

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,

Petitioner,

v.

S.M.R INNOVATIONS LTD and Y.M.R TECH LTD,

Patent Owners.

IPR2024-01048

U.S. Patent 10,547,648

**PATENT OWNERS' DEMONSTRATIVE
EXHIBITS FOR ORAL ARGUMENT**

Pursuant to 37 C.F.R. § 42.70(b), Patent Owners S.M.R Innovations LTD and Y.M.R Tech LTD submit the following demonstrative exhibits for use at the oral argument scheduled for October 28, 2025.

Dated: October 23, 2025

Respectfully submitted,

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Apple Inc. v. S.M.R Innovations LTD & Y.M.R Tech LTD

IPR2024-01048

U.S. Patent No. 10,547,648

**Patent Owners' Demonstrative Exhibits
(Not Evidence)**

Zhang (EX1004), 4:58

The framework can be built on top of many different kinds of communication media, for example but not by way of limitation, Bluetooth™ wireless technology, IEEE 802.11 wireless LAN, infrared, HomeRF™, or even wired networks such as Ethernet. Some of these media, such as Bluetooth™

HomeRF Specification (EX1038), 199

The HomeRF MAC architecture can support both *ad-hoc* networks and *managed* networks. A managed network is controlled and managed by a Connection Point. In an ad-hoc network, the MAC protocol support only asynchronous data service (using CSMA/CA). In a managed network, the MAC also provides support for isochronous services (using TDMA).

Dr. Kiaei Transcript (EX2019) Ex. 2, 62

The network can operate as either an ad-hoc network or as a managed network under the control of a Control Point. In an ad-hoc network all stations are equal and control of the network is distributed between the stations. Since there is no Control Point only data communication is supported in an ad-hoc network.

HomeRF Specification (EX1038), 47

Table 11 - HomeRF Device Types

HomeRF Device Type	Description	Icon
A-node	<i>Asynchronous-node</i>: A HomeRF device that provides asynchronous data services. This type includes wireless network interface cards (NICs).	
S-node	<i>Streaming-node</i>: A HomeRF device that provides priority asynchronous and asynchronous data services. This type includes devices that stream real-time media, such as, audio and video.	
I-node	<i>Isochronous-node</i>: A HomeRF device that provides isochronous data (mainly interactive voice) services. This type includes cordless handsets.	

Dr. Kiaei Transcript (EX2019), 17:17-24

17 Q And an A-node does not have to provide the
18 capabilities of an I-node, correct?

19 A As I said earlier, each node is independent.
20 So if a node happens to be an A-node, it provides its
21 own capabilities.

22 Q And so it would not have to provide the
23 capabilities of an I-node, right?

24 A That is correct. Yes, sir.

HomeRF Specification (EX1038), 29

1.1 Document Overview

The HomeRF specification supports many features, some of which are optional. This makes the specification attractive to product manufacturers, but requires careful description. In order to present the specification in a coherent fashion, it is described in terms of separate architecture blocks.

HomeRF Specification (EX1038), 41

Main types of service	• Asynchronous (connectionless) data service - used for data networking • Priority asynchronous (session-oriented) data service – used for carrying media streams such as audio and video. Requires the presence of a Connection Point. • Isochronous (connection-oriented) data service - used mainly to carry interactive voice. Requires the presence of a Connection Point. • Isochronous connectionless broadcast service (ICBS) – used to carry broadcast messages such as paging of I-nodes, cadence ringing, caller ID, and voice announcement
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Zhang (EX1004), Fig. 1 & Negus (EX1039), Fig. 1

