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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC., LG ELECTRONICS, INC., SAMSUNG ELECTRONICS CO., LTD., AND SAMSUNG ELECTRONICS AMERICA, INC.,
Petitioner,

v.

UNILOC 2017 LLC,
Patent Owner.

Case IPR2019-00510
Patent 6,868,079 B1

Before SALLY C. MEDLEY, JEFFREY S. SMITH, and GARTH D. BAER, *Administrative Patent Judges*.

MEDLEY, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Apple Inc., LG Electronics, Inc., Samsung Electronics Co., Ltd., and Samsung Electronics America, Inc. (collectively "Petitioner") filed a Petition for *inter partes* review of claims 17 and 18 of U.S. Patent No. 6,868,079 B1 (Ex. 1001, "the '079 patent"). Paper 2 ("Pet."). Uniloc 2017 LLC ("Patent Owner") filed a Preliminary Response. Paper 6 ("Prelim. Resp."). Institution of an *inter partes* review is authorized by statute when "the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." 35 U.S.C. § 314(a). Upon consideration of the Petition and Preliminary Response, we conclude the information presented shows that there is a reasonable likelihood that Petitioner would prevail in showing the unpatentability of at least one of the challenged claims.

A. Related Matters

Petitioner and Patent Owner indicate that the '079 patent is the subject of several court proceedings. Pet. 78–79; Prelim. Resp. 3.

B. The '079 Patent

The '079 patent describes "a method of operating a radio communication system," where the radio communication system is "required to be able to exchange [signaling] messages between a Mobile Station (MS) and a Base Station (BS)." Ex. 1001, 1:7–8, 1:18–20. The '079 patent further describes that an object of the invention "is to improve the efficiency of the method by which a MS requests resources from a BS." *Id.* at 1:56–58. The '079 patent describes a secondary station (*i.e.*, MS) transmitting a request for resources to a primary station (*i.e.*, BS) in a time slot allocated to

the secondary station, where the secondary station re-transmits the request in at least a majority of its allocated time slots until an acknowledgment is received from the primary station. *Id.* at 1:60–67. Because there is no possibility of requests from different secondary stations colliding, a secondary station can retransmit requests in each allocated time slot. *Id.* at 2:3–5. Further, the primary station can improve the accuracy with which it determines whether a request was sent by a particular secondary station if the received signal strength is close to the detection threshold by examining the received signals in multiple time slots allocated to the secondary station in question. *Id.* at 2:9–14.

An example radio communication system is illustrated in Figure 1, reproduced below.

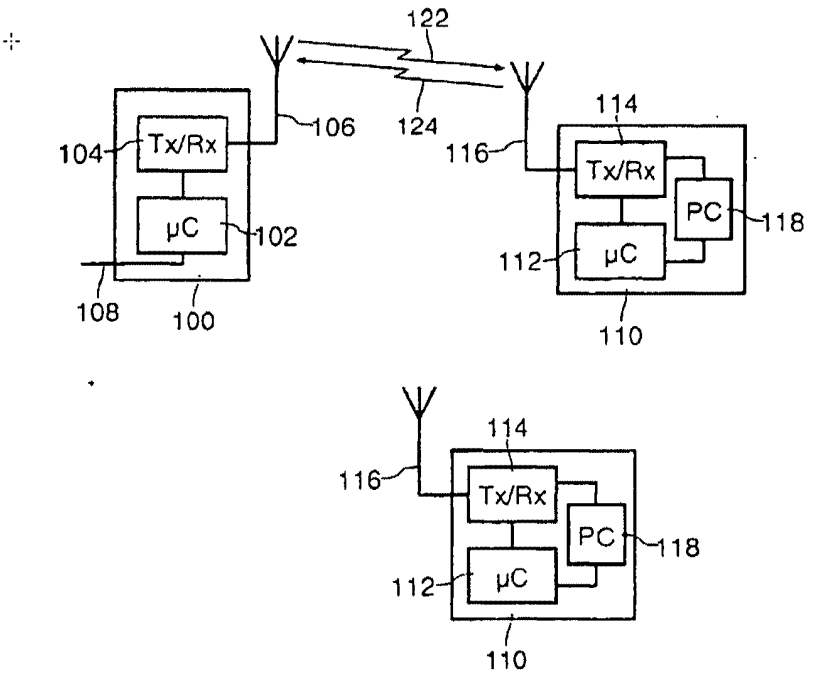

FIG. 1

Figure 1 is a block diagram of a radio communication system comprising a primary station (BS) 100 and a plurality of secondary stations (MS 110). *Id.*

at 3:10–12. Communication from BS 100 to MS 110 takes place on a downlink channel 122, while communication from MS 110 to BS 100 takes place on an uplink channel. *Id.* at 3:19–21.

C. Illustrative Claim

Petitioner challenges independent claims 17 and 18 of the '079 patent. Claims 17 and 18 are reproduced below.

> 17. A method of operating a radio communication system, comprising:
>
> allocating respective time slots in an uplink channel to a plurality of respective secondary stations; and
>
> transmitting a respective request for services to establish required services from at least one of the plurality of respective secondary stations to a primary station in the respective time slots;
>
> wherein the at least one of the plurality of respective secondary stations re-transmits the same respective request in consecutive allocated time slots without waiting for an acknowledgement until said acknowledgement is received from the primary station,
>
> wherein the primary station determines whether a request for services has been transmitted by the at least one of the plurality of respective secondary stations by determining whether a signal strength of the respective transmitted request of the at least one of the plurality of respective secondary stations exceeds a threshold value.

Ex. 1001, 8:12–33.

> 18. A radio communication system, comprising:
>
> a primary station and a plurality of respective secondary stations;
>
> the primary station having means for allocating respective time slots in an uplink channel to the plurality of respective secondary stations to transmit respective requests for services to the primary station to establish required services;

> wherein the respective secondary stations have means for re-transmitting the same respective requests in consecutive allocated time slots without waiting for an acknowledgement until said acknowledgement is received from the primary station,
>
> wherein said primary station determines whether a request for services has been transmitted by at least one of the respective is secondary stations by determining whether a signal strength of the respective transmitted request of the at least one of the respective secondary stations exceeds a threshold value.

Ex. 1001, 8:34–53.

D. Asserted Grounds of Unpatentability

Petitioner asserts that claims 17 and 18 are unpatentable based on the following grounds. Pet. 1:

References	**Basis**[1]	**Challenged Claims**
Wolfe[2], Bousquet[3], and Patsiokas[4]	§ 103	17 and 18
Wolfe, Bousquet, Everett[5], and Patsiokas	§ 103	17 and 18

[1] The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) ("AIA"), amended 35 U.S.C. §§ 102 and 103. Because the '079 patent has an effective filing date before the effective date of the applicable AIA amendments, we refer to the pre-AIA versions of 35 U.S.C. §§ 102 and 103.

[2] US 4,763,325, issued August 9, 1988 (Ex. 1005, "Wolfe").

[3] US 6,298,052, issued October 2, 2001 (Ex. 1006, "Bousquet").

[4] PCT Application Publication No. 1992/021214, published Nov. 26, 1992 (Ex. 1007, "Patsiokas").

[5] John L. Everett, *Very Small Aperture Terminals (VSATs)*, Institution of Electrical Engineers (IEE), Telecommunication Series 28, First Edition (1992) ("Everett," filed as Part 1 and Part 2, both parts identified as Ex. 1008). *See also* Ex. 1017.

II. DISCUSSION

A. Claim Construction

In an *inter partes* review for a petition filed on or after November 13, 2018, "[claims] of a patent . . . shall be construed using the same claim construction standard that would be used to construe the [claims] in a civil action under 35 U.S.C. § 282(b), including construing the [claims] in accordance with the ordinary and customary meaning of such claims as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent." 37 C.F.R. § 42.100(b) (2019); *see* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (amending 37 C.F.R. § 42.100(b) effective November 13, 2018); *see also Phillips v. AWH Corp.*, 415 F.3d 1303, 1312– 14 (Fed. Cir. 2005).

"acknowledgment"

Claim 17 recites "wherein the at least one of the plurality of respective secondary stations re-transmits the same respective request in consecutive allocated time slots without waiting for an acknowledgement until said acknowledgment is received from the primary station." Claim 18 recites similar functional language for the "means for re-transmitting." Petitioner proposes that "acknowledgment" should be construed to mean, "a message sent from the primary station to the secondary station stating the primary station's receipt of the secondary station's request." Pet. 8–9 (citing Ex. 1003 ¶ 34). Petitioner contends that the proposed construction is consistent with the claim language, specification, and file history of the '079 patent and that the construction is supported by a plain meaning of the term "acknowledgment," as evidenced by standard dictionary definitions at the

time of the invention. *Id.* at 9 (citing Ex. 1001, Fig. 3, 2:5–8, 2:23–24, 2:40–47, 3:66–4:7; Ex. 1002, *passim*; Ex. 1003 ¶ 34; Ex. 1015, 25; Ex. 1016, 9–10). At this juncture of the proceeding, Patent Owner does not oppose Petitioner's proposed construction. Prelim. Resp. 8–9. For purposes of the decision, we adopt Petitioner's proposed construction.

"means for allocating"

Independent claim 18 recites "the primary station having means for allocating respective time slots in an uplink channel to the plurality of respective secondary stations to transmit respective requests for services to the primary station to establish required services." Petitioner argues that the "means for allocating" limitation recited in claim 18 is a means-plus-function limitation and should be construed under 35 U.S.C. § 112, sixth paragraph. Pet. 9–13.

Pursuant to 37 C.F.R. § 42.104(b)(3), Petitioner must propose a construction under 35 U.S.C. § 112, sixth paragraph, for any means-plus-function limitation, "identify[ing] the specific portions of the specification that describe the structure, material, or acts corresponding to each claimed function."[6] Petitioner identifies the function associated with the "means for allocating" as "allocating respective time slots in an uplink channel to the plurality of respective secondary stations to transmit respective requests for services to the primary station." *Id.* at 10.

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[6] Section 42.104(b)(3) of Title 37 of the Code of Federal Regulations refers to § 112(f). Section 4(c) of the Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) ("AIA"), re-designated 35 U.S.C. § 112, sixth paragraph, as 35 U.S.C. § 112(f). Because the '079 patent has a filing date before September 16, 2012 (effective date of the relevant section of the AIA), we refer to § 112, sixth paragraph.

Petitioner argues that the '079 patent "does not link structure of the primary station to the 'allocating' function." *Id.* at 10. Petitioner contends, however, based on averments made during litigation by Patent Owner, that the corresponding structure for the "means for allocating" should be interpreted "to cover microcontroller 102 performing the algorithms contained in 3:25–32, 36–41, or an equivalent." *Id.* at 12 (citing Ex. 1013, 1). Patent Owner "does not offer a competing definition" for the "means for allocating." Prelim. Resp. 9.

We agree with Petitioner's contentions that the "means for allocating" recited in claim 18 should be construed according to 35 U.S.C. § 112, sixth paragraph. *See Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348 (Fed. Cir. 2015) (en banc) ("[T]he use of the word 'means' in a claim element creates a rebuttable presumption that § 112, para. 6 applies."). We further agree that a computer programmed to perform the recited function is included as part of the corresponding structure for the "means," and, thus, agree that the corresponding structure includes software (i.e., an algorithm). For purposes of this discussion, we focus on the recited function "allocating respective time slots in an uplink channel to the plurality of respective secondary stations to transmit respective requests for services to the primary station." Petitioner argues that the corresponding structure for the algorithm for this claimed function is found at "3:25–32, 36–41." Pet. 12. Column 3, lines 25 to 41, of the '079 patent Specification is reproduced as follows:

> The uplink channel 124 is divided into a succession of frames 202, each of length 10 ms, and *each MS 110 registered with the BS 100 is allocated a time slot 204 in each frame in which it can transmit a request for service.* Although only *ten time slots 204* are shown in each frame 202, in practice *there may be many more per frame.*

> Although it is anticipated that a single dedicated uplink channel 124 will provide sufficient capacity in normal situations, it is possible for there to be more mobile stations 110 registered with a BS 100 than there are available time slots in each frame. In such circumstances the BS 100 can either make another uplink channel 124 available for fast signaling purposes or increase the capacity of the existing channel by not allocating a time slot for every MS 110 in every frame.

Ex. 1001, 3:25–41 (emphasis added).

Petitioner fails to explain how the above passage is representative of an algorithm used by the primary station's microcontroller 102 to perform the recited function. The above passage, at most, describes the function recited in the "means for allocating" phrase, by describing that each MS 110 registered with the BS 100 is allocated a time slot 204 in each frame for transmitting a request for service. There is no description of how the microcontroller allocates the time slot(s), i.e., which steps the computer uses to perform the "allocating" function. Importantly, Petitioner argues that claim 18 should be interpreted such that it is a computer that does the allocating of respective time slots to the plurality of respective secondary stations to transmit respective requests for services to the primary station. Pet. 11. To us, that would necessarily include some algorithm for performing the function, which is absent from the above passage.

In sum, the corresponding structure for the "means for allocating" includes software with no sufficiently described algorithm for the software. It is well established that "the corresponding structure for a § 112 ¶ 6 claim for a computer-implemented function is the algorithm disclosed in the specification." *Aristocrat Techs. Austl. Pty Ltd. vs. Int'l Game Tech.*, 521 F.3d 1328, 1333 (Fed. Cir. 2008) (quoting *Harris Corp. v. Ericsson Inc.*, 417 F.3d 1241, 1249 (Fed. Cir. 2005)). Petitioner's proposed structure includes

software, but "[s]imply reciting 'software' without providing some detail about the means to accomplish the function is not enough." *Finisar Corp. v. DirecTV Grp., Inc.*, 523 F.3d 1323, 1340–41 (Fed. Cir. 2008); *see also Blackboard, Inc. v. Desire2Learn*, 574 F.3d 1371, 1382 (Fed. Cir. 2009) (holding disclosed "access control manager" insufficient structure to perform "means for assigning access to and control of the data"). Petitioner fails to direct us to any description, whether in prose, flow chart, or any other manner, that provides sufficient structure for allocating as claimed. *See Finisar*, 523 F.3d at 1340. Nor is it enough that a hypothetical person of ordinary skill in the art would know how to design software for allocating time slots as claimed. *See Blackboard*, 574 F.3d at 1385–86. Some type of algorithm would be required to complete the function of allocating time slots to the plurality of secondary stations, but Petitioner has not identified sufficiently such an algorithm in the Specification.

