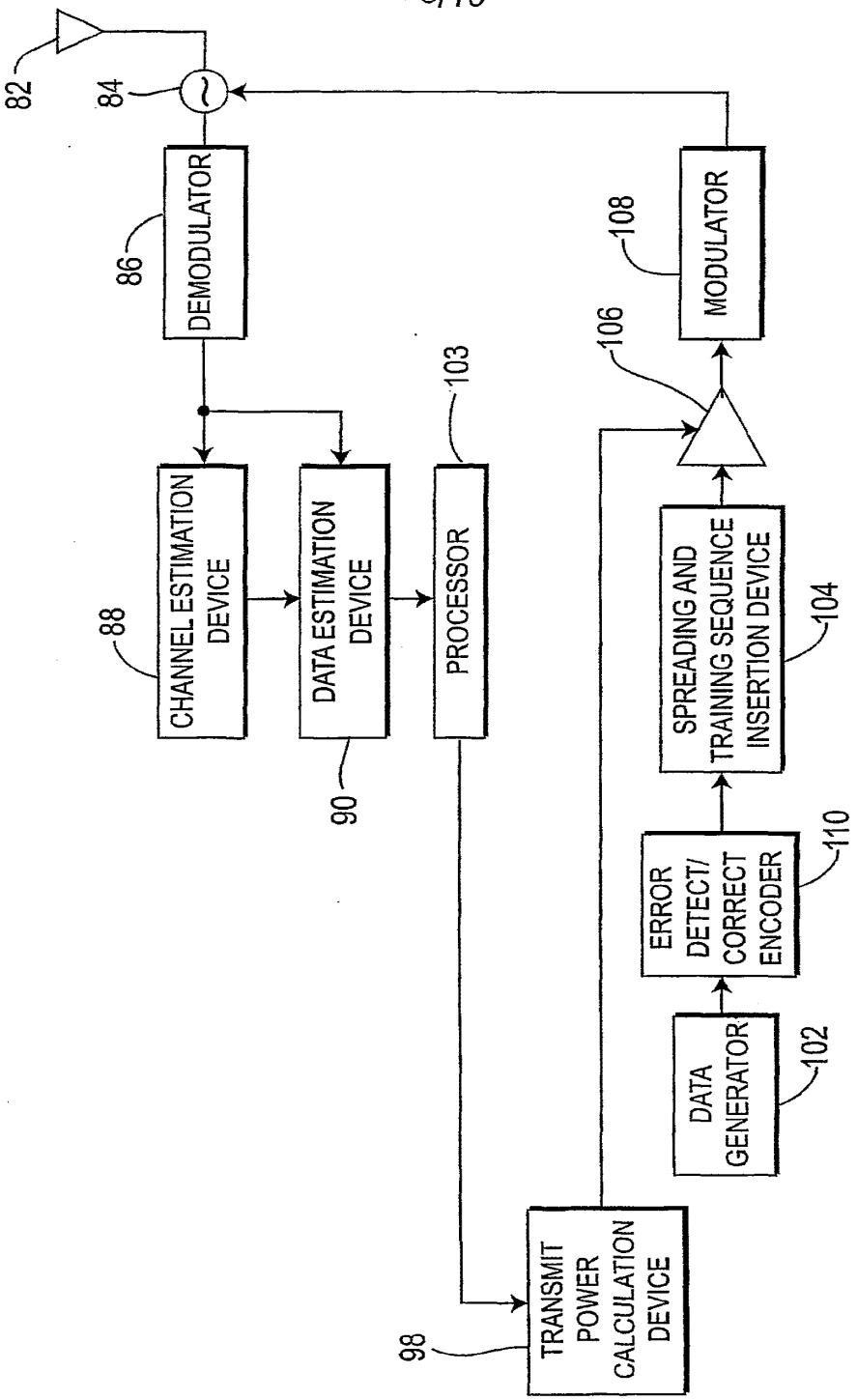

82
84
DEMODULATOR
86
MODULATOR
108
106
103
CHANNEL ESTIMATION DEVICE
88
DATA ESTIMATION DEVICE
90
PROCESSOR
SPREADING AND TRAINING SEQUENCE INSERTION DEVICE
104
ERROR DETECT/ CORRECT ENCODER
110
DATA GENERATOR
102
TRANSMIT POWER CALCULATION DEVICE
98

FIG. 3B

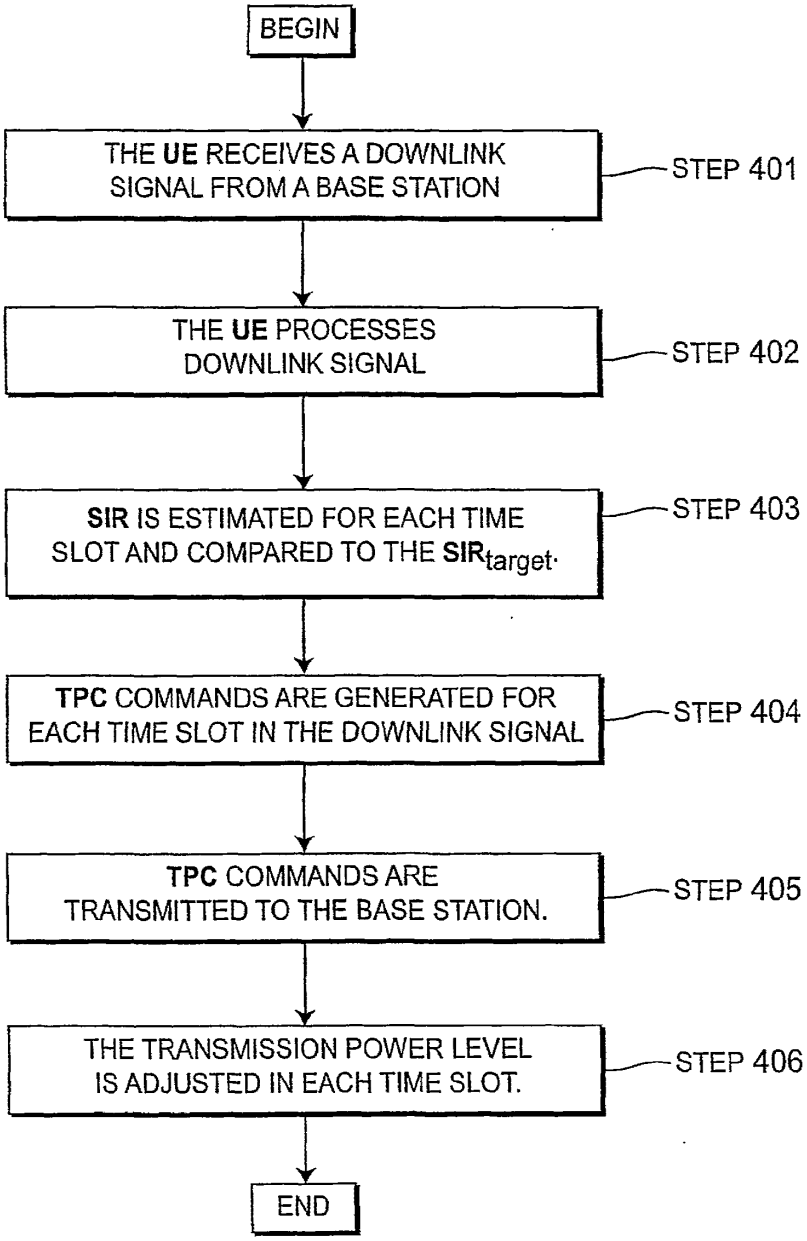

BEGIN
THE UE RECEIVES A DOWNLINK SIGNAL FROM A BASE STATION
STEP 401
THE UE PROCESSES DOWNLINK SIGNAL
STEP 402
SIR IS ESTIMATED FOR EACH TIME SLOT AND COMPARED TO THE SIRtarget.
STEP 403
TPC COMMANDS ARE GENERATED FOR EACH TIME SLOT IN THE DOWNLINK SIGNAL
STEP 404
TPC COMMANDS ARE TRANSMITTED TO THE BASE STATION.
STEP 405
THE TRANSMISSION POWER LEVEL IS ADJUSTED IN EACH TIME SLOT.
STEP 406
END

FIG. 4

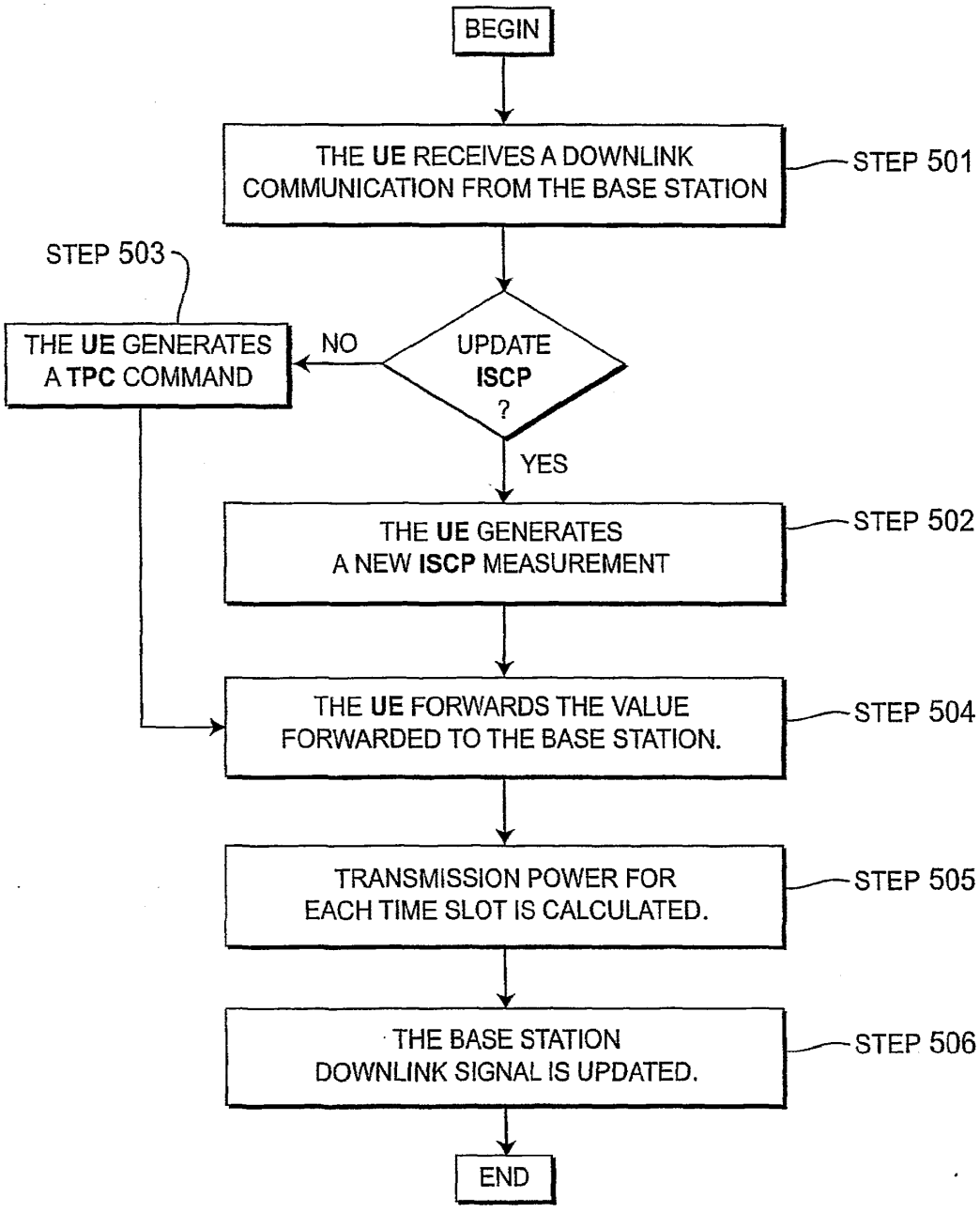

BEGIN
THE UE RECEIVES A DOWNLINK COMMUNICATION FROM THE BASE STATION
STEP 501
STEP 503
THE UE GENERATES A TPC COMMAND
NO
UPDATE ISCP ?
YES
THE UE GENERATES A NEW ISCP MEASUREMENT
STEP 502
THE UE FORWARDS THE VALUE FORWARDED TO THE BASE STATION.
STEP 504
TRANSMISSION POWER FOR EACH TIME SLOT IS CALCULATED.
STEP 505
THE BASE STATION DOWNLINK SIGNAL IS UPDATED.
STEP 506
END

FIG. 5

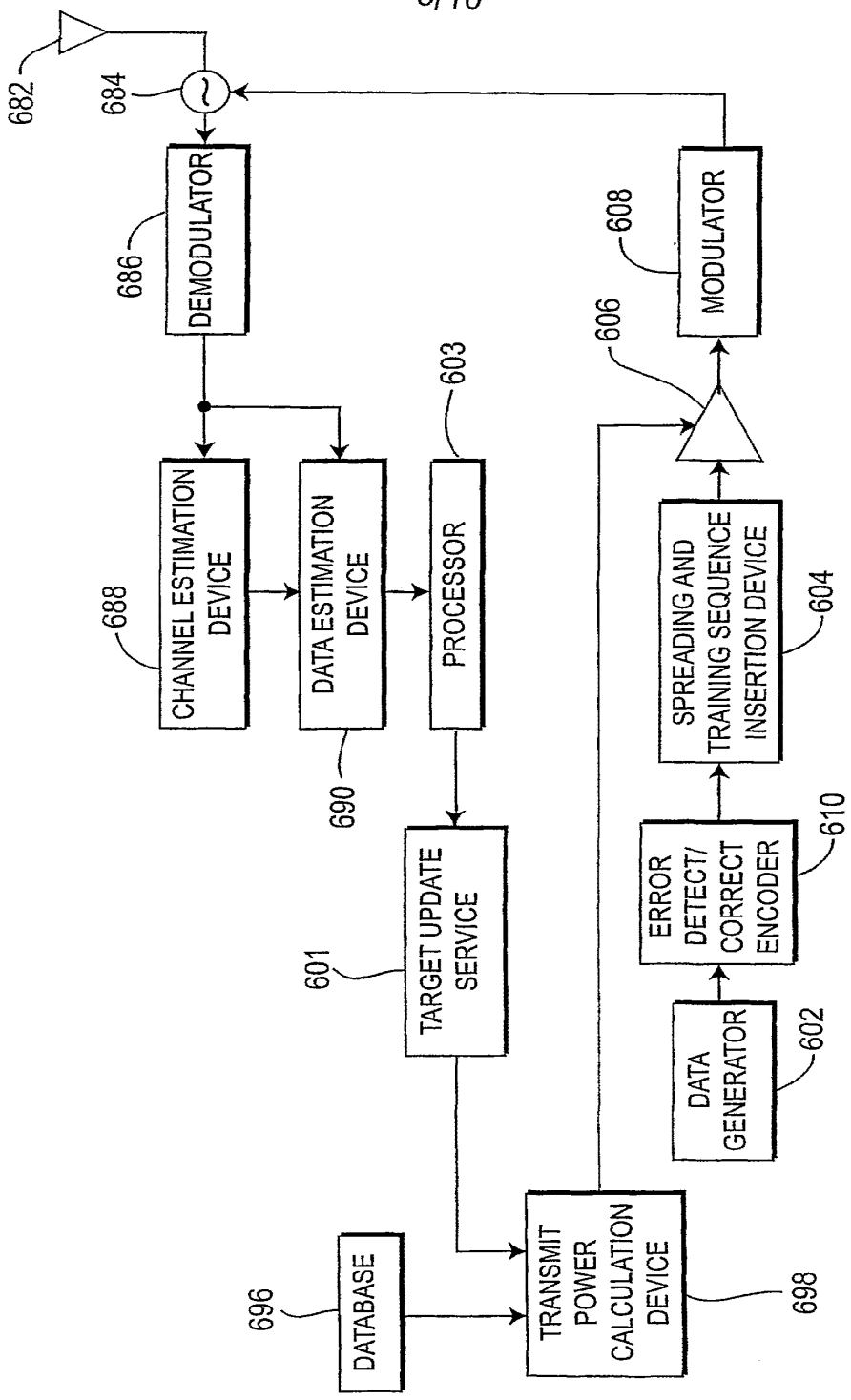

682
684
DEMODULATOR
686
MODULATOR
608
606
603
CHANNEL ESTIMATION DEVICE
688
DATA ESTIMATION DEVICE
690
PROCESSOR
SPREADING AND TRAINING SEQUENCE INSERTION DEVICE
604
TARGET UPDATE SERVICE
601
ERROR DETECT/ CORRECT ENCODER
610
DATA GENERATOR
602
DATABASE
696
TRANSMIT POWER CALCULATION DEVICE
698

FIG. 6

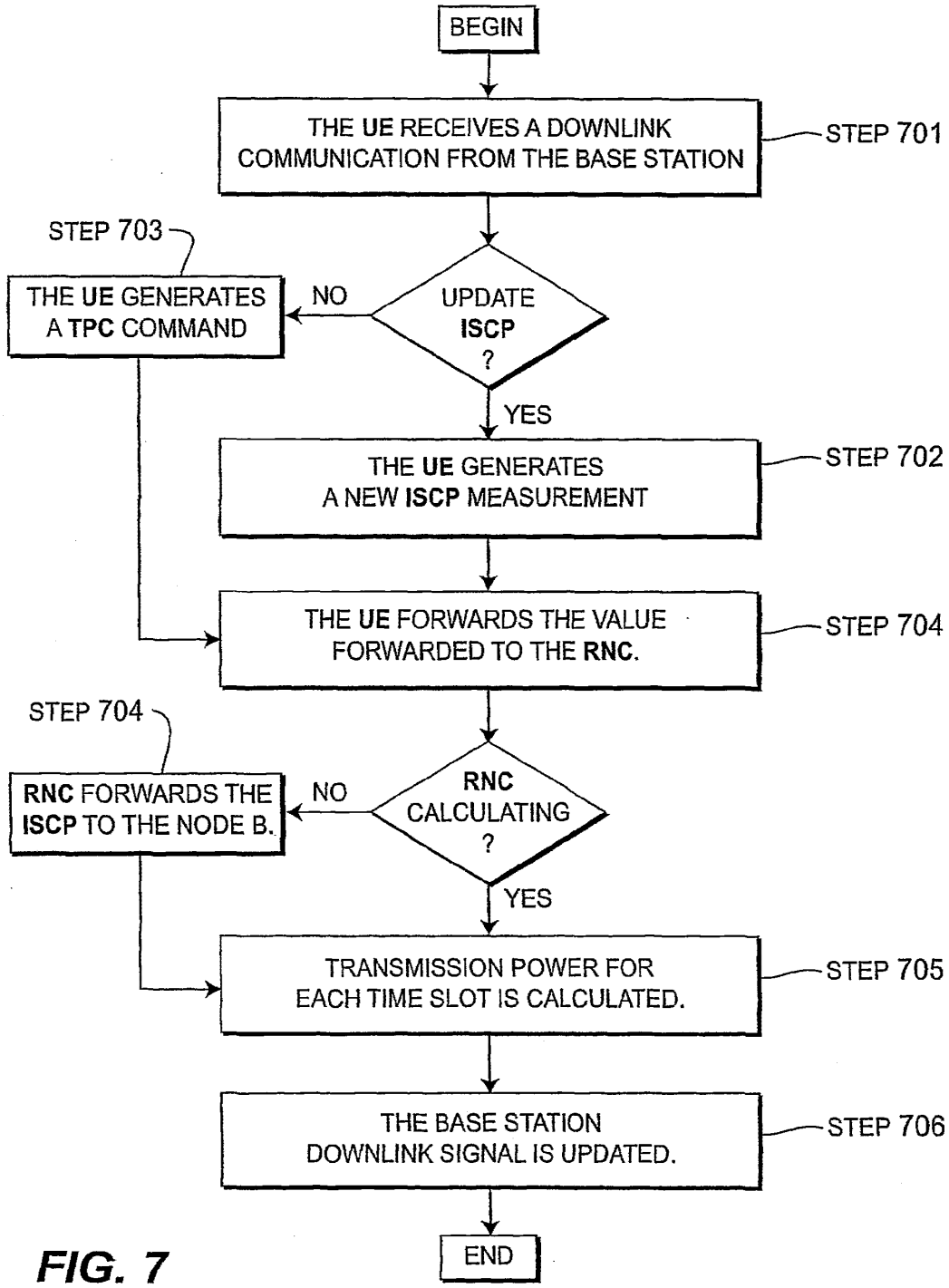

BEGIN
THE UE RECEIVES A DOWNLINK COMMUNICATION FROM THE BASE STATION
STEP 701
STEP 703
THE UE GENERATES A TPC COMMAND
NO
UPDATE ISCP ?
YES
THE UE GENERATES A NEW ISCP MEASUREMENT
STEP 702
THE UE FORWARDS THE VALUE FORWARDED TO THE RNC.
STEP 704
STEP 704
RNC FORWARDS THE ISCP TO THE NODE B.
NO
RNC CALCULATING ?
YES
TRANSMISSION POWER FOR EACH TIME SLOT IS CALCULATED.
STEP 705
THE BASE STATION DOWNLINK SIGNAL IS UPDATED.
STEP 706
END

FIG. 7

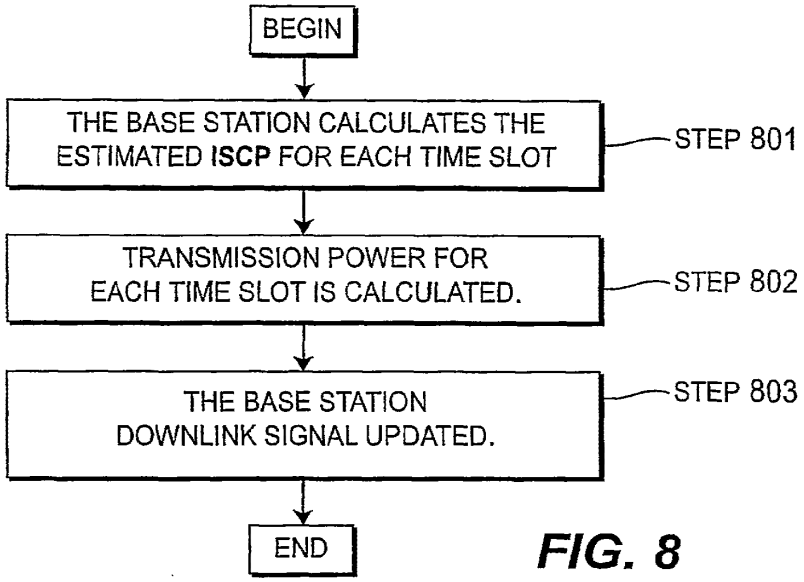

BEGIN
THE BASE STATION CALCULATES THE ESTIMATED ISCP FOR EACH TIME SLOT
STEP 801
TRANSMISSION POWER FOR EACH TIME SLOT IS CALCULATED.
STEP 802
THE BASE STATION DOWNLINK SIGNAL UPDATED.
STEP 803
END

