I.

SUMMARY OF THE LAW GOVERNING REEXAMINATION

A. Claim interpretation

In determining whether a "substantial new question of patentability" exists as to make reexamination appropriate, "the PTO must apply the broadest reasonable meaning to the claim language, taking into account any definitions presented in the specification." *In re Bass*, 314 F.3d 575, 577 (Fed. Cir. 2002) (citing *In re Yamamoto*, 740 F.2d 1569, 1571 (Fed. Cir. 1984)); *accord In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1369 (Fed. Cir. 2004) ("PTO is obligated to give claims their broadest reasonable interpretation during examination."). Thus, during reexamination (as in an original or reissue examination), claims should be given the broadest reasonable interpretation, rather than the narrower interpretation appropriate in a suit for patent infringement. One rationale for this rule is that in a reexamination, unlike an infringement action, the patent owner may amend the claims. *See In re Yamamoto*, 740 F.2d at 1571-1572.

Consistent with applicable law, the identified claims are given their broadest reasonable interpretation consistent with the '576 patent specification, even though the claims may have a narrower interpretation in an infringement suit. In Requestor's opinion, there is a substantial new question of patentability with respect to claims 1-23, irrespective of the breadth of the interpretation of the claims.

The prior art references upon which the Requester relies — in some cases individually, and in other cases in combinations that the references themselves or the knowledge of one skilled the art suggest — are references that a reasonable examiner would consider important in

deciding whether the claims of the '576 patent are patentable.[1] Moreover, applying the preponderance of the evidence standard[2] for anticipation or obviousness in light of these references leads to only one reasonable conclusion: that claims 1-23 of the '576 Gurantz patent are invalid.

B. Originally cited references used in a reexamination rejection

Under 35 U.S.C. § 303(a), the "existence of a substantial new question of patentability is not precluded by the fact that a patent or printed publication was previously cited by or to the Office or considered by the Office." It is noted, however, that this reexamination request is not based solely on art previously before the Patent Office during prosecution of the '576 patent. The primary references relied on in this request were not cited by or to the Office nor were they considered by the Office. Additionally, while the Seo reference was considered by the Office, it was not considered in combination with the new primary references.

C. Evidence that may be used in a reexamination

In addition to patents and printed publications, admissions by a patentee may also be used as evidence to establish a substantial new question of patentability in combination with a patent or a printed publication. MPEP 2217. An admission by a patentee may reside in a record created during litigation. *Id.* Such patentee admissions may be relied upon for any matter affecting patentability. 37 C.F.R. 1.104(c)(3).

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[1] *See* MPEP § 2242 ("It is not necessary that a '*prima facie*' case of unpatentability exist as to the claim in order for 'a substantial new question of patentability' to be present as to the claim. . . .) (citing *In re Etter*, 756 F.2d 852, 857 n.5 (Fed. Cir. 1985)).

[2] *See Xerox Corp. v. 3Com Corp.*, 69 F. Supp. 2d 404, 407 (W.D.N.Y. 1999) ("[I]n a reexamination proceeding before the PTO, there is no presumption of validity and there must only be a preponderance of the evidence to show unpatentability before the PTO may reject the patent claim(s)."); *Bruning v. Hirose*, 161 F.3d 681, 685 (Fed. Cir. 1998) (patents do not "retain the presumption of validity during reexamination proceedings"); *See also In re Etter*, 756 F.2d 852, 858 (Fed. Cir. 1985) (statutory presumption of patent validity does not apply in patent reexamination proceedings, such that the examiner need not satisfy the "clear and convincing" evidentiary burden to reject a claim).

D. Matters appropriate for consideration in reexamination

Determining whether a claim is entitled to claim benefit of priority from an earlier application or benefit from a 37 CFR 1.131 declaration filed in a related patent are appropriate matters for consideration in reexamination because the priority date of a claim determines whether a given reference is prior art to that claim. *See* MPEP §§ 2258(I)(C) and 201.11.

II.
CERTIFICATION OF SERVICE OF THIS REQUEST

Requestor's representative, by signing below, certifies that pursuant to 37 C.F.R §1.33(c) a copy of this Request for Reexamination in its entirety has been served on the attorney of record for the patent owner at the address listed in the PTO PAIR database, and as verified by the Office's roster of patent attorneys and agents:

Michael W. Landry

5098 Seachase St.

San Diego, CA 92130

858-229-6801

III.
COMMUNICATIONS TO THIRD PARTY REQUESTOR

Please direct all communications for the third party requestor concerning this Request for Reexamination to:

Daniel N. Yannuzzi

Sheppard, Mullin Richter & Hampton LLP

12275 El Camino Real, Suite 200

San Diego, CA, 92130

(USPTO Customer Number 30764)

IV.
CLAIMS FOR WHICH REEXAMINATION IS REQUESTED

Presented below is a request for reexamination of all claims 1-23 of the '576 patent, in view of the following documents:

1. "INFORMATION FOR INSTALLERS OF HOT BIRD™ DVB-S SYSTEMS, VERSION 1.0" (hereinafter "Eutelsat Installers Guide", Exhibit B);

2. "DIGITAL SATELLITE EQUIPMENT CONTROL (DiSEqC TM) UPDATE AND RECOMMENDATIONS FOR IMPLEMENTATION, VERSION 2.0" (hereinafter "Eutelsat DiSEqC Specification", Exhibit C);

3. United States Patent No. 6,437,837 to Seo (hereinafter "Seo", Exhibit D);

4. United States Patent No. 5,073,390 to Green *et al.* (hereinafter "Green", Exhibit E);

5. United States Patent No. 6,005,861 to Humplemann (hereinafter "Humplemann", Exhibit F);

6. "A SINGLE CHIP UNIVERSAL DIGITAL SATELLITE RECEIVER WITH 480-Mhz IF INPUT" (hereinafter the "Broadcom Paper", Exhibit G);

7. "PHILLIPS DATA SHEET FOR UAA3202M FREQUENCY SHIFT KEYING RECEIVER", (hereinafter the "Phillips Data Sheet" Exhibit H);

8. United States Patent No. 5,654,774 to Pugel *et al.* (hereinafter "Pugel", Exhibit I);

9. United States Patent No. 4,953184 to Simone (hereinafter "Simone", Exhibit J);

10. European Patent No. 1009113 (hereinafter "EPO 113 Patent", Exhibit K);

11. European Patent No. 0757489 (hereinafter "EPO 480 Patent", Exhibit L); and

12. United States Patent No. 5,285,284 to Takashima *et al.* (hereinafter "Takashima", Exhibit M);

13. United States Patent No. 6,353,463 to Seo (hereinafter "Seo", Exhibit N);

14. "RCA DIRECTTV RECEIVER WITH ULTIMATETV SERVICE SETUP GUIDE (hereinafter the "RCA Setup Guide", Exhibit O); and

15. United States Patent No. 5,278,837 to Kelley (hereinafter "Kelley", Exhibit P).

These documents are listed on the accompanying For, PTO/SB/08a and Form PTO/SB/08b.

V.
DESCRIPTION OF THE '576 PATENT

A. Published '576 Patent

The published '576 Patent is directed to a satellite receiving system where transponder signals (sometimes referred to as transponder channels[3]) from a broadband satellite signal are selected and combined. The combined signal is then transmitted from an outdoor unit to a set top box or Integrated Receiver Decoder (IRD). Representative independent claims 1, 8, and 14 are reproduced below.

> 1. A signal distribution system for distributing a plurality of low noise amplifier and block converter (LNB) signals form satellite outdoor unit (ODU) over a coaxial cable to an integrated receiver decoder (IRD) comprising: a signal selector that receives a plurality of broadband LNB signals comprising a plurality of transponder signals, the signal selector is responsive to transponder select information transmitted by an IRD and selects a plurality of transponder signals from at least on broadband LNB signal based on the transponder select information; a frequency translator coupled to the signal selector that is capable of shifting the selected transponder signals to new carrier frequencies to produce RF signals; and a combiner coupled to at least one frequency translator capable of combining at least two RF signals to produce a composite signal; wherein the modulation of the composite signal is the same as modulation of the broadband LNB signals and wherein the composite signal is transmitted on the coaxial cable; whereby the composite signal is transmitted to the IRD.
>
> 8. A signal distribution system for distributing signals comprising a plurality of channels from a plurality of sources between a first unit and a second unit over a communication medium comprising: means in the first unit responsive to

[3] See, for example, Col. 2, lines 55 – 60 where the selected transponder signals are referred to as "transponder channels."

information transmitted by the second unit for extracting selected channels from each of the plurality of sources and combining the selected channels into a composite signal without demodulating channels and without changing the modulation of the channels and transmitting the composite signal over the medium; and means in the second unit for receiving the composite signal and demodulating and decoding at least one channel; and means in the first unit and second units for bi-directionally communicating control information between the second unit and the first unit.

14. A method of communicating a plurality of transponder signals from a satellite outdoor unit (ODU) that receives a plurality of satellite broadband signals to an integrated receiver decoder (IRD) over a single cable connected to the ODU, the method comprising the steps of: communicating a transponder request signal to the ODU from the IRD; in the ODU, selecting a plurality of transponder signals extracted from the received satellite broadband signals, wherein the selecting is responsive to the transponder request signals; combining selected transponder signals into a composite signal; transmitting the composite signal over the single cable from the ODU to the IRDs, wherein the modulation of the transponder signal is not altered by the steps of selecting, combining, and transmitting.

B. Summary of the Prosecution History of the '576 Patent

The '576 patent was applied for on November 11, 2002, under application Serial Number 10/289/011. The application claimed priority to application 60/345,965 (filed November 7, 2001) and listed Itzhak Gurantz, Ladd El Wardani, and Michael Landry as inventors. The application listed twenty-three (23) claims, three of which were independent – Claims 1, 8, and 14.

On or about April 26, 2005, the Examiner issued a First Office Action rejecting all twenty three claims. In response, on or about August 9, 2005, the patentee amended claims 1, 8, 14, 15, and 17. According to the patentee, these revisions clarified that there is no transmodulation in the claimed invention, that the broadband LNB signal is the full LNB output, and that decoding of transponder signals is performed only in the IRDs,

The patentee's arguments were unpersuasive and the examiner again rejected all 23 claims. In response, the patentee again amended several claims. These amendments imposed limitations that the claimed invention select several transponder signals from the broadband signals and that the claimed invention be able to transmit signals over a single coaxial cable.

Despite these amendments, the Examiner rejected claims 1-23 a third time. Following to this third office action, the patentee conducted an interview with the Examiner and amended claims 8, 16, and 21. The interview included an explanation that the claimed invention "include[s] the limitation of transponder selection responsive to a signal transmitted by an IRD." And that in the claimed "invention, a single cable can run from the selector and combiner, which can be in the ODU, to the inside of the building. The signal is split inside the building using a gateway or splitter device to distribute a composite signal to IRDs. The IRD commands to the selector requests individual transponder signals from satellite signals output by any one of the LNBs. The signal selector selects the transponder signals requested from each IRD, combines all of the selected transponder signals into a composite signal, then transits the composite signal, sent preferably over a single cable, and tunes its requested transponder signal for decoding and display on a television connected to the IRD. The composite signal changes based on collection of transponder select signals from each IRD. ... [W]hereas in the applicant's invention and claim, the frequency translator operates on the signal output from the LNB[.]"

The Examiner allowed all claims as amended following this response. For closer review a detailed summary of the prosecution history is attached as Appendix A.

VI.
THE CITED REFERENCES ARE PRIOR ART TO THE '576 patent

The Eutelsat Installers Guide, Eutelsat DiSEqC Specification[4], Seo Patent, Pugel Patent, Green Patent, Simone Patent, EPO Patent 113, EPO Patent 489, and WIPO 379 references are prior art to the '576 Patent as described below.

A. The Eutelsat Installer's Guide

The Eutelsat Installers Guide (Exhibit B) was published on June 7, 1999, more than two years prior to the earliest possible priority date of the '576 patent and thus is prior art under 35 U.S.C. §102(b).

B. The Eutelsat DiSEqC Specification

The Eutelsat DiSEqC Specification (Exhibit C) was published on February 25, 1998, more than three years prior to the earliest possible priority date of the '576 patent and thus is prior art under 35 U.S.C. §102(b).

C. United States Patent No. 6,437,837 to Seo

The Seo '837 Patent reference (Exhibit D) was filed December 30, 1999, more than two years prior to the earliest possible priority date of the '576 patent and issued on August 20, 2002. It is thus prior art under 35 U.S.C. §102(e).

D. United States Patent No. 5,073,930 to Green

The Green patent reference ((Exhibit E) was filed on October 9, 1989 and issued December 17, 1991, almost 10 years before the earliest possible priority date of the '576 patent and thus is prior art under 35 U.S.C. §102(b).

E. United States Patent No. 6,005,861 to Humpleman

[4] The Eutelsat Installers Guide and the Eutelsat DiSEqC Specification are sometimes referred to collectively as the Eutelsat Reference or the Eutelsat References.

The Humpleman Patent reference (Exhibit F) was filed March 3, 1999, has a priority date of November 22, 1995 and issued December 21, 1999, more than one year prior to the earliest possible priority date of the '576 patent and thus is prior art under 35 U.S.C. §102(b).

F. A Single Chip Universal Digital Satellite Receiver with 480-MHz IF Input (the Broadcom Paper)

The Broadcom Paper (Exhibit G) was published in the IEEE in 1999, more than one year prior to the earliest possible priority date of the '576 patent and thus is prior art under 35 U.S.C. §102(b).

G. Philips Data Sheet for UAA3202M Frequency Shift Keying Receiver (Philips Data Sheet)

The Philips Data Sheet (Exhibit H) was published on August 12, 1997, more than one year prior to the earliest possible priority date of the '576 patent and thus is prior art under 35 U.S.C. §102(b).

H. United States Patent No. 5,654,774 to Pugel *et al.*

The Pugel Patent reference (Exhibit I) was filed June 6, 1995 and issued August 5, 1997, more than four years prior to the earliest possible priority date of the '576 patent and thus is prior art under 35 U.S.C. §102(b).

I. United States Patent No. 4,953,184 to Simone

The Simone Patent reference (Exhibit J) was filed June 1, 1989 and issued August 28, 1990, more than ten years prior to the earliest possible priority date of the '576 patent and thus is prior art under 35 U.S.C. §102(b).

J. European Patent No. 1009113

The EPO 113 Patent reference (Exhibit K) published on June 14, 2001, more than five months prior to the earliest possible priority date of the '576 patent and thus is prior art under 35 U.S.C. §102(a).

K. European Patent No. 0757489

The EPO 489 Patent reference (Exhibit L) was issued on February 5, 1997, more than four years prior to the earliest possible priority date of the '576 patent and thus is prior art under 35 U.S.C. §102(b).

L. United States Patent No. 5,285,284 to Takashima et al.

The Takashima patent reference (Exhibit M) was filed on November 9, 1992 and issued February 8, 1994, over 7 years before the earliest possible priority date of the '576 patent and thus is prior art under 35 U.S.C. §102(b).

M. United States Patent No. 6,353,463 to Seo

The Seo '463 patent reference (Exhibit N) was filed on August 24, 1998 more than 3 years before the earliest possible priority date of the '576 patent and issued March 5, 2002. It is thus prior art under 35 U.S.C. §102(e).

N. RCA DIRECTV Receiver with UltimateTV Service Setup Guide (The RCA Setup Guide)

The RCA Setup Guide (Exhibit O) has a copyright date of 2000. This is before the earliest possible priority data of the '576 patent and thus it is prior art under 35 U.S.C. §102(a).

O. United States Patent No. 5,278,837 to Kelley

The Kelly patent reference (Exhibit P) was filed on June 29, 1992 and issued January 11, 1994, over 7 years before the earliest possible priority date of the '576 patent and thus is prior art under 35 U.S.C. §102(b).

VII.
STATEMENT POINTING OUT EACH SUBSTANTIAL NEW QUESTION OF PATENTABILITY

A. Introduction

Substantial new questions of patentability of the claims of the '576 patent exist under 37 C.F.R. § 1.510(b)(1), as discussed in detail below.

The presence or absence of "a substantial new question of patentability" determines whether or not reexamination is ordered. *See*, MPEP § 2242. In determining whether a substantial new question of patentability exists, MPEP § 2242, Subtitle I, paragraph 3, provides:

> A prior art patent or printed publication raises a substantial question of patentability where there is a substantial likelihood that a reasonable examiner would consider the prior art patent or printed publication important in deciding whether or not the claim is patentable.

The MPEP § 2242 further provides that

> If the prior art patents and/or publications would be considered important, then the examiner should find "a substantial new question of patentability" unless the same question of patentability has already been decided as to the claim in a final holding of invalidity by the Federal court system or by the Office in a previous examination.

For the reasons noted below, Requestor submits that a reasonable Examiner would consider the prior art cited herein important in deciding whether or not the subject claims are patentable. Alone or in combination with other references as described herein.

B. Summary of Applicability of the References

Regarding the references presented with the instant Request, it is noted that with the exception of the Seo '837 patent, none of the references relied on herein were part of the prior art of record during the prosecution of the '576 Patent. The Seo '837 Patent reference was part of the prior art of record, but is presented here in combination references that were not considered by the Examiner during the prosecution of the '576 Patent. As such, and in view of the teachings

thereof, the attached references are believed to present substantial new questions of patentability with respect to the claims of the '576 patent to which it is applied.

A detailed explanation of the pertinence and suggested manner of applying the cited prior art to each of claims 1-23 of the '576 patent is set forth below in Section VIII.

1. The Primary References

a. *The Eutelsat Installer's Guide*

The Eutelsat Installer's Guide (Exhibit B) is directed toward satellite receiving systems and methods for broadband content distribution, and provides an overview of possible satellite reception and distribution system architectures. One such example architecture is illustrated at Figure 11.

Particularly, the Eutelsat Installer's Guide discloses architectures for individual and collective reception systems, that include a satellite dish antenna to receive the satellite transmissions, low noise amplifier and block converters (LNBs) to amplify and block convert the received RF satellite transmission to a lower frequency IF band. The LNBs thus output a broadband LNB signal that is comprised of a plurality of different transponder signals each carrying a different "channel" of program content. For example, Figure 11 illustrates a Quad LNB, which outputs four broadband LNB signals, each carrying one of the four permutations of the two bands (high and low) and two polarizations.

The broadband LNB output signals at the IF frequency are distributed to IF-IF converters, which ultimately perform the channel selection. The distribution can be performed by a matrix switch (sometimes referred to as a multiswitch, multiport switch, or crosspoint switch), or it can be performed by band stacking the LNB outputs and providing the stacked outputs to the IF-IF converters for channel selection. A matrix switch, for example, selects a given broadband LNB

signal and switches or 'connects' it to an identified IF-IF converter. In other words, where a given IF-IF converter has identified a particular channel for selection, satellite IF distribution switches or supplies the broadband LNB signal that contains that channel to the IF-IF converter so it can extract the channel therefrom.

The IF-IF converters receive the broadband LNB signals and select or extract the identified channel therefrom. The IF-IF converters are configured to center the extracted channel about an identified IF frequency so that the channel can be placed in a composite signal along with other channels extracted by other IF-IF converters. To elaborate on channel selection further, each IF-IF converter translates it's extracted channel from its original center frequency in the broadband LNB output to its new center frequency for placement in the composite signal. Without this step, the composite signal could not be properly constructed. As stated by the Eutelsat Installers Guide, the IF-IF converters reconstruct or rebuild the satellite IF spectrum (LNB output) so that it is suitable for distribution by a single cable (the composite signal).

The Eutelsat Installers Guide further discloses that the converted IF outputs combined into the composite signal are distributed by a single cable drop from the combiner to the set top boxes (satellite television receivers). The single composite signal can be split to feed it to multiple set top boxes. Thus, the Eutelsat Installers Guides teaches that a single cable drop from the combiner (in the outdoor unit) can be supplied to the IRDs inside, and split inside, without requiring multiple cable runs from the ODU to inside the premises.

The Eutelsat Installers Guide further discloses that the channel selection can be performed remotely by the IRDs. In particular, the Eutelsat Installers Guide discloses the DiSEqC signaling techniques to provide two-way communication between the satellite receiver (IRD) and the outdoor unit (selection equipment) to allow "remote channel selection."

b. ***The Eutelsat DiSEqC Specifications***

The Eutelsat DiSEqC Specification (Exhibit CD) is directed toward satellite receiving systems and methods, including a signal selector for broadband content distribution. The Eutelsat DiSEqC Specification discloses various architectures for distribution of satellite broadcast signals for satellite television applications, along with remote band and channel selection using the DiSEqC signaling protocol.

One example architecture is illustrated in Figure 19, at page 23 of the Eutelsat DiSEqC Specification (in Annex A of the reference).

The illustrated architecture includes a satellite dish antenna to receive the satellite transmissions, two low noise amplifier and block converters (LNBs) to amplify and block convert the received RF satellite transmission to a lower frequency IF band. The LNBs thus output a broadband LNB signal that is comprised of a plurality of different transponder signals each carrying a different "channel" of program content. For example, Figure 19 illustrates two Quad LNBs, each of which output four broadband LNB signals, wherein each signal carries one of the four permutations of the two bands (high and low) and two polarizations.

The broadband LNB output signals at the IF frequency are distributed to IF-IF converters, which ultimately perform the channel selection. The distribution is illustrated as being performed by a matrix switch (sometimes referred to as a multiswitch, multiport switch, or crosspoint switch) that selects a given broadband LNB signal and switches or 'connects' it to an identified IF-IF converter. In other words, where a given IF-IF converter has identified a particular channel for selection, the matrix switch switches or supplies the broadband LNB signal that contains that channel to the IF-IF converter so it can extract the channel therefrom.

The IF-IF converters receive the broadband LNB signals and select or extract the identified channel therefrom. The IF-IF converters are configured to center the extracted channel about an identified IF frequency so that the channel can be placed in a composite signal along with other channels extracted by other IF-IF converters. To elaborate on channel selection further, each IF-IF converter translates it's extracted channel from its original center frequency in the broadband LNB output to its new center frequency for placement in the composite signal. Without this step, the composite signal could not be properly constructed. As stated by the companion document, the Eutelsat Installers Guide, the IF-IF converters reconstruct or rebuild the satellite IF spectrum (LNB output) so that it is suitable for distribution by a single cable (the composite signal).

The Eutelsat DiSEqC Specification further discloses that the converted IF outputs are combined into the composite signal are distributed by a single cable drop from the combiner to the set top boxes (satellite television receivers). The single composite signal can be split to feed it to multiple set top boxes. Thus, the Eutelsat DiSEqC Specification teaches that a single cable drop from the combiner (in the outdoor unit) can be supplied to the IRDs inside, and split inside, without requiring multiple cable runs from the ODU to inside the premises.

The Eutelsat DiSEqC Specification further discloses that the channel selection can be performed remotely by the IRDs. In particular, the Eutelsat Installers Guide discloses the DiSEqC signaling techniques to provide two-way communication between the satellite receiver (IRD) and the outdoor unit (selection equipment) to allow "remote channel selection."

Because the Eutelsat DiSEqC Specification teaches subject matter claimed in the '576 patent that was not taught in any prior art relied on during prosecution of the '576 patent, the teachings of the Eutelsat Installer's Guide raise a substantial new question of patentability.

2. The Secondary References

The following references in combination the Eutelsat Installers Guide and/or Eutelsat DiSEqC Specification references, render the '576 Patent obvious under 35 U.S.C. §103(a). For each secondary reference, at least one motivation to combine the respective reference with either of the two primary references is provided in accordance with MPEP §2217(I).

a. *The Seo '837 Patent Reference*

The Seo '837 Patent reference (Exhibit D) discloses a digital broadcast signal processing apparatus and method in which channel interference by an analog broadcast is prevented, effectively removing an analog broadcast signal mixed in a digital broadcast signal of a co-channel. The Seo '837 Patent reference was of record during prosecution of the '576 Patent. The Seo Patent reference is presented here in combination with art that was not before the Examiner. Thus, the Seo '837 Patent reference can be applied against the claims of the '576 Patent in combination with other prior art references. The Eutelsat References, discussed above, are related to satellite receiving systems. The Seo '837 reference is related to systems and methods of preventing interference in broadcasts. At the time of the purported invention one of ordinary skill in the art would have been motivated to look to the Seo '837 reference to prevent interference in the satellite broadcasts of the Eutelsat system.

b. *The Green Patent Reference*

The Green Patent reference (Exhibit E) discloses solving the same problem as the Eutelsat References (and the '576 patent). Particularly, the Green Patent reference discloses a system for receiving and distributing satellite transmitted television signals. Even more particularly, Green solves the longstanding satellite television distribution problem that required

multiple cable drops to deliver transponder signals (channels) from a plurality of broadband LNB outputs.

Green solves this problem by allowing transponder channels from a plurality of different LNBs to be provided to subscribers over an existing cable drop. Column 6, lines 42-45 and Column 8, lines 23-26. Thus, Green solves the problem in the same way as it is solved by Eutelsat, and as the solution subsequently appeared in the '576 patent.

This point is best illustrated by referring to a sample figure from each document, illustrating the selection of transponders (channels) from the broadband signal and placement of the selected or extracted channels into the composite signal.

Figure 5 of the '576 Patent:

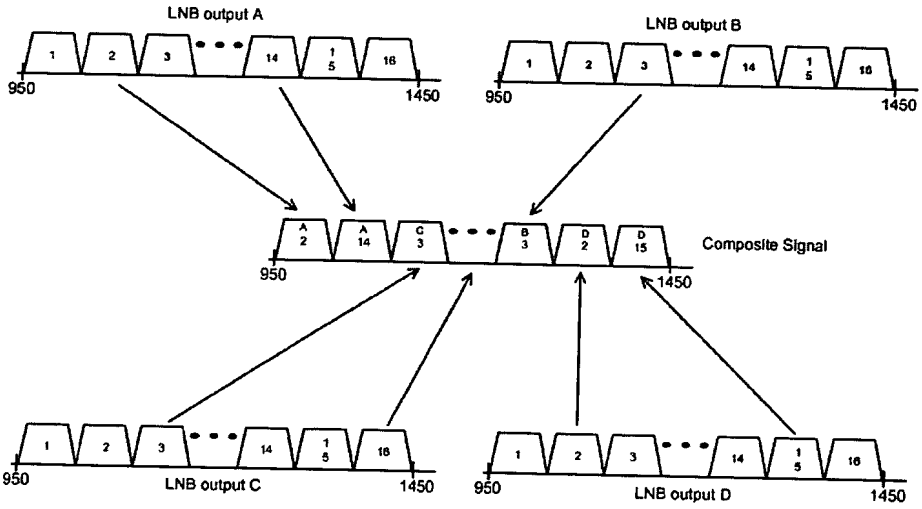


FIG. 5

Figure 2 of the prior art Green Patent:

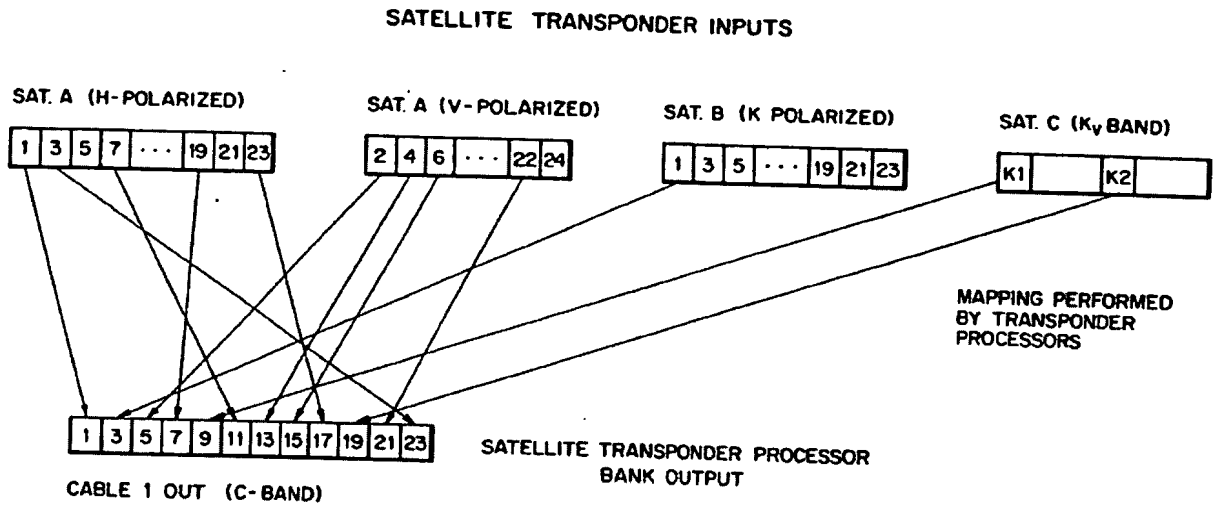


FIG. 2

And, Figure 7 of the prior art Eutelsat Installers Guide

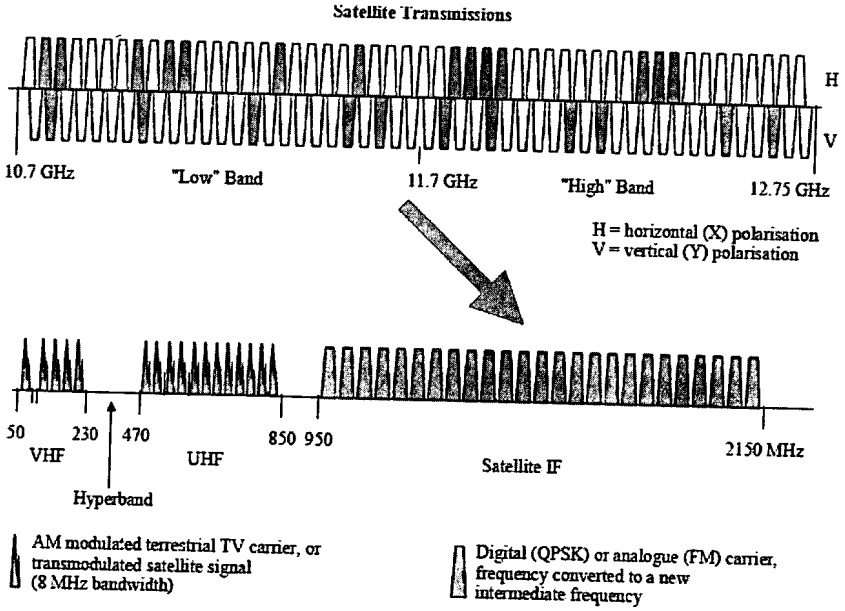


Figure 7 : Broadband Signal Spectrum for an IF-IF Distribution Network

Thus, both prior art references, like the '576 patent, teach selecting transponder signals from a broadband LNB signal, frequency translating the selected signals for placement in a

composite signal, and combining the selected channels into the composite signal for distribution over a single cable to a plurality of users.

The Green Patent reference provides substantial detail regarding, channel selection, combining and distribution. See, for example, Figure 3. Thus, one of ordinary skill in the art reading the Eutelsat reference, would have been motivated to look to Green to obtain detailed information for the solution of the same problem.

c. ***The Humpleman Patent reference***

The Humpleman Patent reference (Exhibit F) discloses a network architecture for in-home distribution of satellite TV (and other signals). The Eutelsat References, discussed above, are related to satellite receiving systems. At the time of the purported invention one of ordinary skill in the art reading the Eutelsat references would have been motivated to look to Humpleman to obtain information regarding in-building distribution of satellite TV signals provided by the Eutelsat outdoor units.

d. ***The Broadcom Digital Satellite Receiver Paper***

The Broadcom Paper (Exhibit G) disclosed conventional receivers use of a SAW filter to perform channel selection for satellite TV systems (Page 11634, first paragraph). Further, the Broadcom paper describes an all digital receiver (Figures 3 and 8) that includes analog to digital converters and digital filtering. Although the Broadcom paper describes analog to digital conversion and digital filtering in the context of a satellite set top box, one of ordinary skill in the art at the time would have understood that such techniques could also be used for channel selection in the signal selector as well.

The Eutelsat References are related to satellite receiving systems. At the time of the purported invention one of ordinary skill in the art would have been motivated to look to the

Broadcom paper to obtain information on digital receiver technology that could be implemented with satellite TV systems such as those taught by the Eutelsat References.

e. ***The Philips Data Sheet***

The Philips Data Sheet (Exhibit H) discloses a wireless receiver that can be used for various wireless communications applications, including, remote controls, telemetry systems, and wireless data transmission. At the time of the purported invention, wireless communications and wireless remote control were a well known alternative to wired communication. Therefore, at the time of the purported invention one of skill in the art would think to use a wireless remote so that to devices that are not located near each other can communicate without wires or cables. Thus, one reading the Eutelsat References would have been motivated to look to the Phillips Data Sheet to obtain information on how to implement wireless signaling for channel control.

f. ***The Pugel Patent Reference***

The Pugel Patent reference (Exhibit I) discloses a tuner for channel selection in a satellite television system. More particularly, at Col. 3, lines 18 – 24, the Pugel Patent reference discloses a tuner **9** for "selecting the particular RF signal corresponding to the desired channel from the plurality of RF signals received ..." And Figure 1 of the Pugel Patent reference illustrates tuner **9** having an input **901** connected directly to the output of the LNB **3**. The Pugel Patent reference further discloses a tuner 54 for a satellite receiver that is configured to select a particular RF signal corresponding to the desired channel from a plurality of RF signals.

The Eutelsat References, discussed above, are related to satellite receiving systems that include channel selection. As discussed above, the Pugel Patent reference discloses a tuner for channel selection in a satellite television system. Therefore, at the time of the purported invention one of skill in the art would have been motivated to look to Pugel to obtain information

on how to implement a tuner for channel selection in a satellite television systems such as those taught by the Eutelsat references.

g. ***The Simone Patent Reference***

The Simone Patent reference (Exhibit J) discloses an analog to digital converter and a digital filter in the same field of endeavor. For example, Col 1, lines 17 – 18 an Col 2, lines 29 - 32 describe a receiver front end that can include and A/D converter as an input to the digital filter 15. One of ordinary skill in the art at the time would have understood that A/D conversion and digital filtering in the context of a satellite set top box could be used for channel selection in the signal selector as well. The Eutelsat References are related to satellite receiving systems. At the time of the purported invention one of ordinary skill in the art would have been motivated to look to the Simone reference to obtain information on A/D conversion and digital filtering that could be implemented with satellite TV systems satellite television systems such as those taught by the Eutelsat references.

h. ***The EPO 113 Patent Reference***

EPO 113 Patent reference (Exhibit K) discloses a satellite reception system that uses tuners (mixers and vcos) to select a channel from a plurality of channels. Figure 2 of the EPO '113 Patent reference shows a structure with a plurality of satellite input signals each having a tuner (mixer and local oscillator) followed by a SAW filter. The Eutelsat References are related to satellite receiving systems. The EPO 113 reference is related to satellite reception system that uses tuners (mixers and VCOs) to select a channel from a plurality of channels. At the time of the purported invention, one of ordinary skill in the art would have been motivated to look to the EPO 113 reference to obtain greater detail for mechanisms for selecting a channel from a plurality of channels in satellite television systems such as those taught by the Eutelsat references.

i. ***The EPO 489 Patent Reference***

The EPO 489 Patent reference (Exhibit L) shows tuners used to select a signal or channel from a satellite broadcast signal. For example, Figures 1 and 3 of EP0757489 illustrate a plurality of satellite input signals SatZF having tuners (mixer and local oscillator). The Eutelsat References are related to satellite receiving systems. The EPO 489 reference is related to tuners used to select a signal or channel from a satellite broadcast signal. Thus, at the time of the purported invention, one of ordinary skill in the art would have been motivated to look to the EPO 489 reference for systems for selecting a channel from a plurality of channels in satellite television systems such as those taught by the Eutelsat references.

j. ***The Takashima et al. Patent Reference***

The Takashima Patent reference (Exhibit M) discloses a television receiver having two tuners. For example, Figure 5, described at Column 2, lines 48 – 52 illustrates a television receiver having a picture-in-picture (PIP) function with two tuners 3 and 4. The Eutelsat References are related to satellite receiver systems, for example, satellite television receiver systems. Because the Takashima reference is directed toward television receiver/tuners and the Eutelsat References are related to satellite televisions receiver systems, one of ordinary skill in the art, at the time of the purported would have been motivated to look to the Takashima reference and known to incorporate two tuners into the system of the Eutelsat References to accomplish the described PIP functionality.

k. ***The Seo '463 Patent Reference***

The Seo '463 Patent Reference (Exhibit N) discloses a dual tuner receiving television signals. The Eutelsat References are related to satellite receiving systems , for example, satellite television receiver systems. Because the Seo '463 patent reference is directed towards television

receiver/tuner and Eutelsat References are directed toward television receiver/tuners, one of ordinary skill in the art, at the time of the purported invention, would have been motivated to look to the '463 reference to incorporate two tuners to allow PIP or watch-and-record functionality in a set top box such as that taught by the Eutelsat references.

l. ***The RCA Setup Guide***

The RCA Setup Guide (Exhibit O) shows a satellite set top box, or IRD, having two tuners. The Eutelsat References are related to satellite receiving systems, for example, satellite television receiver systems. The RCA Setup Guide discloses a dual tuner/receiver receiving television signals. At the time of the purported invention, one of ordinary skill in the art would have been motivated to look to the RCA Setup Guide and noted the use of two tuner/receivers to allow the described PIP or watch-and-record functionality in a set top box such as that taught by the Eutelsat references.

m. ***The Kelly Patent Reference***

The Kelly Patent Reference (Exhibit P) discloses a digital receiver apparatus and method designed for multiple simultaneous users. Because the '576 patent is a satellite receiving system designed to select multiple program channels from one or more broadband signals and the Kelly reference is directed toward digital receiver apparatus and method designed for multiple simultaneous users, one of ordinary skill in the art would have looked to the Kelly reference and known to receive multiple signals.

Kelley is directed at solving the same problem as the Eutelsat references (and the '576 patent) as Kelley describes a receiver system that allows multiple users to receive desired, content selected and extracted from a broadband RF signal. Kelley implements the receiver as a digital receiver.

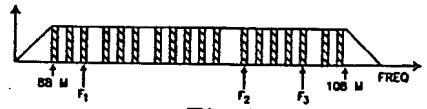


Fig.1

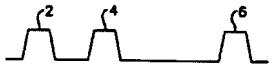


Fig.2

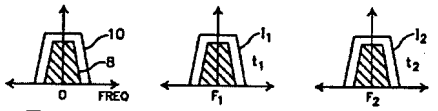


Fig.3 Fig.4a Fig.4b

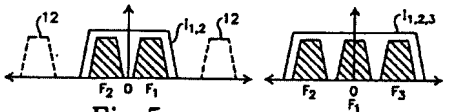


Fig.5 Fig.6

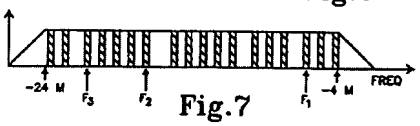


Fig.7

Kelley illustrates the received broadband spectrum in Figure 1, and identifies three channels to be selected therefrom, labeled by their center frequencies F1, F2 and F3. Figure 3 illustrates channel isolation that is obtained by a digital IF filter, Figure 4 illustrates frequency translation of selected channels, and Figure 7 illustrates the reassembled spectrum with the three selected channels frequency translated and reassigned therein.

Because Kelley is directed toward solving the same problem as the Eutelsat References (and the '576 patent), one of ordinary skill in the art reading the Eutelsat References would have been motivated to look to Kelley to determine Kelley's solution and would have understood that a digital receiver could be used for signal selection in satellite television systems such as those taught by the Eutelsat references.

VIII.
DETAILED EXPLANATION OF THE PERTINENCE AND MANNER OF APPLYING THE CITED PRIOR ART TO EVERY CLAIM FOR WHICH REEXAMINATION IS REQUESTED

A. Claims 1, 2, 6, 8, 9, 11-14, 16, 18, 19, 21 and 22 of the '576 Patent are unpatentable under 35 U.S.C. §102(b) as being anticipated by the Eutelsat Installer's Guide as discussed below:

To supplement this detailed discussion, a summary of the applicability of the reference to the claims is provided in the Claim Charts attached as Appendix B.

1. Claim 1

Claim 1 of the '576 patent recites:

> A signal distribution system for distributing a plurality of low noise amplifier and block converter (LNB) signals form satellite outdoor unit (ODU) over a coaxial cable to an integrated receiver decoder (IRD) comprising:
> a signal selector that receives a plurality of broadband LNB signals comprising a plurality of transponder signals, the signal selector is responsive to transponder select information transmitted by an IRD and selects a plurality of transponder signals from at least on broadband LNB signal based on the transponder select information;
> a frequency translator coupled to the signal selector that is capable of shifting the selected transponder signals to new carrier frequencies to produce RF signals;
> and a combiner coupled to at least one frequency translator capable of combining at least two RF signals to produce a composite signal;
> wherein the modulation of the composite signal is the same as modulation of the broadband LNB signals and wherein the composite signal is transmitted on the coaxial cable;
> whereby the composite signal is transmitted to the IRD.

The Eutelsat Installer's Guide discloses every element of claim 1 of the '576 patent. For clarity and ease of discussion, the elements of claim 1 are discussed in their constituent pieces.

a. ***A signal distribution system for distributing a plurality of low noise amplifier and block converter (LNB) signals from a satellite outdoor unit (ODU) over a coaxial cable to an integrated receiver decoder (IRD) comprising***

The Eutelsat Installer's Guide discloses a signal distribution system for distributing a plurality of low noise amplifier and block converter (LNB) signals from a satellite outdoor unit (ODU) over a coaxial cable to an integrated receiver decoder (IRD). Figure 11 (page 20) is a diagram illustrating an example architecture for an RF distribution system including a satellite antenna having a low noise amplifier and block converter (LNB) that sends signals to a satellite receiver (*i.e.*, a set top box or IRD). The LNB is illustrated as a Quad LNB with four output lines to accommodate each of the four band/polarization LNB signals.

For confirmation that the illustrated satellite receiver is an IRD as recited in the claims, the Eutelsat Installer's Guide refers to the satellite receiver as an IRD (integrated receiver decoder) in the description of Figure 11 at page 20, and again at page 27.[5]

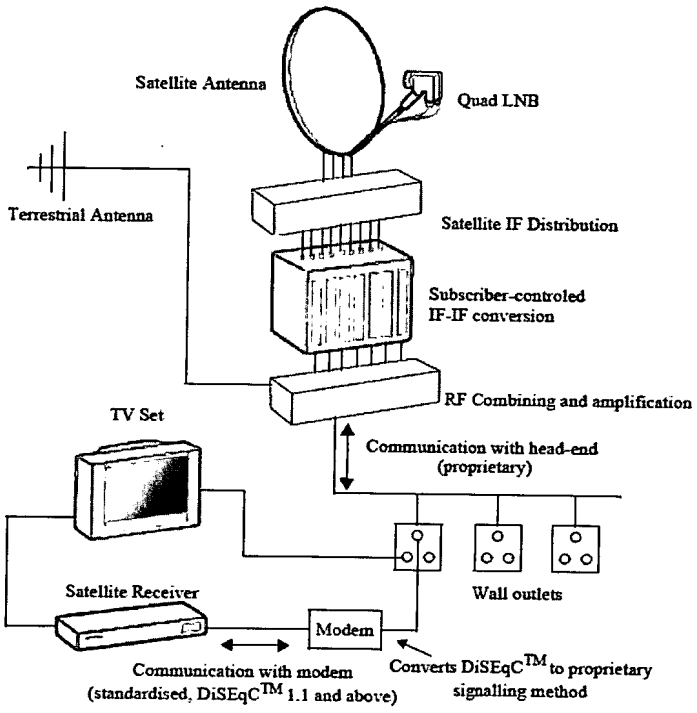


Figure 11 : Architecture of a System with a Remote Controlled Head-End

[5] It should be noted that Figure 11 is similar to the architecture illustrated in Figure 8 with the addition of a signaling capability between the IRD and the upstream equipment for remote channel selection. (Figure 8 has no remote signaling capability).

b. ***a signal selector that receives a plurality of broadband LNB signals comprising a plurality of transponder signals***

The Eutelsat Installers Guide teaches a signal selector that receives a plurality of broadband LNB signals and selects one or more transponder channels. For example, at Figure 11, the Eutelsat Installers Guide teaches a Satellite IF Distribution unit and subscriber-controlled IF-IF converters configured to receive the broadband LNB outputs.

The Eutelsat Installers Guide further discloses that the satellite transmissions received by the various receive architectures comprise two frequency bands and two polarizations. See, page 26, second and third paragraphs. These broadband signals each have a plurality of transponders signals. To illustrate this, the Eutelsat Installers Guide shows the satellite transmission bands in Figure 7 (reproduced below). As this figure illustrates, the satellite spectrum is comprised of four broadband signals each having a plurality of transponder signals (the polygons). Each element of the quad LNB receives the satellite transmission and outputs its respective broadband LNB signal. The LNB also amplifies the signal and converts the satellite RF (10.7 to 12.75 GHz in this case) to an intermediate frequency, or IF (hence the name, low noise amplifier and block converter). Note that Figure 7 does not show this RF to IF conversion performed by the LNBs. However, RF to IF conversion is not part of the claims, and is nonetheless well known as part of satellite receiver systems. As evidence of this, see the Background Section of the '576 patent, which, in discussing the "Prior Art" Figure 1, describes the RF to IF conversion performed by the LNBs.

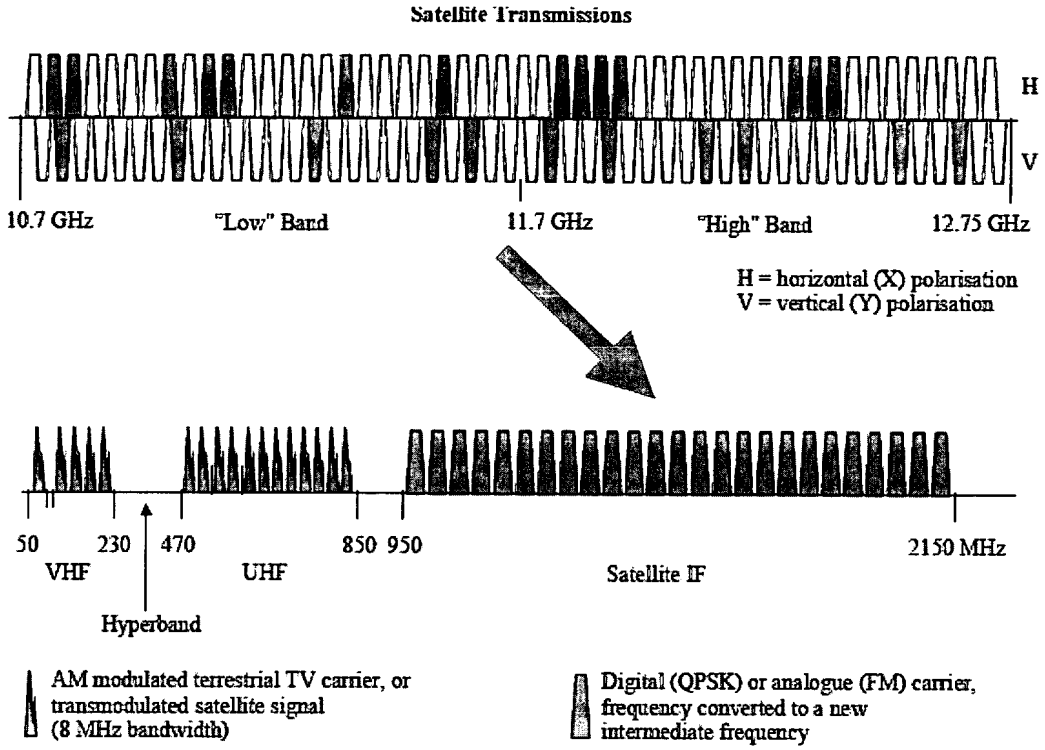


Figure 7 : Broadband Signal Spectrum for an IF-IF Distribution Network

Note that Figure 7 describes IF to IF conversion. Figure 7 is described with reference to Figure 8, which is for channelized IF-IF conversion, rather than for subscriber controlled IF-IF conversion. However, the Eutelsat Installers Guide at page 19, last paragraph, states that the architecture shown in Figure 11 is "similar to that shown in Figure 8 ... except that there must be communication ... so that remote channel selection can be carried out." Therefore, as the only stated difference is that of the remote channel selection, the architecture of Figure 11 is configured to receive the same broadband signals as the architecture of Figure 8.

c. ***the signal selector is responsive to transponder select information transmitted by an IRD***

The Eutelsat Installers Guide discloses that the signal selector is responsive to transponder select information transmitted by an IRD. Particularly, Figure 11 of the Eutelsat Installers Guide illustrates a Satellite Receiver (IRD) that communicates with the head-end

(Outdoor Unit) for channel selection. This is illustrated in Figure 11 by the DiSEqC communications.

Additionally, the Eutelsat Installers Guide at page 19 specifies that there is communication between the terminal (IRD) and the head-end (signal selector) "so that **remote channel selection** can be carried out." (Page 19, last sentence **(emphasis added)**.

Additionally, Section 3.5.1.c of the Eutelsat Installers Guide (page 27) describes one signaling protocol that can be used to communicate information from the IRD to the signal selector. The Eutelsat Installers Guide reference refers to the standardized DiSEqC protocol[6] that is used to provide selection information to the outdoor unit. At page 27, the Eutelsat Installers Guide states that the "DiSEqC™ system uses the satellite receiver (IRD) as a single master terminal controlling a number of remote devices such as LNBs." The Eutelsat Installers Guide further states that DiSEqC "allows for the switching and control of compatible units such as LNBs, switches and positioners..." *Id.*, at 27.

d. ***and selects a plurality of transponder signals from at least one broadband LNB signal based on the transponder select information;***

As stated above, Figure 11 illustrates a receive architecture that allows remote channel selection. As stated above, page 19 of the Eutelsat Installers Guide, specifies that there is communication between the terminal (IRD) and the head-end (selector) "so that **remote channel selection** can be carried out." *Id.*, at page 19, last sentence. Additionally, the second-to-last paragraph on page 19 states that the user's terminal (IRD) can remotely tune to a channel by controlling an IF-IF converter.

---

[6] The Eutelsat Installers Guide at page 27 states that DiSEqC has been adopted as an international standard by CENELEC.

Thus, the Eutelsat Installers Guide teaches that the Subscriber-controlled IF-IF conversion unit (signal selector) selects the appropriate transponder signal(s) from the selected LNB band, based on a DiSEqC command from the IRD.

e. ***a frequency translator coupled to the signal selector that is capable of shifting the selected transponder signals to new carrier frequencies to produce RF signals;***

Figure 11 of the Eutelsat Installers Guide illustrates a Subscriber controlled IF-IF conversion box. As the name suggests, the IF-IF converters convert, or frequency translate, an incoming IF signal at one carrier frequency to an IF signal at another carrier frequency. This IF-IF conversion takes the selected transponder signals (Channels) at the received IF frequency, and converts them to a different IF frequency for placement in a composite signal and distribution to the set top box (IRD).

Additionally, Section 3.4.1.c at page 15 states that the IF-to-IF conversion systems rebuild the satellite IF spectrum so that it is suitable for distribution via a single cable. In other words, the selected transponder signals arrive from the LNBs at a given IF center frequency and are relocated to a new IF center frequency for placement on the composite signal. Although 3.4.1.c is for channelized IF-to-IF conversion, the IF-IF conversion in Figure 11 operates the same, except that it is remote controlled (See, page 19, last paragraph).

Figure 7 provides an example of frequency translation wherein selected transponder signals (the individually shaded polygons) are translated from their original broadband frequencies to the new IF carrier frequencies suitable for placement in a composite signal.

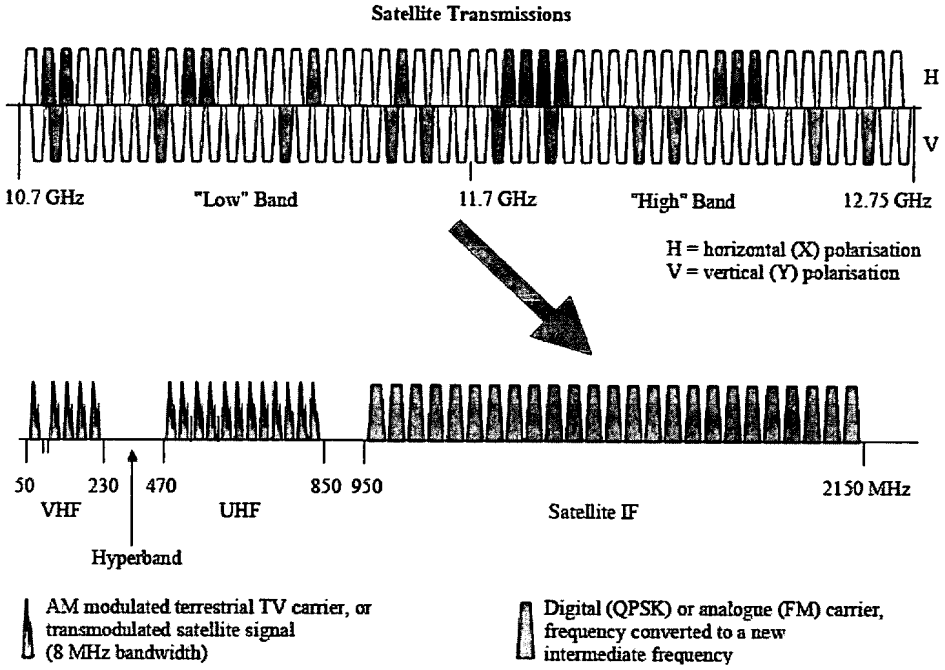
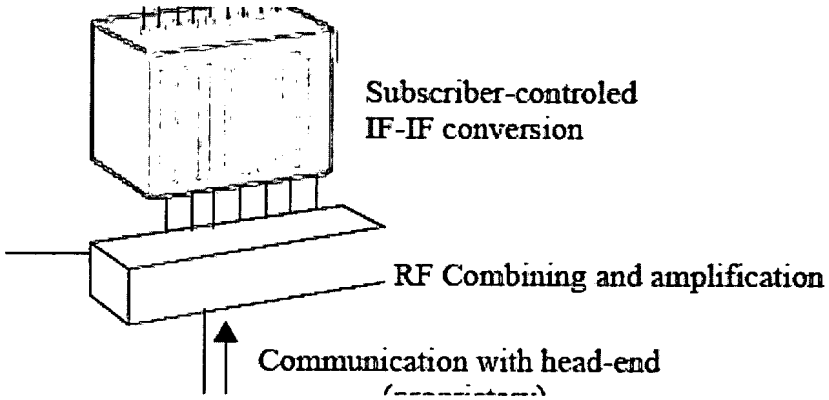


Figure 7 : Broadband Signal Spectrum for an IF-IF Distribution Network

f. ***and a signal combiner coupled to at least one frequency translator capable of combining at least two RF signals to produce a composite signal;***

The Eutelsat Installers Guide also teaches the signal combiner as recited in Claim 1. Particularly, at Figure 11, the Eutelsat Installers Guide discloses an RF Combining and Amplification unit that accepts multiple RF signals from the Subscriber-controlled IF-IF conversion, and combines them into a single composite output signal.



g. ***wherein the modulation of the composite signal is the same as the modulation of the broadband LNB signals;***

The Eutelsat Installers Guide teaches this element of claim 1. Particularly, the Eutelsat Installers Guide discloses architectures that receive QPSK modulated signals, perform the IF-IF frequency translation and provide QPSK signals. Support for this can also be found at Figure 7, which illustrates QPSK signals from the satellite transmission, and selected QPSK transponder signals combined on the composite signal.