For these reasons, Petitioner has not sufficiently identified a structure (e.g., algorithm) corresponding to the function "for allocating respective time slots in an uplink channel to the plurality of respective secondary stations to transmit respective requests for services to the primary station to establish required services" recited in claim 18 as required for such a computer-implemented function.

For purposes of this decision, we need not expressly construe any other claim term at this time. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (holding that "only those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy"); *see also Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Matal*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs.* in the context of an *inter partes* review).

B. Principles of Law

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter 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. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art;[7] and (4) when in evidence, objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

C. Asserted Obviousness of Claims 17 and 18 over Wolfe, Bousquet, and Patsiokas, and over Wolfe, Bousquet, Everett, and Patsiokas

Petitioner contends claims 17 and 18 are unpatentable under 35 U.S.C. § 103(a) as obvious over (1) Wolfe, Bousquet, and Patsiokas, and (2) Wolfe, Bousquet, Everett, and Patsiokas. Pet. 16–78. In support of its showing, Petitioner relies upon the declaration of Dr. Steffes. *Id.* (citing Ex. 1003).

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[7] Relying on the testimony of Dr. Paul G. Steffes, Petitioner offers an assessment as to the level of skill in the art at the time of the '079 patent. Pet. 7–8 (citing Ex. 1003 ¶¶ 31–32). At this time, Patent Owner does not propose an alternative assessment. Prelim. Resp. 7. To the extent necessary, and for purposes of this Decision, we accept the assessment offered by Petitioner as it is consistent with the '079 patent and the asserted prior art.

1. Wolfe

Wolfe describes a method of frame management in a time division multiple access (TDMA) communication system in which a fixed time frame is divided into segments that are assigned to separate stations. Ex. 1005, 4:47–51. Each station is responsible for the management of its own segment. *Id.* at 4:51–52. The frame is further provided with an overflow area. *Id.* at 4:52–53. Whenever a station overflows the capacity of its own assigned segment, a request is made to a central station to assign a small slot in the overflow area to that station. *Id.* at 4:53–56. The control of the slot reverts to the central station when its use by the station terminates. *Id.* at 4:56–57.

An example format of a frame of a TDMA system is illustrated in Figure 3 reproduced below.

FIG. 3

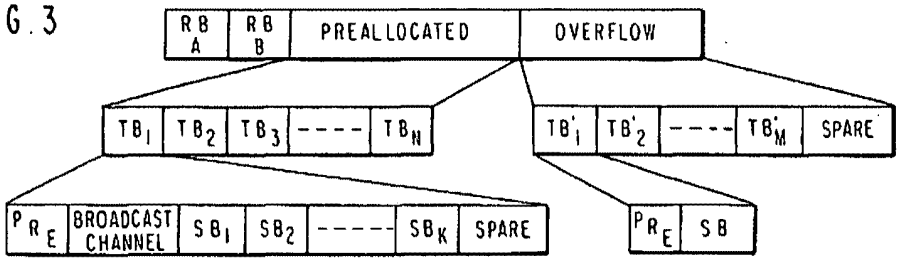

Figure 3 is a timing diagram illustrating a format for a TDMA frame. *Id.* at 5:16–17. The frame begins with two reference bursts RB_a and RB_b, which are separately assigned to each of two reference stations. *Id.* at 5:17–20. A preallocated segment is subdivided into traffic bursts $TB_1 - TB_N$, where each of the traffic bursts are assigned to one of N ground stations 10. *Id.* at 5:35–36. The TDMA frame also includes an overflow area that is divided into overflow slots, where each of the overflow slots is assigned to one of traffic bursts $TB'_1 - TB'_M$, and where unused slots represent spare overflow capacity. *Id.* at 6:1–4.

2. Bousquet

Bousquet describes a shared resource transmission system that is used to set up transmission between a calling station and a called station. Ex. 1006, 1:7–9. The system entails a calling station sending data packets using a resource shared with other stations, where the data packets are access packets for setting up a call between a calling station and a called station. *Id.* at 1:18–21. The various stations share the resource without any prior reservation of time slots and without any temporal synchronization of the stations. *Id.* at 1:22–24. Because there is no reservation, collisions can occur between access packets sent by different stations. *Id.* at 1:24–26. To limit call set-up time and the probability of collision of access packets transmitted by a station, each station requiring to set up a call transmits at least two access packets without waiting for an acknowledgment between sending the access packets. *Id.* at 2:49–54. More specifically, the same access packet is sent n times (n>1) in a given time period whether an acknowledgment message is received from the station to which these packets are sent or not. *Id.* at 2:54–57. The systematic repetition of the access packets in the predefined time period therefore increases the probability that at least one of the packets will reach the destination station, which reduces the time necessary to set up a call. *Id.* at 3:53–56.

3. Patsiokas

Patsiokas describes a method and apparatus whereby a communication unit transmits a communication channel request and the nearest base site makes the communication channel grant. Ex. 1007, 4:11–14. A base site receives the channel request signal, measures the received signal strength (RSS or RSSI) level of the received signal, and if that level is above a first threshold level, a communication channel is granted to the

requesting unit, thus establishing a communication link. *Id.* at 4:14–18. The first threshold level is a predetermined value of decibels above a maximum sensitivity level of a base site. *Id.* at 6:34–36. Then, the base site maintains the communication link as long as the RSSI level does not drop below a second threshold level that is substantially lower than the first threshold level. *Id.* at 4:18–21. The second threshold level is the maximum sensitivity level of the base site. *Id.* at 6:30–31.

4. Everett

Everett describes a communication system involving Very Small Aperture Terminals (VSATs), where a VSAT includes any form of small terminal system. Ex. 1008, 1.[8] Typically, a VSAT communication system, or VSAT system, comprises a hub earth station, with a larger aperture antenna, controlling a cluster of VSATs, with smaller antennas. *Id.* at 2, 3. The objective of the VSAT system is to provide an end-to-end communication link for a user. *Id.* at 8. An example VSAT system is illustrated in Figure 1.6 reproduced below.

[8] Page citations are to those numbers in the left hand corner of the exhibit.

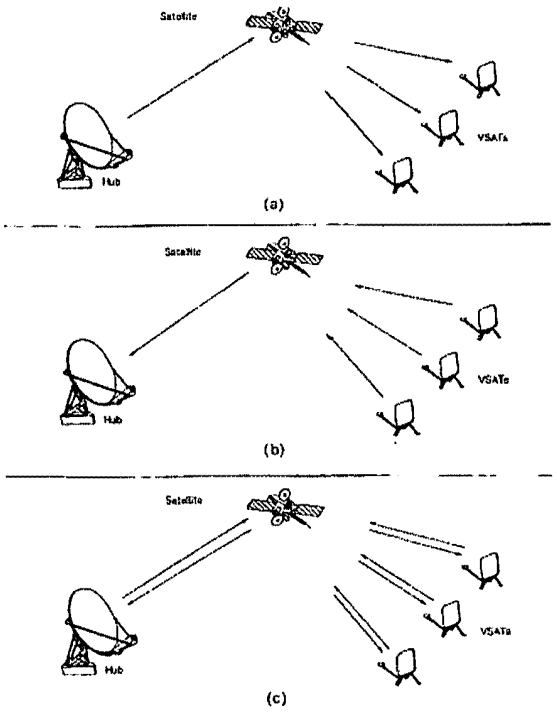

Fig. 1.6 *(a) Data distribution system. (b) Data gathering system. (c) Two-way interactive system.*

Figure 1.6 illustrates three forms of a VSAT system. *Id.* at 11–12. According to Everett, these three forms include: (a) data distribution (involving a one-way communication link); (b) data gathering (also involving a one-way communication link); or (c) interactive (involving a two-way communication link). *Id.* at 11. A typical two-way VSAT system involves a hub in a star configuration transmitting a time division multiplex (TDM) stream to all VSATs in the network. *Id.* at 14. A VSAT with a message for the hub will transmit a short duration burst on a calling channel requesting access to a channel to transmit its message. *Id.* The hub acknowledges the request, assigns a channel and the VSAT changes frequency and transmits its message. *Id.* In a busy network, there will be collisions between some access request bursts and the VSAT may not get an acknowledgment from the hub. *Id.* Under these circumstances, the VSAT retransmits its burst request after a pseudo randomly determined interval and

continues doing so until it receives an acknowledgment and is assigned a channel. *Id.*

Everett further describes an access channel that provides all the signaling information from a VSAT to a hub, where the VSAT can, *inter alia*, request a channel, and where the VSAT can retransmit this request after a pre-determined delay in the event of a collision with another channel request sent by another VSAT. *Id.* at 337–8. Everett further describes a control channel, where the control channel is a signaling channel used by the hub to respond to VSAT requests on the access channel. *Id.* at 338. The control channel has a defined packet structure to allow responses to the VSAT, including, *inter alia*, an acknowledge channel used to send back "clear-to-transmit" messages to the VSAT. *Id.* at 339.

5. Discussion for Claim 17

Petitioner contends that the "Wolfe-Bousquet-Patsiokas" combination renders claim 17 obvious for the reasons described in connection with Petitioner's "Ground 1," but to the extent that Wolfe does not render obvious the proposed construction of "acknowledgment" and re-transmission until an acknowledgment is received, Petitioner argues that Everett in combination with Wolfe, Bousquet, and Patsiokas meets those claimed limitations. Pet. 75. The challenges are otherwise similar. *Id.* at 16–78.

Claim 17 recites a "method of operating a radio communication system, comprising." Petitioner contends that Wolfe describes a satellite communication system in which ground stations 10 and reference station 18 communicate over wireless satellite signals. Pet. 40 (citing Ex. 1005, 1:13–2:9). Petitioner further contends that in Wolfe's system, transmissions between the ground stations and the satellite occur at a radio frequency, and that a person having ordinary skill in the art would have found a satellite

communication system operating at radio frequency to be a radio communication system. *Id.* (citing Ex. 1005, 7:23–28; Ex. 1003 ¶ 85). Petitioner explains that by describing a method of frame management for a satellite communication system operating at radio frequency, Wolf describes a "method of operating of operating a radio communication system." *Id.*

Claim 17 recites "allocating respective time slots in an uplink channel to a plurality of respective secondary stations." Petitioner contends that Wolfe describes a plurality of ground stations 10 (respective secondary stations) where each station is given a portion of a pre-allocated segment of a divided TDMA frame for uplink to satellite 12 (allocating respective time slots in an uplink channel). *Id.* at 41–43 (citing Ex. 1005, 1:13–2:9, 5:6–15, 5:34–46, 8:65–68, Figs. 1, 3; Ex. 1003, ¶¶ 86–87).

Claim 17 recites "transmitting a respective request for services to establish required services from at least one of the plurality of respective secondary stations to a primary station in the respective time slots." Petitioner contends that Wolfe's ground station (secondary station) signals to reference station 18 (primary station) that a channel is required using its preallocated time slot. *Id.* at 43 (citing Ex. 1005, 5:6–15, 6:10–31.) Petitioner further contends that Wolfe's signal from ground station 10 to reference station 18 for additional capacity is a transmitted request for services to establish required services because the channel is required to complete a telephone call. *Id.* at 43–44 (citing Ex. 1005, 6:10–31). Petitioner explains that Wolfe's ground station 10 forwards the received call request to reference station 18 as a connection request for allocation of an additional time slot in the overflow section. *Id.* Petitioner relies on annotated Wolfe Figure 3 to illustrate Wolfe's description of ground stations 10 transmitting a respective request for services to establish required

services in the respective time slots, which results in reference station 18 allocating to a ground station 10 an overflow slot. *Id.* at 44–45 (citing Ex. 1005, Abstract, 1:8–11, 2:32–38, 4:47–57, 5:6–15, 5:52–58, 6:10–50, 8:6–9, 8:55–68, Fig. 3; Ex. 1003, ¶¶88–92).

Claim 17 recites "wherein the at least one of the plurality of respective secondary stations re-transmits the same respective request in consecutive allocated time slots without waiting for an acknowledgement until said acknowledgement is received from the primary station." Petitioner contends that Wolfe describes that reference station 18 (primary station) sends a transmission to a requesting ground station 10 (secondary station) that states receipt of the request and indicates whether an allocation is being made, meeting Petitioner's proposed construction for "acknowledgment." *Id.* at 46–47 (citing Ex. 1005, 6:23–36). Petitioner further contends that Wolfe describes that if a request is denied and the primary station will not make an allocation, the primary station only transmits an acknowledgment that the request has been received and an allocation is not being made. *Id.* Petitioner contends that a person having ordinary skill in the art would have found Wolfe's description at column six, lines twenty-three to thirty-one to render obvious transmission of an acknowledgment, which is separate from transmissions related to Wolfe's making the allocation. *Id.* at 46–47 (citing Ex. 1005, 6:23–36; Ex. 1003 ¶ 94).

Petitioner further asserts that a person having ordinary skill in the art would have found re-transmission obvious based on typical acknowledgement processing in telecommunication systems. *Id.* at 47 (citing Ex. 1003 ¶ 95). Petitioner further contends that to the extent that Wolfe does not disclose that the primary station's transmission is an acknowledgment of a request, a person having ordinary skill in the art would

have found it obvious that Wolfe's secondary station re-transmits the request until an acknowledgment is received. *Id.* (citing Ex. 1005, 6:23–26; Ex. 1003 ¶ 95).