FIG. 8

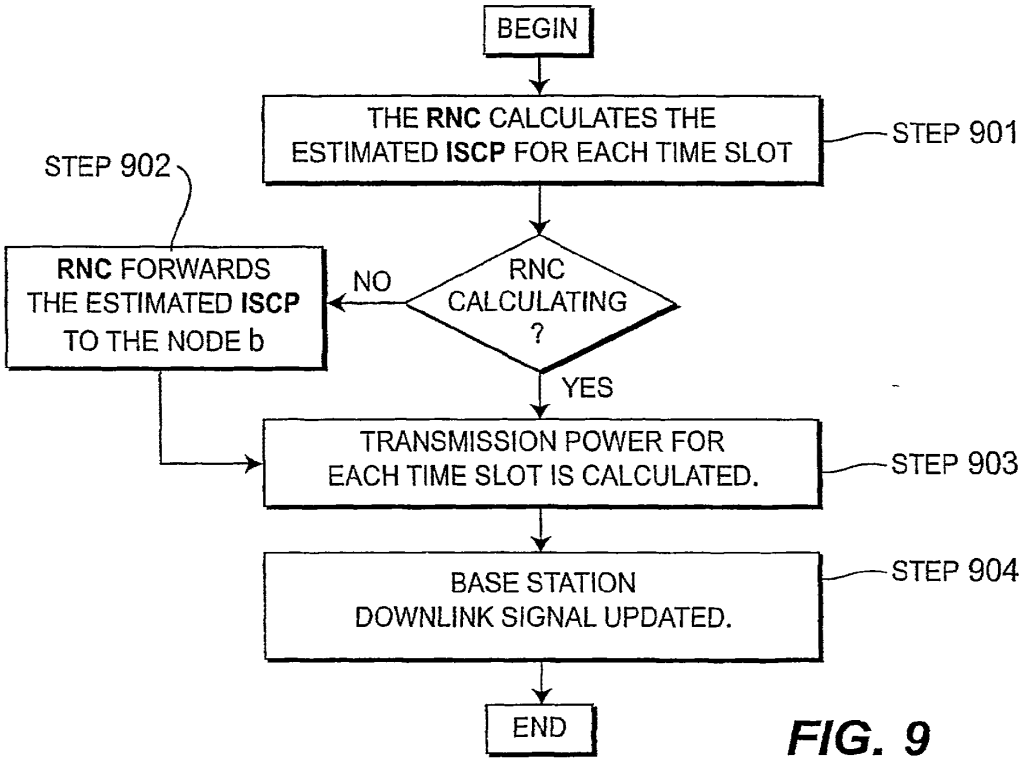

BEGIN
THE RNC CALCULATES THE ESTIMATED ISCP FOR EACH TIME SLOT
STEP 901
STEP 902
RNC FORWARDS THE ESTIMATED ISCP TO THE NODE b
NO
RNC CALCULATING ?
YES
TRANSMISSION POWER FOR EACH TIME SLOT IS CALCULATED.
STEP 903
BASE STATION DOWNLINK SIGNAL UPDATED.
STEP 904
END

FIG. 9

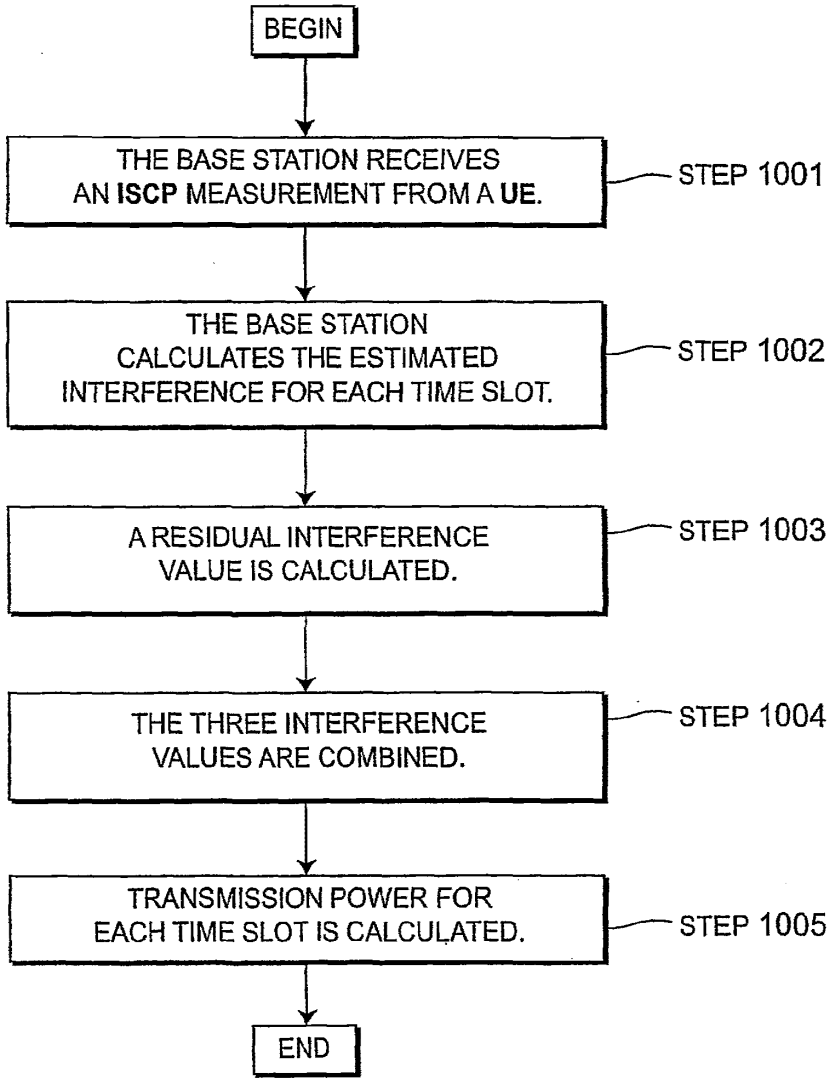

BEGIN
THE BASE STATION RECEIVES AN ISCP MEASUREMENT FROM A UE.
STEP 1001
THE BASE STATION CALCULATES THE ESTIMATED INTERFERENCE FOR EACH TIME SLOT.
STEP 1002
A RESIDUAL INTERFERENCE VALUE IS CALCULATED.
STEP 1003
THE THREE INTERFERENCE VALUES ARE COMBINED.
STEP 1004
TRANSMISSION POWER FOR EACH TIME SLOT IS CALCULATED.
STEP 1005
END

FIG. 10

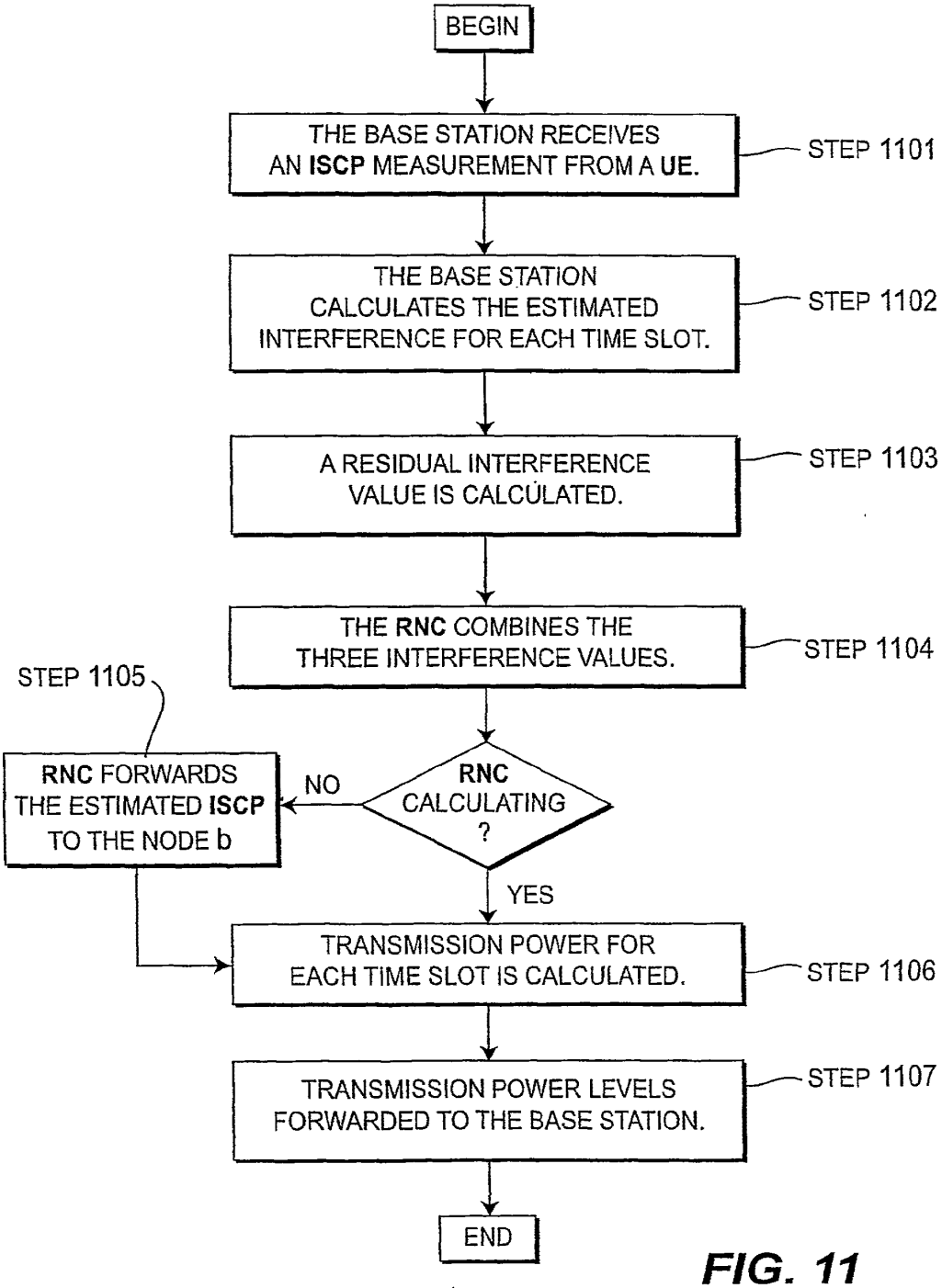

BEGIN
THE BASE STATION RECEIVES AN ISCP MEASUREMENT FROM A UE.
STEP 1101
THE BASE STATION CALCULATES THE ESTIMATED INTERFERENCE FOR EACH TIME SLOT.
STEP 1102
A RESIDUAL INTERFERENCE VALUE IS CALCULATED.
STEP 1103
THE RNC COMBINES THE THREE INTERFERENCE VALUES.
STEP 1104
STEP 1105
RNC FORWARDS THE ESTIMATED ISCP TO THE NODE b
NO
RNC CALCULATING ?
YES
TRANSMISSION POWER FOR EACH TIME SLOT IS CALCULATED.
STEP 1106
TRANSMISSION POWER LEVELS FORWARDED TO THE BASE STATION.
STEP 1107
END

FIG. 11

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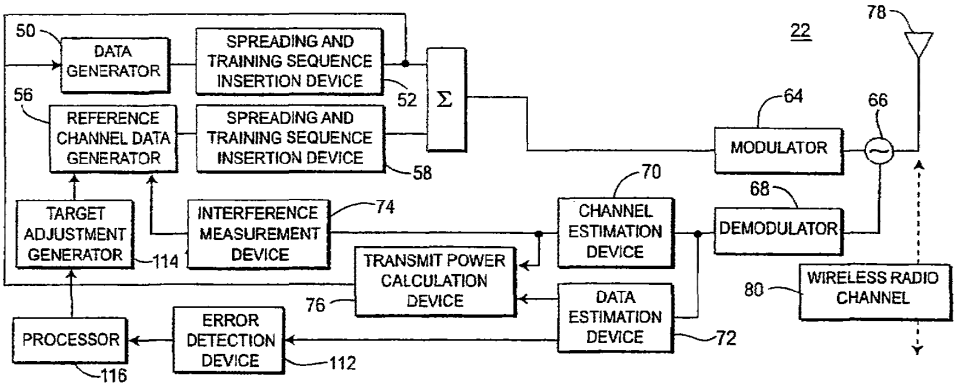
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: DOWNLINK POWER CONTROL FOR MULTIPLE DOWNLINK TIME SLOTS IN TDD COMMUNICATION SYSTEMS



(57) Abstract: The present invention is a method and system for controlling downlink transmission power levels in a spread spectrum time division communications system having frames with time slots for communication, which receives at a user equipment (UE) a downlink communication from a base station and determines an error rate of the received communication. The UE then produces power level adjustments for each of the time slots based in part on the error rate and transmits an uplink communication to the base station which includes the power level. In response to the power level adjustments and(or) other information, transmission power level is set for each time slot in the downlink communication.

WO 01/84740 A3

INT RNATIONAL SEARCH REPORT

Intern. al Application No
PCT/US 01/13720

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04B7/005

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 898 925 A (JOKINEN HARRI ET AL) 27 April 1999 (1999-04-27) abstract; claim 1; figure 8 column 2, line 2 - line 22 column 2, line 52 - last line column 3, line 19 - line 36 ---	1-12
A,P	DE 199 17 061 A (SIEMENS AG) 2 November 2000 (2000-11-02) abstract; claims 1-4,13 column 1, line 60 -column 2, line 27 column 4, line 22 - line 36 column 5, line 15 - line 24 --- -/--	1-12

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
30 November 2001	20. 02. 02

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Katruff, M

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6

INTERNATIONAL SEARCH REPORT

Intern al Application No
PCT/US 01/13720

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	DE 199 57 299 A (SIEMENS AG) 21 June 2001 (2001-06-21) abstract; figure 4 column 2, line 42 - line 52 column 4, line 37 - line 66 column 5, line 53 - line 62; claims 1,2 ---	5-12
A,P	DE 199 09 299 A (SIEMENS AG) 21 September 2000 (2000-09-21) column 2, line 55 - line 58; claims 1-4 column 4, line 19 - line 30 ---	1-12
A,P	WO 00 65748 A (ERICSSON TELEFON AB L M) 2 November 2000 (2000-11-02) abstract; figure 5A claims 1,6 -----	1-12

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Int. ational application No.
PCT/US 01/13720

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-12

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

1. Claims: 1-12

Claims 1-4 relate to a method and system for downlink power control in a CDMA/TDD communication system where the user equipment measures an error rate or (claims 5-12) an interference power (SIR) for each time slot of a multi-slot downlink communication and reports the measured values to a BS or RNC.

2. Claims: 13-21

Claims 13-18 and 21 relate to a method and system for downlink power control in a CDMA/TDD communication system where the base station calculates an estimated interference power measurement (SIR) for each time slot of a multi-slot downlink communication, or (claims 19 and 20) sets the transmission power level in response to a combination of this calculated estimation with a reported measurement of an user equipment.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Intern al Application No
PCT/US 01/13720

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5898925 A	27-04-1999	FI 942191 A	12-11-1995
		AT 205341 T	15-09-2001
		AU 682112 B	18-09-1997
		AU 2410495 A	05-12-1995
		CN 1128604 A	07-08-1996
		DE 69522527 D	11-10-2001
		EP 0709015 A	01-05-1996
		WO 9531879 A	23-11-1995
		JP 9504153 T	22-04-1997
		NO 960118 A	08-03-1996
		US 5991627 A	23-11-1999
DE 19917061 A	02-11-2000	WO 0064069 A	26-10-2000
DE 19957299 A	21-06-2001	AU 2662601 A	12-06-2001
		WO 0141328 A	07-06-2001
DE 19909299 A	21-09-2000	WO 0052846 A	08-09-2000
WO 0065748 A	02-11-2000	AU 4633800 A	10-11-2000
		EP 1173937 A	23-01-2002

Form PCT/ISA/210 (patent family annex) (July 1992)

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
8 November 2001 (08.11.2001)

PCT

(10) International Publication Number
WO 2001/084740 A3

(51) International Patent Classification[7]: H04B 7/005

(21) International Application Number:
PCT/US2001/013720

(22) International Filing Date: 30 April 2001 (30.04.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/200,756 1 May 2000 (01.05.2000) US

(71) Applicant: **INTERDIGITAL TECHNOLOGY CORPORATION** [US/US]; Suite 527, 300 Delaware Avenue, Wilmington, DE 19801 (US).

(72) Inventors: **ZEIRA, Eldad**; 239 West Neck Road, Huntington, NY 11743 (US). **TERRY, Stephen, E.**; 15 Summit Avenue, North Port, NY 11768 (US). **ZEIRA, Ariela**; 239 West Neck Road, Huntington, NY 11743 (US).

(74) Agents: **VOLPE, Anthony, S.** et al.; Volpe and Koenig, P.C., Suite 400, One Penn Center, 1617 John F. Kennedy Boulevard, Philadelphia, PA 19103 (US).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

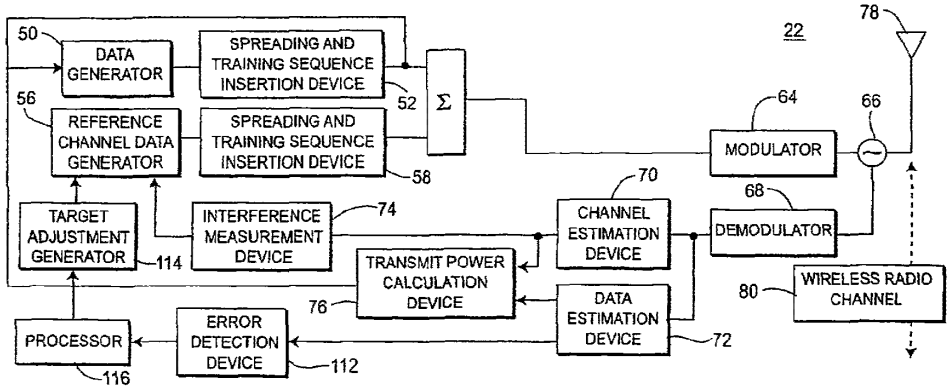
Published:
— *with international search report*

(88) Date of publication of the international search report:
18 April 2002
Date of publication of the revised international search report:
13 May 2004

(15) Information about Correction:
see PCT Gazette No. 20/2004 of 13 May 2004, Section II

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: DOWNLINK POWER CONTROL FOR MULTIPLE DOWNLINK TIME SLOTS IN TDD COMMUNICATION SYSTEMS



(57) Abstract: The present invention is a method and system for controlling downlink transmission power levels in a spread spectrum time division communications system having frames with time slots for communication, which receives at a user equipment (UE) a downlink communication from a base station and determines an error rate of the received communication. The UE then produces power level adjustments for each of the time slots based in part on the error rate and transmits an uplink communication to the base station which includes the power level. In response to the power level adjustments and(or) other information, transmission power level is set for each time slot in the downlink communication.

WO 2001/084740 A3

REVISED VERSION

INTERNATIONAL SEARCH REPORT

Inte il Application No
PCT/US 01/13720

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04B7/005

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04B H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 898 925 A (JOKINEN HARRI ET AL) 27 April 1999 (1999-04-27) abstract; figure 8 column 2, line 2 - line 22 column 2, line 52 - last line column 3, line 19 - line 36	1-12
Y	claim 1 ---	13-18,21
Y	EP 0 977 371 A (NOKIA MOBILE PHONES LTD) 2 February 2000 (2000-02-02)	13-18,21
A	abstract paragraph [0010]; claims 1,5,6,10; figure 1 --- -/--	19,20

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
22 October 2002	30. 10. 02

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Katruff, M

Form PCT/ISA/210 (second sheet) (July 1998)

INTERNATIONAL SEARCH REPORT

Inte Application No
PCT/US 01/13720

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	DE 199 57 299 A (SIEMENS AG) 21 June 2001 (2001-06-21) abstract; figure 4 column 2, line 42 - line 52 column 4, line 37 - line 66 column 5, line 53 - line 62; claims 1,2	5-21
E	EP 1 139 685 A (MATSUSHITA ELECTRIC IND CO LTD) 4 October 2001 (2001-10-04) abstract; claim 1; figure 1	13-21
A,P	DE 199 17 061 A (SIEMENS AG) 2 November 2000 (2000-11-02) abstract; claims 1-4,13 column 1, line 60 -column 2, line 27 column 4, line 22 - line 36 column 5, line 15 - line 24	1-21
A,P	DE 199 09 299 A (SIEMENS AG) 21 September 2000 (2000-09-21) column 2, line 55 - line 58; claims 1-4 column 4, line 19 - line 30	1-21
A,P	WO 00 65748 A (ERICSSON TELEFON AB L M) 2 November 2000 (2000-11-02) abstract; figure 5A claims 1,6	1-21

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

	ıtional application No. PCT/US 01/13720

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

1. Claims: 1-12

Claims 1-4 relate to a method and system for downlink power control in a CDMA/TDD communication system where the user equipment measures an error rate or (claims 5-12) an interference power (SIR) for each time slot of a multi-slot downlink communication and reports the measured values to a BS or RNC.

2. Claims: 13-21

Claims 13-18 and 21 relate to a method and system for downlink power control in a CDMA/TDD communication system where the base station calculates an estimated interference power measurement (SIR) for each time slot of a multi-slot downlink communication, or (claims 19 and 20) sets the transmission power level in response to a combination of this calculated estimation with a reported measurement of an user equipment.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inter[illegible]l Application No
PCT/US 01/13720

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5898925 A	27-04-1999	FI 942191 A	12-11-1995
		AT 205341 T	15-09-2001
		AU 682112 B	18-09-1997
		AU 2410495 A	05-12-1995
		CN 1128604 A,B	07-08-1996
		DE 69522527 D	11-10-2001
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		NO 960118 A	08-03-1996
		US 5991627 A	23-11-1999
EP 0977371 A	02-02-2000	NONE	
DE 19957299 A	21-06-2001	AU 2662601 A	12-06-2001
		WO 0141328 A	07-06-2001
		EP 1234389 A	28-08-2002
EP 1139685 A	04-10-2001	JP 2001111480 A	20-04-2001
		AU 7557400 A	10-05-2001
		CN 1327698 T	19-12-2001
		WO 0126406 A	12-04-2001
DE 19917061 A	02-11-2000	WO 0064069 A	26-10-2000
DE 19909299 A	21-09-2000	WO 0052846 A	08-09-2000
WO 0065748 A	02-11-2000	AU 4633800 A	10-11-2000
		CN 1357178 T	03-07-2002
		EP 1173937 A	23-01-2002

Form PCT/ISA/210 (patent family annex) (July 1992)

Electronic Acknowledgement Receipt

EFS ID:	9322395
Application Number:	10917968
International Application Number:	
Confirmation Number:	3609
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Customer Number:	22242
Filer:	Steven Glen Parmelee/Helen Donegan
Filer Authorized By:	Steven Glen Parmelee
Attorney Docket Number:	9147-96606-US (04-0108)
Receipt Date:	27-JAN-2011
Filing Date:	12-AUG-2004
Time Stamp:	16:37:02
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	96606_2nd_Supplemental_IDS_Transmittal_1.PDF	60032 5da5b8d622ab340b2db98616bcc437b7de641f54	no	2

Warnings:	
Information:	

2	Information Disclosure Statement (IDS) Filed (SB/08)	96606_IDS_Form_01272011.pdf	612299 363c3f239966b4bf2e96b474cf9cdc04ec74e8cb	no	4
Warnings:					
Information:					
3	Foreign Reference	EP1367740_1.PDF	896656 de326376d157757c93d4e3cf241e24c2637a694b	no	16
Warnings:					
Information:					
4	Foreign Reference	WO0184740_1.PDF	1957006 863e266a9c749f0d32f2435c438b2f0434bbe134	no	50
Warnings:					
Information:					
5	NPL Documents	96606_NPL1_1.PDF	295033 66a788865d866ff7f03bbf2c51596c6e953a0ae7	no	7
Warnings:					
Information:					
		Total Files Size (in bytes):	3821026		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.	10/917,968
Filed:	August 12, 2004
Applicant:	Nicholas William Anderson
Title:	**POWER CONTROL IN A WIRELESS COMMUNICATION SYSTEM**
Art Unit:	2618
Examiner:	Dominic E. Rego
Attorney Docket:	9147-96606-US (04-0108) S04B4005US00
Customer No.:	22242

Confirmation No. 3609

This Second Supplemental Information Disclosure Statement Transmittal was electronically filed on January 27, 2011 using the USPTO's EFS-Web.

Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

SECOND SUPPLEMENTAL INFORMATION
DISCLOSURE STATEMENT TRANSMITTAL

Sir:

Pursuant to the duty of disclosure under 37 C.F.R. § 1.56, and in accordance with MPEP § 601 and 37 C.F.R. §§ 1.97 and 1.98, Applicants and the undersigned attorney bring the information listed on Form PTO/SB/08a, filed concurrently herewith, to the attention of the Examiner.

The references cited in this Information Disclosure Statement were cited in A European Search Report (European Application No. 10185576.5-1246) which issued on December 2, 2010, a copy of which is attached.

Pursuant to 37 C.F.R. § 1.97(h), the filing of this Information Disclosure Statement shall not be construed to be an admission that the information cited in the

statement is, or is considered to be, material to patentability as defined in 37 C.F.R. § 1.56(b).