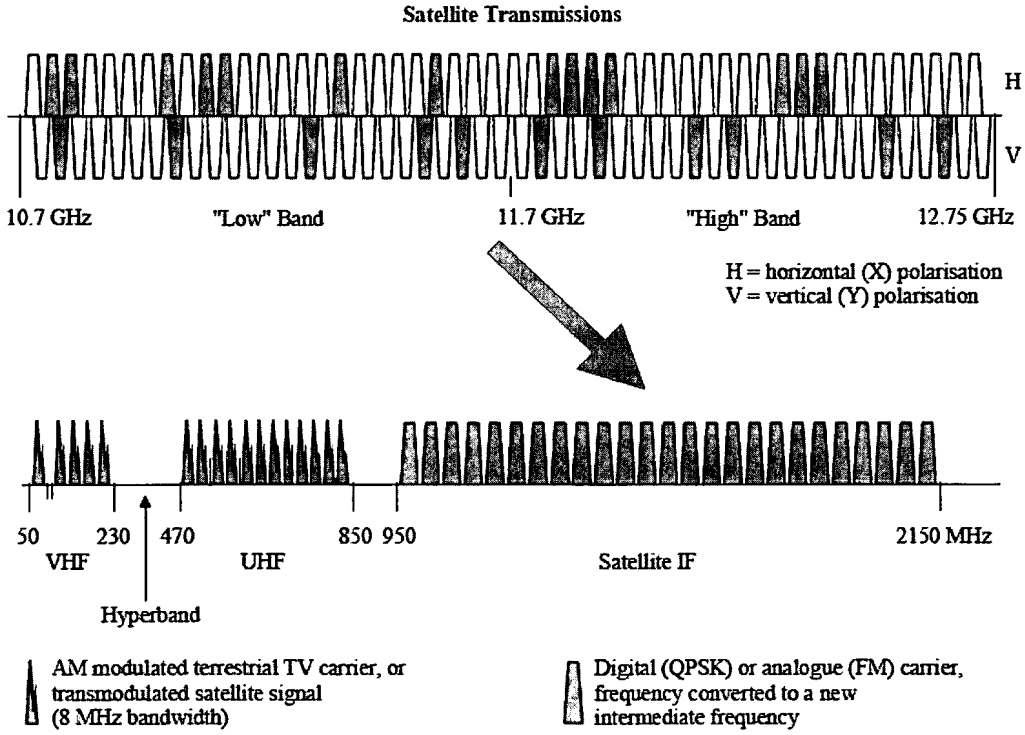


Figure 7 : Broadband Signal Spectrum for an IF-IF Distribution Network

h. ***and wherein the composite signal is transmitted on the coaxial cable;***

The Eutelsat Installers Guide teaches that the composite signal is transmitted on the coaxial cable. At Figure 11, the Eutelsat Installers Guide shows the composite signal routed to the IRDs via a signal path. One of ordinary skill in the art would have understood that satellite TV signals are routed on coaxial cable. Indeed, the Eutelsat Installers Guide reference

specifically refers to this signal path of Figure 11 as coaxial cable. Particularly, at page 27, the Eutelsat Installers Guide references the DiSEqC signaling path as using a coaxial cable. As stated above, this DiSEqC signaling path is the same path as the composite signal path. As such, the Eutelsat Installers Guide teaches that the composite signal path is a coaxial cable.

i. ***whereby the composite signal is transmitted to the IRD***

The Eutelsat Installers Guide teaches that the composite signal is transmitted to the IRD. Still referring to Figure 11, the output of the RF combiner (a composite signal) is sent to the satellite receiver (set top box or IRD).

Accordingly, Claim 1 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat Installers Guide reference.

2. Claim 2

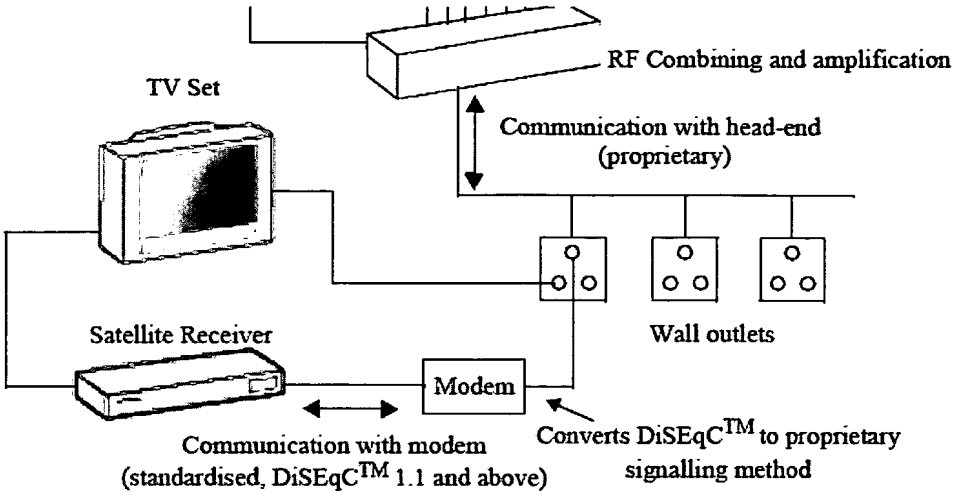
Claim 2 of the '576 patent recites:

> The signal distribution system of claim 1 further comprising a plurality of IRDs and wherein the composite signal is transmitted on a single cable connected to the ODU and all IRDs receive channels extracted from the composite signal.

For clarity and ease of discussion, the elements of claim 2 are discussed in their constituent parts.

a. ***The signal distribution system of claim 1 further comprising a plurality of IRDs***

The Eutelsat Installers Guide teaches that a plurality of IRDs can be provided. Particularly, Figure 11 illustrates multiple wall outlets. One of ordinary skill in the art would have understood that multiple wall outlets are used to support additional IRDs. For example, one IRD can be connected to each additional wall outlet, just as the illustrated IRD is connected to the first wall outlet.



b. ***and wherein the composite signal is transmitted on a single cable connected to the ODU***

Figure 11 also illustrates that the composite signal from the combiner is transmitted on a single cable.

c. ***and all IRDs receive channels extracted from the composite signal.***

Figure 11 also illustrates that the IRDs receive channels from the composite signal. As illustrated, the composite signal is distributed to the IRDs. Particularly, the composite signal is distributed to all the wall outlets (each of which can support an IRD) so that all IRDs connected thereto receive the channels in the composite signal.

Accordingly, Claim 2 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat Installers Guide reference.

3. Claim 6

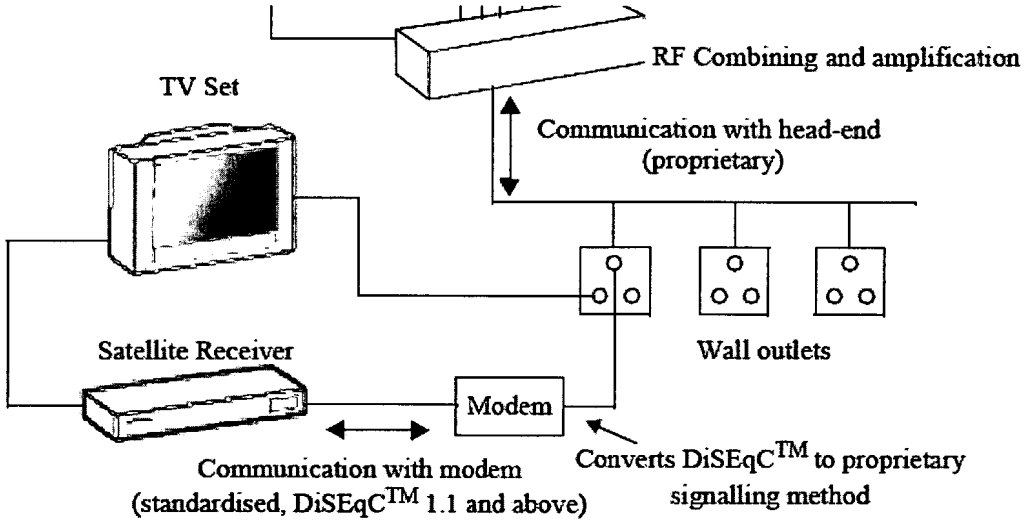
Claim 6 of the '576 patent recites:

a. ***The signal distribution system of claim 1 wherein the transponder select information is transmitted over the same cable as the composite signal.***

The Eutelsat Installers Guide teaches that the channel select information is sent over the same cable as the composite signal. Referring still to Figure 11, the Eutelsat Installers Guide

discloses that the DiSEqC signaling information that is used to select the channels (i.e., to select the transponders) is sent over the same cable as the composite signal.

Also note that the Eutelsat Installers Guide teaches that with conventional signaling systems, the received satellite signals (composite signal) and the control signals are sent over the same cable (page 26, first paragraph after bullets), and that DiSEqC is compatible with these conventional methods (page 27, second-to-last paragraph).



Accordingly, Claim 6 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat Installers Guide reference.

4. Claim 8

Claim 8 of the '576 patent recites:

> A signal distribution system for distributing signals comprising a plurality of channels from a plurality of sources between a first unit and a second unit over a communication medium comprising:
>
> means in the first unit responsive to information transmitted by the second unit for extracting selected channels from each of the plurality of sources and combining the selected channels into a composite signal without demodulating channels and without changing the modulation of the channels and transmitting the composite signal over the medium;

and means in the second unit for receiving the composite signal and demodulating and decoding at least one channel;
and means in the first unit and second units for bi-directionally communicating control information between the second unit and the first unit.

For clarity and ease of discussion, the elements of claim 8 are discussed in their constituent parts.

As stated previously, the Eutelsat Installers Guide reference is directed toward a plurality of receiver system architectures and signaling protocols for satellite TV systems.

a. ***A signal distribution system for distributing signals comprising a plurality of channels from a plurality of sources between a first unit and a second unit over a communication medium comprising:***

As stated above with respect to Claim 1, the Eutelsat Installers Guide discloses a plurality of signal distribution systems for satellite TV. The Eutelsat Installers Guide teaches various architectures for distributing signals (Satellite TV signals) comprising a plurality of channels from a plurality of sources between a first unit (the Outdoor Unit) and a second unit (the IRD). One example of such an architecture is that illustrated in Figure 11 of the Eutelsat Installers Guide (reproduced above with reference to claim 1).

b. ***means in the first unit* [ODU] *responsive to information transmitted by the second unit* [IRD] *for extracting selected channels from each of the plurality of sources***

The Eutelsat Installers Guide reference teaches this element of claim 1. Particularly, the Eutelsat Installers Guide reference teaches that the IRD is configured to send information to the outdoor unit to perform channel selection from satellite signals. Specifically, the Eutelsat Installers Guide at page 29 states that the architecture shown in Figure 11 provides "communication, preferably two-way, between each terminal and the head-end so that remote channel selection can be carried out." (See the last sentence of page 29).

c. ***and combining the selected channels into a composite signal***

The Eutelsat Installers Guide also teaches combining the selected channels into a composite signal. As discussed above with respect to Claim 1, Figure 11 of the Eutelsat Installers Guide discloses an RF Combining and Amplification unit that accepts multiple RF signals from the Subscriber-controlled IF-IF conversion unit, and combines these IF signals into a composite output signal.

d. ***without demodulating channels and without changing the modulation of the channels***

The Eutelsat Installers Guide discloses that the signals are selected and combined without changing the modulation of the channels. As discussed above with respect to claim 1, the Eutelsat Installers Guide discloses that QPSK signals are received from the satellite and the signals are distributed to the satellite receiver (IRD) as QPSK signals. As such, no transmodulation is performed. Additionally, the signals are not demodulated either, as they remain QPSK-modulated signals.

e. ***and transmitting the composite signal over the medium;***

The Eutelsat Installers Guide teaches that the composite signal is transmitted to the IRD. At Figure 11, the Eutelsat Installers Guide shows the composite signal routed to the IRDs via a coaxial cable signal path.

f. ***and means in the second unit* [IRD] *for receiving the composite signal and demodulating and decoding at least one channel;***

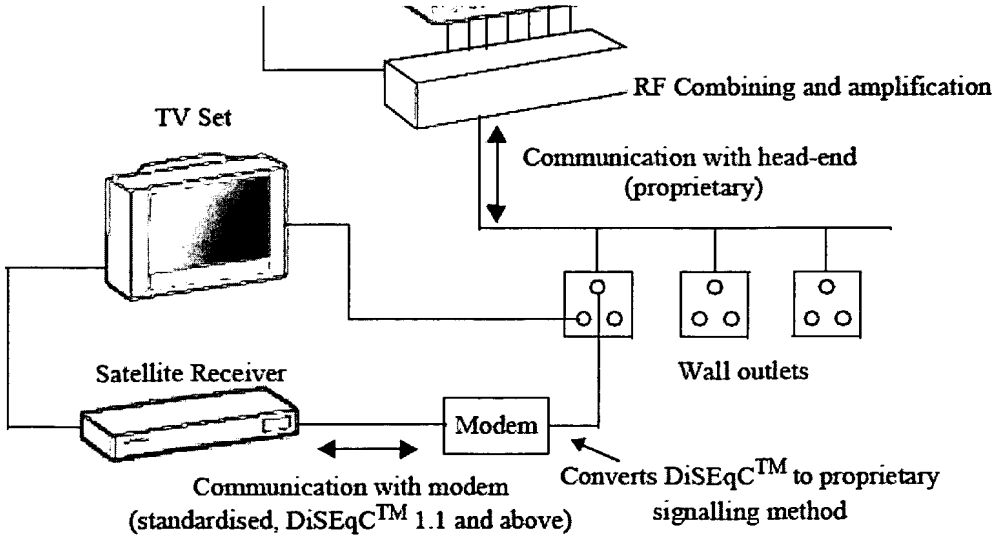
The IRD is defined by the Eutelsat reference as a satellite receiver. Receivers are well known to those of ordinary skill in the art to receive communication signals and to demodulate and decode the signals. Indeed, the Eutelsat Installers Guide discloses that the output of the Satellite Receiver is connected to the television set. As such, one of ordinary skill in the art would have understood that the satellite receiver must demodulate and decode the signal, as

television sets are not configured to handle satellite signals in the IF spectrum as distributed from the combiner.

As further evidence of what one of ordinary skill in the art would have understood regarding satellite television receivers, reference is made to the Background Section of the '576 patent. At Column 1, lines 39 – 44, with reference to the "Prior Art" Figure 1, the IRD (Integrated Receiver Decoder) is described as tuning, demodulating and decoding the received satellite signal.

g. ***and means in the first unit and second units for bi-directionally communicating control information between the second unit and the first unit.***

The Eutelsat Installers Guide teaches bidirectional communication between the IRD and the switching equipment. Figure 11 illustrates a bidirectional communication path between the IRD (through the wall jack) and the switching equipment.



Additionally, Section 3.5.1.c of the Eutelsat Installers Guide at page 27 discloses Two-way (bidirectional) signaling.

Accordingly, Claim 8 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat Installers Guide reference.

5. Claim 9

Claim 9 of the '576 patent recites:

> The signal distribution system of claim 8 wherein the control information comprises channel selection requests originating from the second unit and the control information comprises channel mapping information originating from the first unit.

For clarity and ease of discussion, the elements of claim 9 are discussed in their constituent parts.

a. ***The signal distribution system of claim 8 wherein the control information comprises channel selection requests originating from the second unit***

The Eutelsat Installers Guide reference teaches control information comprising channel selection requests. Particularly, at page 19, the Eutelsat Installers Guide reference states that communication "between each terminal and the head end so that **remote channel selection** can be carried out." Id., at 19 (**emphasis added**).

b. ***and the control information comprises channel mapping information originating from the first unit.***

The Eutelsat Installers Guide reference teaches that the control information also comprises channel mapping information from the switching equipment to the IRD. For example, at page 27 the Eutelsat Installers Guide reference discloses that "[t]wo-way DiSEqC™ (DiSEqC™ 2.0/2.1) further enhances the standard by allowing remote units to report their possible and actual configurations.

One of ordinary skill in the art would have understood that configuration information can include, for example, an identification of the LNB local oscillator frequency or an identification

of the frequencies used by one or more of the IF-IF converters so the IRD can determine which frequency to tune to receive the converter output in the composite signal.

As evidence of what one of ordinary skill in the art would have understood at the time of the purported invention, reference is made to United States Patent No. 5,073,930, to Green *et. al.*, which teaches that the term frequency mapping is used to map the conversion of an IF signal in a wideband LNB output to an IF signal at a translated frequency for placement in the composite signal. *See*, Green at Column 10, lines 4 – 43. As such, one of ordinary skill in the art at the time would have understood that configuration information for the IF-IF converters includes information regarding channel mapping.

Accordingly, Claim 9 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat Installers Guide reference.

6. Claim 11

Claim 11 of the '576 patent recites:

a. ***The signal distribution system of claim 8 wherein the first unit is a satellite outdoor unit and the second unit is a satellite integrated receiver decoder unit.***

The Eutelsat Installers Guide reference teaches an outdoor unit and a satellite integrated receiver decoder unit (IRD). Figure 11 of the Eutelsat Installers Guide reference discloses a Satellite Receiver. The Satellite Receiver is referenced in various places in the Eutelsat Installers Guide reference as an IRD. For example, page 20 refers to the communication between the wall outlet and the "IRD." Likewise, Section 3.5.1.c states that the signaling systems uses the "satellite receiver (IRD)..." Id., at 27.

Figure 11 also illustrates the LNBs and other switching and distribution equipment, which one of ordinary skill in the art would understand to be outdoor equipment. Also, at the

top of page 27, the reference refers to the two-way communications between the IRD and the selection units as signaling "between the outdoor and indoor units."

Furthermore, as further evidence of what was understood by one of ordinary skill in the art at the time, Figure 1 of the '576 patent (labeled as "Prior Art") and the accompanying description disclose that the satellite antenna, LNBs and switches are an outdoor unit, and the description accompanying prior art Figure 1 describes the IRD as a set top box located inside a building.

Accordingly, Claim 11 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat Installers Guide reference.

7. Claim 12

Claim 12 of the '576 patent recites:

a. ***The signal distribution system of claim 11 wherein the communication medium consists of a single coaxial cable connected to the satellite outdoor unit.***

As discussed above with respect to Claim 1, the Eutelsat Installers Guide at page 27 teaches that the communication medium over which the signal is distributed is a coaxial cable. Accordingly, Claim 12 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat Installers Guide reference.

8. Claim 13

Claim 13 of the '576 patent recites:

a. ***The signal distribution system of claim 12 wherein the means for communicating uses the same communication medium as the composite signal.***

In this claim, "means for communicating" refers to the bi-directional communication of control information as recited in the preamble of independent claim 8 from which this claim ultimately depends. The Eutelsat Installers Guide reference teaches that the control information

is communicated along the same signal path as the composite signal. This was discussed above with respect to claim 1, for which Figure 11 of the Eutelsat Installers Guide reference was cited as showing bi-directional signaling capabilities along the same signal path as the composite signal.

Accordingly, Claim 13 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat Installers Guide reference.

9. Claim 14

Claim 14 of the '576 patent recites:

> A method of communicating a plurality of transponder signals from a satellite outdoor unit (ODU) that receives a plurality of satellite broadband signals to an integrated receiver decoder (IRD) over a single cable connected to the ODU, the method comprising the steps of:
>
> communicating a transponder request signal to the ODU from the IRD; in the ODU, selecting a plurality of transponder signals extracted from the received satellite broadband signals, wherein the selecting is responsive to the transponder request signals;
>
> combining selected transponder signals into a composite signal;
>
> transmitting the composite signal over the single cable from the ODU to the IRDs, wherein the modulation of the transponder signal is not altered by the steps of selecting, combining, and transmitting.

For clarity and ease of discussion, the elements of claim 14 are discussed in their constituent parts.

a. ***A method of communicating a plurality of transponder signals from a satellite outdoor unit (ODU) that receives a plurality of satellite broadband signals to an integrated receiver decoder (IRD) over a single cable connected to the ODU, the method comprising the steps of:***

The Eutelsat Installers Guide reference teaches communicating a plurality of transponder signals from a satellite outdoor unit that receives satellite broadband signals and communicates these signals to an IRD over a single cable connected to the outdoor unit. As discussed above

with respect to Claim 1, Figure 11 shows a satellite antenna, LNBs and switching equipment that makes up an outdoor unit for receiving satellite broadband signals. The switching equipment selects a plurality of transponder signals in response to DiSEqC commands from the satellite receiver (IRD) and communicates the selected transponder signals to the IRD.

b. ***communicating a transponder request signal to the ODU from the IRD;***

Figure 11 of the Eutelsat Installers Guide reference illustrates signaling information between the satellite receiver (IRD) and the switching equipment (ODU). Additionally, the Eutelsat Installers Guide reference discloses a signaling protocol referred to as DiSEqC signaling that can provide one-way or two-way communication between the IRD and ODU. The Eutelsat Installers Guide also states that this communication allows "remote channel selection" to be carried out. See, page 19, last sentence.

Later in this claim 14, the transponder signals extracted from the broadband LNB signal are selected based on the transponder request signal. As such, the transponder request signal is taught by the Eutelsat Installers Guide reference to the DiSEqC signal used to carry out remote channel selection.

c. ***in the ODU, selecting a plurality of transponder signals extracted from the received satellite broadband signals, wherein the selecting is responsive to the transponder request signals;***

The Eutelsat Installers Guide reference teaches selecting transponder signals, or channels. As discussed above with respect to claim 1, and with reference to Figures 7 and 11, the transponder signals are extracted from the received satellite broadband signal.

As also discussed above with respect to claim 1, the selection of the transponder signals is in response to signals from the IRD (transponder request signals).

d. ***combining selected transponder signals into a composite signal;***

The Eutelsat Installers Guide reference teaches combining selected transponder signals into a composite signal. As discussed above with respect to claim 1, Figure 11 of the Eutelsat Installers Guide reference illustrates an RF combining and amplification unit that combines the selected transponder signals into a composite output on a single communication path from the combiner to the IRD(s).

e. ***transmitting the composite signal over the single cable from the ODU to the IRDs,***

The Eutelsat Installers Guide reference teaches transmitting the composite signal over the single cable from the ODU to the IRDs. As discussed above with respect to Claim 1, the composite signal is illustrated in Figure 11 as being transmitted over a single communication path to the IRD(s). As also discussed above, Figure 11 illustrates multiple wall outlets. One of ordinary skill in the art reading the Eutelsat Installers Guide reference would understand that a satellite receiver, or IRD, can be hooked up to each wall outlet.

f. ***wherein the modulation of the transponder signal is not altered by the steps of selecting, combining, and transmitting.***

The Eutelsat Installers Guide reference teaches that the modulation of the transponder signal is not altered by the steps of selecting, combining, and transmitting. As discussed above with respect to Claim 1, the Eutelsat Installers Guide reference teaches that a QPSK-modulated signal is received from the satellite, and that the selected transponder signals, or channels, are distributed to the IRD(s) as QPSK modulated signals. As such, a system that does not alter the modulation is taught.

Accordingly, Claim 14 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat Installers Guide reference.

10. Claim 16

Claim 16 of the '576 patent recites:

a. ***The method of claim 14 wherein the step of combining comprises frequency translating the selected transponder channels to a variable frequency before combining.***

The Eutelsat Installers Guide reference teaches frequency translating the selected transponder channels to a variable frequency before combining. As discussed above with respect to claim 1, the Eutelsat Installers Guide reference shows in Figure 7 that the transponder channels are frequency translated from their respective center frequencies in the broadband satellite signal to their new respective center frequencies in the satellite IF distribution channel.

One of ordinary skill in the art would understand that the frequency translation would occur before combination as the signals will need to be reassigned to their new frequency allocation within the bandwidth of the composite signal. One of ordinary skill in the art would also understand that the assignment would be variable to accommodate allocation of multiple selected signals into the available bandwidth.

Accordingly, Claim 16 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat Installers Guide reference.

11. Claim 18

Claim 18 of the '576 patent recites:

a. ***The method of claim 14 further comprising the step of splitting the composite signal inside a home and distributing to a plurality of IRDs.***

The Eutelsat Installers Guide reference teaches splitting the composite signal inside a home and distributing to a plurality of IRDs. Particularly, Figure 11 illustrates that the composite signal is split out to a plurality of wall units and distributed to each of the wall units. As stated above, one of ordinary skill in the art would understand that, as in the first unit, an IRD can be connected to each of the other wall units. As such, Figure 11 illustrates splitting the

signal and distributing it to a plurality of IRDs. Also note that the claim references splitting the signal inside a home. Figure 11 illustrates that the signal is split prior to distribution to the wall units. One of ordinary skill in the art would understand that the wall outlets are in the walls of the building (whether it be a home, office, or other building), and that the splitting can occur inside the home.

Accordingly, Claim 18 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat Installers Guide reference.

12. Claim 19

Claim 19 of the '576 patent recites:

> The method of claim 14 wherein the transponder request signal is transmitted over the cable from an IRD and all IRDs receive the same composite signal.

For clarity and ease of discussion, the elements of claim 19 are discussed in their constituent parts.

a. ***The method of claim 14 wherein the transponder request signal is transmitted over the cable from an IRD***

The Eutelsat Installers Guide reference teaches the transponder request signal is transmitted over the cable from an IRD. As discussed above with respect to claim 2, Figure 11 illustrates that the DiSEqC signal (transponder request signal) is transmitted over the cable from the IRD to the switching equipment.

b. ***and all IRDs receive the same composite signal.***

The Eutelsat Installers Guide reference teaches that all IRDs receive the same composite signal. As discussed above with respect to claim 2, Figure 11 illustrates that the composite signal is distributed via a single cable to the wall outlets, and that an IRD can be connected to each wall outlet.

Accordingly, Claim 19 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat Installers Guide reference.

13. Claim 21

Claim 21 of the '576 patent recites:

> The method of claim 14 further comprising the steps of: frequency translating the selected transponder channels to a variable frequency before combining; and splitting the composite signal inside a home and distributing to a plurality of IRDs.

For clarity and ease of discussion, the elements of claim 21 are discussed in their constituent parts.

a. ***The method of claim 14 further comprising the steps of: frequency translating the selected transponder channels to a variable frequency before combining;***

As discussed above with respect to claim 16, the Eutelsat Installers Guide reference teaches translating the selected transponder channels to a variable frequency before combining.

b. ***and splitting the composite signal inside a home and distributing to a plurality of IRDs.***

As discussed above with respect to claim 18, the Eutelsat Installers Guide reference teaches splitting the composite signal inside a home and distributing to a plurality of IRDs.

Accordingly, Claim 21 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat Installers Guide reference.

14. Claim 22

Claim 22 of the '576 patent recites:

a. ***The method of claim 21 wherein the transponder request signal is transmitted over the cable from an IRD.***

Claim 21 from which this claim depends, is taught by the Eutelsat Installers Guide as described with reference to Claim 21. As discussed above with respect to claim 19, The Eutelsat

Installers Guide reference teaches the transponder request signal is transmitted over the cable from an IRD.

Accordingly, Claim 22 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat Installers Guide reference.

B. Claims 2 – 5, 7, 10, 15-17, and 20-23 of the '576 Patent are unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat Installers Guide in combination with various secondary references as discussed below:

To supplement this detailed discussion, a summary of the applicability of the references to the claims is provided in the claim charts attached as Appendix B, Part II.

1. Claim 2

Claim 2 of the '576 patent recites:

> The signal distribution system of claim 1 further comprising a plurality of IRDs and wherein the composite signal is transmitted on a single cable connected to the ODU and all IRDs receive channels extracted from the composite signal.

For the reasons set forth above with respect to claim 1, the Eutelsat Installers Guide teaches every element of claim 1, from which claim 2 depends.

As stated above the Eutelsat Installers Guide teaches each and every element of claim 2. However, as also stated above, there is some question regarding whether the limitation reciting "channels extracted from the composite signal" calls into question gateway functionality.

United States Patent No. 6,005,861, to Humpleman, discloses a multimedia network architecture for in-premises distribution of satellite television signals. Humpleman teaches that cable or satellite television signals (Col. 3, lines 28-31) are received at the home and distributed by network **10** to one or more televisions **12, 14** or other video equipment (VCR **16**).

With reference to Figure 1, Humpleman discloses that a network interface unit **32** (i.e., Gateway) receives an external satellite broadcast signal (Col. 3, lines 21 – 35), and that the

external signals are distributed via a network **34** (Col. 3, lines 49 – 55). With particular regard to television signals, Humpleman teaches with reference to Figure 4 that the network interface unit (NIU) **32,** or gateway, receives the external video signal and distributes it to the set top box **40** (Column 7, lines 18 – 34).

Humpleman also teaches that the gateway (NIU **32**) can extract channels from the composite signal before the signal is distributed throughout the home to the set top boxes. See, for example, Column 7, lines 35 – 52, where Humpleman discloses demultiplexing the channel from a multiple channel stream.

Accordingly, Claim 2 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by Humpleman's teachings of a gateway in combination with the Eutelsat Installers Guide reference.

2. Claim 3

Claim 3 of the '576 patent recites:

a. ***The signal distribution system of Claim 1 wherein the signal selector comprises an analog to digital converter and a digital filter.***

As discussed above, the Eutelsat Installers Guide reference teaches each and every element of claim 1, from which Claim 3 depends. The Eutelsat Installers Guide does not teach a digital filter. United States Patent No. 5,278,837, to Kelley, teaches a digital receiver with digital channel selection. At Figure 8, Kelley teaches a digital receiver with an analog to digital converter ADC **106** that digitizes the RF input signal and provides it to a digital tuner. Col. 6, lines 31-34. The output of mixer **18** is provided to a digital IF filter **34** to isolate the desired IF signal. Col. 7, lines 34 – 40.

Accordingly, Claim 3 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat Installers Guide in combination with Kelley.

Additionally, The Broadcom Paper teaches that conventional receivers use of a SAW filter to perform channel selection for satellite TV systems (Page 11634, first paragraph). The Broadcom paper describes an all digital receiver (Figures 3 and 8) that includes analog to digital converters and digital filtering. Although the Broadcom paper describes analog to digital conversion and digital filtering in the context of a satellite set top box, one of ordinary skill in the art at the time would have understood that such techniques could also be used for channel selection in the signal selector as well.

Accordingly, Claim 3 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat Installers Guide reference in combination with the Broadcom Paper.

3. Claim 4 - the Eutelsat Installers Guide in combination with United States Patent No. 5,073,930, to Green *et. al.*,

Claim 4 of the '576 patent recites:

a. ***The signal distribution system of claim 1 wherein the signal selector comprises a tuner.***

As discussed above, the Eutelsat Installers Guide reference teaches each and every element of claim 1, from which Claim 4 depends. The Eutelsat Installers Guide does not expressly disclose a tuner to select the transponder signals. However, tuners for channel selection in television receiver systems are notoriously well known. Additionally, there are several references that illustrate the use of tuners in satellite receiver systems.

United States Patent No. 5,073,930, to Green *et. al.*, discloses a satellite receiver system that uses a tuner to perform IF channel selection, and combining a plurality of selected channels into a composite signal for transmission to a set top box.

At Figure 1A, Green discloses a plurality of broadband LNB output signals 104, 106 having a plurality of transponder channels. IF-IF converters 113 are comprised of a plurality of

transponder processors 112 that each receive a broadband LNB signal from which one of the constituent transponder signals will be chosen. Thus, these transponder processors 112 are signal selectors. These signal selectors are described with reference to Figure 3 as including a tuner.

Accordingly, Claim 4 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat Installers Guide in combination with Green.

Additionally, United States Patent No. 5,654,774, to Pugel discloses a tuner for channel selection in a satellite television system. More particularly, at Col. 3, lines 18 – 24, the '774 patent discloses a tuner **9** for "selecting the particular RF signal corresponding to the desired channel from the plurality of RF signals received ..." Thus, Pugel teaches that a tuner can be used as a signal selector.

Accordingly, Claim 4 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat Installers Guide in combination with Pugel.

Also, European patent numbers EP0757489 and EP1009113 show tuners used to select a signal or channel from a satellite broadcast signal. For example, Figures 1 and 3 of EP0757489 illustrate a plurality of satellite input signals SatZF having tuners (mixer and local oscillator).

Accordingly, Claim 4 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat Installers Guide in combination with EP0757489.

Likewise, Figure 2 of EP1009113 shows a similar structure with a plurality of satellite input signals each having a tuner (mixer and local oscillator) followed by a SAW filter.

Accordingly, Claim 4 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat Installers Guide in combination with EP1009113.

4. Claim 5

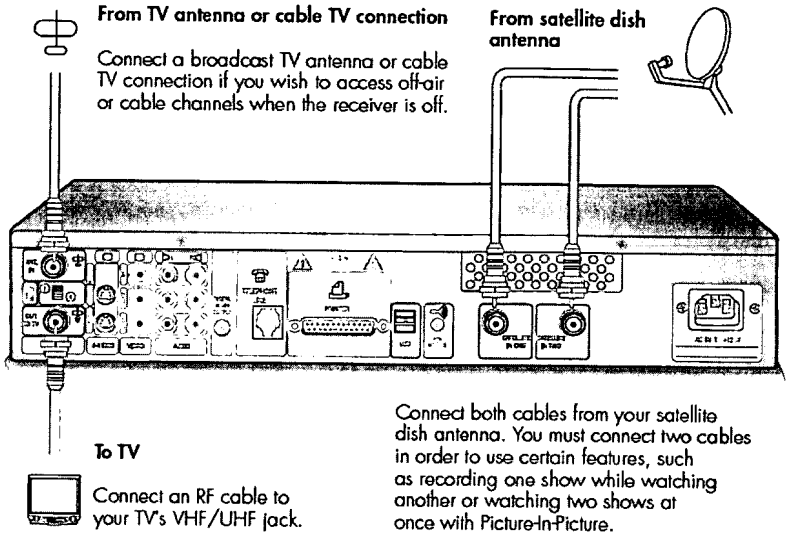
Claim 5 of the '576 patent recites:

a. ***The signal distribution system of claim 1 further comprising an integrated receiver decoder (IRD) connected to the coaxial cable with a plurality of tuners within the IRD, wherein each tuner within the IRD receives the composite signal and each tuner uses at least one transponder signal.***

As discussed above, the Eutelsat Installers Guide teaches each and every element of claim 1, from which Claim 5 depends. Also, as illustrated in Figure 19 (page 26), the Eutelsat Installers Guide discloses a satellite receiver or IRD connected to the coaxial cable. However, the Eutelsat Installers Guide does expressly disclose a plurality of tuners within the IRD.

The concept of two tuners in a television receiver was well known at the time of the purported invention to allow features such as picture-in-picture and watch-and-record. As evidence of what would be known by one of ordinary skill in the art the RCA Setup Guide discloses a satellite set top box, or IRD, with multiple tuners. For example, the Figure on page 6 and the accompanying note teaches two tuners to enable picture-in-picture or watch-and-record capabilities.

NOTE *You can watch TV if you connect only one cable between the satellite dish antenna and the receiver, but you must connect both cables to use features that require both of the receiver's tuners (viewing two shows at once with Picture-In-Picture or recording one show while watching another, for example).*



Accordingly, Claim 5 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat Installers Guide in combination with the RCA Setup Guide.

Additionally, United States Patent No. 5,285,284 teaches a television receiver having two tuners. For example, Figure 5, described at Column 2, lines 48 – 52 illustrates a television receiver having a picture-in-picture (PIP) function with two tuners **3** and **4**.

Accordingly, Claim 5 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat Installers Guide in combination with the '284 patent.

Additionally, United States Patent No. 6,353,463 is also directed toward a television receiver for receiving and signal processing analog or digital signals. Figure 2 of the '463 patent illustrates a dual tuner **20** receiving the television signals.

Accordingly, Claim 5 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat Installers Guide in combination with the '463 patent.

5. Claims 7 and 20

Claim 7 of the '576 patent recites:

a. ***The signal distribution system of claim 1 wherein the transponder select information is transmitted over a wireless link.***

Claim 20 of the '576 patent recites:

b. ***The method of claim 14 wherein the transponder request signal is transmitted over a wireless link to the ODU.***

As stated above, the Eutelsat Installers Guide teaches every element of claims 1 and 14, from which claims 7 and 20 depend, respectively. However, the Eutelsat Installers Guide does not explicitly state that the transponder select information or request signal (*i.e.*, the DiSEqC command) can be sent over a wireless link. However, wireless communications as an alternative to wired communications was well known at the time of the invention.

For example, the Philips Data Sheet for the UAA3202M Frequency Shift Keying Receiver illustrates a single-chip wireless receiver for VHF and UHF systems. (See, General Description on page 2.) Described applications for the wireless receiver are listed as remote control systems, telemetry systems and wireless data transmission (page 2). As such, it would have been obvious to use this or other commonly available wireless technology to communicate transponder select information over a wireless link.

Accordingly, Claim 7 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat Installers Guide in combination with the Philips Data Sheet.

For the same reasons, Claim 20 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat Installers Guide in combination with the Philips Data Sheet.

6. Claim 10

Claim 10 of the '576 patent recites:

a. ***The signal distribution system of claim 8, further comprising a means in the first unit for carrier offset correction.***

The Eutelsat Installers Guide reference teaches every element of claim 8, from which claim 10 depends. The Eutelsat Installers Guide does not explicitly teach carrier offset correction. However, United States Patent No. 6,437,837, to Seo, in the same field of endeavor, teaches the use of carrier offset correction in receive system for digital television signals. See, for example, Column 4, lines 47 – 57 of the '837 reference.

Accordingly, Claim 10 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat Installers Guide in combination with Seo.

Additionally, United States Patent No. 5,073,930, to Green, et al., teaches carrier offset correction in a satellite receiver system. At Column 12, lines 40 – 45, Green discloses carrier offset correction to correct for frequency errors. Note that one would have looked to Green when implementing satellite receiver system architectures. Particularly, Figure 1A of Green illustrates a plurality of selected broadband satellite signals on a bus 110 are sent to transponder units 112 for channel selection, and that the selected transponder channels are then combined by combiners 114. Figure 2 of Green illustrates that the selected transponder channels are mapped into and combined into a single composite signal (labeled as transponder bank output). This is directed toward solving the same goal of channel selection in a satellite receiver system as are the '576 patent and the Eutelsat Installers Guide.

Accordingly, Claim 10 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat Installers Guide in combination with Green reference.

7. Claim 15

Claim 15 of the '576 patent recites:

a. ***The method of claim 14 wherein the step of selecting a transponder signal comprises the step of: filtering a transponder signal with a band pass filter having a bandwidth ranging from 5% TO 100% wider than the bandwidth of the transponder signal.***

The Eutelsat Installers Guide reference teaches every element of claim 14, from which claim 10 depends. The Broadcom Digital Satellite Receiver Paper discloses a 55Mhz bandwidth filter (page 1639, bottom of Col. 1) that is used in a digital satellite receiver capable of supporting variable symbol rates of 1 – 45 Mbaud (i.e., 1 – 45 MHz). Thus, depending on the chosen operating symbol rate, the bandwidth of the filter can range from approximately 20% wider than the signal bandwidth to well more than 100% wider.

Accordingly, Claim 15 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat Installers Guide in combination with Broadcom Digital Satellite Receiver Paper in combination with the Eutelsat Installers Guide.

8. Claim 16

Claim 16 of the '576 patent recites:

a. ***The method of claim 14 wherein the step of combining comprises frequency translating the selected transponder channels to a variable frequency before combining.***

As discussed above, The Eutelsat Installers Guide reference teaches every element of claim 14, from which claim 16 depends. Additionally, as discussed above with respect to claim 1, the Eutelsat Installers Guide teaches frequency translating the selected transponder channels (for example, Figure 19 illustrates that the IF to IF frequency translation occurs prior to the signal combining).

Additionally, United States Patent No. 5,073,930, to Green, et al., teaches translation of transponder channels to a variable frequency prior to combining. Transponder channel selection

and channel translation is performed by transponder processors 112 as illustrated in Figure 1. The channels selected by transponder processors 112 are combined by combiners 114. Details of transponder channel selection by transponder processors 112 are illustrated in Figure 3 of the '930 patent. This illustrates that the broadband transponder input is frequency translated by down converter 200, filtered at 202 to select the channel, and upconverted back to IF by upconverter 204. Upconverter 204 performs a variable frequency translation prior to the signal being combined by combiners 114. Particularly, microntroller 206 instructs PLL 248 to select a VCO frequency from between 1530 – 2130 MHz. Varying the local oscillator signal (VCO) varies the frequency of the transponder channel that is output to be combined by combiner 114 (Fig. 1). This is described at Column 14, lines 5-14.

Additionally, Green teaches that the selected frequency can be varied to accommodate flexible mapping of transponder channels into the composite signal. See, Column 10, lines 34 – 43.

Accordingly, Claim 16 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat Installers Guide in combination with Green.

9. Claim 17

Claim 17 of the '576 patent recites:

a. ***The method of claim 14 further comprising frequency translating the selected transponder channels to a predetermined frequency before combining.***

As discussed above, The Eutelsat Installers Guide reference teaches every element of claim 14, from which claim 17 depends. Additionally, as discussed above with respect to claim 1, the Eutelsat Installers Guide teaches frequency translating the selected transponder channels (for example, Figure 19 illustrates that the IF to IF frequency translation occurs prior to the signal combining).

Additionally, United States Patent No. 5,073,930 teaches translation of transponder channels to a predetermined frequency prior to combining. Figure 1A of Green illustrates a plurality of selected broadband satellite signals on a bus 110 are sent to transponder units 112 for channel selection, and that the selected transponder channels are then combined by combiners 114. Figure 2 of Green illustrates that the selected transponder channels are mapped into and combined into a single composite signal (labeled as transponder bank output).

Although the transponder processor can map to a variable frequency (as discussed with respect to Claim 16), Green also teaches that once a mapping of transponder channels into the combined signal is decided, the processors can be **preprogrammed** to output on a given frequency. See, Column 10, lines 20 – 23. Thus, the processors translate to a predetermined frequency prior to signal combining.

Accordingly, Claim 17 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat Installers Guide reference in combination with Green.

10. Claim 21

Claim 21 of the '576 patent recites:

> The method of claim 14 further comprising the steps of: frequency translating the selected transponder channels to a variable frequency before combining; and splitting the composite signal inside a home and distributing to a plurality of IRDs.

For clarity and ease of discussion, the elements of claim 21 are discussed in their constituent parts.

a. ***The method of claim 14 further comprising the steps of: frequency translating the selected transponder channels to a variable frequency before combining;***

As discussed above with respect to claim 16, the Eutelsat Installers Guide either taken alone or in combination with Green teaches translating the selected transponder channels to a variable frequency before combining.

b. ***and splitting the composite signal inside a home and distributing to a plurality of IRDs.***

As discussed above with respect to claim 18, the Eutelsat Installers Guide reference teaches splitting the composite signal inside a home and distributing to a plurality of IRDs.

Accordingly, Claim 21 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat Installers Guide in combination with Green.

11. Claim 22

Claim 22 of the '576 patent recites:

a. ***The method of claim 21 wherein the transponder request signal is transmitted over the cable from an IRD.***

Claim 21 from which this claim depends, is taught by the combination of the Eutelsat Installers Guide in combination with Green as described with reference to Claim 21. As discussed above with respect to claim 19, The Eutelsat Installers Guide reference teaches the transponder request signal is transmitted over the cable from an IRD.

Accordingly, Claim 22 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat Installers Guide in combination with Green.

12. Claim 23

Claim 23 of the '576 patent recites:

a. ***The method of claim 21 wherein the transponder request signal is transmitted over a wireless link to the ODU.***

Claim 21 from which this claim depends, is taught by the combination of the Eutelsat Installers Guide in combination with Green as described with reference to Claim 21. As

discussed above with respect to claims 7 and 20, the Philips Reference teaches signaling over a wireless link.

Accordingly, Claim 21 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat Installers Guide in combination with Green and further in view of Phillips.

C. Claims 1, 2, 6, 8, 9, 11-14, 16, 18, 19, 21 and 22 of the '576 Patent are unpatentable under 35 U.S.C. §102(b) as being anticipated by the Eutelsat DiSEqC Specification as discussed below

To supplement this detailed discussion, a summary of the applicability of the reference to the claims is provided in the claim charts attached as Appendix C.

1. Claim 1

Claim 1 of the '576 Patent recites:

> A signal distribution system for distributing a plurality of low noise amplifier and block converter (LNB) signals form satellite outdoor unit (ODU) over a coaxial cable to an integrated receiver decoder (IRD) comprising: a signal selector that receives a plurality of broadband LNB signals comprising a plurality of transponder signals, the signal selector is responsive to transponder select information transmitted by an IRD and selects a plurality of transponder signals from at least on broadband LNB signal based on the transponder select information; a frequency translator coupled to the signal selector that is capable of shifting the selected transponder signals to new carrier frequencies to produce RF signals; and a combiner coupled to at least one frequency translator capable of combining at least two RF signals to produce a composite signal; wherein the modulation of the composite signal is the same as modulation of the broadband LNB signals and wherein the composite signal is transmitted on the coaxial cable; whereby the composite signal is transmitted to the IRD.

The Eutelsat DiSEqC Specification discloses every element of claim 1 of the '576 patent. For clarity and ease of discussion, the elements of claim 1 are discussed below in their constituent parts.

a. ***A signal distribution system for distributing a plurality of low noise amplifier and block converter (LNB) signals from a satellite outdoor unit (ODU) over a coaxial cable to an integrated receiver decoder (IRD) comprising:***

The Eutelsat DiSEqC Specification discloses a signal distribution system for distributing a plurality of low noise amplifier and block converter (LNB) signals from a satellite outdoor unit (ODU) over a coaxial cable to an integrated receiver decoder (IRD). Particularly, Figure 19 on page 23 of the Eutelsat DiSEqC Specification document illustrates a signal distribution system. The system illustrated in Figure 19 includes a subscriber controlled Satellite Master Antenna Television (SMATV) system. Figure 19 illustrates distributing a plurality of low noise amplifier and block converter (LNB) signals form satellite outdoor unit (ODU) over a coaxial cable to a satellite receiver, or integrated receiver decoder (IRD).

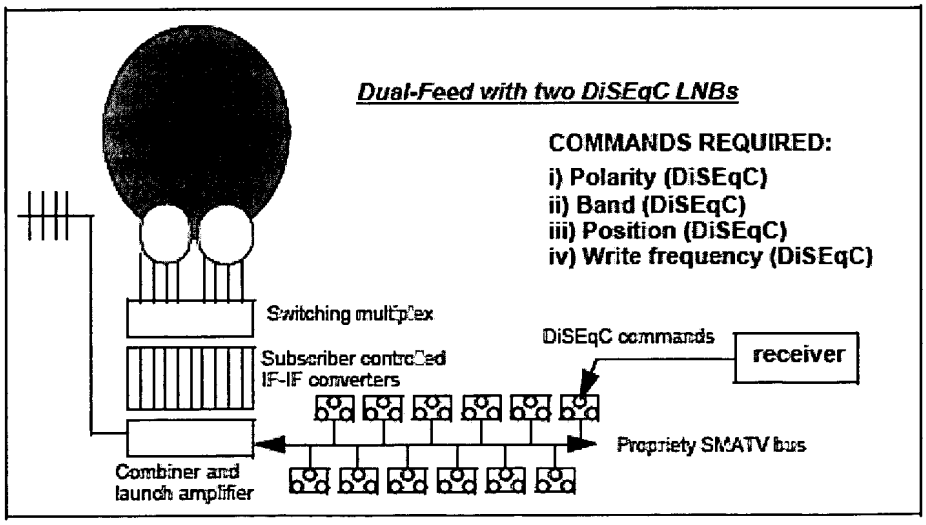


Figure 19: Subscriber controlled SMATV Headend

As stated in the figure itself, the illustrated system is a dual-feed system having two LNBs. As illustrated, each LNB has four LNB outputs feeding a multiplex switch. As illustrated, signals are fed through the selection and combining units to the satellite receiver (IRD).

b. ***a signal selector***

The "signal selector" is described in the '576 patent document as a signal selector **250** (See Figure 2) that extracts the channels from the broadband LNB output. This recited "signal selector" is also specified later on in Claim 1 as selecting a plurality of transponder signals (*i.e.*, transponder channels).

The Eutelsat DiSEqC Specification teaches a signal selector. For example, at Figure 19, the Eutelsat DiSEqC Specification teaches both a switching multiplex (e.g., a multiswitch) as well as subscriber controlled IF-IF converters.

As described more fully below, the switching multiplex selects the broadband LNB output signals and the IF-IF converters select the transponder signal or channel within the LNB output.

c. ***[a signal selector] that receives a plurality of broadband LNB signals comprising a plurality of transponder signals***

The Eutelsat DiSEqC Specification also discloses that the signal selector receives a plurality of broadband LNB signals, comprising a plurality of transponder signals. Referring still to the architecture illustrated in Figure 19, the Eutelsat DiSEqC Specification discloses a satellite antenna in a dual-feed configuration with two LNBs. As the Eutelsat DiSEqC Specification teaches, the signal selector receives the broadband LNB signals from the LNBs.

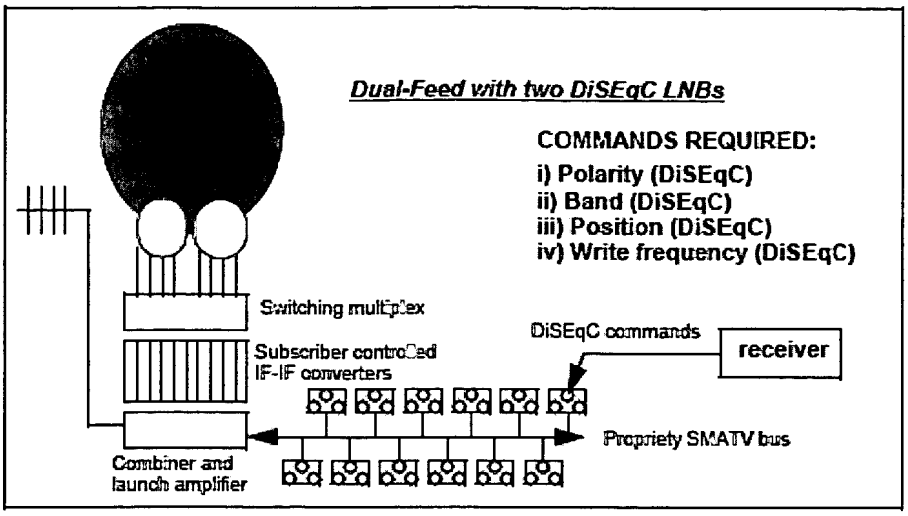


Figure 19: Subscriber controlled SMATV Headend

LNBs, or low noise block converters, were well known at the time of the purported invention. The fact that Figure 19 describes the DiSEqC commands as controlling the Band selected and the Write Frequency further illustrates that the incoming signals include one or more broadband satellite signals (selected by the Band command) with a plurality of channels to be selected (by the Write Frequency command).

Additionally, one of ordinary skill in the art would have understood that LNBs were used to receive a broadband satellite signal, amplify and convert it to similar broadband signals carried at a lower frequency (called intermediate frequency or IF), and output a broadband LNB signal that comprises a plurality of transponder signals. As evidence of what one of ordinary skill in the art would have understood at the time, reference is made to the portion of the Background Section of the '576 patent that references Figure 1, which is labeled as "Prior Art." In this section, at Column 1, Lines 44 – 53, the LNB is described as outputting a broadband 500 MHz signal that is comprised of a plurality of transponder signals of 24MHz bandwidth each. As such, one of ordinary skill in the art would have understood that an LNB outputs a broadband LNB signal comprising a plurality of transponder signals.

d. ***the signal selector is responsive to transponder select information transmitted by an IRD***

The Eutelsat DiSEqC Specification discloses that the signal selector (multiswitch for band selection or IF-IF converter for channel selection) is responsive to transponder select information transmitted by an IRD. The transponder select information taught by the Eutelsat DiSEqC specification is the DiSEqC commands from the IRD. These DiSEqC commands can include a command to select the desired transponder frequency (channel) to be selected and included in the composite signal. For example, reference is made to Figure 19 of the Eutelsat DiSEqC Specification that illustrates a Satellite Receiver (IRD) that sends one or more DiSEqC commands to the signal selector for band and channel selection. Figure 19 also shows that one DiSEqC command is the Write Frequency Command that is explained at page 8, third paragraph, as remotely controlling the selected transponder frequency (channel).