Dr. Steffes, relying on Everett to support his assertions, testifies that a person having ordinary skill in the art would have found use of acknowledgments and re-transmission to have been obvious in light of Wolfe's disclosure and knowledge of satellite communication systems. *Id.* at 48 (citing Ex. 1003 ¶ 96; Ex. 1008, 317–318, Fig. 17.7). For example, Dr. Steffes opines that Everett teaches that a secondary station in a satellite communication system will not receive an acknowledgement from the primary station if the data is lost during transmission. Ex. 1003 ¶ 96 (citing Ex. 1008, 317–318, Fig. 17.7). Dr. Steffes further opines that under such scenario, the secondary station, having not received an acknowledgement, will re-transmit data until the secondary station receives an acknowledgment. *Id.* Alternatively, Petitioner relies on Everett to meet Petitioner's proposed construction of "acknowledgment" and re-transmission until an acknowledgment is received. Pet. 75.

Petitioner further contends that Bousquet performs re-transmission of the same request and does so without waiting for an acknowledgment. *Id.* at 48–49 (citing Ex. 1006, 2:48–60, 3:53–56; Ex. 1003 ¶ 97). According to Bousquet, re-transmission "is done within a time period less than that required for a round trip of a packet between the calling station and the called station." Ex. 1006, 2:57–59. Bousquet further describes "systematic repetition of the access packets in the predefined time period therefore increases the probability that at least one of these packets will reach the destination station, which reduces the time necessary to set up a call." *Id.* at 3:53–56. Petitioner contends a person having ordinary skill in the art would

have understood that Bousquet's technique to be applicable to Wolfe's TDMA system and that altering Wolfe to implement Bousquet's technique to continue re-transmission in consecutive time slots would have been obvious. Pet. 50 (citing Ex. 1005, 1:13–15; Ex. 1006, 2:25–28, 3:57–64; Ex. 1003 ¶ 99). For example, Petitioner explains, with supporting evidence, that since time slots in Wolfe are allocated at time intervals shorter than the round-trip delay, sending multiple requests (e.g., re-transmit the same request in consecutive time slots without waiting for an acknowledgment) would increase the probability that at least one request will be received and reduce the time for call set-up as taught by Bousquet. Pet. 50 (citing Ex. 1005, 1:45–47, 3:68–4:4); *see also* Ex. 1003 ¶¶ 65, 66, 97–100. Petitioner sets forth reasoning with rational underpinning as to why a person having ordinary skill in the art would have combined the teachings of Wolfe and Bousquet and Wolfe, Bousquet, and Everett. *Id.* at 25–35, 49–53, 76–78 (citing multiple passages from Ex. 1003, Ex. 1005, Ex. 1006, and Ex. 1008).

Patent Owner argues that none of Wolfe, Everett, or Bousquet describes "wherein the at least one of the plurality of respective secondary stations re-transmits the same respective request in consecutive allocated time slots without waiting for an acknowledgement until said acknowledgement is received from the primary station." Prelim. Resp. 10–14. Patent Owner's arguments attacking each reference individually are unpersuasive, because the challenge is based on the combined teachings of Wolfe, Everett, and Bousquet as set forth in the Petition. *See In re Keller*, 642 F.2d 413, 426 (CCPA 1981) ("[O]ne cannot show non-obviousness by attacking references individually where, as here, the rejections are based on combinations of references."). For instance, Patent Owner argues that "because Bousquet limits its 'repetition' to 'in the predefined time period,'

Bousquet cannot and does not disclose" the claimed re-transmission of "the same respective request in consecutive allocated time slots without waiting for an acknowledgement *until* said acknowledgement is received from the primary station." Prelim. Resp. 12. Patent Owner's argument is not responsive to Petitioner's showing, which also relies on, for example, the knowledge of a person having ordinary skill in the art as exemplified by Everett. As stated above, Dr. Steffes opines that Everett teaches that a secondary station in a satellite communication system will not receive an acknowledgement from the primary station if the data is lost during transmission. Ex. 1003 ¶ 96 (citing Ex. 1008, 317–318, Fig. 17.7); *see also* Ex. 1003 ¶ 143. Dr. Steffes further opines that under such scenario, the secondary station, having not received an acknowledgement, will re-transmit data until the secondary station receives an acknowledgment. *Id.* Thus, Petitioner does not rely on Bousquet to teach re-transmission "until said acknowledgement is received." That teaching comes, for example, from the knowledge that a person of ordinary skill in the art would have had at the time of the invention, as evidenced by Everett. Accordingly, Patent Owner's attacks on each reference for failing to describe the disputed limitation is misplaced, as Petitioner relies on the combined teachings of the references in addressing the disputed limitation.

Patent Owner argues that none of the references alone or in combination discloses the claimed re-transmission of "the same respective request in consecutive allocated time slots." Prelim. Resp. 10–11, 14–16. Patent Owner's arguments, however, overlook and do not address Petitioner's showing on how the combined prior art teaches or suggests the limitation. To that end, we disagree with Patent Owner that Dr. Steffes' testimony is conclusory and entitled to no weight. Rather, Petitioner

explains, with supporting evidence, that since time slots in Wolfe are allocated at time intervals shorter than the round-trip delay, sending multiple requests (e.g., re-transmit the same request in consecutive time slots without waiting for an acknowledgment) would increase the probability that at least one request will be received and reduce the time for call set-up as taught by Bousquet. Pet. 50 (citing Ex. 1005, 1:45–47, 3:68–4:4); *see also* Ex. 1003 ¶¶ 65, 66, 97–100. Petitioner sets forth reasoning with rational underpinning as to why a person having ordinary skill in the art would have combined the teachings of Wolfe and Bousquet. *Id.* at 25–35, 49–53 (citing multiple passages from Ex. 1005, Ex. 1006, and Ex. 1003). Patent Owner fails to address Petitioner's showing in that regard.

Claim 17 recites "wherein the primary station determines whether a request for services has been transmitted by the at least one of the plurality of respective secondary stations by determining whether a signal strength of the respective transmitted request of the at least one of the plurality of respective secondary stations exceeds a threshold value." Petitioner contends that Patsiokas' description of "the base site detects channel request signals having an RSSI level at or above a first threshold" before granting a communication link in combination with Wolfe, meets the above identified claim. Pet. 53–55 (citing Ex. 1007, 2:11–21, 4:27–5:3, Fig. 3; Ex. 1003 ¶ 110). Petitioner sets forth reasoning with rational underpinning as to why a person having ordinary skill in the art would have combined the teachings of Wolfe and Patsiokas. *Id.* at 55–57 (citing multiple passages from Ex. 1005, Ex. 1007, and Ex. 1003).

Patent Owner argues that Patsiokas addresses a shortcoming in cordless radio telephone systems that is not identified or present in the satellite systems of Wolfe, Bousquet, and Everett, and therefore, a person

having ordinary skill in the art would not have been motivated to make the proposed combinations with Patsiokas. Prelim. Resp. 16–21.

Petitioner explains, with supporting evidence, that like Wolfe's system, Patsiokas' system employs *a channel acquisition method* and includes a primary station with an ability to independently detect a request for a service as well as allocate a channel to a plurality of secondary stations. Pet. 55 (citing Ex. 1007, 1:36–2:1, Fig. 3; Ex. 1005, 5:20–21. Petitioner further contends that it would have been obvious to a person having ordinary skill in the art to look at other communication systems having similar functions. *Id.* (citing Ex. 1003 ¶ 111). Moreover, Petitioner explains that a person having ordinary skill in the art would have understood that signal detectability in a satellite system can fluctuate due to weather and interference issues, and incorporating Patsiokas' "signal threshold method" would have been desirable in order to mitigate signal detection issues. *Id.* (citing Ex. 1003 ¶ 111). Patent Owner's attorney arguments that a person having ordinary skill in the art would not have been motivated to make the proposed combinations with Patsiokas do not take into account or address Petitioner's assertions.

Based on the current record before us, we are persuaded by Petitioner's showing that the asserted prior art references teach or suggest each limitation of claim 17 and that a person of ordinary skill in the art would have had reason with rational underpinning, to combine the references in the manner Petitioner proposes. Pet. 16–78. Accordingly, we determine the information presented shows a reasonable likelihood that Petitioner would prevail in establishing that claim 17 is unpatentable under § 103 as obvious over Wolfe, Bousquet, and Patsiokas, and over Wolfe, Bousquet, Everett, and Patsiokas.

6. Discussion for Claim 18

Independent claim 18 recites that the primary station has "means for allocating respective time slots in an uplink channel to the plurality of respective secondary stations to transmit respective requests for services to the primary station to establish required services." As discussed above, this is a means-plus-function element under 35 U.S.C. § 112, sixth paragraph.

For this element, Petitioner does not sufficiently "identify the specific portions of the specification that describe the structure, material, or acts corresponding to each claimed function," as required by our Rules (37 C.F.R. § 42.104(b)), to enable us to determine if the asserted prior art teaches such structure. Accordingly, Petitioner's contentions are inadequate for the alleged obviousness of claim 18 over Wolfe, Bousquet, and Patsiokas and over Wolfe, Bousquet, Everett, and Patsiokas. Despite this deficiency, we include these challenges to claim 18 in the instituted trial. *See BioDelivery Sci. Int'l, Inc. v. Aquestive Therapeutics, Inc.*, 898 F.3d 1205, 1209 (holding that *SAS Institute, Inc. v. Iancu*, 138 S. Ct. 1348 (2018), "requires institution on all challenged claims and all challenged grounds").

D. Redundant Challenges

Patent Owner contends Petitioner redundantly challenges claims 17 and 18 of the '079 patent without providing any alleged justification for such inefficient redundancies. Prelim. Resp. 4–6. Patent Owner argues, for example, that if one of the two grounds is better than the other, then we should only consider the stronger ground and not burden the Patent Owner and the Board with the weaker ground. *Id.* at 5. We are unpersuaded by such arguments, because Patent Owner fails to address *SAS Inst., Inc. v. Iancu,* 138 S. Ct. 1348 (2018), the subsequent "Guidance on the Impact of

SAS on AIA Trial Proceedings," issued by the Office, April 26, 2018 ("Office Guidance"), or any of the United States for the Federal Circuit cases remanding back to the Board to institute review on all *grounds*. *See, e.g., Biodelivery Scis. Int'l v. Aquestive Therapeutics, Inc.*, 898 F.3d 1205 (Fed. Cir. 2018).

E. Constitutional Challenge to Inter Partes Review

Patent Owner contends, in a pending appeal to the Federal Circuit, *Polaris Innovations Ltd. v. Kingston Technology*, the patent owner Polaris argued that the Board's appointments of administrative patent judges is unconstitutional, and that their decisions must be set aside. Prelim. Resp. 21. "Patent Owner . . . adopts this constitutional challenge . . . to ensure the issue is preserved pending the appeal." *Id.*

The Board previously has declined to consider constitutional challenges because "generally, 'administrative agencies do not have jurisdiction to decide the constitutionality of congressional enactments.'" *Square Inc. v. Unwired Planet LLC*, Case IPR2014-01165, slip op. at 25 (PTAB Oct. 30, 2015) (Paper 32) (quoting *Riggin v. Office of Senate Fair Emp't Practices*, 61 F.3d 1563, 1569 (Fed. Cir. 1995)). We likewise decline to consider the merits of Patent Owner's constitutional challenge.

III. CONCLUSION

For the foregoing reasons, we determine that the information presented establishes a reasonable likelihood that Petitioner would prevail in showing that at least one of claims 17 and 18 of the '079 patent are unpatentable under 35 U.S.C. § 103(a).

IV. ORDER

Accordingly, it is:

ORDERED that pursuant to 35 U.S.C. § 314(a), an *inter partes* review is hereby instituted as to claims 17 and 18 of the '079 patent on the grounds set forth in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial; the trial will commence on the entry date of this decision.

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/455,124	12/06/1999	BERNARD HUNT	PHB-34.306

CONFIRMATION NO. 4674

POWER OF ATTORNEY NOTICE

96051
Uniloc USA Inc.
102 N. College Avenue
Suite 303
Tyler, TX 75702

OC000000109329279

Date Mailed: 07/02/2019

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 06/24/2019.

- 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**.

/deelliott/

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/455,124	12/06/1999	BERNARD HUNT	UN-NP-WT-573

CONFIRMATION NO. 4674

POA ACCEPTANCE LETTER

96051
Uniloc USA Inc.
102 N. College Avenue
Suite 303
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Date Mailed: 07/02/2019

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 06/24/2019.

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**.

/deelliott/

PTO/SB/123 (04-15)
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CHANGE OF CORRESPONDENCE ADDRESS
Patent

Address to:
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Alexandria, VA 22313-1450

Patent Number	6,868,079
Issue Date	3/15/2005
Application Number	09/455,124
Filing Date	12/6/1999
First Named Inventor	Bernard HUNT
Attorney Docket Number	UN-NP-WT-573

Please change the Correspondence Address for the above-identified patent to:

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I am the:

[ ] Patentee.

[ ] Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

[X] Attorney or agent of record. Registration Number 51,513.

Signature

Typed or Printed Name Sean D. Burdick

Date October 1, 2018 | Telephone 972-905-9580 x227

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

[ ] *Total of _____ forms are submitted.

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

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

PTO/SB/81A (12-08)
Approved for use through 01/31/2018. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PATENT - POWER OF ATTORNEY OR REVOCATION OF POWER OF ATTORNEY WITH A NEW POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS

Patent Number	6,868,079
Issue Date	3/15/2005
First Named Inventor	Bernard HUNT
Title	RADIO COMMUNICATION SYSTEM WITH REQUEST RE-TRANSMISSION UNTIL ACKNOWLEDGED
Attorney Docket No	UN-NP-WT-573

I hereby revoke all previous powers of attorney given in the above-identified patent.

☐ 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) with respect to the patent identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

96051

OR

☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s) with respect to the patent identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

Practitioner(s) Name	Registration Number

Please recognize or change the correspondence address for the above-identified patent to:

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☐ Firm or Individual Name					
Address					
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Country					
Telephone		Email			

I am the:

☐ Inventor, having ownership of the patent.