The Commissioner is hereby authorized to charge any additional fees which may be required with respect to this communication, or credit any overpayment, to Deposit Account No. 06-1135.

Respectfully submitted,

FITCH, EVEN, TABIN & FLANNERY

Dated: Jan 27, 2011

Steven G. Parmelee
Registration No. 28,790

120 South LaSalle Street, Suite 1600
Chicago, Illinois 606033406
Telephone (312) 577-7000
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.	10/917,968
Filed:	August 12, 2004
Applicants:	Nicholas William Anderson
Title:	**POWER CONTROL IN A WIRELESS COMMUNICATION SYSTEM**
Art Unit:	2618
Examiner:	Dominic E. Rego
Attorney Docket:	9147-96606 (04-0108) S05B4005US00
Customer No.:	22242

Confirmation No.3609

This Response to Notification of Non-Compliant Appeal Brief was electronically filed on December 17, 2010 using EFS-Web.

Mail Stop AMENDMENT
Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

RESPONSE TO NOTIFICATION OF NON-COMPLIANT APPEAL BRIEF

Sir:

Pursuant to a Notice of Non-Compliant Appeal Brief as mailed on December 10, 2010 in the above-captioned matter, the Applicant's Appeal Brief was faulted as not containing a correct copy of the appealed claims appendix of that document. In particular, the Notification identified Claim 26 as missing the word "and" at a particular location therein. The Notification then indicated that, "an entire brief is not required, only the corrected section."

We hereby submit a Substitute Claims Appendix with Claim 26 now including the identified "and."

Respectfully submitted,

Fitch, Even, Tabin & Flannery

Date: December 17, 2010

By: _____
Steven G. Parmelee
Registration No. 28,790

120 S. LaSalle Street, Suite 1600
Chicago, IL 60603-3406
Telephone: (312) 577-7000
Facsimile: (312) 577-7007

(8) Claims Appendix

1. A method of power control in a radio communication system, the method comprising, at a remote transceiver:

determining a path loss for a radio channel between a base station and the ~~a~~ remote transceiver; and

on a shared physical channel used to carry allocation and scheduling information from the base station to the remote transceiver, receiving an allocation of a scheduled uplink transmission resource and transmit power control (TPC) command; and

calculating at the remote transceiver, a transmit power level for transmission by the remote transceiver on the scheduled uplink transmission resource based upon the path loss and the TPC command.

2. The method of power control of claim 1, the method further comprising transmitting an uplink signal at the calculated transmit power level.

3. The method of power control of claim 1, wherein determining the path loss includes:

receiving a downlink signal transmitted from the base station, wherein the downlink signal signals a transmitted power level of the downlink signal; and

measuring a received power level of the downlink signal.

4. The method of power control of claim 3, wherein determining the path loss further includes computing a difference between the signaled transmit power level and the measured received power level.

7. The method of power control of claim 2, wherein the calculated transmit power level is based on a spreading factor parameter.

8. The method of power control of claim 2, wherein the calculated transmit power level is based on parameters associated with a selected transport format.

Ex.1011 / Page 493 of 1166
TESLA, INC.

15. The power control method of claim 1, further comprising calculating a transmit power level for transmission by the remote transceiver on the scheduled uplink transmission resource based on the path loss and an accumulated TPC command.

16. The power control method of claim 15, further comprising receiving a signal from the base station for instructing the remote transmitter to utilize only the accumulated TPC commands when deriving the calculated transmit power level, thereby disabling use of open loop power control and enabling use of closed loop power control only.

17. The power control method of claim 15, further comprising receiving a signal from the base station for instructing the remote transmitter to disregard the accumulated TPC command when deriving the calculated transmit power level, thereby enabling use of open loop power control only and disabling use of closed loop power control.

26. A remote transceiver for a cellular communication system, the remote transceiver having a computer program stored therein and further for supporting power control in a radio communication system, the computer program comprising instructions for:

determining a path loss for a radio channel between a base station and the remote transceiver;

on a shared physical channel used to carry allocation and scheduling information from the base station to the remote transceiver, receiving an allocation of a scheduled uplink transmission resource and a transmit power control (TPC) command; and

calculating a transmit power level for the remote transceiver based on the path loss and an accumulated TPC command.

28. The remote transceiver of claim 26, wherein determining the path loss includes:

receiving a downlink signal transmitted from the base station, wherein the downlink signal signals a transmitted power level of the downlink signal; and

measuring a received power level of the downlink signal.

30. The remote transceiver of claim 26, the computer program further comprising instructions for receiving a signal from the base station for instructing the remote transmitter to utilize the accumulated TPC command only when calculating the transmit power level, thereby disabling use of open loop power control and enabling use of closed loop power control only.

31. The remote transceiver of claim 26, the computer program further comprising instructions for receiving a signal from the base station for instructing the remote transmitter to disregard the accumulated TPC command when calculating the transmit power level, thereby disabling use of closed loop power control and enabling use of open loop power control only.

32. The remote transceiver of claim 26, the computer program further comprising instructions for transmitting an uplink signal from the remote transceiver at the calculated transmit power level.

33. The remote transceiver of claim 26, wherein calculating the transmit power level is additionally based on a spreading factor parameter.

34. The remote transceiver of claim 26, wherein calculating the transmit power level is additionally based on parameters associated with a selected transport format.

43. A method of power control in a radio communications system, the method comprising, at a base station:

on a shared physical channel used to carry allocation and scheduling information from the base station to a remote transceiver, sending an allocation of a scheduled uplink transmission resource and transmit power control (TPC) command; and

receiving an uplink signal from the remote transceiver at a

calculated transmit power level based on a path loss and the TPC command.

44. The power control method of claim 43, further comprising sending a signal to the remote transceiver for instructing the remote transmitter to utilize only the accumulated TPC commands when deriving the calculated transmit power level, thereby instructing the remote transmitter to disable use of open loop power control and enable use of closed loop power control only.

45. The power control method of claim 43, further comprising sending a signal from the base station to the remote transceiver for instructing the remote transmitter to disregard the accumulated TPC command when deriving the calculated transmit power level, thereby instructing the remote transmitter to enable use of open loop power control only and disable use of closed loop power control.

46. A base station for a cellular communication system, the base station having a computer program stored therein and further for controlling power in a radio communication system, the computer program comprising instructions for:

on a shared physical channel used to carry allocation and scheduling information from the base station to the remote transceiver, sending an allocation of a scheduled uplink transmission resource and a transmit power control (TPC) command; and

receiving an uplink signal from the remote transceiver at a calculated transmit power level based on a path loss and the TPC command.

47. The base station of claim 46, the computer program further comprising instructions for sending a signal to the remote transceiver for instructing the remote transmitter to utilize only the TPC commands when deriving the calculated transmit power level, thereby instructing the remote transmitter to disable use of open loop power control and enable use of closed loop power control only.

48. The base station of claim 46, the computer program further comprising instructions for sending a signal from the base station to the remote transceiver for instructing the remote transmitter to disregard the TPC commands when deriving the calculated transmit power level, thereby instructing the remote transmitter to enable use of open loop power control only and disable use of closed loop power control.

49. A remote transceiver for supporting power control in a radio communication system, the remote transceiver comprising:

a signal processor for determining a path loss for a radio channel between a base station and the remote transceiver; and

a receiver arranged to receive, on a shared physical channel used to carry allocation and scheduling information from the base station, an allocation of a scheduled uplink transmission resource and transmit power control (TPC) command; wherein

the signal processor is arranged to calculate a transmit power level for transmission by the remote transceiver on the scheduled uplink transmission resource based upon the path loss and the TPC command.

50. A base station for supporting power control in a radio communication system, the base station comprising:

a transmitter arranged to transmit, on a shared physical channel used to carry allocation and scheduling information, to a remote transceiver, an allocation of a scheduled uplink transmission resource and transmit power control (TPC) command; and

a receiver arranged to receive an uplink signal from the remote transceiver at a calculated transmit power level based on a path loss and the TPC command.

Electronic Acknowledgement Receipt

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ART UNIT	PAPER NUMBER

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Notification of Non-Compliant Appeal Brief (37 CFR 41.37)	Application No. 10/917,968	Applicant(s) Anderson	
	Examiner Rego	Art Unit 2618	

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

The Appeal Brief filed on *03 December 2010* is defective for failure to comply with one or more provisions of 37 CFR 41.37.

To avoid dismissal of the appeal, applicant must file anamended brief or other appropriate correction (see MPEP 1205.03) within **ONE MONTH or THIRTY DAYS** from the mailing date of this Notification, whichever is longer. **EXTENSIONS OF THIS TIME PERIOD MAY BE GRANTED UNDER 37 CFR 1.136.**

1. ☐ The brief does not contain the items required under 37 CFR 41.37(c), or the items are not under the proper heading or in the proper order.

2. ☐ The brief does not contain a statement of the status of all claims, (e.g., rejected, allowed, withdrawn, objected to, canceled), or does not identify the appealed claims (37 CFR 41.37(c)(1)(iii)).

3. ☐ At least one amendment has been filed subsequent to the final rejection, and the brief does not contain a statement of the status of each such amendment (37 CFR 41.37(c)(1)(iv)).

4. ☐ (a) The brief does not contain a concise explanation of the subject matter defined in each of the independent claims involved in the appeal, referring to the specification by page and line number and to the drawings, if any, by reference characters; and/or (b) the brief fails to: (1) identify, for each independent claim involved in the appeal and for each dependent claim argued separately, every means plus function and step plus function under 35 U.S.C. 112, sixth paragraph, and/or (2) set forth the structure, material, or acts described in the specification as corresponding to each claimed function with reference to the specification by page and line number, and to the drawings, if any, by reference characters (37 CFR 41.37(c)(1)(v)).

5. ☐ The brief does not contain a concise statement of each ground of rejection presented for review (37 CFR 41.37(c)(1)(vi))

6. ☐ The brief does not present an argument under a separate heading for each ground of rejection on appeal (37 CFR 41.37(c)(1)(vii)).

7. ☒ The brief does not contain a correct copy of the appealed claims as an appendix thereto (37 CFR 41.37(c)(1)(viii)).

8. ☐ The brief does not contain copies of the evidence submitted under 37 CFR 1.130, 1.131, or 1.132 or of any other evidence entered by the examiner **and relied upon by appellant in the appeal**, along with a statement setting forth where in the record that evidence was entered by the examiner, as an appendix thereto (37 CFR 41.37(c)(1)(ix)).

9. ☐ The brief does not contain copies of the decisions rendered by a court or the Board in the proceeding identified in the Related Appeals and Interferences section of the brief as an appendix thereto (37 CFR 41.37(c)(1)(x)).

10. ☒ Other (including any explanation in support of the above items):

7. Claim 26 is missing the word (and) at the end of the 3rd paragraph as amendment on 12/03/10 filed with the Appeal Brief. An entire brief is not required, only the corrected section.

Gloria Henderson, Paralegal
571-272-4616
Supervisory Paralegal: D. Perry
571-272-9797

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application No. 10/917,968	
Filed:	August 12, 2004
Applicants:	Nicholas William Anderson
Title:	**POWER CONTROL IN A WIRELESS COMMUNICATION SYSTEM**
Art Unit:	2618
Examiner:	Dominic E. Rego
Attorney Docket:	9147-96606-US (04-0108) S05B4005US00
Customer No.:	22242

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APPEAL BRIEF

Sir:

Pursuant to 37 C.F.R. § 41.37, the Applicants hereby respectfully submit the following Brief in support of their appeal.

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(1) Real Party in Interest

The real party in interest is Wireless Technology Solutions LLC, a corporation having a primary place of business in New York, New York.

(2) Related Appeals and Interferences

There are no related appeals or interferences known to appellant, the appellant's legal representative, or assignee that will directly affect, or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

Claims 1-4, 7, 8, 15-17, 26, 28, 30-34, and 43-50 are pending and presently stand at least twice and finally rejected and constitute the subject matter of this appeal.

(4) Status of Amendments

No post-final amendments have been submitted.

(5) Summary of Claimed Subject Matter

A concise explanation of this subject matter appears as follows in the form of claim subject matter maps with corresponding references to the specification by paragraph numbering and to the drawings by figure number and reference characters where applicable.[1]

Independent Claim 1

Reference Characters	Specification Paragraph Numbers Figure Numbers
A method of power control in a radio communication system, the method comprising, at a remote transceiver (140):	FIGS. 1-4 Paragraph 0025
determining (230, 432) a path loss for a radio channel between a base station (120) and the remote transceiver; and	FIGS. 2, 4 Paragraph 0025, 0063-0066
on a shared physical channel (416) used to carry allocation and scheduling information from the base station to the remote transceiver, receiving an allocation of a scheduled uplink transmission resource (402) and transmit power control (TPC) command (418);	FIG. 4 Paragraphs 0033, 0065
and calculating (436) at the remote transceiver, a transmit power level for transmission by the remote transceiver on the scheduled uplink transmission resource based upon the path loss and the TPC command.	FIG. 4 Paragraphs 0066-0072

[1] It will be understood that this summarization of the claimed subject matter is, in fact, a "summary" and that the Applicants do not represent or intend that this brief presentation, or the accompanying references to the drawings and the specification, comprise an exhaustive presentation in this regard. As always, the claims are to be viewed and interpreted in view of the context of the entire specification sans the Abstract.

Independent Claim 26

Reference Characters	Specification Paragraph Numbers Figure Numbers
A remote transceiver (140) for a cellular communication system, the having a computer program stored therein and further for supporting power control in a radio communication system, the computer program comprising instructions for:	FIGS. 1-4 Paragraph 0024, 0025
determining (230, 432) a path loss for a radio channel between a base station (120) and the remote transceiver;	FIGS. 2, 4 Paragraphs 0063-0066
on a shared physical channel (416) used to carry allocation and scheduling information from the base station to the remote transceiver, receiving an allocation of a scheduled uplink transmission resource (402) and a transmit power control (TPC) command (418); and	FIG. 4 Paragraphs 0033, 0065
calculating (436) a transmit power level for the remote transceiver based on the path loss and an accumulated TPC command.	FIG. 4 Paragraphs 0066-0072

Independent Claim 43

Reference Characters	Specification Paragraph Numbers Figure Numbers
A method of power control in a radio communications system, the method comprising, at a base station (120):	FIGS. 1-4 Paragraph 0025

Reference Characters	Specification Paragraph Numbers Figure Numbers
on a shared physical channel (416) used to carry allocation and scheduling information from the base station to a remote transceiver (140), sending an allocation of a scheduled uplink transmission resource (402) and transmit power control (TPC) command (418);	FIG. 4 Paragraphs 0025, 0033, 0065
and receiving an uplink signal from the remote transceiver at a calculated (436) transmit power level based on a path loss (230, 432) and the TPC command.	FIGS. 2, 4 Paragraphs 0066-0072

Independent Claim 46

Reference Characters	Specification Paragraph Numbers Figure Numbers
A base station (120) for a cellular communication system, the base station having a computer program stored therein and further for controlling power in a radio communication system, the computer program comprising instructions for:	FIGS. 1-4 Paragraphs 0024, 0025
on a shared physical channel (416) used to carry allocation and scheduling information from the base station to the remote transceiver (140), sending an allocation of a scheduled uplink transmission resource (402) and a transmit power control (TPC) command (418);	FIG. 4 Paragraphs 0025, 0033, 0065

Reference Characters	Specification Paragraph Numbers Figure Numbers
and receiving an uplink signal from the remote transceiver at a calculated (436) transmit power level based on a path loss (230, 432) and the TPC command.	FIGS. 2, 4 Paragraphs 0066-0072

Independent Claim 49

Reference Character	Specification Paragraph Numbers Figure Number/
A remote transceiver (140) for supporting power control in a radio communication system, the remote transceiver comprising:	FIGS. 1-4 Paragraph 0025
a signal processor (140) for determining (230, 432) a path loss for a radio channel between a base station (120) and the remote transceiver; and	FIGS. 2, 4 Paragraphs 0024, 0025, 0063-0066
a receiver arranged to receive, on a shared physical channel (416) used to carry allocation and scheduling information from the base station, an allocation of a scheduled uplink transmission resource (402) and transmit power control (TPC) command (418);	FIG. 4 Paragraphs 0033, 0065
wherein the signal processor is arranged to calculate (436) a transmit power level for transmission by the remote transceiver on the scheduled uplink transmission resource based upon the path loss and the TPC command.	FIG. 4 Paragraphs 0024, 0066-0072

Independent Claim 50

Reference Characters	Specification Paragraph Numbers Figure Numbers
A base station (120) for supporting power control in a radio communication system, the base station comprising:	FIGS. 1-4 Paragraph 0025
a transmitter (120) arranged to transmit, on a shared physical channel (416) used to carry allocation and scheduling information, to a remote transceiver (140), an allocation of a scheduled uplink transmission resource (402) and transmit power control (TPC) command (418);	FIG. 4 Paragraphs 0025, 0033, 0065
and a receiver (120) arranged to receive an uplink signal from the remote transceiver at a calculated (436) transmit power level based on a path loss (230, 432) and the TPC command.	FIGS. 2, 4 Paragraphs 0066-0072

(6) Grounds of Rejection to be Reviewed on Appeal

Claim 26 was objected to. Claims 26, 28, 30-34, and 46-48 are rejected under 35 U.S.C. 101. Claims 26, 28, 30-34, and 46-48 are rejected under 35 U.S.C. § 112, first paragraph. Claims 1-4, 7, 15, 26, 28, 32, 33, 43, 46, 49, and 50 were rejected under 35 U.S.C. 103(a) as being unpatentable over Zeira et al. (International Publication Number #WO 00/57574) ("Zeira") in view of Chen et al. (US Pub. No. 2005/0025056) ("Chen") and further in view of Van Lieshout et al. (US Pub. No. 2001/0036823) ("Lieshout").

(7) Argument

Objections

The Examiner noted a informality in claim 26. We agree with the Examiner's observation and we have submitted a post-final amendment and response to cure this informality. This post-final amendment was submitted simultaneously with this Appeal Brief and hence we do not know the present status of this amendment. For purposes of this Brief we presume entry of that amendment.

Rejections under 35 U.S.C. § 112, first paragraph

Claims 26, 28, 30-34, and 46-48 were rejected under 35 U.S.C. § 112, first paragraph. The Examiner's specific concern is expressed as follows[2]:

> Regarding claims 26 and 46, Applicant recites the limitations "A remote transceiver or A base station for a cellular communication system, the remote transceiver or the base station having a computer program stored therein" is not disclose in the Specification.

Paragraph 0024 of our specification as originally filed, however, reads as follows:

> **[0024]** Some portions of the detailed description which follows are presented in terms of procedures, steps, logic blocks, processing, and other symbolic representations of operations on data bits that can be performed on computer memory. A procedure, computer executed step, logic block, process etc., are here conceived to be a self-consistent sequence of steps or instructions leading to a desired result. The steps are those utilizing physical manipulations of physical quantities. These quantities can take the form of electrical, magnetic, or radio signals capable of being stored, transferred, combined, compared, and otherwise manipulated in a computer system. These signals may be referred to at times as bits, values, elements, symbols, characters, terms, numbers, or the like. Each step may be performed by hardware, software, firmware, or combinations thereof.

2 Final Rejection at page 3, section 5.

Accordingly, we respectfully observe that all of the steps described in the specification, whether described as being carried out by a base station or by the remote transceiver, have been specifically presented as being doable via a corresponding computer system, computer memory, hardware, firmware, and/or computer execution. We therefore submit that the specification provides more than sufficient support for the reference in these claims to the execution of the described steps via a computer program that is stored at one or the other of the base station and remote transceiver.

Rejections under 35 U.S.C. § 101

Claims 26, 28, 30-34, and 46-48 were rejected under 35 U.S.C. 101.

Independent claim 26 begins as follows:

> "A remote transceiver for a cellular communication system, the remote transceiver having a computer program stored therein and further for supporting power control in a radio communication system, the computer program comprising instructions for:"

In turn, independent claim 46 begins as follows:

> "A base station for a cellular communication system, the base station having a computer program stored therein and further for controlling power in a radio communication system, the computer program comprising instructions for:"

The Examiner expresses the basis for this rejection as follows[3]:

3 Final Rejection at page 2, section 3.

> Claims 26,28,30-34 and 46-48 recite "A remote transceiver or A base station for a cellular communication system, the remote transceiver or the base station having a computer program stored therein". In the specification, paragraph 0026, recites "A procedure, computer executed step, logic block, process etc., are here conceived to be a self-consistent sequence of steps or instructions leading to a desired result. The steps are those utilizing physical manipulations of physical quantities. These quantities can take the form of electrical, magnetic, or radio signals capable of being stored, transferred, combined, compared, and otherwise manipulated in a computer system. These signals may be referred to at times as bits, values, elements, symbols, characters, terms, numbers, or the like". So treating claim 26-39 and 46-48 as a whole, it is effectively claiming a signal. Signal does not within any of the statutory categories, thus, not statutory (See MPEP 2100, In re Nuitjen, Docket no. 2006-1371 (Fed. Cir. Sept 20, 2007)(slip. Op. at 18)). Applicant is advised to delete the above underlying part from the specification because of "claiming signals".

With all due respect, the Examiner's analysis is flawed and does not represent an appropriate approach under 35 U.S.C. 101. The simple fact is that none of these claims are process claims but rather are claims to a manufacture or machine (with independent claim 26 comprising a "remote transceiver" and independent claim 46 comprising a "base station"). Just as clearly these claims are not, as suggested by the Examiner, nothing more than effective surrogates for "signals" that are not, in and of themselves, suitable subject matter under 35 U.S.C. 101.

Accordingly, and with all due respect, these claims readily pass muster under 35 U.S.C. 101.

Rejections under 35 U.S.C. § 102(b)

Not applicable

Rejections under 35 U.S.C. § 103(a)

Claims 1-4, 7, 15, 26, 28, 32, 33, 43, 46, 49, and 50 were rejected under 35 U.S.C. 103(a) as being unpatentable over Zeira in view of Chen and further in view of Van Lieshout. All of our independent claims (1, 26, 43, 46, 49, and 50) can be treated as a single group for purposes of this appeal.

Simply put, the Van Lieshout reference does not teach allocating a scheduled uplink transmission resource and TCP command on a shared physical channel that is also used to carry allocation and scheduling information from a base station to a remote transceiver.

Our claim 1, for example, specifies that a remote transceiver receives "an allocation of a scheduled uplink transmission resource and transmit power control (TPC) command" on "a shared physical channel used to carry allocation and scheduling information from the base station to the remote transceiver." The Examiner agrees that neither Zeira nor Chen disclose such a thing. The Examiner then seeks to rely upon the Van Lieshout reference to supplant this missing content.

The Examiner's specific interpretation of Van Lieshout reads as follows:

> However, Van Lieshout teaches on a shared physical channel (shared radio channel) used to carry allocation and scheduling information (*Para. 0006, Van Lieshout teaches since the DRNC is in charge of scheduling how data is multiplexed in a frame on the shared radio channel and allocating particular radio resources, such as channelization codes and associated spreading factors, the DRNC can convey to the mobile radio, using the transport format indicator, these types of specific details to allow the mobile radio unit to decode information sent over the shared radio channel).*

Van Lieshout's paragraph 0006 as relied upon by the Examiner reads as follows:

> [0006] In one example implementation of the present invention, a computer-generated data signal, (e.g., generated in a computer in the DRNC), is transported on a separate transport bearer between the DRNC and the base station having a particular format. A frame number field includes a specific frame number identifying a frame on the shared radio channel. A transport format indicator field includes information relating to a particular radio channel resource in the corresponding frame. In one example implementation, the transport format indicator field includes an index to a transport format table previously stored in the mobile radio unit. In other words, the index addresses particular entries in the look-up table so the mobile can retrieve certain information that will allow it to receive and decode information intended for that mobile radio unit on the shared radio channel. For example, since the DRNC is in charge of scheduling how data is multiplexed in a frame on the shared radio channel and allocating particular radio resources, such as channelization codes and associated spreading factors, the DRNC can convey to the mobile radio, using the transport format indicator, these types of specific details to allow the mobile radio unit to decode information sent over the shared radio channel.