As such, the Eutelsat teaches that the signal selector is responsive to transponder select information from the IRD.

e. ***and selects a plurality of transponder signals from at least one broadband LNB signal based on the transponder select information;***

As stated above, Figure 19 illustrates a receive architecture that allows remote channel selection. As also stated above the Eutelsat DiSEqC Specification specifies that in response to the DiSEqC command, the signal selector selects the transponder signals (channels) from the selected LNB output signal. For instance, the Eutelsat DiSEqC Specification specifies that control of the headend (signal selector) to select a desired channel is accomplished using the DiSEqC Write Frequency command to specify the frequency of the desired transponder signal. *See*, page 8. The legend in Figure 19 further describes that one DiSEqC command is the Write Frequency command, described at page 8 as selecting the desired transponder signal (identified by its center frequency).

f. ***a frequency translator coupled to the signal selector that is capable of shifting the selected transponder signals to new carrier frequencies to produce RF signals;***

Figure 19 of the Eutelsat DiSEqC Specification illustrates a subscriber controlled IF-IF converter. This IF-IF conversion not only extracts the selected transponder signals (channels) in response to the DiSEqC Write Frequency command, but also converts the selected channels to a different IF frequency for distribution to the set top box (IRD). As the name suggests, the IF-IF converters convert, or frequency translate, an incoming IF signal at one carrier frequency to an IF signal at another carrier frequency.

Additionally, page 8 of the Eutelsat DiSEqC Specification discloses a "remote controllable frequency" converter that converts the selected transponder signal.

g. ***and a signal combiner coupled to at least one frequency translator capable of combining at least two RF signals to produce a composite signal;***

The Eutelsat DiSEqC Specification also teaches the signal combiner as recited in Claim 1. Particularly, at Figure 19, the Eutelsat DiSEqC Specification discloses a combiner that combines the RF signals received from the subscriber-controlled IF-IF conversion unit, and combines them into a single composite output signal.

h. ***wherein the modulation of the composite signal is the same as the modulation of the broadband LNB signals;***

The Eutelsat DiSEqC Specification teaches this element of claim 1. Particularly, as illustrated in Figure 19, there is no transmodulation of any of the incoming satellite signals. As such one of ordinary skill in the art would have understood that without transmodulation, the modulation of the composite signal is the same as that of the broadband LNB signals.

i. ***and wherein the composite signal is transmitted on the coaxial cable;***

The Eutelsat DiSEqC Specification teaches that the composite signal is transmitted on the coaxial cable. At Figure 19, the Eutelsat DiSEqC Specification shows the composite signal routed to the IRDs via a signal path. At page 8, the Eutelsat DiSEqC Specification describes using the existing cable tree distribution networks already installed in buildings at that time. One of ordinary skill in the art would have clearly understood that television cable distribution within buildings was done by coaxial cable..

As evidence of what one of ordinary skill in the art would have understood, reference is made to the portion of the Background Section of the '576 patent that describes the Prior Art Figure 1. Here, at Column 1, Lines 33-39, the patentees admit that coaxial cable is commonly used to route the downconverted satellite TV signals.

j. ***whereby the composite signal is transmitted to the IRD***

The Eutelsat DiSEqC Specification teaches that the composite signal is transmitted to the IRD. Still referring to Figure 19, the output of the RF combiner (a composite signal) is sent to the satellite receiver. The satellite receiver is not only well known to be a set-top box, or IRD, but is also referred to as an IRD on page 8.

Accordingly, Claim 1 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat DiSEqC Specification reference.

2. Claim 2

Claim 2 of the '576 patent recites:

> The signal distribution system of claim 1 further comprising a plurality of IRDs and wherein the composite signal is transmitted on a single cable connected to the ODU and all IRDs receive channels extracted from the composite signal.

For clarity and ease of discussion, Claim 2 is discussed in its constituent parts.

a. ***The signal distribution system of claim 1 further comprising a plurality of IRDs***

The Eutelsat DiSEqC Specification reference teaches that a plurality of IRDs can be provided. Particularly, Figure 19 illustrates an IRD connected to a first wall outlet. Figure 19 further illustrates additional wall outlets. One of ordinary skill in the art would have understood that multiple wall outlets are used to support multiple IRDs. For example, an IRD can be connected to each additional wall outlet, just as the illustrated IRD is connected to the first wall outlet.

b. ***and wherein the composite signal is transmitted on a single cable connected to the ODU***

Figure 19 also illustrates that the composite signal from the combiner is transmitted on a single cable. Additionally, at page 8, the Eutelsat DiSEqC Specification states that with intelligent headends it is possible to use existing single cable distribution network for signaling..

c. ***and all IRDs receive channels extracted from the composite signal.***

Figure 19 also illustrates that the IRDs receive channels from the composite signal. As illustrated, the composite signal is distributed to all the wall outlets (each of which can support an IRD) so that all IRDs receive the channels in the composite signal. As such, the claim as written is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat DiSEqC Specification .

However, requestors note that the claim wording might be ambiguous in the manner in which it refers to channel extraction from the composite signal. The specification of the '576 patent appears to attribute this extraction to the Gateway. (See, the Summary Section of the '576 patent). Also note, that the Gateway is described as a splitter/summer (col. 4, lines 42 – 47) or mechanism for signal distribution. There is no description, however, regarding how a more complex Gateway would be implemented to ***extract*** channels from the composite signals, nor are

their any drawings illustrating what would be inside a gateway. In fact, the gateway is only illustrated as a 'black box' gateway 230 (Figure 2) or gateway 1160 (Figure 11). Nonetheless, in the event that this element is found to cover extraction from the composite signal by a Gateway, Requestor has uncovered another reference that teaches this in the context of a satellite television distribution system. This reference is addressed below, in the section dealing with substantial new questions of patentability under 35 U.S.C. § 103.

3. Claim 6

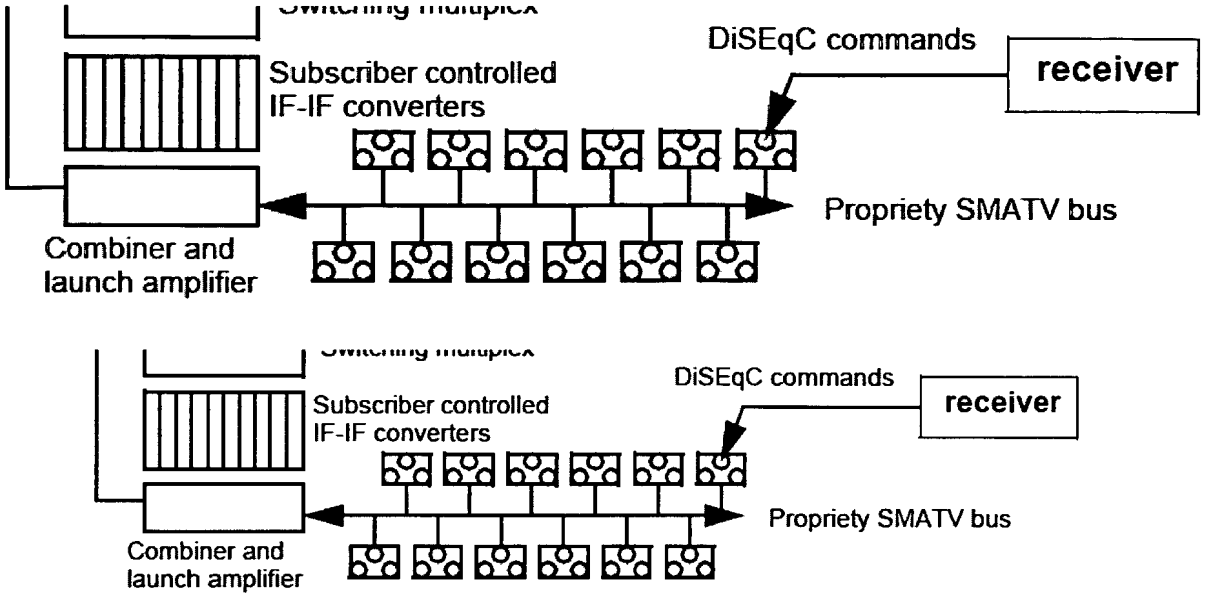
Claim 6 of the '576 patent recites:

a. ***The signal distribution system of claim 1 wherein the transponder select information is transmitted over the same cable as the composite signal.***

The Eutelsat DiSEqC Specification reference teaches that the channel select information is sent over the same cable as the composite signal. Referring again to Figure 19, the Eutelsat DiSEqC Specification discloses that the DiSEqC signaling information that is used to select the channels (i.e., to select the transponders) is sent over the same cable as the composite signal. In Figure 19, the composite signal distributed by the combiner is illustrated as being distributed over a single cable to an IRD (subsequently split to serve multiple wall outlets). The DiSEqC information is also illustrated as being transmitted over the same cable.

Additionally, at Page 8, the Eutelsat DiSEqC Specification teaches that the DiSEqC commands can be transmitted over the existing cable distribution network (i.e., the same coaxial

cable on which the program content is distributed.



Accordingly, Claim 6 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat DiSEqC Specification reference.

4. Claim 8

Claim 8 of the '576 patent recites:

> A signal distribution system for distributing signals comprising a plurality of channels from a plurality of sources between a first unit and a second unit over a communication medium comprising: means in the first unit responsive to information transmitted by the second unit for extracting selected channels from each of the plurality of sources and combining the selected channels into a composite signal without demodulating channels and without changing the modulation of the channels and transmitting the composite signal over the medium; and means in the second unit for receiving the composite signal and demodulating and decoding at least one channel; and means in the first unit and second units for bi-directionally communicating control information between the second unit and the first unit.

For clarity and ease of discussion, the elements of claim 8 are discussed in their constituent parts.

a. ***A signal distribution system for distributing signals comprising a plurality of channels from a plurality of sources between a first unit and a second unit over a communication medium comprising:***

As stated above with respect to Claim 1, the Eutelsat DiSEqC Specification reference discloses a signal distribution systems for satellite TV. The Eutelsat DiSEqC Specification reference teaches various architectures for distributing signals (Satellite TV signals) comprising a plurality of channels from a plurality of sources between a first unit (the Outdoor Unit) and a second unit (the set top box or IRD). One example of such an architecture is that illustrated in Figure 19 of the Eutelsat DiSEqC Specification (page 23).

b. ***means in the first unit responsive to information transmitted by the second unit for extracting selected channels from each of the plurality of sources***

The Eutelsat DiSEqC Specification reference teaches this element of claim 8. Particularly, the Eutelsat DiSEqC Specification reference teaches that the satellite receiver (IRD) is configured to send information to the outdoor unit to perform channel selection from satellite signals. Specifically, the Eutelsat DiSEqC Specification at page 8 states that the receiver (IRD) transmits a desired transponder frequency to be selected by the first unit (headend).

The Eutelsat DiSEqC Specification also discloses that the multiswitch and IF-IF converter are responsive to transponder select information transmitted by an IRD. The Eutelsat DiSEqC Specification teaches that the DiSEqC commands from the IRD can include a command to select the desired transponder frequency to be selected and included in the composite signal (*i.e.*, for extracting selected channels). For example, reference is made to Figure 19 of the Eutelsat DiSEqC Specification that illustrates a Satellite Receiver (IRD) that sends one or more DiSEqC commands to the signal selector for channel selection.

c. ***and combining the selected channels into a composite signal***

The Eutelsat DiSEqC Specification also teaches combining the selected channels into a composite signal. As discussed above with respect to Claim 1, Figure 19 of the Eutelsat DiSEqC Specification discloses a signal Combiner unit that accepts multiple signals from the Subscriber-controlled IF-IF conversion unit, and combines these signals into a composite output signal.

d. ***without demodulating channels and without changing the modulation of the channels***

The Eutelsat DiSEqC Specification reference discloses that the signals are selected and combined without changing the modulation of the channels. As discussed above with respect to claim 1, one of ordinary skill in the art would have understood that QPSK signals are received from the satellite and the signals are distributed to the satellite receiver (IRD) as QPSK signals. As such, no transmodulation is performed. Additionally, the signals are not demodulated either, as they remain QPSK-modulated signals. The Eutelsat DiSEqC Specification shows a system with no demodulation (until the set top box).

Additionally, one of ordinary skill in the art would have understood at the time of the invention that with satellite television systems, the signal was typically distributed to the set-top box as a QPSK signal to account for the lower signal-to-noise ratios associate with satellite television signals as compared to cable television signals. As evidence of the knowledge of one of ordinary skill in the art, reference is made to the Broadcom Digital Satellite Receiver Paper at page 1638, which describes this phenomenon:

> a very high SNR (~30 dB). The low SNR of the satellite-TV system mandates the use of a lower order modulation format (QPSK) versus the higher order modulation formats used in the cable-TV systems (64/256/1024-QAM). Because of the lower order modulation format, the symbol rate must be increased to achieve comparable bit rates, thus requiring the use of more dedicated hardware (i.e., less hardware sharing in the architecture).

e. ***and transmitting the composite signal over the medium;***

The Eutelsat DiSEqC Specification teaches that the composite signal is transmitted to the satellite receiver/IRD. At Figure 19, the Eutelsat DiSEqC Specification shows the composite signal routed to the IRDs via a signal path (the cable tree network).

f. ***and means in the second unit for receiving the composite signal and demodulating and decoding at least one channel;***

The second unit is disclosed by the Eutelsat DiSEqC Specification as a satellite receiver or IRD. Indeed, the term IRD stands for Integrated Receiver Decoder.[7] Receivers are well known to those of ordinary skill in the art to receive communication signals and to tune and demodulate the signals. As the name implies, the, Integrated Receiver Decoder not only receives the signal but also decodes it.

As evidence of what one of ordinary skill in the art would have understood at the time, reference is made to the portion of the Background Section of the '576 patent that references Figure 1, which is labeled as "Prior Art." In this section, the '576 patent teaches that IRDs, or set top boxes are commonly known. See, Column 1, lines 30 – 32. This Background Section further teaches that the satellite receiver or IRD demodulates and decodes the signal. See, Column 1, lines 39 – 44.

g. ***and means in the first unit and second units for bi-directionally communicating control information between the second unit and the first unit.***

The Eutelsat DiSEqC Specification reference teaches bidirectional communication between the IRD and the switching equipment. Although the above-cited Figure 19 is an illustration for one-way DiSEqC, the Eutelsat DiSEqC Specification also teaches two-way, or bi-directional DiSEqC. See, for example, Section 4.3 in the first full paragraph at page 11, where it

[7] This definition can be found in the Background Section of the '576 patent at Col. 1, lines 29-31.

states: "All of the above recommendations for one-way DiSEqC are applicable to full two-way DiSEqC..."

Accordingly, Claim 8 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat DiSEqC Specification reference.

5. Claim 9

Claim 9 of the '576 patent recites:

> The signal distribution system of claim 8 wherein the control information comprises channel selection requests originating from the second unit and the control information comprises channel mapping information originating from the first unit.

For clarity and ease of discussion, the elements of claim 9 are discussed in their constituent parts.

a. ***wherein the control information comprises channel selection requests originating from the second unit***

As stated above, the Eutelsat DiSEqC Specification teaches each and every element of claim 8, from which claim 9 depends. Additionally, the Eutelsat DiSEqC Specification reference teaches control information comprising channel selection requests. Particularly, at page 8, the Eutelsat DiSEqC Specification reference states that the IRDs send write frequency commands (i.e., channel selection requests) to the headend to select the appropriate transponder signal, or channel.

b. ***and the control information comprises channel mapping information originating from the first unit.***

The Eutelsat DiSEqC Specification reference teaches that the control information also comprises channel mapping information from the switching equipment to the IRD. For example, the Eutelsat DiSEqC Specification reference discloses that two-way DiSEqC (DiSEqC 2.0/2.1

etc.) further enhances the standard by allowing the receiver to receive configuration information (mapping information) from the head end. See, for example, page 11.

One of ordinary skill in the art would have understood that configuration information can include, for example, an identification of the LNB local oscillator frequency or an identification of the frequencies used by one or more of the IF-IF converters so the IRD can determine which frequency to tune to in order to receive the converter output in the composite signal.

As evidence of what one of ordinary skill in the art would have understood at the time of the purported invention, reference is made to United States Patent No. 5,073,930, to Green *et. al.*, which teaches that the term frequency mapping is used to map the conversion of an IF signal in a wideband LNB output to an IF signal at a translated frequency for placement in the composite signal. *See*, Green at Column 10, lines 4 – 43. As such, one of ordinary skill in the art at the time would have understood that configuration information includes information regarding channel mapping.

Accordingly, Claim 9 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat DiSEqC Specification reference.

6. Claim 11

Claim 11 of the '576 patent recites:

> The signal distribution system of claim 8 wherein the first unit is a satellite outdoor unit and the second unit is a satellite integrated receiver decoder unit.

a. ***The signal distribution system of claim 8 wherein the first unit is a satellite outdoor unit and the second unit is a satellite integrated receiver decoder unit.***

The Eutelsat DiSEqC Specification reference teaches an outdoor unit and a satellite integrated receiver decoder unit (IRD). Figure 19 of the Eutelsat DiSEqC Specification

reference discloses a Satellite Receiver. The Satellite Receiver is referred to at page 8 in the Eutelsat DiSEqC Specification reference as an IRD.

Figure 19 also illustrates the LNBs and other switching and distribution equipment, which one of ordinary skill in the art would understand to be outdoor equipment. Moreover, the Eutelsat DiSEqC Specification document, illustrates the antennae, LNBs, switching equipment, etc. as outdoor equipment, and the satellite receiver as indoor equipment.

Furthermore, as further evidence of what was understood at the time, Figure 1 of the '576 patent, labeled as "Prior Art" discloses that the satellite antenna, LNBs and switches are an outdoor unit, and the description accompanying prior art Figure 1 describes the IRD as a set top box located inside a building.

Accordingly, Claim 11 of the '576 patent is a unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat DiSEqC Specification reference.

7. Claim 12

Claim 12 of the '576 patent recites:

a. ***The signal distribution system of claim 11 wherein the communication medium consists of a single coaxial cable connected to the satellite outdoor unit.***

As discussed above with respect to Claim 1, the Eutelsat DiSEqC Specification reference teaches that the communication medium over which the signal is distributed is a coaxial cable.

Accordingly, Claim 12 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat DiSEqC Specification reference.

8. Claim 13

a. ***The signal distribution system of claim 12 wherein the means for communicating uses the same communication medium as the composite signal.***

In this claim, "means for communicating" refers to the bi-directional communication of control information as recited in Claim 8. The Eutelsat DiSEqC Specification reference teaches that the control information is communicated along the same signal path as the composite signal. This was discussed above with respect to claim 1, for which Figure 19 of the Eutelsat DiSEqC Specification reference was cited as showing signaling capabilities along the same signal path as the composite signal. Additionally, as stated above with respect to claim 8, Section 4.3 on page 13 describes bi-directional signaling.

Accordingly, Claim 13 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat DiSEqC Specification reference.

9. Claim 14

Claim 14 of the '576 patent recites:

> A method of communicating a plurality of transponder signals from a satellite outdoor unit (ODU) that receives a plurality of satellite broadband signals to an integrated receiver decoder (IRD) over a single cable connected to the ODU, the method comprising the steps of:
>
> communicating a transponder request signal to the ODU from the IRD; in the ODU, selecting a plurality of transponder signals extracted from the received satellite broadband signals, wherein the selecting is responsive to the transponder request signals;
>
> combining selected transponder signals into a composite signal;
>
> transmitting the composite signal over the single cable from the ODU to the IRDs, wherein the modulation of the transponder signal is not altered by the steps of selecting, combining, and transmitting.

For clarity and ease of discussion, the elements of claim 14 are discussed in their constituent parts.

a. ***A method of communicating a plurality of transponder signals from a satellite outdoor unit (ODU) that receives a plurality of satellite***

broadband signals to an integrated receiver decoder (IRD) over a single cable connected to the ODU, the method comprising the steps of:

The Eutelsat DiSEqC Specification reference teaches communicating a plurality of transponder signals from a satellite outdoor unit that receives satellite broadband signals to an integrated receiver decoder over a single cable connected to the outdoor unit as discussed above with respect to Claims 1 and 8.

b. ***communicating a transponder request signal to the ODU from the IRD;***

Figure 19 of the Eutelsat DiSEqC Specification reference teaches signaling information between the satellite receiver (IRD) and the switching equipment (ODU). Additionally, as discussed above with respect to claim 1, the Eutelsat DiSEqC Specification reference discloses the signaling protocol referred to as DiSEqC signaling that can provide one-way or two-way communication between the IRD and ODU.

The Eutelsat DiSEqC Specification reference discloses sending a transponder request signal to the ODU. Particularly, at page 8 it teaches that a DiSEqC command for selecting a channel based on the transponder frequency (Write Frequency command) is sent from the IRD to the ODU.

c. ***in the ODU, selecting a plurality of transponder signals extracted from the received satellite broadband signals, wherein the selecting is responsive to the transponder request signals;***

The Eutelsat DiSEqC Specification reference teaches selecting transponder signals, or channels. As discussed above with respect to claim 1, the transponder signals are extracted from the received satellite broadband signal.

As also discussed above with respect to claim 1, the selection of the transponder signals is in response to signals from the IRD (transponder request signals).

d. ***combining selected transponder signals into a composite signal;***

The Eutelsat DiSEqC Specification reference teaches combining selected transponder signals into a composite signal. As discussed above with respect to claim 1, Figure 19 of the Eutelsat DiSEqC Specification reference illustrates an RF combining and amplification unit that combines the selected transponder signals (or channels) into a composite output on a single communication path from the combiner to the IRD(s).

e. ***transmitting the composite signal over the single cable from the ODU to the IRDs,***

The Eutelsat DiSEqC Specification reference teaches transmitting the composite signal over the single cable from the ODU to the IRDs. As discussed above with respect to Claim 1, the composite signal is illustrated in Figure 19 as being output from the combiner and transmitted over a single communication path to the IRD(s). As also discussed above, Figure 19 illustrates multiple wall outlets. One of ordinary skill in the art reading the Eutelsat DiSEqC Specification reference would understand that a satellite receiver, or IRD, can be hooked up to one or more of the multiple wall outlets.

f. ***wherein the modulation of the transponder signal is not altered by the steps of selecting, combining, and transmitting.***

The Eutelsat DiSEqC Specification reference teaches that the modulation of the transponder signal is not altered by the steps of selecting, combining, and transmitting. As discussed above with respect to Claim 1, the Eutelsat DiSEqC Specification reference does not show or require any form of transmodulation. As such, one of ordinary skill in the art reading the Eutelsat DiSEqC Specification would understand that the modulation of the carrier signal is not altered.

Accordingly, Claim 14 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat DiSEqC Specification reference.

10. Claim 16

Claim 16 of the '576 patent recites:

a. ***The method of claim 14 wherein the step of combining comprises frequency translating the selected transponder channels to a variable frequency before combining.***

The Eutelsat DiSEqC Specification reference teaches frequency translating the selected transponder channels to a variable frequency before combining. As discussed above with respect to claim 1, the Eutelsat DiSEqC Specification reference teaches the transponder channels are frequency translated from their respective center frequencies in the broadband satellite signal to their new respective center frequencies in the satellite IF distribution channel. And Figure 19 illustrates that the IF to IF frequency translation occurs prior to the signal combining.

One of ordinary skill in the art would understand that the assignment could be variable to accommodate flexibility in allocating multiple selected signals into the available bandwidth.

Accordingly, Claim 16 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat DiSEqC Specification reference.

11. Claim 18

Claim 18 of the '576 patent recites:

a. ***The method of claim 14 further comprising the step of splitting the composite signal inside a home and distributing to a plurality of IRDs.***

The Eutelsat DiSEqC Specification reference teaches splitting the composite signal inside a home and distributing to a plurality of IRDs. Particularly, Figure 19 illustrates that the composite signal is split out to a plurality of wall units and distributed to each of the wall units. As stated above, one of ordinary skill in the art would understand that, as in the first unit, an IRD can be connected to any or all of the other wall units. As such, Figure 19 illustrates splitting the signal and distributing it to a plurality of IRDs.

Also note that the claim references splitting the signal inside a home. Figure 19 illustrates that the signal is split prior to distribution to the wall units. One of ordinary skill in the art would understand that the wall outlets are in the walls of the building (whether it be a home, office, or other building), and that the splitting can occur inside the home.

Accordingly, Claim 18 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat DiSEqC Specification reference.

12. Claim 19

Claim 19 of the '576 patent recites:

> The method of claim 14 wherein the transponder request signal is transmitted over the cable from an IRD and all IRDs receive the same composite signal.

For clarity and ease of discussion, the elements of claim 19 are discussed in their constituent parts.

a. *The method of claim 14 wherein the transponder request signal is transmitted over the cable from an IRD*

The Eutelsat DiSEqC Specification reference teaches the transponder request signal is transmitted over the cable from an IRD. As discussed above with respect to claim 6, Figure 19 illustrates that the DiSEqC signal (transponder request signal) is transmitted over the cable from the IRD to the switching equipment.

b. *and all IRDs receive the same composite signal.*

The Eutelsat DiSEqC Specification reference teaches that all IRDs receive the same composite signal. As discussed above with respect to claim 2, Figure 11 illustrates that the composite signal from the combiner is distributed via a single cable to the wall outlets, and that an IRD can be connected to each wall outlet.

Accordingly, Claim 19 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat DiSEqC Specification reference.

13. Claim 21

Claim 21 of the '576 patent recites:

> The method of claim 14 further comprising the steps of: frequency translating the selected transponder channels to a variable frequency before combining; and splitting the composite signal inside a home and distributing to a plurality of IRDs.

For clarity and ease of discussion, the elements of claim 21 are discussed in their constituent parts.

a. ***The method of claim 14 further comprising the steps of: frequency translating the selected transponder channels to a variable frequency before combining;***

As discussed above with respect to claim 16, the Eutelsat DiSEqC Specification reference teaches translating the selected transponder channels to a variable frequency before combining.

b. ***and splitting the composite signal inside a home and distributing to a plurality of IRDs.***

As discussed above with respect to claim 18, the Eutelsat DiSEqC Specification reference teaches splitting the composite signal inside a home and distributing to a plurality of IRDs.

Accordingly, Claim 21 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat DiSEqC Specification reference.

14. Claim 22

Claim 22 of the '576 patent recites:

a. ***The method of claim 21 wherein the transponder request signal is transmitted over the cable from an IRD.***

Claim 21 from which this claim depends, is taught by the Eutelsat DiSEqC Specification as described with reference to Claim 21. As discussed above with respect to claim 19, The

Eutelsat DiSEqC Specification reference teaches the transponder request signal is transmitted over the cable from an IRD.

Accordingly, Claim 22 of the '576 patent is unpatentable under 35 U.S.C. § 102(b) as being anticipated by the Eutelsat DiSEqC Specification reference.

D. Claims 2 – 5, 7, 10, 15-17, and 20-23 of the '576 Patent are unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat DiSEqC Specification as discussed below:

To supplement this detailed discussion, a summary of the applicability of the reference to the claims is provided in the claim charts attached as Appendix C, Part II.

1. Claim 2 - the Eutelsat DiSEqC Specification in combination with United States Patent No. 6,005,861, to Humpleman.

Claim 2 of the '576 patent recites:

> The signal distribution system of claim 1 further comprising a plurality of IRDs and wherein the composite signal is transmitted on a single cable connected to the ODU and all IRDs receive channels extracted from the composite signal.

For the reasons set forth above with respect to claim 1, the Eutelsat Installers Guide teaches every element of claim 1, from which claim 2 depends.

As stated above under the application of the Eutelsat Installers Guide under 35 U.S.C. § 102, the Eutelsat Installers Guide teaches each and every element of claim 2. However, as also stated above, there is some question regarding whether the limitation reciting "channels extracted from the composite signal" calls into question gateway functionality.

United States Patent No. 6,005,861, to Humpleman, discloses a multimedia network architecture for in-premises distribution of satellite television signals. Humpleman teaches that cable or satellite television signals (Col. 3, lines 28-31) are received at the home and distributed by network **10** to one or more televisions **12, 14** or other video equipment (VCR **16**).

With reference to Figure 1, Humpleman discloses that a network interface unit **32** (i.e., Gateway) receives an external satellite broadcast signal (Col. 3, lines 21 – 35), and that the external signals are distributed via a network **34** (Col. 3, lines 49 – 55). With particular regard to television signals, Humpleman teaches with reference to Figure 4 that the network interface unit (NIU) **32,** or gateway, receives the external video signal and distributes it to the set top box **40** (Column 7, lines 18 – 34).

Humpleman also teaches that the gateway (NIU **32**) can extract channels from the composite signal before the signal is distributed throughout the home to the set top boxes. See, for example, Column 7, lines 35 – 52, where Humpleman discloses demultiplexing the channel from a multiple channel stream.

Accordingly, Claim 2 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by Humpleman's teachings of a gateway in combination with the Eutelsat DiSEqC Specification.

2. Claim 3

Claim 3 of the '576 patent recites:

a. ***The signal distribution system of Claim 1 wherein the signal selector comprises an analog to digital converter and a digital filter.***

As discussed above, the Eutelsat Installers Guide reference teaches each and every element of claim 1, from which Claim 3 depends. The Eutelsat Installers Guide does not teach a digital filter. United States Patent No. 5,278,837, to Kelley, teaches a digital receiver with digital channel selection. At Figure 8, Kelley teaches a digital receiver with an analog to digital converter ADC **106** that digitizes the RF input signal and provides it to a digital tuner. Col. 6, lines 31-34. The output of mixer **18** is provided to a digital IF filter **34** to isolate the desired IF signal. Col. 7, lines 34 – 40.

Accordingly, Claim 3 of the '576 patent unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat DiSEqC Specification in combination with Kelley.

Additionally, The Broadcom Paper teaches that conventional receivers use of a SAW filter to perform channel selection for satellite TV systems (Page 11634, first paragraph). The Broadcom paper describes an all digital receiver (Figures 3 and 8) that includes analog to digital converters and digital filtering. Although the Broadcom paper describes analog to digital conversion and digital filtering in the context of a satellite set top box, one of ordinary skill in the art at the time would have understood that such techniques could also be used for channel selection in the signal selector as well.

Accordingly, Claim 3 of the '576 patent unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat DiSEqC Specification in combination with the Broadcom Digital Satellite Receiver Reference.

3. Claim 4

Claim 4 of the '576 patent recites:

a. ***The signal distribution system of claim 1 wherein the signal selector comprises a tuner.***

As discussed above, the Eutelsat DiSEqC Specification reference teaches each and every element of claim 1, from which Claim 4 depends. The Eutelsat DiSEqC Specification does expressly disclose a tuner to select the transponder signals. However, tuners for channel selection in television receiver systems are notoriously well known. Additionally, there are several references that illustrate the use of tuners in satellite receiver systems.

United States Patent No. 5,073,930, to Green *et. al.*, discloses a satellite receiver system that uses a tuner to perform IF channel selection, and combining a plurality of selected channels into a composite signal for transmission to a set top box.

At Figure 1A, Green discloses a plurality of broadband LNB output signals 104, 106 having a plurality of transponder channels. IF-IF converters 113 are comprised of a plurality of transponder processors 112 that each receive a broadband LNB signal from which one of the constituent transponder signals will be chosen. Thus, these transponder processors 112 are signal selectors. These signal selectors are described with reference to Figure 3 as including a tuner.

Accordingly, Claim 4 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat DiSEqC Specification in combination with Green.

Additionally, United States Patent No. 5,654,774, to Pugel discloses a tuner for channel selection in a satellite television system. More particularly, at Col. 3, lines 18 – 24, the '774 patent discloses a tuner **9** for "selecting the particular RF signal corresponding to the desired channel from the plurality of RF signals received ..." Thus, Pugel teaches that a tuner can be used as a signal selector.

Accordingly, Claim 4 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat DiSEqC Specification in combination with Pugel.

Also, European patent numbers EP0757489 and EP1009113 show tuners used to select a signal or channel from a satellite broadcast signal. For example, Figures 1 and 3 of EP0757489 illustrate a plurality of satellite input signals SatZF having tuners (mixer and local oscillator).

Accordingly, Claim 4 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat DiSEqC Specification in combination with EP0757489.

Likewise, Figure 2 of EP1009113 shows a similar structure with a plurality of satellite input signals each having a tuner (mixer and local oscillator) followed by a SAW filter.

Accordingly, Claim 4 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat DiSEqC Specification in combination with EP1009113.

4. Claim 5

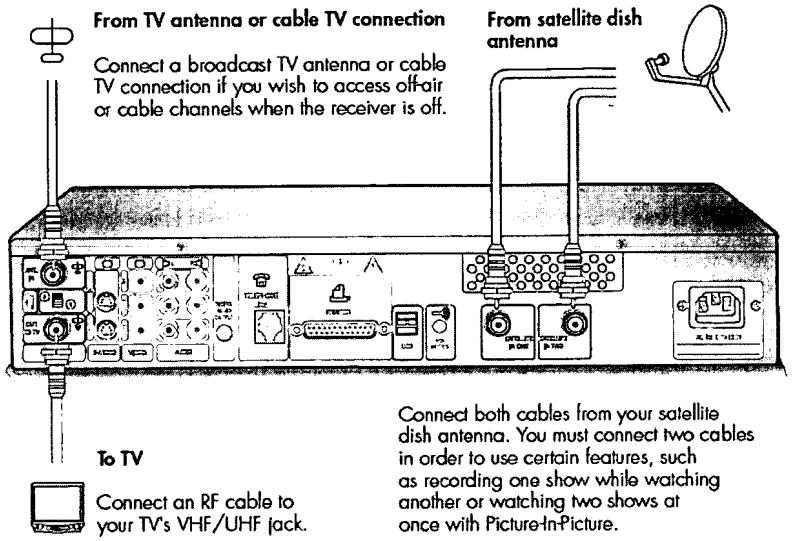
Claim 5 of the '576 patent recites:

a. ***The signal distribution system of claim 1 further comprising an integrated receiver decoder (IRD) connected to the coaxial cable with a plurality of tuners within the IRD, wherein each tuner within the IRD receives the composite signal and each tuner uses at least one transponder signal.***

As discussed above, the Eutelsat DiSEqC Specification teaches each and every element of claim 1, from which Claim 5 depends. Also, as illustrated in Figure 19 (page 26), the Eutelsat Installers Guide discloses a satellite receiver or IRD connected to the coaxial cable. However, the Eutelsat Installers Guide does expressly disclose a plurality of tuners within the IRD.

The concept of two tuners in a television receiver was well known at the time of the purported invention to allow features such as picture-in-picture and watch-and-record. As evidence of what would have been known by one of ordinary skill in the art, the RCA Setup Guide discloses a satellite set top box, or IRD, with multiple tuners. For example, the Figure on page 6 and the accompanying note teaches two tuners to enable picture-in-picture or watch-and-record capabilities.

NOTE *You can watch TV if you connect only one cable between the satellite dish antenna and the receiver, but you must connect both cables to use features that require both of the receiver's tuners (viewing two shows at once with Picture-In-Picture or recording one show while watching another, for example).*



Accordingly, Claim 5 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat DiSEqC Specification in combination with the RCA Setup Guide.

Additionally, United States Patent No. 5,285,284 teaches a television receiver having two tuners. For example, Figure 5, described at Column 2, lines 48 – 52 illustrates a television receiver having a picture-in-picture (PIP) function with two tuners **3** and **4**.

Accordingly, Claim 5 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat DiSEqC Specification in combination with the '284 patent.

Additionally, United States Patent No. 6,353,463 is also directed toward a television receiver for receiving and signal processing analog or digital signals. Figure 2 of the '463 patent illustrates a dual tuner **20** receiving the television signals.

Accordingly, Claim 5 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat DiSEqC Specification in combination with the '463 patent.

5. Claims 7 and 20

Claim 7 of the '576 patent recites:

a. ***The signal distribution system of claim 1 wherein the transponder select information is transmitted over a wireless link.***

Claim 20 of the '576 patent recites:

b. ***The method of claim 14 wherein the transponder request signal is transmitted over a wireless link to the ODU.***

As stated above, the Eutelsat DiSEqC Specification teaches every element of claims 1 and 14, from which claims 7 and 20 depend, respectively. However, the Eutelsat DiSEqC Specification does not explicitly state that the transponder select information or request signal (*i.e.*, the DiSEqC command) can be sent over a wireless link. However, wireless communications as an alternative to wired communications was well known at the time of the invention.

For example, the Philips Data Sheet for the UAA3202M Frequency Shift Keying Receiver illustrates a single-chip wireless receiver for VHF and UHF systems. (See, General Description on page 2.) Described applications for the wireless receiver are listed as remote control systems, telemetry systems and wireless data transmission (page 2). As such, it would have been obvious to use this or other commonly available wireless technology to communicate transponder select information over a wireless link.

Accordingly, Claim 7 the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat DiSEqC Specification in combination with the Philips Data Sheet.

Likewise, Claim 20 the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat DiSEqC Specification in combination with the Philips Data Sheet.

6. Claim 10

Claim 10 of the '576 patent recites:

a. ***The signal distribution system of claim 8, further comprising a means in the first unit for carrier offset correction.***

The Eutelsat DiSEqC Specification reference teaches every element of claim 8, from which claim 10 depends. The Eutelsat DiSEqC Specification does not explicitly teach carrier offset correction. However, United States Patent No. 6,437,837, to Seo, in the same field of endeavor, teaches the use of carrier offset correction in receive system for digital television signals. See, for example, Column 4, lines 47 – 57 of Seo.

Accordingly, Claim 10 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by Seo in combination with the Eutelsat Installers Guide.

Additionally, United States Patent No. 5,073,930, to Green, et al., teaches carrier offset correction in a satellite receiver system. At Column 12, lines 40 – 45, Green discloses carrier offset correction to correct for frequency errors. Note that one would have looked to Green when implementing satellite receiver system architectures. Particularly, Figure 1A of Green illustrates a plurality of selected broadband satellite signals on a bus 110 are sent to transponder units 112 for channel selection, and that the selected transponder channels are then combined by combiners 114. Figure 2 of Green illustrates that the selected transponder channels are mapped into and combined into a single composite signal (labeled as transponder bank output). This is directed toward solving the same goal of channel selection in a satellite receiver system as are the '576 patent and the Eutelsat Installers Guide. Accordingly, Claim 10 of the '576 patent is rendered obvious by Green in view of Eutelsat Installers Guide.

Accordingly, Claim 10 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat Installers Guide combination with Green.

7. Claim 15

Claim 15 of the '576 patent recites:

a. ***The method of claim 14 wherein the step of selecting a transponder signal comprises the step of: filtering a transponder signal with a band pass filter having a bandwidth ranging from 5% TO 100% wider than the bandwidth of the transponder signal.***

The Eutelsat DiSEqC Specification reference teaches every element of claim 14, from which claim 15 depends. The Broadcom Digital Satellite Receiver Paper discloses a 55Mhz bandwidth filter (page 1639, bottom of Col. 1) that is used in a digital satellite receiver capable of supporting variable symbol rates of 1 – 45 Mbaud (i.e., 1 – 45 MHz). Thus, depending on the chosen operating symbol rate, the bandwidth of the filter can range from approximately 20% wider than the signal bandwidth to well more than 100% wider.

Accordingly, Claim 15 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Broadcom Paper in combination with Eutelsat DiSEqC Specification.

8. Claim 16

Claim 16 of the '576 patent recites:

a. ***The method of claim 14 wherein the step of combining comprises frequency translating the selected transponder channels to a variable frequency before combining.***

As discussed above, The Eutelsat DiSEqC Specification reference teaches every element of claim 14, from which claim 16 depends. Additionally, as discussed above with respect to claim 1, the Eutelsat DiSEqC Specification teaches frequency translating the selected transponder channels (for example, Figure 19 illustrates that the IF to IF frequency translation occurs prior to the signal combining).

Additionally, United States Patent No. 5,073,930, to Green, et al., teaches translation of transponder channels to a variable frequency prior to combining. Transponder channel selection and channel translation is performed by transponder processors 112 as illustrated in Figure 1. The channels selected by transponder processors 112 are combined by combiners 114. Details of transponder channel selection by transponder processors 112 are illustrated in Figure 3 of Green. This illustrates that the broadband transponder input is frequency translated by down converter 200, filtered at 202 to select the channel, and upconverted back to IF by upconverter 204. Upconverter 204 performs a variable frequency translation prior to the signal being combined by combiners 114. Particularly, microntroller 206 instructs PLL 248 to select a VCO frequency from between 1530 – 2130 MHz. Varying the local oscillator signal (VCO) varies the frequency of the transponder channel that is output to be combined by combiner 114 (Fig. 1). This is described at Column 14, lines 5-14.

Additionally, Green teaches that the selected frequency can be varied to accommodate flexible mapping of transponder channels into the composite signal. See, Column 10, lines 34 – 43.

Accordingly, Claim 16 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat DiSEqC Specification reference in combination with Green.

9. Claim 17

Claim 17 of the '576 patent recites:

a. ***The method of claim 14 further comprising frequency translating the selected transponder channels to a predetermined frequency before combining.***

As discussed above, The Eutelsat DiSEqC Specification reference teaches every element of claim 14, from which claim 17 depends. Additionally, as discussed above with respect to

claim 1, the Eutelsat DiSEqC Specification teaches frequency translating the selected transponder channels (for example, Figure 19 illustrates that the IF to IF frequency translation occurs prior to the signal combining).

Additionally, United States Patent No. 5,073,930 teaches translation of transponder channels to a predetermined frequency prior to combining. Figure 1A of Green illustrates a plurality of selected broadband satellite signals on a bus 110 are sent to transponder units 112 for channel selection, and that the selected transponder channels are then combined by combiners 114. Figure 2 of Green illustrates that the selected transponder channels are mapped into and combined into a single composite signal (labeled as transponder bank output).

Although the transponder processor can map to a variable frequency (as discussed with respect to Claim 16), Green also teaches that once a mapping of transponder channels into the combined signal is decided, the processors can be **preprogrammed** to output on a given frequency. See, Column 10, lines 20 – 23. Thus, the processors translate to a predetermined frequency prior to signal combining.

Accordingly, Claim 17 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat DiSEqC Specification reference in combination with Green.

10. Claim 21

Claim 21 of the '576 patent recites:

> The method of claim 14 further comprising the steps of: frequency translating the selected transponder channels to a variable frequency before combining; and splitting the composite signal inside a home and distributing to a plurality of IRDs.

For clarity and ease of discussion, the elements of claim 21 are discussed in their constituent parts.

a. ***The method of claim 14 further comprising the steps of: frequency translating the selected transponder channels to a variable frequency before combining;***

As discussed above with respect to claim 16, the Eutelsat DiSEqC Specification either taken alone or in combination with Green teaches translating the selected transponder channels to a variable frequency before combining.

b. ***and splitting the composite signal inside a home and distributing to a plurality of IRDs.***

As discussed above with respect to claim 18, the Eutelsat DiSEqC Specification reference teaches splitting the composite signal inside a home and distributing to a plurality of IRDs.

Accordingly, Claim 21 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat DiSEqC Specification in combination with Green.

11. Claim 22

Claim 22 of the '576 patent recites:

a. ***The method of claim 21 wherein the transponder request signal is transmitted over the cable from an IRD.***

Claim 21 from which this claim depends, is taught by the combination of the Eutelsat DiSEqC Specification in combination with Green as described with reference to Claim 21. As discussed above with respect to claim 19, The Eutelsat DiSEqC Specification reference teaches the transponder request signal is transmitted over the cable from an IRD.

Accordingly, Claim 22 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat DiSEqC Specification in combination with Green.

12. Claim 23

Claim 23 of the '576 patent recites:

> The method of claim 21 wherein the transponder request signal is transmitted over a wireless link to the ODU.

Claim 21 from which this claim depends, is taught by the combination of the Eutelsat DiSEqC Specification in combination with Green as described with reference to Claim 21. As discussed above with respect to claims 7 and 20, the Philips Reference teaches signaling over a wireless link.

Accordingly, Claim 21 of the '576 patent is unpatentable under 35 U.S.C. §103 as being rendered obvious by the Eutelsat DiSEqC Specification in combination with Green and further in view of the Phillips reference.

IX.
ACTION REQUESTED

In view of the presentation of the above delineated references and their particular relevance to the validity (or patentability) of the subject claims, grant of the subject Reexamination Request is hereby respectfully solicited. Please charge the required fee of $2,520 to Deposit Account No. 191853. Please also charge any additional fees to Deposit Account No. 191853.

Respectfully Submitted,

DATED: February 6, 2007

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of Gurantz, et al.	)	
	)	
In re REQUEST FOR REEXAMINATION	)	
of	)	
U.S. Patent No. 7,130,576	)	
	)	
Patent Date: October 31, 2006	)	Atty. Dkt. No. 05JM-127751
	)	Control No. 90/008,389
For: SIGNAL SELECTOR AND COMBINER FOR BROADBAND CONTENT DISTRIBUTION	)	

Enclosed are copies of:

Letter Transmittal;
Cover Letter accompanying Revised Information Disclosure Statement and Clarifying Remarks;
Replacement Statement for the Request for Reexamination of U.S. Patent No. 7,130,576;
Form PTO/SB/08a;
Form PTO/SB/08b;
Certificate of Mailing by "Express " (37 CFR 1.10); and
One (1) return postcard.

addressed to:

Michael W. Landry
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San Diego, California 92130

I hereby certify that the above party has been served by Express Mail Label No. EV 834194145 at the address indicated, all the above-referenced documents in their entirety.

Lisa E. Jambeau

February 6, 2007
Date

Litigation Search Report CRU 3999

Reexam Control No. 90/008,389

TO: Scott Weaver **Location: CRU** **Art Unit : 3992** **Date: 02/26/07** **Case Serial Number: 90/008,389**	**From: James R. Matthews** **Location: CRU 3999** **MDW 7C71** **Phone: (571) 272-4233** **JamesR.Matthews@uspto.gov**

Search Notes

U.S. Patent No- 7,130,576

1) I performed a KeyCite Search in Westlaw, which retrieves all history on the patent including any litigation.

2) I performed a search on the patent in Lexis CourtLink for any open dockets or closed cases.

3) I performed a search in Lexis in the Federal Courts and Administrative Materials databases for any cases found.

4) I performed a search in Lexis in the IP Journal and Periodicals database for any articles on the patent.

5) I performed a search in Lexis in the news databases for any articles about the patent or any articles about litigation on this patent.

Litigation was not found.

Date of Printing: FEB 26,2007

KEYCITE

US PAT 7130576 SIGNAL SELECTOR AND COMBINER FOR BROADBAND CONTENT DISTRIBUTION, Assignee: Entropic Communications, Inc. (Oct 31, 2006)

History

=> 1 **SIGNAL SELECTOR AND COMBINER FOR BROADBAND CONTENT DISTRIBUTION,** US PAT 7130576, 2006 WL 3085317 (U.S. PTO Utility Oct 31, 2006) (NO. 10/289011)

Patent Family

2 SIGNAL DISTRIBUTION SYSTEM FOR DIRECT BROADCAST SATELLITE SYSTEM, COMBINES RADIO FREQUENCY SIGNALS TO PRODUCE COMPOSITE SIGNAL WHICH USES MODULATION PROCEDURE SAME AS BROADBAND LOW NOISE AMPLIFIER AND BLOCK CONVERTER SIG, DWPL 2007-052908

Assignments

3 Assignee(s): ENTROPIC COMMUNICATIONS INC.,
DATE RECORDED: Dec 27, 2002

Prior Art

C 4 US PAT 6441797 AGGREGATED DISTRIBUTION OF MULTIPLE SATELLITE TRANSPONDER SIGNALS FROM A SATELLITE DISH ANTENNA, Assignee: Hughes Electronics Corporation, (U.S. PTO Utility 2002)

C 5 US PAT 6556807 ANTENNA RECEIVING SYSTEM, Assignee: Mitsubishi Electric & Electronics USA,, (U.S. PTO Utility 2003)

C 6 US PAT 5760822 CENTRAL NODE CONVERTER FOR LOCAL NETWORK HAVING SINGLE COAXIAL CABLE, Assignee: Lucent Technologies Inc., (U.S. PTO Utility 1998)

C 7 US PAT 6437837 DIGITAL BROADCAST SIGNAL PROCESSING APPARATUS AND METHOD IN WHICH CHANNEL INTERFERENCE BY ANALOG BROADCAST IS PREVENTED, Assignee: Samsung Electronics Co., Ltd., (U.S. PTO Utility 2002)

C 8 US PAT 5959592 &LDQUO;IF&RDQUO; BANDSTACKED LOW NOISE BLOCK CONVERTER COMBINED WITH DIPLEXER, Assignee: EchoStar Engineering Corporation, (U.S. PTO Utility 1999)

C 9 US PAT 6947702 SATELLITE BROADCAST RECEIVING AND DISTRIBUTION SYSTEM, Assignee: Global Communications, Inc., (U.S. PTO Utility 2005)

C 10 US PAT 6600730 SYSTEM FOR DISTRIBUTION OF SATELLITE SIGNALS FROM SEPARATE MULTIPLE SATELLITES ON A SINGLE CABLE LINE, Assignee: Hughes Electronics Corporation, (U.S. PTO Utility 2003)

C 11 US PAT 6134419 TRANSMODULATED BROADCAST DELIVERY SYSTEM FOR USE IN MULTIPLE DWELLING UNITS, Assignee: Hughes Electronics Corporation, (U.S. PTO Utility 2000)

C 12 US PAT 6493873 TRANSMODULATOR WITH DYNAMICALLY SELECTABLE CHANNELS, Assignee: Hughes Electronics Corporation, (U.S. PTO Utility 2002)

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Patent Search 7130576 2/26/2007

No cases found.

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289011 (10) 7130576 October 31, 2006

UNITED STATES PATENT AND TRADEMARK OFFICE GRANTED PATENT

7130576

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October 31, 2006

Signal selector and combiner for broadband content distribution

INVENTOR: Gurantz, Itzhak - San Diego, California, United States (US); El Wardani, Ladd - La Jolla, California, United States (US); Landry, Michael - San Diego, California, United States (US)

APPL-NO: 289011 (10)

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ASSIGNEE-AT-ISSUE: Entropic Communications, Inc., San Diego, California, United States (US), United States company or corporation (02)

LEGAL-REP: Landry, Michael W. -

PUB-TYPE: October 31, 2006 - Utility Patent having no previously published pre-grant publication (B1)

PUB-COUNTRY: United States (US)

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Provisional Application Ser. No. 60345965, November 7, 2001, PENDING
Provisional Application Ser. No. 60333722, November 27, 2001, PENDING
Provisional Application Ser. No. 60358817, February 22, 2002, PENDING

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CL: 455, 725

SEARCH-FLD: 455#3.01-3.05, 455#12.1, 455#20, 455#103, 455#137, 455#427, 725#64, 725#71, 725#78, 725#98, 725#118

IPC-MAIN-CL: [8] H04H 001#00 (20060101) Advanced Inventive 20061031 (A F I B H US)

PRIM-EXMR: Anderson, Matthew D.

ASST-EXMR: Sharma, Sujatha

REF-CITED:
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CORE TERMS: channel, transponder, filter, frequency, cable, band, digital, converter, spectrum, selector, sample, bandwidth, select, selecting, combined, analog, satellite, gateway, carrier, tuner, composite, filtering, point switch, outdoor, alternatively, offset, input, transmitted, translated, broadband

ENGLISH-ABST:

In a satellite receiving system, program channels are selected from one or more broadband signals and combined with other selected channels and transmitted from a first unit, for example an outdoor unit, to a second unit, for example a gateway, server, or set-top box, using a single cable. Channels can be selected by digitizing the broadband signal then digitally filtering to isolate the desired channels. The outputs of several LNBs can be selected and combined into one signal. Multiple set-top boxes can receive independent signals over a single cable from the outdoor unit.

NO-OF-CLAIMS: 23

EXMPL-CLAIM: 1

NO-OF-FIGURES: 17

NO-DRWNG-PP: 17

PARENT-PAT-INFO:

RELATED APPLICATIONS

[0001]This application claims priority to U.S. provisional patent application No. 60/345,965 filed Nov. 7, 2001 entitled "Signal Selector and Combiner for Broadband Content Distribution"; U.S. provisional patent application No. 60/333,722 filed Nov. 27, 2001 entitled "Signal Selector and Combiner for Broadband Content Distribution"; and U.S. provisional patent application No. 60/358,817 filed Feb. 22, 2002 entitled "Signal Selector and Combiner for Broadband Content Distribution", each of which is incorporated herein by reference.

SUMMARY:

BACKGROUND

[0002]Referring to FIG. 1, a satellite receiver outdoor unit (ODU) 110 typically comprises a dish antenna 150, one or more antenna feed horns 130, one or more low noise amplifier and block down converters (LNB) 140, and an optional multiport cross point switch 160. Dish 150 collects and focuses received signal power onto antenna feed horns 130 which couples the signal to LNBs 140. A single dish 150 may have multiple feed horns 130 wherein each feed receives a signal from a different satellite in orbit. An installation may have more than one dish, feed, and LNB assemblies. The cross point switch 160 allows connection of the outdoor unit 110 to more than one integrated receiver decoder (IRD) 180 located inside the building. IRDs are commonly called set top boxes (STBs) arising from their typical installed location on top of TV sets. The LNB 140 converts the signal transmitted by a satellite in Earth orbit, for example C band, Ku band, or another frequency band, to a lower intermediate frequency (IF) suitable for transmission through coax inside a building. For example, L band IF (950 to 1450 MHZ) with RG-6 or RG-11 coax cable is commonly used. The IRD 180 tunes one transponder channel, demodulates the IF signal from the LNB down to base band, provides channel selection, conditional access, decodes the digital data to produce a video signal, and generates an RF output to drive a television.

[0003]A satellite outdoor unit may have as many as three or more LNBs each with two receiving polarizations. The received polarization is selected by sending a voltage or other control signal to the LNB. In this configuration there are six possible 500 MHz signals that may be selected by the multiport cross point switch to be routed to each IRD. The 500 MHz signal is typically comprised of 16 transponder signals of 24 MHz bandwidth each with a guard band in between each transponder signal. Other transponder bandwidths are used such as 36 MHz, 54 MHz with a single channel or shared by two TV signals, and 43 MHz.