OR

☒ Patent owner.

Statement under 37 CFR 3.73(b) (Form PTO/SB/96) submitted herewith or filed on _____

SIGNATURE of Inventor or Patent Owner

Signature		Date	October 1, 2018
Name	Clay Stchegoyen	Telephone	
Title and Company	CEO of Uniloc 2017 LLC		

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.

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

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

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

STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Uniloc 2017 LLC

Application No./Patent No.: 6,868,079 Filed/Issue Date: 3/15/2005

Titled: RADIO COMMUNICATION SYSTEM WITH REQUEST RE-TRANSMISSION UNTIL ACKNOWLEDGED

Uniloc 2017 LLC, a corporation

(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. [X] 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. [X] A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: HUNT, BERNARD To: U.S. PHILIPS CORPORATION

   The document was recorded in the United States Patent and Trademark Office at

   Reel 010450, Frame 0643, or for which a copy thereof is attached.

2. From: U.S. PHILIPS CORPORATION To: KONINKLIJKE PHILIPS ELECTRONICS N.V.

   The document was recorded in the United States Patent and Trademark Office at

   Reel 016227, Frame 0340, or for which a copy thereof is attached.

STATEMENT UNDER 37 CFR 3.73(c)

3. From: KONINKLIJKE PHILIPS ELECTRONICS N.V. To: IPG ELECTRONICS 503 LIMITED

The document was recorded in the United States Patent and Trademark Office at
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4. From: IPG ELECTRONICS 503 LIMITED To: PENDRAGON WIRELESS LLC

The document was recorded in the United States Patent and Trademark Office at
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5. From: PENDRAGON WIRELESS LLC To: UNILOC LUXEMBOURG S.A.

The document was recorded in the United States Patent and Trademark Office at
Reel 045338, Frame 0601, or for which a copy thereof is attached.

6. From: UNILOC LUXEMBOURG S.A. To: UNILOC 2017 LLC

The document was recorded in the United States Patent and Trademark Office at
Reel 046532, Frame 0088, 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.

Signature	October 1, 2018 Date
Sean D. Burdick Printed or Typed Name	51,513 Title or Registration Number

Privacy Act Statement

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

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

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

Electronic Acknowledgement Receipt

EFS ID:	36396193
Application Number:	09455124
International Application Number:	
Confirmation Number:	4674
Title of Invention:	RADIO COMMUNICATION SYSTEM WITH REQUEST RE-TRANSMISSION UNTIL ACKNOWLEDGED
First Named Inventor/Applicant Name:	BERNARD HUNT
Customer Number:	24737
Filer:	Sean Dylan Burdick/Kristina Pangan
Filer Authorized By:	Sean Dylan Burdick
Attorney Docket Number:	PHB-34.306
Receipt Date:	24-JUN-2019
Filing Date:	06-DEC-1999
Time Stamp:	21:08:19
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Change of Address	WT-573_Change_of_Address.pdf	150159 ada7f5f459d7e75427696418ebba311f0cc3eb3c	no	2

Warnings:

Information:					
2	Power of Attorney	WT-573_POA.pdf	352634 a695f58a4b9c9b5f8d1472066477c4643949ed49	no	2
Warnings:					
Information:					
3	Assignee showing of ownership per 37 CFR 3.73	WT-573_Statement.pdf	314921 7e54aa54a20eb7aee991fadec4a0524a8f32ba78	no	3
Warnings:					
Information:					
			Total Files Size (in bytes):	817714	

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

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

SOL

AO 120 (Rev. 08/10)

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

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Eastern District of Texas, Marshall Division on the following ☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2:18-cv-00304	7/23/2018	Eastern District of Texas, Marshall Division

PLAINTIFF	DEFENDANT
UNILOC USA, INC. and UNILOC 2017, LLC	ZTE (USA), INC. and ZTE (TX), INC.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	6,868,079	3/15/2005	Uniloc 2017, LLC
2			
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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

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

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

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

AO 120 (Rev. 08/10)

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

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

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

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
3:18-cv-2835-N	7/23/2018	Northern District of Texas, Dallas Division

PLAINTIFF	DEFENDANT
Uniloc USA Inc, Uniloc 2017 LLC, Uniloc Licensing USA LLC	ZTE (USA) Inc, ZTE (TX) Inc

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	6,868,079	3/15/2005	Uniloc 2017, LLC
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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

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

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE
Karen Mitchell	s/K. Cheng	10/24/2018

Copy 1—Upon initiation of action, mail this copy to Director **Copy 3—Upon termination of action, mail this copy to Director**
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AO 120 (Rev. 08/10)

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

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

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

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2:18-cv-00075	3/13/2018	Eastern District of Texas, Marshall Division

PLAINTIFF	DEFENDANT
UNILOC USA, INC. and UNILOC LUXEMBOURG, S.A.	HUAWEI DEVICE USA, INC. and HUAWEI DEVICE CO. LTD.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	6,868,079	3/15/2005	Uniloc Luxembourg, S.A.
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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

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

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AO 120 (Rev. 08/10)

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

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Eastern District of Texas, Marshall Division on the following ☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2:18-cv-00042	2/26/2017	Eastern District of Texas, Marshall Division

PLAINTIFF	DEFENDANT
UNILOC USA, INC. and UNILOC LUXEMBOURG, S.A.	SAMSUNG ELECTRONICS AMERICA, INC. and SAMSUNG ELECTRONICS, CO. LTD.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	6,868,079	3/15/2005	Uniloc Luxembourg, S.A.
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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

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

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

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Copy 2—Upon filing document adding patent(s), mail this copy to Director **Copy 4—Case file copy**

AO 120 (Rev. 08/10)

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

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

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

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2:18-cv-00304	7/23/2018	Eastern District of Texas, Marshall Division

PLAINTIFF	DEFENDANT
UNILOC USA, INC. and UNILOC 2017, LLC	ZTE (USA), INC. and ZTE (TX), INC.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	6,868,079	3/15/2005	Uniloc 2017, LLC
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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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DECISION/JUDGEMENT

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Copy 2—Upon filing document adding patent(s), mail this copy to Director **Copy 4—Case file copy**

AO 120 (Rev. 08/10)

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

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

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

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
3:18-cv-01883-S	7/23/2018	Northern District of Texas, Dallas Division

PLAINTIFF	DEFENDANT
Uniloc USA Inc et al	Blackberry Corporation

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	6,868,079	3/15/2005	Uniloc 2017 LLC
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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

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

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE
Karen Mitchell	s/S. Shelby	7/23/2018

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

AO 120 (Rev. 08/10)

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

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

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

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2:18-cv-00075	3/13/2018	Eastern District of Texas, Marshall Division

PLAINTIFF	DEFENDANT
UNILOC USA, INC. and UNILOC LUXEMBOURG, S.A.	HUAWEI DEVICE USA, INC. and HUAWEI DEVICE CO. LTD.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	6,868,079	3/15/2005	Uniloc Luxembourg, S.A.
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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

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

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

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

AO 120 (Rev. 08/10)

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

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

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

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2:18-cv-00042	2/26/2017	Eastern District of Texas, Marshall Division

PLAINTIFF	DEFENDANT
UNILOC USA, INC. and UNILOC LUXEMBOURG, S.A.	SAMSUNG ELECTRONICS AMERICA, INC. and SAMSUNG ELECTRONICS, CO. LTD.

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

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

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

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

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (703) 746-4000

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

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

24737 7590 11/05/2004

PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

02/08/2005 SSITHIB2 00000128 141270 09455124

01 FC:1501 1400.00 DA

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

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the Un States Postal Service with sufficient postage for first class mail in an envel addressed to the Mail Stop ISSUE FEE address above, or being facsim transmitted to the USPTO (703) 746-4000, on the date indicated below.

Natale A. Manzo	(Depositor's na
Natale A Manzo	(Signat
February 2, 2005	(D

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/455,124	12/06/1999	BERNARD HUNT	PHB-34.306	4674

TITLE OF INVENTION: RADIO COMMUNICATION SYSTEM WITH REQUEST RE-TRANSMISSION UNTIL ACKNOWLEDGED

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1370	$0	$1370	02/07/2005

EXAMINER	ART UNIT	CLASS-SUBCLASS
GANTT, ALAN T	2684	370-345000

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

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

1 Dicran Halajian
2
3

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

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

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

KONINKLIJKE PHILIPS ELECTRONIC N.V. EINDHOVEN, THE NETHERLANDS

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

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

4b. Payment of Fee(s):
- ☐ A check in the amount of the fee(s) is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☒ The Director is hereby authorized by charge the required fee(s), or credit any overpayment Deposit Account Number 14-1270 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.
- ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above. NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other part interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature Dicran Halajian Date 2/2/05

Typed or printed name Dicran Halajian Registration No. 39,703

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to proc an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, 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 comp 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 Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 14 Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

UNITED STATES PATENT AND TRADEMARK OFFICE

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

NOTICE OF ALLOWANCE AND FEE(S) DUE

24737 7590 11/05/2004

PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

EXAMINER	
GANTT, ALAN T	
ART UNIT	PAPER NUMBER
2684	

DATE MAILED: 11/05/2004

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/455,124	12/06/1999	BERNARD HUNT	PHB-34.306	4674

TITLE OF INVENTION: RADIO COMMUNICATION SYSTEM WITH REQUEST RE-TRANSMISSION UNTIL ACKNOWLEDGED

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1370	$0	$1370	02/07/2005

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

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM TH MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. TH STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOV REFLECTS A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE APPLIED IN THIS APPLICATION. THE PTOL-85B (O AN EQUIVALENT) MUST BE RETURNED WITHIN THIS PERIOD EVEN IF NO FEE IS DUE OR THE APPLICATION WIL BE REGARDED AS ABANDONED.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is n claiming SMALL ENTITY status, check box 5a on Part B - Fee Transmittal and pay the PUBLICATION FEE (if required) and 1 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL should be completed and returned to the United States Patent and Trademark Office (USPTO) w your ISSUE FEE and PUBLICATION FEE (if required). Even if the fee(s) have already been paid, Part B - Fee(s) Transmittal should completed and returned. If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should completed and an extra copy of the form should be submitted.

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

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

PART B - FEE(S) TRANSMITTAL

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

or Fax **(703) 746-4000**

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

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

24737 7590 11/05/2004

PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

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

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the Un States Postal Service with sufficient postage for first class mail in an envel addressed to the Mail Stop ISSUE FEE address above, or being facsim transmitted to the USPTO (703) 746-4000, on the date indicated below.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/455,124	12/06/1999	BERNARD HUNT	PHB-34.306	4674

TITLE OF INVENTION: RADIO COMMUNICATION SYSTEM WITH REQUEST RE-TRANSMISSION UNTIL ACKNOWLEDGED

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1370	$0	$1370	02/07/2005

EXAMINER	ART UNIT	CLASS-SUBCLASS
GANTT, ALAN T	2684	370-345000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

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

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

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

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

4a. The following fee(s) are enclosed:

☐ Issue Fee

☐ Publication Fee (No small entity discount permitted)

☐ Advance Order - # of Copies _____

4b. Payment of Fee(s):

☐ A check in the amount of the fee(s) is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director is hereby authorized by charge the required fee(s), or credit any overpayment Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above. NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other part interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to proc an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, 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 comp 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 Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 14 Alexandria, Virginia 22313-1450.

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UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/455,124	12/06/1999	BERNARD HUNT	PHB-34.306	4674

24737 7590 11/05/2004

PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

EXAMINER	
GANTT, ALAN T	

ART UNIT	PAPER NUMBER
2684	

DATE MAILED: 11/05/2004

Determination of Patent Term Extension under 35 U.S.C. 154 (b)
(application filed after June 7, 1995 but prior to May 29, 2000)

The Patent Term Extension is 0 day(s). Any patent to issue from the above-identified application will include indication of the 0 day extension on the front page.

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

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

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office Patent Legal Administration at (703) 305-1383. Questions relating to issue and publication fee payments should directed to the Customer Service Center of the Office of Patent Publication at (703) 305-8283.

Notice of Allowability	Application No.	Applicant(s)	
	09/455,124	HUNT, BERNARD	
	Examiner	Art Unit	
	Alan T. Gantt	2684	

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

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

1. ☒ This communication is responsive to *7/20/04*.

2. ☒ The allowed claim(s) is/are *1,3-6,9,10,14,15 and 19-27*.

3. ☒ The drawings filed on *12/6/99* are accepted by the Examiner.

4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All b) ☐ Some* c) ☐ None of the:
      1. ☒ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

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

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 7/20/04 have been fully considered and are deemed persuasive. Applicant has incorporated material previously indicated as allowable subject matter.

Allowable Subject Matter

Claims 1, 3-6, 9, 10, 14, 15, and 19-27 are allowed.

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

Regarding claims 1, 6, and 9, a method of operating a radio communication system where the primary station determines whether a request for service has been transmitted by a secondary station from a combination of the received signals in a plurality of successive time slots allocated to the at least one respective secondary station was neither found, suggested, nor made evident by the prior art.

Regarding claims 14and 15, a method of operating a radio communication system where the primary station determines whether a request for service has been transmitted by a secondary station by determining whether a signal strength of the respective transmitted request exceeds a threshold value was neither found, suggested, nor made evident by the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication from the examiner should be addressed to Alan Gantt at telephone number (703) 305-0077. The examiner can normally be reached between 9:30 AM and 6 PM within the Eastern Time Zone. The group FAX number is (703) 872-9306.

Any inquiry of a general nature or relating to this application should be directed to the group receptionist at telephone number (703) 305-4700.

Alan T. Gantt

Alan T. Gantt

October 15, 2004

NICK CORSARO
PRIMARY EXAMINER

CERTIFICATE OF FACSIMILE TRANSMISSION

TO THE UNITED STATES PATENT AND TRADEMARK OFFICE

(703) 872-9306

I certify that this document consisting of 13 pages is being transmitted via facsimile to the United States Patent and Trademark Office at the telephone number set forth above on July 20, 2004.