We acknowledge that Van Lieshout does refer to a "shared radio channel" in this paragraph. This shared radio channel, however, does *not* convey allocation and scheduling information. Instead, as Van Lieshout discloses elsewhere in his specification, Van Lieshout uses a dedicated (and *non-shared*) downlink channel to convey downlink information of this sort. Van Lieshout further discloses that this dedicated non-shared downlink channel is used to convey such information as relates to downlink (and not uplink) shared resources.

Our claim 1, however, specifies, "on a shared physical channel used to carry allocation and scheduling information from the base station to the remote transceiver, receiving an allocation of a scheduled uplink transmission resource and transmit power control (TPC) command." In making his rejection, the Examiner misses the point that Van Lieshout discloses sending his allocation and scheduling information to a transceiver on a downlink *dedicated* (and hence not shared) channel, with his follow-on data (which is distinctly not the allocation and

scheduling information) then being sent on a *downlink* shared channel. As a result, Van Lieshout plainly and wholly fails to teach sending uplink allocation and scheduling information on a shared channel as specified by our claims.

Our dependent claims 2-4, 7, 15, 28, 32, 33, and 43 are all ultimately dependent upon one of the independent claims shown above to be allowable. While we believe that other arguments are available to highlight the allowable subject matter presented in various ones of these dependent claims, we also believe that the comments set forth herein regarding allowability of the independent claims are sufficiently compelling to warrant present exclusion of such additional points for the sake of brevity and expedited consideration.

Accordingly we respectfully seek reversal of the Examiner's rejections of claims 1-4, 7, 8, 15-17, 26, 28, 30-34, and 43-50.

Respectfully submitted,
FITCH, EVEN, TABIN & FLANNERY

Dated: December 3, 2010

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(8) Claims Appendix

1. A method of power control in a radio communication system, the method comprising, at a remote transceiver:

determining a path loss for a radio channel between a base station and the ~~a~~ remote transceiver; and

on a shared physical channel used to carry allocation and scheduling information from the base station to the remote transceiver, receiving an allocation of a scheduled uplink transmission resource and transmit power control (TPC) command; and

calculating at the remote transceiver, a transmit power level for transmission by the remote transceiver on the scheduled uplink transmission resource based upon the path loss and the TPC command.

2. The method of power control of claim 1, the method further comprising transmitting an uplink signal at the calculated transmit power level.

3. The method of power control of claim 1, wherein determining the path loss includes:

receiving a downlink signal transmitted from the base station, wherein the downlink signal signals a transmitted power level of the downlink signal; and

measuring a received power level of the downlink signal.

4. The method of power control of claim 3, wherein determining the path loss further includes computing a difference between the signaled transmit power level and the measured received power level.

7. The method of power control of claim 2, wherein the calculated transmit power level is based on a spreading factor parameter.

8. The method of power control of claim 2, wherein the calculated transmit power level is based on parameters associated with a selected transport format.

15. The power control method of claim 1, further comprising calculating a transmit power level for transmission by the remote transceiver on the scheduled uplink transmission resource based on the path loss and an accumulated TPC command.

16. The power control method of claim 15, further comprising receiving a signal from the base station for instructing the remote transmitter to utilize only the accumulated TPC commands when deriving the calculated transmit power level, thereby disabling use of open loop power control and enabling use of closed loop power control only.

17. The power control method of claim 15, further comprising receiving a signal from the base station for instructing the remote transmitter to disregard the accumulated TPC command when deriving the calculated transmit power level, thereby enabling use of open loop power control only and disabling use of closed loop power control.

26. A remote transceiver for a cellular communication system, the remote transceiver having a computer program stored therein and further for supporting power control in a radio communication system, the computer program comprising instructions for:

determining a path loss for a radio channel between a base station and the remote transceiver;

on a shared physical channel used to carry allocation and scheduling information from the base station to the remote transceiver, receiving an allocation of a scheduled uplink transmission resource and a transmit power control (TPC) command;

calculating a transmit power level for the remote transceiver based on the path

loss and an accumulated TPC command.

28. The remote transceiver of claim 26, wherein determining the path loss includes:

receiving a downlink signal transmitted from the base station, wherein the downlink signal signals a transmitted power level of the downlink signal; and

measuring a received power level of the downlink signal.

30. The remote transceiver of claim 26, the computer program further comprising instructions for receiving a signal from the base station for instructing the remote transmitter to utilize the accumulated TPC command only when calculating the transmit power level, thereby disabling use of open loop power control and enabling use of closed loop power control only.

31. The remote transceiver of claim 26, the computer program further comprising instructions for receiving a signal from the base station for instructing the remote transmitter to disregard the accumulated TPC command when calculating the transmit power level, thereby disabling use of closed loop power control and enabling use of open loop power control only.

32. The remote transceiver of claim 26, the computer program further comprising instructions for transmitting an uplink signal from the remote transceiver at the calculated transmit power level.

33. The remote transceiver of claim 26, wherein calculating the transmit power level is additionally based on a spreading factor parameter.

34. The remote transceiver of claim 26, wherein calculating the transmit power level is additionally based on parameters associated with a selected transport format.

43. A method of power control in a radio communications system, the method comprising, at a base station:

on a shared physical channel used to carry allocation and scheduling information from the base station to a remote transceiver, sending an allocation of a scheduled uplink transmission resource and transmit power control (TPC) command; and

receiving an uplink signal from the remote transceiver at a calculated transmit power level based on a path loss and the TPC command.

44. The power control method of claim 43, further comprising sending a signal to the remote transceiver for instructing the remote transmitter to utilize only the accumulated TPC commands when deriving the calculated transmit power level, thereby instructing the remote transmitter to disable use of open loop power control and enable use of closed loop power control only.

45. The power control method of claim 43, further comprising sending a signal from the base station to the remote transceiver for instructing the remote transmitter to disregard the accumulated TPC command when deriving the calculated transmit power level, thereby instructing the remote transmitter to enable use of open loop power control only and disable use of closed loop power control.

46. A base station for a cellular communication system, the base station having a computer program stored therein and further for controlling power in a radio communication system, the computer program comprising instructions for:

on a shared physical channel used to carry allocation and scheduling information from the base station to the remote transceiver, sending an allocation of a scheduled uplink transmission resource and a transmit power control (TPC) command; and

receiving an uplink signal from the remote transceiver at a calculated transmit power level based on a path loss and the TPC command.

47. The base station of claim 46, the computer program further comprising instructions for

sending a signal to the remote transceiver for instructing the remote transmitter to utilize only the TPC commands when deriving the calculated transmit power level, thereby instructing the remote transmitter to disable use of open loop power control and enable use of closed loop power control only.

48. The base station of claim 46, the computer program further comprising instructions for sending a signal from the base station to the remote transceiver for instructing the remote transmitter to disregard the TPC commands when deriving the calculated transmit power level, thereby instructing the remote transmitter to enable use of open loop power control only and disable use of closed loop power control.

49. A remote transceiver for supporting power control in a radio communication system, the remote transceiver comprising:

a signal processor for determining a path loss for a radio channel between a base station and the remote transceiver; and

a receiver arranged to receive, on a shared physical channel used to carry allocation and scheduling information from the base station, an allocation of a scheduled uplink transmission resource and transmit power control (TPC) command; wherein

the signal processor is arranged to calculate a transmit power level for transmission by the remote transceiver on the scheduled uplink transmission resource based upon the path loss and the TPC command.

50. A base station for supporting power control in a radio communication system, the base station comprising:

a transmitter arranged to transmit, on a shared physical channel used to carry allocation and scheduling information, to a remote transceiver, an allocation of a scheduled uplink transmission resource and transmit power control (TPC) command; and

a receiver arranged to receive an uplink signal from the remote transceiver at a calculated transmit power level based on a path loss and the TPC command.

(9) Evidence Appendix

None

(10) Related Proceedings Appendix

None

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.	10/917,968
Filed:	August 12, 2004
Applicants:	Nicholas William Anderson
Title:	**POWER CONTROL IN A WIRELESS COMMUNICATION SYSTEM**
Art Unit:	2618
Examiner:	Dominic E. Rego
Attorney Docket:	9147-96606 (04-0108) S05B4005US00
Customer No.:	22242

Confirmation No.3609

This Amendment B And Response was electronically filed on December 3, 2010 using EFS-Web.

Mail Stop AMENDMENT
Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

AMENDMENT B AND RESPONSE

Sir:

Applicants hereby petition under 37 CFR § 1.136(a) for a three-month extension of time in the above-identified application, up to and including December 3, 2010, to make this reply timely.

Please amend the above-identified patent application as follows:

Amendments to the Claims are reflected in the listing of claims beginning on page 2 of this paper; and

Remarks begin on page 8 of this paper.

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented): A method of power control in a radio communication system, the method comprising, at a remote transceiver:

determining a path loss for a radio channel between a base station and the remote transceiver; and

on a shared physical channel used to carry allocation and scheduling information from the base station to the remote transceiver, receiving an allocation of a scheduled uplink transmission resource and transmit power control (TPC) command; and

calculating at the remote transceiver, a transmit power level for transmission by the remote transceiver on the scheduled uplink transmission resource based upon the path loss and the TPC command.

2. (Previously Presented): The method of power control of claim 1, the method further comprising transmitting an uplink signal at the calculated transmit power level.

3. (Original): The method of power control of claim 1, wherein determining the path loss includes:

receiving a downlink signal transmitted from the base station, wherein the downlink signal signals a transmitted power level of the downlink signal; and

measuring a received power level of the downlink signal.

4. (Original): The method of power control of claim 3, wherein determining the path loss further includes computing a difference between the signaled transmit power level and the measured received power level.

5-6. (Canceled)

7. (Original): The method of power control of claim 2, wherein the calculated transmit power level is based on a spreading factor parameter.

8. (Previously Presented): The method of power control of claim 2, wherein the calculated transmit power level is based on parameters associated with a selected transport format.

9.-14. (Canceled)

15. (Previously presented): The power control method of claim 1, further comprising calculating a transmit power level for transmission by the remote transceiver on the scheduled uplink transmission resource based on the path loss and an accumulated TPC command.

16. (Previously presented): The power control method of claim 15, further comprising receiving a signal from the base station for instructing the remote transmitter to utilize only the accumulated TPC commands when deriving the calculated transmit power level, thereby disabling use of open loop power control and enabling use of closed loop power control only.

17. (Previously presented): The power control method of claim 15, further comprising receiving a signal from the base station for instructing the remote transmitter to disregard the accumulated TPC command when deriving the calculated transmit power level, thereby enabling use of open loop power control only and disabling use of closed loop power control.

18-25. (Cancelled)

26. (Currently amended): A remote transceiver for a cellular communication system, the remote transceiver having a computer program stored therein and further for supporting power control in a

radio communication system, the computer program comprising instructions for:

determining a path loss for a radio channel between a base station and the remote transceiver; ~~and~~

on a shared physical channel used to carry allocation and scheduling information from the base station to the remote transceiver, receiving an allocation of a scheduled uplink transmission resource and a transmit power control (TPC) command; and

calculating a transmit power level for the remote transceiver based on the path loss and an accumulated TPC command.

27. (Cancelled)

28. (Previously Presented): The remote transceiver of claim 26, wherein determining the path loss includes:

receiving a downlink signal transmitted from the base station, wherein the downlink signal signals a transmitted power level of the downlink signal; and

measuring a received power level of the downlink signal.

29. (Cancelled)

30. (Previously Presented): The remote transceiver of claim 26, the computer program further comprising instructions for receiving a signal from the base station for instructing the remote transmitter to utilize the accumulated TPC command only when calculating the transmit power level, thereby disabling use of open loop power control and enabling use of closed loop power control only.

31. (Previously Presented): The remote transceiver of claim 26, the computer program further comprising instructions for receiving a signal from the base station for instructing the remote transmitter to disregard the accumulated TPC command when calculating the transmit power level, thereby disabling use of closed loop power control and enabling use of open loop power

control only.

32. (Previously Presented): The remote transceiver of claim 26, the computer program further comprising instructions for transmitting an uplink signal from the remote transceiver at the calculated transmit power level.

33. (Previously Presented): The remote transceiver of claim 26, wherein calculating the transmit power level is additionally based on a spreading factor parameter.

34. (Previously Presented): The remote transceiver of claim 26, wherein calculating the transmit power level is additionally based on parameters associated with a selected transport format.

35.- 42. (Cancelled)

43. (Previously Presented): A method of power control in a radio communications system, the method comprising, at a base station:

on a shared physical channel used to carry allocation and scheduling information from the base station to a remote transceiver, sending an allocation of a scheduled uplink transmission resource and transmit power control (TPC) command; and

receiving an uplink signal from the remote transceiver at a calculated transmit power level based on a path loss and the TPC command.

44. (Previously presented): The power control method of claim 43, further comprising sending a signal to the remote transceiver for instructing the remote transmitter to utilize only the accumulated TPC commands when deriving the calculated transmit power level, thereby instructing the remote transmitter to disable use of open loop power control and enable use of closed loop power control only.

45. (Previously presented): The power control method of claim 43, further comprising sending a

signal from the base station to the remote transceiver for instructing the remote transmitter to disregard the accumulated TPC command when deriving the calculated transmit power level, thereby instructing the remote transmitter to enable use of open loop power control only and disable use of closed loop power control.

46. (Previously Presented): A base station for a cellular communication system, the base station having a computer program stored therein and further for controlling power in a radio communication system, the computer program comprising instructions for:

on a shared physical channel used to carry allocation and scheduling information from the base station to the remote transceiver, sending an allocation of a scheduled uplink transmission resource and a transmit power control (TPC) command; and

receiving an uplink signal from the remote transceiver at a calculated transmit power level based on a path loss and the TPC command.

47. (Previously Presented): The base station of claim 46, the computer program further comprising instructions for sending a signal to the remote transceiver for instructing the remote transmitter to utilize only the TPC commands when deriving the calculated transmit power level, thereby instructing the remote transmitter to disable use of open loop power control and enable use of closed loop power control only.

48. (Previously Presented): The base station of claim 46, the computer program further comprising instructions for sending a signal from the base station to the remote transceiver for instructing the remote transmitter to disregard the TPC commands when deriving the calculated transmit power level, thereby instructing the remote transmitter to enable use of open loop power control only and disable use of closed loop power control.

49. (Previously Presented) A remote transceiver for supporting power control in a radio communication system, the remote transceiver comprising:

a signal processor for determining a path loss for a radio channel between a base station and

the remote transceiver; and

a receiver arranged to receive, on a shared physical channel used to carry allocation and scheduling information from the base station, an allocation of a scheduled uplink transmission resource and transmit power control (TPC) command; wherein

the signal processor is arranged to calculate a transmit power level for transmission by the remote transceiver on the scheduled uplink transmission resource based upon the path loss and the TPC command.

50. (Previously Presented) A base station for supporting power control in a radio communication system, the base station comprising:

a transmitter arranged to transmit, on a shared physical channel used to carry allocation and scheduling information, to a remote transceiver, an allocation of a scheduled uplink transmission resource and transmit power control (TPC) command; and

a receiver arranged to receive an uplink signal from the remote transceiver at a calculated transmit power level based on a path loss and the TPC command.

REMARKS

In an Office Communication dated January 8, 2010 as entered in the above-captioned matter, the Examiner noted an informality in claim 26. We agree with the Examiner's observation and submit this post-final amendment to cure this informality. This correction does not raise new substantive issues, will not create a need for a new search, and will place the claims in better condition for allowance and/or appeal.

If there is any other issue that may be resolved, the Examiner is respectfully requested to telephone the undersigned.

Respectfully submitted,

Fitch, Even, Tabin & Flannery

Date: December 3, 2010

By: _____
Steven G. Parmelee
Registration No. 28,790

120 S. LaSalle Street, Suite 1600
Chicago, IL 60603-3406
Telephone: (312) 577-7000
Facsimile: (312) 577-7007

Electronic Patent Application Fee Transmittal

Application Number:	10917968
Filing Date:	12-Aug-2004
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Filer:	Steven Glen Parmelee/Helen Donegan
Attorney Docket Number:	9010/96606 (04-0108)

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Filing a brief in support of an appeal	1402	1	540	540
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 3 months with $0 paid	1253	1	1110	1110
Miscellaneous:				
		Total in USD ($)		**1650**

Electronic Acknowledgement Receipt

EFS ID:	8964608
Application Number:	10917968
International Application Number:	
Confirmation Number:	3609
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Customer Number:	22242
Filer:	Steven Glen Parmelee/Helen Donegan
Filer Authorized By:	Steven Glen Parmelee
Attorney Docket Number:	9010/96606 (04-0108)
Receipt Date:	03-DEC-2010
Filing Date:	12-AUG-2004
Time Stamp:	16:04:49
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1650
RAM confirmation Number	2390
Deposit Account	061135
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

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Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)	
Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Appeal Brief Filed	96606_Appeal_Brief.pdf	370578 b0a2eca972129f7e36b94d88a936b9090cb2fbef	no	23
Warnings:					
Information:					
2		96606_Amendment_B_and_Response.pdf	129074 e3cbd9d1757e49bc71b0843b820e74c3a5474291	yes	8

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment/Argument after Notice of Appeal	1	1
Claims	2	7
Applicant Arguments/Remarks Made in an Amendment	8	8

Warnings:					
Information:					
3	Fee Worksheet (PTO-875)	fee-info.pdf	32094 ca660be108b514d5e50029db8ec5abd5a76272bd	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	531746		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 10/917,968	Filing Date 08/12/2004	☐ To be Mailed

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☐		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	12/03/2010	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 23	Minus	** 46	= 0	X $ =		OR	X $52=	0
	Independent (37 CFR 1.16(h))	* 6	Minus	***10	= 0	X $ =		OR	X $220=	0
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/CASSANDRA B. DOWNS/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/917,968	08/12/2004	Nicholas William Anderson	9010/96606 (04-0108)	3609

22242 7590 08/03/2010

FITCH EVEN TABIN & FLANNERY
120 SOUTH LASALLE STREET
SUITE 1600
CHICAGO, IL 60603-3406

EXAMINER	
REGO, DOMINIC E	
ART UNIT	PAPER NUMBER
2618	

MAIL DATE	DELIVERY MODE
08/03/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of Panel Decision from Pre-Appeal Brief Review	Application/Control No.	Applicant(s)/Patent under Reexamination	
	10/917,968	ANDERSON, NICHOLAS WILLIAM	
	DOMINIC REGO	Art Unit	2618

This is in response to the Pre-Appeal Brief Request for Review filed 8 June 2010.

1. ☐ **Improper Request** – The Request is improper and a conference will not be held for the following reason(s):

☐ The Notice of Appeal has not been filed concurrent with the Pre-Appeal Brief Request.
☐ The request does not include reasons why a review is appropriate.
☐ A proposed amendment is included with the Pre-Appeal Brief request.
☐ Other: .

The time period for filing a response continues to run from the receipt date of the Notice of Appeal or from the mail date of the last Office communication, if no Notice of Appeal has been received.

2. ☒ **Proceed to Board of Patent Appeals and Interferences** – A Pre-Appeal Brief conference has been held. The application remains under appeal because there is at least one actual issue for appeal. Applicant is required to submit an appeal brief in accordance with 37 CFR 41.37. The time period for filing an appeal brief will be reset to be one month from mailing this decision, or the balance of the two-month time period running from the receipt of the notice of appeal, whichever is greater. Further, the time period for filing of the appeal brief is extendible under 37 CFR 1.136 based upon the mail date of this decision or the receipt date of the notice of appeal, as applicable.

☒ The panel has determined the status of the claim(s) is as follows:
Claim(s) allowed: _____.
Claim(s) objected to: _____.
Claim(s) rejected: *1-4, 7-8, 15-17, 26, 28, 30-34, 43-50*.
Claim(s) withdrawn from consideration: _____.

3. ☐ **Allowable application** – A conference has been held. The rejection is withdrawn and a Notice of Allowance will be mailed. Prosecution on the merits remains closed. No further action is required by applicant at this time.

4. ☐ **Reopen Prosecution** – A conference has been held. The rejection is withdrawn and a new Office action will be mailed. No further action is required by applicant at this time.

All participants:

(1) *DUC NGUYEN*. (3)*EDWARD URBAN*.

(2) *DOMINIC REGO*. (4)_____.

/Duc Nguyen/
Supervisory Patent Examiner, Art Unit 2618

/Edward Urban/
Supervisory Patent Examiner, Art Unit 2618

Doc Code: AP.PRE.REQ

PTO/SB/33 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional): 9010/96606 (04-0108)

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)]

on _____

Signature _____

Typed or printed name _____

Application Number	Filed
10/917,968	August 12, 2004

First Named Inventor: Nicholas William Anderson

Art Unit	Examiner
2618	Dominic E. Rego

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

- ☐ applicant/inventor.
- ☐ assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)
- ☑ attorney or agent of record. Registration number 28,790.
- ☐ attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____

/Steven G. Parmelee/
Signature

Steven G. Parmelee
Typed or printed name

312/577-7000
Telephone number

June 8, 2010
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☑ *Total of 1 forms are submitted.

This collection of information is required by 35 U.S.C. 132. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.	10/917,968
Filed:	August 12, 2004
Applicants:	Nicholas William Anderson
Title:	**POWER CONTROL IN A WIRELESS COMMUNICATION SYSTEM**
Art Unit:	2618
Examiner:	Dominic E. Rego
Attorney Docket:	9010/96606 (04-0108) SO5B4005US00
Customer No.:	22242

Confirmation No.3609

This Notice of Appeal was electronically filed on June 8, 2010 using the U.S. Patent and Trademark Office's EFS Web

Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

NOTICE OF APPEAL FROM THE PRIMARY EXAMINER TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

Sir:

Applicants hereby appeal to the Board of Patent Appeals and Interferences from the decision of the Examiner dated January 8, 2010 finally rejecting claims 1-4, 7, 15, 26, 28, 32, 33, 43, 46, 49, and 50.

☒ The fee for this Notice of Appeal is $ 540.00 (37 CFR § 41.20(b)(1)).

☒ Applicants submit herewith a Pre-Appeal Brief Request For Review and Brief In Support of Pre-Appeal Brief Request For Review.

☒ Authorization to charge Deposit Account No. 06-1135 for the Appeal Fee was given using EFS-Web.

☒ The Commissioner is hereby authorized to charge any additional fees which may be required in connection with this appeal (specifically including the fee for filing a brief in support of this appeal if such brief is filed unaccompanied by full payment therefor, and the fee for filing a request for an oral hearing if such request is made unaccompanied by full payment therefor), or credit any overpayment to Deposit Account No. 06-1135.

June 8, 2010
Date

Steven G. Parmelee
Registration No. 28,790
Attorney or Agent of record

FITCH, EVEN, TABIN & FLANNERY
120 South LaSalle Street, Suite 1600
Chicago, Illinois 60603-3406
Telephone: (312) 577-7000
Facsimile: (312) 577-7007

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.	10/917,968
Filed:	August 12, 2004
Applicants:	Nicholas William Anderson
Title:	**POWER CONTROL IN A WIRELESS COMMUNICATION SYSTEM**
Art Unit:	2618
Examiner:	Dominic E. Rego
Attorney Docket:	9010/96606 (04-0108) SO5B4005US00
Customer No.:	22242

Confirmation No.3609

This Brief in Support of a Pre-Appeal Request for Review was electronically filed on June 8, 2010 using the U.S. Patent and Trademark Office's EFS Web

BRIEF IN SUPPORT OF PRE-APPEAL BRIEF REQUEST FOR REVIEW

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action dated January 8, 2010, as entered in the above-captioned matter, please enter the following brief in support of the attached Pre-Appeal brief Request for Review. A Notice of Appeal is also submitted herewith.

Certain claims were objected to or rejected under 35 U.S.C. 112 and 35 U.S.C. 101. Claims 1-4, 7, 15, 26, 28, 32, 33, 43, 46, 49, and 50 were rejected under 35 U.S.C. 103(a) as being unpatentable over Zeira et al. (International Publication Number #WO 00/57574) ("Zeira") in view of Chen et al. (US Pub. No. 2005/0025056) ("Chen") and further in view of Van Lieshout et al. (US Pub. No. 2001/0036823) ("Lieshout"). We respectfully observe that at least some of these rejections are based upon clear error.