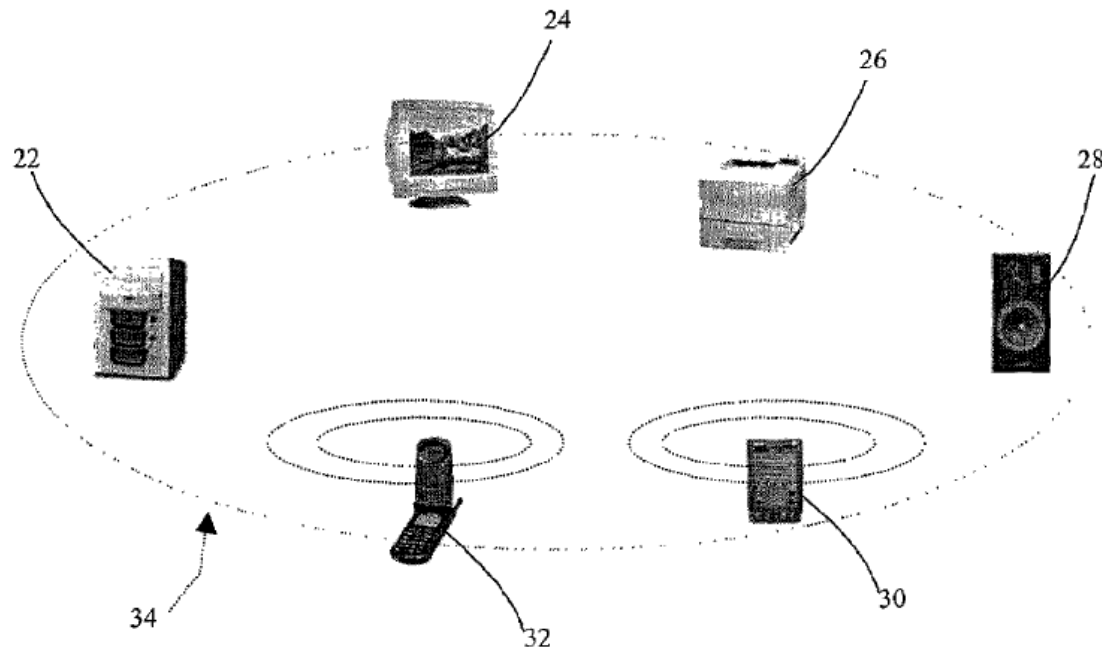


Fig. 1 A Helper Environment

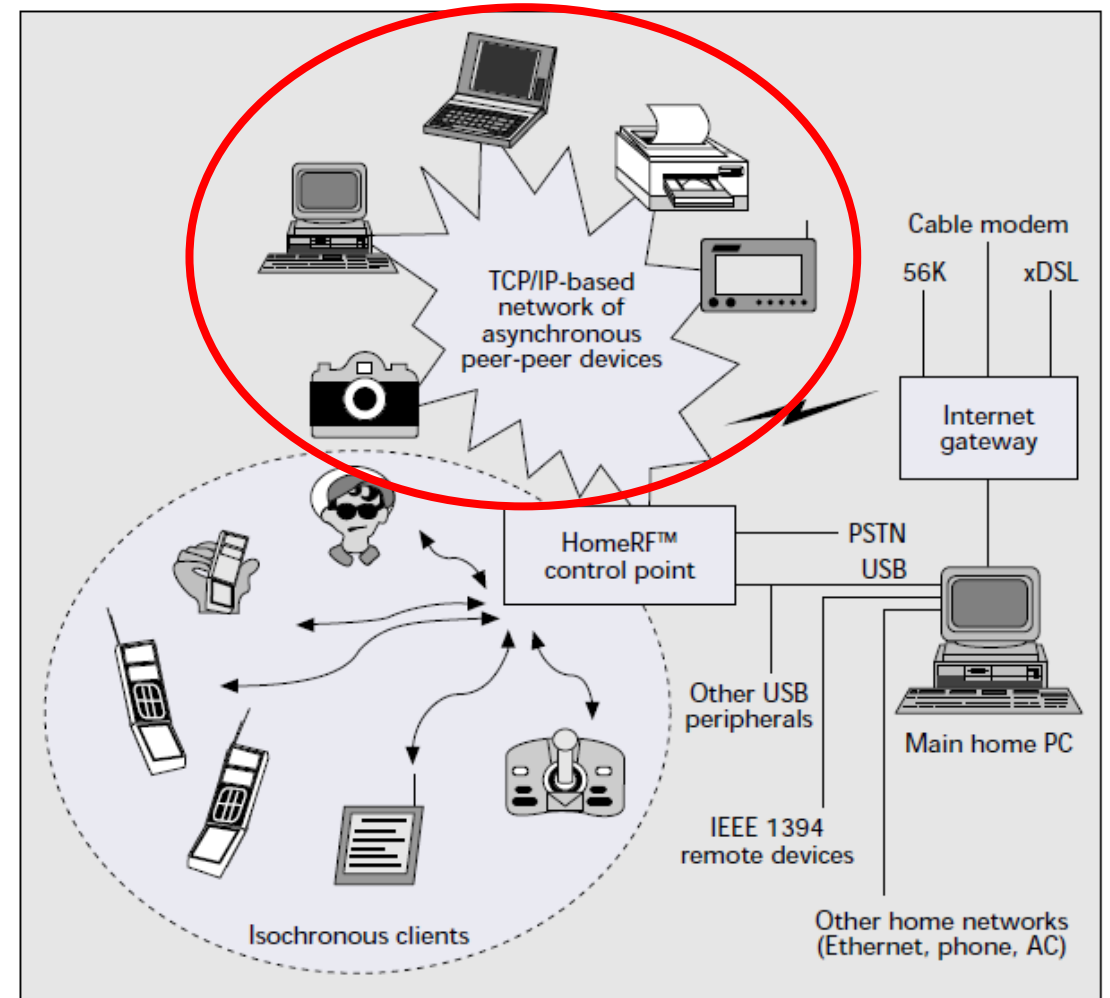


Figure 1. The SWAP vision for home networking.

HomeRF Specification (EX1038), 55

The implementation of the MAC services differs from DECT MAC. However, because the services it provides are similar, the DECT higher layers (DLC, NWK and IWU) can be hosted on the HomeRF MAC with little modification. The use of the DECT protocol enables the HomeRF network to support call setup for the isochronous data service and to interoperate, through a Connection Point, with the PSTN.

Negus (EX1039), 4

■ Table 1

The SWAP MAC has been optimized for the home environment and is designed to carry both voice and data traffic and interoperate with the PSTN using a subset of the Digital Enhanced Cordless Telecommunications (DECT) standard, a digital cordless telephone standard used in residential applications throughout Europe. The MAC is designed for use with a frequency-hop-

HomeRF Specification (EX1038), 41

- Isochronous (connection-oriented) data service - used mainly to carry interactive voice. Requires the presence of a Connection Point.

HomeRF Specification (EX1038), 32

Connection Point

A HomeRF node that is capable of providing control-point services

Class-1 Connection Point

A Connection Point that supports I-nodes, A-nodes, and S-nodes

Class-2 Connection Point

A Connection Point that supports A-nodes and S-nodes

Class-3 Connection Point

A Connection Point that supports A-nodes and S-nodes but is not required to perform A-node power-management services

Negus (EX1039), 2