By Natale A. Manzo
(Signature) Natale A. Manzo

RESPONSE UNDER 37 CFR 1.116
EXPEDITED PROCEDURE
EXAMINING GROUP 2684

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Please enter amendment

BERNARD HUNT — PHB 34,306

Confirmation No. 4674

Serial No. 09/455,124 — Group Art Unit: 2684

Filed: DECEMBER 6, 1999 — Examiner: ALAN T. GANTT

Title: RADIO COMMUNICATION SYSTEM WITH REQUEST RE-TRANSMISSION UNTIL ACKNOWLEDGED (As Amended)

Commissioner for Patents
Alexandria, VA 22313-1450

AMENDMENT UNDER §1.116

Sir:

In response to the Final Office Action mailed May 7, 2004, please amend the above-identified application as follows:

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

BIBDATASHEET

Bib Data Sheet

CONFIRMATION NO. 4674

SERIAL NUMBER	FILING OR 371(c) DATE / RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
09/455,124	12/06/1999 RULE	370	2684	PHB-34.306

APPLICANTS

BERNARD HUNT, REDHILL, GB, UNITED KINGDOM;

**** CONTINUING DATA **********

**** FOREIGN APPLICATIONS **********

UNITED KINGDOM 9827182.8 12/10/1998

IF REQUIRED, FOREIGN FILING LICENSE GRANTED

** 01/10/2000

Foreign Priority claimed	35 USC 119 (a-d) conditions met	Verified and Acknowledged	STATE OR COUNTRY	SHEETS DRAWING	TOTAL CLAIMS	INDEPENDENT CLAIMS
☑ yes ☐ no	☑ yes ☐ no ☐ Met after Allowance	Examiner's Signature Initials	GB	3	12	4

ADDRESS

24737

TITLE

RADIO COMMUNICATION SYSTEM WITH REQUEST RE-TRANSMISSION UNTIL ACKNOWLEDGED

FILING FEE RECEIVED	FEES: Authority has been given in Paper 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
838		

Issue Classification	Application No.	Applicant(s)	
	09/455,124	HUNT, BERNARD	
	Examiner	Art Unit	
	Alan T. Gantt	2684	

ISSUE CLASSIFICATION

ORIGINAL		CROSS REFERENCE(S)							
CLASS	SUBCLASS	CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)						
370	345	370	328	336	343	347			
INTERNATIONAL CLASSIFICATION		455	434	435.3	457				
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Alan T. Gantt 10/16/04
(Assistant Examiner) (Date)

A Dager 10/21/04
(Legal Instruments Examiner) (Date)

NICK CORSARO
PRIMARY EXAMINER

(Primary Examiner) 10/18/04 (Date)

Total Claims Allowed: 18

O.G. Print Claim(s)	O.G. Print Fig.
1	3

☐ 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	1		31		61		91		121		151		181
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12	9		39		69		99		129		159		189
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15	26		56		86		116		146		176		206
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	29		59		89		119		149		179		209
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ISSUE SLIP STAPLE AREA (for additional cross references)

POSITION	INITIALS	ID NO.	DATE
FEE DETERMINATION	[illegible]	[illegible]	
O.I.P.E. CLASSIFIER		2	12/22/99
FORMALITY REVIEW	[illegible]	[illegible]	1-10-00
RESPONSE FORMALITY REVIEW			

INDEX OF CLAIMS

✔ .... Rejected		N .... Non-elected	
= .... Allowed		I .... Interference	
— (Through numeral)... Canceled		A .... Appeal	
÷ .... Restricted		O .... Objected	

Claim Final	Claim Original	Date 6/15/[illegible]	Date 12/15/0[illegible]	Date 6/14/0[illegible]	Date [illegible]/15/0[illegible]	Date 10/8/03	Date [illegible]	Date	Date	Date	Date
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If more than 150 claims or 10 actions staple additional sheet here

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Search Notes

Application No.	Applicant(s)	
09/455,124	HUNT, BERNARD	
Examiner	**Art Unit**	
Alan T. Gantt	2684	

SEARCHED

Class	Subclass	Date	Examiner
370	328	10/16/04	AG
↓	329	↓	↓
	336		
	337		
	345		
	343		
	230		
370	347		
455	434		
455	451		
455	435.3	10/16/04	AG

INTERFERENCE SEARCHED

Class	Subclass	Date	Examiner
455	434	10/16/04	AG
	435.3	10/16/04	AG
	451	10/16/04	AG

SEARCH NOTES (INCLUDING SEARCH STRATEGY)

	DATE	EXMR
Searched EAST 10/2/04 -	10/2/04 - 10/16/04	AG

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By Natale A. Manzo
(Signature) Natale A. Manzo

RESPONSE UNDER 37 CFR 1.116
EXPEDITED PROCEDURE
EXAMINING GROUP 2684

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BERNARD HUNT — PHB 34,306

Confirmation No. 4674

Serial No. 09/455,124 — Group Art Unit: 2684

Filed: DECEMBER 6, 1999 — Examiner: ALAN T. GANTT

Title: RADIO COMMUNICATION SYSTEM WITH REQUEST RE-TRANSMISSION UNTIL ACKNOWLEDGED (As Amended)

Commissioner for Patents
Alexandria, VA 22313-1450

AMENDMENT UNDER §1.116

Sir:

In response to the Final Office Action mailed May 7, 2004, please amend the above-identified application as follows:

IN THE CLAIMS

Please cancel claim 2 without prejudice, and amend claims 1, 3, 6, 9 and 14-15 as follows:

1. (Currently amended) A method of operating a radio communication system, comprising:

allocating respective time slots in an uplink channel to a plurality of respective secondary stations; and

transmitting a respective request for services to establish required services from at least one of the respective secondary stations to a primary station in the respective time slots;

wherein the at least one respective secondary station re-transmits the same respective request in consecutive allocated time slots without waiting for an acknowledgement until said acknowledgement is received from the primary station,

wherein the primary station determines whether a request has been transmitted by the at least one respective secondary station from a combination of the received signals in a plurality of

successive time slots allocated to the at least one respective secondary station.

Claim 2 (Canceled)

3. (Currently amended) The method of claim 1, wherein the primary station determines whether ~~a~~ said request has been transmitted ~~by the at least one respective secondary station from a combination of the received signals in a plurality of successive time slots allocated to the at least one respective secondary station~~ only if the level of a received request is between lower and upper thresholds.

4. (Previously presented) The method of claim 1, wherein the at least one respective secondary station modifies the power of the re-transmitted requests in response to a lack of acknowledgment from the primary station.

5. (Previously presented) The method of claim 4, wherein the at least one respective secondary station increases the power of

the re-transmitted requests in response to a lack of acknowledgment from the primary station.

6. (Currently amended) A radio communication system, comprising:

a primary station and a plurality of respective secondary stations;

the primary station having means for allocating respective time slots in an uplink channel to a plurality of respective secondary stations to transmit respective requests for services to the primary station to establish required services;

wherein the respective secondary stations have means for re-transmitting the same respective requests in consecutive allocated time slots without waiting for an acknowledgement until said acknowledgement is received from the primary station,

wherein the primary station determines whether a request has been transmitted by at least one of the plurality of respective secondary stations from a combination of the received signals in a plurality of successive time slots allocated to the at least one of the plurality of respective secondary stations.

Claims 7 and 8: (Cancelled)

9. (Currently amended) A secondary station for use in a radio communication system, comprising:

means for transmitting a request for services to establish required services to a primary station in respective allocated time slots in an uplink channel;

wherein the primary station allocates respective time slots in the uplink channel to a plurality of respective secondary stations; and

means for re-transmitting the same request for services in consecutive allocated time slots without waiting for an acknowledgement until said acknowledgment is received from the primary station,

wherein the primary station determines whether a request has been transmitted by at least one of the plurality of respective secondary stations from a combination of the received signals in a plurality of successive time slots allocated to the at least one of the plurality of respective secondary stations.

10. (Previously presented) The secondary station of claim 9, further comprising means for modifying the power of the re-transmitted requests in response to lack of acknowledgement from the primary station.

Claims 11-13: (Cancelled)

14. (Currently amended) ~~The method of claim 1,~~ A method of operating a radio communication system, comprising:

allocating respective time slots in an uplink channel to a plurality of respective secondary stations; and

transmitting a respective request for services to establish required services from at least one of the plurality of respective secondary stations to a primary station in the respective time slots;

wherein the at least one of the plurality of respective secondary stations re-transmits the same respective request in consecutive allocated time slots without waiting for an acknowledgement until said acknowledgement is received from the primary station,

wherein the primary station determines whether a request for services has been transmitted by the at least one of the plurality of respective secondary stations by determining whether a signal strength of the respective transmitted request of the at least one of the plurality of respective secondary stations exceeds a threshold value.

15. (Currently amended) ~~The radio communication system of claim 6,~~ A radio communication system, comprising:

a primary station and a plurality of respective secondary stations;

the primary station having means for allocating respective time slots in an uplink channel to the plurality of respective secondary stations to transmit respective requests for services to the primary station to establish required services;

wherein the respective secondary stations have means for re-transmitting the same respective requests in consecutive allocated time slots without waiting for an acknowledgement until said acknowledgement is received from the primary station,

wherein said primary station determines whether a request for services has been transmitted by at least one of the respective

secondary stations by determining whether a signal strength of the respective transmitted request of the at least one of the respective secondary stations exceeds a threshold value.

Claims 16-18: (Cancelled)

19. (Previously presented) The method of claim 1, wherein:

the allocating of the respective time slots comprises allocating the respective time slots in frames in the uplink channel;

each frame has a plurality of time slots; and

the at least one respective secondary station re-transmits the respective request in the consecutive allocated time slots in consecutive frames until the acknowledgement is received from the primary station.

20. (Previously presented) The method of claim 1, wherein:

when the at least one respective secondary station has received the acknowledgement from the primary station, the at least one respective secondary station stops any further requests for

services from being transmitted, and begins negotiations with the primary station to define fully the requested services.

21. (Previously presented) The method of claim 1, wherein:

the requests for services comprise requests for establishing a new uplink channel for voice or data services.

22. (Previously presented) The radio communication system of claim 6, wherein:

the means for allocating allocates the respective time slots in frames in the uplink channel;

each frame has a plurality of time slots; and

the means for re-transmitting re-transmit the respective requests in the consecutive allocated time slots in consecutive frames until the acknowledgement is received from the primary station.

23. (Previously presented) The radio communication system of claim 6, wherein:

when at least one of the respective secondary stations has received the acknowledgement from the primary station, the at least

one respective secondary station stops any further requests for services from being transmitted, and begins negotiations with the primary station to define fully the requested services.

24. (Previously presented) The radio communication system of claim 6, wherein:

the requests for services comprise requests for establishing a new uplink channel for voice or data services.

25. (Previously presented) The secondary station of claim 9, wherein:

the primary station allocates the respective time slots in frames in the uplink channel;

each frame has a plurality of time slots; and

the means for re-transmitting re-transmit the request in the consecutive allocated time slots in consecutive frames until the acknowledgement is received from the primary station.

26. (Previously presented) The secondary station of claim 9, further comprising:

means for stopping any further requests for services from

being transmitted when the acknowledgement is received from the primary station; and

means for beginning negotiations with the primary station to define fully the requested services when the acknowledgement is received from the primary station.

27. (Previously presented) The secondary station of claim 9, wherein:

the request for services comprises a request for establishing a new uplink channel for voice or data services.

REMARKS

Reconsideration of the present application and entry of the present amendment are respectfully requested.

In the Office Action, the Examiner indicated that claims 2-3 and 14-15 would be allowable if rewritten in independent form. Applicant gratefully acknowledges the indication that claims 2-3 and 14-15 contain allowable subject matter. By means of the present amendment, claim 2 has been canceled without prejudice, claims 1, 6 and 9 have been amended to included the features of allowable claim 2; and claims 14-5 have been written in independent form. Further, claim 3 has been amended for conformance with amended claim 1.

Applicant furthermore reserves his right to reintroduce subject matter deleted herein at a later time during the prosecution of this application or continuing applications.

Accordingly, it is respectfully submitted that claims 1, 6, 9 and 14-15 are in allowable form, and allowance thereof is respectfully requested. In addition, it is respectfully submitted that claims 3-5, 10 and 19-27 should also be allowed at least based on their dependence from independent claims 1, 6 and 9.

In view of the above, it is respectfully submitted that the present application is in condition for allowance, and a Notice of Allowance is earnestly solicited.

If any informalities remain, the Examiner is requested to telephone the undersigned in order to expedite allowance.

Please charge any fee deficiencies and credit any overpayments to Deposit Account No. 14-1270.

Respectfully submitted,

By Frank J. Keegan
Frank J. Keegan, Reg. 50,145
Attorney
(914) 333-9669
July 20, 2004

PATENT APPLICATION FEE DETERMINATION RECORD
Effective November 10, 1998

Application or Docket Number: 9/455,124

CLAIMS AS FILED - PART I

C

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA
BASIC FEE		
TOTAL CLAIMS	19 minus 20=	*
INDEPENDENT CLAIMS	3 minus 3 =	*
MULTIPLE DEPENDENT CLAIM PRESENT		

SMALL ENTITY TYPE ☐ RATE	FEE	OR	OTHER THAN SMALL ENTITY RATE	FEE
		OR		
		OR		
		OR		
		OR		
TOTAL		OR	TOTAL	

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

AMENDMENT A

D

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	* 19	Minus	**	=
Independent	* 3	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

SMALL ENTITY RATE	ADDITIONAL FEE	OR	OTHER THAN SMALL ENTITY RATE	ADDITIONAL FEE
		OR		
		OR		
		OR		
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT B

E

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	* 18	Minus	**	=
Independent	* ~~3~~ 5	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

RATE	ADDITIONAL FEE	OR	RATE	ADDITIONAL FEE
		OR		
		OR		
		OR		
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT C

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

RATE	ADDITIONAL FEE	OR	RATE	ADDITIONAL FEE
		OR		
		OR		
		OR		
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/455,124	12/06/1999	BERNARD HUNT	PHB-34.306	4674

24737 7590 05/07/2004

PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

EXAMINER	
GANTT, ALAN T	

ART UNIT	PAPER NUMBER
2684	18

DATE MAILED: 05/07/2004

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

Office Action Summary	Application No.	Applicant(s)	
	09/455,124	HUNT, BERNARD	
	Examiner	Art Unit	
	Alan T. Gantt	2684	

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 February 2004*.