[0004]A problem with the conventional approach to connecting an outdoor unit to IRDs is that multiple cables are required to be run from the outdoor unit: one cable for each room where an IRD is located. When a new IRD is added another cable must be installed. In an application using a media server, a central processor for all video signals, multiple cables are needed to route signals from the ODU to the server.

[0005]FIG. 4 shows a representative spectrum of the signal output by an LNB. In a conventional satellite ODU this signal is routed through a cross point switch to one of the IRDs. Note that all transponder channels in the signal are from a single LNB and from the same polarization satellite signal. The cross point switch allows any of the cables connected from the ODU to the IRDs to be switched to any of the LNBs. A dedicated cable for each IRD is needed because in general each IRD is not using the same LNB and polarization at the same time. A server requires access to several LNB signals simultaneously, thus requiring several cables.

[0006]U.S. Pat. No. 6,134,419, incorporated herein by reference, by Williams assigned to Hughes Electronics, addresses part of the problem. The Williams patent recognizes that the bandwidth of the signal from each of the two polarizations is too broad to be transmitted over

standard RG-6 or RG-59 cable, particularly when combined with the cable CATV signal. Williams addresses this problem using a transmodulator, by demodulating and remodulating to a different modulation scheme the RHCP and LHCP signals using a tuner, decoder, packetizer, cable encoder, and up converter for each of 32 transponder channels. The transmodulator outputs a signal with a higher-level modulation scheme to reduce the bandwidth occupied by the satellite signals. In the example provided, the QPSK signals from the LNBs are transmodulated to 128-QAM, reducing the bandwidth from 1000 MHz to 192 MHz. At the set top box (STB) the 128 QAM signal is demodulated and processed to produce an NTSC analog video signal sent to a television set.

[0007]One problem with the Williams approach is the circuit complexity due to the 32 tuner paths required in the transmodulator. For an increase in the number of satellite signals, this problem becomes more pronounced. Williams discloses modulation using 128-QAM, which requires a higher signal to noise ratio (SNR) than QPSK and is it more susceptible to impairment from multipath present in a cable environment.

[0008]U.S. Pat. No. 5,959,592 incorporated herein by reference, by Petruzzelli addresses combining both the left hand circular polarized (LHCP) and right hand circular polarized (RHCP) signals into one signal that is transmitted from the ODU. In the disclosed band stacking approach, the output of two low noise amplifiers (LNAs), each 500 MHz wide, are frequency translated to different IF frequencies and summed into a signal with a bandwidth of more than 1000 MHz. In one example disclosed, the different IF bands are 950 to 1450 MHz and 1550 to 2050 MHz. The problem with this approach is that the resulting bandwidth is very wide and becomes impractical when the number of LNB signals increases because each LNB output requires 500 MHz of bandwidth on the cable.

[0009]Satellite systems are described generally in G. E. Lewis, "Communication Services via Satellite" Butterworth-Heinemann Ltd. 1992.

SUMMARY OF THE INVENTION

[0010]A channel selecting and combining solution is used in the outdoor unit where one or more transponder channels are selected from each LNB output. The transponder channel or channels needed from each LNB are selected by a filter. Each selected transponder signal may be translated to a new channel frequency. The selected transponder channels are combined to form a composite signal. All of the selected, translated, and combined transponder channels are transmitted over a single cable to a gateway unit that extracts the channels to distribute to the IRDs. The gateway can frequency translate each transponder channel to its original frequency. Alternatively, the IRDs connect directly from the cable or through a splitter and tune the desired transponder channels. A channel translation mapping table is used to coordinate the channel assignment between the original channels and new channels. In another alternative embodiment, the gateway transmits the video information over a digital data network.

[0011]LNB outputs can be sampled by a broadband A/D converter and filtered with a digital filter to select a transponder channel. Alternatively, a tuner can select a transponder channel. The selecting process extracts from the wide band LNB output a narrow band transponder channel.

[0012]Each IRD communicates the channels it needs to receive, directly or indirectly, to the signal selector. This information is used to select the transponder channel to combine in the signal selector output signal, the ODU downlink. New IRD designs can incorporate a signaling channel that uses unoccupied regions of the frequency spectrum of the cable, or a wireless communication link, to communicate the channel information. To provide compatibility with existing IRDs, the channel information can be communicated by an IR or RF auxiliary channel

to the gateway or outdoor unit.

[0013]Many newer homes have coaxial cable installed that runs to a central location. In the present invention a gateway is located at the central location that receives the combined signal from the outdoor unit and distributes the signals to the IRDs. An IRD requests a channel through an IR or RF signal communicated to the gateway. The RF communication can be in the cable connecting the IRD to the gateway or a wired or wireless signal.

[0014]The present invention requires only one cable wire to be routed from the outdoor unit to inside the building or to a gateway. Additional IRDs can be added without any installation effort needed on the outdoor unit. In certain configurations the invention eliminates the cross point switch.

[0015]The present invention can be used along with other signals transmitted on the distribution cable. The combined transponder signal can occupy a predetermined region of the frequency spectrum while another service, such as CATV can occupy a different region. Another example of shared use of the cable is along with a single or band stacked satellite signal. In this example, frequencies such as 950[ndash]1450 and 1550[ndash]2050 are used by a conventional satellite system, and frequencies outside and between these frequency bands are occupied with a combined transponder signal according to the present invention.

DRWDESC:

BRIEF DESCRIPTION OF THE DRAWINGS

[0016]FIG. 1 Shows a prior art configuration of a satellite TV installation.

[0017]FIG. 2 shows a satellite TV installation according to the present invention.

[0018]FIG. 3 shows a block diagram of a selector and combiner according to the present invention.

[0019]FIG. 4 Shows a diagram of the frequency spectrum of individual LNB output signals according to the prior art.

[0020]FIG. 5 shows a diagram of the frequency spectrum of individual LNB output signals and the frequency spectrum of the composite RF signal comprising selected transponder signals in accordance with the present invention.

[0021]FIG. 6 shows an embodiment of the present invention wherein the sampled data is distributed digitally to channel selector filters.

[0022]FIG. 7 shows an embodiment of the present invention wherein the selected channel data is distributed digitally to the up converters.

[0023]FIG. 8 shows an embodiment of the present invention wherein the each LNB has a dedicated selector and up converter.

[0024]FIG. 9 shows an embodiment of the present invention wherein tuners and up converter are used to select and combine transponder channels.

[0025]FIG. 10 shows an embodiment wherein selected channel are processed by an MPEG transport stream demultiplexer and combined as data packets for digital LAN transmission.

[0026]FIG. 11 shows a satellite TV installation according to the present invention providing compatibility with existing installed STBs and new STBs and using a server/gateway.

[0027]FIG. 12 shows details of an outdoor unit providing compatibility with new and existing STBs.

[0028]FIG. 13 shows the frequency spectrum of signals at various points in the signal processing.

[0029]FIG. 14 shows the frequency spectrum of signals in another embodiment of the invention using base band processing.

[0030]FIG. 15 shows the frequency spectrum of signals filtered and combined with excess bandwidth.

[0031]FIG. 16 shows the frequency spectrum of conventional LNB signals combined with selected transponder channels in accordance with the present invention.

[0032]FIG. 17 shows one example of a frequency translator and filter.

DETDESC:

DETAILED DESCRIPTION OF THE INVENTION

[0033]Referring to FIG. 2, a satellite TV installation according to the present invention is shown. Signal selector 250, part of satellite outdoor unit 210, extracts the needed transponder channels from each of the LNB outputs and combines the channels into one composite signal transmitted on cable 220. Gateway 230 receives the signals and provides distribution to the IRDs located in the building. Controller 255 is responsible for communicating channel map, control, and status information with gateway 230 and IRDs 240. Controller 255 also tunes filters and local oscillators in the signal selector and maintains the channel map specifying the assigned frequency slots for transponder channels. Alternatively, the channel map can be maintained by gateway 230.

[0034]Gateway 230 can be a simple power splitter/summer allowing the IRDs to connect directly to the cable. Gateway 230 would be located inside the home in a convenient location that allows connection to the IRDs 240. Gateway 230 is designed to pass signaling from IRDs 240 to ODU 210 that contains the channel selection information.

[0035]Each LNB output signal is applied to a signal selector that extracts zero, one, or more transponder channels to be combined into a composite signal.

[0036]Refer to FIG. 3. In an embodiment of the present invention, a quadrature down converter is used to produce I and Q analog signals. The down converter is comprised of a local oscillator 382, phase splitter 384 to produce an in-phase and quadrature-phase LO, two mixers 310, and two filters 320. The filters 320 reject the undesired mixing products. The I and Q signals are sampled by high-speed broadband A/D converters 330 to create I and Q digital samples. The samples are N bits wide, where N is selected to limit the degradation to the signal to an acceptable level. The entire 500 MHz band is digitized by this operation. All further digital processing is done using complex operations applied to the I and Q digital samples. The sample rate is 500 MHz or higher.

[0037]The resolution of the A/D converters is in the range of 4 to 12 bits. To sample and reproduce a QPSK signal 6 to 8 bits would be adequate. More bandwidth efficient modulation

such as 8PSK would require more bits of resolution. The selection of resolution is based on considering power consumption, SNR, and cost.

[0038]A coherent LO generated by carrier tracking is not needed since the sampled data is not decoded in the ODU. An unknown carrier offset is present between the LO and the carrier of the received signal. A small additional carrier offset is introduced by the down conversion process but will be removed in the carrier recovery operation in the IRD. It is desirable that the LO carrier noise be low enough to be tracked out by the carrier loop in the IRD.

[0039]Digital filtering 340 is used to select one or more of the transponder output signals. The digital filter may operate by applying a band pass filter transfer function to the broadband signal to isolate a single transponder channel. The filter uses known digital architectures such as finite impulse response (FIR) or infinite impulse response (IIR). The filter is tuned by programming a set of filter coefficients to select a specific pass band. Frequency domain filter can also be employed using FFT or DFT architectures. Other filtering techniques include polyphase filter structure. These filtering techniques are well known in the digital signal processing field. References covering digital filtering include Thomas J. Cavicchi "Digital Signal Processing" John Wiley & Sons, 2000; Sanjit K. Mitra, "Digital Signal processing, a Computer Based Approach" McGraw-Hill, 2001; Proakis and Manolakis, "Introduction to Digital Signal Processing", Macmillan Publishing, 1988; DSP and applications, Analog Devices.

[0040]Referring again to FIG. 3, the selected transponder channel is then frequency translated to a new carrier frequency. The selected and frequency translated digital signal is converted to an analog signal using a D/A converter for the I and Q components. One approach is to convert the digitally filtered signal to the analog domain using a D/A converter 350, then using a quadrature modulator with mixers 360, phase splitter 388, LO 386, and summer 380. Alternatively, this can be done by a digital mixing operation where a rotating phasor is multiplied by the data samples to translate their frequency, then converting the frequency shifted digital signal to an analog signal with a D/A.

[0041]LO 386 is variable to allow the selected channel to be frequency translated to any of the channels available in the band. Alternatively, the LO can be fixed at different a frequency for each of the channel selectors.

[0042]Alternatively, a single transponder channel can be selected by translating the spectrum down in frequency to place the selected channel at base band then applying a low pass filter transfer function to isolate a single channel. The translation can be done by a digital mixing operation wherein the sample data is multiplied by a data sequence representing a carrier frequency. A post-mixing filter rejects the undesired mixing terms.

[0043]FIG. 14 shows the frequency spectrum of the signal as it is processed. The original spectrum 1 is frequency translated to locate the selected transponder channel at base band, as shown in spectrum 2. A low pass filter then passes one transponder channel and removes signal information from the other transponder channels, shown in spectrum 3. This signal is then converted to an analog signal, mixed to a new frequency, and summed with other channels in the analog domain.

[0044]One summer input is provided for each signal selectors. This is a broadband signal comprising up to 16 or 32 channels. Alternatively, a summer combines the analog I and Q signals from all the signal selectors.

[0045]Two basic approaches to combining are possible. One approach is to combine digitally filtered signals in the digital domain. This can be achieved with all filtered transponder channels to be combined presented at a sample rate equal to the composite output rate. The other approach is to combine the selected signals in the analog domain. This leads to two

possible approaches to filtering. One is to implement filters with the same input and output sample rate. The other approach is to filter with an output sample rate that differs from the input sample rate.

[0046]An example of a digital combining embodiment, a 500 msps broadband sampling of the LNB output could be filtered to produce a 500 msps output stream representing one or more transponder channels. Each transponder channel may be frequency translated to the desired new carrier frequency, then filtered to produce a single transponder signal that can be combined with other similarly selected transponder channels.

[0047]FIG. 13 shows the frequency spectrum of a sample stream as it is processed. The original spectrum 1 is frequency translated to locate the selected transponder channel at the desired frequency, as shown in spectrum 2. A band pass filter then passes one transponder channel and removes signal information from the other transponders channels, shown in spectrum 3. This filtering operation selects one transponder. In this example transponder channel B is selected. The sample stream for the selected channel is added to the sample stream from other filtering sections, represented in spectrum 4, to produce a composite sample stream in spectrum 5. Other selected channels are represented by channels labeled X.

[0048]FIG. 17 shows a block diagram of the processing elements to perform these steps. Local oscillator (LO) 1710 feeds mixer 1720 and is then band pass filtered by filter. LO is variable to allow the selected channel to be frequency translated to any of the channels available in the band. Filter 1730 has a programmable pass band frequency, tuned by loading different filter coefficients. Summer 1740 adds the sample stream to other sample streams. Several transponder channels are selected, each requiring one input to an adder. One embodiment uses a two input adder for each filter channel to implement a pipeline adder. The time delay introduced by a pipeline adder does not present a problem to the system because the receivers are each demodulating one transponder and the relative time delay is not apparent.

[0049]The frequency translation can occur either before or after the filtering operation. An advantage to translating first followed by filtering is that the filter removes the unwanted mixing terms generated. In either case, a rotating phasor is multiplied by the data samples to translate their frequency.

[0050]An example of an analog-combining embodiment, the digital filters may have an output sample rate that differs from the input sample rate. This can be inherent in the filtering operation or result from a down sampling done after filtering. Down sampling after the selecting filter is possible because the single channel the bandwidth is narrower than the A/D output and fewer samples are needed to represent the signal.

[0051]The spectrum is placed at the desired RF frequency by choosing the LO frequency driving the up converters. One example would be 950 to 1450 MHz, a standard IF frequency for DBS systems. This frequency band is compatible with standard set top box (STB) hardware. Other IF frequencies could be used. Using this technique, standard STB hardware can receive the new composite signal and demodulate and decode the video and audio signals. Specific TV channels are located at new transponder frequencies. A mapping table allows the IRD/STB to tune to the correct transponder channel. The bandwidth of the spectrum can be 500 MHz for a 16-transponder system, 1000 MHz for a 32-transponder system, or other bandwidths according to the number of transponder channels present on the cable. If the system uses band stacking, the A/D converter can directly sample the 1000 MHz IF signal, with or without a frequency translation, or the two LNB polarizations can be separated into two 500 MHz signals each digitized with separate A/D converters.

[0052]Alternatively, the IF signal from the LNB can be directly band pass sampled by a single

A/D converter. The IF signal can be frequency translated to a different IF frequency before band pass sampling. Band pass sampling requires a higher speed A/D converter than base band sampling, but only a single A/D.

[0053]One pair of A/D converters is provided for each LNB output. Alternatively, the LNB output can be band pass sampled using a single A/D converter. At a given point in time some LNB outputs may not be accessed by a user. If no transponder channel is selected from a particular LNB output, the A/D converters associated with that LNB output may be switched off to reduce power consumption and heat generation, or reallocated to process another LNB output.

[0054]The A/D digitizes the entire LNB output signal; therefore all transponder channels are available in the sampled data. More than one transponder channel may be selected from the A/D data to be combined in the composite signal. When all A/D are powered up any combination of transponder channels from any LNB output can be combined into the composite signal for distribution to the gateway and STBs.

[0055]FIG. 5 shows a frequency spectrum of the composite signal. Each of the available channels can be occupied with any transponder channel of any polarization from any LNB. One or more channels are used by each active IRD connected to the system. The number of transponder channels in the composite signal can be from as few as 2 to as many as 32, depending on the number of simultaneous channels needed in the system.

[0056]In general, the selecting and combining process will result in transponder channels located at different frequencies than where originally found. A translation table maps original channel locations on the selector input to new channel locations on the selector output. This map created and maintained by a controller located in the ODU or the gateway and is communicated to the IRDs or other devices in the network.

[0057]The channel selector performs a frequency selective filtering operation to select the desired transponder frequency. The transition band of this filter is steep, passing the selected transponder channel and rejecting adjacent transponder channels. The transition region available is derived from the guard band between channels. This can be as small a few Mega-Hertz. If the LNB carrier offset is large, a shift in the spectrum will result in the selecting filter cutting off part of the desired spectrum and passing part of an adjacent channel. For this reason a carrier offset estimate is desirable. Since all transponder channels from a given LNB will have approximately the same offset, it is only necessary to monitor one transponder channel from each LNB to determine the offset for all channels. Any of several know techniques for estimating the carrier offset may be employed. One example is two use two filters each approximately half the transponder bandwidth. By measuring the ratio of power from each filter output, an estimate of the carrier offset can be determined. Once the carrier offset is estimated, the sampled signal can be multiplied by a rotating phasor value to digitally shift the spectrum back to the nominal position. Alternatively, this frequency offset correction can be done in the analog domain, or a combination of digital and analog approaches.

[0058]Another approach to addressing the unknown carrier offset in the LNB is to use a wider filter to select transponder channels, wherein the bandwidth of the filter passes the selected transponder and part of the adjacent spectrum. In this way, if the transponder signal is not centered in the filter bandwidth the band edges will not be attenuated by the filter roll off. This excess bandwidth will allow some energy from the neighboring transponder signals. A wider channel separation is needed on the combined signal, for example the selected transponders can be spaced twice the conventional spacing. This approach makes less efficient use of the cable spectrum but simplifies the hardware implementation by reducing the requirement of or eliminating the carrier offset correction. Additionally, a less steep filter roll off is possible.

[0059]FIG. 15 shows the signal spectrum as it is processed. Spectrum 1 is a representative original spectrum. Spectrum 2 shows the filter pass band characteristic, which is wider than one transponder channel. Spectrum 3 is the result of filtering one transponder channel. Spectrum 4 is a composite of several transponder channels. A region between the selected channels is unused. The exact shape of the unused spectrum will be dependent on the filter roll-off characteristics, but is not significant. The objective is to pass the selected transponder signal without distortion.

[0060]The approach of using a filter with excess bandwidth technique is also useful for implementing the invention using an analog approach. A filter with a stop band substantially wider than the transponder channel allow using filters with more gradual transition band, and is therefore simpler to implement. The excess bandwidth can range from less than 5% to 100% wider than the transponder bandwidth.

[0061]FIG. 6 shows a variation of the present invention that uses a cross point switch or shared bus 640 to distribute data from the A/Ds to the channel selecting filters. The cross point switch, also called crossbar switch, allows any signal input to be passed to any output. It can take the form of a data selector or multiplexer. Implemented as a shared bus, data sinks receive signals from data source using a time-multiplexed bus. Either a cross point switch or a shared bus can be unidirectional or bidirectional. The cross point principle applies to digital signals and analog signals. LNB outputs are quadrature down converted 620 and sampled by dual A/D converters 630. The parallel data is routed through cross point switch 640 so that any filter has access to any A/D data. Filter/selector 650 selects the desired transponder channel that is then up converted by quadrature modulator 660. All selected channels are combined in summer 670.

[0062]FIG. 7 shows a variation where the cross point switch 740 is located after the selecting filter 720. In this configuration the selecting filter 720 may also include a down sampler to reduce the bus traffic bandwidth in the cross point switch 740. Down sampling is possible because after selecting a single desired channel the bandwidth is narrower and fewer samples are needed to represent the signal. One or more selecting filters 720 may be connected to the output of each A/D, each filter 720 selecting one transponder channel.

[0063]FIG. 8 shows a configuration wherein each LNB has a dedicated selecting filter and up converter. The selecting filter may digitally select multiple channels from the broadband A/D data to drive the up converter and DAC.

[0064]FIG. 9 shows another alternative where analog tuners 930 select desired transponder channels that are up converted by up converter 940. All signals are combined by summer 950 to drive the signal cable 970 from the ODU. A multiport switch 920 allows any tuner to connect to any LNB output. The number of signal selecting paths comprising tuner 930 and up converter 940 is selected based on the maximum number of simultaneous users. A multiple-tuner personal video recorder would use more than one signal. Controller 960 receives channel select information either from the cable or a separate data channel such as infrared (IR) or wireless RF link or other source. Channel select information from the controller 960 programs the tuner 930 and up converter 940 LO. Channel select information can come to the controller over a wireless remote control signal or using signaling sent over the cable.

[0065]Up converters 940 can operate at a fixed LO frequency with one up converter 940 being assigned to each user connected on the cable. The various LO frequencies are unique. Alternatively, the down conversion process of each tuner 930 can be set to down convert directly to a predetermined IF frequency which is unique for each selected signal, thereby eliminating a separate up converter. A simplified IRD can be used with this approach wherein the IRD needs only tune to a single selectable IF frequency. The tuning range is narrower

than a convention 500 MHz tuner and the channel selection is limited to as few as four choices compared to up to 16 or more in a convention IRD tuner.

[0066]FIG. 10 shows another alternative where signal selector 1010 selects a transponder channel. MPEG transport stream demultiplexer 1020 extracts a specific video program that is combined by data combiner 1030. Several MPEG streams are multiplexed as needed, and packets are formatted for transmission on a digital network. A digital LAN 1040 connects directly to the ODU. Channel information is communicated to the ODU through the LAN.

[0067]FIG. 11 shows another alternative used where new STBs are used with existing STBs. ODU 1110 supplies a signal to each of the connected cables according to the type of STB attached to the cable. Existing legacy STBs 1120 are supplied with an IF signal as in a conventional system, and the STBs 1120 will tune to a single transponder channel. New STBs 1140 will be supplied with a composite signal according to the present invention comprising all the transponder channels that are selected; the new STB 1140 will tune and decode the requested channel.

[0068]A new STB 1140 can be installed in place of an existing STB 1130 by simply connecting the new STB 1140 to the cable in place of the existing STB 1130. More than one new STB 1140 can be installed by using a signal splitter 1150 to provide a signal to multiple STBs. New STBs use a signaling system for selecting transponder channels that passes through the splitter to the ODU. Existing STBs will each have a dedicated connection to the ODU, as provided in the original installation. This is required because existing STBs use voltages or other control means to select LNB outputs that do not support multiple STBs on a single cable.

[0069]Also in FIG. 11, server/gateway 1160 receives the composite transponder signal, decodes specific programs, and distributes the program information in packetized MPEG over a digital local area network (LAN) 1170 to STBs 1180. Ethernet or other LAN technology is suitable for this function.

[0070]A new STB operating in accordance with the present invention is provided with a means of communication with the signal selector and combiner in the ODU. At power up or at periodic intervals the ODU or the STB initiates communication over the attached cable. This communication can be an in band or out of band signal. The ODU polls the STBs connected to determine if the STB is a conventional STB or new design STB. Because conventional STBs will not respond to the polling request, the absence of response is an indication of a conventional STB. A new STB will respond to the polling request and establish communication with the ODU.

[0071]The means of communication on the cable can be a TDMA frame structure with slots assigned to each STB, a frequency division multiplex (FDM) approach with unique frequencies assigned to each STB, or any other known technique for two-way communication by multiple devices over a signal channel. An extension of DiSEqC protocol commonly used for satellite dish control can be used for this communication. DiSEqC uses a gated 22 kHz carrier to communicate binary data and can be adapted for use to transfer data needed. The data rates are low for this communication path. Device configuration, channel mapping, and channel requests are among the types of data communicated between the ODU and STB.

[0072]Referring to FIG. 12, signal selector and combiner 1220 taps the signals output from each LNB to provide the transponder selection function. Switch 1220 is under control of the signal selector and combiner 1210. Switch 1220 will be actuated to supply either a conventional signal from multiport switch 1260 or the composite transponder signal from signal selector and combiner 1210. Switch 1220 can be a solid-state device or electromechanical relay.

[0073]Referring to FIG. 16, another application of the present invention is to provide selected transponder signals along with other services transmitted on the same cable wiring. The selected transponder signals can be transmitted in unoccupied regions of the cable, such as above, below, or between broadband satellite signals. The number of transponder channels transmitted can be adapted to the available spectrum. In one example, 950 MHz to 1450 MHz is used by one conventional LNB output signal; 1550 MHz to 2050 MHz is used by another conventional LNB output, leaving 1450 MHz to 1550 MHz available. One or more selected transponder channels from any LNB can be inserted into this region. Suitable guard bands need to be provided to prevent interference, for example 3 transponder channels at 31.25 MHz spacing uses 93.75 MHz. Another example of this application is to combine a standard CATV signal occupying 50 to 750 MHz with selected satellite transponder channels that are combined and transmitted at frequencies above the CATV band.

[0074]Using the present invention, any number of transponder channels can be selected and combined. Conventional IRD tuners are designed to tune channels anywhere in a 500 MHz or 1000 MHz range, requiring a wide tuning range for the front-end filter and LO. In an application where few channels are needed, the tuner range can be narrower, thus simplifying the design and lower cost. For example, a residential installation may typically have four television sets, some tuning only one channel at a time; others tune two channels in the case of picture in picture (PIP) or personal video recorder (PVR). This application would require 4 to 8 channels be distributed in the house simultaneously. A tuner would be required to tune over a 125 MHz to 250 MHz range.

[0075]Several variations in architecture are possible using the present invention. At each stage in the signal path, alternatives are available for implementation. Specific functions can be implemented in the analog domain or digital domain. Dedicated resources can be provided for each possible connection, or a pool of resources can be used. Dedicated resources insure that the peak demand can be satisfied unconditionally, but leads to unused capacity. Pooling enables a trunking efficiency to be realized and exploits statistical properties of usage to address most requirements.

[0076]A pool of A/D converters that can accept a signal from any LNB output through an RF crossbar switch. The number of simultaneous LNB signals that can be processed is limited to the number of A/D converters provided. Alternatively, dedicated A/D converters, one connected to each LNB output allows all LNBs to be processed if needed.

[0077]A pool of filter/selectors connected to a common bus, the pool size dictating the number of simultaneous transponder channels that can be selected. Alternatively, a predetermined number of filters can be attached to each A/D converter.

[0078]The filters/selectors can be grouped with each LNB or can be a common resource available to process any signal from any LNB. This choice trades off circuit complexity of implementing more filters with circuit complexity of routing LNB outputs through a crossbar switch.

[0079]Each of the operations of mixing, filtering, and combining can be done as an analog operation or digital operation.

[0080]Partitioning of functions can take a number of forms. The circuitry can be implemented in a monolithic integrated circuit (IC), a hybrid, discrete components, or a combination of technologies.

[0081]Another application of the present invention is to simplify upgrades to an existing system. A dual tuner STB that enables viewing and recording of two different channels requires two input cables to allow any combination of LNB signals to be received. A single cable input would be limited to viewing and recording two channels from the same LNB

output. When the upgrade is performed, the installation of an additional cable is difficult. By selecting and combining the desired channels at the ODU a single cable can be used to transmit all channels. A re-map of channel locations occurs. A conventional dual tuner STB can be used with this approach by providing a splitter at the input to the STB that supplies the composite signal to both cable inputs. A software upgrade to the STB may be needed to support the channel re-mapping.

[0082]Other implementations for signal processing include: No cross point switch, digitize, digital filter select, frequency translate, RF combine; cross point switch, analog tuner select, frequency translate, RF combine; digitize, digital filter select, digital network combine; digitize, digital filter select, decode, MPEG stream over a network; digitize, digital filter select, decode, MPEG to analog, restack channels, RF combine. One skilled in the art will recognize that many variations are possible to implement the present invention of selecting signals and combining onto a signal cable.

[0083]Another property of the present invention is that the process of digitizing, selecting, and combining is modulation independent. Either a digital or analog selecting and combining approach can be designed to process any form of phase/amplitude modulation. Although the dominant modulation type in direct broadcast satellite systems is QPSK, alternatively BPSK, 8-PSK or multi-level QAM and PSK signals can be distributed in the same way.

ENGLISH-CLAIMS:
Return to Top of Patent

What is claimed is:

1. A signal distribution system for distributing a plurality of low noise amplifier and block converter (LNB) signals from a satellite outdoor unit (ODU) over a coaxial cable to an integrated receiver decoder (IRD) comprising: a signal selector that receives a plurality of broadband LNB signals comprising a plurality of transponder signals, the signal selector is responsive to transponder select information transmitted by an IRD and selects a plurality of transponder signals from at least one broadband LNB signal based on the transponder select information;a frequency translator coupled to the signal selector that is capable of shifting the selected transponder signals to new carrier frequencies to produce RF signals; anda signal combiner coupled to at least one frequency translator capable of combining at least two RF signals to produce a composite signal;wherein the modulation of the composite signal is the same as the modulation of the broadband LNB signals and wherein the composite signal is transmitted on the coaxial cable;whereby the composite signal is transmitted to the IRD.

2. The signal distribution system of claim 1 further comprising a plurality of IRDs and wherein the composite signal is transmitted on a single cable connected to the ODU and all IRDs receive channels extracted from the composite signal.

3. The signal distribution system of claim 1 wherein the signal selector comprises an analog to digital converter and a digital filter.

4. The signal distribution system of claim 1 wherein the signal selector comprises a tuner.

5. The signal distribution system of claim 1 further comprising an integrated receiver decoder (IRD) connected to the coaxial cable with a plurality of tuners within the IRD, wherein each tuner within the IRD receives the composite signal and each tuner uses at least one transponder signal.

6. The signal distribution system of claim 1 wherein transponder select information is

transmitted over the same cable as the composite signal.

7. The signal distribution system of claim 1 wherein transponder select information is transmitted over a wireless link.

8. A signal distribution system for distributing signals comprising a plurality of channels from a plurality of sources between a first unit and a second unit over a communication medium comprising: means in the first unit responsive to information transmitted by the second unit for extracting selected channels from each of the plurality of sources and combining the selected channels into a composite signal without demodulating channels and without changing the modulation of the channels and transmitting the composite signal over the medium; andmeans in the second unit for receiving the composite signal and demodulating and decoding at least one channel; andmeans in the first unit and second units for bi-directionally communicating control information between the second unit and the first unit.

9. The signal distribution system of claim 8 wherein the control information comprises channel selection requests originating from the second unit and the control information comprises channel mapping information originating from the first unit.

10. The signal distribution system of claim 8, further comprising a means in the first unit for carrier offset correction.

11. The signal distribution system of claim 8 wherein the first unit is a satellite outdoor unit and the second unit is a satellite integrated receiver decoder unit.

12. The signal distribution system of claim 11 wherein the communication medium consists of a single coaxial cable connected to the satellite outdoor unit.

13. The signal distribution system of claim 12 wherein the means for communicating uses the same communication medium as the composite signal.

14. A method of communicating a plurality of transponder signals from a satellite outdoor unit (ODU) that receives a plurality of satellite broadband signals to an integrated receiver decoder (IRD) over a single cable connected to the ODU, the method comprising the steps of: communicating a transponder request signal to the ODU from the IRD;in the ODU, selecting a plurality of transponder signals extracted from the received satellite broadband signals, wherein the selecting is responsive to the transponder request signals;combining selected transponder signals into a composite signal;transmitting the composite signal over the single cable from the ODU to the IRDs, wherein the modulation of the transponder signal is not altered by the steps of selecting, combining, and transmitting.

15. The method of claim 14 wherein the step of selecting a transponder signal comprises the step of: filtering a transponder signal with a band pass filter having a bandwidth ranging from 5% to 100% wider than the bandwidth of the transponder signal.

16. The method of claim 14 wherein the step of combining comprises frequency translating the selected transponder channels to a variable frequency before combining.

17. The method of claim 15 further comprising frequency translating the selected transponder channels to a predetermined frequency before combining.

18. The method of claim 14 further comprising the step of splitting the composite signal inside a home and distributing to a plurality of IRDs.

19. The method of claim 14 wherein the transponder request signal is transmitted over the cable from an IRD and all IRDs receive the same composite signal.

20. The method of claim 14 wherein the transponder request signal is transmitted over a wireless link to the ODU.

21. The method of claim 14 further comprising the steps of: frequency translating the selected transponder channels to a variable frequency before combining; andsplitting the composite signal inside a home and distributing to a plurality of IRDs.

22. The method of claim 21 wherein the transponder request signal is transmitted over the cable from an IRD.

23. The method of claim 21 wherein the transponder request signal is transmitted over a wireless link to the ODU.

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California Inventors Develop Broadband Content Distribution Signal Combiner US Fed News November 7, 2006 Tuesday 5:59 AM EST

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November 7, 2006 Tuesday 5:59 AM EST

LENGTH: 243 words

HEADLINE: California Inventors Develop Broadband Content Distribution Signal Combiner

BYLINE: US Fed News

DATELINE: Alexandria, Va.

BODY:

ALEXANDRIA, Va., Nov. 7 -- Itzhak Gurantz and Michael Landry, both of San Diego, and Ladd El Wardani of La Jolla, Calif., have developed a signal selector and combiner for broadband content distribution.

According to the U.S. Patent & Trademark Office: "In a satellite receiving system, program channels are selected from one or more broadband signals and combined with other selected channels and transmitted from a first unit, for example an outdoor unit, to a second unit, for example a gateway, server, or set-top box, using a single cable. Channels can be selected by digitizing the broadband signal then digitally filtering to isolate the desired channels. The outputs of several low noise amplifier and block converters can be selected and combined into one signal. Multiple set-top boxes can receive independent signals over a single cable from the outdoor unit."

The inventors were issued U.S. Patent No. **7,130,576** on Oct. 31.

The patent has been assigned to Entropic Communications Inc., San Diego.

The original application was filed on Nov. 6, 2002, and is available at:

http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=%2Fnetahtml%2FPTO%2Fsrchnum.htm&r=1&f=G&l=50&s1=**7,130,576.**PN.&OS=PN/**7,130,576**&RS=PN/**7,130,576**.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/008,389	02/06/2007	7130576	05JM-127751	3367

24244 7590 03/23/2007

MICHAEL W LANDRY
5098 SEACHASE STREET
SAN DIEGO, CA 92130

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

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EX PARTE REEXAMINATION COMMUNICATION TRANSMITTAL FORM

REEXAMINATION CONTROL NO 90/008389

PATENT NO. 7,130,576

ART UNI 3992

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified ex parte reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a replly has passed, no submission on behalf of the ex parte reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

Order Granting / Denying Request For Ex Parte Reexamination	Control No.	Patent Under Reexamination	
	90/008,389	7130576	
	Examiner	Art Unit	
	Scott L. Weaver	3992	

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

The request for *ex parte* reexamination filed *06 February 2007* has been considered and a determination has been made. An identification of the claims, the references relied upon, and the rationale supporting the determination are attached.

Attachments: a)☐ PTO-892, b)☒ PTO/SB/08, c)☒ Other: *Decision On Request*

1. ☒ The request for *ex parte* reexamination is GRANTED.

RESPONSE TIMES ARE SET AS FOLLOWS:

For Patent Owner's Statement (Optional): TWO MONTHS from the mailing date of this communication (37 CFR 1.530 (b)). **EXTENSIONS OF TIME ARE GOVERNED BY 37 CFR 1.550(c).**

For Requester's Reply (optional): TWO MONTHS from the **date of service** of any timely filed Patent Owner's Statement (37 CFR 1.535). **NO EXTENSION OF THIS TIME PERIOD IS PERMITTED.** If Patent Owner does not file a timely statement under 37 CFR 1.530(b), then no reply by requester is permitted.

2. ☐ The request for *ex parte* reexamination is DENIED.

This decision is not appealable (35 U.S.C. 303(c)). Requester may seek review by petition to the Commissioner under 37 CFR 1.181 within ONE MONTH from the mailing date of this communication (37 CFR 1.515(c)). **EXTENSION OF TIME TO FILE SUCH A PETITION UNDER 37 CFR 1.181 ARE AVAILABLE ONLY BY PETITION TO SUSPEND OR WAIVE THE REGULATIONS UNDER 37 CFR 1.183.**

In due course, a refund under 37 CFR 1.26 (c) will be made to requester:

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c) ☐ by credit to a credit card account, unless otherwise notified (35 U.S.C. 303(c)).

cc:Requester (if third party requester)

Decision on Request for Ex Parte Reexamination

Reexamination has been requested for claims 1-23 of United States Patent Number 7,130,576 to Gurantz et al. filed November 6, 2002, issued on October 31, 2006.

A substantial new question of patentability (SNQ) affecting claims 1-23 of United States Patent Number 7,130,576 to Gurantz is raised by the request for reexamination on February 6, 2007 for the reasons set forth below.

The References Cited in The Request

The Request identifies the following documents as providing teachings relevant to claims 1-23 of United States Patent Number 7,130,576 to Gurantz

Exhibit B	"INFORMATION FOR INSTALLERS OF HOT BIRD TM DVB-S SYSTEMS, VERSION 1.0" (hereinafter "Eutelsat Installers Guide"), EUTELSAT, dated June 7, 1999;
Exhibit C	"DIGITAL SATELLITE EQUIPMENT CONTROL (DiSEqC TM) UPDATE AND RECOMMENDATIONS FOR IMPLEMENTATION, VERSION 2.0" (hereinafter "Eutelsat DiSEqC Specification"), EUTELSAT, dated April 18, 1997;
Exhibit D	United States Patent No. 6,437,837 to Seo (hereinafter "Seo");
Exhibit E	United States Patent No. 5,073,390 to Green et al. (hereinafter "Green");
Exhibit F	United States Patent No. 6,005,861 to Humplemann (hereinafter "Humplemann");
Exhibit G	"A SINGLE CHIP UNIVERSAL DIGITAL SATELLITE RECEIVER WITH 480-Mhz IF INPUT" (hereinafter the "Broadcom Paper");
Exhibit H	"PHILLIPS DATA SHEET FOR UAA3202M FREQUENCY SHIFT KEYING RECEIVER", (hereinafter the "Phillips Data Sheet");
Exhibit I	United States Patent No. 5,654,774 to Pugel et al. (hereinafter "Pugel");
Exhibit J	United States Patent No. 4,953184 to Simone (hereinafter "Simone");

Exhibit K	European Patent No. 1009113 (hereinafter "EPO '113 Patent");
Exhibit L	European Patent No. 0757489 (hereinafter "EPO '489 Patent");
Exhibit M	United States Patent No. 5,285,284 to Takashima et al. (hereinafter "Takashima");
Exhibit N	United States Patent No. 6,353,463 to Seo (hereinafter "Seo")
Exhibit O	"RCA DIRECTTV RECEIVER WITH ULTIMATETV SERVICE SETUP GUIDE (hereinafter the "RCA Setup Guide");
Exhibit P	United States Patent No. 5,278,837 to Kelley (hereinafter "Kelley").

Exhibit D was of record during examination of the application with became the 7,130,576 patent to Gurantz, however, Exhibit D was not considered in combination with the new references cited in the request and as such is being viewed in a new light.

None of exhibits B-C or E-P listed above was previously considered nor made of record during prosecution of the application which became the 7,130,576 patent to Gurantz and as such have not been previously considered nor addressed during an 'examination' of the application which became the 7,130,576 patent to Gurantz, nor in a final holding of invalidity by the Federal Courts. The references listed above are not cumulative to the prior art of record.

Prosecution History

An examiners reasons for allowance was not provided during prosecution of the application which became the 7,130,576 patent to Gurantz.

In response to a third office action rejecting the claims, the patentee conducted an interview with the examiner. The interview included an explanation of the distinction between the claimed invention and the references relied on. The interview included an explanation that the claimed invention "include[s] the limitation of transponder selection responsive to a signal transmitted by an IRD." And that in the claimed "invention, a single cable can run from the selector and combiner, which can be in the ODU, to the inside of the building. The signal is split inside the building using a gateway or splitter device to distribute a composite signal to IRDs. The IRD commands to the selector requests individual transponder signals from satellite signals output by any one of the LNBs. The signal selector selects the transponder signals requested from each IRD, combines all of the selected transponder signals into a composite signal, then transits the composite signal, sent preferably over a single cable, and tunes its requested transponder signal for decoding and display on a television connected to the IRD. The composite signal changes based on collection of transponder select signals from each IRD.... [W]hereas in the applicant's invention and claim, the frequency translator operates on the signal output from the LNB[.]"

Claim 1 reads as follows:

> 1. A signal distribution system for distributing a plurality of low noise amplifier and block converter (LNB) signals from a satellite outdoor unit (ODU) over a coaxial cable to an integrated receiver decoder (IRD) comprising:
> a signal selector that receives a plurality of broadband LNB signals comprising a plurality of transponder signals, the signal selector is responsive to transponder select information transmitted by an IRD and selects a plurality of transponder signals from at least one broadband LNB signal based on the transponder select information;
> a frequency translator coupled to the signal selector that is capable of shifting the selected transponder signals to new carrier frequencies to produce RF signals; and
> a signal combiner coupled to at least one frequency translator capable of combining at least two RF signals to produce a composite signal;
> wherein the modulation of the composite signal is the same as the modulation of the broadband LNB signals and wherein the composite signal is transmitted on the coaxial cable; whereby the composite signal is transmitted to the IRD.

Issues Raised in the Request

The Requestor alleges that an SNQ is raised by Exh B.

It is agreed that the consideration of Exh B raises a substantial new question of patentability as to claims 1-2, 6, 8-9, 11-14, 16, 18-19, and 21-22 of the 7,130,576 patent to Gurantz.

Request pages 30-38, are hereby incorporated by reference from the request for reexamination for their explanation of the teaching provided in Exh B that was not present in the prosecution of the application which became the 7,130,576 patent to Gurantz

In summary, Exh B provides a discussion of Figure 11 and page 19 of Exh B which discusses architecture that includes communication between the terminal (IRD) and the head-end (selector) so that remote channel selection can be carried out , transmission of composite signal on coaxial cable (figure 11, p.27), and transmission of the composite signal (output of the RF combiner) sent to the IRD .

There is a substantial likelihood that a reasonable examiner would consider this teaching important in deciding whether or not the claim is patentable. Exh B was not before the examiner during prosecution of the 10/289,011 application which became the 7,130,576 patent to Gurantz. Accordingly, Exh B raises a substantial new question of patentability as to claims 1-2, 6, 8-9, 11-14, 16, 18-19, and 21-22 which question has not been decided in a previous examination of the 7,130,576 patent to Gurantz.

The Requestor alleges that an SNQ is raised by Exh C.

It is agreed that the consideration of Exh C raises a substantial new question of patentability as to claims 1-2, 6, 8-9, 11-14, 16, 18-19, and 21-22 of the 7,130,576 patent to Gurantz.

Request pages 65-71, are hereby incorporated by reference from the request for reexamination for their explanation of the teaching provided in Exh C that was not present in the prosecution of the application which became the 7,130,576 patent to Gurantz

In summary, Exh C provides a discussion of Figure 19 and page 8 of Exh B which discusses architecture that includes communication between the terminal (IRD) and the multiswitch (selector) so that band and channel selection can be carried out , transmission of composite signal on coaxial cable (figure 19, p.8), and transmission of the composite signal (output of the RF combiner) sent to the satellite receiver (IRD).

There is a substantial likelihood that a reasonable examiner would consider this teaching important in deciding whether or not the claim is patentable. Exh C was not before the examiner during prosecution of the 10/289,011 application which became the 7,130,576 patent to Gurantz. Accordingly, Exh C raises a substantial new question of patentability as to claims 1-2, 6, 8-9, 11-14, 16, 18-19, and 21-22 which question has not been decided in a previous examination of the 7,130,576 patent to Gurantz.

Requestor further alleges that claims 2-5, 7, 10, 15-17, and 20-23 may be unpatentable in consideration of secondary references (exhibits D-P) in combination with (exhibit B as indicated on pages 53- 65 and exhibit C as indicated on pages 87-99) of the request. Since each of the exhibits B and C as indicated in the request is considered to raise a substantial new question of patentability as noted above, the combinations of exhibits B and C separately with exhibits D-P therewith as suggested on pages 53-65 and 87-99 respectively of the request also raises substantial new question of patentability for similar reasons.

All claims 1-23 of the patent will be reexamined as requested in the request.

Conclusion

Extensions of time under 37 CFR 1.136(a) will not be permitted in these proceedings because the provisions of 37 CFR 1.136 apply only to "an applicant" and not to parties in a reexamination proceeding. Additionally, 35 U.S.C. 305 requires that *ex parte* reexamination proceedings "will be conducted with special dispatch" (37 CFR 1.550(a)). Extensions of time in *ex parte* reexamination proceedings are provided for in 37 CFR 1.550(c).

The patent owner is reminded of the continuing responsibility under 37 CFR 1.565(a) to apprise the Office of any litigation activity, or other prior or concurrent proceeding, involving U.S. Patent Number 7,130,576 throughout the course of this reexamination proceeding. The third party requester is also reminded of the ability to similarly apprise the Office of any such activity or proceeding throughout the course of this reexamination proceeding. See MPEP §§ 2207, 2282 and 2286.

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Scott L. Weaver
Primary Examiner
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CRU EXAMINER-AU 3992

Conferees:

ROLAND G. FOSTER
CRU EXAMINER-AU 3992

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Complete if Known	
Application Number	TBD
Filing Date	TBD
First Named Inventor	Itzhak GURANTZ
Art Unit	TBD
Examiner Name	TBD
Attorney Docket Number	05JM-127751

U. S. PATENT DOCUMENTS

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/SLW/		US-5,278,837		Kelley	
/SLW/		US-5,285,284		Takashima et al.	
/SLW/		US-5,654,774		Pugel et al.	
/SLW/		US-5,703,390		Green et al	
/SLW/		US-6,005,861		Humpleman	
/SLW/		US-6,353,463		Seo	
/SLW/		US-6,437,837		Seo	
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FOREIGN PATENT DOCUMENTS

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/SLW/		EP 1009113				
/SLW/		EP 0757489				

Examiner Signature	/Scott Weaver/	Date Considered	03/20/2007

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 2 of 2

Complete if Known	
Application Number	TBD
Filing Date	TBD
First Named Inventor	Itzhak GURANTZ
Art Unit	TBD
Examiner Name	TBD
Attorney Docket Number	05JM-127751

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	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, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
/SLW/		Eutelstat, "Information for Installers of Hot Bird tm DVB-S Systems, Version 1.0" http://www.eutelstat.com/docs/tech, June 7, 1999	
/SLW/		Eutelstat, Digital Satellite Equipment Control (DiSEqC TM) "Update and Recommendation for Implementation, Version 2.0" http://www.eutelstat.org/press/tv_recept1/html#DiSEqC, April 18, 1997	
/SLW/		A.Y. Kwentus, et al. "A Single Chip Universal Digital Satellite Receiver with 480-Mhz IF Input" IEEE Journal of Solid-State Circuits, VoL. 34, No.11, November 1999, pp.1634-1646	
/SLW/		Philips Semiconductors-Integrated Circuits "Data Sheet for UAA3203M Frequency Shift Keying Receiver" Preliminary specification, 1997 Aug 12, www.datasheetcatalog.com	
/SLW/		Thomson Consumer Electronics "RCA DirectTV Receiver with UltimateTV Service Setup Guide" WebTV Networks, Inc. 2000	

Examiner Signature	/Scott Weaver/	Date Considered	03/20/2007

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Sheet 1 of 2

Complete if Known	
Application Number	90/08,389
Filing Date	12/20/06
First Named Inventor	Itzhak GURANTZ
Art Unit	TBD
Examiner Name	James R. MATTHEWS
Attorney Docket Number	05JM-127751

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
SW		US-5,278,837		Kelley	
SW		US-5,285,284		Takashima et al.	
SW		US-5,654,774		Pugel et al.	
SW		US-5,703,390		Green et al	
SW		US-6,005,861		Humpleman	
SW		US-6,353,463		Seo	
SW		US-6,437,837		Seo	
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Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3] "Number[4] "Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
		EP 1009113				
		EP 0757489				

Examiner Signature: SW — Date Considered: 3/20/2007

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Sheet 2 of 2

	Complete if Known
Application Number	90/008,389
Filing Date	12/20/06
First Named Inventor	Itzhak GURANTZ
Art Unit	TBD
Examiner Name	James R. MATTHEWS
Attorney Docket Number	05JM-127751

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	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, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
SW		Eutelstat, "Information for Installers of Hot Bird tm DVB-S Systems, Version 1.0" http://www.eutelstat.com/docs/tech, June 7, 1999	
SW		Eutelstat, Digital Satellite Equipment Control (DiSEqC TM) "Update and Recommendation for Implementation, Version 2.0" http://www.eutelstat.org/press/tv_recept1/html#DiSEqC, April 18, 1997	
SW		Philips Semiconductors-Integrated Circuits "Data Sheet for UAA3203M Frequency Shift Keying Receiver" Preliminary specification, 1997 Aug 12, www.datasheetcatalog.com	
SW		A.Y. Kwentus, et al. "A Single Chip Universal Digital Satellite Receiver with 480-Mhz IF Input" IEEE Journal of Solid-State Circuits, Vol. 34, No. 11, November 1999, pp. 1634-1646	
SW		Thomson Consumer Electronics "RCA DirectTV Receiver with UltimateTV Service Setup Guide" WebTV Networks, Inc. 2000	

Examiner Signature	SW	Date Considered	3/20/07

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Reexamination	Application/Control No.	Applicant(s)/Patent Under Reexamination
	90/008,389	7130576
	Certificate Date	Certificate Number

Requester Correspondence Address: ☐ **Patent Owner** ☒ **Third Party**

Daniel N. Yannuzzi
Sheppard, Mullin, Richter & Hampton LLP
12275 El Camino Real, Suite 200
San Diego, CA 92130

LITIGATION REVIEW ☒	**SLW** (examiner initials)	**2/2/6/2007** (date)
Case Name		Director Initials
None		

COPENDING OFFICE PROCEEDINGS	
TYPE OF PROCEEDING	**NUMBER**
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3.	
4.	

Litigation Search Report CRU 3999

Reexam Control No. 90/008,389

TO: Eric Keasel/Fred Ferris Location: CRU Art Unit : 3992 Date: 06/03/08 Case Serial Number: 90/008,389	From: James R. Matthews Location: CRU 3999 MDW 7C71 Phone: (571) 272-4233 JamesR.Matthews@uspto.gov

Search Notes

U.S. Patent No.- 7,130,576

1) I performed a KeyCite Search in Westlaw, which retrieves all history on the patent including any litigation.

2) I performed a search on the patent in Lexis CourtLink for any open dockets or closed cases.

3) I performed a search in Lexis in the Federal Courts and Administrative Materials databases for any cases found.

4) I performed a search in Lexis in the IP Journal and Periodicals database for any articles on the patent.

5) I performed a search in Lexis in the news databases for any articles about the patent or any articles about litigation on this patent.

Date of Printing: JUN 03,2008

KEYCITE

US PAT 7130576 SIGNAL SELECTOR AND COMBINER FOR BROADBAND CONTENT DISTRIBUTION, Assignee: Entropic Communications, Inc. (Oct 31, 2006)

History

=> 1 **SIGNAL SELECTOR AND COMBINER FOR BROADBAND CONTENT DISTRIBUTION**, US PAT 7130576, 2006 WL 3085317 (U.S. PTO Utility Oct 31, 2006) (NO. 10/289011)

Patent Family

2 SIGNAL DISTRIBUTION SYSTEM FOR DIRECT BROADCAST SATELLITE SYSTEM, COMBINES RADIO FREQUENCY SIGNALS TO PRODUCE COMPOSITE SIGNAL WHICH USES MODULATION PROCEDURE SAME AS BROADBAND LOW NOISE AMPLIFIER AND BLOCK CONVERTER SIG, DWPL 2007-052908

Assignments

3 Assignee(s): ENTROPIC COMMUNICATIONS INC.,
DATE RECORDED: Dec 27, 2002

Patent Status Files

. Request for Re-Examination, (OG date: Apr 10, 2007)

Prior Art (Coverage Begins 1976)

C 5 US PAT 6441797 AGGREGATED DISTRIBUTION OF MULTIPLE SATELLITE TRANSPONDER SIGNALS FROM A SATELLITE DISH ANTENNA, Assignee: Hughes Electronics Corporation, (U.S. PTO Utility 2002)

C 6 US PAT 6556807 ANTENNA RECEIVING SYSTEM, Assignee: Mitsubishi Electric & Electronics USA,, (U.S. PTO Utility 2003)

C 7 US PAT 5760822 CENTRAL NODE CONVERTER FOR LOCAL NETWORK HAVING SINGLE COAXIAL CABLE, Assignee: Lucent Technologies Inc., (U.S. PTO Utility 1998)

C 8 US PAT 6437837 DIGITAL BROADCAST SIGNAL PROCESSING APPARATUS AND METHOD IN WHICH CHANNEL INTERFERENCE BY ANALOG BROADCAST IS PREVENTED, Assignee: Samsung Electronics Co., Ltd., (U.S. PTO Utility 2002)

C 9 US PAT 5959592 &LDQUO;IF&RDQUO; BANDSTACKED LOW NOISE BLOCK CONVERTER COMBINED WITH DIPLEXER, Assignee: EchoStar Engineering Corporation, (U.S. PTO Utility 1999)

C 10 US PAT 6947702 SATELLITE BROADCAST RECEIVING AND DISTRIBUTION SYSTEM, Assignee: Global Communications, Inc., (U.S. PTO Utility 2005)

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C 11 US PAT 6600730 SYSTEM FOR DISTRIBUTION OF SATELLITE SIGNALS FROM SEPARATE MULTIPLE SATELLITES ON A SINGLE CABLE LINE, Assignee: Hughes Electronics Corporation, (U.S. PTO Utility 2003)

C 12 US PAT 6134419 TRANSMODULATED BROADCAST DELIVERY SYSTEM FOR USE IN MULTIPLE DWELLING UNITS, Assignee: Hughes Electronics Corporation, (U.S. PTO Utility 2000)

C 13 US PAT 6493873 TRANSMODULATOR WITH DYNAMICALLY SELECTABLE CHANNELS, Assignee: Hughes Electronics Corporation, (U.S. PTO Utility 2002)

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Patent Search 7130576 6/3/2008

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289011 (10) 7130576 October 31, 2006

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7130576

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Link to Claims Section

October 31, 2006

Signal selector and combiner for broadband content distribution

REEXAM-LITIGATE: February 6, 2007 - Reexamination requested February 6, 2007 by RF Magic, San Diego, CA; (Attny. Is: Daniel N. Yannuzzi, Sheppard, Mullin, Richter & Hampton, LLP, San Diego, CA), Reexamination No. 90/008,389 (O.G. April 10, 2007) Ex. Gp.: 3992

INVENTOR: Gurantz, Itzhak - San Diego, California, United States (US); El Wardani, Ladd - La Jolla, California, United States (US); Landry, Michael - San Diego, California, United States (US)

APPL-NO: 289011 (10)

FILED-DATE: November 6, 2002

GRANTED-DATE: October 31, 2006

ASSIGNEE-PRE-ISSUE: December 27, 2002 - ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS)., ENTROPIC COMMUNICATIONS INC. 9276 SCRANTON ROAD, SUITE 200 SAN DIEGO CALIFORNIA 92121, Reel and Frame Number: 014140/0486

ASSIGNEE-AT-ISSUE: Entropic Communications, Inc., San Diego, California, United States (US), United States company or corporation (02)

LEGAL-REP: Landry, Michael W. -

PUB-TYPE: October 31, 2006 - Utility Patent having no previously published pre-grant publication (B1)

PUB-COUNTRY: United States (US)

REL-DATA:

Provisional Application Ser. No. 60345965, November 7, 2001, PENDING
Provisional Application Ser. No. 60333722, November 27, 2001, PENDING
Provisional Application Ser. No. 60358817, February 22, 2002, PENDING

US-MAIN-CL: 455#3.02

US-ADDL-CL: 455#3.01, 455#3.04, 455#427, 725#71, 725#78

CL: 455, 725

SEARCH-FLD: 455#3.01-3.05, 455#103, 455#137, 455#12.1, 455#20, 455#427, 725#64, 725#71, 725#78, 725#98, 725#118

IPC-MAIN-CL: [8] H04H 001#00 (20060101) Advanced Inventive 20061031 (A F I B H US)

PRIM-EXMR: Anderson, Matthew D.