I. Clear Error: The Van Lieshout reference does not teach allocating a scheduled uplink transmission resource and TCP command on a shared physical

channel that is also used to carry allocation and scheduling information from a base station to a remote transceiver

Our claim 1 specifies that a remote transceiver receives "an allocation of a scheduled uplink transmission resource and transmit power control (TPC) command" on "a shared physical channel used to carry allocation and scheduling information from the base station to the remote transceiver." The Examiner agrees that neither Zeira nor Chen disclose such a thing. The Examiner then seeks to rely upon the Van Lieshout reference in these regards.

The Examiner's specific interpretation of Van Lieshout reads as follows:

> However, Van Lieshout teaches on a shared physical channel (shared radio channel) used to carry allocation and scheduling information (*Para. 0006, Van Lieshout teaches since the DRNC is in charge of scheduling how data is multiplexed in a frame on the shared radio channel and allocating particular radio resources, such as channelization codes and associated spreading factors, the DRNC can convey to the mobile radio, using the transport format indicator, these types of specific details to allow the mobile radio unit to decode information sent over the shared radio channel).*

Van Lieshout's paragraph 0006 as relied upon by the Examiner reads as follows:

> [0006] In one example implementation of the present invention, a computer-generated data signal, (e.g., generated in a computer in the DRNC), is transported on a separate transport bearer between the DRNC and the base station having a particular format. A frame number field includes a specific frame number identifying a frame on the shared

> radio channel. A transport format indicator field includes information relating to a particular radio channel resource in the corresponding frame. In one example implementation, the transport format indicator field includes an index to a transport format table previously stored in the mobile radio unit. In other words, the index addresses particular entries in the look-up table so the mobile can retrieve certain information that will allow it to receive and decode information intended for that mobile radio unit on the shared radio channel. For example, since the DRNC is in charge of scheduling how data is multiplexed in a frame on the shared radio channel and allocating particular radio resources, such as channelization codes and associated spreading factors, the DRNC can convey to the mobile radio, using the transport format indicator, these types of specific details to allow the mobile radio unit to decode information sent over the shared radio channel.

Van Lieshout does refer to a "shared radio channel" in this paragraph. This shared radio channel, however, does not convey allocation and scheduling information. Instead, and elsewhere in his specification, Van Lieshout discloses use of a dedicated (and *non-shared*) downlink channel to convey downlink information of this sort. Van Lieshout further discloses that this dedicated non-shared downlink channel is used to convey such information as relates to downlink (and not uplink) shared resources.

Our claim 1, however specifies, "on a shared physical channel used to carry allocation and scheduling information from the base station to the remote transceiver, receiving an allocation of a scheduled uplink transmission resource and transmit power control (TPC) command." In making his rejection, the Examiner misses the point that Van Lieshout discloses sending his allocation and scheduling information to a transceiver on a downlink *dedicated* (and not shared) channel, with his follow-on data (which is distinctly not the allocation and scheduling information) being then sent on a *downlink* shared channel. As a result, Van Lieshout plainly and wholly fails to teach sending uplink allocation and scheduling information on a shared channel as specified by our claims.

II. Conclusion

We respectfully submit that the proffered claims are allowable over the references of record. In any event, we submit that our independent claims, such as claim 1 discussed in detail above, clearly contain content that is different from the teachings of Van Lieshout.

Respectfully submitted,

FITCH, EVEN, TABIN & FLANNERY

Date: June 8, 2010

By: _____
Steven G. Parmelee
Registration No. 28,790

120 South LaSalle Street, Suite 1600
Chicago, Illinois 60603-4277
Telephone: (312) 577-7000

Electronic Patent Application Fee Transmittal

Application Number:	10917968
Filing Date:	12-Aug-2004
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Filer:	Steven Glen Parmelee/Helen Donegan
Attorney Docket Number:	9010/96606 (04-0108)

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Notice of appeal	1401	1	540	540
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 2 months with $0 paid	1252	1	490	490
Miscellaneous:				
		Total in USD ($)		**1030**

Electronic Acknowledgement Receipt	
EFS ID:	7767150
Application Number:	10917968
International Application Number:	
Confirmation Number:	3609
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Customer Number:	22242
Filer:	Steven Glen Parmelee/Helen Donegan
Filer Authorized By:	Steven Glen Parmelee
Attorney Docket Number:	9010/96606 (04-0108)
Receipt Date:	08-JUN-2010
Filing Date:	12-AUG-2004
Time Stamp:	12:57:02
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1030
RAM confirmation Number	9549
Deposit Account	061135
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Pre-Brief Conference request	96606_Preappeal_Brief_Request_for_Review.pdf	234192 1864af45de8d335d184927dd6c49184d8235e807	no	2
Warnings:					
Information:					
2	Notice of Appeal Filed	96606_Notice_of_Appeal_From_the_Primary_Examiner.pdf	80632 f229299fabe2d7d27015994734a9031b5052aab2	no	1
Warnings:					
Information:					
3	Notice of Appeal Filed	96606_Brief_in_Support_of_Preappeal_Brief_Request_for_Review.pdf	188938 f4f1957bbacb0ed0a65c5769bc25adec4960f697	no	4
Warnings:					
Information:					
4	Fee Worksheet (PTO-875)	fee-info.pdf	31772 965a03f9fa3084b3d570df931725af1e0d7d596a	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	535534		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
10/917,968	08/12/2004	Nicholas William Anderson	562492000500

CONFIRMATION NO. 3609

22242
FITCH EVEN TABIN & FLANNERY
120 SOUTH LASALLE STREET
SUITE 1600
CHICAGO, IL 60603-3406

POA ACCEPTANCE LETTER

OC000000040497704

Date Mailed: 03/12/2010

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/03/2010.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/klvestal/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
10/917,968	08/12/2004	Nicholas William Anderson	562492000500

CONFIRMATION NO. 3609

25226
MORRISON & FOERSTER LLP
755 PAGE MILL RD
PALO ALTO, CA 94304-1018

POWER OF ATTORNEY NOTICE

OC000000040497667

Date Mailed: 03/12/2010

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/03/2010.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/klvestal/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.:	10/917,968	)	**CONFIRMATION NO. 3609**
Inventor:	Nicholas William Anderson	)	This Change in Entity Status was electronically filed on March 4, 2010 using the U.S. Patent and Trademark Office's EFS Web
Filed:	August 12, 2004	)	
For:	**POWER CONTROL IN A WIRELESS COMMUNICATION SYSTEM**	)	
TC/A.U.:	2618	)	
Examiner:	Dominic E. Rego	)	
Docket No.:	9010/96606 (04-0108)	)	
Customer No.:	22242	)	

ASSERTION OF SMALL ENTITY STATUS

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In accordance with 37 C.F.R. §1.28(b), written notification is hereby provided to the U.S. Patent and Trademark Office of the assertion of small entity status in the above-identified patent. The Assignee of the present patent is a small entity under 37 C.F.R. §1.27(a)(3) and hereby requests that the patent show said small entity status.

Respectfully requested,

FITCH, EVEN, TABIN & FLANNERY

By: _____
Steven G. Parmelee
Registration No. 28,790

Date: 3/4/2010

120 South LaSalle Street, Suite 1600
Chicago, Illinois 60603-4277
Telephone: (312) 577-7000

Electronic Acknowledgement Receipt

EFS ID:	7145004
Application Number:	10917968
International Application Number:	
Confirmation Number:	3609
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Customer Number:	25226
Filer:	Steven Glen Parmelee/Helen Donegan
Filer Authorized By:	Steven Glen Parmelee
Attorney Docket Number:	562492000500
Receipt Date:	04-MAR-2010
Filing Date:	12-AUG-2004
Time Stamp:	18:09:36
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	96606_Assertion_of_Small_Entity_Status_1.PDF	32230 8bcbde4ed0068efb6802622fb1ef1e5c7986c765	no	1

Warnings:	
Information:	

Total Files Size (in bytes):	32230

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/80 (01-06)
Approved for use through 12/31/2008. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

[X] Practitioners associated with the Customer Number: 22242

OR

[ ] Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

[X] The address associated with Customer Number: 22242

OR

[ ] Firm or Individual Name			
Address			
City		State	Zip
Country			
Telephone		Email	

Assignee Name and Address:

IPWireless, Inc.
90 New Montgomery Street, Suite 315
San Francisco, California 94105

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date	7/10/09
Name	ALAN EDWARD JONES	Telephone	+44 1249 800114
Title	EXECUTIVE VICE PRESIDENT		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PTO/SB/96 (10-07)
Approved for use through 10/31/2007. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Nicholas W. Anderson

Application No./Patent No.: 10/917,968 Filed/Issue Date: August 12, 2004

Entitled: Power Control in a Wireless Communication System

IPWireless, Inc., a Corporation
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☑ the assignee of the entire right, title, and interest; or

2. ☐ an assignee of less than the entire right, title and interest
(The extent (by percentage) of its ownership interest is_____ %)

in the patent application/patent identified above by virtue of either:

A. ☑ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 024006, Frame 0144, or for which a copy thereof is attached.

OR

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

3. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet.

☐ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Steven G. Parmelee/	March 3, 2010
Signature	Date
Steven G. Parmelee	312/577-7000
Printed or Typed Name	Telephone Number
Attorney for Applicant	
Title	

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	7128974
Application Number:	10917968
International Application Number:	
Confirmation Number:	3609
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Customer Number:	25226
Filer:	Steven Glen Parmelee/Helen Donegan
Filer Authorized By:	Steven Glen Parmelee
Attorney Docket Number:	562492000500
Receipt Date:	03-MAR-2010
Filing Date:	12-AUG-2004
Time Stamp:	11:20:35
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	96606_Power_of_Attorney_1.PDF	271845 be2eeb3f537db4f0f3b20aa6a87548eab8f6a756	no	3

Warnings:	
Information:	

Total Files Size (in bytes):	271845

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)		
	Application Number	10917968
	Filing Date	2004-08-12
	First Named Inventor	Nicholas William Anderson
	Art Unit	2618
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	9010/96606 (04-0108)

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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	1							☐

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	10917968
	Filing Date	2004-08-12
	First Named Inventor	Nicholas William Anderson
	Art Unit	2618
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	9010/96606 (04-0108)

	1	Communication pursuant to Article 94(3) EPC from European Patent Application No. 05 801 370.7-1246 dated December 30, 2009	☐

If you wish to add additional non-patent literature document citation information please click the Add button [Add]

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	10917968
	Filing Date	2004-08-12
	First Named Inventor	Nicholas William Anderson
	Art Unit	2618
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	9010/96606 (04-0108)

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☒ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Steven G. Parmelee/	Date (YYYY-MM-DD)	2010-02-24
Name/Print	Steven G. Parmelee	Registration Number	28790

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	7076613
Application Number:	10917968
International Application Number:	
Confirmation Number:	3609
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Customer Number:	25226
Filer:	Steven Glen Parmelee/Helen Donegan
Filer Authorized By:	Steven Glen Parmelee
Attorney Docket Number:	562492000500
Receipt Date:	24-FEB-2010
Filing Date:	12-AUG-2004
Time Stamp:	13:50:34
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	96606_Supplemental_IDS_Transmittal_1.PDF	57682 56bd6c55689ae672f5a46043cabcd04209f28cad	no	2
Warnings:					
Information:					

2	Information Disclosure Statement (IDS) Filed (SB/08)	96606_IDS_Form.pdf	614113 4ff03fe63acc40208b74a6c6e87720018c30d468	no	4
Warnings:					
Information:					
A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.					
3	NPL Documents	96606_EPC_Article94.pdf	166213 7e5cd91db5fd27f8a0b9c73f6eaeb8de047b56c0	no	4
Warnings:					
Information:					
		Total Files Size (in bytes):	838008		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. 10/917,968	*Confirmation No. 3609*
Filed: August 12, 2004	
Applicant: Nicholas William Anderson	
Title: **POWER CONTROL IN A WIRELESS COMMUNICATION SYSTEM**	This Supplemental Information Disclosure Statement Transmittal was electronically filed on February 24, 2010 using the USPTO's EFS-Web.
Art Unit: 2618	
Examiner: Dominic E. Rego	
Attorney Docket: 9010/96606 (04-0108)	
Customer No.: 22242	

Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

SUPPLEMENTAL INFORMATION
DISCLOSURE STATEMENT TRANSMITTAL

Sir:

Pursuant to the duty of disclosure under 37 C.F.R. § 1.56, and in accordance with MPEP § 601 and 37 C.F.R. §§ 1.97 and 1.98, Applicants and the undersigned attorney bring the information listed on Form PTO/SB/08a, filed concurrently herewith, to the attention of the Examiner.

The references cited in this Information Disclosure Statement were cited in the Communication Pursuant to Article 94(3) EPC (European Application No. 05 801 370.7-1246) which issued on December 30, 2009, a copy of which is attached.

Pursuant to 37 C.F.R. § 1.97(h), the filing of this Information Disclosure Statement shall not be construed to be an admission that the information cited in the

statement is, or is considered to be, material to patentability as defined in 37 C.F.R. § 1.56(b).

The Commissioner is hereby authorized to charge any additional fees which may be required with respect to this communication, or credit any overpayment, to Deposit Account No. 06-1135.

Respectfully submitted,

FITCH, EVEN, TABIN & FLANNERY

Dated: Feb 24, 2010

Steven G. Parmelee
Registration No. 28,790

120 South LaSalle Street, Suite 1600
Chicago, Illinois 606033406
Telephone (312) 577-7000
Facsimile (312) 577-7007

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/917,968	08/12/2004	Nicholas William Anderson	562492000500	3609

25226 7590 01/08/2010

MORRISON & FOERSTER LLP
755 PAGE MILL RD
PALO ALTO, CA 94304-1018

EXAMINER	
REGO, DOMINIC E	
ART UNIT	PAPER NUMBER
2618	

MAIL DATE	DELIVERY MODE
01/08/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/917,968	ANDERSON, NICHOLAS WILLIAM	
	Examiner	Art Unit	
	DOMINIC E. REGO	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 September 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,7,8,15-17,26,28,30-34 and 43-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,7,8,15-17,26,28,30-34 and 43-50* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This communication is responsive to the application filed on September 30, 2009.

Claims 1-4,7-8,15-17,26,28,30-34, and 43-50 are pending and presented for prosecution.

Claims 1-2,26,28,30-32,34,43,46-48 have been amended and new claims 49-50 have been added.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 26,28,30-34 and 46-48 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 26,28,30-34 and 46-48 recite "A remote transceiver or A base station for a cellular communication system, the remote transceiver or the base station having a computer program stored therein". In the specification, paragraph 0026, recites "A procedure, computer executed step, logic block, process etc., are here conceived to be a self-consistent sequence of steps or instructions leading to a desired result. The steps are those utilizing physical manipulations of physical quantities. These quantities can take the form of electrical, magnetic, or radio signals capable of being stored,

transferred, combined, compared, and otherwise manipulated in a computer system. These signals may be referred to at times as bits, values, elements, symbols, characters, terms, numbers, or the like". So treating claim 26-39 and 46-48 as a whole, it is effectively claiming a signal. Signal does not within any of the statutory categories, thus, not statutory (See MPEP 2100, In re Nuitjen, Docket no. 2006-1371 (Fed. Cir. Sept 20, 2007)(slip. Op. at 18)). Applicant is advised to delete the above underlying part from the specification because of "claiming signals".

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 26,28,30-34 and 46-48 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Regarding claims 26 and 46, Applicant recites the limitations "A remote transceiver or A base station for a cellular communication system, the remote transceiver or the base station having a computer program stored therein" is not disclose in the Specification.

Claim Objections

6. Claim 26 is objected to because of the following informalities: Applicant recited limitations "A remote transceiver for a cellular communication system, the having a computer program stored therein". The underlying part should be -- the remote transceiver having a computer program stored therein --. Appropriate correction is required.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1-4,7,15,26,28,32,33,43,46,49 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zeira et al. (International Publication Number #WO 00/57574) in view of Chen et al. (US Pub. No. 2005/0025056) and further in view of Van Lieshout et al. (US Pub. No. 2001/0036823).

Regarding claim 1, Zeira teaches a method of power control in a radio communications system (See Abstract), the method comprising, at a remote transceiver:

determining a path loss of a radio channel between a base station and the remote transceiver (Page 2, lines 14- 21; Page 4, line 17-Page 5, line 8);

receiving a transmit power control (TPC) command (Page 4, line 17-Page 5, line 8);

calculating, at the remote transceiver, a transmit power level for transmission by the remote transceiver on the scheduled uplink transmission resource based upon the path loss and the TPC command *(Page 4, line 18-Page 5, line 8, Zeira teaches the first station (base station) transmits power commands based on in part a reception quality of the received communications. The first station (base station) transmits a second communication (remote terminal) having a transmission power level in a first time slot. The second station receives the second communication and the power commands. A power level of the second communication as received is measured (calculated). A path loss estimate is determined based on in part the measured received second communication power level and the first communication power level),* except on a shared physical channel used to carry allocation and scheduling information from the base station to the remote transceiver, receiving an allocation of a scheduled uplink transmission resource.

However, in related art, Chen teaches on a downlink dedicated control channel (DCCH) channel used to carry allocation and scheduling information from the base station to the remote transceiver, receiving an allocation of a scheduled uplink transmission resource *(Paragraphs 0012,0052-0057, especially, paragraph 0012, Chen teaches it is an object of the present invention to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method. Paragraph 0054, Chen teaches the transmitting unit 15 is*

*configured to notify the radio resources allocated by the resource allocating 14 to the mobile station via a downlink dedicated control channel (DCCH). Paragraph 0052, Chen teaches the resource allocating unit 14 is configured to allocate a radio resource which is used in uplink packet communications with the mobile station, by referring to the virtual buffer corresponding to the mobile station 30).*Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Chen to Zeira in order to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method (Chen, paragraph 0012).

Chen, further, teaches downlink dedicated control channel (DCCH) used to carry allocation and scheduling information (Paragraphs 0012,0052, and 0054, see above), but does not specifically teachon a shared physical channel used to carry allocation and scheduling information.

However, Van Lieshout teaches on a shared physical channel (shared radio channel) used to carry allocation and scheduling information (*Para. 0006, Van Lieshout teaches since the DRNC is in charge of scheduling how data is multiplexed in a frame on the shared radio channel and allocating particular radio resources, such as channelization codes and associated spreading factors, the DRNC can convey to the mobile radio, using the transport format indicator, these types of specific details to allow the mobile radio unit to decode information sent over the shared radio channel).* Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of van Lieshout to Zeira and Chen so that the

mobile unit can find out the available resources that it can use from the base station.

Regarding claims 2 and 32, the combination of Zeira, Chen, and Van Lieshout teach all the claimed elements in claims 1 and 26. In addition, Zeira teaches the method of power control, the method further comprising transmitting an uplink signal at a calculated transmit power level (Page 5, lines 4-8).

Regarding claims 3 and 28, the combination of Zeira, Chen, and Van Lieshout teach all the claimed elements in claims 1 and 26. In addition, Zeira teaches the method of power control, wherein determining the path loss includes: receiving a downlink signal transmitted from the base station, wherein the downlink signal signals a transmitted power level of the downlink signal; and measuring a received power level of the downlink signal (Page 2, lines 14-21; Page 4, lines 17-page 8).

Regarding claim 4, the combination of Zeira, Chen, and Van Lieshout teach all the claimed elements in claim 1. In addition, Zeira teaches the method of power control, wherein determining the path loss further includes computing a difference between the signaled transmit power level and the measured received power level (Page 2, lines 1-lines 21; Page 5, lines 2-lines 4).

Regarding claims 7 and 33, the combination of Zeira, Chen, and Van Lieshout teach all the claimed elements in claim 1. In addition, Zeira teaches the method of power control, wherein the calculated the transmit power level is based on a spreading factor parameter (Page 13, lines 2-15).

Regarding claim 15, the combination of Zeira, Chen, and Van Lieshout teach all the claimed elements in claim 1. In addition, Zeira teaches the power control method,

further comprising calculating a transmit power level for transmission by the remote transceiver on the scheduled uplink transmission resource based on the path loss and an accumulated TPC command (Page 4, line 17-Page 5, line 8).

Regarding claim 26, Zeira teaches a remote transceiver for a cellular communication system, the remote transceiver having a computer program for controlling power in a radio communication system, the computer program comprising instructions for:

determining a path loss for a radio channel between a base station and the remote transceiver (Page 2, lines 14- 21; Page 4, line 17-Page 5, line 8);

and

receiving a transmit power control (TPC) command (Page 4, line 17-Page 5, line 8);

calculating a transmit power level for the remote transceiver based on the path loss and an accumulated TPC command *(Page 4, line 18-Page 5, line 8, Zeira teaches the first station (base station) transmits power commands based on in part a reception quality of the received communications. The first station (base station) transmits a second communication (remote terminal) having a transmission power level in a first time slot. The second station receives the second communication and the power commands. A power level of the second communication as received is measured (calculated). A path loss estimate is determined based on in part the measured received second communication power level and the first communication power level),* except

However, in related art, Chen teaches on a downlink dedicated control channel (DCCH) channel used to carry allocation and scheduling information from the base station to the remote transceiver, receiving an allocation of a scheduled uplink transmission resource *(Paragraphs 0012,0052-0057, especially, paragraph 0012, Chen teaches it is an object of the present invention to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method. Paragraph 0054, Chen teaches the transmitting unit 15 is configured to notify the radio resources allocated by the resource allocating 14 to the mobile station via a downlink dedicated control channel (DCCH). Paragraph 0052, Chen teaches the resource allocating unit 14 is configured to allocate a radio resource which is used in uplink packet communications with the mobile station, by referring to the virtual buffer corresponding to the mobile station 30).*Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Chen to Zeira in order to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method (Chen, paragraph 0012).

Chen, further, teaches downlink dedicated control channel (DCCH) used to carry allocation and scheduling information (Paragraphs 0012,0052, and 0054, see above), but does not specifically teachon a shared physical channel used to carry allocation and scheduling information.

However, Van Lieshout teaches on a shared physical channel (shared radio channel) used to carry allocation and scheduling information (*Para. 0006, Van Lieshout*

teaches since the DRNC is in charge of scheduling how data is multiplexed in a frame on the shared radio channel and allocating particular radio resources, such as channelization codes and associated spreading factors, the DRNC can convey to the mobile radio, using the transport format indicator, these types of specific details to allow the mobile radio unit to decode information sent over the shared radio channel). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of van Lieshout to Zeira and Chen so that the mobile unit can find out the available resources that it can use from the base station.

Regarding claim 43, Zeira teaches a method of power control in a radio communications system (See Abstract), the method comprising, at a base station:

sending transmit power control (TPC) commands (Page 4, line 17-Page 5, line 8); and

receiving an uplink signal from the remote transceiver at a calculated transmit power level based on a path loss and the TPC command *(Page 4, line 18-Page 5, line 8, Zeira teaches the first station (base station) transmits power commands based on in part a reception quality of the received communications. The first station (base station) transmits a second communication (remote terminal) having a transmission power level in a first time slot. The second station receives the second communication and the power commands. A power level of the second communication as received is measured (calculated). A path loss estimate is determined based on in part the measured received second communication power level and the first communication power level),* except on a shared physical channel used to carry allocation and scheduling information from

the base station to a remote transceiver, sending an allocation of a scheduled uplink transmission resource.

However, in related art, Chen teaches on a downlink dedicated control channel (DCCH) channel used to carry allocation and scheduling information from the base station to the remote transceiver, sending an allocation of a scheduled uplink transmission resource *(Paragraphs 0012,0052-0057, especially, paragraph 0012, Chen teaches it is an object of the present invention to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method. Paragraph 0054, Chen teaches the transmitting unit 15 is configured to notify the radio resources allocated by the resource allocating 14 to the mobile station via a downlink dedicated control channel (DCCH). Paragraph 0052, Chen teaches the resource allocating unit 14 is configured to allocate a radio resource which is used in uplink packet communications with the mobile station, by referring to the virtual buffer corresponding to the mobile station 30).*Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Chen to Zeira in order to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method (Chen, paragraph 0012).