The SWAP networking vision is also apparent in Fig. 1. The HomeRF technology supports both isochronous clients that are slaves to the main home PC and an asynchronous network of peer devices which is effectively a wireless Ethernet. In most cases the system starts with a control point, usually connected to the main home PC via USB. This control point is not absolutely necessary for devices in the asynchronous network of Fig. 1, but even in that case it offers some interesting power saving

Dr. Kiaei Transcript (EX2019) Ex. 2, 62

The network can operate as either an ad-hoc network or as a managed network under the control of a Control Point. In an ad-hoc network all stations are equal and control of the network is distributed between the stations. Since there is no Control Point only data communication is supported in an ad-hoc network.

HomeRF Specification (EX1038), 48, 40, 429

Class-1 Connection Point

A HomeRF device that provides management of I-nodes, S-nodes and A-nodes.

It provides connectivity to the PSTN and a host PC.

A HomeRF network can include nodes that perform the functions of the following kinds of devices:

- A Connection Point (CP) that acts as the gateway between the personal computer, the PSTN, and HomeRF-compatible devices

A Connection Point (CP) is a HomeRF device that provides management of a HomeRF network, and can provide (depending on its class) a connection between the On-Air interface, the public telephone network and a personal computer.

HomeRF Specification (EX1038), 59

Figure 10 shows the architecture of a Class-1 CP that is integrated into a Host PC. The host network driver can communicate directly with the HomeRF CP IWU.