ASST-EXMR: Sharma, Sujatha

REF-CITED:
5760822, June, 1998, Coutinho, United States (US), 348#121
6437837, August, 2002, Seo, United States (US), 348#735
6441797, August, 2002, Shah, United States (US), 343#840
6493873, December, 2002, Williams, United States (US), 725#78
6556807, April, 2003, Horie et al., United States (US), 455#3.02
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20030031191, February, 2003, El Wardani et al., United States (US), 370#401
20030115608, June, 2003, Armstrong et al., United States (US), 725#78
20040058642, March, 2004, Merio, United States (US), 455#3.02
20040060065, March, 2004, James et al., United States (US), 725#71
20050005296, January, 2005, Bargroff et al., United States (US), 725#63

CORE TERMS: channel, transponder, filter, frequency, cable, band, digital, converter, spectrum, selector, sample, bandwidth, select, selecting, combined, analog, satellite, gateway, carrier, tuner, composite, filtering, point switch, outdoor, alternatively, offset, input, transmitted, translated, broadband

ENGLISH-ABST:

In a satellite receiving system, program channels are selected from one or more broadband signals and combined with other selected channels and transmitted from a first unit, for example an outdoor unit, to a second unit, for example a gateway, server, or set-top box, using a single cable. Channels can be selected by digitizing the broadband signal then digitally filtering to isolate the desired channels. The outputs of several LNBs can be selected and combined into one signal. Multiple set-top boxes can receive independent signals over a single cable from the outdoor unit.

NO-OF-CLAIMS: 23

EXMPL-CLAIM: 1

NO-OF-FIGURES: 17

NO-DRWNG-PP: 17

PARENT-PAT-INFO:

RELATED APPLICATIONS

[0001]This application claims priority to U.S. provisional patent application No. 60/345,965 filed Nov. 7, 2001 entitled "Signal Selector and Combiner for Broadband Content Distribution"; U.S. provisional patent application No. 60/333,722 filed Nov. 27, 2001 entitled "Signal Selector and Combiner for Broadband Content Distribution"; and U.S. provisional patent application No. 60/358,817 filed Feb. 22, 2002 entitled "Signal Selector and Combiner for Broadband Content Distribution", each of which is incorporated herein by reference.

SUMMARY:

BACKGROUND

[0002]Referring to FIG. 1, a satellite receiver outdoor unit (ODU) 110 typically comprises a dish antenna 150, one or more antenna feed horns 130, one or more low noise amplifier and block down converters (LNB) 140, and an optional multiport cross point switch 160. Dish 150 collects and focuses received signal power onto antenna feed horns 130 which couples the signal to LNBs 140. A single dish 150 may have multiple feed horns 130 wherein each feed receives a signal from a different satellite in orbit. An installation may have more than one dish, feed, and LNB assemblies. The cross point switch 160 allows connection of the outdoor unit 110 to more than one integrated receiver decoder (IRD) 180 located inside the building. IRDs are commonly called set top boxes (STBs) arising from their typical installed location on top of TV sets. The LNB 140 converts the signal transmitted by a satellite in Earth orbit, for example C band, Ku band, or another frequency band, to a lower intermediate frequency (IF) suitable for transmission through coax inside a building. For example, L band IF (950 to 1450 MHZ) with RG-6 or RG-11 coax cable is commonly used. The IRD 180 tunes one transponder channel, demodulates the IF signal from the LNB down to base band, provides channel selection, conditional access, decodes the digital data to produce a video signal, and generates an RF output to drive a television.

[0003]A satellite outdoor unit may have as many as three or more LNBs each with two receiving polarizations. The received polarization is selected by sending a voltage or other control signal to the LNB. In this configuration there are six possible 500 MHz signals that may be selected by the multiport cross point switch to be routed to each IRD. The 500 MHz signal is typically comprised of 16 transponder signals of 24 MHz bandwidth each with a guard band in between each transponder signal. Other transponder bandwidths are used such as 36 MHz, 54 MHz with a single channel or shared by two TV signals, and 43 MHz.

[0004]A problem with the conventional approach to connecting an outdoor unit to IRDs is that multiple cables are required to be run from the outdoor unit: one cable for each room where an IRD is located. When a new IRD is added another cable must be installed. In an application using a media server, a central processor for all video signals, multiple cables are needed to route signals from the ODU to the server.

[0005]FIG. 4 shows a representative spectrum of the signal output by an LNB. In a conventional satellite ODU this signal is routed through a cross point switch to one of the IRDs. Note that all transponder channels in the signal are from a single LNB and from the same polarization satellite signal. The cross point switch allows any of the cables connected from the ODU to the IRDs to be switched to any of the LNBs. A dedicated cable for each IRD

is needed because in general each IRD is not using the same LNB and polarization at the same time. A server requires access to several LNB signals simultaneously, thus requiring several cables.

[0006]U.S. Pat. No. 6,134,419, incorporated herein by reference, by Williams assigned to Hughes Electronics, addresses part of the problem. The Williams patent recognizes that the bandwidth of the signal from each of the two polarizations is too broad to be transmitted over standard RG-6 or RG-59 cable, particularly when combined with the cable CATV signal. Williams addresses this problem using a transmodulator, by demodulating and remodulating to a different modulation scheme the RHCP and LHCP signals using a tuner, decoder, packetizer, cable encoder, and up converter for each of 32 transponder channels. The transmodulator outputs a signal with a higher-level modulation scheme to reduce the bandwidth occupied by the satellite signals. In the example provided, the QPSK signals from the LNBs are transmodulated to 128-QAM, reducing the bandwidth from 1000 MHz to 192 MHz. At the set top box (STB) the 128 QAM signal is demodulated and processed to produce an NTSC analog video signal sent to a television set.

[0007]One problem with the Williams approach is the circuit complexity due to the 32 tuner paths required in the transmodulator. For an increase in the number of satellite signals, this problem becomes more pronounced. Williams discloses modulation using 128-QAM, which requires a higher signal to noise ratio (SNR) than QPSK and is it more susceptible to impairment from multipath present in a cable environment.

[0008]U.S. Pat. No. 5,959,592 incorporated herein by reference, by Petruzzelli addresses combining both the left hand circular polarized (LHCP) and right hand circular polarized (RHCP) signals into one signal that is transmitted from the ODU. In the disclosed band stacking approach, the output of two low noise amplifiers (LNAs), each 500 MHz wide, are frequency translated to different IF frequencies and summed into a signal with a bandwidth of more than 1000 MHz. In one example disclosed, the different IF bands are 950 to 1450 MHz and 1550 to 2050 MHz. The problem with this approach is that the resulting bandwidth is very wide and becomes impractical when the number of LNB signals increases because each LNB output requires 500 MHz of bandwidth on the cable.

[0009]Satellite systems are described generally in G. E. Lewis, "Communication Services via Satellite" Butterworth-Heinemann Ltd. 1992.

SUMMARY OF THE INVENTION

[0010]A channel selecting and combining solution is used in the outdoor unit where one or more transponder channels are selected from each LNB output. The transponder channel or channels needed from each LNB are selected by a filter. Each selected transponder signal may be translated to a new channel frequency. The selected transponder channels are combined to form a composite signal. All of the selected, translated, and combined transponder channels are transmitted over a single cable to a gateway unit that extracts the channels to distribute to the IRDs. The gateway can frequency translate each transponder channel to its original frequency. Alternatively, the IRDs connect directly from the cable or through a splitter and tune the desired transponder channels. A channel translation mapping table is used to coordinate the channel assignment between the original channels and new channels. In another alternative embodiment, the gateway transmits the video information over a digital data network.

[0011]LNB outputs can be sampled by a broadband A/D converter and filtered with a digital filter to select a transponder channel. Alternatively, a tuner can select a transponder channel. The selecting process extracts from the wide band LNB output a narrow band transponder channel.

[0012]Each IRD communicates the channels it needs to receive, directly or indirectly, to the signal selector. This information is used to select the transponder channel to combine in the signal selector output signal, the ODU downlink. New IRD designs can incorporate a signaling channel that uses unoccupied regions of the frequency spectrum of the cable, or a wireless communication link, to communicate the channel information. To provide compatibility with existing IRDs, the channel information can be communicated by an IR or RF auxiliary channel to the gateway or outdoor unit.

[0013]Many newer homes have coaxial cable installed that runs to a central location. In the present invention a gateway is located at the central location that receives the combined signal from the outdoor unit and distributes the signals to the IRDs. An IRD requests a channel through an IR or RF signal communicated to the gateway. The RF communication can be in the cable connecting the IRD to the gateway or a wired or wireless signal.

[0014]The present invention requires only one cable wire to be routed from the outdoor unit to inside the building or to a gateway. Additional IRDs can be added without any installation effort needed on the outdoor unit. In certain configurations the invention eliminates the cross point switch.

[0015]The present invention can be used along with other signals transmitted on the distribution cable. The combined transponder signal can occupy a predetermined region of the frequency spectrum while another service, such as CATV can occupy a different region. Another example of shared use of the cable is along with a single or band stacked satellite signal. In this example, frequencies such as 950[ndash]1450 and 1550[ndash]2050 are used by a conventional satellite system, and frequencies outside and between these frequency bands are occupied with a combined transponder signal according to the present invention.

DRWDESC:

BRIEF DESCRIPTION OF THE DRAWINGS

[0016]FIG. 1 Shows a prior art configuration of a satellite TV installation.

[0017]FIG. 2 shows a satellite TV installation according to the present invention.

[0018]FIG. 3 shows a block diagram of a selector and combiner according to the present invention.

[0019]FIG. 4 Shows a diagram of the frequency spectrum of individual LNB output signals according to the prior art.

[0020]FIG. 5 shows a diagram of the frequency spectrum of individual LNB output signals and the frequency spectrum of the composite RF signal comprising selected transponder signals in accordance with the present invention.

[0021]FIG. 6 shows an embodiment of the present invention wherein the sampled data is distributed digitally to channel selector filters.

[0022]FIG. 7 shows an embodiment of the present invention wherein the selected channel data is distributed digitally to the up converters.

[0023]FIG. 8 shows an embodiment of the present invention wherein the each LNB has a dedicated selector and up converter.

[0024]FIG. 9 shows an embodiment of the present invention wherein tuners and up converter are used to select and combine transponder channels.

[0025]FIG. 10 shows an embodiment wherein selected channel are processed by an MPEG transport stream demultiplexer and combined as data packets for digital LAN transmission.

[0026]FIG. 11 shows a satellite TV installation according to the present invention providing compatibility with existing installed STBs and new STBs and using a server/gateway.

[0027]FIG. 12 shows details of an outdoor unit providing compatibility with new and existing STBs.

[0028]FIG. 13 shows the frequency spectrum of signals at various points in the signal processing.

[0029]FIG. 14 shows the frequency spectrum of signals in another embodiment of the invention using base band processing.

[0030]FIG. 15 shows the frequency spectrum of signals filtered and combined with excess bandwidth.

[0031]FIG. 16 shows the frequency spectrum of conventional LNB signals combined with selected transponder channels in accordance with the present invention.

[0032]FIG. 17 shows one example of a frequency translator and filter.

DETDESC:

DETAILED DESCRIPTION OF THE INVENTION

[0033]Referring to FIG. 2, a satellite TV installation according to the present invention is shown. Signal selector 250, part of satellite outdoor unit 210, extracts the needed transponder channels from each of the LNB outputs and combines the channels into one composite signal transmitted on cable 220. Gateway 230 receives the signals and provides distribution to the IRDs located in the building. Controller 255 is responsible for communicating channel map, control, and status information with gateway 230 and IRDs 240. Controller 255 also tunes filters and local oscillators in the signal selector and maintains the channel map specifying the assigned frequency slots for transponder channels. Alternatively, the channel map can be maintained by gateway 230.

[0034]Gateway 230 can be a simple power splitter/summer allowing the IRDs to connect directly to the cable. Gateway 230 would be located inside the home in a convenient location that allows connection to the IRDs 240. Gateway 230 is designed to pass signaling from IRDs 240 to ODU 210 that contains the channel selection information.

[0035]Each LNB output signal is applied to a signal selector that extracts zero, one, or more transponder channels to be combined into a composite signal.

[0036]Refer to FIG. 3. In an embodiment of the present invention, a quadrature down converter is used to produce I and Q analog signals. The down converter is comprised of a local oscillator 382, phase splitter 384 to produce an in-phase and quadrature-phase LO, two mixers 310, and two filters 320. The filters 320 reject the undesired mixing products. The I and Q signals are sampled by high-speed broadband A/D converters 330 to create I and Q

digital samples. The samples are N bits wide, where N is selected to limit the degradation to the signal to an acceptable level. The entire 500 MHz band is digitized by this operation. All further digital processing is done using complex operations applied to the I and Q digital samples. The sample rate is 500 MHz or higher.

[0037]The resolution of the A/D converters is in the range of 4 to 12 bits. To sample and reproduce a QPSK signal 6 to 8 bits would be adequate. More bandwidth efficient modulation such as 8PSK would require more bits of resolution. The selection of resolution is based on considering power consumption, SNR, and cost.

[0038]A coherent LO generated by carrier tracking is not needed since the sampled data is not decoded in the ODU. An unknown carrier offset is present between the LO and the carrier of the received signal. A small additional carrier offset is introduced by the down conversion process but will be removed in the carrier recovery operation in the IRD. It is desirable that the LO carrier noise be low enough to be tracked out by the carrier loop in the IRD.

[0039]Digital filtering 340 is used to select one or more of the transponder output signals. The digital filter may operate by applying a band pass filter transfer function to the broadband signal to isolate a single transponder channel. The filter uses known digital architectures such as finite impulse response (FIR) or infinite impulse response (IIR). The filter is tuned by programming a set of filter coefficients to select a specific pass band. Frequency domain filter can also be employed using FFT or DFT architectures. Other filtering techniques include polyphase filter structure. These filtering techniques are well known in the digital signal processing field. References covering digital filtering include Thomas J. Cavicchi "Digital Signal Processing" John Wiley & Sons, 2000; Sanjit K. Mitra, "Digital Signal processing, a Computer Based Approach" McGraw-Hill, 2001; Proakis and Manolakis, "Introduction to Digital Signal Processing", Macmillan Publishing, 1988; DSP and applications, Analog Devices.

[0040]Referring again to FIG. 3, the selected transponder channel is then frequency translated to a new carrier frequency. The selected and frequency translated digital signal is converted to an analog signal using a D/A converter for the I and Q components. One approach is to convert the digitally filtered signal to the analog domain using a D/A converter 350, then using a quadrature modulator with mixers 360, phase splitter 388, LO 386, and summer 380. Alternatively, this can be done by a digital mixing operation where a rotating phasor is multiplied by the data samples to translate their frequency, then converting the frequency shifted digital signal to an analog signal with a D/A.

[0041]LO 386 is variable to allow the selected channel to be frequency translated to any of the channels available in the band. Alternatively, the LO can be fixed at different a frequency for each of the channel selectors.

[0042]Alternatively, a single transponder channel can be selected by translating the spectrum down in frequency to place the selected channel at base band then applying a low pass filter transfer function to isolate a single channel. The translation can be done by a digital mixing operation wherein the sample data is multiplied by a data sequence representing a carrier frequency. A post-mixing filter rejects the undesired mixing terms.

[0043]FIG. 14 shows the frequency spectrum of the signal as it is processed. The original spectrum 1 is frequency translated to locate the selected transponder channel at base band, as shown in spectrum 2. A low pass filter then passes one transponder channel and removes signal information from the other transponder channels, shown in spectrum 3. This signal is then converted to an analog signal, mixed to a new frequency, and summed with other channels in the analog domain.

[0044]One summer input is provided for each signal selectors. This is a broadband signal

comprising up to 16 or 32 channels. Alternatively, a summer combines the analog I and Q signals from all the signal selectors.

[0045]Two basic approaches to combining are possible. One approach is to combine digitally filtered signals in the digital domain. This can be achieved with all filtered transponder channels to be combined presented at a sample rate equal to the composite output rate. The other approach is to combine the selected signals in the analog domain. This leads to two possible approaches to filtering. One is to implement filters with the same input and output sample rate. The other approach is to filter with an output sample rate that differs from the input sample rate.

[0046]An example of a digital combining embodiment, a 500 msps broadband sampling of the LNB output could be filtered to produce a 500 msps output stream representing one or more transponder channels. Each transponder channel may be frequency translated to the desired new carrier frequency, then filtered to produce a single transponder signal that can be combined with other similarly selected transponder channels.

[0047]FIG. 13 shows the frequency spectrum of a sample stream as it is processed. The original spectrum 1 is frequency translated to locate the selected transponder channel at the desired frequency, as shown in spectrum 2. A band pass filter then passes one transponder channel and removes signal information from the other transponders channels, shown in spectrum 3. This filtering operation selects one transponder. In this example transponder channel B is selected. The sample stream for the selected channel is added to the sample stream from other filtering sections, represented in spectrum 4, to produce a composite sample stream in spectrum 5. Other selected channels are represented by channels labeled X.

[0048]FIG. 17 shows a block diagram of the processing elements to perform these steps. Local oscillator (LO) 1710 feeds mixer 1720 and is then band pass filtered by filter. LO is variable to allow the selected channel to be frequency translated to any of the channels available in the band. Filter 1730 has a programmable pass band frequency, tuned by loading different filter coefficients. Summer 1740 adds the sample stream to other sample streams. Several transponder channels are selected, each requiring one input to an adder. One embodiment uses a two input adder for each filter channel to implement a pipeline adder. The time delay introduced by a pipeline adder does not present a problem to the system because the receivers are each demodulating one transponder and the relative time delay is not apparent.

[0049]The frequency translation can occur either before or after the filtering operation. An advantage to translating first followed by filtering is that the filter removes the unwanted mixing terms generated. In either case, a rotating phasor is multiplied by the data samples to translate their frequency.

[0050]An example of an analog-combining embodiment, the digital filters may have an output sample rate that differs from the input sample rate. This can be inherent in the filtering operation or result from a down sampling done after filtering. Down sampling after the selecting filter is possible because the single channel the bandwidth is narrower than the A/D output and fewer samples are needed to represent the signal.

[0051]The spectrum is placed at the desired RF frequency by choosing the LO frequency driving the up converters. One example would be 950 to 1450 MHz, a standard IF frequency for DBS systems. This frequency band is compatible with standard set top box (STB) hardware. Other IF frequencies could be used. Using this technique, standard STB hardware can receive the new composite signal and demodulate and decode the video and audio signals. Specific TV channels are located at new transponder frequencies. A mapping table allows the IRD/STB to tune to the correct transponder channel. The bandwidth of the

spectrum can be 500 MHz for a 16-transponder system, 1000 MHz for a 32-transponder system, or other bandwidths according to the number of transponder channels present on the cable. If the system uses band stacking, the A/D converter can directly sample the 1000 MHz IF signal, with or without a frequency translation, or the two LNB polarizations can be separated into two 500 MHz signals each digitized with separate A/D converters.

[0052]Alternatively, the IF signal from the LNB can be directly band pass sampled by a single A/D converter. The IF signal can be frequency translated to a different IF frequency before band pass sampling. Band pass sampling requires a higher speed A/D converter than base band sampling, but only a single A/D.

[0053]One pair of A/D converters is provided for each LNB output. Alternatively, the LNB output can be band pass sampled using a single A/D converter. At a given point in time some LNB outputs may not be accessed by a user. If no transponder channel is selected from a particular LNB output, the A/D converters associated with that LNB output may be switched off to reduce power consumption and heat generation, or reallocated to process another LNB output.

[0054]The A/D digitizes the entire LNB output signal; therefore all transponder channels are available in the sampled data. More than one transponder channel may be selected from the A/D data to be combined in the composite signal. When all A/D are powered up any combination of transponder channels from any LNB output can be combined into the composite signal for distribution to the gateway and STBs.

[0055]FIG. 5 shows a frequency spectrum of the composite signal. Each of the available channels can be occupied with any transponder channel of any polarization from any LNB. One or more channels are used by each active IRD connected to the system. The number of transponder channels in the composite signal can be from as few as 2 to as many as 32, depending on the number of simultaneous channels needed in the system.

[0056]In general, the selecting and combining process will result in transponder channels located at different frequencies than where originally found. A translation table maps original channel locations on the selector input to new channel locations on the selector output. This map created and maintained by a controller located in the ODU or the gateway and is communicated to the IRDs or other devices in the network.

[0057]The channel selector performs a frequency selective filtering operation to select the desired transponder frequency. The transition band of this filter is steep, passing the selected transponder channel and rejecting adjacent transponder channels. The transition region available is derived from the guard band between channels. This can be as small a few Mega-Hertz. If the LNB carrier offset is large, a shift in the spectrum will result in the selecting filter cutting off part of the desired spectrum and passing part of an adjacent channel. For this reason a carrier offset estimate is desirable. Since all transponder channels from a given LNB will have approximately the same offset, it is only necessary to monitor one transponder channel from each LNB to determine the offset for all channels. Any of several know techniques for estimating the carrier offset may be employed. One example is two use two filters each approximately half the transponder bandwidth. By measuring the ratio of power from each filter output, an estimate of the carrier offset can be determined. Once the carrier offset is estimated, the sampled signal can be multiplied by a rotating phasor value to digitally shift the spectrum back to the nominal position. Alternatively, this frequency offset correction can be done in the analog domain, or a combination of digital and analog approaches.

[0058]Another approach to addressing the unknown carrier offset in the LNB is to use a wider filter to select transponder channels, wherein the bandwidth of the filter passes the selected transponder and part of the adjacent spectrum. In this way, if the transponder

signal is not centered in the filter bandwidth the band edges will not be attenuated by the filter roll off. This excess bandwidth will allow some energy from the neighboring transponder signals. A wider channel separation is needed on the combined signal, for example the selected transponders can be spaced twice the conventional spacing. This approach makes less efficient use of the cable spectrum but simplifies the hardware implementation by reducing the requirement of or eliminating the carrier offset correction. Additionally, a less steep filter roll off is possible.

[0059]FIG. 15 shows the signal spectrum as it is processed. Spectrum 1 is a representative original spectrum. Spectrum 2 shows the filter pass band characteristic, which is wider than one transponder channel. Spectrum 3 is the result of filtering one transponder channel. Spectrum 4 is a composite of several transponder channels. A region between the selected channels is unused. The exact shape of the unused spectrum will be dependent on the filter roll-off characteristics, but is not significant. The objective is to pass the selected transponder signal without distortion.

[0060]The approach of using a filter with excess bandwidth technique is also useful for implementing the invention using an analog approach. A filter with a stop band substantially wider than the transponder channel allow using filters with more gradual transition band, and is therefore simpler to implement. The excess bandwidth can range from less than 5% to 100% wider than the transponder bandwidth.

[0061]FIG. 6 shows a variation of the present invention that uses a cross point switch or shared bus 640 to distribute data from the A/Ds to the channel selecting filters. The cross point switch, also called crossbar switch, allows any signal input to be passed to any output. It can take the form of a data selector or multiplexer. Implemented as a shared bus, data sinks receive signals from data source using a time-multiplexed bus. Either a cross point switch or a shared bus can be unidirectional or bidirectional. The cross point principle applies to digital signals and analog signals. LNB outputs are quadrature down converted 620 and sampled by dual A/D converters 630. The parallel data is routed through cross point switch 640 so that any filter has access to any A/D data. Filter/selector 650 selects the desired transponder channel that is then up converted by quadrature modulator 660. All selected channels are combined in summer 670.

[0062]FIG. 7 shows a variation where the cross point switch 740 is located after the selecting filter 720. In this configuration the selecting filter 720 may also include a down sampler to reduce the bus traffic bandwidth in the cross point switch 740. Down sampling is possible because after selecting a single desired channel the bandwidth is narrower and fewer samples are needed to represent the signal. One or more selecting filters 720 may be connected to the output of each A/D, each filter 720 selecting one transponder channel.

[0063]FIG. 8 shows a configuration wherein each LNB has a dedicated selecting filter and up converter. The selecting filter may digitally select multiple channels from the broadband A/D data to drive the up converter and DAC.

[0064]FIG. 9 shows another alternative where analog tuners 930 select desired transponder channels that are up converted by up converter 940. All signals are combined by summer 950 to drive the signal cable 970 from the ODU. A multiport switch 920 allows any tuner to connect to any LNB output. The number of signal selecting paths comprising tuner 930 and up converter 940 is selected based on the maximum number of simultaneous users. A multiple-tuner personal video recorder would use more than one signal. Controller 960 receives channel select information either from the cable or a separate data channel such as infrared (IR) or wireless RF link or other source. Channel select information from the controller 960 programs the tuner 930 and up converter 940 LO. Channel select information can come to the controller over a wireless remote control signal or using signaling sent over the cable.

[0065]Up converters 940 can operate at a fixed LO frequency with one up converter 940 being assigned to each user connected on the cable. The various LO frequencies are unique. Alternatively, the down conversion process of each tuner 930 can be set to down convert directly to a predetermined IF frequency which is unique for each selected signal, thereby eliminating a separate up converter. A simplified IRD can be used with this approach wherein the IRD needs only tune to a single selectable IF frequency. The tuning range is narrower than a convention 500 MHz tuner and the channel selection is limited to as few as four choices compared to up to 16 or more in a convention IRD tuner.

[0066]FIG. 10 shows another alternative where signal selector 1010 selects a transponder channel. MPEG transport stream demultiplexer 1020 extracts a specific video program that is combined by data combiner 1030. Several MPEG streams are multiplexed as needed, and packets are formatted for transmission on a digital network. A digital LAN 1040 connects directly to the ODU. Channel information is communicated to the ODU through the LAN.

[0067]FIG. 11 shows another alternative used where new STBs are used with existing STBs. ODU 1110 supplies a signal to each of the connected cables according to the type of STB attached to the cable. Existing legacy STBs 1120 are supplied with an IF signal as in a conventional system, and the STBs 1120 will tune to a single transponder channel. New STBs 1140 will be supplied with a composite signal according to the present invention comprising all the transponder channels that are selected; the new STB 1140 will tune and decode the requested channel.

[0068]A new STB 1140 can be installed in place of an existing STB 1130 by simply connecting the new STB 1140 to the cable in place of the existing STB 1130. More than one new STB 1140 can be installed by using a signal splitter 1150 to provide a signal to multiple STBs. New STBs use a signaling system for selecting transponder channels that passes through the splitter to the ODU. Existing STBs will each have a dedicated connection to the ODU, as provided in the original installation. This is required because existing STBs use voltages or other control means to select LNB outputs that do not support multiple STBs on a single cable.

[0069]Also in FIG. 11, server/gateway 1160 receives the composite transponder signal, decodes specific programs, and distributes the program information in packetized MPEG over a digital local area network (LAN) 1170 to STBs 1180. Ethernet or other LAN technology is suitable for this function.

[0070]A new STB operating in accordance with the present invention is provided with a means of communication with the signal selector and combiner in the ODU. At power up or at periodic intervals the ODU or the STB initiates communication over the attached cable. This communication can be an in band or out of band signal. The ODU polls the STBs connected to determine if the STB is a conventional STB or new design STB. Because conventional STBs will not respond to the polling request, the absence of response is an indication of a conventional STB. A new STB will respond to the polling request and establish communication with the ODU.

[0071]The means of communication on the cable can be a TDMA frame structure with slots assigned to each STB, a frequency division multiplex (FDM) approach with unique frequencies assigned to each STB, or any other known technique for two-way communication by multiple devices over a signal channel. An extension of DiSEqC protocol commonly used for satellite dish control can be used for this communication. DiSEqC uses a gated 22 kHz carrier to communicate binary data and can be adapted for use to transfer data needed. The data rates are low for this communication path. Device configuration, channel mapping, and channel requests are among the types of data communicated between the ODU and STB.

[0072]Referring to FIG. 12, signal selector and combiner 1220 taps the signals output from each LNB to provide the transponder selection function. Switch 1220 is under control of the signal selector and combiner 1210. Switch 1220 will be actuated to supply either a conventional signal from multiport switch 1260 or the composite transponder signal from signal selector and combiner 1210. Switch 1220 can be a solid-state device or electromechanical relay.

[0073]Referring to FIG. 16, another application of the present invention is to provide selected transponder signals along with other services transmitted on the same cable wiring. The selected transponder signals can be transmitted in unoccupied regions of the cable, such as above, below, or between broadband satellite signals. The number of transponder channels transmitted can be adapted to the available spectrum. In one example, 950 MHz to 1450 MHz is used by one conventional LNB output signal; 1550 MHz to 2050 MHz is used by another conventional LNB output, leaving 1450 MHz to 1550 MHz available. One or more selected transponder channels from any LNB can be inserted into this region. Suitable guard bands need to be provided to prevent interference, for example 3 transponder channels at 31.25 MHz spacing uses 93.75 MHz. Another example of this application is to combine a standard CATV signal occupying 50 to 750 MHz with selected satellite transponder channels that are combined and transmitted at frequencies above the CATV band.

[0074]Using the present invention, any number of transponder channels can be selected and combined. Conventional IRD tuners are designed to tune channels anywhere in a 500 MHz or 1000 MHz range, requiring a wide tuning range for the front-end filter and LO. In an application where few channels are needed, the tuner range can be narrower, thus simplifying the design and lower cost. For example, a residential installation may typically have four television sets, some tuning only one channel at a time; others tune two channels in the case of picture in picture (PIP) or personal video recorder (PVR). This application would require 4 to 8 channels be distributed in the house simultaneously. A tuner would be required to tune over a 125 MHz to 250 MHz range.

[0075]Several variations in architecture are possible using the present invention. At each stage in the signal path, alternatives are available for implementation. Specific functions can be implemented in the analog domain or digital domain. Dedicated resources can be provided for each possible connection, or a pool of resources can be used. Dedicated resources insure that the peak demand can be satisfied unconditionally, but leads to unused capacity. Pooling enables a trunking efficiency to be realized and exploits statistical properties of usage to address most requirements.

[0076]A pool of A/D converters that can accept a signal from any LNB output through an RF crossbar switch. The number of simultaneous LNB signals that can be processed is limited to the number of A/D converters provided. Alternatively, dedicated A/D converters, one connected to each LNB output allows all LNBs to be processed if needed.

[0077]A pool of filter/selectors connected to a common bus, the pool size dictating the number of simultaneous transponder channels that can be selected. Alternatively, a predetermined number of filters can be attached to each A/D converter.

[0078]The filters/selectors can be grouped with each LNB or can be a common resource available to process any signal from any LNB. This choice trades off circuit complexity of implementing more filters with circuit complexity of routing LNB outputs through a crossbar switch.

[0079]Each of the operations of mixing, filtering, and combining can be done as an analog operation or digital operation.

[0080]Partitioning of functions can take a number of forms. The circuitry can be implemented

in a monolithic integrated circuit (IC), a hybrid, discrete components, or a combination of technologies.

[0081]Another application of the present invention is to simplify upgrades to an existing system. A dual tuner STB that enables viewing and recording of two different channels requires two input cables to allow any combination of LNB signals to be received. A single cable input would be limited to viewing and recording two channels from the same LNB output. When the upgrade is performed, the installation of an additional cable is difficult. By selecting and combining the desired channels at the ODU a single cable can be used to transmit all channels. A re-map of channel locations occurs. A conventional dual tuner STB can be used with this approach by providing a splitter at the input to the STB that supplies the composite signal to both cable inputs. A software upgrade to the STB may be needed to support the channel re-mapping.

[0082]Other implementations for signal processing include: No cross point switch, digitize, digital filter select, frequency translate, RF combine; cross point switch, analog tuner select, frequency translate, RF combine; digitize, digital filter select, digital network combine; digitize, digital filter select, decode, MPEG stream over a network; digitize, digital filter select, decode, MPEG to analog, restack channels, RF combine. One skilled in the art will recognize that many variations are possible to implement the present invention of selecting signals and combining onto a signal cable.

[0083]Another property of the present invention is that the process of digitizing, selecting, and combining is modulation independent. Either a digital or analog selecting and combining approach can be designed to process any form of phase/amplitude modulation. Although the dominant modulation type in direct broadcast satellite systems is QPSK, alternatively BPSK, 8-PSK or multi-level QAM and PSK signals can be distributed in the same way.

ENGLISH-CLAIMS:

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What is claimed is:

1. A signal distribution system for distributing a plurality of low noise amplifier and block converter (LNB) signals from a satellite outdoor unit (ODU) over a coaxial cable to an integrated receiver decoder (IRD) comprising: a signal selector that receives a plurality of broadband LNB signals comprising a plurality of transponder signals, the signal selector is responsive to transponder select information transmitted by an IRD and selects a plurality of transponder signals from at least one broadband LNB signal based on the transponder select information;a frequency translator coupled to the signal selector that is capable of shifting the selected transponder signals to new carrier frequencies to produce RF signals; anda signal combiner coupled to at least one frequency translator capable of combining at least two RF signals to produce a composite signal;wherein the modulation of the composite signal is the same as the modulation of the broadband LNB signals and wherein the composite signal is transmitted on the coaxial cable;whereby the composite signal is transmitted to the IRD.

2. The signal distribution system of claim 1 further comprising a plurality of IRDs and wherein the composite signal is transmitted on a single cable connected to the ODU and all IRDs receive channels extracted from the composite signal.

3. The signal distribution system of claim 1 wherein the signal selector comprises an analog to digital converter and a digital filter.

4. The signal distribution system of claim 1 wherein the signal selector comprises a tuner.

5. The signal distribution system of claim 1 further comprising an integrated receiver decoder (IRD) connected to the coaxial cable with a plurality of tuners within the IRD, wherein each tuner within the IRD receives the composite signal and each tuner uses at least one transponder signal.

6. The signal distribution system of claim 1 wherein transponder select information is transmitted over the same cable as the composite signal.

7. The signal distribution system of claim 1 wherein transponder select information is transmitted over a wireless link.

8. A signal distribution system for distributing signals comprising a plurality of channels from a plurality of sources between a first unit and a second unit over a communication medium comprising: means in the first unit responsive to information transmitted by the second unit for extracting selected channels from each of the plurality of sources and combining the selected channels into a composite signal without demodulating channels and without changing the modulation of the channels and transmitting the composite signal over the medium; andmeans in the second unit for receiving the composite signal and demodulating and decoding at least one channel; andmeans in the first unit and second units for bi-directionally communicating control information between the second unit and the first unit.

9. The signal distribution system of claim 8 wherein the control information comprises channel selection requests originating from the second unit and the control information comprises channel mapping information originating from the first unit.

10. The signal distribution system of claim 8, further comprising a means in the first unit for carrier offset correction.

11. The signal distribution system of claim 8 wherein the first unit is a satellite outdoor unit and the second unit is a satellite integrated receiver decoder unit.

12. The signal distribution system of claim 11 wherein the communication medium consists of a single coaxial cable connected to the satellite outdoor unit.

13. The signal distribution system of claim 12 wherein the means for communicating uses the same communication medium as the composite signal.

14. A method of communicating a plurality of transponder signals from a satellite outdoor unit (ODU) that receives a plurality of satellite broadband signals to an integrated receiver decoder (IRD) over a single cable connected to the ODU, the method comprising the steps of: communicating a transponder request signal to the ODU from the IRD;in the ODU, selecting a plurality of transponder signals extracted from the received satellite broadband signals, wherein the selecting is responsive to the transponder request signals;combining selected transponder signals into a composite signal;transmitting the composite signal over the single cable from the ODU to the IRDs, wherein the modulation of the transponder signal is not altered by the steps of selecting, combining, and transmitting.

15. The method of claim 14 wherein the step of selecting a transponder signal comprises the step of: filtering a transponder signal with a band pass filter having a bandwidth ranging from 5% to 100% wider than the bandwidth of the transponder signal.

16. The method of claim 14 wherein the step of combining comprises frequency translating the selected transponder channels to a variable frequency before combining.

17. The method of claim 15 further comprising frequency translating the selected

transponder channels to a predetermined frequency before combining.

18. The method of claim 14 further comprising the step of splitting the composite signal inside a home and distributing to a plurality of IRDs.

19. The method of claim 14 wherein the transponder request signal is transmitted over the cable from an IRD and all IRDs receive the same composite signal.

20. The method of claim 14 wherein the transponder request signal is transmitted over a wireless link to the ODU.

21. The method of claim 14 further comprising the steps of: frequency translating the selected transponder channels to a variable frequency before combining; andsplitting the composite signal inside a home and distributing to a plurality of IRDs.

22. The method of claim 21 wherein the transponder request signal is transmitted over the cable from an IRD.

23. The method of claim 21 wherein the transponder request signal is transmitted over a wireless link to the ODU.

SYS-LOAD-DATE: April 11, 2007

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Terms: **patno=7130576** (Edit Search | Suggest Terms for My Search)
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California Inventors Develop Broadband Content Distribution Signal Combiner US Fed News November 7, 2006 Tuesday 5:59 AM EST

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US Fed News

November 7, 2006 Tuesday 5:59 AM EST

LENGTH: 243 words

HEADLINE: California Inventors Develop Broadband Content Distribution Signal Combiner

BYLINE: US Fed News

DATELINE: Alexandria, Va.

BODY:

ALEXANDRIA, Va., Nov. 7 -- Itzhak Gurantz and Michael Landry, both of San Diego, and Ladd El Wardani of La Jolla, Calif., have developed a signal selector and combiner for broadband content distribution.

According to the U.S. Patent & Trademark Office: "In a satellite receiving system, program channels are selected from one or more broadband signals and combined with other selected channels and transmitted from a first unit, for example an outdoor unit, to a second unit, for example a gateway, server, or set-top box, using a single cable. Channels can be selected by digitizing the broadband signal then digitally filtering to isolate the desired channels. The outputs of several low noise amplifier and block converters can be selected and combined into one signal. Multiple set-top boxes can receive independent signals over a single cable from the outdoor unit."

The inventors were issued U.S. Patent No. **7,130,576** on Oct. 31.

The patent has been assigned to Entropic Communications Inc., San Diego.

The original application was filed on Nov. 6, 2002, and is available at:

http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=%2Fnetahtml%2FPTO%2Fsrchnum.htm&r=1&f=G&l=50&s1=**7,130,576.**PN.&OS=PN/**7,130,576**&RS=PN/**7,130,576**.

For more information about US Fed News federal patent awards please contact: Myron Struck, Managing Editor/US Bureau, US Fed News, Direct: 703/866-4708, Cell: 703/304-1897, Myron@targetednews.com.

LOAD-DATE: November 7, 2006

Source: Command Searching > **News, All (English, Full Text)**
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JUVENILE PROSTITUTION DIFFICULT TO FIGHT;SEX RING LEADER SENTENCED, BUT PLAGUE NOT ERASED Saint Paul Pioneer Press (Minnesota) July 14, 2000 Friday

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Saint Paul Pioneer Press (Minnesota)

July 14, 2000 Friday

SECTION: LOCAL; Pg. 1B

LENGTH: 828 words

HEADLINE: JUVENILE PROSTITUTION DIFFICULT TO FIGHT;
SEX RING LEADER SENTENCED, BUT PLAGUE NOT ERASED

BYLINE: Ruben Rosario Staff Columnist

BODY:
The guilty verdicts had just been read.

After 20 years of brazenly exporting mostly juvenile Minnesota and Wisconsin runaway girls like indentured sex slaves to 24 states and across the Canadian border, the gig was finally up for six members of "The Family."

LeVorn Evans, one of six Twin Cities men most responsible for running the largest juvenile prostitution ring ever prosecuted by the federal government, turned to his chief adversary seated at the prosecutor's table.

"Hey, Joe," Evans said.

Detective Sgt. Joe Delia of the Maryland Heights, Mo., Police Department looked his way. It was Delia, with the help of Minneapolis Police Sgt. Andrew Schmidt, who built the case and persuaded federal officials in St. Louis to prosecute it after two juvenile prostitutes from Minnesota were pulled over July 7, 1997, on a routine traffic stop in Maryland Heights.

"Yeah, Vern," the cop replied, using the convicted man's nickname.

"You brought the big man down," Evans said. "You brought the big man down. You partying tonight? I would if I had won."

Evans' pimping and partying days of $10,000 fur coats and luxury cars have been put on ice. The man whom authorities called the ring's leader was sentenced Thursday to 45 years in prison, a little more than three years after the case began.

Most folks think this kind of depraved child exploitation doesn't happen here. If it does, then it's because these girls, probably poor, promiscuous, minority and from the inner city,

willingly went along for the sex, the money or both. These are not our kids, they say. They're someone else's.

The Evans case proved them wrong. A good number of the girls who testified came from either the suburbs or small towns. Some were from good, middle-class families. Most were white. Many ran away from abuse, lack of love or other troubles at home only to find worse. Sometimes, we are the pimp's greatest allies without realizing it.

The Evans case provided a blueprint for how law enforcement at the local and federal level can team up and put a serious hurting on interstate pimps. The question we should now ask is: Will Minnesota take the very real problem of juvenile prostitution seriously enough to make it a top crime priority?

Prosecuting pimps has rarely been a top policy concern with local or federal law enforcement, as it also generally isn't in most areas of the country.

"I think the citizenry is largely ignorant about the problem because it is painful to recognize what is happening to our children," said Suzanne Peterson, policy coordinator for Family and Children's Services, a local nonprofit organization that runs a counseling program for juvenile and adult prostitutes.

"The Evans case has had a tremendous impact in Minnesota because it prevents us from denying that this doesn't exist."

The Legislature this year set aside $150,000 to train cops and prosecutors statewide about the juvenile prostitution problem. It also earmarked $3 million to finance desperately needed emergency housing for prostituted juveniles and at-risk runaways. It also increased felony prison terms of up to 20 years for those who prostitute minors 18 and under. But any law is only as good as its enforcement.

Delia believes a statewide task force with local and federal prosecutorial teeth is what Minnesota needs.

"We have task forces for gangs and for drugs and we find all kinds of money and resources for child pornography and other crimes on the Internet," says Delia. "I'm not saying that isn't good, but what about these girls, who have been abused and denigrated every which way imaginable? As much as the kid on the Internet, these are children, too."

The juvenile meat market continues to thrive. A runaway girl from a rock-solid family in Brainerd, Minn., was recently reunited with her parents after a local pimp took her to Florida.

Schmidt, a former vice cop reassigned to Minneapolis' Organized Crime Task Force, encountered a 15-year-old girl working the streets of south Minneapolis a few weeks ago. The man accused of working as her pimp is a teen-age nephew of LeVorn Evans.

"It's still out there," Schmidt says.

The sentences
Fifteen members of a Minneapolis-based prostitution ring known as "The Family" were convicted after being indicted in 1999.

The ring operated mostly as a mobile service supplying girls and young women at hotels and motels. Most of the 50 women and girls identified in the investigation were recruited in Minneapolis.

Sentences of key members convicted during trial in St. Louis:

LeVorn Evans, 52, 45 years

Derry Evans, 28, 85 years

Monroe Evans, 50, 33 years

Terrence Roberts, 28, 36 years

Clem Evans, 54, 20 years

Johnny Lee Evans, 45, a sixth key defendant, will be sentenced next week.

Nine other members of the ring earlier pleaded guilty before the trial and have been sentenced.

Ruben Rosario can be reached at rrosario@pioneerpress.com or (651) 228-5454.

NOTES: See related story: Sex ring's leader gets 45 years on Page 3B.

LOAD-DATE: January 30, 2002

Source: Command Searching > **News, All (English, Full Text)**
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Business in Brief Sarasota Herald-Tribune (Florida) July 13, 2000, Thursday,

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Sarasota Herald-Tribune (Florida)

July 13, 2000, Thursday, ENGLEWOOD EDITION

SECTION: MAIN STREET ENGLEWOOD, Pg. 17

LENGTH: 306 words

HEADLINE: Business in Brief

BODY:
Network at Noon

The next Englewood Area Chamber of Commerce "Network at Noon" will be July 20 at the Lock and Key Restaurant, 2045 N. Beach Road on Manasota Key.

Chamber members can meet to help each other build their businesses through information sharing, exchanging business cards and discussing current events affecting local business.

The guest speaker is Marilyn Schott with "30 Second Commercials." The luncheon is scheduled to start at 11:30 a.m.

Cost is $ 8 per person and reservations are required.

For more information or to make a reservation, call Network chairman John Maurer, 474-3059, or contact the chamber at 474-5511.

Tips for small business growth

The Manasota Chapter of SCORE, the Service Corps of Retired Executives, is hosting a workshop on "How to Make Your Small Business Grow," in Venice on July 29.

The workshop is part of a series of small business development forums SCORE is hosting in Sarasota and Venice. Registration is $ 25 per person, which includes seminar materials, counseling before and after the workshop.

The event is scheduled for 9:30 a.m. to 12:40 p.m. at the Venice Public Library, 300 S. Nokomis Ave.

To register or for more information about SCORE workshops, call 941-955- 1029, fax 955-5581 or e-mail to score116@gte.net

Retired service corps hopes to diversify staff

The Manasota Chapter of SCORE, the Service Corps of Retired Executives, is looking for more women and minority volunteers to participate in its business counseling programs.

In conjunction with the Small Business Administration, SCORE offers free counseling to current and prospective small business owners or people working in a business field from Englewood to Bradenton.

To volunteer or inquire about counseling, call the SCORE office at 955-1029 or e-mail score@116gte.net.

GRAPHIC: PHOTO (C;

In late June, Tom Moore and Cherie Selman opened Clothes Horse Tropical Imports at 443 W. Dearborn Street. The shop imports home accessories, clothing and gift items from Malaysia, Indonesia, and Java.;

The couple operated Tropical Imports in the Gulf Gate area of Sarasota for more than a year, but they decided to relocate the shop to Englewood to be closer to their two Clothes Horse Consignment shops on Indiana Avenue and Placida Road.;

Tropical Imports offers wood-carved figures, mirrors, and women's apparel at wholesale prices.;

Along with the import shop, Moore also opened the Tom Moore Salon, a hair styling boutique at the Dearborn Street shop. Moore has been a hair stylist in Englewood for 18 years.;

Staff Photo/Rodney Crouther

LOAD-DATE: July 14, 2000

Source: Command Searching > **News, All (English, Full Text)**
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NO HEADLINE Pittsburgh Post-Gazette (Pennsylvania) July 12, 2000, Wednesday,

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July 12, 2000, Wednesday, WEST EDITION

SECTION: SPORTS, Pg. W-10, LOOKING BACK

LENGTH: 94 words

HEADLINE: NO HEADLINE

BODY:
(Past sports highlights in the PG West area, July 12-18)

10 YEARS AGO

July 16, 1990 -- Moon American Legion pitcher Tom Morrow raised his record to 9-0, scattering six hits in a 7-1 win over Crafton-Ingram-Thornburg.

July 16, 1990 -- Langley graduate Jeff Bachner hit two home runs, pacing West Pittsburgh to a 4-1 win over Mt. Lebanon in Federation League semipro baseball play. 15 YEARS AGO

July 16, 1985 -- Tim Bruzdewicz struck out 18 batters in a seven-inning American Legion baseball game, leading West Allegheny to a 6-0 win over Brookline.

LOAD-DATE: July 19, 2000

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Workstation and PLC are combined in one unit.; programmable logic controllers; Nematron ULTRA CIM; product announcement I&CS (Instrumentation & Control Systems) March 1, 1989

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I&CS (Instrumentation & Control Systems)

March 1, 1989

SECTION: Pg. p78(1) Vol. V62 No. N3 ISSN: 0746-2395

ACC-NO: 7130576

LENGTH: 992 words

HEADLINE: Workstation and PLC are combined in one unit.; programmable logic controllers; Nematron ULTRA CIM; product announcement

BYLINE: Hall, John

BODY:

ABSTRACT

Officials of Nematron announce the ULTRA CIM, a system that combinesProgrammable Logic Controller (PLC) control functions with an industrial computer and operator interface. The system is not a true PLC replacement device, but is to be used in applications where PLC functions are not the primary factor. The ULTRA CIM is based on 80286-80386 microprocessors, the IBM PC-AT bus architecture and a multitasking DOS shell. A major component of the system is its common data base and memory for all functions. The ULTRA CIM is available in a number of configurations. The smallest configuration is an 80286-based model that uses a PLC-emulating coprocessor and operator interface; it costs approximately $12,900.

Workstation and PLC are combined in one unit The Nematron ULTRA CIM combines PLC control functions with an industrial computer and operator interface in one unit that integrates control, communications, information processing, and operator interface.

The ULTRA CIM is targeted for applications requiring data collection and management, process control, man/machine interface, graphic displays, and small amounts of PLC logic control. It is not intended as a true PLC replacement device, but as a better solution when PLC requirements are not the driving

factor.

Based on 80286/80386 microprocessors, the IBM PC/AT bus architecture, and a multitasking DOS shell, it uses plug-in cards for scanning traditional PLC remote I/O, and makes use of independent coprocessorsfor PLC ladder-logic functions. As an alternative, PLC-emulating software can be run on the host processor.

The system consists of a PC/AT-compatible industrial computer withadditional hardware for performing PLC functions. Models are also available with built-in displays and keyboards. The unit can communicate with remote PLC I/O using scanner cards from Allen-Bradley, Modicon, Digitronics Sixnet or GE Fanuc Automation's GEnius I/O. It can also work with such remote I/O processors as Transition Technology's TransPort I/O or Opto-22's OptoMUX I/O, communicating with them via a serial port.

Vital to the machine is a common data base and memory for all functions. The PLC I/O data base can be linked with programs running on the industrial computer, using the system's common data bus for communication.

All data used or generated in an ULTRA CIM application will, at the user's option, be quickly and easily available to any ULTRA CIM function without the need for external/internal communications or additional programming. This allows one unit to perform tasks that would otherwise be done by combining several devices. For example, ladder logic, ASCII/BASIC communications, nonladder logic control such as PIDand motion control, and traditional computer functions including MIS, SPC/SQC, can all be done in the one machine.

Hardware features include a 40M byte hard disk, 80286/386 CPU, CGA/EGA or VGA display, a printer port, two isolated communications ports, a multitasking operating system, process control software for loopcontrol, data base management, statistical process control, graphics, a man-machine interface, and full documentation.

The system will be available in several configurations. Smallest is an 80286-based model that uses a PLC-emulating coprocessor and operator interface. This unit can handle up to 2048 I/O, scans in 3-5 ms, and has 1M byte of RAM for the host and 8K for the coprocessor. It will sell for about $12,900. A similar unit, with an 80386 CPU, 20MHz clock, 1M byte of host RAM and 8K of coprocessor RAM, will sell for about $13,950.

An alternate configuration uses PLC-emulating host software, an I/O scanner that plugs into the PC bus, and an operator interface. Thismodel handles 1024 I/O, scans in 5-10 ms, and has 1M byte of RAM. It will sell for about $13,850. An 80386-based version, with up to 16M bytes of RAM, will be priced starting at $14,900.

The units allow the use of canned and bundled industrial control software to supplement ladder-logic functions. The software can be used for analog control; acquisition, storage, and analysis of production data; and remote communications and networking. Software for the man-machine interface could include such packages as ScreenWare2 fromComputer Technology Corp.--Nematron, Ann Arbor, MI, (313) 994-0501.

BOOTH 730

The ATCOM 64 real-time controller provides 64 digital I/O, four analog inputs, and four analog outputs, each with 12-bit resolution. This analog capability, a high-level language, and comprehensive instructions set provide P, PI, and PID functions for control. Up to fourloops can be handled simultaneously, and the digital I/O provides upto 64 unique alarm conditions. The micro-programmable controller isthe first to combine single loop control with digital control.--Automatic Timing and Controls Co., Inc., King of Prussia, PA.

BOOTH 754

Intelligent, independent modules make true distributed control a reality. The SYNERGY system puts independent, real-time, multitaskingpower at each critical machine or operation point. It is composed of Intel's BITBUS, FORTH's programming language, and a fully integrated programming environment. Each module can access the host computer's storage, console, printer, and so on. Their use can improve efficiency, reduce costs, and increase productivity.--Encoder Products Co.,Sandpoint, ID 83864.