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

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

Disposition of Claims

4)☒ Claim(s) *1-6,9,10,14,15 and 19-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-6,9,10 and 19-27* is/are rejected.

7)☒ Claim(s) *2,3,14 and 15* is/are objected to.

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

Application Papers

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

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

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

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

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

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

a)☒ All b)☐ Some * c)☐ None of:

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

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

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

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

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 2/24/04 have been fully considered but they are not persuasive. Applicant primarily argues that:

(a) Claims 1, 6, and 9 have been amended for clarification and not amended to address issues of patentability.

(b) The Willey reference discloses that each transmission includes different data and the Willey system waits for a certain time to ascertain receipt of the acknowledgment.

(c) The Schwartz reference also teaches retransmitting different data in each frame and the required services are already established.

Regarding (a), the nature of the some of the added language, specifically "without waiting for an acknowledgment", changes the scope of the independent claims in the opinion of the examiner. Therefore, any new art applied against these claims will make the Rejection Final.

Regarding (b) and (c), the examiner is in agreement with applicant on these points when the revised language of the independent claims is taken into account. Therefore, new art (Sorenson et al.) is introduced to meet the new claim language.

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.

Claims 1, 4-6, 9, 10, 19, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walton et al., in view of Sorenson et al.

Regarding claim 1, Walton discloses a method and apparatus for controlling the transmission of signals from one or more of a plurality of mobile stations to a base station on a plurality of multiple access channels. Walton provides for access channel time slot for a mobile station (col. 7, lines 12-20). Walton also meets the following limitations related to a method of operating a radio communication system:

allocating respective time slots in an uplink channel to a plurality of respective secondary stations; (col. 7, lines 12-20 [since the mobile station has a time slot to initially try for service with the serving base station, obviously the base station has allocated the time slot for the uplink channel prior to the usage by the mobile station. Also, it is well known for a base station to allocate uplink time slots to mobile stations.]) and

transmitting a respective request for services to establish required services from at least one of the respective secondary stations to a primary station in the respective time slots; (col. 7, lines 21-28)

Although Walton allows for retransmitting a request for an access probe, the reference does not state that it has to be the exact same request.

Sorenson discloses a method for acquiring an alternate communication system upon failure of reverse link communications. In doing so, Sorenson uses a technique to attempt connection of the mobile station with the present base station. This technique meets the following claim limitation:

> wherein the at least one respective secondary station re-transmits the same respective request in consecutive allocated time slots without waiting for an—acknowledgement until said acknowledgement is received from the primary station. (col. 9, lines 39-44 and col. 7, line 58 to col. 10, line 3 [Both Walton and Sorenson suggest meeting the consecutive time slots without waiting for an acknowledgment as there is no mention of a backoff delay period. Sorenson does have a predetermined maximum number of access probe sequences before a terminating process. However, this shows and additional step and obviously, without the terminating step the process could be allowed to continue, still seeking an acknowledgment])

Walton and Sorenson are combinable since they share a common endeavor, namely, communication systems having procedures for access probes and acknowledgment between mobile stations and an a base station. At the time of the applicant's invention it would have obvious to modify Walton to permit the exact same access channel message to be sent continuously by the mobile station to the base station if no acknowledgment is received as this

increases the chances of the desired outcome of allocated resources for the particular mobile station.

Regarding claim 4, Walton meets the limitation- The method of claim 1, wherein the at least one respective secondary station modifies the power of the re-transmitted requests in response to a lack of acknowledgment from the primary station. (col. 2, lines 25-39) Sorenson also meets the limitation. (col. 9, line 45-57)

Regarding claim 5, Walton meets the limitation - The method of claim 4, wherein the at least one respective secondary station increases the power of the re-transmitted requests in response to a lack of acknowledgment from the primary station. (col. 2, lines 25-39) Sorenson also meets the limitation. (col. 9, line 45-57)

Regarding claim 6, Walton discloses a method and apparatus for controlling the transmission of signals from one or more of a plurality of mobile stations to a base station on a plurality of multiple access channels. Walton provides for access channel time slot for a mobile station (col. 7, lines 12-20). Walton also meets the following limitations related to a method of operating a radio communication system comprising:

a primary station and a plurality of respective secondary stations; (col. 3, lines 6-9)

the primary station having means for allocating respective time slots in an uplink channel to a plurality of respective

secondary stations to transmit respective requests for services to the primary station to establish required services; (col. 7, lines 12-20 [since the mobile station has a time slot to initially try for service with the serving base station, obviously the base station has allocated the time slot for the uplink channel prior to the usage by the mobile station. Also, it is well known for a base station to allocate uplink time slots to mobile stations.])

Although Walton allows for retransmitting a request for an access probe, the reference does not state that it has to be the exact same request.

Sorenson discloses a method for acquiring an alternate communication system upon failure of reverse link communications. In doing so, Sorenson uses a technique to attempt connection of the mobile station with the present base station. This technique meets the following claim limitation:

wherein the respective secondary stations have means for re-transmitting the same respective requests in consecutive allocated time slots without waiting for an acknowledgement until said acknowledgement is received from the primary station. (col. 9, lines 39-44 and col. 7, line 58 to col. 10, line 3 [Both Walton and Sorenson suggest meeting the consecutive time slots without waiting for an acknowledgment as there is no mention of a backoff delay period. Sorenson does have a predetermined maximum number of access probe sequences before a terminating process. However, this shows and additional step

and obviously, without the terminating step the process could be allowed to continue, still seeking an acknowledgment])

Walton and Sorenson are combinable since they share a common endeavor, namely, communication systems having procedures for access probes and acknowledgment between mobile stations and an a base station. At the time of the applicant's invention it would have obvious to modify Walton to permit the exact same access channel message to be sent continuously by the mobile station to the base station if no acknowledgment is received as this increases the chances of the desired outcome of allocated resources for the particular mobile station.

Regarding claim 9, Walton discloses a method and apparatus for controlling the transmission of signals from one or more of a plurality of mobile stations to a base station on a plurality of multiple access channels. Walton provides for an access channel time slot for a mobile station (col. 7, lines 12-20). Walton also meets the following limitations related to a secondary station for use in a radio communication system, comprising:

means for transmitting a request for services to establish required services to a primary station in respective allocated time slots in an uplink channel; (col. 7, lines 12-20 [since the mobile station has a time slot to initially try for service with the serving base station, obviously the base station has allocated the time slot for the uplink channel prior to the usage by the mobile station. Also, it is well known for a base station to allocate uplink time slots to mobile stations.])

wherein the primary station allocates respective time slots in the uplink channel to a plurality of respective secondary stations; (col. 7, lines 12-20 [since the mobile station has a time slot to initially try for service with the serving base station, obviously the base station has allocated the time slot for the uplink channel prior to the usage by the mobile station. Also, it is well known for a base station to allocate uplink time slots to mobile stations.])

Although Walton allows for retransmitting a request for an access probe, the reference does not state that it has to be the exact same request.

Sorenson discloses a method for acquiring an alternate communication system upon failure of reverse link communications. In doing so, Sorenson uses a technique to attempt connection of the mobile station with the present base station. This technique meets the following claim limitation:

means for re-transmitting the same request for services in consecutive allocated time slots without waiting for an acknowledgment until said acknowledgment is received from the primary station. [Both Walton and Sorenson suggest meeting the consecutive time slots without waiting for an acknowledgment as there is no mention of a backoff delay period. Sorenson does have a predetermined maximum number of access probe sequences before a terminating process. However, this shows and additional step and obviously, without the terminating step the process could be allowed to continue, still seeking an acknowledgment])

Walton and Sorenson are combinable since they share a common endeavor, namely, communication systems having procedures for access probes and acknowledgment between mobile stations and an a base station. At the time of the applicant's invention it would have obvious to modify Walton to permit the exact same access channel message to be sent continuously by the mobile station to the base station if no acknowledgment is received as this increases the chances of the desired outcome of allocated resources for the particular mobile station.

Regarding claim 10, Walton meets the limitation The secondary station of claim 9, further comprising means for modifying the power of the retransmitted requests in response to lack of acknowledgement from the primary station. (col. 2, lines 25-39) Sorenson also meets the limitation. (col. 9, line 45-57)

Regarding 19 and 22, Walton meets the limitation - The method of claim 1, wherein:

the at least one respective secondary station re-transmits the respective request in the consecutive allocated time slots inconsecutive frames until the acknowledgement is received from the primary station. (col. 2, lines25-39)

Both Walton and Sorenson are silent regarding the limitations "the allocating of the respective time slots comprises allocating the respective time slots in frames in the uplink channel" and provisions for "each frame having a plurality of time slots".

However, the examiner takes Official Notice that it is well known to allocate time slots in frames and that it would have been obvious to modify Walton / Sorenson to include time slots as

part of frames with each frame having a plurality of time slots as multiple tasks can be handled as each secondary station for each exchange between the primary and secondary stations.

Claims 20, 21, and 23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walton et al., in view of Sorenson et al., and further in view of Norstedt et al.

Regarding claims 20, 21, 23, 24, 26, and 27, the Walton / Sorenson combination provide for continuous of request for resources without an immediate acknowledgment by the primary station. However, the combination is silent regarding actions taken after the acknowledgement has been received.

Norstedt discloses a channel resource management procedure with in a digital mobile communication network. Norstedt meets the limitation, "begins negotiations with the primary station to define fully the requested services [col. 3, line 61 to col. 4, line 18 –mobile station sends a request for a signaling channel over a RACH , the BSC allocates an SDCCH to the mobile. Regarding claims 20, 23, and 26, the "communicating necessary control and service related data over the newly allocated SDCCH, a traffic channel is seized" shows the negotiation between the secondary (mobile) and the primary (base station). Regarding claims 21, 24, and 27, the "traffic channel is seized" phrase shows the establishing of the new uplink channel for voice or data services.].

Walton, Sorenson, and Norstedt are combinable because they share a common endeavor, namely, channel allocation methods. At the time of the applicant's invention it would have been

obvious to modify the Walton / Sorenson combination to include negotiating to defined more fully the requested services and the assigning of the new uplink channel as done by Norstedt in order to obtain a complete and responsive channel resource management system.

Allowable Subject Matter

Claims 2, 3, 14, 15 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 2, a primary station that determines whether a request has been transmitted by a secondary station based on a combination of the received signals in a plurality of successive time slots allocated to the secondary station was neither found, suggested, nor made evident by the prior art.

Regarding claim 3, a primary station that determines whether a request has been transmitted by a secondary station n based on a combination of the received signals in a plurality of successive time slots allocated to the secondary station only if the received request is between lower and upper thresholds was neither found, suggested, nor made evident by the prior art.

Regarding claims 14 and 15, a primary station that determines whether a request for services has been transmitted by a secondary station by determining whether the signal strength of the transmitted request of the secondary station exceeds a threshold value was neither found, suggested, nor made evident by the prior art.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Crisler et al. discloses a time slot allocation method for uplink time slots.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication from the examiner should be addressed to Alan Gantt at telephone number (703) 305-0077. The examiner can normally be reached between 9:30 AM and 6 PM within the Eastern Time Zone. The group FAX number is (703) 872-9306.

Any inquiry of a general nature or relating to this application should be directed to the group receptionist at telephone number (703) 305-4700.

Alan T. Gantt

Alan T. Gantt

April 30, 2004

NAY MAUNG
SUPERVISORY PATENT EXAMINER

Notice of References Cited	Application/Control No. 09/455,124	Applicant(s)/Patent Under Reexamination HUNT, BERNARD	
	Examiner Alan T. Gantt	Art Unit 2684	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-5,594,738	01-1997	Crisler et al.	370/347
	B	US-6,542,488	04-2003	Walton et al.	370/335
	C	US-6,463,298	10-2002	Sorenson et al.	455/552.1
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

US-PAT-NO: 6463298

DOCUMENT-IDENTIFIER: US 6463298 B1

TITLE: Method of acquiring an alternate communication system upon failure of reverse link communications

---------- KWIC ---------

US Patent No. - PN (1):
6463298

Detailed Description Text - DETX (21):
In system access state 206, the mobile station 100 transmits on the access channel using a random access procedure. The entire process of sending one access channel message and receiving (or failing to receive) an acknowledgment of that access channel message is called an "access attempt." An access attempt comprises transmitting one or more "access probe sequences." Each access probe sequence comprises transmitting one or more "access probes." Each access probe comprises the access channel message and the mobile station transmits the same access channel message in each access probe in an access attempt.

Detailed Description Text - DETX (23):
If one access probe sequence is unsuccessful in evoking an acknowledgment from the base station, another identical access probe sequence will begin. The mobile station 100 stops transmitting access probe sequences, thus ending the access attempt, when it receives an acknowledgment from the base station, or when it has transmitted a predetermined maximum number of

access probe
sequences. Termination of the access attempt due to reaching the predetermined
number of access probe sequences would be a case of the reverse link limited
situation described above. It should be noted that access attempts may be
performed in other ways as are known in the art, depending on the nature of the
system providing service.

US-PAT-NO: 6205133

DOCUMENT-IDENTIFIER: US 6205133 B1
See image for Certificate of Correction

TITLE: Flexible wideband architecture for use in radio communications systems

---------- KWIC ---------

Detailed Description Text - DETX (12):
The resource manager 335 may be implemented as a stand-alone component, using for example a designated programmable micro-controller, or it may instead be implemented in software running on a processor which is used to otherwise control hub station functionality. Many standard processors available today are well suited for carrying out the tasks associated with the resource manager 335. As is described in more detail below, the resource manager 335 monitors signal levels and interference measurements received from receive signal strength indicators (RSSIs) within the uplink channelizer 350, as well as call traffic messages received from the MSC 100, to assign calls to appropriate channels (i.e., frequency carriers and time slots) within the system and to control non-blocking switches within the uplink and downlink channelizers 350,355 to dynamically allocate signal processing resources as capacity requirements evolve.