Chen, further, teaches downlink dedicated control channel (DCCH) used to carry allocation and scheduling information (Paragraphs 0012,0052, and 0054, see above), but does not specifically teachon a shared physical channel used to carry allocation and scheduling information.

However, Van Lieshout teaches on a shared physical channel (shared radio channel) used to carry allocation and scheduling information (*Para. 0006, Van Lieshout teaches since the DRNC is in charge of scheduling how data is multiplexed in a frame on the shared radio channel and allocating particular radio resources, such as channelization codes and associated spreading factors, the DRNC can convey to the mobile radio, using the transport format indicator, these types of specific details to allow the mobile radio unit to decode information sent over the shared radio channel).* Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of van Lieshout to Zeira and Chen so that the mobile unit can find out the available resources that it can use from the base station.

Regarding claim 46, Zeira teaches a base station for a cellular communication system, the base station having a computer program stored therein and further for controlling power in a radio communication system (See Abstract), the computer program comprising instructions for:

sending a transmit power control (TPC) command (Page 4, line 17-Page 5, line 8);

receiving an uplink signal from the remote transceiver at a calculated transmit power level based on a path loss and the TPC command *(Page 4, line 18-Page 5, line 8, Zeira teaches the first station (base station) transmits power commands based on in part a reception quality of the received communications. The first station (base station) transmits a second communication (remote terminal) having a transmission power level in a first time slot. The second station receives the second communication and the*

power commands. A power level of the second communication as received is measured (calculated). A path loss estimate is determined based on in part the measured received second communication power level and the first communication power level), but fails to teach on a shared physical channel used to carry allocation and scheduling information from the base station to the remote transceiver, sending an allocation of a scheduled uplink transmission resource.

However, in related art, Chen teaches on a downlink dedicated control channel (DCCH) channel used to carry allocation and scheduling information from the base station to the remote transceiver, sending an allocation of a scheduled uplink transmission resource *(Paragraphs 0012,0052-0057, especially, paragraph 0012, Chen teaches it is an object of the present invention to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method. Paragraph 0054, Chen teaches the transmitting unit 15 is configured to notify the radio resources allocated by the resource allocating 14 to the mobile station via a downlink dedicated control channel (DCCH). Paragraph 0052, Chen teaches the resource allocating unit 14 is configured to allocate a radio resource which is used in uplink packet communications with the mobile station, by referring to the virtual buffer corresponding to the mobile station 30).*Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Chen to Zeira in order to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method (Chen, paragraph 0012).

Chen, further, teaches downlink dedicated control channel (DCCH) used to carry allocation and scheduling information (Paragraphs 0012,0052, and 0054, see above), but does not specifically teachon a shared physical channel used to carry allocation and scheduling information.

However, Van Lieshout teaches on a shared physical channel (shared radio channel) used to carry allocation and scheduling information (*Para. 0006, Van Lieshout teaches since the DRNC is in charge of scheduling how data is multiplexed in a frame on the shared radio channel and allocating particular radio resources, such as channelization codes and associated spreading factors, the DRNC can convey to the mobile radio, using the transport format indicator, these types of specific details to allow the mobile radio unit to decode information sent over the shared radio channel).* Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of van Lieshout to Zeira and Chen so that the mobile unit can find out the available resources that it can use from the base station.

Regarding claim 49, Zeira teaches a remote transceiver for supporting power control in a radio communication system, the remote transceiver comprising:

a signal processor for determining a path loss for a radio channel between a base station and the remote transceiver (Page 2, lines 14- 21; Page 4, line 17-Page 5, line 8); and

a receiver arranged to receive transmit power control (TPC) command *(Page 4, line 18-Page 5, line 8, Zeira teaches the first station (base station) transmits power commands based on in part a reception quality of the received communications. The*

first station (base station) transmits a second communication (remote terminal) having a transmission power level in a first time slot. The second station receives the second communication and the power commands. A power level of the second communication as received is measured (calculated). A path loss estimate is determined based on in part the measured received second communication power level and the first communication power level;

wherein the signal processor is arranged to calculate a transmit power level for transmission by the remote transceiver on the scheduled uplink transmission resource based upon the path loss and the TPC command *(Page 4, line 18-Page 5, line 8, Zeira teaches the first station (base station) transmits power commands based on in part a reception quality of the received communications. The first station (base station) transmits a second communication (remote terminal) having a transmission power level in a first time slot. The second station receives the second communication and the power commands. A power level of the second communication as received is measured (calculated). A path loss estimate is determined based on in part the measured received second communication power level and the first communication power level),* except on a shared physical channel used to carry allocation and scheduling information from the base station and an allocation of a scheduled uplink transmission resource.

However, in related art, Chen teaches on a downlink dedicated control channel (DCCH) channel used to carry allocation and scheduling information from the base station and an allocation of a scheduled uplink transmission resource *(Paragraphs 0012,0052-0057, especially, paragraph 0012, Chen teaches it is an object of the*

*present invention to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method. Paragraph 0054, Chen teaches the transmitting unit 15 is configured to notify the radio resources allocated by the resource allocating 14 to the mobile station via a downlink dedicated control channel (DCCH). Paragraph 0052, Chen teaches the resource allocating unit 14 is configured to allocate a radio resource which is used in uplink packet communications with the mobile station, by referring to the virtual buffer corresponding to the mobile station 30).*Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Chen to Zeira in order to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method (Chen, paragraph 0012).

Chen, further, teaches downlink dedicated control channel (DCCH) used to carry allocation and scheduling information (Paragraphs 0012,0052, and 0054, see above), but does not specifically teachon a shared physical channel used to carry allocation and scheduling information.

However, Van Lieshout teaches on a shared physical channel (shared radio channel) used to carry allocation and scheduling information (*Para. 0006, Van Lieshout teaches since the DRNC is in charge of scheduling how data is multiplexed in a frame on the shared radio channel and allocating particular radio resources, such as channelization codes and associated spreading factors, the DRNC can convey to the mobile radio, using the transport format indicator, these types of specific details to allow*

the mobile radio unit to decode information sent over the shared radio channel). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of van Lieshout to Zeira and Chen so that the mobile unit can find out the available resources that it can use from the base station.

Regarding claim 50, Zeira teaches a base station for supporting power control in a radio communication system, the base station comprising:

a transmitter arranged to transmit to a remote transceiver and transmit power control (TPC) command *(Page 4, line 18-Page 5, line 8, Zeira teaches the first station (base station) transmits power commands based on in part a reception quality of the received communications. The first station (base station) transmits a second communication (remote terminal) having a transmission power level in a first time slot. The second station receives the second communication and the power commands. A power level of the second communication as received is measured (calculated). A path loss estimate is determined based on in part the measured received second communication power level and the first communication power level)*; and

a receiver arranged to receive an uplink signal from the remote transceiver at a calculated transmit power level based on a path loss and the TPC command (Page 2, lines 14- 21; Page 4, line 17-Page 5, line 8), except for on a shared physical channel used to carry allocation and scheduling information and an allocation of a scheduled uplink transmission resource.

However, in related art, Chen teaches on a downlink dedicated control channel (DCCH) channel used to carry allocation and scheduling information and an allocation

of a scheduled uplink transmission resource *(Paragraphs 0012,0052-0057, especially, paragraph 0012, Chen teaches it is an object of the present invention to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method. Paragraph 0054, Chen teaches the transmitting unit 15 is configured to notify the radio resources allocated by the resource allocating 14 to the mobile station via a downlink dedicated control channel (DCCH). Paragraph 0052, Chen teaches the resource allocating unit 14 is configured to allocate a radio resource which is used in uplink packet communications with the mobile station, by referring to the virtual buffer corresponding to the mobile station 30).*Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Chen to Zeira in order to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method (Chen, paragraph 0012).

Chen, further, teaches downlink dedicated control channel (DCCH) used to carry allocation and scheduling information (Paragraphs 0012,0052, and 0054, see above), but does not specifically teachon a shared physical channel used to carry allocation and scheduling information.

However, Van Lieshout teaches on a shared physical channel (shared radio channel) used to carry allocation and scheduling information (*Para. 0006, Van Lieshout teaches since the DRNC is in charge of scheduling how data is multiplexed in a frame on the shared radio channel and allocating particular radio resources, such as channelization codes and associated spreading factors, the DRNC can convey to the*

mobile radio, using the transport format indicator, these types of specific details to allow the mobile radio unit to decode information sent over the shared radio channel).
Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of van Lieshout to Zeira and Chen so that the mobile unit can find out the available resources that it can use from the base station.

9. Claims 8 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zeira et al. (International Publication Number #WO 00/57574) in view of Chen et al. (US Pub. No. 2005/0025056) in view of Van Lieshout et al. (US Pub. No. 2001/0036823) and further in view of Shiu et al. (US Patent #6,983,166).

Regarding claims 8 and 34, the combination of Zeira, Chen, and Van Lieshout fails to teach the method of power control, wherein the calculated transmit power level is based on parameter associated with a selected transport format.

However, in related art, Shiu teaches the method of power control, wherein the calculated transmit power level is based on parameter associated with a selected transport format. (Col 3, lines 27-41).Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Shiu to Zeira, Chen, and Van Lieshout in order to adjust transmit power and achieve target block error rate (BLERs) (See Shiu, Col 3, line 31).

10. Claims 16,17,30,31,44,45,47, and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zeira et al. (International Publication Number #WO 00/57574) in view of Chen et al. (US Pub. No. 2005/0025056) in view of Van Lieshout et al. (US Pub. No. 2001/0036823) and further in view of Krishnan et al. (US Pub. No. 2005/0176455).

Regarding claims 16,30,44, and 47, the combination of Zeira, Chen, and Van Lieshout fail to teach the power control method, further comprising receiving a signal from the base station for instructing the remote transmitter to utilize only the accumulated TPC commands when deriving the calculated transmit power level, thereby disabling use of open loop power control and enabling use of closed loop power control only.

However, in related art, Krishnan teaches the power control method, further comprising receiving a signal from the base station for instructing the remote transmitter to utilize only the accumulated TPC commands when deriving the calculated transmit power level, thereby disabling use of open loop power control and enabling use of closed loop power control only (Paragraphs 0047-0050, especially, Paragraphs 0049-0050). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Krishnan to Zeira, Chen, and Van Lieshout in order to provide the transmitting terminal feedback regarding the power of signals received at the receiving terminal.

Regarding claim 17,31,45, and 48, the combination of Zeira, Chen, and Van

Lieshout fail to teach the power control method, further comprising receiving a signal from the base station for instructing the remote transmitter to disregard the accumulated TPC command when deriving the calculated transmit power level, thereby enabling use of open loop power control only and disabling use of closed loop power control.

However, in related art, Krishnan teaches the power control method, further comprising receiving a signal from the base station for instructing the remote transmitter to disregard the accumulated TPC command when deriving the calculated transmit power level, thereby enabling use of open loop power control only and disabling use of closed loop power control (Paragraphs 0047-0050, especially, Paragraphs 0049-0050).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Krishnan to Zeira, Chen, and Van Lieshout in order to provide the transmitting terminal feedback regarding the power of signals received at the receiving terminal.

11. Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner. SEE MPEP 2141.02 [R-5] VI. PRIOR ART MUST BE CONSIDERED

IN ITS ENTIRETY, INCLUDING DISCLOSURES THAT TEACH AWAY FROM THE CLAIMS: A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984) In re Fulton, 391 F.3d 1195, 1201,73 USPQ2d 1141, 1146 (Fed. Cir. 2004). >See also MPEP §2123.

Response to Arguments

12. Applicant's arguments with respect to claims 1-4,7,8,15-17,26,28,30-34, and 43-48 have been considered but are moot in view of the new ground(s) of rejection. Regarding claims 1,26,43, 46,49, and 50, Applicant argues that Zeira in view of Chen and further in view of Van Lieshout fail to teach "on a shared physical channel used to carry allocation and scheduling information and receiving an allocation of a scheduled uplink transmission resource. The Examiner respectfully disagrees. P*aragraph 0012, Chen teaches it is an object of the present invention to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method. Paragraph 0054, Chen teaches the transmitting unit 15 is configured to notify the radio resources allocated by the resource allocating 14 to the mobile station via a downlink dedicated control channel (DCCH). Paragraph 0052, Chen teaches the resource allocating unit 14 is configured to allocate a radio resource which is used in uplink packet communications with the mobile station, by referring to the virtual buffer corresponding to the mobile station 30. Above cited paragraphs covers the*

*limitations "*downlink dedicated control channel (DCCH) used to carry allocation and scheduling information and receiving an allocation of a scheduled uplink transmission resource". On the other hand, Van Lieshout, Paragraph 0006, teaches *since the DRNC is in charge of scheduling how data is multiplexed in a frame on the shared radio channel and allocating particular radio resources, such as channelization codes and associated spreading factors, the DRNC can convey to the mobile radio, using the transport format indicator, these types of specific details to allow the mobile radio unit to decode information sent over the shared radio channel which covers the limitations "*on a shared physical channel (shared radio channel) used to carry allocation and scheduling information".

For the reasons as set forth above, the examiner contends that the rejection to 1-4,7-8,15-17,26,28,30-34, and 43-50 is proper.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DOMINIC E. REGO whose telephone number is (571)272-8132. The examiner can normally be reached on Monday-Friday, 9:00 am-5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duc M. Nguyen can be reached on 571-272-7503. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dominic E Rego/

Examiner, Art Unit 2618
Tel 571-272-8132

/Duc Nguyen/
Supervisory Patent Examiner, Art Unit 2618

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10917968	ANDERSON, NICHOLAS WILLIAM
	Examiner	**Art Unit**
	DOMINIC E REGO	2618

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	06/14/2007	03/13/2008	07/28/2008	03/15/2009	01/01/2010				
	1	✓	÷	✓	✓	✓				
	2	✓	÷	✓	✓	✓				
	3	✓	÷	✓	✓	✓				
	4	✓	÷	✓	✓	✓				
	5	✓	÷	-	-	-				
	6	✓	÷	-	-	-				
	7	✓	÷	✓	✓	✓				
	8	✓	÷	✓	✓	✓				
	9	✓	÷	✓	-	-				
	10	✓	÷	N	-	-				
	11	✓	÷	N	-	-				
	12	✓	÷	✓	-	-				
	13	✓	÷	N	-	-				
	14		÷	✓	-	-				
	15		÷	✓	✓	✓				
	16		÷	✓	✓	✓				
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	27		÷	✓	-	-				
	28		÷	✓	✓	✓				
	29		÷	✓	-	-				
	30		÷	✓	✓	✓				
	31		÷	✓	✓	✓				
	32		÷	✓	✓	✓				
	33		÷	✓	✓	✓				
	34		÷	✓	✓	✓				
	35		÷	✓	-	-				

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10917968	ANDERSON, NICHOLAS WILLIAM
	Examiner	**Art Unit**
	DOMINIC E REGO	2618

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	06/14/2007	03/13/2008	07/28/2008	03/15/2009	01/01/2010				
	36		÷	✓	-	-				
	37		÷	✓	-	-				
	38		÷	✓	-	-				
	39		÷	✓	-	-				
	40		÷	N	-	-				
	41		÷	N	-	-				
	42		÷	N	-	-				
	43		÷	✓	✓	✓				
	44		÷	✓	✓	✓				
	45		÷	✓	✓	✓				
	46		÷	✓	✓	✓				
	47		÷	✓	✓	✓				
	48		÷	✓	✓	✓				
	49					✓				
	50					✓				

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10917968	ANDERSON, NICHOLAS WILLIAM
	Examiner	Art Unit
	DOMINIC E REGO	2618

SEARCHED			
Class	Subclass	Date	Examiner
455	522,68,69,115.3,126,127.1,296,127.2,67.11,434,436,135,226.3,277.2	7/28/2008	DR
370	331,320,335,342,318,392,252,276,280	7/28/2008	DR
375	147,130	7/28/2008	DR

SEARCH NOTES		
Search Notes	Date	Examiner
Consulted SPE Duc Nguyen regarding Restriction requirement	3/13/08	DR
Updated East Search	7/28/2008	DR
Updated East, Google, Inventor, and NPL search	3/15/2009	DR
Updated East Search	12/31/2009	DR

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	87	(nicholas near2 anderson).in.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/01/03 22:16
L2	1065	(allocat$3 same schedul$3 same resource).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/01/03 22:23
L3	5	1 and 2	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/01/03 22:23
L4	70	allocat$3 same schedul$3 same resource same shared near2 physical near2 channel	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/01/03 22:26
L5	56	4 same (reverse near2 link up$link)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/01/03 22:27
L6	1	5 and (@ad <= "20040812" @rlad <= "20040812" @pd <= "20040812")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/01/03 22:28

L7	279	(ipwireless ip adj wireless).as.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/01/03 22:30
L8	8	2 and 7	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/01/03 22:31

1/3/2010 10:33:12 PM
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PTO/SB/06 (07-06)
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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
10/917,968	08/12/2004	

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☐		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 09/30/2009	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 24	Minus	** 46	= 0	X $ =		OR	X $52=	0
Independent (37 CFR 1.16(h))	* 4	Minus	***10	= 0	X $ =		OR	X $220=	0
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

AMENDMENT	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/C. DESSAU/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.	10/917,968
Filed:	August 12, 2004
Applicants:	Nicholas William Anderson
Title:	**POWER CONTROL IN A WIRELESS COMMUNICATION SYSTEM**
Art Unit:	2618
Examiner:	Dominic E. Rego
Attorney Docket:	9010/96606
Customer No.:	22242

Confirmation No.3609

This Amendment And Response was electronically filed on September 30, 2009 using EFS-Web.

Mail Stop AMENDMENT
Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

AMENDMENT AND RESPONSE

Sir:

Applicants hereby petition under 37 CFR § 1.136(a) for a three-month extension of time in the above-identified application, up to and including September 30, 2009, to make this reply timely.

In response to the Office Action mailed March 31, 2009, please amend the above-identified patent application as follows:

Amendments to the Claims being reflected in the listing of claims beginning on page 2 of this paper; and

Remarks beginning on page 8 of this paper.

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended): A method of power control in a radio communication system, the method comprising, at a remote transceiver:

determining a path loss for a radio channel between a base station and the ~~a~~ remote transceiver; and

on a shared physical channel used to carry allocation and scheduling information from the base station to the remote transceiver, receiving an allocation of a scheduled uplink transmission resource and transmit power control (TPC) command; and

calculating at the remote transceiver, a transmit power level for transmission by the remote transceiver on the scheduled uplink transmission resource based upon the path loss and the TPC command.

2. (Currently Amended): The method of power control of claim 1, the method further comprising transmitting an uplink signal ~~from the remote transceiver~~ at the calculated transmit power level.

3. (Original): The method of power control of claim 1, wherein determining the path loss includes:

receiving a downlink signal transmitted from the base station, wherein the downlink signal signals a transmitted power level of the downlink signal; and

measuring a received power level of the downlink signal.

4. (Original): The method of power control of claim 3, wherein determining the path loss further

includes computing a difference between the signaled transmit power level and the measured received power level.

5-6. (Canceled)

7. (Original): The method of power control of claim 2, wherein the calculated transmit power level is based on a spreading factor parameter.

8. (Previously Presented): The method of power control of claim 2, wherein the calculated transmit power level is based on parameters associated with a selected transport format.

9.-14. (Canceled)

15. (Previously presented): The power control method of claim 1, further comprising calculating a transmit power level for transmission by the remote transceiver on the scheduled uplink transmission resource based on the path loss and an accumulated TPC command.

16. (Previously presented): The power control method of claim 15, further comprising receiving a signal from the base station for instructing the remote transmitter to utilize only the accumulated TPC commands when deriving the calculated transmit power level, thereby disabling use of open loop power control and enabling use of closed loop power control only.

17. (Previously presented): The power control method of claim 15, further comprising receiving a signal from the base station for instructing the remote transmitter to disregard the accumulated TPC command when deriving the calculated transmit power level, thereby enabling use of open loop power control only and disabling use of closed loop power control.

18-25. (Cancelled)

26. (Currently Amended): A remote transceiver for a cellular communication system, the having ~~computer-readable medium encoded with~~ a computer program stored therein and further for supporting ~~controlling~~ power control in a radio communication system, the computer program comprising instructions for:

determining a path loss for a radio channel between a base station and the ~~a~~ remote transceiver; and

on a shared physical channel used to carry allocation and scheduling information from the base station to the remote transceiver, receiving an allocation of a scheduled uplink transmission resource and a transmit power control (TPC) command calculating a transmit power level for the remote transceiver based on the path loss and an accumulated TPC command.

27. (Cancelled)

28. (Currently Amended): The remote transceiver ~~computer-readable medium~~ of claim 26, wherein determining the path loss includes:

receiving a downlink signal transmitted from the base station, wherein the downlink signal signals a transmitted power level of the downlink signal; and

measuring a received power level of the downlink signal.

29. (Cancelled)

30. (Currently Amended): The remote transceiver ~~computer-readable medium~~ of claim 26 ~~29~~, the computer program further comprising instructions for receiving a signal from the base station for instructing the remote transmitter to utilize the accumulated TPC command only when calculating the transmit power level, thereby disabling use of open loop power control and enabling use of closed loop power control only.

31. (Currently Amended): The remote transceiver ~~computer-readable medium~~ of claim 26 ~~29~~, the computer program further comprising instructions for receiving a signal from the base station for instructing the remote transmitter to disregard the accumulated TPC command when calculating the transmit power level, thereby disabling use of closed loop power control and enabling use of open loop power control only.

32. (Currently Amended): The remote transceiver ~~computer-readable medium~~ of claim 26 ~~29~~, the computer program further comprising instructions for transmitting an uplink signal from the remote transceiver at the calculated transmit power level.

33. (Currently Amended): The remote transceiver ~~computer-readable medium~~ of claim 26 ~~29~~, wherein calculating the transmit power level is additionally based on a spreading factor parameter.

34. (Currently Amended): The remote transceiver ~~computer-readable medium~~ of claim 26 ~~29~~, wherein calculating the transmit power level is additionally based on parameters associated with a selected transport format.

35.- 42. (Cancelled)

43. (Currently Amended): A method of power control in a radio communications system, the method comprising, at a base station:

on a shared physical channel used to carry allocation and scheduling information from the base station to a ~~the~~ remote transceiver, sending an allocation of a scheduled uplink transmission resource and transmit power control (TPC) command; and

receiving an uplink signal from the remote transceiver at a calculated transmit power level based on a path loss and the TPC command.

44. (Previously presented): The power control method of claim 43, further comprising sending a signal to the remote transceiver for instructing the remote transmitter to utilize only the accumulated TPC commands when deriving the calculated transmit power level, thereby instructing the remote transmitter to disable use of open loop power control and enable use of closed loop power control only.

45. (Previously presented): The power control method of claim 43, further comprising sending a signal from the base station to the remote transceiver for instructing the remote transmitter to disregard the accumulated TPC command when deriving the calculated transmit power level, thereby instructing the remote transmitter to enable use of open loop power control only and disable use of closed loop power control.

46. (Currently Amended): A base station for a cellular communication system, the base station having ~~computer-readable medium encoded with~~ a computer program stored therein and further for controlling power in a radio communication system, the computer program comprising instructions for:

on a shared physical channel used to carry allocation and scheduling information from the base station to the remote transceiver, sending an allocation of a scheduled uplink transmission resource and a transmit power control (TPC) command; and

receiving an uplink signal from the remote transceiver at a calculated transmit power level based on a path loss and the TPC command.

47. (Currently Amended): The base station ~~computer-readable medium~~ of claim 46, the computer program further comprising instructions for sending a signal to the remote transceiver for instructing the remote transmitter to utilize only the TPC commands when deriving the calculated transmit power level, thereby instructing the remote transmitter to disable use of open loop power control and enable use of closed loop power control only.

48. (Currently Amended): The base station ~~computer-readable medium~~ of claim 46, the computer program further comprising instructions for sending a signal from the base station to the remote transceiver for instructing the remote transmitter to disregard the TPC commands when deriving the calculated transmit power level, thereby instructing the remote transmitter to enable use of open loop power control only and disable use of closed loop power control.