BOOTH 830

A new operator interface technology is changing operator workstation construction. The ACCESS4000 eliminates hardwiring with a single coaxial cable and saves up to 50-70% of workstation costs. Also displayed: ScreenWare2, a PC-based operator's interface software package used to monitor/control machine or process operations; and IPS2000, a modular, microprocessor-based system that provides standard, cost-effective alternative to custom hardwired panels.--Computer Technology Corp., Milford, OH 45150.

GRAPHIC: photograph
illustration

LOAD-DATE: March 27, 2008

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/008,389	02/06/2007	7130576	05JM-127751	3367

24244 7590 06/16/2008

MICHAEL W LANDRY
5098 SEACHASE STREET
SAN DIEGO, CA 92130

EXAMINER	
ART UNIT	PAPER NUMBER

DATE MAILED: 06/16/2008

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

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SAN DIEGO, CA 92130

EX PARTE REEXAMINATION COMMUNICATION TRANSMITTAL FORM

REEXAMINATION CONTROL NO. *90/008,389*.

PATENT NO. *7130576*.

ART UNIT *3992*.

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified *ex parte* reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the *ex parte* reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

Office Action in Ex Parte Reexamination	Control No. 90/008,389	Patent Under Reexamination 7130576	
	Examiner Fred Ferris	Art Unit 3992	

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

a☒ Responsive to the communication(s) filed on *23 May 2007*. b☐ This action is made FINAL.
c☐ A statement under 37 CFR 1.530 has not been received from the patent owner.

A shortened statutory period for response to this action is set to expire 2 month(s) from the mailing date of this letter. Failure to respond within the period for response will result in termination of the proceeding and issuance of an *ex parte* reexamination certificate in accordance with this action. 37 CFR 1.550(d). **EXTENSIONS OF TIME ARE GOVERNED BY 37 CFR 1.550(c).** If the period for response specified above is less than thirty (30) days, a response within the statutory minimum of thirty (30) days will be considered timely.

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☐ Notice of References Cited by Examiner, PTO-892.
2. ☐ Information Disclosure Statement, PTO/SB/08.
3. ☐ Interview Summary, PTO-474.
4. ☐ _____.

Part II SUMMARY OF ACTION

1a. ☒ Claims *1-23* are subject to reexamination.
1b. ☐ Claims _____ are not subject to reexamination.
2. ☐ Claims _____ have been canceled in the present reexamination proceeding.
3. ☐ Claims _____ are patentable and/or confirmed.
4. ☒ Claims *1-23* are rejected.
5. ☐ Claims _____ are objected to.
6. ☐ The drawings, filed on _____ are acceptable.
7. ☐ The proposed drawing correction, filed on _____ has been (7a)☐ approved (7b)☐ disapproved.
8. ☐ Acknowledgment is made of the priority claim under 35 U.S.C. § 119(a)-(d) or (f).
   a)☐ All b)☐ Some* c)☐ None of the certified copies have
   1☐ been received.
   2☐ not been received.
   3☐ been filed in Application No. _____.
   4☐ been filed in reexamination Control No. _____.
   5☐ been received by the International Bureau in PCT application No. _____.
   * See the attached detailed Office action for a list of the certified copies not received.
9. ☐ Since the proceeding appears to be in condition for issuance of an *ex parte* reexamination certificate 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.
10. ☐ Other: _____

cc: Requester (if third party requester)

DETAILED ACTION

I. Summary

This Office Action addresses the claims for which reexamination has been requested and a substantial new question of patentability has been determined to exist. Specifically, claims 1-23 of U.S. 7,130,576 issued to Gurantz et al. Claims 1-23 now stand rejected in view of newly disclosed prior art.

II. Notice Regarding Certain Reexamination Issues

The patent owner is reminded of the continuing responsibility under 37 CFR 1.565(a), to apprise the Office of any litigation activity, or other prior or concurrent proceeding, involving Patent No. 7,130,576 throughout the course of this reexamination proceeding. See MPEP §§ 2207, 2282 and 2286.

Extensions of time under 37 CFR 1.136(a) will not be permitted in these proceedings because the provisions of 37 CFR 1.136 apply only to "a Patent Applicant" and not to parties in a reexamination proceeding. Additionally, 35 U.S.C. 305 requires that reexamination proceedings "will be conducted with special dispatch" (37 CFR 1.550(a)). Extension of time in *ex parte* reexamination proceedings are provided for in 37 CFR 1.550(c).

Where the IDS citations are submitted but not described, the examiner is only responsible for cursorily reviewing the references. MPEP 2256 recites the following: "Where patents, publications, and other such items of information are submitted by a party (patent owner or requester) in compliance with the requirements of the rules, the requisite degree of consideration to be given to such information will be normally limited by the degree to which the party filing the information citation has explained the content and relevance of the information.

The initials of the examiner placed adjacent to the citations on the form PTO /SB /08A and 08B or its equivalent, without an indication to the contrary in the record, do not signify that the information has been considered by the examiner any further than to the extent noted above."

Accordingly, the IDS submissions have been considered by the Examiner only with the scope required by MPEP 2256.

III. References Cited in the Request

"INFORMATION FOR INSTALLERS OF HOT BIRD TM DVB-S SYSTEMS, VERSION 1.0" (hereinafter "Eutelsat Installers Guide"), EUTELSAT, dated June 7, 1999;

"DIGITAL SATELLITE EQUIPMENT CONTROL (DiSEqC TM) UPDATE AND RECOMMENDATIONS FOR IMPLEMENTATION, VERSION 2.0" (hereinafter "Eutelsat DiSEqC Specification"), EUTELSAT, dated April 18, 1997;

United States Patent No. 6,437,837 to Seo (hereinafter "Seo");

United States Patent No. 5,073,390 to Green et al. (hereinafter "Green");

United States Patent No. 6,005,861 to Humplemann (hereinafter "Humplemann");

"A SINGLE CHIP UNIVERSAL DIGITAL SATELLITE RECEIVER WITH 480-Mhz IF INPUT" (hereinafter the "Broadcom Paper");

"PHILLIPS DATA SHEET FOR UAA3202M FREQUENCY SHIFT KEYING RECEIVER", (hereinafter the "Phillips Data Sheet");

United States Patent No. 5,654,774 to Pugel et al. (hereinafter "Pugel");

United States Patent No. 4,953184 to Simone (hereinafter "Simone");

European Patent No. 1009113 (hereinafter "EPO '113 Patent");

European Patent No. 0757489 (hereinafter "EPO '489 Patent");

United States Patent No. 5,285,284 to Takashima et al. (hereinafter "Takashima");

United States Patent No. 6,353,463 to Seo (hereinafter "Seo")

"RCA DIR CTTV RECEIVER WITH ULTIMATETV SERVICE SETUP GUIDE (hereinafter the "RCA Setup Guide");

United States Patent No. 5,278,837 to Kelley (hereinafter "Kelley").

IV. Background and Overview

The '576 patent is drawn to a method and system for a satellite receiving system where program channels are selected from one or more broadband signals, and combined with other selected channels and transmitted from a first unit, for example an outdoor unit, to a second unit, for example a gateway, server, or set-top box, using a single cable. Channels can be selected by digitizing the broadband signal then digitally filtering to isolate the desired channels. The outputs of several LNBs can be selected and combined into one signal. Multiple set-top boxes can receive independent signals over a single cable from the outdoor unit.

During prosecution of the '576 patent, the examiner ultimately passed the case to allowance responsive to patent owners arguments that the claimed invention "include[s] the limitation of transponder selection responsive to a signal transmitted by an IRD." And that in the claimed "invention, a single cable can run from the selector and combiner, which can be in the ODU, to the inside of the building. The signal is split inside the building using a gateway or splitter device to distribute a composite signal to IRDs. The IRD commands to the selector requests individual transponder signals from satellite signals output by any one of the LNBs. The signal selector selects the transponder signals requested from each IRD, combines all of the selected transponder signals into a composite signal, then transits the composite signal, sent preferably

over a single cable, and tunes its requested transponder signal for decoding and display on a television connected to the IRD. The composite signal changes based on collection of transponder select signals from each IRD .... [W]hereas in the applicant's invention and claim, the frequency translator operates on the signal output from the LNB[.]" (See: Amendment arguments 7/10/2006) Against this backdrop the examiner submits that these features are disclosed in newly cited prior art as set forth in the rejections appearing below.

V. Claim Rejections – Relevant Statutes

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

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.

VI. Detailed Analysis

The requester in the reexamination of the '576 Patent has proposed multiple rejections of the claims that were requested for reexamination as set forth in the Claim Charts. While the

examiner generally concurs that the references all "read on" the claims requested for rexamination, the teachings appear to be cumulative of the prior art teachings set forth in the rejections appearing below. In the interest of simplifying issues in the case only selected references have been used in the examiners' rejection.

1. Claims 1, 6, 8, 9, 11-14, 16, 18, 19, 21 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by the Eutelsat Installers Guide.

The Eutelsat Installer's Guide discloses every element of claim 1 of the '576 patent as follows:

a. A signal distribution system for distributing a plurality of low noise amplifier and block converter (LNB) signals from a satellite outdoor unit (ODU) over a coaxial cable to an integrated receiver decoder (IRD) comprising

The Eutelsat Installer's Guide discloses a signal distribution system for distributing a plurality of low noise amplifier and block converter (LNB) signals from a satellite outdoor unit (ODU) over a coaxial cable to an integrated receiver decoder (IRD). Figure 11 (page 20) is a diagram illustrating an example architecture for an RF distribution system including a satellite antenna having a low noise amplifier and block converter (LNB) that sends signals to a satellite receiver (i.e., a set top box or IRD). The LNB is illustrated as a Quad LNB with four output lines to accommodate each of the four band/polarization LNB signals.

For confirmation that the illustrated satellite receiver is an IRD as recited in the claims, the Eutelsat Installer's Guide refers to the satellite receiver as an IRD (integrated receiver decoder) in the description of Figure 11 at page 20, and again at page 27.

Note: Figure 11 reproduced below demonstrates similar architecture to Figure 8 with the addition of a signaling capability between the IRD and the upstream equipment for remote channel selection.

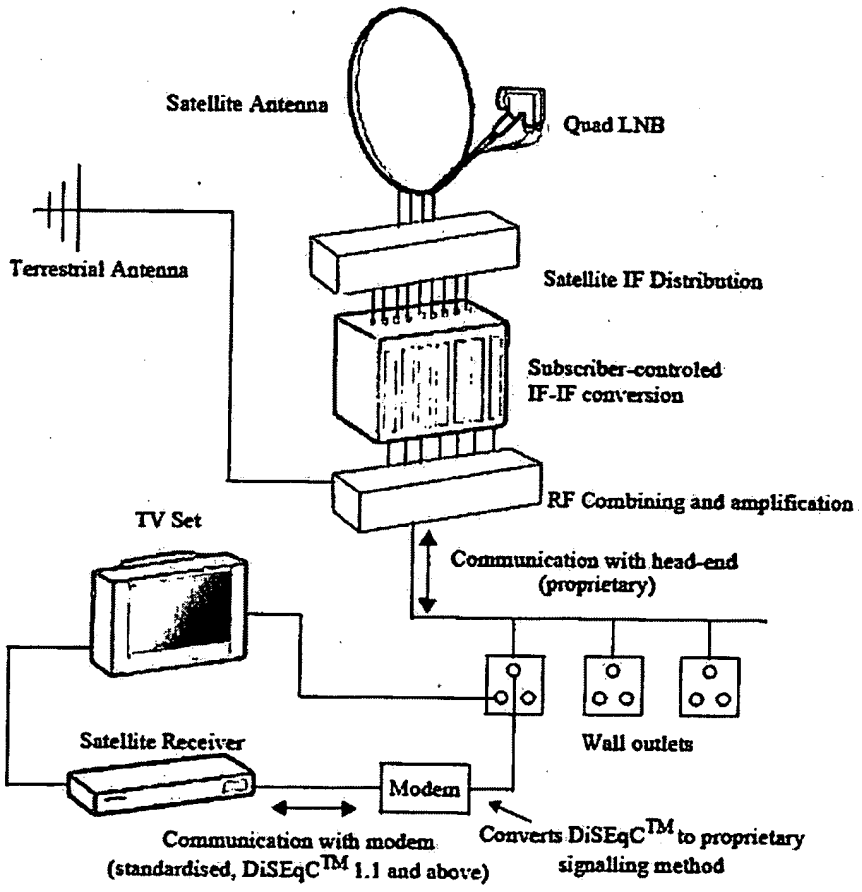


Figure 11 : Architecture of a System with a Remote Controlled Head-End

b. a signal selector that receives a plurality of broadband LNB signals comprising a plurality of transponder signals

The Eutelsat Installers Guide teaches a signal selector that receives a plurality of broadband LNB signals and selects one or more transponder channels. For example, at Figure 11, the Eutelsat Installers Guide teaches a Satellite IF Distribution unit and subscriber-controlled IF-IF

converters configured to receive the broadband LNB outputs. The Eutelsat Installers Guide further discloses that the satellite transmissions received by the various receive architectures comprise two frequency bands and two polarizations. See, page 26, second and third paragraphs. These broadband signals each have a plurality of transponders signals. To illustrate this, the Eutelsat Installers Guide shows the satellite transmission bands in Figure 7 (reproduced below). As this figure illustrates, the satellite spectrum is comprised of four broadband signals each having a plurality of transponder signals (the polygons). Each element of the quad LNB receives the satellite transmission and outputs its respective broadband LNB signal. The LNB also amplifies the signal and converts the satellite RF (10.7 to 12.75 GHz in this case) to an intermediate frequency, or IF (hence the name, low noise amplifier and block converter). Note that Figure 7 does not show this RF to IF conversion performed by the LNBs. However, RF to IF conversion is not part of the claims, and is nonetheless well known as part of satellite receiver systems. As evidence of this, see the Background Section of the '576 patent, which, in discussing the "Prior Art" Figure 1, describes the RF to IF conversion performed by the LNBs.

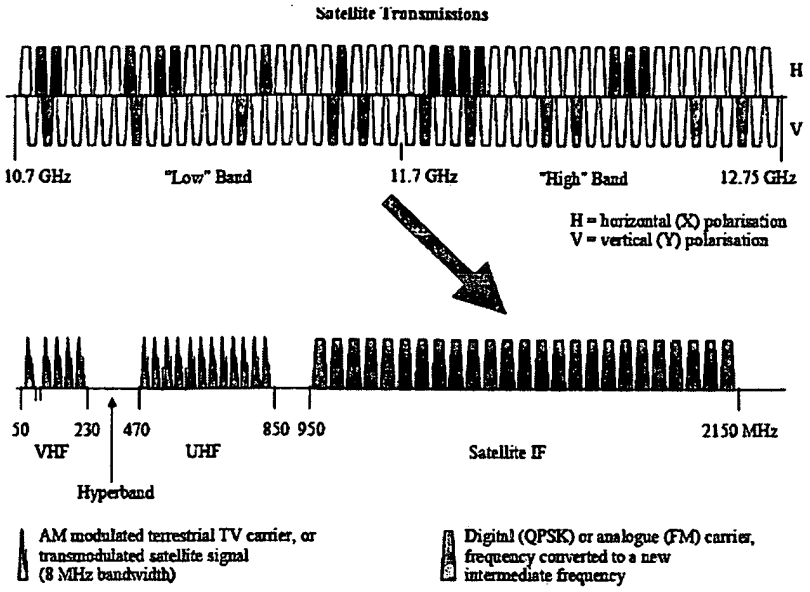


Figure 7 : Broadband Signal Spectrum for an IF-IF Distribution Network

Note that Figure 7 describes IF to IF conversion. Figure 7 is described with reference to Figure 8, which is for channelized IF-IF conversion, rather than for subscriber controlled IF-IF conversion. However, the Eutelsat Installers Guide at page 19, last paragraph, states that the architecture shown in Figure 11 is "similar to that shown in Figure 8 ... except that there must be communication ... so that remote channel selection can be carried out." Therefore, as the only stated difference is that of the remote channel selection, the architecture of Figure 11 is configured to receive the same broadband signals as the architecture of Figure 8.

c. the signal selector is responsive to transponder select information transmitted by an IRD

The Eutelsat Installers Guide discloses that the signal selector is responsive to transponder select information transmitted by an IRD. Particularly, Figure 11 of the Eutelsat Installers Guide illustrates a Satellite Receiver (IRD) that communicates with the head-end (Outdoor Unit) for

channel selection. This is illustrated in Figure 11 by the DiSEqC communications. Additionally, the Eutelsat Installers Guide at page 19 specifies that there is communication between the terminal (IRD) and the head-end (signal selector) "so that remote channel selection can be carried out." (Page 19, last sentence (emphasis added). Additionally, Section 3.5.1.c of the Eutelsat Installers Guide (page 27) describes one signaling protocol that can be used to communicate information from the IRD to the signal selector. The Eutelsat Installers Guide reference refers to the standardized DiSEqC protocol6 that is used to provide selection information to the outdoor unit. At page 27, the Eutelsat Installers Guide states that the "DiSEqC TM system uses the satellite receiver (IRD) as a single master terminal controlling a number of remote devices such as LNBs." The Eutelsat Installers Guide further states that DiSEqC "allows for the switching and control of compatible units such as LNBs, switches and positioners..." *Id.* at 27.

d. and selects a plurality of transponder signals from at least one broadband LNB signal based on the transponder select information;

As stated above, Figure 11 illustrates a receive architecture that allows remote channel selection. As stated above, page 19 of the Eutelsat Installers Guide, specifies that there is communication between the terminal (IRD) and the head-end (selector) "so that remote channel selection can be carried out." Id., at page 19, last sentence. Additionally, the second-to-last paragraph on page 19 states that the user's terminal (IRD) can remotely tune to a channel by controlling an IF-IF converter.

Thus, the Eutelsat Installers Guide teaches that the Subscriber-controlled IF-IF conversion unit (signal selector) selects the appropriate transponder signal(s) from the selected LNB band, based on a DiSEqC command from the IRD.

e. a frequency translator coupled to the signal selector that is capable of shifting the selected transponder signals to new carrier frequencies to produce RF signals;

Figure 11 (above) of the Eutelsat Installers Guide illustrates a Subscriber controlled IF-IF conversion box. As the name suggests, the IF-IF converters convert, or frequency translate, an incoming IF signal at one carrier frequency to an IF signal at another carrier frequency. This IF-IF conversion takes the selected transponder signals (Channels) at the received IF frequency, and converts them to a different IF frequency for placement in a composite signal and distribution to the set top box (IRD).

Additionally, Section 3.4.1.c at page 15 states that the IF-to-IF conversion systems rebuild the satellite IF spectrum so that it is suitable for distribution via a single cable. In other words, the selected transponder signals arrive from the LNBs at a given IF center frequency and are relocated to a new IF center frequency for placement on the composite signal. Although 3.4.1 .c is for channelized IF-to-IF conversion, the IF-IF conversion in Figure 11 operates the same, except that it is remote controlled (See, page 19, last paragraph).

Figure 7 (above) provides an example of frequency translation wherein selected transponder signals (the individually shaded polygons) are translated from their original broadband frequencies to the new IF carrier frequencies suitable for placement in a composite signal.

The Eutelsat Installers Guide also teaches the signal combiner as recited in Claim 1. Particularly, at Figure 11, the Eutelsat Installers Guide discloses an RF Combining and Amplification unit

that accepts multiple RF signals from the Subscriber-controlled IF-IF conversion, and combines them into a single composite output signal.

g. wherein the modulation of the composite signal is the same as the modulation of the broadband LNB signals;

The Eutelsat Installers Guide teaches this element of claim 1. Particularly, the Eutelsat Installers Guide discloses architectures that receive QPSK modulated signals, perform the IF-IF frequency translation and provide QPSK signals. Support for this can also be found at Figure 7, which illustrates QPSK signals from the satellite transmission, and selected QPSK transponder signals combined on the composite signal.

h. and wherein the composite signal is transmitted on the coaxial cable;

The Eutelsat Installers Guide teaches that the composite signal is transmitted on the coaxial cable. At Figure 11, the Eutelsat Installers Guide shows the composite signal routed to the IRDs via a signal path. One of ordinary skill in the art would have understood that satellite TV signals are routed on coaxial cable. Indeed, the Eutelsat Installers Guide reference specifically refers to this signal path of Figure 11 as coaxial cable. Particularly, at page 27, the Eutelsat Installers Guide references the DiSEqC signaling path as using a coaxial cable. As stated above, this DiSEqC signaling path is the same path as the composite signal path. As such, the Eutelsat Installers Guide teaches that the composite signal path is a coaxial cable.

i. whereby the composite signal is transmitted to the IRD

The Eutelsat Installers Guide teaches that the composite signal is transmitted to the IRD. Still referring to Figure 11, the output of the RF combiner (a composite signal) is sent to the satellite

receiver (set top box or IRD). Accordingly, each element of claim 1 of the '576 patent is anticipated by the Eutelsat Installers Guide reference.

Per claim 6:

a. The signal distribution system of claim 1 wherein the transponder select information is transmitted over the same cable as the composite signal

The Eutelsat Installers Guide teaches that the channel select information is sent over the same cable as the composite signal. Referring still to Figure 11, the Eutelsat Installers Guide discloses that the DiSEqC signaling information that is used to select the channels (i.e., to select the transponders) is sent over the same cable as the composite signal.

Also note that the Eutelsat Installers Guide teaches that with conventional signaling systems, the received satellite signals (composite signal) and the control signals are sent over the same cable (page 26, first paragraph after bullets), and that DiSEqC is compatible with these conventional methods (page 27, second-to-last paragraph).

Accordingly, Claim 6 of the '576 patent anticipated by the Eutelsat Installers Guide reference.

Per claim 8:

a. A signal distribution system for distributing signals comprising a plurality of channels from a plurality of sources between a first unit and a second unit over a communication medium comprising:

As stated previously, the Eutelsat Installers Guide reference is directed toward a plurality of receiver system architectures and signaling protocols for satellite TV systems.

As also stated above with respect to Claim 1, the Eutelsat Installers Guide discloses a plurality of signal distribution systems for satellite TV. The Eutelsat Installers Guide teaches various architectures for distributing signals (Satellite TV signals) comprising a plurality of channels from a plurality of sources between a first unit (the Outdoor Unit) and a second unit (the IRD). One example of such an architecture is that illustrated in Figure 11 of the Eutelsat Installers Guide (reproduced above with reference to claim 1).

b. means in the first unit [ODU] responsive to information transmitted by the second unit [IRD] for extracting selected channels from each of the plurality of sources

The Eutelsat Installers Guide reference teaches this element of claim 1. Particularly, the Eutelsat Installers Guide reference teaches that the IRD is configured to send information to the outdoor unit to perform channel selection from satellite signals. Specifically, the Eutelsat Installers Guide at page 29 states that the architecture shown in Figure 11 provides "communication, preferably two-way, between each terminal and the head-end so that remote channel selection can be carried out." (See the last sentence of page 29).

c. and combining the selected channels into a composite signal

The Eutelsat Installers Guide also teaches combining the selected channels into a composite signal. As discussed above with respect to Claim 1, Figure 11 of the Eutelsat Installers Guide discloses an RF Combining and Amplification unit that accepts multiple RF signals from the Subscriber-controlled IF-IF conversion unit, and combines these IF signals into

a composite output signal.

d. without demodulating channels and without changing the modulation of the channels

The Eutelsat Installers Guide discloses that the signals are selected and combined without changing the modulation of the channels. As discussed above with respect to claim 1, the Eutelsat Installers Guide discloses that QPSK signals are received from the satellite and the signals are distributed to the satellite receiver (IRD) as QPSK signals. As such, no transmodulation is performed. Additionally, the signals are not demodulated either, as they remain QPSK-modulated signals.

e. and transmitting the composite signal over the medium;

The Eutelsat Installers Guide teaches that the composite signal is transmitted to the IRD. At Figure 11, the Eutelsat Installers Guide shows the composite signal routed to the IRDs via a coaxial cable signal path.

f. and means in the second unit [IRD] for receiving the composite signal and demodulating and decoding at least one channel;

The IRD is defined by the Eutelsat reference as a satellite receiver. Receivers are well known to those of ordinary skill in the art to receive communication signals and to demodulate and decode the signals. Indeed, the Eutelsat Installers Guide discloses that the output of the Satellite Receiver is connected to the television set. As such, one of ordinary skill in the art would have understood that the satellite receiver must demodulate and decode the signal, as television sets

are not configured to handle satellite signals in the IF spectrum as distributed from the combiner. As further evidence of what one of ordinary skill in the art would have understood regarding satellite television receivers, reference is made to the Background Section of the '576 patent. At Column 1, lines 39 - 44, with reference to the "Prior Art" Figure 1, the IRD (Integrated Receiver Decoder) is described as tuning, demodulating and decoding the received satellite signal.

g. and means in the first unit and second units for bi-directionally communicating control information between the second unit and the first unit.

The Eutelsat Installers Guide teaches bidirectional communication between the IRD and the switching equipment. Figure 11 (above) illustrates a bidirectional communication path between the IRD (through the wall jack) and the switching equipment. Additionally, Section 3.5.1.c of the Eutelsat Installers Guide at page 27 discloses Two-way (bidirectional) signaling.

Accordingly, Claim 8 of the '576 patent anticipated by the Eutelsat Installers Guide reference.

Per claim 9:

a. The signal distribution system of claim 8 wherein the control information comprises channel selection requests originating from the second unit

The Eutelsat Installers Guide reference teaches control information comprising channel selection requests. Particularly, at page 19, the Eutelsat Installers Guide reference states that communication "between each terminal and the head end so that remote channel selection can be carried out." *Id.*, at 19 (emphasis added).

b. and the control information comprises channel mapping information originating from the first unit.

The Eutelsat Installers Guide reference teaches that the control information also comprises channel mapping information from the switching equipment to the IRD. For example, at page 27 the Eutelsat Installers Guide reference discloses that "[t]wo-way DiSEqC TM (DiSEqC TM 2.0/2.1) further enhances the standard by allowing remote units to report their possible and actual configurations.

One of ordinary skill in the art would have understood that configuration information can include, for example, an identification of the LNB local oscillator frequency or an identification of the frequencies used by one or more of the IF-IF converters so the IRD can determine which frequency to tune to receive the converter output in the composite signal.

As evidence of what one of ordinary skill in the art would have understood at the time of the purported invention, reference is made to United States Patent No. 5,073,930, to Green et. al., which teaches that the term frequency mapping is used to map the conversion of an IF signal in a wideband LNB output to an IF signal at a translated frequency for placement in the composite signal. See, Green at Column 10, lines 4 - 43. As such, one of ordinary skill in the art at the time would have understood that configuration information for the IF-IF converters includes information regarding channel mapping.

Accordingly, Claim 9 of the '576 patent is anticipated by the Eutelsat Installers Guide reference.

Per claim 11:

a. The signal distribution system of claim 8 wherein the first unit is a satellite outdoor unit and the second unit is a satellite integrated receiver decoder unit.

The Eutelsat Installers Guide reference teaches an outdoor unit and a satellite integrated receiver decoder unit (IRD). Figure 11 of the Eutelsat Installers Guide reference discloses a Satellite Receiver. The Satellite Receiver is referenced in various places in the Eutelsat Installers Guide reference as an IRD. For example, page 20 refers to the communication between the wall outlet and the "IRD." Likewise, Section 3.5.1 .c states that the signaling systems uses the "satellite receiver (IRD)..." *Id.*, at 27.

Figure 11 (above) also illustrates the LNBs and other switching and distribution equipment, which one of ordinary skill in the art would understand to be outdoor equipment. Also, at the top of page 27, the reference refers to the two-way communications between the IRD and the selection units as signaling "between the outdoor and indoor units."

Furthermore, as further evidence of what was understood by one of ordinary skill in the art at the time, Figure 1 of the '576 patent (labeled as "Prior Art") and the accompanying description disclose that the satellite antenna, LNBs and switches are an outdoor unit, and the description accompanying prior art Figure 1 describes the IRD as a set top box located inside a building. Accordingly, Claim 11 of the '576 patent is anticipated by the Eutelsat Installers Guide reference.

Per claim 12:

a. The signal distribution system of claim 11 wherein the communication medium consists of a single coaxial cable connected to the satellite outdoor unit.

As discussed above with respect to Claim 1, the Eutelsat Installers Guide at page 27 teaches that the communication medium over which the signal is distributed is a coaxial cable. Accordingly, Claim 12 of the '576 patent is anticipated by the Eutelsat Installers Guide reference.

Per claim 13:

a. The signal distribution system of claim 12 wherein the means for communicating uses the same communication medium as the composite signal

In this claim, "means for communicating" refers to the bi-directional communication of control information as recited in the preamble of independent claim 8 from which this claim ultimately depends. The Eutelsat Installers Guide reference teaches that the control information is communicated along the same signal path as the composite signal. This was discussed above with respect to claim 1, for which Figure 11 of the Eutelsat Installers Guide reference was cited as showing bi-directional signaling capabilities along the same signal path as the composite signal.

Accordingly, Claim 13 of the '576 patent is anticipated by the Eutelsat Installers Guide reference.

Per claim 14:

a. A method of communicating a plurality of transponder signals from a satellite outdoor unit (ODU) that receives a plurality of satellite broadband signals to an integrated receiver decoder (IRD) over a single cable connected to the ODU, the method comprising the steps of."

The Eutelsat Installers Guide reference teaches communicating a plurality of transponder signals from a satellite outdoor unit that receives satellite broadband signals and communicates these signals to an IRD over a single cable connected to the outdoor unit. As discussed above with respect to Claim 1, Figure 11 shows a satellite antenna, LNBs and switching equipment that makes up an outdoor unit for receiving satellite broadband signals. The switching equipment selects a plurality of transponder signals in response to DiSEqC commands from the satellite

receiver (IRD) and communicates the selected transponder signals to the IRD.

b. communicating a transponder request signal to the ODU from the IRD;

Figure 11 of the Eutelsat Installers Guide reference illustrates signaling information between the satellite receiver (IRD) and the switching equipment (ODU). Additionally, the Eutelsat Installers Guide reference discloses a signaling protocol referred to as DiSEqC signaling that can provide one-way or two-way communication between the IRD and ODU. The Eutelsat Installers Guide also states that this communication allows "remote channel selection" to be carried out. See, page 19, last sentence.

Later in this claim 14, the transponder signals extracted from the broadband LNB signal are selected based on the transponder request signal. As such, the transponder request signal is taught by the Eutelsat Installers Guide reference to the DiSEqC signal used to carry out remote channel selection.

c. in the ODU, selecting a plurality of transponder signals extracted from the received satellite broadband signals, wherein the selecting is responsive to the transponder request signals;

The Eutelsat Installers Guide reference teaches selecting transponder signals, or channels. As discussed above with respect to claim 1, and with reference to Figures 7 and 11, the transponder signals are extracted from the received satellite broadband signal.

As also discussed above with respect to claim 1, the selection of the transponder signals is in response to signals from the IRD (transponder request signals).

d. combining selected transponder signals into a composite signal;

The Eutelsat Installers Guide reference teaches combining selected transponder signals into a composite signal. As discussed above with respect to claim 1, Figure 11 of the Eutelsat Installers Guide reference illustrates an RF combining and amplification unit that combines the selected transponder signals into a composite output on a single communication path from the combiner to the IRD(s).

e. transmitting the composite signal over the single cable from the ODU to the IRDs,

The Eutelsat Installers Guide reference teaches transmitting the composite signal over the single cable from the ODU to the IRDs. As discussed above with respect to Claim 1, the composite signal is illustrated in Figure 11 as being transmitted over a single communication path to the IRD(s). As also discussed above, Figure 11 illustrates multiple wall outlets. One of ordinary skill in the art reading the Eutelsat Installers Guide reference would understand that a satellite receiver, or IRD, can be hooked up to each wall outlet.

f. wherein the modulation of the transponder signal is not altered by the steps of selecting, combining, and transmitting.

The Eutelsat Installers Guide reference teaches that the modulation of the transponder signal is not altered by the steps of selecting, combining, and transmitting. As discussed above with respect to Claim 1, the Eutelsat Installers Guide reference teaches that a QPSK-modulated signal is received from the satellite, and that the selected transponder signals, or channels, are distributed to the IRD(s) as QPSK modulated signals. As such, a system that does not alter the

modulation is taught.

Accordingly, Claim 14 of the '576 patent is anticipated by the Eutelsat Installers Guide reference.

Per claim 16:

a. The method of claim 14 wherein the step of combining comprises frequency translating the selected transponder channels to a variable frequency before combining.

The Eutelsat Installers Guide reference teaches frequency translating the selected transponder channels to a variable frequency before combining. As discussed above with respect to claim 1, the Eutelsat Installers Guide reference shows in Figure 7 that the transponder channels are frequency translated from their respective center frequencies in the broadband satellite signal to their new respective center frequencies in the satellite IF distribution channel.

One of ordinary skill in the art would understand that the frequency translation would occur before combination as the signals will need to be reassigned to their new frequency allocation within the bandwidth of the composite signal. One of ordinary skill in the art would also understand that the assignment would be variable to accommodate allocation of multiple selected signals into the available bandwidth.

Accordingly, Claim 16 of the '576 patent is anticipated by the Eutelsat Installers Guide reference.

Per claim 18:

a. The method of claim 14 further comprising the step of splitting the composite signal inside a home and distributing to a plurality of IRDs.

The Eutelsat Installers Guide reference teaches splitting the composite signal inside a home and distributing to a plurality of IR s. Particularly, Figure 11 illustrates that the composite signal is

split out to a plurality of wall units and distributed to each of the wall units. As stated above, one of ordinary skill in the art would understand that, as in the first unit, an IRD can be connected to each of the other wall units. As such, Figure 11 illustrates splitting the signal and distributing it to a plurality of IRDs. Also note that the claim references splitting the signal inside a home. Figure 11 illustrates that the signal is split prior to distribution to the wall units. One of ordinary skill in the art would understand that the wall outlets are in the walls of the building (whether it be a home, office, or other building), and that the splitting can occur inside the home. Accordingly, Claim 18 of the '576 patent is anticipated by the Eutelsat Installers Guide reference.

Per claim 19:

a. The method of claim 14 wherein the transponder request signal is transmitted over the cable from an IRD

The Eutelsat Installers Guide reference teaches the transponder request signal is transmitted over the cable from an IRD. As discussed above with respect to claim 2, Figure 11 illustrates that the DiSEqC signal (transponder request signal) is transmitted over the cable from the IRD to the switching equipment.

b. and all IRDs receive the same composite signal

The Eutelsat Installers Guide reference teaches that all IRDs receive the same composite signal. As discussed above with respect to claim 2, Figure 11 illustrates that the composite signal is distributed via a single cable to the wall outlets, and that an IRE) can be connected to each wall outlet. Accordingly, Claim 19 of the '576 patent is anticipated by the Eutelsat Installers Guide

reference.

Per claim 21:

a. The method of claim 14 further comprising the steps of frequency translating the selected transponder channels to a variable frequency before combining;

As discussed above with respect to claim 16, the Eutelsat Installers Guide reference teaches translating the selected transponder channels to a variable frequency before combining.

b. and splitting the composite signal inside a home and distributing to a plurality of IRDs.

As discussed above with respect to claim 18, the Eutelsat Installers Guide reference teaches splitting the composite signal inside a home and distributing to a plurality of IRDs.

Accordingly, Claim 21 of the '576 patent is anticipated by the Eutelsat Installers Guide reference.

Per claim 22:

a. The method of claim 21 wherein the transponder request signal is transmitted over the cable from an IRD.

Claim 21 from which this claim depends, is taught by the Eutelsat Installers Guide as described with reference to Claim 21. As discussed above with respect to claim 19, The Eutelsat Installers Guide reference teaches that the transponder request signal is transmitted over the cable from an IRD. (Fig. 11) Accordingly, Claim 22 of the '576 patent is anticipated by the Eutelsat Installers Guide reference.

2. Claim 2 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over the Eutelsat Installers Guide reference in view of Humpleman.

Per claim 2:

a. The signal distribution system of claim l further comprising a plurality of IRDs

The Eutelsat Installers Guide teaches that a plurality of IRDs can be provided. Particularly, Figure 11 illustrates multiple wall outlets. One of ordinary skill in the art would have understood that multiple wall outlets are used to support additional IRDs. For example, one IRD can be connected to each additional wall outlet, just as the illustrated IRE) is connected to the first wall outlet.

b. and wherein the composite signal is transmitted on a single cable connected to the ODU

Figure 11 also illustrates that the composite signal from the combiner is transmitted on a single cable.

c. and all IRDs receive channels extracted from the composite signal

Figure 11 also illustrates that the IRDs receive channels from the composite signal. As illustrated, the composite signal is distributed to the IRDs. Particularly, the composite signal is distributed to all the wall outlets (each of which can support an IRD) so that all IRDs connected thereto receive the channels in the composite signal.

Accordingly, Claim 2 of the '576 patent anticipated by the Eutelsat Installers Guide reference.

In the alternative, claim 2 is rejected under 103(a) as being obvious in view of Humpleman. The alternative rejection is necessitated the limitation reciting "channels extracted form the composite signal" that, in an alternate interpretation, could be interpreted to include gateway functionality. (See: '576 at 2:62)

Analogous art Humpleman, discloses a multimedia network architecture for in-premises distribution of satellite television signals. Humpleman teaches that cable or satellite television signals (Col. 3, lines 28-31) are received at the home and distributed by network 10 to one or more televisions 12, 14 or other video equipment (VCR 16). With reference to Figure 1, Humpleman discloses that a network interface unit 32 (i.e., Gateway) receives an external satellite broadcast signal (Col. 3, lines 21 - 35), and that the external signals are distributed via a network 34 (Col. 3, lines 49 - 55). With particular regard to television signals, Humpleman teaches with reference to Figure 4 that the network interface unit (NIU) 32, or gateway, receives the external video signal and distributes it to the set top box 40 (Column 7, lines 18 - 34). Humpleman also teaches that the gateway (NIU 32) can extract channels from the composite signal before the signal is distributed throughout the home to the set top boxes. See, for example, Column 7, lines 35 - 52, where Humpleman discloses demultiplexing the channel from a multiple channel stream.

A skilled artisan would have knowingly modified the teachings of the Eutelsat Installer Guide to include the gateway teachings of Humpleman since using a gateway for channel extraction would have been part of the ordinary capabilities of a skilled artisan and there would have been a reasonable expectation of success based on similar uses of gateways in the same technological arena.

Accordingly, Claim 2 of the '576 patent is rendered obvious by Humpleman's teachings of a gateway in combination with the Eutelsat Installers Guide reference.

3. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over the Eutelsat Installers Guide in view of Kelly.

Per claim 3: As cited above, the Eutelsat Installers Guide teaches every element of independent claim 1.

Eutelsat Installers Guide does not explicitly disclose a digital filter.

Analogous art Kelley, teaches a digital receiver with digital channel selection. At Figure 8, Kelley teaches a digital receiver with an analog to digital converter ADC 106 that digitizes the RF input signal and provides it to a digital tuner. Col. 6, lines 31-34. The output of mixer 18 is provided to a digital IF filter 34 to isolate the desired IF signal. Col. 7, lines 34 - 40.

A skilled artisan would have knowingly modified the teachings of the Eutelsat Installer Guide to include the digital filter teachings of Kelly since using a digital filter and analog to digital converter would have been part of the ordinary capabilities of a skilled artisan and there would have been a reasonable expectation of success based on similar uses of the devices in the same technological arena. Accordingly, Claim 3 of the '576 patent is rendered obvious by the Eutelsat Installers Guide in combination with Kelley.

4. Claims 4, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Eutelsat Installers Guide in view of Green.

Per claim 4:

a. The signal distribution system of claim 1 wherein the signal selector comprises a tuner.

As cited above, the Eutelsat Installers Guide teaches every element of independent claim 1. However, the Eutelsat Installers Guide does not explicitly disclose a tuner to select the transponder signals. Tuners for channels selection in television receivers are notoriously well known.

Analogous art Green et. al., discloses a satellite receiver system that uses a tuner to perform IF channel selection, and combining a plurality of selected channels into a composite signal for transmission to a set top box. At Figure 1A, Green discloses a plurality of broadband LNB output signals 104, 106 having a plurality of transponder channels. IF-IF converters 113 are comprised of a plurality of transponder processors 112 that each receive a broadband LNB signal from which one of the constituent transponder signals will be chosen. Thus, these transponder processors 112 are signal selectors. These signal selectors are described with reference to Figure 3 as including a tuner.

A skilled artisan would have knowingly modified the teachings of the Eutelsat Installer Guide to include the tuner teachings of Green since using tuners for channels selection in television receivers is notoriously well known would have been part of the ordinary capabilities of a skilled artisan. Accordingly, Claim 3 of the '576 patent is rendered obvious by the Eutelsat Installers Guide in combination with Kelley.

Per claim 10

a. The signal distribution system of claim 8, further comprising a means in the first unit for carrier offset correction.

The Eutelsat Installers Guide reference teaches every element of claim 8 as cited above. However, the Eutelsat Installers Guide does not explicitly teach carrier offset correction. Analogous art Green, et al., teaches carrier offset correction in a satellite receiver system. At Column 12, lines 40 - 45, Green discloses carrier offset correction to correct for frequency errors. Note that one would have looked to Green when implementing satellite receiver system architectures. Particularly, Figure 1A of Green illustrates a plurality of selected broadband satellite signals on a bus 110 are sent to transponder units 112 for channel selection, and that the selected transponder channels are then combined by combiners 114. Figure 2 of Green illustrates that the selected transponder channels are mapped into and combined into a single composite signal (labeled as transponder bank output). This is directed toward solving the same goal of channel selection in a satellite receiver system as are the '576 patent and the Eutelsat Installers Guide. Hence, a skilled artisan would have knowingly modified the teachings of the Eutelsat Installer Guide to include carrier offset correction teachings of Green and there would have been a reasonable expectation of success. Accordingly, Claim 10 of the '576 patent is rendered obvious by the Eutelsat Installers Guide in combination with Green.

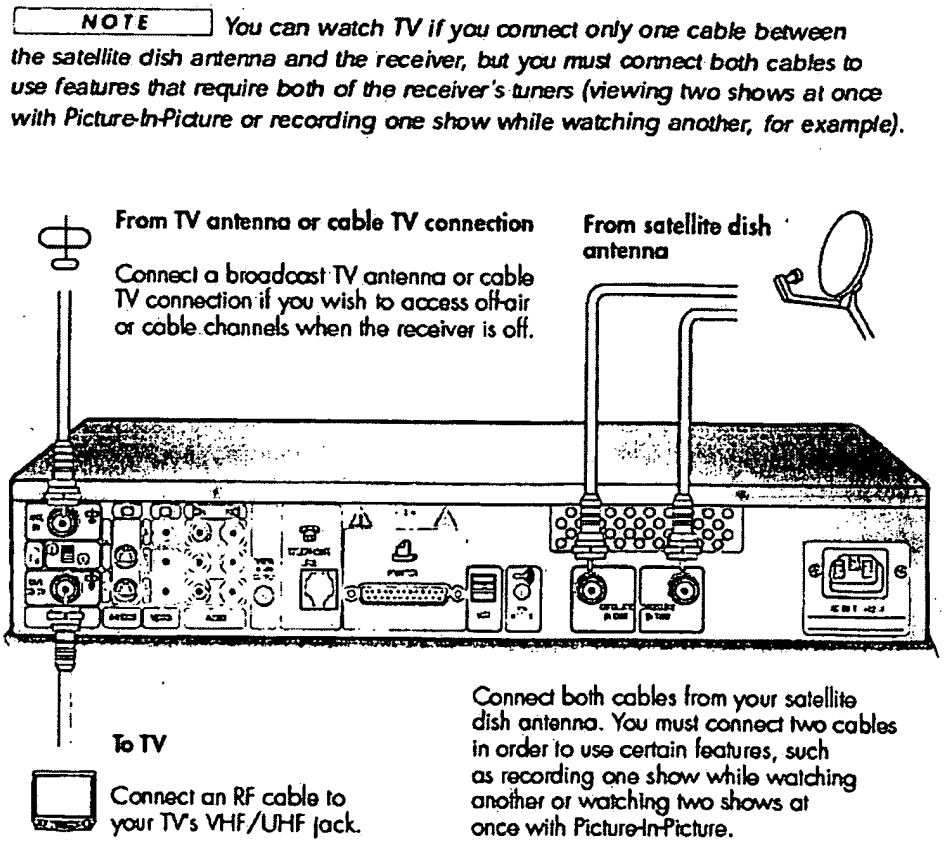
5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over the Eutelsat Installers Guide in view of the RCA Setup Guide.

Per claim 5:

a. The signal distribution system of claim 1 further comprising an integrated receiver decoder (IRD) connected to the coaxial cable with a plurality of tuners within the IRD, wherein each tuner within the IRD receives the composite signal and each tuner uses at least one transponder signal.

As cited above, the Eutelsat Installers Guide teaches every element of independent claim 1. Also, as illustrated in Figure 19 (page 26), the Eutelsat Installers Guide discloses a satellite receiver or IRD connected to the coaxial cable. However, the Eutelsat Installers Guide does not explicitly disclose a plurality of tuners within the IRD.

The concept of two tuners in a television receiver was well known at the time of the purported invention to allow features such as picture-in-picture and watch-and-record. As evidence of what would be known by one of ordinary skill in the art the RCA Setup Guide discloses a satellite set top box, or IRD, with multiple tuners. For example, the Figure on page 6 and the accompanying note teaches two tuners to enable picture-in-picture or watch-and-record capabilities.



A skilled artisan would have knowingly modified the teachings of the Eutelsat Installer Guide to include the multiple tuner teachings as evidenced by the RCA Setup Guide since using multiple tuners was notoriously well known in the art and would have been part of the ordinary capabilities of a skilled artisan. Accordingly, Claim 5 of the '576 patent is rendered obvious by the Eutelsat Installers Guide in combination with the RCA Setup Guide.

6. Claims 7, 20, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Eutelsat Installers Guide in view of the Philips Data Sheet.

Per claims 7 and 20:

a. (claim 7) The signal distribution system of claim 1 wherein the transponder select information is transmitted over a wireless link.

b. (claim 20) The method of claim 14 wherein the transponder request signal is transmitted over a wireless link to the ODU.

As cited above, the Eutelsat Installers Guide teaches every element of claims 1 and 14. However, the Eutelsat Installers Guide does not explicitly state that the transponder select information or request signal (i.e., the DiSEqC command) can be sent over a wireless link. Wireless communications as an alternative to wired communications were very well known at the time of the invention.

The Philips Data Sheet for the UAA3202M Frequency Shift Keying Receiver illustrates a single-chip wireless receiver for VHF and UHF systems. (See, General Description on page 2.) Described applications for the wireless receiver are listed as remote control systems, telemetry systems and wireless data transmission (page 2). As such, it would have been obvious to use this or other commonly available wireless technology to communicate transponder select information over a wireless link. Hence, a skilled artisan would have knowingly modified the teachings of the

Eutelsat Installer Guide to include the wireless technology of the Philips Data Sheet since this technology would have been part of the capabilities of a skilled artisan at the time of the invention. Accordingly, claims 7 and 20 of the '576 patent are rendered obvious by the Eutelsat Installers Guide in combination with the Philips Data Sheet.

Per claim 23:

a. The method of claim 21 wherein the transponder request signal is transmitted over a wireless link to the ODU.

Claim 21 elements are taught by the Eutelsat Installers Guide as previously cited above. As also cited above, the Philips Data Sheet for the UAA3202M Frequency Shift Keying Receiver illustrates a single-chip wireless receiver for VHF and UHF systems. (See, General Description on page 2.) Described applications for the wireless receiver are listed as remote control systems, telemetry systems and wireless data transmission (page 2). As such, it would have been obvious to use this or other commonly available wireless technology to communicate transponder select information over a wireless link. Hence, a skilled artisan would have knowingly modified the teachings of the Eutelsat Installer Guide to include the wireless technology of the Philips Data Sheet since this technology would have been part of the capabilities of a skilled artisan at the time of the invention. Accordingly, claim 23 is rendered obvious by the Eutelsat Installers Guide in combination with the Philips Data Sheet.

7. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over the Eutelsat Installers Guide in view of the Broadcom Digital Satellite Receiver Paper.

Per claim 15:

a. The method of claim 14 wherein the step of selecting a transponder signal comprises the step of filtering a transponder signal with a band pass filter having a bandwidth ranging from 5% TO 100% wider than the bandwidth of the transponder signal

The Eutelsat Installers Guide reference teaches every element of claim 14, from which claim 10 depends. The Broadcom Digital Satellite Receiver Paper discloses a 55Mhz bandwidth filter (page 1639, bottom of Col. 1) that is used in a digital satellite receiver capable of supporting variable symbol rates of 1 - 45 Mbaud (i.e., 1 - 45 MHz). Thus, depending on the chosen operating symbol rate, the bandwidth of the filter can range from approximately 20% wider than the signal bandwidth to well more than 100% wider. A skilled artisan would have knowingly modified the teachings of the Eutelsat Installer Guide to include the filter teachings of the Broadcom Digital Satellite Receiver Paper the use of filters is very well known in the art and would have been part of the ordinary capabilities of a skilled artisan. Further, a skilled artisan implementing a filter for the transponder signal would have had a reasonable expectation of success. Accordingly, Claim 15 of the '576 patent is rendered obvious by the Eutelsat Installers Guide in combination with Broadcom Digital Satellite Receiver Paper.

8. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over the Eutelsat Installers Guide in view of Broadcom Digital Satellite Receiver in further view of Green.

Per claim 17:

a. The method of claim 15 further comprising frequency translating the selected transponder channels to a predetermined frequency before combining.

As discussed above, The Eutelsat Installers Guide and Broadcom references teach every element of claim 15. Additionally, as discussed above with respect to claim 1, the Eutelsat Installers

Guide teaches frequency translating the selected transponder channels (for example, Figure 19 illustrates that the IF to IF frequency translation occurs prior to the signal combining). However, it is unclear if the translation is to a predetermined frequency before combining.

Green specifically teaches translation of transponder channels to a predetermined frequency prior to combining. Figure 1A of Green illustrates a plurality of selected broadband satellite signals on a bus 110 are sent to transponder units 112 for channel selection, and that the selected transponder channels are then combined by combiners 114. Figure 2 of Green illustrates that the selected transponder channels are mapped into and combined into a single composite signal (labeled as transponder bank output). Although the transponder processor can map to a variable frequency (as discussed with respect to Claim 16), Green also teaches that once a mapping of transponder channels into the combined signal is decided, the processors can be preprogrammed to output on a given frequency. See, Column 10, lines 20 - 23. Thus, the processors translate to a predetermined frequency prior to signal combining. Accordingly, Claim 17 of the '576 patent is rendered obvious by the Eutelsat Installers Guide reference in combination with Green.

VII. Conclusion

In order to ensure full consideration of any amendments, affidavits or declarations, or other documents as evidence of patentability, such documents must be submitted in response to this Office action. Submissions after the next Office action, which is intended to be a final action, will be governed by the requirements of 37 CFR 1.116, after final rejection and 37 CFR 41.33 after appeal, which will be strictly enforced.

Any paper filed with the USPTO, i.e., any submission made, by either the Patent Owner or the Third Party Requester must be served on every other party in the reexamination proceeding, including any other third party requester that is part of the proceeding due to merger of the reexamination proceedings. As proof of service, the party submitting the paper to the Office must attach a Certificate of Service to the paper, which sets forth the name and address of the party served and the method of service. Papers filed without the required Certificate of Service may be denied consideration. 37 CFR 1.903; MPEP 2666.06.

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Fred Ferris
Primary Examiner
AU 3992

Conferees:
ESK
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Reexamination	Application/Control No.	Applicant(s)/Patent Under Reexamination
	90/008,389	7130576
	Certificate Date	Certificate Number

Requester Correspondence Address: ☐ Patent Owner ☒ Third Party

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L. de la Garza

Linda M. de la Garza

1. Amendment and Response to Office Action in Ex Parte Reexamination

In re Patent Application of:	Gurantz, et al.	
Title:	SIGNAL SELECTOR AND COMBINER FOR BROADBAND CONTENT DISTRIBUTION	
Patent No.:	7,130,576	Filed: February 06, 2007
Examiner:	Ferris III, Fred O.	Group Art Unit: 3992
Our Docket No.:	05JM-139053	**Date Faxed: August 14, 2008**
Client:	Entropic Communications, Inc.	**Date Due: August 16, 2008**
Atty/Sec.:	Yannuzzi/de la Garza	

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In re Patent Application of: Gurantz, *et al.*	Attorney Docket No.: 05JM-139053
Control No.: 90/008,389 Patent No.: 7,130,576	Confirmation No.: 3367
Filed: February 06, 2007	Art Unit: 3992
For: Signal Selector and Combiner for Broadband Content Distribution	Examiner: Ferris III, Fred O.

Amendment and Response to Office Action in Ex Parte Reexamination

Via facsimile

Box Reexamination
(571) 273-9900
Central Reexamination Unit

INTRODUCTORY COMMENTS

This is in response to the Office Action in Ex Parte Reexamination mailed June 16, 2008, time for response to which is set to expire August 16, 2008. The considered claims, claims 1-23, stand rejected. Careful consideration has been given to the grounds for rejection, and the following amendment and discussion are offered in response. Reconsideration is respectfully requested.

Amendments to the Claims are reflected in the listing of claims, which begins on page 2 of this paper.

Remarks/Arguments begin on page 8 of this paper.