US-PAT-NO: 6542488

DOCUMENT-IDENTIFIER: US 6542488 B2

TITLE: Methods and apparatuses for fast power control of signals transmitted on a multiple access channel

---------- KWIC ---------

Brief Summary Text - BSTX (9):

In CDMA systems operating in accordance with the IS-95 standard, the mobile station determines a level at which to transmit on the R-ACH based upon an open loop power control estimate, adjusted by some overhead parameters. More particularly, under the IS-95 standard, the mobile station attempts an access on a R-ACH by sending one or more access probes. An access probe is the message which the mobile station is trying to send to the base station. The mobile station starts by sending an access probe; if the mobile station does not receive an acknowledgment to this access probe, the mobile station increases its transmit power (by a value given in overhead messages) and sends the probe again. This continues until the mobile station receives an acknowledgment or the mobile station has reached the limit of access probes which are permitted.

US-PAT-NO: 6374099

DOCUMENT-IDENTIFIER: US 6374099 B1

TITLE: High priority and/or emergency overload access control system

---------- KWIC ---------

Brief Summary Text - BSTX (16):

The mobile station delays its transmit timing of each access probe by RN PN chips as shown in block 38. Timing between access probes of an access probe sequence is also generated pseudo-randomly. After transmitting each access probe, the mobile waits a specified period, TA=80.times.(2+acc_tmo) milliseconds from the end of the slot to receive an acknowledgment from the base station as shown by blocks 40 and 42. If an acknowledgment is received, the access attempt is successful as shown in block 44. If no acknowledgment is received within the time TA, the next access probe in the access probe sequence is transmitted after an additional backoff delay RT, from 1 to 1+probe_bkoff slots as shown by blocks 46-52. As shown in block 54, the next access probe and each subsequent access probe is transmitted at a power level a specified amount PI dB (determined from pwr_step) higher than the previous access probe until an acknowledgment response is obtained or the sequence ends as determined at block 48. Each access attempt comprises up to max_req_seq (for a request access) or max_rsp_seq (for a response access) access probe sequences as shown by blocks 56 and 58. If an acknowledgment has not been received after the last access probe sequence has been transmitted, the access

attempt fails as shown
in block 60. After an access probe sequence, a backoff
delay, RS, of from 0 to
1+bkoff slots is generated pseudo randomly and applied as
shown by blocks 62
and 64.

US-PAT-NO: 6252865

DOCUMENT-IDENTIFIER: US 6252865 B1
See image for Certificate of Correction

TITLE: Methods and apparatuses for fast power control of signals transmitted on a multiple access channel

---------- KWIC ---------

Brief Summary Text - BSTX (9):

In CDMA systems operating in accordance with the IS-95 standard, the mobile station determines a level at which to transmit on the R-ACH based upon an open loop power control estimate, adjusted by some overhead parameters. More particularly, under the IS-95 standard, the mobile station attempts an access on a R-ACH by sending one or more access probes. An access probe is the message which the mobile station is trying to send to the base station. The mobile station starts by sending an access probe; if the mobile station does not receive an acknowledgment to this access probe, the mobile station increases its transmit power (by a value given in overhead messages) and sends the probe again. This continues until the mobile station receives an acknowledgment or the mobile station has reached the limit of access probes which are permitted.

US-PAT-NO: 6011978

DOCUMENT-IDENTIFIER: US 6011978 A

TITLE: Automatic system switching in a multiple-mode wireless communication device

---------- KWIC ---------

Detailed Description Text - DETX (26):
In system access state 206, the mobile station 100 transmits on the access channel using a random access procedure. The entire process of sending one access channel message and receiving (or failing to receive) an acknowledgment of that access channel message is called an "access attempt." An access attempt comprises transmitting one or more "access probe sequences." Each access probe sequence comprises transmitting one or more "access probes." Each access probe comprises the access channel message and the mobile station transmits the same access channel message in each access probe in an access attempt.

Detailed Description Text - DETX (28):
If one access probe sequence is unsuccessful in evoking an acknowledgment from the base station, another identical access probe sequence will begin. The mobile station 100 stops transmitting access probe sequences, thus ending the access attempt, when it receives an acknowledgment from the base station, or when it has transmitted a predetermined maximum number of access probe sequences. Termination of the access attempt due to reaching the predetermined number of access probe sequences would be a case of the reverse link limited

situation described above. It should be noted that access attempts may be performed in other ways as are known in the art, depending on the nature of the system providing service.

#17/ amdt D.
2/24/04 2684
a.s. entered.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	Atty. Docket
BERNARD HUNT	PHB 34,306
	Confirmation No. 4674
Serial No. 09/455,124	Group Art Unit: 2684
Filed: DECEMBER 6, 1999	Examiner: ALAN T. GANTT

Title: RADIO COMMUNICATION SYSTEM WITH REQUEST RE-TRANSMISSION UNTIL ACKNOWLEDGED (As Amended)

Honorable Commissioner for Patents
Alexandria, VA 22313-1450

AMENDMENT

Sir:

In response to the Office Action mailed November 10, 2003, please amend the above-identified application as follows:

IN THE CLAIMS

Please amend claims 1, 6, 9, 19, 22 and ~~25~~ as follows:

1. (Currently amended) A method of operating a radio communication system, comprising:

allocating respective time slots in an uplink channel to a plurality of respective secondary stations; and

transmitting a respective request for services to establish required services from at least one of the respective secondary stations to a primary station in the respective time slots;

wherein the at least one respective secondary station re-transmits the same respective request in consecutive allocated time slots without waiting for an acknowledgement until ~~an~~ said acknowledgement is received from the primary station.

2. (Previously presented) The method of claim 1, wherein the primary station determines whether a request has been transmitted by the at least one respective secondary station from a combination of the received signals in a plurality of successive time slots allocated to the at least one respective secondary station.

3. (Previously presented) The method of claim 1, wherein the primary station determines whether a request has been transmitted by the at least one respective secondary station from a combination of the received signals in a plurality of successive time slots allocated to the at least one respective secondary station only if the level of a received request is between lower and upper thresholds.

4. (Previously presented) The method of claim 1, wherein the at least one respective secondary station modifies the power of the re-transmitted requests in response to a lack of acknowledgment from the primary station.

D1 Cont.

5. (Previously presented) The method of claim 4, wherein the at least one respective secondary station increases the power of the re-transmitted requests in response to a lack of acknowledgment from the primary station.

6. (Currently amended) A radio communication system, comprising:

a primary station and a plurality of respective secondary stations;

the primary station having means for allocating respective time slots in an uplink channel to a plurality of respective secondary stations to transmit respective requests for services to the primary station to establish required services;

wherein the respective secondary stations have means for re-transmitting the same respective requests in consecutive allocated time slots without waiting for an acknowledgement until ~~an~~ said acknowledgement is received from the primary station.

D1 Cont.

Claims 7 and 8: (Cancelled)

9. (Currently amended) A secondary station for use in a radio communication system, comprising:

means for transmitting a request for services to establish required services to a primary station in respective allocated time slots in an uplink channel;

wherein the primary station allocates respective time slots in the uplink channel to a plurality of respective secondary stations; and

means for re-transmitting the same request for services in consecutive allocated time slots without waiting for an acknowledgement until ~~an~~ said acknowledgment is received from the primary station.

10. (Previously presented) The secondary station of claim 9, further comprising means for modifying the power of the re-transmitted requests in response to lack of acknowledgement from the primary station.

Claims 11-13: (Cancelled)

14. (Previously presented) The method of claim 1, wherein the primary station determines whether a request for services has been transmitted by the at least one respective secondary station by determining whether a signal strength of the respective transmitted request of the at least one respective secondary station exceeds a threshold value.

15. (Previously presented) The radio communication system of claim 6, wherein said primary station determines whether a request

for services has been transmitted by at least one of the respective secondary stations by determining whether a signal strength of the respective transmitted request of the at least one respective secondary station exceeds a threshold value.

Claims 16-18: (Cancelled)

19. (Currently amended) The method of claim 1, wherein:

the allocating of the respective time slots comprises allocating the respective time slots in frames in the uplink channel;

each frame has a plurality of time slots; and

the at least one respective secondary station re-transmits the respective request in the consecutive allocated time slots in consecutive frames until the acknowledgement is received from the primary station.

20. (Previously presented) The method of claim 1, wherein:

when the at least one respective secondary station has received the acknowledgement from the primary station, the at least one respective secondary station stops any further requests for

services from being transmitted, and begins negotiations with the primary station to define fully the requested services.

21. (Previously presented) The method of claim 1, wherein:

the requests for services comprise requests for establishing a new uplink channel for voice or data services.

22. (Currently amended) The radio communication system of claim 6, wherein:

the means for allocating allocates the respective time slots in frames in the uplink channel;

each frame has a plurality of time slots; and

the means for re-transmitting re-transmit the respective requests in the consecutive allocated time slots in consecutive frames until the acknowledgement is received from the primary station.

23. (Previously presented) The radio communication system of claim 6, wherein:

when at least one of the respective secondary stations has received the acknowledgement from the primary station, the at least

one respective secondary station stops any further requests for services from being transmitted, and begins negotiations with the primary station to define fully the requested services.

24. (Previously presented) The radio communication system of claim 6, wherein:

the requests for services comprise requests for establishing a new uplink channel for voice or data services.

25. (Currently amended) The secondary station of claim 9, wherein:

the primary station allocates the respective time slots in frames in the uplink channel;

each frame has a plurality of time slots; and

the means for re-transmitting re-transmit the request in the consecutive allocated time slots in consecutive frames until the acknowledgement is received from the primary station.

26. (Previously presented) The secondary station of claim 9, further comprising:

means for stopping any further requests for services from

being transmitted when the acknowledgement is received from the primary station; and

means for beginning negotiations with the primary station to define fully the requested services when the acknowledgement is received from the primary station.

27. (Previously presented) The secondary station of claim 9, wherein:

the request for services comprises a request for establishing a new uplink channel for voice or data services.

REMARKS

Reconsideration of the present application, as amended, is respectfully requested.

By means of the present amendment, claims 19, 22 and 25 have been amended for clarification. Thus, claims 19, 22 and 25 were not amended in order to address issues of patentability and Applicant respectfully reserves all rights he may have under the Doctrine of Equivalents.

In the Office Action, claims 1-3, 6, 9, 14-15, 22 and 25 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. 5,854,785 (Willey) in view Schwartz, Telecommunication Network, pages 122-124 (Schwartz). Further, claims 4-5 and 10 were rejected under 35 U.S.C. §103(a) as being unpatentable over Willey in view of Schwartz, and further in view of U.S. 6,256,301 (Tiedermann). In addition, claims 20-21, 23-24 and 26-27 were rejected under 35 U.S.C. §103(a) as being unpatentable over Willey in view of Schwartz, and further in view of U.S. 5,926,469 (Norstedt). Applicant respectfully traverses these rejections, however independent claim 1, 6 and 9 have been amended for clarification. Thus, claims 1, 6 and 9 were not amended in order to address issues

of patentability and Applicant respectfully reserves all rights he may have under the Doctrine of Equivalents. It is respectfully submitted that claims 1-6, 9-10, 14-15 and 19-27 are patentable over Willey, Schwartz, Tiedermann and Norstedt for at least the following reasons.

Willey discloses a wireless communication system that provides soft handoff where an access channel message is built as noted in step 210 of FIG 2. Pilot strengths are measured (steps 205, 220) and reported or transmitted (step 210), thus each transmission includes different data. The newly measured, thus different, pilot strengths are transmitted until an acknowledgement is received (step 225). However, as specifically recited in step 225, it is ascertained that the acknowledgement is received "in time". Thus, the Willey system waits for a certain time to ascertain receipt of the acknowledgement. Further, the Willey system also waits an additional period of time as indicated in step 235 of FIG 2.

In stark contrast, the present invention as recited in independent claims 1, 6 and 9, requires re-transmission of the same request in consecutive allocated time slots without waiting for an acknowledgement until said acknowledgement is received from the primary station.

Schwartz teaches a go-back-N or continuous transmission which is an error recovery protocol, whereas Willey is directed to soft handoff. Accordingly, there is no motivation to combine Schwartz and Willey. Assuming, arguendo, that it is proper to combine Schwartz and Willey, such a combination still does not teach or suggest the features of independent claims 1, 6 and 9 noted above. Similar to Willey, Schwartz teaches retransmitting different data in each frame, as clearly ascertained from line 1, page 123, which indicates that "all frames following are retransmitted." Certainly, if all these frames contained the same data, there would be no need to retransmit all the frames, as retransmitting a single frame would suffice.

Further, Schwartz does not teach or suggest, nor is it concerned with, transmitting a request for services to establish required services. In Schwartz, the required services are already established, and data or messages are being transmitted. Thus, any combination of Schwartz and Willey would merely teaches to continuously transmit data or messages once the required services between two stations have been established.

In summary, Schwartz and Willey, alone or in combination, do not teach or suggest transmitting a request for services to

establish required services in the respective time slots; and re-transmits the same respective request in consecutive allocated time slots without waiting for an acknowledgement until the acknowledgement is received, as recited in independent claims 1, 6, 9. Tiedermann and Norstedt are cited in rejecting claims 4-5, 10, 20-21, 23-24 and 26-27 and do not remedy the deficiencies in Schwartz and Willey.

Accordingly, it is respectfully submitted that independent claims 1, 6 and 9 be allowed. In addition, it is respectfully submitted that claims 2-5, 10, 14-15 and 19-27 should also be allowed at least based on their dependence from independent claims 1, 6 and 9.