The *separate* CP potentially splits the user-interface into a “local” and an “on PC” component. The *integrated* CP presents only a single user-interface. It is tightly coupled to its host PC. It could be a plug-in adapter card, or it could be integrated onto the PC’s motherboard. The user perceives that the PC is the connection-point.

The integrated CP is still required to support mandatory CP procedures, even when the PC appears to be switched off. Refer to section 12.7.

HomeRF Specification (EX1038), 431-432

12.7.1 Class 1 CP Requirements

Class-1 CP shall support all mandatory items defined in Table 279, depending upon its current operating mode.

Table 279 - Class-1 CP Requirements

Item	Reference	CP Operating Mode		
		Standalone	Autonomous	Slave
Call pickup conferencing	8.1.8 (Pickup conferencing)	M, 2	M, 2	MA, 2
Intercom conferencing	8.1.9 (Intercom conferencing)	O	O	O
Intercom call	8.1.3 (Intercom Call)	O	M	MA
Outgoing call	8.3.1 (Outgoing call)	M	M	MA
Incoming call	8.3.2 (Incoming call)	M	M	MA
MB-SAP services	5.15 (MB-SAP (ICBS) Service)	M	M	M
MC-SAP services	5.14 (MC-SAP Services)	M	M	M
MD-SAP services	5.12 (MD-SAP Service)	M	M	M
MS-SAP services	5.13 (MS-SAP Service)	O	O	O
I-node Authentication	15.4 (HomeRF Authentication)	MU	MU	MU
TDMA Encryption	5.20.6 (TDMA Encryption)	MU	MU	MU
MD-SAP Encryption	5.12.5 (MD-SAP Encryption Layer)	MU	MU	MU

Unicast Power-Management support	5.18.7.3 (CP Unicast Power-Management Service) and 5.18.7.5 (CP Unicast Power-Supporting)	M	M	M
Multicast Power-Management support	5.18.8 (Multicast Power-Saving)	M	M	M
Number of PSTN lines		> 0	> 0	> 0
Voice Stack	7 (Voice Stack and On-Air Voice Processor)	M	M	M
CP Assertion	5.17.8 (Connection Point Negotiation)	M	M	M
Hold	8.1.4 (Call hold)	O	O	O
Call Transfer	8.1.5 (Call transfer)	O	O	O
Call Forward	8.1.6 (Call forward)	O	O	O
Remote Off-hook	8.1.7 (Remote off-hook (babycom))	O	O	O
Voice connection to PC ("Computer call")	8.1.10 (Computer Call)	X	M	M

Negus (EX1039), 2

medium access control (MAC) overview later. The isochronous clients, such as cordless telephones, wireless headsets, or remote I/O devices to the home PC (a consumer personal information manager, PIM), are always bound to the control point, which assigns them guaranteed bandwidth for bounded latency communication. The asynchronous peers can also com-

Dr. Kiaei Transcript (EX2019), 37:7-20

7 Q All right. The only thing I have, Dr. Kiaei,
8 you mentioned that you had a correction to make to
9 paragraph 12 in your supplemental declaration. What was
10 that correction you wanted to do -- make on the record?

11 MR. ALEXANDER: Objection. Outside the
12 scope of the cross.

13 THE WITNESS: On paragraph 12, I mistyped
14 the -- in the parentheses which says, "E.g. Zhang's
15 mobile device." That should be, e.g. HomeRF. And I
16 made the same mistake also, I repeated that in
17 Paragraph, I believe it was 19. Same exact -- same
18 thing. Verbatim on that same paragraph, I have in the
19 parentheses, "Zhang's mobile device," that should be
20 HomeRF.

'648 Patent (EX1001), 11:46-67

Scenario 3

1. A person, say Smith, carrying a cell phone is sitting in a hotel lobby
2. In the lobby there are four land/fixed line phones
3. A phone call arrives at the person's cell phone 50
4. Option A:
 - a. The person points his phone at one of the land/fixed line phones
 - b. The cell phone detects the said phone as busy
 - c. The person points his phone at another land/fixed line phones 55
 - d. The phone call is routed to that, available, land/fixed phone
 - e. The chosen land/fixed phone rings, or flashes to indicate the rerouted call 60
5. Option B:
 - a. While ringing, the cell phone indicates on its display that a nearby phone is available
 - b. The person approves the routing of the call to that nearby phone 65
 - c. The nearby phone rings, or flashes to indicate the rerouted call

'648 Patent Prosecution History (EX1002), 261-62

Examiner indicated that **Claim 4** recites, "*connecting the one or more devices*" and "*signaling the one or more devices*" and that the Claim further recites to identify one or more available devices and that it is not clear whether the claimed "*one or more devices*" indicates the one or more available devices or different one or more devices. Applicant amended the claim to recite "*one or more available devices*" and not "*one or more devices*".