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AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A signal distribution system for distributing a plurality of low noise amplifier and block converter (LNB) signals from satellite outdoor unit (ODU) over a coaxial cable to an integrated receiver decoder (IRD) comprising:

a signal selector that receives a plurality of broadband LNB signals comprising a plurality of transponder signals and digitizes the received broadband LNB signals, the signal selector is responsive to transponder select information transmitted by an IRD and selects a plurality of transponder signals in the digital domain from at least one broadband LNB signal based on the transponder select information;

a frequency translator coupled to the signal selector that is [capable of shifting] configured to shift the selected transponder signals to new carrier frequencies and a converter configured to convert the shifted selected transponder signals to produce RF signals; and

a combiner communicatively coupled to at least one frequency translator, the combiner configured to combine[capable of combining] at least two of the shifted selected RF signals to produce a composite signal;

wherein the modulation of the composite signal is the same as modulation of the broadband LNB signals and wherein the composite signal is transmitted on the coaxial cable;

whereby the composite signal is transmitted to the IRD.

2. (Original) The signal distribution system of claim 1 further comprising a plurality of IRDs and wherein the composite signal is transmitted on a single cable connected to the ODU and all IRDs receive channels extracted from the composite signal.

3. (Original) The signal distribution system of claim 1 wherein the signal selector comprises an analog to digital converter and a digital filter.

4. (Original) The signal distribution system of claim 1 wherein the signal selector comprises a tuner.

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5. (Original) The signal distribution system of claim 1 further comprising an integrated receiver decoder (IRD) connected to the coaxial cable with a plurality of tuners within the IRD, wherein each tuner within the IRD receives the composite signal and each tuner uses at least one transponder signal.

6. (Original) The signal distribution system of claim 1 wherein transponder select information is transmitted over the same cable as the composite signal.

7. (Original) The signal distribution system of claim 1 wherein transponder select information is transmitted over a wireless link.

8. (Currently Amended) A signal distribution system for distributing signals comprising a plurality of satellite transponder channels of a broadband signal from a plurality of sources between a first unit and a second unit over a communication medium comprising:

means in the first unit for digitizing the broadband signal from each of the plurality of sources;

means in the first unit responsive to information transmitted by the second unit for extracting selected channels from [each of the plurality of sources] the digitized broadband signals in the digital domain; and

means in the first unit for combining the selected channels into a composite signal without demodulating channels and without changing the modulation of the channels and transmitting the composite signal over the medium; and

means in the second unit for receiving the composite signal and demodulating and decoding at least one channel; and

means in the first unit and second units for bi-directionally communicating control information between the second unit and the first unit.

9. (Original) The signal distribution system of claim 8 wherein the control information comprises channel selection requests originating from the second unit and the control information comprises channel mapping information originating from the first unit.

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10. (Original) The signal distribution system of claim 8, further comprising a means in the first unit for carrier offset correction.

11. (Original) The signal distribution system of claim 8 wherein the first unit is a satellite outdoor unit and the second unit is a satellite integrated receiver decoder unit.

12. (Original) The signal distribution system of claim 11 wherein the communication medium consists of a single coaxial cable connected to the satellite outdoor unit.

13. (Original) The signal distribution system of claim 12 wherein the means for communicating uses the same communication medium as the composite signal.

14. (Currently Amended) A method of communicating a plurality of transponder signals from a satellite outdoor unit (ODU) that receives a plurality of satellite broadband signals to an integrated receiver decoder (IRD) over a single cable connected to the ODU, the method comprising the steps of:

communicating a transponder request signal to the ODU from the IRD;

in the ODU, digitizing the plurality of satellite broadband signals, selecting and extracting a plurality of transponder signals [extracted] from the received digitized satellite broadband signals, wherein the selecting is responsive to the transponder request signals;

combining extracted selected transponder signals into a composite signal;

transmitting the composite signal over the single cable from the ODU to the IRDs, wherein the modulation of the transponder signal is not altered by the steps of selecting, combining, and transmitting.

15. (Currently Amended) The method of claim 14 wherein the step of selecting and extracting a transponder signal comprises the step of: filtering a transponder signal with a band pass filter having a bandwidth ranging from 5% to 100% wider than the bandwidth of the transponder signal.

16. (Currently Amended) The method of claim 14 wherein the step of combining comprises frequency translating the selected and extracted transponder channels to a variable frequency before combining.

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36. (Newly Added) The method of claim 14, wherein the combining is performed in the digital domain.

37. (Newly Added) The method of claim 17, wherein frequency translating comprises using a digital mixer to apply a rotating phasor to the data samples to translate their frequency.

38. (Newly Added) The method of claim 14, further comprising frequency translating the digitized broadband signal prior to selecting and extracting transponder signal.

39. (Newly Added) The method of claim 38, wherein frequency translating comprises translating the original digitized broadband signal to locate a selected transponder channel at baseband.

40. (Newly Added) The method of claim 14, further comprising maintaining a channel translation table at the outdoor unit, the channel translation table specifying assigned frequency slots for transponder channels in the composite signal.

41. (Newly Added) The method of claim 38, further comprising providing the channel translation table to the IRD to allow the IRD to tune to a desired selected translated transponder channel.

42. (Newly Added) The method of claim 14, wherein selecting and extracting comprises low-pass filtering the translated digitized broadband signal thereby substantially removing signal information from non-selected transponder channels.

17. (Currently Amended) The method of claim 15, further comprising frequency translating the selected transponder channels to a predetermined frequency before combining.

18. (Original) The method of claim 14 further comprising the step of splitting the composite signal inside a home and distributing to a plurality of IRDs.

19. (Original) The method of claim 14 wherein the transponder request signal is transmitted over the cable from an IRD and all IRDs receive the same composite signal.

20. (Original) The method of claim 14 wherein the transponder request signal is transmitted over a wireless link to the ODU.

21. (Original) The method of claim 14 further comprising the steps of: frequency translating the selected transponder channels to a variable frequency before combining; and splitting the composite signal inside a home and distributing to a plurality of IRDs.

22. (Original) The method of claim 21 wherein the transponder request signal is transmitted over the cable from an IRD.

23. (Original) The method of claim 21 wherein the transponder request signal is transmitted over a wireless link to the ODU.

24. (Newly Added) The signal distribution system of claim 1, wherein the signal selector comprises a digital filter configured to apply a pass band filter transfer function to the digitized broadband signal to isolate a transponder channel.

25. (Newly Added) The signal distribution system of claim 1, wherein the converter comprises a digital-to-analog converter configured to convert the selected and frequency translated signal to an analog signal prior to combining.

26. (Newly Added) The signal distribution system of claim 1, wherein the frequency translator comprises a digital mixer configured to apply a rotating phasor to the data samples to translate their frequency.

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27. (Newly Added) The signal distribution system of claim 1, wherein shifting a selected transponder signal to a new carrier frequency comprises translating the original digitized broadband signal to locate a selected transponder channel at baseband.

28. (Newly Added) The signal distribution system of claim 1, wherein the channels combined in the composite signal are combined at a sample rate substantially equal to the composite output rate.

29. (Newly Added) The signal distribution system of claim 1, further comprising a controller to control the signal selector, frequency translator and converter and combiner.

30. (Newly Added) The signal distribution system of claim 29, wherein the controller, signal selector, frequency translator and combiner are part of a satellite outdoor unit.

31. (Newly Added) The signal distribution system of claim 29, further comprising a channel translation table maintained by the controller and specifying assigned frequency slots for transponder channels in the composite signal.

32. (Newly Added) The signal distribution system of claim 31, wherein the channel translation table is provided to the IRD to allow the IRD to tune to a desired selected translated transponder channel.

33. (Newly Added) The signal distribution system of claim 1, wherein the new carrier frequencies to which the selected transponder channels are shifted is determined such that the translated channels are placed at respective center frequencies where they will be positioned in the composite signal.

34. (Newly Added) The method of claim 14, wherein selecting and extracting comprises applying a pass band filter transfer function to the digitized broadband signal.

35. (Newly Added) The method of claim 14, further comprising converting the selected signal to an analog signal using a digital to analog converter prior to combining.

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REMARKS

Upon entry of the foregoing amendments, claims 1 - 41 are pending in the application. Claims 1, 8 and 14 – 17 are amended and new claims 24 – 42 are added by the above amendments. These changes are believed to introduce no new matter, and their entry is respectfully requested. Support for the above amendments can be foundat Column 4, line 28 through Column 6, line 50, *inter alios*, and in the drawings accompanying that description.

In view of the above amendments and following remarks, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the outstanding rejections of the claims and to pass this application to issue. If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

The Original claims were rejected under 35 U.S.C. § 102(b) and under 35 U.S.C. § 103 as being anticipated or rendered obvious. The above amendments to the claims render these grounds of rejection moot. The currently pending claims are patentably distinct from cited references, whether taken either alone or in combination, for at least the reasons set forth below.

In responding to the rejection, the Patentee adopts the same shorthand definitions set forth in the Office Action. These are reproduced below for convenience:

> "INFORMATION FOR INSTALLERS OF HOT BIRD TM DVB-S SYSTEMS,VERSION 1.0" (hereinafter "Eutelsat Installers' Guide"), EUTELSAT, dated June 7, 1999;
>
> "DIGITAL SATELLITE EQUIPMENT CONTROL (DiSEqC TM) UPDATE AND RECOMMENDATIONS FOR IMPLEMENTATION,

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VERSION 2.0" (hereinafter "Eutelsat DiSEqC Specification"), dated April 18, 1997;

United States Patent No. 6,437,837 to Seo (hereinafter "Seo");

United States Patent No. 5,073,390 to Green et al. (hereinafter "Green");

United States Patent No. 6,005,861 to Humplemann (hereinafter "Humplemann");

"A SINGLE CHIP UNIVERSAL DIGITAL SATELLITE RECEIVER WITH480-Mhz IF INPUT" (hereinafter the "Broadcom Paper");

"PHILLIPS DATA SHEET FOR UAA3202M FREQUENCY SHIFT KEYING RECEIVER", (hereinafter the "Phillips Data Sheet");

United States Patent No. 5,654,774 to Pugel et al. (hereinafter "Pugel");

United States Patent No. 4,953184 to Simone (hereinafter "Simone");

European Patent No. 1009113 (hereinafter "EPO '113 Patent");

European Patent No. 0757489 (hereinafter "EPO '489 Patent");

United States Patent No. 5,285,284 to Takashima et al. (hereinafter "Takashima");

United States Patent No. 6,353,463 to Seo (hereinafter "Seo")

"RCA DIR CTTV RECEIVER WITH ULTIMATETV SERVICE SETUP GUIDE (hereinafter the "RCA Setup Guide");

United States Patent No. 5,278,837 to Kelley (hereinafter "Kelley").

1. **Rejection of claims Claims 1, 6, 8, 9, 11-14, 16, 18, 19, 21 and 22 under 35 U.S.C. 102(b) as being anticipated by the Eutelsat Installers Guide.**

A patent claim is anticipated under 35 U.S.C. § 102 if and only if each and every limitation of that claim is found either expressly or inherently in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). However, where inherency is relied on, such inherency may not be established by 'probabilities or possibilities.' *Continental Can Co. USA v. Monsanto Co.,*

948 F.2d 264, 1268 (Fed. Cir. 1991). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Furthermore, for a rejection to be proper under 35 U.S.C. § 102, the reference must describe the claimed invention with sufficient clarity and detail to establish that the invention existed and was known by those of ordinary skill in the art. *Diversitech Corp. v. Century Steps, Inc., 850* F.2d 675, 677 (Fed. Cir. 1988). Such a person of ordinary skill must perceive 'no difference between the claimed invention and the reference disclosure.' *Suzuki Motor Co.,* at 1236-37.

a. Independent Claims 1, 8 and 14 and Their Respective Dependent Claims, 2-7, 9-13, and 15-23.

Independent Claims 1 and 14 have been amended to recite that the system or method includes digitizing the broadband signal and the claims as amended are generally directed toward systems and methods of signal distribution of a plurality of satellite transponder channels of a broadband signal, wherein the broadband signal is digitized, and desired transponder channels are translated and selected in the digital domain. This is in contrast to the cited references, which do not teach or suggest digitizing the broadband satellite signal and operating on that digitized content.

i. Claim 1 and its Originally Dependent Claims, Claims 2-7

Claim 1, as amended, now recites that the signal selector also "digitizes the received broadband LNB signals" and that the channel selection is performed "in the digital domain." These features of digitizing the broadband signal and performing channel selection in the digital domain represent a significant departure from the prior art at the time of the invention, which only taught operating in the RF and IF domains. Moreover, the digitization of the broadband signal – *i.e.*, digitizing a complete band – is not obvious in light of the prior art because broadband digitization results in an architecture that is substantially different from that achievable through conventionally known technologies such as those found in the cited art. These differences in architecture represent a significant departure from conventional

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implementations. For example, digitization of the broadband signal prior to channel selection enables an architecture that can be implemented without the costly, large and maintenance-intensive matrix switches. It also allows for simplification of translation, and channel selection (filtering). Also, digitizing a complete band allows the avoidance of channel-by-channel digitization, which would require duplication of hardware to perform this digitization for each channel. As yet another distinction, prior art teachings, such as IF-IF conversion require down conversion and up conversion, which requires multiple local oscillators. Digitizing the broadband signal allows frequency translation to be performed using digital mixing without requiring multiple local oscillators to convert a transponder channel to its position in the composite signal.

As noted above, these features – digitizing the broadband LNB signals and performing channel selection in the digital domain – are neither taught nor suggested by the cited references or by the other references presented in the original reexamination request. Indeed, these patentable features stand in stark contrast to the teachings of the art at the time of the invention. For example, the Eutelsat references teach reception systems performing channel selection and combining in the RF and/or IF domains, and do not teach or suggest broadband digitization of the incoming signal combined with channel selection from that digitized signal in the digital domain. Particularly, the Eutelsat Installers' Guide describes, in Section 3.4, the six contemplated collective reception architectures: FM/QPSK to AM re-modulation; Switched IF Systems, IF – IF conversion; IF – RF – IF conversion; Remote controlled head-ends; and QPSK to QAM re-modulation. The FM/QPSK to AM re-modulation, IF – IF conversion, IF – RF – IF conversion and QPSK to QAM remodulation architectures perform distribution, channelization and combining in the RF and/or IF domains. The Switched IF systems do not perform channelization and combining, but instead distribute multiple broadband signals in "parallel" to a plurality of IRDs. This deficiency is not cured by the Eutelsat DiSEqC Specification reference, which only describes the specifications and operation of the DiSEqC commands and switches.

Indeed, the only discussion relating to the digital domain in the Eutelsat references is limited to the remote control of the head end via the DiSEqC ™ (Digital Satellite Equipment Control) signal that is used by the IRDs to control the LNBs. *See,* Eutelsat Installers' Guide,

pp 26 – 27. However, this is only the control-signaling methodolgy between the IRD and the LNBs and, as stated above, distribution, channelization and combining are still performed in the RF and/or IF domains.

None of the other references cited in these reexamination proceedings teach or suggest a signal distribution system for distributing a plurality of LNB signals from a satellite outdoor unit to an integrated receiver decocer (IRD) that includes a signal selector that digitizes the received broadband LNB signals in response to transponder select information transmitted by the IRD and that selects a plurality of transponder signals in the digital domain from a broadband LNB signal based on the transponder select information.

Accordingly, for at least these reasons, Claim 1 of the '576 patent recites patentable subject matter and respondents respectfully request that the Examiner pass Claim 1 and the claims that depend therefrom to allowance.

Additionally, Claim 1 as amended further recites a converter configured to convert the shifted selected transponder signals back into the analog domain prior to combining them into the composite signal. This feature is also neither taught nor suggested by the prior art references, which, as outlined above, are limited to performing their operations in the RF and/or IF domains.

Accordingly, for at least this additional reason, Claim 1 of the '576 patent recites patentable subject matter and respondents respectfully request that the Examiner pass Claim 1 and the claims that depend therefrom to allowance.

i. Claim 8 and its Originally Dependent Claims, Claims 9-13

Claim 8 as amended recites a signal distribution system for distributing signals comprising a plurality of satellite transponder channels of a broadband signal that includes a means for digitizing the broadband signal from each of a plurality of sources and a means for extracting selected channels from the digitized broadband signals in the digital domain. As described above with reference to Claim 1, broadband digitization and digital channel

selection represent a significant departure from the prior art. As also stated above, the Eutelsat references teach reception systems performing channel selection and combining in the RF and/or IF domains, and do not teach or suggest broadband digitization of the incoming signal combined with channel selection from that digitized signal in the digital domain. Particularly, the Eutelsat Installers' Guide describes, in Section 3.4, the six contemplated collective reception architectures, none of which teach or suggest digitizing the broadband signal from each of a plurality of sources and a means for extracting selected channels from the digitized broadband signals in the digital domain.

None of the other references cited in these reexamination proceedings teach or suggest a signal distribution system for distributing signals comprising a plurality of satellite transponder channels of a broadband signal from a plurality of sources between a first unit and a second unit over a communication medium that includes a means in the first unit for digitizing the broadband signal from each of the plurality of sources, and a means in the first unit for combining the selected channels into a composite signal without demodulating channels and without changing the modulation of the channels and transmitting the composite signal over the medium.

Accordingly, for at least these reasons, Claim 8 of the '576 patent recites patentable subject matter and respondents respectfully request that the Examiner pass Claim 8 and the claims that depend therefrom to allowance.

ii. Claim 14 and its Originally Dependent Claims, Claims 15-23

Claim 14 as amended recites a method of communicating a plurality of transponder signals from a satellite outdoor unit (ODU) to an integrated receiver decoder (IRD) where the method includes "digitizing the plurality of satellite broadband signals," and "selecting and extracting a plurality of transponder signals from the received digitized satellite broadband signals." As described above with reference to Claim 1, broadband digitization and digital channel selection represent a significant departure from the prior art. As also stated above, the Eutelsat references teach reception systems performing channel selection and combining

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in the RF and/or IF domains, and do not teach or suggest broadband digitization of the incoming signal combined with channel selection from that digitized signal in the digital domain. Particularly, the Eutelsat Installers' Guide describes, in Section 3.4, the six contemplated collective reception architectures, none of which teach or suggest digitizing the broadband signal from each of a plurality of sources and a means for extracting selected channels from the digitized broadband signals in the digital domain.

None of the other references cited in these reexamination proceedings teach or suggest a method of communicating a plurality of transponder signals from a satellite outdoor unit (ODU) that receives a plurality of satellite broadband signals to an integrated receiver decoder (IRD) over a single cable connected to the ODU, that includes communicating a transponder request signal to the ODU from the IRD; in the ODU, digitizing the plurality of satellite broadband signals, selecting and extracting a plurality of transponder signals from the received digitized satellite broadband signals, wherein the selecting is responsive to the transponder request signals; combining extracted selected transponder signals into a composite signal; transmitting the composite signal over the single cable from the ODU to the IRDs, wherein the modulation of the transponder signal is not altered by the steps of selecting, combining, and transmitting.

Accordingly, for at least these reasons, Claim 14 of the '576 patent recites patentable subject matter and respondents respectfully request that the Examiner pass Claim 14 and the claims that depend therefrom to allowance.

b. Newly Added Claims 24 - 42

Patentee has added new dependent claims 24 – 42. Claims 24 – 33 directly or indirectly depend from Independent Claim 1. New Claims 34 – 42 directly or indirectly depend from Independent Claim 14. Because each of these claims depends from and adds additional limitiations to their respective base claim (Claim 1 or Claim 14) these new claims also recite patentable subject matter and should be passed to allowance.

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Application No.: 90/008,389 Docket No.: 05JM-139053

CONCLUSION

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue. If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 18-1953 referencing 19-1853 Docket No. 05JM-139053. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Dated: August 14, 2008

Respectfully submitted,

By: _____

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Certificate of Service

I Lester J. Anderson hereby certify that on the 14th day of August, 2008, I caused a copy of the Amendment and Response to be served, by hand, on the following:

Daniel N. Yannuzzi
12275 El Camino Real
Suite 200
San Diego, CA 92130

by:

Date: 8/14/2008

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/008,389	02/06/2007	7130576	05JM-127751	3367

24244 7590 01/07/2009

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EXAMINER	
ART UNIT	PAPER NUMBER

DATE MAILED: 01/07/2009

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

Notice Of Defective Paper In Ex Parte Reexamination	Control Number	Patent Under Reexamination
	90/008,389	7130576
	Examiner	Art Unit
	Fred Ferris	3992

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

1. ☐ Since no proof of service was included with the paper filed on _____ , it fails to comply with 37 CFR 1.248 and 1.540. Proof of service is required within ONE (1) MONTH or THIRTY (30) DAYS from the mailing date of this letter, whichever is longer. Failure to provide proof of service may result in a refusal to consider the paper. If the failure to comply with this requirement results in a patent owner failure to file a timely and appropriate response to any Office action or any written statement of an interview required under 37 CFR 1.560(b), the prosecution of the reexamination proceeding will be terminated under 37 CFR 1.550(d).

2. ☐ The paper filed on _____ is unsigned. A duplicate paper or ratification, properly signed, is required within ONE (1) MONTH or THIRTY (30) DAYS from the mailing date of this letter, whichever is longer. Failure to comply with this requirement will result in the paper not being considered. If the failure to comply results in a patent owner failure to file a timely and appropriate response to any Office action or any written statement of an interview required under 37 CFR 1.560(b), the prosecution of the reexamination proceeding will be terminated under 37 CFR 1.550(d).

3. ☐ The paper filed on _____ is signed by _____ , who is not of record. A duplicate paper or ratification signed by a person of record, a person made of record by way of a new power of attorney, is required within ONE (1) MONTH or THIRTY (30) DAYS from the mailing date of this letter, whichever is longer. Failure to comply with this requirement will result in the paper not being considered. If the failure to comply results in a patent owner failure to file a timely and appropriate response to any Office action or any written statement of an interview required under § 1.560(b), the prosecution of the reexamination proceeding will be terminated under 37 CFR 1.550(d).

4. ☒ The Amendment filed on *14 August 2008* does not comply with 37 CFR 1.530(d)-(j). Patent owner is given ONE (1) MONTH or THIRTY (30) DAYS from the mailing date of this letter, whichever is longer to correct this informality; otherwise, the prosecution of the the reexamination proceeding will be terminated under (37 CFR 1.550(d)).

5. ☐ The amendment filed by patent owner on _____, does not comply with 37 CFR ☐1.20(c)(3) and/or ☐1.20(c)(4), as to excess claim fees. Patent owner is given a time period of ONE (1) MONTH or THIRTY (30) DAYS from the mailing date of this letter, whichever is longer, to correct this fee deficiency, or the prosecution of the reexamination proceeding will be terminated under 37 CFR 1.550(d), to effect the "abandonment" set forth in 37 CFR 1.20(c)(5).

6. ☒ Other :

By the amendment of 14 August 2008 Patent owner has now added new claims 24-42 and amended claims 1, 8, and 14-17. Patent owner's response merely broadly refers to col. 4, line 26 to col. 6, line 50 of the specification and the drawings (all) as support for these new limitations. (See: page 6, first paragraph) This is insufficient to meet the requirements of CFR 1.530(e) which requires an explanation of the support in the disclosure for changes made to the claims.

NOTE: EXTENSION OF TIME ARE GOVERNED BY 37 CFR 1.550(c). If the period for response specified above is less than thirty (30) days, a response within the statutory minimum of thirty (30) days will be considered timely.

/Fred Ferris/	CEL	155K

cc: Requester (if third party requester)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of: Gurantz, *et al.*	Attorney Docket No.: 05JM-139053
Control No.: 90/008,389 Patent No.: 7,130,576	Confirmation No.: 3367
Filed: February 06, 2007	Art Unit: 3992
For: Signal Selector and Combiner for Broadband Content Distribution	Examiner: Ferris III, Fred O.

Amendment and Response to Office Action in *Ex Parte* Reexamination

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

INTRODUCTORY COMMENTS

This is in response to the Office Action in *Ex Parte* Reexamination mailed January 7, 2009, time for response to which is set to expire February 9, 2009. The considered claims, claims 1-23, stand rejected. Careful consideration has been given to the grounds for rejection, and the following amendment and discussion are offered in response. Reconsideration is respectfully requested.

Amendments to the Claims are reflected in the listing of claims, which begins on page 2 of this paper.

Remarks/Arguments begin on page 8 of this paper.

AMENDMENTS TO THE CLAIMS

1. (Previously presented) A signal distribution system for distributing a plurality of low noise amplifier and block converter (LNB) signals from satellite outdoor unit (ODU) over a coaxial cable to an integrated receiver decoder (IRD) comprising:

a signal selector that receives a plurality of broadband LNB signals comprising a plurality of transponder signals and digitizes the received broadband LNB signals, the signal selector is responsive to transponder select information transmitted by an IRD and selects a plurality of transponder signals in the digital domain from at least one broadband LNB signal based on the transponder select information;

a frequency translator coupled to the signal selector that is configured to shift the selected transponder signals to new carrier frequencies and a converter configured to convert the shifted selected transponder signals to produce RF signals; and

a combiner communicatively coupled to at least one frequency translator, the combiner configured to combine at least two of the shifted selected RF signals to produce a composite signal;

wherein the modulation of the composite signal is the same as modulation of the broadband LNB signals and wherein the composite signal is transmitted on the coaxial cable;

whereby the composite signal is transmitted to the IRD.

2. (Currently amended) The signal distribution system of claim 1, further comprising a plurality of IRDs and wherein the composite signal is transmitted on a single cable connected to the ODU and all IRDs receive channels extracted from the composite signal.

3. (Currently amended) The signal distribution system of claim 1, wherein the signal selector comprises an analog to digital converter and a digital filter.

4. (Currently amended) The signal distribution system of claim 1, wherein the signal selector comprises a tuner.

5. (Currently amended) The signal distribution system of claim 1, further comprising an integrated receiver decoder (IRD) connected to the coaxial cable with a plurality of tuners within the IRD, wherein each tuner within the IRD receives the composite signal and each tuner uses at least one transponder signal.

6. (Currently amended) The signal distribution system of claim 1, wherein transponder select information is transmitted over the same cable as the composite signal.

7. (Currently amended) The signal distribution system of claim 1, wherein transponder select information is transmitted over a wireless link.

8. (Previously presented) A signal distribution system for distributing signals comprising a plurality of satellite transponder channels of a broadband signal from a plurality of sources between a first unit and a second unit over a communication medium comprising:

means in the first unit for digitizing the broadband signal from each of the plurality of sources;

means in the first unit responsive to information transmitted by the second unit for extracting selected channels from the digitized broadband signals in the digital domain; and

means in the first unit for combining the selected channels into a composite signal without demodulating channels and without changing the modulation of the channels and transmitting the composite signal over the medium; and

means in the second unit for receiving the composite signal and demodulating and decoding at least one channel; and

means in the first unit and second units for bi-directionally communicating control information between the second unit and the first unit.

9. (Currently amended) The signal distribution system of claim 8, wherein the control information comprises channel selection requests originating from the second unit and the control information comprises channel mapping information originating from the first unit.

10. (Original) The signal distribution system of claim 8, further comprising a means in the first unit for carrier offset correction.

11. (Currently amended) The signal distribution system of claim 8, wherein the first unit is a satellite outdoor unit and the second unit is a satellite integrated receiver decoder unit.

12. (Currently amended) The signal distribution system of claim 11, wherein the communication medium consists of a single coaxial cable connected to the satellite outdoor unit.

13. (Currently amended) The signal distribution system of claim 12, wherein the means for communicating uses the same communication medium as the composite signal.

14. (Previously presented) A method of communicating a plurality of transponder signals from a satellite outdoor unit (ODU) that receives a plurality of satellite broadband signals to an integrated receiver decoder (IRD) over a single cable connected to the ODU, the method comprising the steps of:

communicating a transponder request signal to the ODU from the IRD;

in the ODU, digitizing the plurality of satellite broadband signals, selecting and extracting a plurality of transponder signals [extracted] from the received digitized satellite broadband signals, wherein the selecting is responsive to the transponder request signals;

combining extracted selected transponder signals into a composite signal;

transmitting the composite signal over the single cable from the ODU to the IRDs, wherein the modulation of the transponder signal is not altered by the steps of selecting, combining, and transmitting.

15. (Currently amended) The method of claim 14, wherein the step of selecting and extracting a transponder signal comprises the step of: filtering a transponder signal with a band pass filter having a bandwidth ranging from 5% to 100% wider than the bandwidth of the transponder signal.

16. (Currently amended) The method of claim 14, wherein the step of combining comprises frequency translating the selected and extracted transponder channels to a variable frequency before combining.

17. (Previously presented) The method of claim 15, further comprising frequency translating the selected transponder channels to a predetermined frequency before combining.

18. (Currently amended) The method of claim 14, further comprising the step of splitting the composite signal inside a home and distributing to a plurality of IRDs.

19. (Currently amended) The method of claim 14, wherein the transponder request signal is transmitted over the cable from an IRD and all IRDs receive the same composite signal.

20. (Currently amended) The method of claim 14, wherein the transponder request signal is transmitted over a wireless link to the ODU.

21. (Currently amended) The method of claim 14, further comprising the steps of: frequency translating the selected transponder channels to a variable frequency before combining; and splitting the composite signal inside a home and distributing to a plurality of IRDs.

22. (Currently amended) The method of claim 21, wherein the transponder request signal is transmitted over the cable from an IRD.

23. (Currently amended) The method of claim 21, wherein the transponder request signal is transmitted over a wireless link to the ODU.

24. (Previously presented) The signal distribution system of claim 1, wherein the signal selector comprises a digital filter configured to apply a pass band filter transfer function to the digitized broadband signal to isolate a transponder channel.

25. (Previously presented) The signal distribution system of claim 1, wherein the converter comprises a digital-to-analog converter configured to convert the selected and frequency translated signal to an analog signal prior to combining.

26. (Previously presented) The signal distribution system of claim 1, wherein the frequency translator comprises a digital mixer configured to apply a rotating phasor to the data samples to translate their frequency.

27. (Previously presented) The signal distribution system of claim 1, wherein shifting a selected transponder signal to a new carrier frequency comprises translating the original digitized broadband signal to locate a selected transponder channel at baseband.

28. (Previously presented) The signal distribution system of claim 1, wherein the channels combined in the composite signal are combined at a sample rate substantially equal to the composite output rate.

29. (Previously presented) The signal distribution system of claim 1, further comprising a controller to control the signal selector, frequency translator and converter and combiner.

30. (Previously presented) The signal distribution system of claim 29, wherein the controller, signal selector, frequency translator and combiner are part of a satellite outdoor unit.

31. (Previously presented) The signal distribution system of claim 29, further comprising a channel translation table maintained by the controller and specifying assigned frequency slots for transponder channels in the composite signal.

32. (Previously presented) The signal distribution system of claim 31, wherein the channel translation table is provided to the IRD to allow the IRD to tune to a desired selected translated transponder channel.

33. (Previously presented) The signal distribution system of claim 1, wherein the new carrier frequencies to which the selected transponder channels are shifted is determined such that the translated channels are placed at respective center frequencies where they will be positioned in the composite signal.

34. (Previously presented) The method of claim 14, wherein selecting and extracting comprises applying a pass band filter transfer function to the digitized broadband signal.

35. (Previously presented) The method of claim 14, further comprising converting the selected signal to an analog signal using a digital to analog converter prior to combining.

36. (Previously presented) The method of claim 14, wherein the combining is performed in the digital domain.

37. (Previously presented) The method of claim 17, wherein frequency translating comprises using a digital mixer to apply a rotating phasor to the data samples to translate their frequency.

38. (Previously presented) The method of claim 14, further comprising frequency translating the digitized broadband signal prior to selecting and extracting transponder signal.

39. (Previously presented) The method of claim 38, wherein frequency translating comprises translating the original digitized broadband signal to locate a selected transponder channel at baseband.

40. (Previously presented) The method of claim 14, further comprising maintaining a channel translation table at the outdoor unit, the channel translation table specifying assigned frequency slots for transponder channels in the composite signal.

41. (Previously presented) The method of claim 38, further comprising providing the channel translation table to the IRD to allow the IRD to tune to a desired selected translated transponder channel.

42. (Previously presented) The method of claim 14, wherein selecting and extracting comprises low-pass filtering the translated digitized broadband signal thereby substantially removing signal information from non-selected transponder channels.

REMARKS

Claims 1-4, 6-8, 10-15, 17-20, 22-33, 35, 46-53, 55-63, and 65 are pending in the application. Claims 5, 9, 16, 21, 34, 36-45, 54, and 64 were canceled in a previous response. Claims 2-7, 9, and 15-23 have been amended to correct informalities in the punctuation of the claims. No new matter has been added. In view of the above amendments, the following remarks, and the remarks in the previous Response to the Office Action that was mailed November 21, 2008, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejections of the claims and to pass this application to issue. If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

Objection based on 37 C.F.R. § 1.530(e)

The Notice of Defective Paper in *Ex Parte* Reexamination objects to the support provided for the amendments to claims 1, 8, and 14-17, stating that the support "is insufficient to meet the requirements of CFR 1.530(e) which requires an explanation of the support in the disclosure for changes made to the claims." This explanation is provided below on a claim-by-claim basis.

The Applicants would like to thank the Examiner for taking the time to discuss the Office Action in *Ex Parte* Reexamination mailed January 7, 2009. During that discussion the requirements of 37 CFR § 1.530(e) were clarified for the Applicants. The Examiner stated

that more specific cites to each of the claim amendments were needed. This response is believed to comply with those requirements.

Claim 1

Claim 1 includes the recitation of "a signal selector that . . . digitizes the received broadband LNB signals." Support for this recitation is found in the specification in at least column 7, lines 25-31; Figures 6, 7, and 8; and column 4, lines 60-61.

Claim 1 includes the recitation of "select[ing] a plurality of transponder signals in the digital domain." Support for this recitation is found in the specification in at least column 6, lines 1-5 and lines 11-18; and Figures 6, 7, and 8.

Claim 1 includes the recitation of "a frequency translator coupled to the signal selector that is configured to shift the selected transponder signals to new carrier frequencies." Support for this recitation is found in the specification in at least claim 1 of U.S. 7,130,576, which includes the recitation "capable of shifting"; and Figure 3, mixer 360.

Claim 1 includes the recitation of "a converter configured to convert the shifted selected transponder signals to produce RF signals." Support for this recitation is found in the specification from at least column 8, line 61 to column 9, line 25; and the upconverters in Figures 8 and 9.

Claim 1 includes the recitation of "a combiner communicatively coupled to at least one frequency translator, the combiner configured to combine at least two of the shifted selected RF signals to produce a composite signal." Support for this recitation is found in the specification in at least claim 1 of U.S. 7,130,576 "capable of combining"; combiner 1030, Figure 10; and combiner 1220, Figure 12.

Claim 8

Claim 8 includes the recitation "signal distribution system for distributing signals comprising a plurality of satellite transponder channels of a broadband signal from a plurality of sources between a first unit and a second unit over a communication medium." Support for this recitation is found in the specification in at least column 10, lines 19-45; and Figure 12.

Claim 8 includes the recitation "means in the first unit for digitizing the broadband signal from each of the plurality of sources." Support for this recitation is found in the specification in at least column 7, lines 25-31; column 4, lines 60-61; and Figures 6, 7, and 8.

Claim 8 includes the recitation "means in the first unit responsive to information transmitted by the second unit for extracting selected channels from the digitized broadband signals in the digital domain." Support for this recitation is found in the specification in at least column 4, lines 60-61.

Claim 8 includes the recitation "means in the first unit for combining the selected channels into a composite signal without demodulating channels and without changing the modulation of the channels and transmitting the composite signal over the medium." Support for this recitation is found in claim 8 of U.S. 7,130,576 "means in the first unit" and the specification in at least column 6, lines 26-30; and Figures 5, 13, and 17.

Claim 14

Claim 14 includes the recitation "digitizing the plurality of satellite broadband signals, selecting and extracting a plurality of transponder signals [extracted] from the received digitized satellite broadband signals, wherein the selecting is responsive to the transponder request signals." Support for this recitation is found in the specification in at

least column 7, lines 25-31; Figures 6, 7, and 8; and column 4, lines 60-61. Support is also found in claim 14 of U.S. 7,130,576 "extracted."

Claim 14 includes the recitation "combining extracted selected transponder signals into a composite signal." Support for this recitation is found in the specification in at least column 4, lines 30-33, 49-50; column 9, lines 27-29; and Figures 2 and 10. Support is also found in claim 14 of U.S. 7,130,576 "extracted."

Claim 15

Claim 15 includes the recitation "selecting and extracting a transponder signal comprises the step of: filtering a transponder signal with a band pass filter having a bandwidth ranging from 5% to 100% wider than the bandwidth of the transponder signal." Support for this recitation is found in the specification in at least column 4, lines 30-33, 49-50; column 9, lines 27-29; and Figures 2 and 10. Support is also found in claim 14 of U.S. 7,130,576 "extracted."

Claim 16

Claim 16 includes the recitation "extracted transponder channels to a variable frequency before combining." Support for this recitation is found in the specification in at least column 4, lines 30-33, 49-50; column 9, lines 27-29; and Figures 2 and 10. Support is also found in claim 14 of U.S. 7,130,576 "extracted."

Claim 17

The amendment of claim 17 involved a change in punctuation. No new matter was submitted by this change.

Claim 24

Claim 24 includes the recitation "signal selector comprises a digital filter configured to apply a pass band filter transfer function to the digitized broadband signal to isolate a transponder channel." Support for this recitation is found in the specification in at least column 5, lines 12-29; column 6, lines 36-38; and column 5, lines 15 and 50.

Claim 25

Claim 25 includes the recitation of a "converter comprises a digital-to-analog converter configured to convert the selected and frequency translated signal to an analog signal prior to combining." Support for this recitation is found in the specification in at least column 5, lines 30-38, and lines 66-67; and Figure 3, 350 and 380.

Claim 26

Claim 26 includes the recitation of a "frequency translator comprises a digital mixer configured to apply a rotating phasor to the data samples to translate their frequency." Support for this recitation is found in the specification in at least column 5, lines 37-41 and column 6, lines 49-50.

Claim 27

Claim 27 includes the recitation of "shifting a selected transponder signal to a new carrier frequency comprises translating the original digitized broadband signal to locate a selected transponder channel at baseband." Support for this recitation is found in the specification in at least column 5, lines 46-54 and column 6, lines 47-49.

Claim 28

Claim 28 includes the recitation of "channels combined in the composite signal are combined at a sample rate substantially equal to the composite output rate." Support for this recitation is found in the specification in at least column 6, lines 1-5.

Claim 29

Claim 29 includes the recitation of "a controller to control the signal selector, frequency translator and converter and combiner. Support for this recitation is found in the specification in at least column 7, line 45, column 9, lines 9-11; column 9, lines 6-13; column 4, lines 34-40; and Figure 2, 255 and Figure 9, 960.

Claim 30

Claim 30 includes the recitation of a "controller, signal selector, frequency translator and combiner are part of a satellite outdoor unit." Support for this recitation is found in the specification in at least Figure 2, 210 and column 4, lines 31-41.

Claim 31

Claim 31 includes the recitation of "a channel translation table maintained by the controller and specifying assigned frequency slots for transponder channels in the composite signal." Support for this recitation is found in the specification in at least column 4, lines 35-41 and column 7, lines 42-47.

Claim 32

Claim 32 includes the recitation of a "channel translation table is provided to the IRD to allow the IRD to tune to a desired selected translated transponder channel." Support for this recitation is found in the specification in at least column 4, lines 35-41; column 6, line 67 to column 7, lines 1-2; and column 7, lines 42-47.

Claim 33

Claim 33 includes the recitation of "new carrier frequencies to which the selected transponder channels are shifted is determined such that the translated channels are placed at respective center frequencies where they will be positioned in the composite signal."

Support for this recitation is found in the specification in at least column 4, lines 47-49; column 5, line 31-32; column 8, line 19-35; column 9, lines 39-43; and Figures 5 and 15.

Claim 34

Claim 34 includes the recitation of "selecting and extracting comprises applying a pass band filter transfer function to the digitized broadband signal." Support for this recitation is found in the specification in at least column 2, line 54 to column 3, line 4.

Claim 35

Claim 35 includes the recitation of "converting the selected signal to an analog signal using a digital to analog converter prior to combining." Support for this recitation is found in the specification in at least column 5, lines 66-67; column 6, lines 5-10; Figure 3, 350, 380; and Figures 6, 7, 8.

Claim 36

Claim 36 includes the recitation wherein "combining is performed in the digital domain." Support for this recitation is found in the specification in at least column 5, lines 66-67; column 6, lines 1-5 and 11-18.

Claim 37

Claim 37 includes the recitation wherein "frequency translating comprises using a digital mixer to apply a rotating phasor to the data samples to translate their frequency." Support for this recitation is found in the specification in at least column 5, lines 37-41; column 6, lines 49-50.

Claim 38

Claim 38 includes the recitation of "frequency translating the digitized broadband signal prior to selecting and extracting transponder signal." Support for this recitation is found in the specification in at least column 5, lines 12-29; and column 6, lines 46-49.

Claim 39

Claim 39 includes the recitation of "frequency translating compris[ing] translating the original digitized broadband signal to locate a selected transponder channel at baseband." Support for this recitation is found in the specification in at least column 5, lines 46-63; and Figure 14.

Claim 40

Claim 40 includes the recitation of "maintaining a channel translation table at the outdoor unit, the channel translation table specifying assigned frequency slots for transponder channels in the composite signal." Support for this recitation is found in the specification in at least column 2, line 66 to column 3, line 2; column 4, lines 29-39, lines 35-41, and lines 48-50; and column 7, lines 42-47.

Claim 41

Claim 41 includes the recitation of "providing the channel translation table to the IRD to allow the IRD to tune to a desired selected translated transponder channel." Support for this recitation is found in the specification in at least column 4, lines 35-41 and column 7, lines 42-47.

Claim 42

Claim 42 includes the recitation of "selecting and extracting comprises low-pass filtering the translated digitized broadband signal thereby substantially removing signal

information from non-selected transponder channels." Support for this recitation is found in the specification in at least column 2, line 54 to column 3, line 4; column 4, lines 48-49; and column 5, lines 12-29 and 46-54.

CONCLUSION

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue. If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 18-1953 referencing Docket No. 05JM-139053. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Dated: February 6, 2009

Respectfully submitted,

By: _____

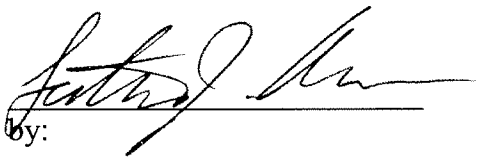
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Certificate of Service

I Lester J. Anderson hereby certify that on the 6 day of February, 2009, I caused a copy of the Amendment and Response to be served, by hand, on the following:

Daniel N. Yannuzzi
12275 El Camino Real
Suite 200
San Diego, CA 92130

by: 

Date: 02/06/2009

Electronic Acknowledgement Receipt

EFS ID:	4753274
Application Number:	90008389
International Application Number:	
Confirmation Number:	3367
Title of Invention:	SIGNAL SELECTOR AND COMBINER FOR BROADBAND CONTENT DISTRIBUTION
First Named Inventor/Applicant Name:	7130576
Customer Number:	24244
Filer:	Daniel N. Yannuzzi/Linda de la Garza
Filer Authorized By:	Daniel N. Yannuzzi
Attorney Docket Number:	05JM-127751
Receipt Date:	06-FEB-2009
Filing Date:	06-FEB-2007
Time Stamp:	19:13:48
Application Type:	Reexam (Patent Owner)

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		139053-Amendmnt.pdf	169749 e536f5a716df13c1c6b94bd79ee452e633ce e09f	yes	19

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Miscellaneous Incoming Letter	1	1
	Response after Ex Parte Quayle Action	2	19
Warnings:			
Information:			
	Total Files Size (in bytes):	169749	

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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.

AMENDMENT TRANSMITTAL LETTER (Small Entity) Applicant(s): **Gurantz, et al.**				Docket No. **05JM-139053**	
Application No. **90/008,389**	Filing Date **11-06-2002**	Examiner **Ferris III, Fred O.**	Customer No. **30764**	Group Art Unit **3992**	Confirmation No. **3367**

Invention: **SIGNAL SELECTOR AND COMBINER FOR BROADBAND CONTENT DISTRIBUTION**

COMMISSIONER FOR PATENTS:

Transmitted herewith is an amendment in the above-identified application.

☒ Applicant claims small entity status. See 37 CFR 1.27

The fee has been calculated and is transmitted as shown below.

CLAIMS AS AMENDED

	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST # PREV. PAID FOR		NUMBER EXTRA CLAIMS PRESENT	RATE	ADDITIONAL FEE
TOTAL CLAIMS	42	-	42	=	0	x $26.00	$0.00
INDEP. CLAIMS	3	-	3	=	0	x $110.00	$0.00
Multiple Dependent Claims (check if applicable) ☐							$0.00
TOTAL ADDITIONAL FEE FOR THIS AMENDMENT							$0.00

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- ☐ Any patent application processing fees under 37 CFR 1.17.

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Signature

Dated: **February 6, 2009**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/008,389	02/06/2007	7130576	05JM-127751	3367

24244 7590 05/12/2009

MICHAEL W LANDRY
5098 SEACHASE STREET
SAN DIEGO, CA 92130

EXAMINER	
ART UNIT	PAPER NUMBER

DATE MAILED: 05/12/2009

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DANIEL N. YANNUZZI

SHEPPARD, MULLIN,RICHTER &HAMPTON LLP

12275 EL CAMINO REAL, SUITE 200

SAN DIEGO, CA 92130

EX PARTE REEXAMINATION COMMUNICATION TRANSMITTAL FORM

REEXAMINATION CONTROL NO. *90/008,389*.

PATENT NO. *7130576*.

ART UNIT *3992*.

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified *ex parte* reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the *ex parte* reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

Notice of Intent to Issue Ex Parte Reexamination Certificate	Control No. 90/008,389	Patent Under Reexamination 7130576	
	Examiner Fred Ferris	Art Unit 3992	

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

1. ☒ Prosecution on the merits is (or remains) closed in this *ex parte* reexamination proceeding. This proceeding is subject to reopening at the initiative of the Office or upon petition. *Cf.* 37 CFR 1.313(a). A Certificate will be issued in view of
   - (a) ☒ Patent owner's communication(s) filed: *06 February 2009*.
   - (b) ☐ Patent owner's late response filed: _____.
   - (c) ☐ Patent owner's failure to file an appropriate response to the Office action mailed: _____.
   - (d) ☐ Patent owner's failure to timely file an Appeal Brief (37 CFR 41.31).
   - (e) ☐ Other: _____.

   Status of *Ex Parte* Reexamination:
   - (f) Change in the Specification: ☐ Yes ☒ No
   - (g) Change in the Drawing(s): ☐ Yes ☒ No
   - (h) Status of the Claim(s):
     - (1) Patent claim(s) confirmed: ~~1-42~~. ESK
     - (2) Patent claim(s) amended (including dependent on amended claim(s)): 1-23
     - (3) Patent claim(s) cancelled: _____.
     - (4) Newly presented claim(s) patentable: 24-42.
     - (5) Newly presented cancelled claims: _____.

2. ☒ Note the attached statement of reasons for patentability and/or confirmation. Any comments considered necessary by patent owner regarding reasons for patentability and/or confirmation must be submitted promptly to avoid processing delays. Such submission(s) should be labeled: "Comments On Statement of Reasons for Patentability and/or Confirmation."

3. ☐ Note attached NOTICE OF REFERENCES CITED (PTO-892).

4. ☐ Note attached LIST OF REFERENCES CITED (PTO/SB/08).

5. ☐ The drawing correction request filed on _____ is: ☐ approved ☐ disapproved.

6. ☐ Acknowledgment is made of the priority claim under 35 U.S.C. § 119(a)-(d) or (f).
   a)☐ All b)☐ Some* c)☐ None of the certified copies have
   - ☐ been received.
   - ☐ not been received.
   - ☐ been filed in Application No. _____.
   - ☐ been filed in reexamination Control No. _____.
   - ☐ been received by the International Bureau in PCT Application No. _____.

   * Certified copies not received: _____.

7. ☒ Note attached Examiner's Amendment.

8. ☐ Note attached Interview Summary (PTO-474).

9. ☐ Other: _____.

cc: Requester (if third party requester)

STATEMENT OF REASONS FOR PATENTABILITY AND/OR CONFIRMATION

Summary

This is an *ex parte* reexamination of U.S. Patent 7,130,576 issued to Gurantz et al.

The status of the claims is as follows:

Amended claims: 1, 8, 14-17

Newly added claims: 24-42

Claims patentable as amended: 1-23

Patentable new claims: 24-42

Claims not subject to reexamination: None

Cancelled claims: None

Response to Arguments and Amendment to the claims

Patent owner's amendment to the claims and supporting arguments are persuasive in overcoming the prior art of record. Accordingly, the prior art rejections cited in the previous Office actions are hereby withdrawn.

However, it is first noted that the amendment of 6 February 2008, which was intended to correct 37 CFR 1.530 (e) defects (see: NINA 1/7/09), incorrectly identifies the status of the claims. (page 8, para:1) Since this error appears to unintentional, the status of the claims is taken as noted above. Further, the amendment filed 6 February 2009 in not fully compliant with 37 CFR 1.530 as follows:

37 CFR 1.530 (f) recites the following:

"(f) Changes shown by markings. Any changes relative to the patent being reexamined which are made to the specification, including the claims, must

include the following markings:
(1) The matter to be omitted by the reexamination proceeding must be enclosed in brackets; and
(2) The matter to be added by the reexamination proceeding must be underlined."

It is further noted that Patent owner's amendment of 14 August 2008, while not compliant under 37 CFR 1.530 (e), IS compliant under 37 CFR 1.530 (f) with regard to the listing of the claims. In order to prevent any further delay of the reexamination proceeding and to ensure that it is conducted with special dispatch, the examiner makes the following Examiner's Amendment of record in order to correct the noted unintentional defects and to expedite the issuance of a Notice of Intent to Issue Ex Parte Reexamination Certificate.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below.

ESK

Claims 1, 8, 14-~~16~~ 17 are amended and new claims 24-42 are added to reflect the changes as set forth in Patent owner's amendment dated 14 August 2008 which is attached to this Office Action. (See attachment)

Reasons for Patentability/ Confirmation

The following is an examiner's statement of reasons for patentability and/or confirmation of the claims found patentable in this reexamination proceeding:

Patent owner has now amended independent claim 1, 8, and 14 and dependent claims 15 and 16.

As now amended, independent claim 1 requires a signal selector that receives broadband LNB signals comprising transponder signals that digitizes the received broadband LNB signals and subsequently selects the transponder signals in the digital domain from the LNB signal. The claim further requires a frequency translator coupled to a signal selector that is configured to shift the selected transponder signal to a new carrier frequency and a converter configured to convert the shifted selected transponder signals to produce RF signals. Additionally, the amended claim now requires a combiner coupled to a frequency translator that is configured to combine at least two of the shifted selected RF signals. In other words, the claim requires that the digitization of the broadband signal occurs prior to channel selection. Digitizing the broadband signal allows frequency translation to be performed using digital mixing and does not require multiple local oscillators such as those suggested in the Eutelsat Installers' Guide (Section 3.4) Amended claim 1 is therefor distinguishable over the Eutelsat reference for at least these reasons.

Independent claim 8 similarly requires a signal distribution system comprising satellite transponder channels of a broadband signal from a plurality of sources between a first unit and a second unit with a means in the first unit for digitizing the broadband signals from each of the plurality of sources and the first unit being responsive to information transmitted by the second unit for extracting selected channels from the digitized broadband signals in the digital domain. However, while the Eutelsat Installers' Guide describes at least six contemplated reception architectures (See: Section 3.4), none of these architectures appear to digitizing the broadband

signal from each source and a means for extracting selected channels from the digitized broadband signals in the digital domain as now required by amended claim 8.

As with independent claims 1 and 8, independent claim 14 also requires that the signals form the ODU to the IDU include digitizing the plurality of satellite broadband signals and selecting and extracting the transponder signals from received digitized satellite broadband signals. Accordingly, independent claim 14 is likewise distinguished over the Eutelsat Installers' Guide for at lease the same reasons set forth above.

Prior art Humpleman teaches distribution of satellite television signals via a digital network (e.g. a gateway), but appears to be silent with regard to actually digitizing the satellite broadband signals and selecting and extracting the transponder signals from received digitized satellite broadband signals as now required by the amended claims.

Prior art Kelly indeed teaches a digital receiver with digital channel selection, digital filter, and an ADC. (Fig. 8) However, Kelly is specific to AM and FM radio receiver ands is again silent with regard to actually digitizing the satellite broadband LNB signals from and ODU to an IRD and selecting and extracting the transponder signals from received digitized satellite broadband signals as now required by the amended claims.

The remaining prior art of record does not appear to suggest or render obvious the specific combination of method steps, or arrangement of apparatus elements for distribution of and communicating transponder signals from a satellite ODU receiving satellite broadband signals to an IRD and subsequently digitizing the satellite broadband signals and extracting transponder signals from received digitized satellite signals as now required by amended claims 1, 8, and 14.

Dependent claims are deemed patentable as being dependent either directly or indirectly from claims 1, 8, and 14 respectively.

Any comments considered necessary by PATENT OWNER regarding the above statement must be submitted promptly to avoid processing delays. Such submission by the patent owner should be labeled: "Comments on Statement of Reasons for Patentability and/or Confirmation" and will be placed in the reexamination file.

Conclusion

Any paper filed with the USPTO, i.e., any submission made, by either the Patent Owner or the Third Party Requester must be served on every other party in the reexamination proceeding, including any other third party requester that is part of the proceeding due to merger of the reexamination proceedings. As proof of service, the party submitting the paper to the Office must attach a Certificate of Service to the paper, which sets forth the name and address of the party served and the method of service. Papers filed without the required Certificate of Service may be denied consideration. 37 CFR 1.903; MPEP 2666.06.

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Attn: Central Reexamination Unit
Randolph Building, Lobby Level
401 Dulany Street
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the examiner, or as to the status of this proceeding, should be directed to the Central Reexamination Unit at telephone number (571) 272-7705.