49. (New) A remote transceiver for supporting power control in a radio communication system, the remote transceiver comprising:

a signal processor for determining a path loss for a radio channel between a base station and the remote transceiver; and

a receiver arranged to receive, on a shared physical channel used to carry allocation and scheduling information from the base station, an allocation of a scheduled uplink transmission resource and transmit power control (TPC) command; wherein

the signal processor is arranged to calculate a transmit power level for transmission by the remote transceiver on the scheduled uplink transmission resource based upon the path loss and the TPC command.

50. (New) A base station for supporting power control in a radio communication system, the base station comprising:

a transmitter arranged to transmit, on a shared physical channel used to carry allocation and scheduling information, to a remote transceiver, an allocation of a scheduled uplink transmission resource and transmit power control (TPC) command; and

a receiver arranged to receive an uplink signal from the remote transceiver at a calculated transmit power level based on a path loss and the TPC command.

REMARKS

Claims 1-4, 7, 8, 15-17, 26, 28, 30-34 and 43-48 were pending.

By virtue of this response, Claims 1-2, 26, 28, 30-34, 43 and 46-48 are amended.

New apparatus Claims 49 and 50 are being added.

By virtue of this response, Claims 1-4, 7, 8, 15-17, 26, 28, 30-34 and 43-50 are now pending

No new matter is being added.

Objections to the claims

Claims 30-34 were objected to as depending from a cancelled claim (claim 29). The applicant thanks the Examiner for noting this informality and for affording this opportunity to make a corresponding correction. Pursuant to this amendment these claims now depend from claim 26. The applicant therefore respectfully submits that these claims are in suitable condition to support examination and allowance.

Rejections under 35 U.S.C. 101

Claims 1-4, 7, 8, 15-17, 26-39, and 43-48 were rejected under 35 U.S.C. 101 as not presenting patent-eligible subject matter.

Claims 26-39 and 46-48

These claims were directed to a "computer-readable medium." The Examiner expressed concern that this expression is broad enough to encompass non-statutory content. Pursuant to this amendment, claims 26, 28, and 30-34 have been amended to now be directed to a "remote transceiver" while claims 27, 29, and 35-39 have been cancelled without prejudice. As a remote transceiver is clearly an apparatus, the applicant respectfully submits that the claimed subject matter is now clearly within the ambit of 35 U.S.C. 101. Claims 46-48, in turn, are amended to now refer to a "base station." As a base station is clearly an apparatus, again the applicant respectfully submits that the claimed subject matter is now clearly within the ambit of 35 U.S.C. 101.

Claims 1-4, 7, 8, 15-17, and 43-45

These claims were directed to "methods." The Examiner expressed concern that the recited steps could potentially be carried out in the absence of a corresponding apparatus and hence represent non-statutory content. Pursuant to this amendment we have made the tie between the recited steps and a particular apparatus clear. In independent claim 1, it is now clear that the steps are carried out by a "remote transceiver." In independent claim 43, it is now clear that the steps are carried out by a "base station." The remaining claims are ultimately dependent upon one of these independent claims. As these method claims are now all clearly tied to a particular apparatus, we respectfully submit that all of these claims are well within the patent-eligibility requirements of 35 U.S.C. 101.

Claim Rejection under 35 U.S.C § 103(a) of claims 1-4, 7, 8, 15-17, 26, 28, 30-34 and 43-48

On pages 4-7 of the Office Action, Claims 1-4, 7, 8, 15-17, 26, 28, 30-34 and 43-48 are rejected under 35 USC § 103(a) as being unpatentable over WO 00/57574 (hereinafter referred to as "Zeira") in view of US 2005/0025056 (hereinafter referred to as "Chen") and further in view of US 2001/0036823 (hereinafter referred to as "Van Lieshout"). Applicants are traversing this rejection.

The application presently contains six independent claims, namely method Claims 1 and 43, and apparatus Claims 26, 46, 49, and 50 (the latter two claims being newly introduced).. Each of independent Claims 1, 26, 43, 46, 49 and 50 recites, inter alia, "on a ***shared physical channel*** used to carry allocation and scheduling information from the base station to the remote transceiver, ***receiving [or sending] an allocation of a scheduled uplink transmission resource and transmit power control (TPC) command***". Below, Applicants explain that Ziera in view of Chen and further in view of Van Lieshout does not teach all of the elements of these claims.

The Office Action suggests that Ziera discloses, with respect to Claim 1, the features of: determining a path loss for a radio channel between a base station and the remote transceiver (on page 2, lines 14-21; page 4, line 17-page 5, line 8); receiving a transmit power control (TPC) command (on page 4, line 17-page 5, line 8); and calculating at the remote transceiver, a transmit

power level for the scheduled uplink transmission resource based upon the path loss and the TPC command (on page 4, line 18 to page 5, line 8).

The Office Action suggests that Ziera fails to disclose, with respect to Claim 1, the features of '***a shared physical channel*** used to carry allocation and scheduling information from the base station to the remote transceiver, and ***receiving an allocation of a scheduled uplink transmission resource***'.

The Office Action then suggests that Chen, in a 'related' art and in paragraphs [0012] and [0052-0057], discloses, with respect to Claim 1, the features of: 'used to carry allocation and scheduling information from the base station to the remote transceiver, and receiving an allocation of a scheduled uplink transmission resource'.

Based thereon, the Office Action states that it is 'obvious to one of ordinary skill in the art at the time of the invention to provide the teaching of Chen to Zeira in order to perform the efficient scheduling processing and to locate radio resources efficiently in the uplink high-speed packet communications method (Chen paragraph 12)'.

The Office Action then acknowledges that Ziera and Chen both fail to disclose, with respect to Claim 1, the feature of 'on ***a shared physical channel*** used to carry allocation and scheduling information and receiving an allocation of a scheduled uplink transmission resource …'.

The Office Action then suggests, however, that Van Lieshout, in a field that is neither characterized as being related to nor in a same field of endeavor, in paragraph [0006], discloses, with respect to Claim 1, the feature of: 'on ***a shared physical channel*** used to carry allocation and scheduling information and receiving an allocation of a scheduled ***uplink*** transmission resource …'.

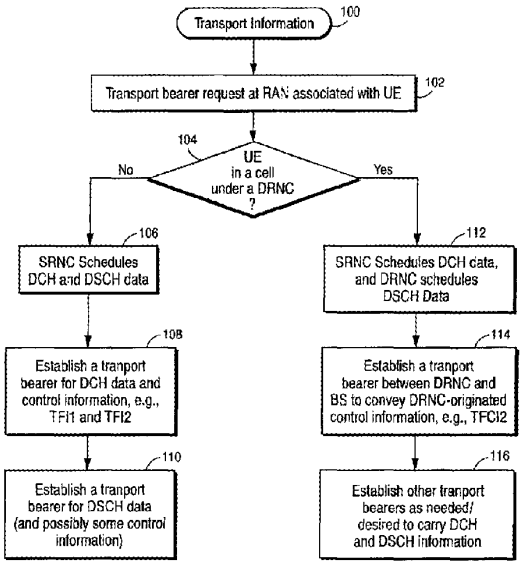
Based thereon, the Office Action states that it is 'obvious to one of ordinary skill in the art at the time of the invention to provide the teaching of Van Lieshout to Chen and Zeira so that the mobile unit can find out the available resources that it can use from the base station'.

In response, Applicants respectfully disagree.

It is respectfully submitted that the Office Action fails to establish prima facie obviousness for the following reasons. Below, Applicants explain that Zeira, in view of Chen and Van Lieshout, does not teach all of the elements of Claims 1, 26, 43 and 46.

With reference to the features of Claim 1 above, the teachings of Zeira in view of Chen and further in view of Van Lieshout fail to teach: 'on ***a shared physical channel*** used to carry allocation and scheduling information and receiving an allocation of a scheduled uplink transmission resource …', as recited in Claim 1.

It is clear to a skilled person in reading Van Lieshout that what is actually disclosed by Van Lieshout is a network that ***does not use a shared control channel*** on the downlink to allocate ***uplink*** resources. In contrast, the teaching of Van Lieshout is to use a transport format combination indicator (TFCI) transmission on a ***dedicated*** downlink channel to convey downlink shared channel resources (DSCH) to a mobile unit. We respectfully observe that this is the antithesis of the claimed invention. This clear teaching of Van Lieshout is illustrated in Fig. 5 (shown at the right) where the downlink shared channel resources "DSCH" indication clarifies that Van Lieshout discloses allocation of downlink resources (and notably not ***uplink*** (UL) resources). A further clarification of the teaching of Van Lieshout in allocating downlink resources is found in paragraph [0023] and again in the last five lines of paragraph [0026], where it specifies that the allocation of DL resources is made via a dedicated DL channel, see paragraphs [0031], [0033] and [0036].



Thus, Applicants respectfully disagree that Van Lieshout discloses the feature in Claim 1 of 'on ***a shared physical channel*** used to carry allocation and scheduling information and receiving an allocation of a scheduled ***uplink*** transmission resource …', (***Emphasis added***).

Claim 26 is a remote transceiver that implements a computer program corresponding to the method of Claim 1. Consequently, the arguments set forth above in support of Claim 1 apply equally to Claim 26. In accordance with the aforementioned explanations, it is therefore respectfully submitted that the teachings of Zeira in view of Chen and further in view of Van Lieshout fail to teach: 'on ***a shared physical channel*** used to carry allocation and scheduling information and receiving an allocation of a scheduled ***uplink*** transmission resource …, as recited in claim 26.

Claim 43 is a method claim for a base station that corresponds to the remote transceiver method of Claim 1. Consequently, the arguments set forth above in support of Claim 1 apply equally to Claim 43. In accordance with the aforementioned explanations, it is therefore respectfully submitted that the teachings of Zeira in view of Chen and further in view of Van Lieshout fail to teach: 'on a ***shared physical channel*** used to carry allocation and scheduling information from the base station to a remote transceiver, ***sending*** an allocation of a scheduled ***uplink*** transmission resource ***and transmit power control (TPC) command'*** as recited in claim 3.

Claim 46 is a base station having a computer program that corresponds to the method of Claim 1. Consequently, the arguments set forth above in support of Claim 1 apply equally to Claim 46. In accordance with the aforementioned explanations, it is therefore respectfully submitted that the teachings of Zeira in view of Chen and further in view of Van Lieshout fail to teach: 'on ***a shared physical channel*** used to carry allocation and scheduling information and receiving an allocation of a scheduled ***uplink*** transmission resource and a transmit power control (TPC) command, as recited in claim 46.

New Claim 49 is a remote transceiver that implements the method of Claim 1. Consequently, the arguments set forth above in support of Claim 1 apply equally to Claim 49. In accordance with the aforementioned explanations, it is therefore respectfully submitted that the teachings of Zeira in view of Chen and further in view of Van Lieshout fail to teach: 'on ***a shared physical channel*** used to carry allocation and scheduling information and receiving an allocation of a scheduled ***uplink*** transmission resource …, as recited in claim 49.

New Claim 50 is a base station claim that implements the method of Claim 43. Consequently, the arguments set forth above in support of Claim 43 apply equally to Claim 50. In accordance with the aforementioned explanations, it is therefore respectfully submitted that the teachings of Zeira in view of Chen and further in view of Van Lieshout fail to teach: 'on a ***shared physical channel*** used to carry allocation and scheduling information from the base station to a remote transceiver, ***sending*** an allocation of a scheduled ***uplink*** transmission resource ***and transmit power control (TPC) command'*** as recited in claim 50.

Although the points raised above are sufficient to distinguish the claims from the cited prior art references, for the record we note that the Office Action also suggests that Zeira and Chen comprise a "related art." Applicant respectfully disagrees with this suggestion.

Zeira (see throughout the description, for example the abstract and background) clearly indicates that it's relevant field is 'combined closed loop/open loop power control in a spread spectrum communication system' and more particularly measuring power levels from transmissions and determining path loss estimates. Chen, on the other hand, clearly relates to the wholly different field of packet data communications between a base station and a mobile station (see throughout the description, for example the abstract and field of the invention).

It is noteworthy that there is no disclosure within Zeira of any aspect of packet data communications. Thus, there is no reason for a skilled person working in the field of power control to consider the field of packet data communications, as disclosed by Chen. Furthermore, there is no reason for a skilled person working in the packet data communications field of Chen to consider the field of power control, as disclosed by Zeira.

It is further noted that the field of Van Lieshout is a use of indicators in a drift radio network controller to allocate downlink resources (see background). It is further noted that the Office Action has advanced no comment as to why Van Lieshout is from the same field of endeavor as that of Zeira and Chen. Thus, Applicant respectfully disagrees with any suggestion that a skilled artisan would consider their respective teachings.

In addition, it is respectfully submitted that any theoretical combination of the teachings of Zeira with Chen will require considerable modification to the architecture of both Zeira as

well as Chen, not least because the communication units and associated methods of either document have no bearing on the field of the other document.

Furthermore, it is respectfully submitted that any theoretical combination of the teachings of Zeira with Van Lieshout will again require considerable modification to the architecture of both Zeira as well as Van Lieshout, not least because the communication units and associated methods of either document have no bearing on the field of the other document.

Furthermore, it is respectfully submitted that any theoretical combination of the teachings of Chen with Van Lieshout will also require considerable modification to the architecture of both Chen as well as Van Lieshout, not least because the communication units and associated methods of either document have no bearing on the field of the other document.

Indeed, the Office Action does not explain how such a combination of wholly different teachings can be achieved.

Additionally, Applicants note that under a rejection under 35 U.S.C.5 103, the prior art references must not render the prior art unsatisfactory for its intended purpose of the claimed invention (MPEP § 2143.01).

Accordingly, one of skill in the art would not apply any theoretical teaching of shared downlink physical channels (noting the shared physical channel teaching of Van Lieshout allocates ***downlink*** resource) to both Zeira and Chen, as making such a combination would render both Zeira and Chen respectively unsatisfactory for their intended purpose, as both explicitly require the use of a dedicated control channel for their respective, wholly different purposes.

In addition, it is particularly noted that Chen has as an objective (see paragraphs [0010] and [0011]), a reduction in the number of notification bits to report in data packets to reduce a burden on a transmission buffer. In direct contrast to the aim of Chen, the Office Action has suggested that a skilled person may wish to combine the teaching of Zeira into Chen and, thus, send further information in the packet data communication architecture, namely power control commands. Applicants note, therefore, that the rejection under 35 U.S.C.5 103, where the prior art references must not render the prior art unsatisfactory for its intended purpose of the claimed

invention (MPEP 2143.01) is improperly formulated. See MPEP 2143.01, Subsection entitled THE PROPOSED MODIFICATION CANNOT RENDER THE PRIOR ART UNSATISFACTORY FOR ITS INTENDED PURPOSE citing *In re Gordon*, 733 F.2d 900 (Fed Cir. 1984).

It is further respectfully submitted that the reasons stated in the Office Action for combining the references is insufficient for establishing prima facie obviousness. In this respect, the reason provided in the Office Action for combining the teachings of Zeira and Chen is simply:

> "…obvious … to provide the above teaching of Chen to Zeira in order to perform the ***efficient scheduling processing*** and to allocate ***radio resources efficiently in the uplink high speed packet communications method***" [Emphasis added]

The claimed invention provides a mechanism for performing a combined open loop and closed loop power control scheme and in particular for combining on the same physical channel an allocation of scheduled uplink transmission resources with feedback information on the combined power control scheme (see paragraph [0084]).

Zeira has, as an objective (see page 4, lines 13-14), the maintenance of signal quality and low transmission levels. Thus, the Office Action does not advance any evidence that Chen will satisfy this requirement.

Chen, has, as an objective (see paragraphs [0010] and [0011]), a reduction in the number of notification bits to report in data packets to reduce a burden on a transmission buffer. In direct contrast to the aim of Chen, the Office Action has suggested that a skilled person may wish to combine the teaching of Zeira into Chen and, thus, send further information in the packet data communication architecture, namely power control commands.

Furthermore, these reasons appear to be taken from Chen, which already offers a solution to the aforementioned allocation of ***radio resources efficiently in the uplink***. Consequently, it is respectfully submitted that if Chen meets the above need to allocate ***radio resources efficiently in the uplink***, the skilled person would have no reason to refer to either Zeira (or Van Lieshout,

where no properly formulated reason has yet been provided), and indeed would be particularly motivated not to refer to Zeira for the reasons mentioned above.

Hence, it is submitted that a sufficient reason has not been provided to make the suggested combination. Referring to MPEP 2143.01, Subsection IV entitled "Mere Statement That The Claimed Invention Is Within the Capabilities of One of Ordinary Skill in the Art is Not Sufficient By Itself To Establish Prima Facie Obviousness." seems pertinent. This subsection states: "Rejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.'" *KSR Int'l v. Teleflex, Inc.*, 550 U.S. 127, 82 USPQ2d at 1396 (2007). See also *Ex parte Penhasi*, BPAI Appeal No. 2007-2534 (December 13, 2007) ("The Examiner has not articulated a sufficient reason why one skilled in the art would have modified [the art] and arrived at the presently claimed subject matter."). It is therefore submitted that the Office Action has not satisfied the necessary criteria of providing a reasoning to combine Zeira with Chen and further with Van Lieshout and so the rejection raised is improperly formulated.

Furthermore, it is respectfully submitted that Zeira does not suggest any modification thereof with the teachings of Chen. Similarly, Chen does not suggest modification thereof with the teachings of Zeira. Similarly, Zeira does not suggest modification thereof with the teachings of Van Lieshout. Similarly, Chen does not suggest modification thereof with the teachings of Van Lieshout. Indeed, it is submitted that the skilled person, reading Zeira or Chen or Van Lieshout, is not provided with a reasonable expectation of success when making the combination suggested in the Office Action due to the lack of any such indication of suitability or desirability to make a modification.

Hence, there is no teaching in the cited prior art suggesting the modification and it is the present application alone that teaches the modified apparatus. The applicant's respectfully submit that one can only achieve something close to the claimed result by employing the applicant's own teachings, using impermissible hindsight, to effect a highly-selective picking and choosing amongst the teachings of these various references.

Claims 2-4, 7, 15, 26, 28, 32, 33 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Zeira in view of Chen and further in view of Van Lieshout.

For at least the reason that Claims 2-4, 7, 15, 26, 28, 32, 33 each depend from an allowable independent Claim, Claims 2-4, 7, 15, 26, 28, 32, 33 are also allowable. Applicants respectfully request reconsideration and allowance of Claims 2-4, 7, 15, 26, 28, 32, 33.

Claims 8 and 34 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Zeira in view of Chen and further in view of Van Lieshout, and further in view of Shiu et al. US 6,983,166.

For at least the reasons Claims 8 and 34 each depend from an allowable independent claim, Claims 8 and 34 are also allowable. Applicants respectfully request reconsideration and allowance of Claims 8 and 34.

Claims 16, 30, 44 and 47 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Zeira in view of Chen and further in view of Van Lieshout, and further in view of Krishnan (US Pub. No. 2005/0176455).

For at least the reasons Claims 16, 30, 44 and 47 each depend from an allowable independent claim, Claims 16, 30, 44 and 47 are also allowable. Applicants respectfully request reconsideration and allowance of Claims 16, 30, 44 and 47.

While the applicant believes that other arguments are available to highlight the allowable subject matter presented in various ones of these dependent claims, the applicant also believes that the comments set forth herein regarding allowability of the independent claims are sufficiently compelling to warrant present exclusion of such additional points for the sake of brevity and expedited consideration.

In summary, none of the references discloses or suggests "on a ***shared physical channel*** used to carry allocation and scheduling information from the base station to the remote transceiver, ***receiving (or sending) an allocation of a scheduled uplink transmission resource and transmit power control (TPC) command***", as required by the claims. For at least this reason, the alleged prior art references, alone or combined, do not teach or suggest all the claim limitations for Claims 1-4, 7, 8, 15-17, 26, 28, 30-34 and 43-50.

Accordingly, Applicant respectfully requests reconsideration and allowance of Claims 1-4, 7, 8, 15-17, 26, 28, 30-34 and 43-50.

The case is believed to be in condition for allowance and notice to such effect is respectfully requested. If there is any issue that may be resolved, the Examiner is respectfully requested to telephone the undersigned.

Respectfully submitted,

Fitch, Even, Tabin & Flannery

Date: September 30, 2009 By: _____

Steven G. Parmelee
Registration No. 28,790

120 S. LaSalle Street, Suite 1600
Chicago, IL 60603-3406
Telephone: (312) 577-7000
Facsimile: (312) 577-7007

Electronic Patent Application Fee Transmittal

Application Number:	10917968
Filing Date:	12-Aug-2004
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Filer:	Steven Glen Parmelee/Helen Donegan
Attorney Docket Number:	562492000500

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Independent claims in excess of 3	1201	2	220	440
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 3 months with $0 paid	1253	1	1110	1110
Miscellaneous:				
		Total in USD ($)		**1550**

Electronic Acknowledgement Receipt	
EFS ID:	6172857
Application Number:	10917968
International Application Number:	
Confirmation Number:	3609
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Customer Number:	25226
Filer:	Steven Glen Parmelee/Helen Donegan
Filer Authorized By:	Steven Glen Parmelee
Attorney Docket Number:	562492000500
Receipt Date:	30-SEP-2009
Filing Date:	12-AUG-2004
Time Stamp:	10:52:14
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1550
RAM confirmation Number	403
Deposit Account	061135
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		96606_Amendment_and_Response.pdf	213055 bf9762958a68eb1a9fef6f58e185c4847730745b	yes	18

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Amendment/Req. Reconsideration-After Non-Final Reject	1	1
Claims	2	7
Applicant Arguments/Remarks Made in an Amendment	8	18

Warnings:

Information:

2	Fee Worksheet (PTO-875)	fee-info.pdf	31786 c7bfb7660dad9ee69b73b670823cff19ef245eb1	no	2

Warnings:

Information:

Total Files Size (in bytes):	244841

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/21 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission	3

Application Number	10/917,968
Filing Date	August 12, 2004
First Named Inventor	Nicholas W. ANDERSON
Art Unit	2618
Examiner Name	D. Rego
Attorney Docket Number	562492000500

ENCLOSURES (*Check all that apply*)

- [ ] Fee Transmittal Form
- [ ] Fee Attached
- [ ] Amendment/Reply
- [ ] After Final
- [ ] Affidavits/declaration(s)
- [ ] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Reply to Missing Parts/ Incomplete Application
- [ ] Reply to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s) _____
- [ ] Landscape Table on CD
- [ ] After Allowance Communication to TC
- [ ] Appeal Communication to Board of Appeals and Interferences
- [ ] Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- [ ] Proprietary Information
- [ ] Status Letter
- [x] Other Enclosure(s) (please Identify below):

1. Request for Withdrawal as Attorney or Agent and Change of Correspondence Address - 2 pages

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	MORRISON & FOERSTER LLP (Customer Number 25226)		
Signature	Robert Saltzberg		
Printed name	Robert A. Saltzberg		
Date	August 27, 2009	Reg. No.	36,910

sf-2723674

Doc Code: PET.POA.WDRW
Document Description: Petition to withdraw attorney or agent (SB83)

PTO/SB/83 (11-08)
Approved for use through 11/30/2011. OMB 0651-0035
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

REQUEST FOR WITHDRAWAL AS ATTORNEY OR AGENT AND CHANGE OF CORRESPONDENCE ADDRESS		
	Application Number	10/917,968
	Filing Date	August 12, 2004
	First Named Inventor	Nicholas W. ANDERSON
	Art Unit	2618
	Examiner Name	D. Rego
	Attorney Docket Number	562492000500

To: Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Please withdraw me as attorney or agent for the above identified patent application, and

- [ ] all the practitioners of record;
- [ ] the practitioners (with registration numbers) of record listed on the attached paper(s); or
- [x] the practitioners of record associated with Customer Number: 25226

NOTE: The immediately preceding box should only be marked when the practitioners were appointed using the listed Customer Number.