Examiner indicated that **Claim 9**, it is not clear whether the claimed "one or more available device" (Line 2) and the claimed "the one or more device" (line 3) are same devices or different devices. Applicant amended the claim to recite "*one or more available devices*" and not "*one or more devices*".

Cambridge Grammar of the English Language (EX2014), 4

- Potential differences between attributive and predicative adjectives
- Ordinary attributive adjectives can be used predicatively with the same sense: we can call these **ascriptive** adjectives since they can occur as complement to the verb *be* in its ascriptive sense (Ch. 4, §5.5.1). Ascriptive attributive adjectives characteristically have the four properties illustrated summarily for *shy* in [3], whereas most attributive-only adjectives lack one or more of them.
- [3]
- i ENTAILMENT *X is a shy N* entails *X is an N* (e.g. *Tom is a shy man* entails *Tom is a man*).
 - ii SUBSET *A shy N* gives an answer to the question *What kind of an N is X?* (e.g. *A shy man* is an answer to the question *What kind of a man is Tom?*)
 - iii MODIFIABILITY *Shy* can itself be modified (e.g. *a very shy man*).
 - iv PRO-FORM *Shy* can modify the pro-form *one* (e.g. *Tom is the shy one*).

Joint Claim Construction Statement (EX2008), 2

availability of compatible equipment / availability of said identified compatible media handling devices / availability for accepting a routed media available devices ('990 Patent, claims 1-3, 9, & 24; '866 Patent, claims 22-24; '223 Patent, claims 1, 5, 7-10, 13-16, 18, 19, & 22; '648 Patent, claims. 1, 5-8, 10, 11, 13, 15, 16, 18, & 19) These phrases were proposed for construction by Apple.	<u>Original Proposal:</u> Availability: whether equipment / device is free and able to receive a routed signal Available: devices that are free and able to receive a routed signal <u>Alternative:</u> plain meaning, where the plain meaning requires "readiness for immediate use," not mere presence	Plain meaning
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Dr. Kiaei Declaration (EX1003), ¶182

Modifying *Zhang-Fillebrown-Pasanen* in view of *Rofheart's* teachings of user selection would have been the use of a known technique of selecting one or more of a plurality of helper servers or other remote devices to which to route media content (e.g., phone call) to improve *Zhang-Fillebrown-Pasanen* in the same way as *Rofheart*. A POSITA would have recognized the benefit of providing users control to select one or more of a plurality of devices, rather than always connecting to the first identified available compatible device, as taught by *Zhang*, beneficially permitting users control of which device will handle the call. Thus, a POSITA would have understood that when modifying *Zhang-Fillebrown-Pasanen* in view of *Rofheart*, the same advantages of *Rofheart's* system would have also applied to the

Dr. Kiaei Declaration (EX1003), ¶126

wireless audio interface 12. *See* Claim 1. A POSITA would have understood that a phone call would have been routed to an available device after receipt of a response to the signaling received from the one or more available devices (e.g., wireless audio interface 12) in accordance with the mapping above. *See* Claim 1. A POSITA would have understood that *Zhang's* signaling is provided through several “essential steps” that the mobile device takes to interact with helper servers, where in one step *Zhang* performs a “service query,” where the mobile device “queries the identified helper servers to determine if they are capable of providing the helper service.” *Zhang*, 3:49-51. As discussed above, *Pasanen* expressly discloses the situation where the

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §§ 42.6(e) and 42.105(a) and (b), I certify that on the date indicated below, a true and accurate copy of the foregoing document was served on the following counsel for Petitioner via e-mail, pursuant to Petitioner's consent to e-mail service:

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