Fred Ferris
Primary Examiner
AU 3992

Conferees:

CWR
ESK

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A signal distribution system for distributing a plurality of low noise amplifier and block converter (LNB) signals from satellite outdoor unit (ODU) over a coaxial cable to an integrated receiver decoder (IRD) comprising:

a signal selector that receives a plurality of broadband LNB signals comprising a plurality of transponder signals and digitizes the received broadband LNB signals, the signal selector is responsive to transponder select information transmitted by an IRD and selects a plurality of transponder signals in the digital domain from at least one broadband LNB signal based on the transponder select information;

a frequency translator coupled to the signal selector that is [capable of shifting] configured to shift the selected transponder signals to new carrier frequencies and a converter configured to convert the shifted selected transponder signals to produce RF signals; and

a combiner communicatively coupled to at least one frequency translator, the combiner configured to combine[capable of combining] at least two of the shifted selected RF signals to produce a composite signal;

wherein the modulation of the composite signal is the same as modulation of the broadband LNB signals and wherein the composite signal is transmitted on the coaxial cable;

whereby the composite signal is transmitted to the IRD.

2. (Original) The signal distribution system of claim 1 further comprising a plurality of IRDs and wherein the composite signal is transmitted on a single cable connected to the ODU and all IRDs receive channels extracted from the composite signal.

3. (Original) The signal distribution system of claim 1 wherein the signal selector comprises an analog to digital converter and a digital filter.

4. (Original) The signal distribution system of claim 1 wherein the signal selector comprises a tuner.

PAGE 3/18 * RCVD AT 8/14/2008 7:33:27 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/20 * DNIS:2739000 * CSID:858 509 3691 * DURATION (mm-ss):07-06

5. (Original) The signal distribution system of claim 1 further comprising an integrated receiver decoder (IRD) connected to the coaxial cable with a plurality of tuners within the IRD, wherein each tuner within the IRD receives the composite signal and each tuner uses at least one transponder signal.

6. (Original) The signal distribution system of claim 1 wherein transponder select information is transmitted over the same cable as the composite signal.

7. (Original) The signal distribution system of claim 1 wherein transponder select information is transmitted over a wireless link.

8. (Currently Amended) A signal distribution system for distributing signals comprising a plurality of satellite transponder channels of a broadband signal from a plurality of sources between a first unit and a second unit over a communication medium comprising:

means in the first unit for digitizing the broadband signal from each of the plurality of sources;

means in the first unit responsive to information transmitted by the second unit for extracting selected channels from [each of the plurality of sources] the digitized broadband signals in the digital domain; and

means in the first unit for combining the selected channels into a composite signal without demodulating channels and without changing the modulation of the channels and transmitting the composite signal over the medium; and

means in the second unit for receiving the composite signal and demodulating and decoding at least one channel; and

means in the first unit and second units for bi-directionally communicating control information between the second unit and the first unit.

9. (Original) The signal distribution system of claim 8 wherein the control information comprises channel selection requests originating from the second unit and the control information comprises channel mapping information originating from the first unit.

10. (Original) The signal distribution system of claim 8, further comprising a means in the first unit for carrier offset correction.

11. (Original) The signal distribution system of claim 8 wherein the first unit is a satellite outdoor unit and the second unit is a satellite integrated receiver decoder unit.

12. (Original) The signal distribution system of claim 11 wherein the communication medium consists of a single coaxial cable connected to the satellite outdoor unit.

13. (Original) The signal distribution system of claim 12 wherein the means for communicating uses the same communication medium as the composite signal.

14. (Currently Amended) A method of communicating a plurality of transponder signals from a satellite outdoor unit (ODU) that receives a plurality of satellite broadband signals to an integrated receiver decoder (IRD) over a single cable connected to the ODU, the method comprising the steps of:

communicating a transponder request signal to the ODU from the IRD;

in the ODU, digitizing the plurality of satellite broadband signals, selecting and extracting a plurality of transponder signals [extracted] from the received digitized satellite broadband signals, wherein the selecting is responsive to the transponder request signals;

combining extracted selected transponder signals into a composite signal;

transmitting the composite signal over the single cable from the ODU to the IRDs, wherein the modulation of the transponder signal is not altered by the steps of selecting, combining, and transmitting.

15. (Currently Amended) The method of claim 14 wherein the step of selecting and extracting a transponder signal comprises the step of: filtering a transponder signal with a band pass filter having a bandwidth ranging from 5% to 100% wider than the bandwidth of the transponder signal.

16. (Currently Amended) The method of claim 14 wherein the step of combining comprises frequency translating the selected and extracted transponder channels to a variable frequency before combining.

17. (Currently Amended) The method of claim 15, further comprising frequency translating the selected transponder channels to a predetermined frequency before combining.

18. (Original) The method of claim 14 further comprising the step of splitting the composite signal inside a home and distributing to a plurality of IRDs.

19. (Original) The method of claim 14 wherein the transponder request signal is transmitted over the cable from an IRD and all IRDs receive the same composite signal.

20. (Original) The method of claim 14 wherein the transponder request signal is transmitted over a wireless link to the ODU.

21. (Original) The method of claim 14 further comprising the steps of: frequency translating the selected transponder channels to a variable frequency before combining; and splitting the composite signal inside a home and distributing to a plurality of IRDs.

22. (Original) The method of claim 21 wherein the transponder request signal is transmitted over the cable from an IRD.

23. (Original) The method of claim 21 wherein the transponder request signal is transmitted over a wireless link to the ODU.

24. (Newly Added) The signal distribution system of claim 1, wherein the signal selector comprises a digital filter configured to apply a pass band filter transfer function to the digitized broadband signal to isolate a transponder channel.

25. (Newly Added) The signal distribution system of claim 1, wherein the converter comprises a digital-to-analog converter configured to convert the selected and frequency translated signal to an analog signal prior to combining.

26. (Newly Added) The signal distribution system of claim 1, wherein the frequency translator comprises a digital mixer configured to apply a rotating phasor to the data samples to translate their frequency.

27. (Newly Added) The signal distribution system of claim 1, wherein shifting a selected transponder signal to a new carrier frequency comprises translating the original digitized broadband signal to locate a selected transponder channel at baseband.

28. (Newly Added) The signal distribution system of claim 1, wherein the channels combined in the composite signal are combined at a sample rate substantially equal to the composite output rate.

29. (Newly Added) The signal distribution system of claim 1, further comprising a controller to control the signal selector, frequency translator and converter and combiner.

30. (Newly Added) The signal distribution system of claim 29, wherein the controller, signal selector, frequency translator and combiner are part of a satellite outdoor unit.

31. (Newly Added) The signal distribution system of claim 29, further comprising a channel translation table maintained by the controller and specifying assigned frequency slots for transponder channels in the composite signal.

32. (Newly Added) The signal distribution system of claim 31, wherein the channel translation table is provided to the IRD to allow the IRD to tune to a desired selected translated transponder channel.

33. (Newly Added) The signal distribution system of claim 1, wherein the new carrier frequencies to which the selected transponder channels are shifted is determined such that the translated channels are placed at respective center frequencies where they will be positioned in the composite signal.

34. (Newly Added) The method of claim 14, wherein selecting and extracting comprises applying a pass band filter transfer function to the digitized broadband signal.

35. (Newly Added) The method of claim 14, further comprising converting the selected signal to an analog signal using a digital to analog converter prior to combining.

36. (Newly Added) The method of claim 14, wherein the combining is performed in the digital domain.

37. (Newly Added) The method of claim 17, wherein frequency translating comprises using a digital mixer to apply a rotating phasor to the data samples to translate their frequency.

38. (Newly Added) The method of claim 14, further comprising frequency translating the digitized broadband signal prior to selecting and extracting transponder signal.

39. (Newly Added) The method of claim 38, wherein frequency translating comprises translating the original digitized broadband signal to locate a selected transponder channel at baseband.

40. (Newly Added) The method of claim 14, further comprising maintaining a channel translation table at the outdoor unit, the channel translation table specifying assigned frequency slots for transponder channels in the composite signal.

41. (Newly Added) The method of claim 38, further comprising providing the channel translation table to the IRD to allow the IRD to tune to a desired selected translated transponder channel.

42. (Newly Added) The method of claim 14, wherein selecting and extracting comprises low-pass filtering the translated digitized broadband signal thereby substantially removing signal information from non-selected transponder channels.

Reexamination	Application/Control No.	Applicant(s)/Patent Under Reexamination
	90/008,389	7130576
	Certificate Date	Certificate Number
		C1

Requester Correspondence Address:	☐ Patent Owner	☒ Third Party

DANIEL N. YANNUZZI
SHEPPARD, MULLIN,RICHTER &HAMPTON LLP
12275 EL CAMINO REAL, SUITE 200
SAN DIEGO, CA 92130

LITIGATION REVIEW ☒	FOF (examiner initials)	6/3/08 (date)
Case Name		Director Initials
None		Eric Kassel for GM

COPENDING OFFICE PROCEEDINGS	
TYPE OF PROCEEDING	NUMBER
1. no concurrent office proceedings	
2.	
3.	
4.	

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

Bib Data Sheet

CONFIRMATION NO. 3367

SERIAL NUMBER	FILING OR 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
90/008,389	02/06/2007 RULE	455	3992	05JM-127751

APPLICANTS

7130576, Residence Not Provided;
Entropic Communications Inc.(OWNER), San Diego, CA;
RF Magic(3RD PTY REQ), San Diego, CA;
Daniel N. Yannuzzi, San Diego, CA

**** CONTINUING DATA ***************************

This application is a REX of 10/289,011 11/06/2002 PAT 7,130,576
which claims benefit of 60/345,965 11/07/2001
and claims benefit of 60/333,722 11/27/2001
and claims benefit of 60/358,817 02/22/2002

verified ESK 5/11/09

**** FOREIGN APPLICATIONS ***********************

none ESK 5/11/09

Foreign Priority claimed	STATE OR COUNTRY	SHEETS DRAWING	TOTAL CLAIMS	INDEPENDENT CLAIMS
☐ yes ☒ no 35 USC 119 (a-d) conditions met ☐ yes ☒ no ☐ Met after Allowance Verified and Acknowledged Examiner's Signature Initials			23	3

Examiner's Signature: Linda Hasel For Ferris ESK

ADDRESS
24244

TITLE
SIGNAL SELECTOR AND COMBINER FOR BROADBAND CONTENT DISTRIBUTION

FILING FEE RECEIVED	FEES: Authority has been given in Paper
2520	No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:

- ☐ All Fees
- ☐ 1.16 Fees (Filing)
- ☐ 1.17 Fees (Processing Ext. of time)
- ☐ 1.18 Fees (Issue)
- ☐ Other _____
- ☐ Credit

Issue Classification	Application/Control No. 90/008,389	Applicant(s)/Patent under Reexamination 7130576
	Examiner Fred Ferris	Art Unit 3992

ISSUE CLASSIFICATION

ORIGINAL		INTERNATIONAL CLASSIFICATION											
CLASS	SUBCLASS	CLAIMED						NON-CLAIMED					
455	3.02	H	04	H	1	/00							/
CROSS REFERENCES													
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					/							/
455	3.01	3.04	427			/							/
725	71	78				/							/
						/							/
						/							/
						/							/

(Assistant Examiner) (Date)

(Legal Instruments Examiner) (Date)

Fred Ferris
5/08/2009

(Primary Examiner) (Date)

Total Claims Allowed: 42

O.G. Print Claim(s)	O.G. Print Fig.
1	2

☒ **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
	1		31		61		91		121		151		181
	2		32		62		92		122		152		182
	3		33		63		93		123		153		183
	4		34		64		94		124		154		184
	5		35		65		95		125		155		185
	6		36		66		96		126		156		186
	7		37		67		97		127		157		187
	8		38		68		98		128		158		188
	9		39		69		99		129		159		189
	10		40		70		100		130		160		190
	11		41		71		101		131		161		191
	12		42		72		102		132		162		192
	13		43		73		103		133		163		193
	14		44		74		104		134		164		194
	15		45		75		105		135		165		195
	16		46		76		106		136		166		196
	17		47		77		107		137		167		197
	18		48		78		108		138		168		198
	19		49		79		109		139		169		199
	20		50		80		110		140		170		200
	21		51		81		111		141		171		201
	22		52		82		112		142		172		202
	23		53		83		113		143		173		203
	24		54		84		114		144		174		204
	25		55		85		115		145		175		205
	26		56		86		116		146		176		206
	27		57		87		117		147		177		207
	28		58		88		118		148		178		208
	29		59		89		119		149		179		209
	30		60		90		120		150		180		210

Search Notes

Application/Control No.	Applicant(s)/Patent under Reexamination	
90/008,389	7130576	
Examiner	**Art Unit**	
Fred Ferris	3992	

SEARCHED			
Class	Subclass	Date	Examiner
455	3.02	5/8/2009	FOF

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	DATE	EXMR
Reveiwed prior art of record	5/8/2009	FOF

UNITED STATES PATENT AND TRADEMARK OFFICE

REEXAMINATION CLERK CHECKLIST

☒ *Ex Parte* Reexam ☐ *Inter Partes* Reexam

CONTROL NO(S).
90/008,389
9__/
9__/

PATENT REEXAMINATION SPECIALIST or REEXAMINATION CLERK:

All of the following items must be completed by you:

A. After completion, the following items should be forwarded (together), via the CRU SPE (for reexams in CRU) or TC SPRE (for reexams in TC),to the Office of Patent Legal Administration. Check box(es) when item is present.

☒ **1.** This Reexamination Clerk Checklist (PTO-1517)
☒ **2.** Examiner Checklist – Reexamination (PTO-1516)
☒ **3.** Patent file wrapper (if one exists)

B. Mark the following boxes upon ensuring that the item is present in the file history, in correct form, and complete:

☒ **1.** The title report, Patent Abstract of Title, or a statement under § 3.73(b)

Filed/Prepared by the Office [Give date & IFW doc code of latest document in IFW]

IFW doc code RXTTLRPT Date 12/28/2006

(• ~ Note Item 26 of Examiner Checklist)

☒ **2.** All PTO-892 and PTO-1449 reference citation sheets

Total no. of sheets 4 (Note: **include only one copy** of duplicate sheets)

C. Mark each of the following boxes upon ensuring that the item has been completed by the examiner.

Items on IFW – *Issue Classification* form

☒ **1.** Patent Number
☒ **2.** Reexamination Control Number
☒ **3.** International Classification
☒ **4.** Original U.S. Classification
☒ **5.** Cross References (*Entry present or a dash placed in the x-ref. box for no entry.*)
☒ **6.** Assistant Examiner (if any – for reexam in TC)
☒ **7.** Primary Examiner
☒ **8.** Claim No. for O.G.
☒ **9.** Drawing Fig., if any, for certificate and for O.G.
☒ **10.** Index of Claims

Items on IFW – *Reexamination* form

☒ **11.** Co-pending Office Proceedings.
(information or "No concurrent Office proceedings" entered in lower left hand box)
☒ **12.** Reexamination Certificate No. (e.g. C1, C2, C3 to be entered in "Certificate Number" box)
☒ **13.** Litigation Review

Items on IFW – *Search Notes* form

☒ **14.** Reexamination Field of Search ("None" entered, if no search)

- In each of the following items mark either the "YES" or "NO" box.

YES NO

☐ ☒ **1.** Are there any amendments to the description? If yes, identify the IFW doc code(s) and dates of the document(s) containing the amendments. (• ▪ Note Item 1 of Examiner Checklist).

IFW doc code _____ Date ___/___/___
IFW doc code _____ Date ___/___/___
IFW doc code _____ Date ___/___/___

☐ ☒ **2.** Are there any changes to the patent drawings? If yes, identify the following. (• • - Note Item 2 of Examiner Checklist).

IFW doc code _____ Date ___/___/___
Fig. No(s). containing changes: _____

IFW doc code _____ Date ___/___/___
Fig. No(s). containing changes: _____

☐ ☒ **3.** Was a terminal disclaimer filed DURING reexamination and approved? (• • - Note Item 3 of Examiner Checklist.) If yes, the Terminal Disclaimer "approved" box on the IFW – *Terminal Disclaimer* form must be checked. Also, indicate the document(s) containing the terminal disclaimer(s).

IFW doc code _____ Date ___/___/___
IFW doc code _____ Date ___/___/___

☐ ☒ **4.** Have any certificates of correction been issued? If yes, indicate date(s) issued. (• • - Note Item 4 of Examiner Checklist.)

_____
_____

☐ ☒ **5.** Has any document been submitted indicating the names of registered attorneys or agents or a law firm to be published on the reexam certificate? If yes, indicate the filing date and IFW doc code of the document containing the names.
(• • - Note Item 5 of Examiner Checklist.)

Filed [Give filing date(s) & IFW doc code(s)] _____

☐ ☒ **6.** Was/were any statutory disclaimers or dedications filed prior to, or during, the reexamination, and approved?
If yes, complete the following, *and* place copy of approved dedication/statutory disclaimer in reexamination file.
(• ▪ Note Items 9 & 10 of the Examiner Checklist.)

1a. Filed - IFW doc code _____ Date ___/___/___
1b. O.G. citation _____
1c. Claims disclaimed/dedicated _____

2a. Filed - IFW doc code _____ Date ___/___/___
2b. O.G. citation _____
2c. Claims disclaimed/dedicated _____

YES NO

☒ ☐ **7.** Have any claims been amended? A claim is "amended" if there is **any** change to its text. If yes, list all amended claims by the most recent IFW doc code date of the document which contains the **final** version of all of the amended claims. (• • - Note Item 12 of Examiner Checklist.)

IFW doc code RXNIRC Date / /
Claims 1, 8, 14-17
IFW doc code _____ Date / /
Claims _____
IFW doc code _____ Date / /
Claims _____
IFW doc code _____ Date / /
Claims _____

(Note: these claims will be printed on the reexamination certificate.)

☒ ☐ **8.** Have new claims been added **and allowed** during the reexamination? If yes, (1) indicate the filing date and IFW doc code of the document containing the final version of the allowed, new claims and (2) list the claims by **final** number. (• • - Note Item 14 of Examiner Checklist.)

IFW doc code RXNIRC Date / /
Claims 24-42
IFW doc code _____ Date / /
Claims _____
IFW doc code _____ Date / /
Claims _____
IFW doc code _____ Date / /
Claims _____

(Note: these claims will be printed on the reexamination certificate.)

E. Have any of the following items been **changed or added** since the patent was issued? If yes, indicate the filing date and IFW doc code of the document containing the change/addition and mark the appropriate boxes upon ensuring statement is correct. Certificate of Correction changes are not to be indicated here; instead see Item D.4.

YES	NO	INID CODE	
☐	☒	(54)	**1.** Title of Invention. (• • - Note Item 21 of Examiner Checklist.)
☐	☒	(75)	**2.** Inventor(s). (• • - Note Item 22 of Examiner Checklist.)
		or	
☐	☐	(76)	
☐	☒	(73)	**3.** Assignee (if any): Compare assignee information on **(a)** title report, Patent Abstract of Title, or 37 CFR 3.73(b) statement (see Item B1 above), with **(b)** printed patent entry, and **(c)** reexamination bib data sheet entry.

Assignment/owner document:

IFW doc code _____ Date / /

☐ Update information has been entered on bib data sheet.

IFW doc code _____ Date / /

☐ Update information has been entered on reexamination bib data sheet.

YES	NO	INID CODE	
			4. Continuing Data. (• •- Note Item 23 of Examiner Checklist.)
☐	☒	(60)	a. --Combination of Division and Continuation and/or C.I.P.

Document adding data:

IFW doc code _____ Date ___/___/___

-- Provisional Application(s)

Document adding data:

IFW doc code _____ Date ___/___/___

☐	☒	(62)	b. Division(s).

Document adding data:

IFW doc code _____ Date ___/___/___

☐	☒	(63)	c. Continuation(s) and/or C.I.P.

Document adding data:

IFW doc code _____ Date ___/___/___

☐	☒	(64)	d. Reissue(s) where patent reissues during pendency of reexam.

Amendment document containing the statement "This is a reissue of _____."-

IFW doc code _____ Date ___/___/___

☐ Update information has been entered on reexamination bib data sheet.

☐ Update information has been entered in the first sentence of the specification following the title. 37 CFR 1.78(a).

☐	☒	(30)	**5.** Foreign Priority. (• •- Note Item 24 of Examiner Checklist.)

Document adding data:

IFW doc code _____ Date ___/___/___

☐ Update information has been entered on reexamination bib data sheet.

☐	☒	(57)	**6.** Abstract. (• •- Note Item 25 of Examiner Checklist.)

IFW doc code _____ Date ___/___/___

Patent Reexamination Specialist	DATE	CRU SPE/TC SPRE REVIEW	DATE
Eric Keasel	5/11/09	Eric Keasel	5/11/09

FORM PTO-1517
(5-11-07) *KMS*

UNITED STATES PATENT AND TRADEMARK OFFICE

EXAMINER CHECKLIST - REEXAMINATION

☐ *Ex Parte* Reexam ☐ *Inter Partes* Reexam

CONTROL NO(S).
90/008,389
90__/
90__/

EXAMINER:

All items must be reviewed and completed by the examiner. After completion, this checklist and the reexamination IFW Action Folder (and the patent file wrapper, if one exists) should be forwarded (a) for a reexam in the TC, to the reexamination clerk, or (b) for a reexam in the CRU, to the Patent Reexamination Specialist. Note: If a previous reexamination certificate has been issued, all references below to "the patent" should be replaced by "previous reexamination certificate" and all data entries should be made accordingly.

YES NO

☐ ☑ **1.** Are there any amendments to the description? If yes, indicate (a) the doc code and date of the document containing the amendments and (b) the patent column number(s) and beginning & ending lines of the paragraph(s) containing the changes.

(1)(a) IFW doc code _____ Date__/__/__
(1)(b) _____
_____
(2)(a) IFW doc code _____ Date__/__/__
(2)(b) _____
_____

☐ ☑ **2.** Are there any amendments to the patent drawings? If yes, indicate (a) Fig. No. containing the change(s), (b) the doc code and date of the document containing the NEW sheet of drawings, and (c) a brief description of the change(s), e.g., "reference numerals 10 and 11 have been added to Fig. 1."

(1)(a) Fig. No(s).____
(1)(b) IFW doc code _____ Date__/__/__
(1)(c) The drawings figure(s) have been changed as follows:
_____
_____
_____

(2)(a) Fig. No(s).____
(2)(b) IFW doc code _____ Date__/__/__
(2)(c) The drawings figure(s) have been changed as follows:
_____
_____
_____

☐ ☑ **3.** Was a terminal disclaimer filed and approved DURING reexamination? If terminal disclaimer approved, "approved" box on the IFW – *Terminal Disclaimer* form (available in OACS) must be checked. Also, give the doc code and date(s) of each document containing approved terminal disclaimer.

Terminal disclaimer IFW doc code _____ Date__/__/__
Terminal disclaimer IFW doc code _____ Date__/__/__
Terminal disclaimer IFW doc code _____ Date__/__/__

YES NO

☐ ☑ **4.** Have any certificates of correction to the patent been issued? If yes, give date(s) issued (the date signed & sealed by the USPTO Director on the certificate of correction).

_____

_____

☐ ☑ **5.** Has a document been submitted indicating the names of the registered attorneys or agents or a law firm to be printed on the reexaminations certificate? If yes, indicate the doc code and date of the document containing the names. (Must be a separate document addressed solely to this issue.)

IFW doc code _____ Date____/ /____

☐ ☑ **6.** Did a litigation search, or any other part of the record, indicate the existence of litigation with respect to the patent being reexamined? Has an entry been made in the "Litigation Review" box of the IFW - *Reexamination* form? If yes, **and a court decision has been issued**, complete the following entry. Such decisions include final court decisions (even if still appealable), vacate decisions, remands, and decisions as to the merits of the patent claims. Non-merits decisions on motions such as for a new venue, a new trial/discovery date, or sanctions are not to be entered.

"Attention is directed to the decision of _____

_____

_____

relating to this patent. This reexamination may not have resolved all questions raised by this decision. See 37 CFR 1.552(c) for *ex parte* reexam and 37 CFR 1.906(c) for *inter partes* reexam." (Enter case name, court, and date of decision.)

☐ ☑ **6.1.** Is there a reissue application/reexamination proceeding pending at this point, with which this reexamination proceeding has **not** been merged? If yes, **(a)** fill in the application or reexamination control number(s), and the filing date(s), and **(b)** check the appropriate box(es) (two boxes–if both reissue & reexam are pending).

☐ "At the time of issuance and publication of this certificate, the patent remains subject to pending reissue application number_____ filed _____. The claim content of the patent may be subsequently revised in the reissue proceeding."

☐ "At the time of issuance and publication of this certificate, the patent remains subject to pending reissue application numbers_____ _____ filed _____ _____respectively. The claim content of the patent may be subsequently revised in the reissue proceedings."

☐ "At the time of issuance and publication of this certificate, the patent remains subject to pending reexamination control number_____ filed _____. The claim content of the patent may be subsequently revised in the reexamination proceeding."

☐ "At the time of issuance and publication of this certificate, the patent remains subject to pending reexamination control numbers_____ _____filed_____ _____ respectively. The claim content of the patent may be subsequently revised in the reexamination proceedings."

For items 7-16, mark the "YES" box(es) where appropriate and complete the statement. If not applicable, mark the "NO" box(es). Patent claims retain their original number. All **NEW** allowed claims should be renumbered, if necessary, to immediately follow the highest numbered patent claim. Note that a Claim is "amended" if there is **ANY** change to its text. A claim number should **NOT** be repeated in items 7-16.

ALL the **ORIGINAL** patent claims and **ONLY** new renumbered **ALLOWED** claims must be listed in items 7-16. Only original patent claims are to be listed in items 7-13 and 15-16. Only new allowed claims are listed in item 14; cancelled new claims are not listed anywhere on this form.

YES	NO	
	X	**7.** The patentability of claim(s) _____ _____(and) _____ is confirmed.
☐	X	**8.** Claim(s) _____ and _____was (were) previously cancelled. (Relates to a **prior** proceeding.)
☐	X	**9.** Claim(s) _____ and _____ was (were) previously disclaimed. (Statutory disclaimer **prior to present** reexam.)
☐	X	**10.** Claim(s) _____ and _____ is (are) now disclaimed. (Statutory disclaimer in **present** reexamination.)
☐	X	**11.** Claim(s) _____ and _____ is (are) cancelled. (**Examiner Note**: item 11 is not to be used for new claims that were cancelled. Cancelled new claims are not entered on this form.)
X	☐	**12.** Claim(s) 1, 8, 14, 15, 16, 17 and _____ is (are) determined to be patentable as amended. (**Printer Note**: these claims are to be printed on the reexamination certificate.)
X	☐	**13.** Claim(s) 2-7, 9-13 and 18-23, dependent on an amended claim, is (are) determined to be patentable. (**Examiner Note**: item 13 is to be used for dependent claims whose text has not changed. Dependent claims with changes **in the text** are "amended claims" which must be listed in item 12, above.)
X	☐	**14.** New claim(s) 24-42 and _____ is (are) added and determined to be patentable. (**Printer Note**: these claims are to be printed on the reexamination certificate.)

YES NO

☐ ☒ **15.** Claim(s) _____ and _____ was (were) not reexamined.

☐ ☒ **16.** Other (identify claims and status)_____

_____

_____

Mark the following boxes upon ensuring that the following statements relating to the IFW – *Issue Classification* form (available in OACS) are **correct**.

☑ **17.** The international classification (updated to reflect the **current** format of the most recent edition) includes all international classifications presently listed on the patent.

☑ **18.** The reexamination original U.S. classification is the same as the **current** original U.S. classification of the patent.

☑ **19.** All current cross-reference classifications are included.

For items 21-25, mark the "YES" or "NO" box indicating whether the item **has been changed or added** during the reexamination. **If yes**, indicate doc code date of document containing the change or addition. Certificate of Correction changes are *not* to be indicated here; instead see Item 4.

YES NO INID CODE

☐ ☑ (54) **21.** Title of Invention.

IFW doc code _____ Date____/ /____

☐ ☑ (75) **22.** Inventor(s)
or
☐ ☑ (76)

IFW doc code _____ Date____/ /____

23. Continuing Data

☐ ☑ (60) **a.** --Combination of Division and Continuation and/or C.I.P.
Give doc code and date of document adding data:
IFW doc code _____ Date____/ /____

--Provisional Application(s)
Give doc code and date of document adding data:
IFW doc code _____ Date____/ /____

☐ ☑ (62) **b.** Division(s)
Give doc code and date of document adding data:
IFW doc code _____ Date____/ /____

☐ ☑ (63) **c.** Continuation(s) and/or C.I.P.
Give doc code and date of document adding data:
IFW doc code _____ Date____/ /____

☐ ☑ (64) **d.** Reissue(s)
Give doc code and date of amendment document :
IFW doc code _____ Date____/ /____

YES	NO	INID CODE	
☐	☑	(30)	**24.** Foreign Priority Give doc code and date of document adding data: IFW doc code _____ Date 1 1
☐	☑	(57)	**25.** Abstract Give doc code and date: IFW doc code _____ Date 1 1

26. For item 26, (a) check the box indicating which document identifies the correct, **current owner/assignee** of the patent, and (b) indicate the date of the document that you checked. (**Examiner Note**: only one box is to be checked and completed.)

☑ (a) Title Report, (b) Prepared [Give doc code and date]
IFW doc code RXTTLRPT Date 12 / 28 / 2006

☐ (b) § 3.73 (b) Statement, (b) Filed [Give doc code and date]
IFW doc code _____ Date 1 1

(**Examiner Note**:Give the latest document, unless the record reflects that an earlier document gives the current patent owner/assignee.)

EXAMINER	DATE	CRU SPE/TC SPRE REVIEW	DATE
	5/6/09		5/14/09

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Application Number	90/008,389
Filing Date	02/06/2007
First Named Inventor	7,130,576
Art Unit	3992
Examiner Name	Ferris III, Fred O.
Attorney Docket Number	05JM-139053

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EFS ID:	5367589
Application Number:	90008389
International Application Number:	
Confirmation Number:	3367
Title of Invention:	SIGNAL SELECTOR AND COMBINER FOR BROADBAND CONTENT DISTRIBUTION
First Named Inventor/Applicant Name:	7130576
Customer Number:	24244
Filer:	Daniel N. Yannuzzi/Linda de la Garza
Filer Authorized By:	Daniel N. Yannuzzi
Attorney Docket Number:	05JM-127751
Receipt Date:	20-MAY-2009
Filing Date:	06-FEB-2007
Time Stamp:	13:31:02
Application Type:	Reexam (Patent Owner)

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Change of Address	139053-ChangeofCorr.pdf	36364 25417a7e00091c6ef136c9756d3beb53c375d5fd	no	1

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CONFIRMATION NO. 3367

SERIAL NUMBER	FILING OR 371(c) DATE / RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
90/008,389	02/06/2007	455	3992	05JM-127751

APPLICANTS

7130576, Residence Not Provided;
Entropic Communications Inc.(OWNER), San Diego, CA;
RF Magic(3RD PTY REQ), San Diego, CA;
Daniel N. Yannuzzi, San Diego, CA

**** CONTINUING DATA ***************************

This application is a REX of 10/289,011 11/06/2002 PAT 7,130,576
which claims benefit of 60/345,965 11/07/2001
and claims benefit of 60/333,722 11/27/2001
and claims benefit of 60/358,817 02/22/2002

**** FOREIGN APPLICATIONS *********************

Foreign Priority claimed	STATE OR COUNTRY	SHEETS DRAWING	TOTAL CLAIMS	INDEPENDENT CLAIMS
☐ yes ☐ no			23	3
35 USC 119 (a-d) conditions met ☐ yes ☐ no ☐ Met after Allowance				
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TITLE

SIGNAL SELECTOR AND COMBINER FOR BROADBAND CONTENT DISTRIBUTION

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US007130576C1

(12) EX PARTE REEXAMINATION CERTIFICATE (6993rd)
United States Patent
Gurantz et al.

(10) Number: US 7,130,576 C1
(45) Certificate Issued: Aug. 11, 2009

(54) SIGNAL SELECTOR AND COMBINER FOR BROADBAND CONTENT DISTRIBUTION

(75) Inventors: **Itzhak Gurantz**, San Diego, CA (US); **Ladd El Wardani**, La Jolla, CA (US); **Michael Landry**, San Diego, CA (US)

(73) Assignee: **Entropic Communications Inc.**, San Diego, CA (US)

Reexamination Request:
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Reexamination Certificate for:
Patent No.: **7,130,576**
Issued: **Oct. 31, 2006**
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Filed: **Nov. 6, 2002**

Related U.S. Application Data

(60) Provisional application No. 60/345,965, filed on Nov. 7, 2001, provisional application No. 60/333,722, filed on Nov. 27, 2001, and provisional application No. 60/358,817, filed on Feb. 22, 2002.

(51) **Int. Cl.**
H04H 1/00 (2006.01)

(52) **U.S. Cl.** **455/3.02**; 455/3.01; 455/3.04; 455/427; 725/71; 725/78

(58) **Field of Classification Search** 455/3.02
See application file for complete search history.

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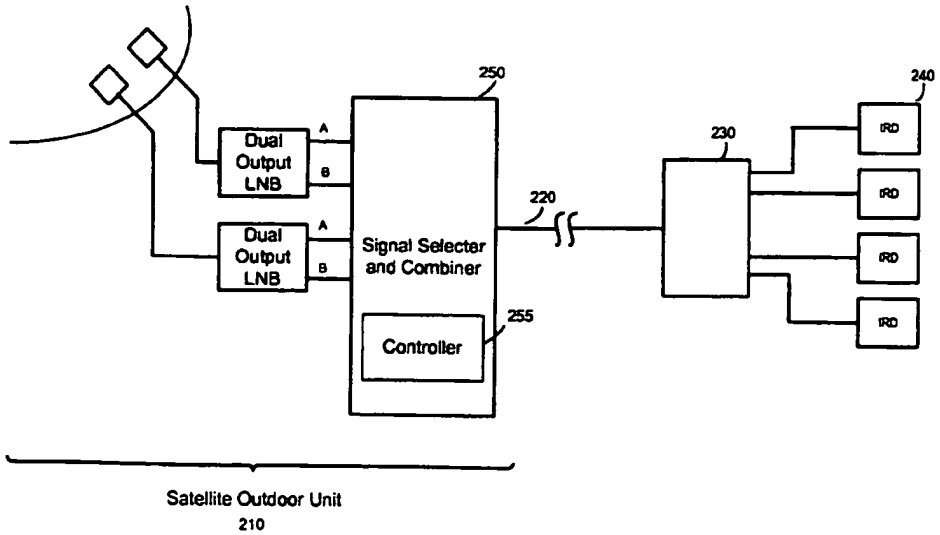
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Primary Examiner—Fred Ferris

(57) **ABSTRACT**

In a satellite receiving system, program channels are selected from one or more broadband signals and combined with other selected channels and transmitted from a first unit, for example an outdoor unit, to a second unit, for example a gateway, server, or set-top box, using a single cable. Channels can be selected by digitizing the broadband signal then digitally filtering to isolate the desired channels. The outputs of several LNBs can be selected and combined into one signal. Multiple set-top boxes can receive independent signals over a single cable from the outdoor unit.



EX PARTE REEXAMINATION CERTIFICATE ISSUED UNDER 35 U.S.C. 307

THE PATENT IS HEREBY AMENDED AS INDICATED BELOW.

Matter enclosed in heavy brackets [ ] appeared in the patent, but has been deleted and is no longer a part of the patent; matter printed in italics indicates additions made to the patent.

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1, 8, 14, 15, 16** and **17** are determined to be patentable as amended.

Claims **2–7, 9–13** and **18–23**, dependent on an amended claim, are determined to be patentable.

New claims **24–42** are added and determined to be patentable.

1. A signal distribution system for distributing a plurality of low noise amplifier and block converter (LNB) signals from a satellite outdoor unit (ODU) over a coaxial cable to an integrated receiver decoder (IRD) comprising:

a signal selector that receives a plurality of broadband LNB signals comprising a plurality of transponder signals *and digitizes the received broadband LNB signals*, the signal selector is responsive to transponder select information transmitted by an IRD and selects a plurality of transponder signals *in the digital domain* from at least one broadband LNB signal based on the transponder select information;

a frequency translator coupled to the signal selector that is [capable of shifting] *configured to shift* the selected transponder signals to new carrier frequencies *and a converter configured to convert the shifted selected transponder signals* to produce RF signals; and

a signal combiner *communicatively* coupled to at least one frequency translator [capable of combining], *the combiner configured to combine* at least two *of the shifted selected* RF signals to produce a composite signal;

wherein the modulation of the composite signal is the same as the modulation of the broadband LNB signals and wherein the composite signal is transmitted on the coaxial cable;

whereby the composite signal is transmitted to the IRD.

8. A signal distribution system for distributing signals comprising a plurality of *satellite transponder* channels *of a broadband signal* from a plurality of sources between a first unit and a second unit over a communication medium comprising:

means in the first unit for digitizing the broadband signal from each of the plurality of sources;

means in the first unit responsive to information transmitted by the second unit for extracting selected channels from [each of the plurality of sources] *the digitized broadband signals in the digital domain;* and

means in the first unit for combining the selected channels into a composite signal without demodulating channels and without changing the modulation of the channels and transmitting the composite signal over the medium; and

means in the second unit for receiving the composite signal and demodulating and decoding at least one channel; and

means in the first unit and second units for bi-directionally communicating control information between the second unit and the first unit.

14. A method of communicating a plurality of transponder signals from a satellite outdoor unit (ODU) that receives a plurality of satellite broadband signals to an integrated receiver decoder (IRD) over a single cable connected to the ODU, the method comprising the steps of:

communicating a transponder request to the ODU from the IRD;

in the ODU, *digitizing the plurality of satellite broadband signals,* selecting *and extracting* a plurality of transponder signals [extracted] from the received *digitized* satellite broadband signals, wherein the selecting is responsive to the transponder request signals;

combining *extracted* selected transponder signals into a composite signal;

transmitting the composite signal over the single cable from the ODU to the IRDs, wherein the modulation of the transponder signal is not altered by the steps of selecting, combining, and transmitting.

15. The method of claim **14** wherein the step of selecting *and extracting* a transponder signal comprises the step of: filtering a transponder signal with a band pass filter having a bandwidth ranging from 5% to 100% wider than the bandwidth of the transponder signal.

16. The method of claim **14** wherein the step of combining comprises frequency translating the selected *and extracted* transponder channels to a variable frequency before combining.

17. The method of claim **15**, further comprising frequency translating the selected transponder channels to a predetermined frequency before combining.

24. The signal distribution system of claim 1, wherein the signal selector comprises a digital filter configured to apply a pass band filter transfer function to the digitized broadband signal to isolate a transponder channel.

25. The signal distribution system of claim 1, wherein the converter comprises a digital-to-analog converter configured to convert the selected and frequency translated signal to an analog signal prior to combining.

26. The signal distribution system of claim 1, wherein the frequency translator comprises a digital mixer configured to apply a rotating phasor to the data samples to translate their frequency.

27. The signal distribution system of claim 1, wherein shifting a selected transponder signal to a new carrier frequency comprises translating the original digitized broadband signal to locate a selected transponder channel at baseband.

28. The signal distribution system of claim 1, wherein the channels combined in the composite signal are combined at a sample rate substantially equal to the composite output rate.

29. The signal distribution system of claim 1, further comprising a controller to control the signal selector, frequency translator and converter and combiner.

30. The signal distribution system of claim 29, wherein the controller, signal selector, frequency translator and combiner are part of a satellite outdoor unit.

31. The signal distribution system of claim 29, further comprising a channel translation table maintained by the controller and specifying assigned frequency slots for transponder channels in the composite signal.

32. The signal distribution system of claim 31, wherein the channel translation table is provided to the IRD to allow the IRD to tune to a desired selected translated transponder channel.

33. The signal distribution system of claim 1, wherein the new carrier frequencies to which the selected transponder channels are shifted is determined such that the translated channels are placed at respective center frequencies where they will be positioned in the composite signal.

34. The method of claim 14, wherein selecting and extracting comprises applying a pass band filter transfer function to the digitized broadband signal.

35. The method of claim 14, further comprising converting the selected signal to an analog signal using a digital to analog converter prior to combining.

36. The method of claim 14, wherein the combining is performed in the digital domain.

37. The method of claim 17, wherein frequency translating comprises using a digital mixer to apply a rotating phasor to the data samples to translate their frequency.

38. The method of claim 14, further comprising frequency translating the digitized broadband signal prior to selecting and extracting transponder signal.

39. The method of claim 38, wherein frequency translating comprises translating the original digitized broadband signal to locate a selected transponder channel at baseband.

40. The method of claim 14, further comprising maintaining a channel translation table at the outdoor unit, the channel translation table specifying assigned frequency slots for transponder channels in the composite signal.

41. The method of claim 38, further comprising providing the channel translation table to the IRD to allow the IRD to tune to a desired selected translated transponder channel.

42. The method of claim 14, wherein selecting and extracting comprises low-pass filtering the translated digitized broadband signal thereby substantially removing signal information from non-selected transponder channels.

* * * * *

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Application Number:	90008389
International Application Number:	
Confirmation Number:	3367
Title of Invention:	SIGNAL SELECTOR AND COMBINER FOR BROADBAND CONTENT DISTRIBUTION
First Named Inventor/Applicant Name:	7130576
Customer Number:	77882
Filer:	Christopher C. Winslade/Deb Wilson
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Receipt Date:	15-JUN-2015
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2	Power of Attorney	Entropic_POA_PreAIA.pdf	340881 8107f4c6d5473b527f97e45769199b81a37aad1b	no	2

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STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Itzhak Gurantz, Ladd El Wardani, Michael Landry

Application No./Patent No.: 90/008,389 Filed/Issue Date: 02/06/2007

Titled: SIGNAL SELECTOR AND COMBINER FOR BROADBAND CONTENT DISTRIBUTION

Entropic Communications, LLC , a corporation

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.

states that it is:

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2. ☐ an assignee of less than the entire right, title, and interest in (The extent (by percentage) of its ownership interest is _____ %); or

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/Christopher C. Winslade/ 06/15/2015

Signature Date

Christopher C. Winslade, Reg. No. 36308 Attorney for Applicant

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.
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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.

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/008,389	02/06/2007	7130576	E010004USREX1	3367

77882 7590 06/16/2015

Sheppard Mullin Richter & Hampton LLP
12275 El Camino Real, Suite 200
San Diego, CA 92130

EXAMINER
FERRIS III, FRED O

ART UNIT	PAPER NUMBER
3992	

MAIL DATE	DELIVERY MODE
06/16/2015	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.

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SHEPPARD MULLING RICHTER & HAMPTON LLP
12275 EL CAMINO REAL
SUITE 200
SAN DIEGO, CA 92130

90/008389

Cc: MCANDREWS HELD & MALLOY, LTD.
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661

Date Mailed: 06/16/15

DENIAL OF REQUEST FOR POWER OF ATTORNEY IN A REEXAMINATION PROCEEDING

The request for Power of Attorney filed 06/15/15 is acknowledged. However, the request cannot be granted at this time for the reason stated below.

☐ The power of attorney you provided did not comply with 37 CFR 1.32. See 69 Fed. Reg. 29865 (May 26, 2004).

The revocation is not signed by the applicant, the assignee of the entire interest, or one particular principal attorney having the authority to revoke.

The power of attorney is from an assignee and the statement required by 37 CFR 3.73(b) has not been received.

☐ The person signing for the assignee has omitted their empowerment to sign on behalf of the assignee.

☐ The inventor(s) is/are without authority to appoint attorneys since the assignee has intervened as provided by 37 CFR 3.71.

☐ The signature(s) of _____, co-inventor(s) in this application, has/have been omitted. The power of attorney will be entered upon receipt of confirmation signed by said co-inventor(s).

☐ The person(s) appointed in the power of attorney is/are not registered to practice before the U.S. Patent and Trademark Office.

XX The correspondence address in the request for power of attorney is different than the address for the **patent** that is currently of record in the patent file. Pursuant to 37 CFR 1.33, any paper attempting to change the correspondence address in a reexamination proceeding to other than that of record in the patent file is ineffective. See MPEP 2224, 2624. Since the power of attorney will not be separately processed from the change of correspondence address, the power of attorney is ineffective. The correspondence address in the reexamination proceeding is the address of record in the patent file as listed at the top of this letter.

Note: to properly change the correspondence address in the reexamination proceeding, a change of correspondence address **must first (or concurrently) be filed in the patent file**, for example, through form PTO/SB/123. Note that patent owner may designate a separate address solely for payment of maintenance fees through form PTO/SB/47, also along with **Certificate of Service** when 3rd party in Reexamination.

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Questions relating to this Notice should be directed to the Central Reexamination Unit at (571) 272-7705.

PTO/SB/81B (08-12)
Approved for use through 11/30/2014. OMB 0651-0035
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REEXAMINATION OR SUPPLEMENTAL EXAMINATION – PATENT OWNER POWER OF ATTORNEY OR REVOCATION OF POWER OF ATTORNEY WITH A NEW POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS FOR REEXAMINATION OR SUPPLEMENTAL EXAMINATION AND PATENT

Control Number(s)	
Filing Date(s)	
First Named Inventor	
Title	
Patent Number	
Examiner Name	
Attorney Docket No(s)	

I. Power of Attorney. This form may be used to change the Power of Attorney in a reexamination or supplemental examination proceeding (or multiple proceedings where merged). This form may also be used to change the Power of Attorney in the patent file; in such a case, a copy of this form will be placed in both the patent file and the reexamination or supplemental examination proceeding.

A. Revocation of Previous Power of Attorney. I hereby revoke all previous patent owner powers of attorney, if any, given:

☐ in the above-identified reexamination or supplemental examination proceeding control number(s) (more than one may be changed only if the proceedings are merged).

☐ in the file of the above-identified patent.

(check BOTH boxes if change in BOTH the patent file and the reexamination or supplemental examination proceeding is requested).

B. Designation of Power of Attorney.

☐ A Power of Attorney is submitted herewith.

OR

☐ I hereby appoint Practitioner(s) associated with the Customer Number identified in the box at right as my/our attorney(s) or agent(s) to prosecute the proceeding(s)/patent identified above and selected in section I(A), and to transact all business in the United States Patent and Trademark Office connected therewith:

OR

☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s) to prosecute the proceeding(s) identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

Practitioner(s) Name	Registration Number

Authorization for the Power of Attorney is provided by the signature on page 2 of this form.

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 update (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 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.**

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II. Change of Correspondence Address

Please recognize or change the correspondence address for the above-identified reexamination or supplemental examination proceeding control number(s) (more than one may be changed **only** if they are merged proceedings) **and for the file of the above-identified patent** to be:

☐ The address associated with the above-identified Customer Number.
OR
☐ The address associated with the Customer Number identified in the box at right: ☐
OR

☐ Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

NOTE: THE CORRESPONDENCE ADDRESS FOR THE REEXAMINATION OR SUPPLEMENTAL EXAMINATION PROCEEDING CONTROL NUMBER(S) MUST BE THE SAME AS THAT FOR THE PATENT. SEE 37 CFR 1.33.

III. Authorization for Power of Attorney and (if selected) Change of Correspondence Address

I am the:
☐ Inventor, having ownership of the patent being reexamined.
OR
☐ Patent owner.
Statement under 37 CFR 3.73(c) (Form PTO/SB/96) submitted herewith or filed on _____.

Signature of Inventor or Patent Owner		Date	
Name		Telephone	
Title and Company			

NOTE: Signatures of all the inventors or patent owners of the entire interest or their representative(s) are required. If more than one signature is required, submit multiple forms, check the box below, and identify the total number of forms submitted in the blank below.

☐ A total of _____ forms are submitted. *If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

Privacy Act Statement

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PTO/SB/80 (11-08)
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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:

☑ Practitioners associated with the Customer Number: 23446

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:

☑ The address associated with Customer Number: 23446

OR

☐ Firm or Individual Name			
Address			
City		State	Zip
Country			
Telephone		Email	

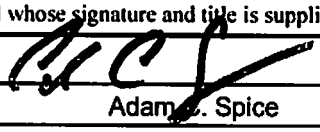
Assignee Name and Address:

Entropic Communications, LLC
5966 La Place Court, Suite 100
Carlsbad, CA 92008

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	10/10/16
Name	Adam C. Spice	Telephone	949-333-0092
Title	Chief Financial Officer		

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.**

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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 Acknowledgement Receipt

EFS ID:	35721686
Application Number:	90008389
International Application Number:	
Confirmation Number:	3367
Title of Invention:	SIGNAL SELECTOR AND COMBINER FOR BROADBAND CONTENT DISTRIBUTION
First Named Inventor/Applicant Name:	7130576
Customer Number:	77882
Filer:	Christopher C. Winslade/Brenda Campillo
Filer Authorized By:	Christopher C. Winslade
Attorney Docket Number:	E010004USREX1
Receipt Date:	15-APR-2019
Filing Date:	06-FEB-2007
Time Stamp:	10:28:12
Application Type:	Reexam (Patent Owner)

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	Assignee showing of ownership per 37 CFR 3.73	29399US05_S373b.pdf	428255 0ed85a0f01bfb2638f522a9dd6dc3edd1a8b39ed	no	2

Warnings:

Information:					
2	Power of Attorney	Entropic_MxL_PreAIA_POA.pdf	130279 b2865feee1de6b03326acadca7e3660514a43c2a	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	558534	

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/96 (07-09)
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STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Entropic Communications, LLC

Application No./Patent No.: 90/008,389 Filed/Issue Date: 02/06/2007

Titled: Signal Selector and Combiner for Broadband Content Distribution

Entropic Communications, LLC , 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 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: EXCALIBUR ACQUISITION CORPORATION;I To: ENTROPIC COMMUNICATIONS, INC.

The document was recorded in the United States Patent and Trademark Office at
Reel 035704 , Frame 0504 , or for which a copy thereof is attached.

2. From: ENTROPIC COMMUNICATIONS, INC.;EXCA To: ENTROPIC COMMUNICATIONS, LLC

The document was recorded in the United States Patent and Trademark Office at
Reel 035706 , Frame 0188 , 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(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.

/Christopher C. Winslade/ April 15, 2019

Signature Date

Christopher C. Winslade Attorney/Agent of Record

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.**

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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.

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
90/008,389	02/06/2007	7130576	E010004USREX1

CONFIRMATION NO. 3367

POA ACCEPTANCE LETTER

23446
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661

OC000000107780836

Date Mailed: 04/30/2019

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/15/2019.

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.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/tplovelace/

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
90/008,389	02/06/2007	7130576	E010004USREX1

CONFIRMATION NO. 3367

77882
Sheppard Mullin Richter & Hampton LLP
650 Town Center Drive, 4th Floor
Costa Mesa, CA 92626

POWER OF ATTORNEY NOTICE

OC000000107780820

Date Mailed: 04/30/2019

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/15/2019.

- 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).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/tplovelace/

PTO/AIA/80 (07-17)
Approved for use through 03/31/2021. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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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(c).

I hereby appoint:

[X] Practitioners associated with Customer Number: 23,446

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(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:

[X] The address associated with Customer Number: 23,446

OR

[ ]

Firm or individual name		
Address		
City	State	Zip
Country		
Telephone	Email	

Assignee name and address: ENTROPIC COMMUNICATIONS, LLC
1345 AVENUE OF THE AMERICAS, 46TH FLOOR
NEW YORK, NY 10105

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of the practitioners appointed in this form, 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 /Andrea L. Gothing/	Date 2021-05-04
Name Andrea L. Gothing	Telephone 415-830-0613
Title Licensing Officer and Authorized Signatory, Entropic Communications, 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 update (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 18 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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Privacy Act Statement

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Electronic Acknowledgement Receipt

EFS ID:	43328420
Application Number:	90008389
International Application Number:	
Confirmation Number:	3367
Title of Invention:	SIGNAL SELECTOR AND COMBINER FOR BROADBAND CONTENT DISTRIBUTION
First Named Inventor/Applicant Name:	7130576
Customer Number:	23446
Filer:	Ronald H. Spuhler/Deborah Wilson
Filer Authorized By:	Ronald H. Spuhler
Attorney Docket Number:	E010004USREX1
Receipt Date:	23-JUL-2021
Filing Date:	06-FEB-2007
Time Stamp:	12:01:15
Application Type:	Reexam (Patent Owner)

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	Assignee showing of ownership per 37 CFR 3.73	29399US05_373c_Statement_AIA-96.pdf	124383 3c943bb2ad7a40be7b4f1ef1b37d35d1ad1bc5ce	no	3

Warnings:

Information:					
2	Power of Attorney	Entropic-POA_General_Assignee_EntropicCommunications_ALG.pdf	487892 51444e06ae84b241bfc127dc47c5d6c646944dd7	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	612275	

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/AIA/96 (08-12)
Approved for use through 01/31/2013. 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(c)

Applicant/Patent Owner: ENTROPIC COMMUNICATIONS, LLC

Application No./Patent No.: 90/008,389 Filed/Issue Date: 2007-02-06

Titled: SIGNAL SELECTOR AND COMBINER FOR BROADBAND CONTENT DISTRIBUTION

ENTROPIC COMMUNICATIONS, LLC, a limited liability company

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

   ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

   ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

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 thereof is attached.

B. ☑ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Itzhak Gurantz, Ladd El Wardani, Michael Landry To: ENTROPIC COMMUNICATIONS, INC.

   The document was recorded in the United States Patent and Trademark Office at
   Reel 014140, Frame 0486, or for which a copy thereof is attached.

2. From: EXCALIBUR ACQUISITION CORPORATION, ENTROPIC COMMUNICATIONS, INC. To: ENTROPIC COMMUNICATIONS, INC.

   The document was recorded in the United States Patent and Trademark Office at
   Reel 035704, Frame 0504, or for which a copy thereof is attached.

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.**

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STATEMENT UNDER 37 CFR 3.73(c)

3. From: ENTROPIC COMMUNICATIONS, INC., EXCALIBUR SUBSIDIARY, LLC To: ENTROPIC COMMUNICATIONS, LLC

The document was recorded in the United States Patent and Trademark Office at
Reel 035706, Frame 0188, or for which a copy thereof is attached.

4. 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.

5. 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.

6. 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(s).

☑ As required by 37 CFR 3.73(c)(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.

/Ronald H. Spuhler/	2021-07-23
Signature	Date
Ronald H. Spuhler	52245
Printed or Typed Name	Title or Registration Number

[Page 2 of 2]

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