The reason(s) for this request are those described in 37 CFR:

[ ] 10.40(b)(1)	[ ] 10.40(b)(2)	[ ] 10.40(b)(3)	[x] 10.40(b)(4)
[ ] 10.40(c)(1)(i)	[ ] 10.40(c)(1)(ii)	[ ] 10.40(c)(1)(iii)	[ ] 10.40(c)(1)(iv)
[ ] 10.40(c)(1)(v)	[ ] 10.40(c)(1)(vi)	[ ] 10.40(c)(2)	[ ] 10.40(c)(3)
[ ] 10.40(c)(4)	[ ] 10.40(c)(5)	[ ] 10.40(c)(6) Please explain below:	

Certifications

Check each box below that is factually correct. WARNING: If a box is left unchecked, the request will likely not be approved.

1. [x] I/We have given reasonable notice to the client, prior to the expiration of the response period, that the practitioner(s) intend to withdraw from employment.

2. [x] I/We have delivered to the client or a duly authorized representative of the client all papers and property (including funds) to which the client is entitled.

3. [x] I/We have notified the client of any responses that may be due and the time frame within which the client must respond.

Please provide an explanation, if necessary:

The practitioners have been discharged by the assignee/client. The assignee/client has requested transfer.

sf-2723675

REQUEST FOR WITHDRAWAL AS ATTORNEY OR AGENT AND CHANGE OF CORRESPONDENCE ADDRESS

Complete the following section only when the correspondence address will change. *Changes of address will only be accepted to an inventor or an assignee that has properly made itself of record pursuant to 37 CFR 3.71.*

Change the correspondence address and direct all future correspondence to:

A. ☐ The address of the inventor or assignee associated with Customer Number: _____

OR

B. ☐ Inventor or Assignee Name

Address

City	State	Zip	Country

Telephone	Email

I am authorized to sign on behalf of myself and all withdrawing practitioners.

Signature	Robert Saltzberg		
Name	Robert A. Saltzberg	Registration No.	36,910

Address: Morrison & Foerster LLP
425 Market Street

City	State	Zip	Country
San Francisco	CA	94105-2482	US

Date	Telephone No.
August 27, 2009	(415) 268-6428

NOTE: ***Withdrawal is effective when approved rather than when received.***

sf-2723675

Electronic Acknowledgement Receipt

EFS ID:	5987082
Application Number:	10917968
International Application Number:	
Confirmation Number:	3609
Title of Invention:	Power control in a wireless communication system
First Named Inventor/Applicant Name:	Nicholas William Anderson
Customer Number:	25226
Filer:	Robert A. Saltzberg/Lindsay Seydel
Filer Authorized By:	Robert A. Saltzberg
Attorney Docket Number:	562492000500
Receipt Date:	31-AUG-2009
Filing Date:	12-AUG-2004
Time Stamp:	17:43:50
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	562492000500_trans.pdf	55239 f1aad97ce243bc54beee4764d1b7a8fe18fc6902	no	1

Warnings:	
Information:	

2	Power of Attorney	562492000500_req.pdf	90593 d8a25e455c3b49722e7d4d0ac6d602435ffb815f	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	145832	

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/917,968	08/12/2004	Nicholas William Anderson	562492000500	3609

25226 7590 03/31/2009

MORRISON & FOERSTER LLP
755 PAGE MILL RD
PALO ALTO, CA 94304-1018

EXAMINER	
REGO, DOMINIC E	
ART UNIT	PAPER NUMBER
2618	
MAIL DATE	DELIVERY MODE
03/31/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/917,968	ANDERSON, NICHOLAS WILLIAM	
	Examiner	Art Unit	
	DOMINIC E. REGO	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 January 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,7,8,15-17,26,28,30-34 and 43-48* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,7,8,15-17,26,28,30-34 and 43-48* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This communication is responsive to the application filed on January 27, 2009.

Claims 1-4,7-8,15-17,26-,28,30-34, and 43-48 are pending and presented for prosecution.

Claims 1,8,26,30-32,34,43, and 45-48 have been amended.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 01/27/2009 has been entered.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 26-39 and 46-48 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 26-39 and 46-48 recite “A computer-readable medium”. The claimed “a computer-readable medium “ is defined by the specification as “hardware, software, firmware, or combinations thereof” (See Paragraph [0026]). Since the claimed “ a computer-readable medium” may be softer which is not tangible, the claimed invention is directed to not-statutory subject matter. Further, in the specification, paragraph 0026, recites “A procedure, computer executed step, logic block, process etc., are here conceived to be a self-consistent sequence of steps or instructions leading to a desired result. The steps are those utilizing physical manipulations of physical quantities. These quantities can take the form of electrical, magnetic, or radio signals capable of being stored, transferred, combined, compared, and otherwise manipulated in a computer system. These signals may be referred to at times as bits, values, elements, symbols, characters, terms, numbers, or the like”. So treating claim 26-39 and 46-48 as a whole, it is effectively claiming a signal. Signal does not within any of the statutory categories, thus, not statutory (See MPEP 2100, In re Nuitjen, Docket no. 2006-1371 (Fed. Cir. Sept 20, 2007)(slip. Op. at 18)).

5. Claims 1-4,7,8,15-17, and 43-45 are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. Supreme Court precedent (*Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584,588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876)) and recent Federal Circuit decisions (*In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008)) indicate that a statutory "process" under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform

underlying subject matter (such as an article or material) to a different state or thing. While the instant claim recites a series of steps or acts to be performed, the claim neither transforms underlying subject matter nor is positively tied to another statutory category that accomplishes the claimed method steps, and therefore does not qualify as a statutory process. In this case, a method of claims 1 and 43 including steps of determining, sending, receiving, and calculating is of sufficient breadth that it would be reasonably interpreted as a series of steps completely performed mentally, verbally or without a machine.

Claim Objections

6. Claims 30-34 are objected to because of the following informalities: claims 30-34 are currently depending on cancelled claim 29. Appropriate correction is required.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1-4,7,15,26,28,32,33,43, and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zeira et al. (International Publication Number #WO 00/57574) in view of Chen et al. (US Pub. No. 2005/0025056) and further in view of Van Lieshout et al. (US Pub. No. 2001/0036823).

Regarding claim 1, Zeira teaches a method of power control in a radio communications system (See Abstract), the method comprising:

determining a path loss of a radio channel between a base station and a remote transceiver (Page 2, lines 14- 21; Page 4, line 17-Page 5, line 8);

receiving a transmit power control (TPC) command (Page 4, line 17-Page 5, line 8);

calculating, at the remote transceiver, a transmit power level for the scheduled uplink transmission resource based upon the path loss and the TPC command *(Page 4, line 18-Page 5, line 8, Zeira teaches the first station (base station) transmits power commands based on in part a reception quality of the received communications. The first station (base station) transmits a second communication (remote terminal) having a transmission power level in a first time slot. The second station receives the second communication and the power commands. A power level of the second communication as received is measured (calculated). A path loss estimate is determined based on in part the measured received second communication power level and the first communication power level),* except on a shared physical channel used to carry

allocation and scheduling information from the base station to the remote transceiver, receiving an allocation of a scheduled uplink transmission resource.

However, in related art, Chen teaches on a downlink dedicated control channel (DCCH) channel used to carry allocation and scheduling information from the base station to the remote transceiver, receiving an allocation of a scheduled uplink transmission resource *(Paragraphs 0012,0052-0057, especially, paragraph 0012, Chen teaches it is an object of the present invention to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method. Paragraph 0054, Chen teaches the transmitting unit 15 is configured to notify the radio resources allocated by the resource allocating 14 to the mobile station via a downlink dedicated control channel (DCCH). Paragraph 0052, Chen teaches the resource allocating unit 14 is configured to allocate a radio resource which is used in uplink packet communications with the mobile station, by referring to the virtual buffer corresponding to the mobile station 30).*Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Chen to Zeira in order to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method (Chen, paragraph 0012).

The combination of Zeira and Chen fail to teach on a shared physical channel used to carry allocation and scheduling information.

However, Van Lieshout teaches on a shared physical channel (shared radio channel) used to carry allocation and scheduling information (Para. 0006). Therefore, it

would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of van Lieshout to Zeira and Chen so that the mobile unit can find out the available resources that it can use from the base station.

Regarding claims 2 and 32, the combination of Zeira, Chen, and Van Lieshout teach all the claimed elements in claim 1. In addition, Zeira teaches the method of power control, the method further comprising transmitting an uplink signal from the remote transceiver at a calculated transmit power level (Page 5, lines 4-8).

Regarding claims 3 and 28, the combination of Zeira, Chen, and Van Lieshout teach all the claimed elements in claims 1 and 26. In addition, Zeira teaches the method of power control, wherein determining the path loss includes: receiving a downlink signal transmitted from the base station, wherein the downlink signal signals a transmitted power level of the downlink signal; and measuring a received power level of the downlink signal (Page 2, lines 14-21; Page 4, lines 17-page 8).

Regarding claim 4, the combination of Zeira, Chen, and Van Lieshout teach all the claimed elements in claim 1. In addition, Zeira teaches the method of power control, wherein determining the path loss further includes computing a difference between the signaled transmit power level and the measured received power level (Page 2, lines 1-lines 21; Page 5, lines 2-lines 4).

Regarding claims 7 and 33, the combination of Zeira, Chen, and Van Lieshout teach all the claimed elements in claim 1. In addition, Zeira teaches the method of power control, wherein the calculated the transmit power level is based on a spreading factor parameter (Page 13, lines 2-15).

Regarding claim 15, the combination of Zeira, Chen, and Van Lieshout teach all the claimed elements in claim 1. In addition, Zeira teaches the power control method, further comprising calculating a transmit power level for transmission by the remote transceiver on the scheduled uplink transmission resource based on the path loss and an accumulated TPC command (Page 4, line 17-Page 5, line 8).

Regarding claim 26, Zeira teaches a computer-readable medium encoded with a computer program for controlling power in a radio communication system, the computer program comprising instructions for:

determining a path loss for a radio channel between a base station and a remote transceiver (Page 2, lines 14- 21; Page 4, line 17-Page 5, line 8);

and

receiving a transmit power control (TPC) command (Page 4, line 17-Page 5, line 8);

calculating a transmit power level for the remote transceiver based on the path loss and an accumulated TPC command *(Page 4, line 18-Page 5, line 8, Zeira teaches the first station (base station) transmits power commands based on in part a reception quality of the received communications. The first station (base station) transmits a second communication (remote terminal) having a transmission power level in a first time slot. The second station receives the second communication and the power commands. A power level of the second communication as received is measured (calculated). A path loss estimate is determined based on in part the measured received second communication power level and the first communication power level),* except

However, in related art, Chen teaches on a downlink dedicated control channel (DCCH) channel used to carry allocation and scheduling information from the base station to the remote transceiver, receiving an allocation of a scheduled uplink transmission resource *(Paragraphs 0012,0052-0057, especially, paragraph 0012, Chen teaches it is an object of the present invention to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method. Paragraph 0054, Chen teaches the transmitting unit 15 is configured to notify the radio resources allocated by the resource allocating 14 to the mobile station via a downlink dedicated control channel (DCCH). Paragraph 0052, Chen teaches the resource allocating unit 14 is configured to allocate a radio resource which is used in uplink packet communications with the mobile station, by referring to the virtual buffer corresponding to the mobile station 30).*Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Chen to Zeira in order to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method (Chen, paragraph 0012).

The combination of Zeira and Chen fail to teach on a shared physical channel used to carry allocation and scheduling information.

However, Van Lieshout teaches on a shared physical channel (shared radio channel) used to carry allocation and scheduling information (Para. 0006). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to

provide the above teaching of van Lieshout to Zeira and Chen so that the mobile unit can find out the available resources that it can use from the base station.

Regarding claim 43, Zeira teaches a method of power control in a radio communications system (See Abstract), the method comprising:

sending transmit power control (TPC) commands (Page 4, line 17-Page 5, line 8); and

receiving an uplink signal from the remote transceiver at a calculated transmit power level based on a path loss and the TPC command *(Page 4, line 18-Page 5, line 8, Zeira teaches the first station (base station) transmits power commands based on in part a reception quality of the received communications. The first station (base station) transmits a second communication (remote terminal) having a transmission power level in a first time slot. The second station receives the second communication and the power commands. A power level of the second communication as received is measured (calculated). A path loss estimate is determined based on in part the measured received second communication power level and the first communication power level),* except on a shared physical channel used to carry allocation and scheduling information from the base station to the remote transceiver, sending an allocation of a scheduled uplink transmission resource.

However, in related art, Chen teaches on a downlink dedicated control channel (DCCH) channel used to carry allocation and scheduling information from the base station to the remote transceiver, sending an allocation of a scheduled uplink transmission resource *(Paragraphs 0012,0052-0057, especially, paragraph 0012, Chen*

*teaches it is an object of the present invention to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method. Paragraph 0054, Chen teaches the transmitting unit 15 is configured to notify the radio resources allocated by the resource allocating 14 to the mobile station via a downlink dedicated control channel (DCCH). Paragraph 0052, Chen teaches the resource allocating unit 14 is configured to allocate a radio resource which is used in uplink packet communications with the mobile station, by referring to the virtual buffer corresponding to the mobile station 30).*Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Chen to Zeira in order to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method (Chen, paragraph 0012).

The combination of Zeira and Chen fail to teach on a shared physical channel used to carry allocation and scheduling information.

However, Van Lieshout teaches on a shared physical channel (shared radio channel) used to carry allocation and scheduling information (Para. 0006). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of van Lieshout to Zeira and Chen so that the mobile unit can find out the available resources that it can use from the base station.

Regarding claim 46, Zeira teaches a computer-readable medium encoded with a computer program for controlling power in a radio communication system (See Abstract), the computer program comprising instructions for:

sending a transmit power control (TPC) command (Page 4, line 17-Page 5, line 8);

receiving an uplink signal from the remote transceiver at a calculated transmit power level based on a path loss and the TPC command *(Page 4, line 18-Page 5, line 8, Zeira teaches the first station (base station) transmits power commands based on in part a reception quality of the received communications. The first station (base station) transmits a second communication (remote terminal) having a transmission power level in a first time slot. The second station receives the second communication and the power commands. A power level of the second communication as received is measured (calculated). A path loss estimate is determined based on in part the measured received second communication power level and the first communication power level)*, but fails to teach on a shared physical channel used to carry allocation and scheduling information from the base station to the remote transceiver, sending an allocation of a scheduled uplink transmission resource.

However, in related art, Chen teaches on a downlink dedicated control channel (DCCH) channel used to carry allocation and scheduling information from the base station to the remote transceiver, sending an allocation of a scheduled uplink transmission resource *(Paragraphs 0012,0052-0057, especially, paragraph 0012, Chen teaches it is an object of the present invention to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method. Paragraph 0054, Chen teaches the transmitting unit 15 is configured to notify the radio resources allocated by the resource allocating 14 to the*

*mobile station via a downlink dedicated control channel (DCCH). Paragraph 0052, Chen teaches the resource allocating unit 14 is configured to allocate a radio resource which is used in uplink packet communications with the mobile station, by referring to the virtual buffer corresponding to the mobile station 30).*Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Chen to Zeira in order to perform the efficient scheduling processing and to allocate radio resources efficiently in the uplink high-speed packet communications method (Chen, paragraph 0012).

The combination of Zeira and Chen fail to teach on a shared physical channel used to carry allocation and scheduling information.

However, Van Lieshout teaches on a shared physical channel (shared radio channel) used to carry allocation and scheduling information (Para. 0006). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of van Lieshout to Zeira and Chen so that the mobile unit can find out the available resources that it can use from the base station.

9. Claims 8 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zeira et al. (International Publication Number #WO 00/57574) in view of Chen et al. (US Pub. No. 2005/0025056) in view of Van Lieshout et al. (US Pub. No. 2001/0036823) and further in view of Shiu et al. (US Patent #6,983,166).

Regarding claims 8 and 34, the combination of Zeira, Chen, and Van Lieshout fails to teach the method of power control, wherein the calculated transmit power level is based on parameter associated with a selected transport format.

However, in related art, Shiu teaches the method of power control, wherein the calculated transmit power level is based on parameter associated with a selected transport format. (Col 3, lines 27-41).Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Shiu to Zeira, Chen, and Van Lieshout in order to adjust transmit power and achieve target block error rate (BLERs) (See Shiu, Col 3, line 31).

10. Claims 16,17,30,31,44,45,47, and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zeira et al. (International Publication Number #WO 00/57574) in view of Chen et al. (US Pub. No. 2005/0025056) in view of Van Lieshout et al. (US Pub. No. 2001/0036823) and further in view of Krishnan et al. (US Pub. No. 2005/0176455).

Regarding claims 16,30,44, and 47, the combination of Zeira, Chen, and Van Lieshout fail to teach the power control method, further comprising receiving a signal from the base station for instructing the remote transmitter to utilize only the accumulated TPC commands when deriving the calculated transmit power level, thereby disabling use of open loop power control and enabling use of closed loop power control only.

However, in related art, Krishnan teaches the power control method, further comprising receiving a signal from the base station for instructing the remote transmitter to utilize only the accumulated TPC commands when deriving the calculated transmit power level, thereby disabling use of open loop power control and enabling use of closed loop power control only (Paragraphs 0047-0050, especially, Paragraphs 0049-0050). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Krishnan to Zeira, Chen, and Van Lieshout in order to provide the transmitting terminal feedback regarding the power of signals received at the receiving terminal.

Regarding claim 17,31,45, and 48, the combination of Zeira, Chen, and Van Lieshout fail to teach the power control method, further comprising receiving a signal from the base station for instructing the remote transmitter to disregard the accumulated TPC command when deriving the calculated transmit power level, thereby enabling use of open loop power control only and disabling use of closed loop power control.

However, in related art, Krishnan teaches the power control method, further comprising receiving a signal from the base station for instructing the remote transmitter to disregard the accumulated TPC command when deriving the calculated transmit power level, thereby enabling use of open loop power control only and disabling use of closed loop power control (Paragraphs 0047-0050, especially, Paragraphs 0049-0050).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Krishnan to Zeira, Chen, and Van

Lieshout in order to provide the transmitting terminal feedback regarding the power of signals received at the receiving terminal.

11. Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner. SEE MPEP 2141.02 [R-5] VI. PRIOR ART MUST BE CONSIDERED IN ITS ENTIRETY, INCLUDING DISCLOSURES THAT TEACH AWAY FROM THE CLAIMS: A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984) In re Fulton, 391 F.3d 1195, 1201,73 USPQ2d 1141, 1146 (Fed. Cir. 2004). >See also MPEP §2123.

Response to Arguments

12. Applicant's arguments with respect to claims 1-4,7,8,15-17,26,28,30-34, and 43-48 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Miyoshi et al. (US Pub. No. 2004/0171387), Kim et al. (US Pub. No. 2003/0032411, Para. 0008), Jiang et al. (US Pub. No. 2005/0041673, Para. 0005), Hwang et al. (US Pub. No. 2005/0207359, Para. 0038), Petrovic et al. (US Pub. No. 2007/0081492, Para. 0010 and 0117), Chao et al. (US Pub. No. 2009/0028111, Claims 1 and 5).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DOMINIC E. REGO whose telephone number is (571)272-8132. The examiner can normally be reached on Monday-Friday, 8:30 am-5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duc M. Nguyen can be reached on 571-272-7503. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dominic E. Rego
/Dominic E Rego/
Examiner, Art Unit 2618
Tel 571-272-8132

/Duc Nguyen/
Supervisory Patent Examiner, Art Unit 2618

Notice of References Cited	Application/Control No. 10/917,968	Applicant(s)/Patent Under Reexamination ANDERSON, NICHOLAS WILLI	
	Examiner DOMINIC E. REGO	Art Unit 2618	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2001/0036823	11-2001	Van Lieshout et al.	455/418
*	B	US-2004/0171387	09-2004	Miyoshi et al.	455/452.2
*	C	US-2003/0032411	02-2003	Kim et al.	455/414
*	D	US-2005/0041673	02-2005	Jiang et al.	370/401
*	E	US-2005/0207359	09-2005	Hwang et al.	370/278
*	F	US-2007/0081492	04-2007	Petrovic et al.	370/331
*	G	US-2009/0028111	01-2009	Chao et al.	370/331
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10917968	ANDERSON, NICHOLAS WILLIAM
	Examiner	**Art Unit**
	DOMINIC E REGO	2618

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	06/14/2007	03/13/2008	07/28/2008	03/15/2009					
	1	✓	÷	✓	✓					
	2	✓	÷	✓	✓					
	3	✓	÷	✓	✓					
	4	✓	÷	✓	✓					
	5	✓	÷	-	-					
	6	✓	÷	-	-					
	7	✓	÷	✓	✓					
	8	✓	÷	✓	✓					
	9	✓	÷	✓	-					
	10	✓	÷	N	-					
	11	✓	÷	N	-					
	12	✓	÷	✓	-					
	13	✓	÷	N	-					
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	15		÷	✓	✓					
	16		÷	✓	✓					
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	23		÷	✓	-					
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	25		÷	✓	-					
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	30		÷	✓	✓					
	31		÷	✓	✓					
	32		÷	✓	✓					
	33		÷	✓	✓					
	34		÷	✓	✓					
	35		÷	✓	-					

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	Examiner	**Art Unit**
	DOMINIC E REGO	2618

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	06/14/2007	03/13/2008	07/28/2008	03/15/2009					
	36		÷	✓	-					
	37		÷	✓	-					
	38		÷	✓	-					
	39		÷	✓	-					
	40		÷	N	-					
	41		÷	N	-					
	42		÷	N	-					
	43		÷	✓	✓					
	44		÷	✓	✓					
	45		÷	✓	✓					
	46		÷	✓	✓					
	47		÷	✓	✓					
	48		÷	✓	✓					

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10917968	ANDERSON, NICHOLAS WILLIAM
	Examiner	Art Unit
	DOMINIC E REGO	2618

SEARCHED			
Class	Subclass	Date	Examiner
455	522,68,69,115.3,126,127.1,296,127.2,67.11,434,436,135,226.3,277.2	7/28/2008	DR
370	331,320,335,342,318,392,252,276,280	7/28/2008	DR
375	147,130	7/28/2008	DR

SEARCH NOTES		
Search Notes	Date	Examiner
Consulted SPE Duc Nguyen regarding Restriction requirement	3/13/08	DR
Updated East Search	7/28/2008	DR
Updated East, Google, Inventor, and NPL search	3/15/2009	DR

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S56	28	shar$3 near2 physical near2 channel same allocat$3 with schedul$3 with resource	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/24 17:22
S59	130	shar$3 near4 channel same allocat$3 with schedul$3 with resource	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/24 17:28
S60	43	S59 and (@ad <= "20040812" @rlad <= "20040812" @pd <= "20040812")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/24 17:28
S61	9	shar$3 near4 channel same allocat$3 same schedul$3 same resource same (power near4 control$4)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/24 19:14
S62	12	(d$2s$2ch shar$3 near4 channel) same allocat$3 same schedul$3 same resource same (power near4 control$4)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/24 19:18
S65	4	power near4 control$4 same allocat$3 same schedul$3 same resource same (share near4 channel d$2s$2ch)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/24 19:32

S68	9	power near4 control$4 same allocat$3 same schedul$3 same (share near4 channel d$2s$2ch)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/24 19:42
S69	44	(tpc power near4 control$4 near2 command$3) near5 (share near4 channel d$2s $2ch)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/24 19:45
S70	34	S69 and (@ad <= "20040812" @rlad <= "20040812" @pd <= "20040812")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/24 19:46
S72	8	allocat$3 same schedul$3 same resource same (forward$3 up $link) same (transmit$4 near power near control tpc) near3 command$3	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/24 19:56
S73	134	(d$2s$2ch shar$3 near4 channel) with resource near3 available	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/24 20:27
S74	8	(d$2s$2ch shar$3 near2 physical near2 channel) near5 resource near3 available	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/24 20:28
S75	79	S73 and (@ad <= "20040812" @rlad <= "20040812" @pd <= "20040812")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/24 20:30

S76	6	S73 same (power near3 control$4)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/24 20:30
S77	66	S73 and (tpc power near3 control$4)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/24 20:32
S78	41	S77 and (@ad <= "20040812" @rlad <= "20040812" @pd <= "20040812")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/24 20:32

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