In view of the above, it is respectfully submitted that the present application is in condition for allowance, and a Notice of Allowance is earnestly solicited.

If any informalities remain, the Examiner is requested to telephone the undersigned in order to expedite allowance.

Please charge any fee deficiencies and credit any overpayments to Deposit Account No. 14-1270.

Respectfully submitted,

By _____
Dicran Halajian, Reg. 39,703
Attorney
(914) 333-9607
February 10, 2004

CERTIFICATE OF MAILING

It is hereby certified that this correspondence is being deposited with the United States Postal Service as first-class mail in an envelope addressed to:

COMMISSIONER FOR PATENTS
P.O. BOX 1450
ALEXANDRIA, VA 22313-1450

On 2/10/04
(Date of Mailing)

By _____
(Signature)

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/455,124	12/06/1999	BERNARD HUNT	PHB-34.306	4674

24737 7590 11/10/2003

PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

EXAMINER	
GANTT, ALAN T	

ART UNIT	PAPER NUMBER
2684	16

DATE MAILED: 11/10/2003

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

Office Action Summary	Application No.	Applicant(s)	
	09/455,124	HUNT, BERNARD	
	Examiner	Art Unit	
	Alan T. Gantt	2684	

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 October 2003* .

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

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

Disposition of Claims

4)☒ Claim(s) *1-6,9,10,14,15 and 19-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,9,10,14,15 and 19-27* is/are rejected.

7)☒ Claim(s) _____ is/are objected to.

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

Application Papers

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

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

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

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

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

a)☒ All b)☐ Some * c)☐ None of:

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

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

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

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

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 10/3/03 have been fully considered but they are not persuasive. Applicant primarily argues that:

(a) (a) The Willey reference utilizes an access channel message that is continuously transmitted and contains different data each time, namely different newly measured neighbor pilot strengths.

(b) The Schwartz reference also teaches retransmitting different data in each frame as is ascertained from the passage "all frames following are retransmitted". If all frames contained the same data there would be no need to retransmit all frames, as retransmitting a single frame would suffice.

Regarding (a) and (b), the language of the independent claims do not negate the two references. The Willey reference is resending the message as required and it continues to resend the message (after a predetermined time period) until the base station acknowledges and the mobile does this at each time slot allocated to it. It would seem irrelevant that the most recent neighbor pilot strengths are attached to the message. The mobile would still be seeking the attention of the base station until it gets its acknowledgement. Also, with regards to the Schwartz reference, the reference provides that "all frames following are retransmitted". Applicant assumes that there is no need to retransmit all the frames as retransmitting a single frame would suffice. However, Schwartz shows that it is possible to retransmit the same information until the base

station acknowledges regardless of the information being retransmitted as is also done by applicant's invention.

Applicant's revisions to the existing independent and dependent claims are mostly cosmetic in nature. Thus, regarding those claims, the previous Office Action Rejection is upheld. Applicant has added nine new claims, which will be given the greater scrutiny with this rejection.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3, 6, 9, 14, 15, 19, 22, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Willey, in view of Schwartz, Telecommunication Networks, pages, 122-124.

Regarding claim 1, 6, and 9, Willey discloses a method as applied to a radio communication system for a radiotelephone to communicate an access channel message to a serving base station that includes the most recently measured pilot strengths of neighboring base stations. The transmitting of the access channel message in subsequent access probes are repeated until the radiotelephone receives from the base station an acknowledgment within a predetermined time period or a maximum number of access probes have been transmitted (col. 5, lines 23-42). As the radiotelephone is sending the information whenever the time period expires it follows that nearly 100% of the radiotelephone's allocated time slots are being used for the re-transmitting the

request. Further, it is known in the art that the base station controllers assign time slots to secondary stations. Determining uplink signaling sequences and the allocated time slot frame based on the downlink broadcast from the base station is also known in the art. There are, however, a maximum number of retransmit attempts allowed by Willey, as the applicant's has no stated limit regarding the number of retransmit attempts.

Schwartz discloses a protocol known as G-back-N or continuous transmission. With this protocol, data frames are transmitted continuously, if available, without waiting for an acknowledgment. On receipt of a negative acknowledgment, or expiration of the timeout without receipt of an ack/nak, the frame in question and all the frames following are retransmitted. The illustrated examples show stations A and B where, by the acknowledgment tasks, B is the primary station and A is the secondary station (pages 122-124).

Willey and Schwartz are combinable because they share a common endeavor, namely, telecommunication networks requiring clearance to transmit on a time-shared channel as governed by the primary station in the form of an acknowledgment. At the time of the applicant's invention it would have been obvious to modify Willey to not limit the number of re-transmission of requests as such limits are not done by Schwartz so that the communication can weather short term fading.

Regarding claim 2, the examiner takes Official Notice that it is well-known practice for a primary station to determine whether a request has been transmitted by the base station from a combination of the received signals in a plurality of successive time slots allocated to the secondary station and it would have been obvious for Willey to utilize such a system since a

sequential numbering of the request would let the primary station know how long the secondary has been trying to make contact.

Regarding claims 3 and 8, the examiner takes Official Notice that it is well-known practice for a primary station to determine whether a request has been transmitted by the base station from a combination of the received signals in a plurality of successive time slots allocated to the secondary station if the received level is between a lower and an upper threshold [as done by Mansfield (col. 11, lines 8-30)] and it would have been obvious for Willey to use such a method since such a method indicates to the primary station the quality of the propagation path between the primary and the secondary station.

Regarding claims 14 and 15, Willey states that the infrastructure (i.e., the network, primary station and controller) creates a second Active Set for forward channel traffic reception and compares the first active set with this second set, which specifies more current pilot strengths. Willey further states the infrastructure begins to allocate the base stations identified in each access channel message that will transmit over their respective Paging Channel. Also, access channel messages can include the measured separately both the measured pilot strengths and corresponding identities of neighboring pilots that have sufficient measured pilot strength that an associated forward traffic channel can be successfully demodulated and the identities of neighboring pilots that have sufficient measured pilot strength that an associated paging channel could be successfully demodulated (col. 7, lines 2-20 and col. 7, lines 31-65). These passages meet the claim language of claims 14 and 15, which generally reads as follows:

- Examining by a primary station [controller], signal strengths of a request received from a secondary station in a plurality of allocated time slots, when one of said signal strengths is close to a detection threshold.

Regarding claims 19, 22, and 25, considering that the primary station typically allocates time slots in the uplink channel as part of frames, obviously Willey meets this limitation. Further, the last limitation contains elements of claim 1 and thus, is covered by the references of claim 1.

3. Claims 4, 5, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Willey, in view of Schwartz, Telecommunication Networks, pages, 122-124, and further in view of Tiedemann, Jr. et al.

4. Regarding claims 4, 5, and 10; Willey and Schwartz provide for continuous of request for resources without an immediate acknowledgment by the primary station. However, the combination is silent regarding modifying the secondary station's transmit power due to a lack of acknowledgment.

Tiedemann provides for power control of the reverse channel from commands by the primary station (forward channel) when the secondary station is transmitting on the reserved access channel (col. 3, lines 30-35, col. 4, lines 50-64 and col. 13, lines 24-50).

Willey, and Schwartz, and Tiedemann are combinable because they share a common endeavor, namely, telecommunication networks requiring clearance to transmit on a time-shared channel as governed by the primary station in the form of an acknowledgment. At the time of the applicant's invention it would have been obvious to modify Willey to include the capability to keeps retransmitting without a maximum number of retransmits so that the communication can weather fades and to modify the combination to include means for modifying the power of the

secondary station as done by Tiedemann such that when the primary station notices that requests are not being received, it can boost the secondary station transmission power.

5. Claims 20, 21, 23, 24, 26, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Willey, in view of Schwartz, Telecommunication Networks, pages, 122-124, and further in view of Norstedt et al.

Regarding claims 20, 21, 23, 24, 26, and 27 the Willey / Schwartz combination provide for continuous of request for resources without an immediate acknowledgment by the primary station. However, the combination is silent regarding actions taken after the acknowledgement has been received.

Norstedt discloses a channel resource management procedure with in a digital mobile communication network. Norstedt meets the limitation, "begins negotiations with the primary station to define fully the requested services [col. 3, line 61 to col. 4, line 18 –mobile station sends a request for a signaling channel over a RACH , the BSC allocates an SDCCH to the mobile. Regarding claims 20, 23, and 26, the "communicating necessary control and service related data over the newly allocated SDCCH, a traffic channel is seized" shows the negotiation between the secondary (mobile) and the primary (base station). Regarding claims 21, 24, and 27, the "traffic channel is seized" phrase shows the establishing of the new uplink channel for voice or data services.].

Willey, Schwartz, and Norstedt are combinable because they share a common endeavor, namely, channel allocation methods. At the time of the applicant's invention it would have been obvious to modify the Willey /Schwartz combination to include negotiating to defined more fully

the requested services and the assigning of the new uplink channel as done by Norstedt in order to obtain a complete and responsive channel resource management system.

Conclusion

6. Any inquiry concerning this communication from the examiner should be addressed to Alan Gantt at telephone number (703) 305-0077. The examiner can normally be reached between 9:30 AM and 6 PM within the Eastern Time Zone. The group FAX number is (703) 872-9306.

Any inquiry of a general nature or relating to this application should be directed to the group receptionist at telephone number (703) 305-4700.

Alan T. Gantt

Alan T. Gantt

October 31, 2003

Notice of References Cited	Application/Control No. 09/455,124	Applicant(s)/Patent Under Reexamination HUNT, BERNARD	
	Examiner Alan T. Gantt	Art Unit 2684	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-5,926,469	07-1999	Norstedt et al.	370/329
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

#14/RCE & 2100

REQUEST FOR CONTINUED EXAMINATION (RCE) TRANSMITTAL

To Commissioner For Patents
Please enter the following submission and withdraw the finality of the proceeding office action or withdraw any pending appeal and reopen prosecution before the Examiner.

Application Number	09/455,124 10/3/03
Filing Date	December 6, 1999 a.d.
First Named Inventor	Bernard Hunt
Group Art Unit	2684
Examiner Name	Alan T. Gantt
Attorney Docket Number	PHB 34,306

This is an RCE under 37 C.F.R. § 1.114 of the above-identified application (which is made prior to: payment of issue fee; abandonment; notice of appeal to the CAFC; or commencement of civil action under 35 U.S.C. 145 or 146.)

1. **Submission required under 37 C.F.R. § 1.114**

a. ☐ Previously submitted

i. ☐ Consider the amendment(s)/reply under 37 C.F.R. § 1.116 previously filed on _____ (Any unentered amendment(s) referred to above will be entered).

ii. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously field on _____

iii. ☐ Other _____

b. ☒ Enclosed

i. ☒ Preliminary Amendment

ii. ☐ Affidavit(s)Declaration(s)

iii. ☐ Information Disclosure Statement (IDS)

iv. ☐ Other _____ (may not be a brief)

2. **Miscellaneous**

a. ☐ Suspension of action on the above-identified application is requested under 37 C.F.R. §1.103(c) for a period of _____ months. (May not exceed 3 months; Fee required per 37 C.F.R. § 1.117(i)

b. ☐ Other _____

3. **Fees**

a. ☒ The Commissioner For Patents is hereby authorized to charge all required fees except the issue fee or credit any overpayments, to Deposit Account No. 14-1270

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Name (Print Type)	Dicran Halajian	*Registration No. (Attorney/Agent)*	39,703
Signature		*Date*	September 16, 2003

CERTIFICATE OF MAILING OR TRANSMISSION

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Name (Print Type)	Natale A. Manzo		
Signature		*Date*	9/16/03

09/23/2003 AWONDAF1 00000031 141270 09455124

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Bernard Hunt	**Examiner:**	Alan T. Gantt
Serial No:	09/455,124	**Art Unit:**	2684
Filed:	December 6, 1999	**Docket:**	PHB 34,306 (16865)
For:	RADIO COMMUNICATION SYSTEM WITH REQUEST RE-TRANSMISSION UNTIL ACKNOWLEDGED	**Date:**	RECEIVED SEP 2 3 2003 Technology Center 2600

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

PRELIMINARY AMENDMENT ACCOMPANYING REQUEST FOR CONTINUED EXAMINATION UNDER 37 C.F.R. §1.114

Sir:

This is a second response to the Final Office Action mailed on June 16, 2003. Applicant filed a first response on July 28, 2003. An Advisory Action was mailed on August 20, 2003. This response is being filed within 3 months of the mailing date of the Final Office Action. Accordingly, no extension fee is due.

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United State Postal Service as first-class mail in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Dated: September 16, 2003

Natale A. Manzo
Natale Manzo

Amendments to the claims:

1. (Currently amended) A method of operating a radio communication system, comprising:

allocating respective time slots in an uplink channel to a plurality of respective ~~a~~ secondary stations; and

~~-~~transmitting a respective ~~a-~~request~~-~~ for services from at least one of the respective secondary stations ~~for resources~~ to a primary station in the respective time slots; ~~in a time slot allocated to the secondary station,~~

wherein the at least one respective secondary station re-transmits ~~ting~~ the respective request in consecutive ~~at least a majority of its~~ allocated time slots until an acknowledgement is received from the primary station.

2. (Currently amended) The method of ~~as claimed in~~ claim 1, wherein the primary station determines whether a request has been transmitted by the at least one respective ~~the~~ secondary station from a combination of the received signals in a plurality of successive time slots allocated to the at least one respective secondary station.

3. (Currently amended) The method of ~~as claimed in~~ claim 1, wherein the primary station determines whether a request has been transmitted by the at least one ~~the~~ respective secondary station from a combination of the received signals in a plurality of successive time slots allocated to the at least one respective secondary station only if the level of a received request is between ~~a~~ lower and ~~an~~ upper thresholds.

4. (Currently amended) The method of ~~as claimed in~~ claim 1, wherein the at least one respective secondary station modifies the power of the re-transmitted requests in response to a lack of acknowledgment from the primary station.

5. (Currently amended) The method of ~~as claimed in~~ claim 4, wherein the at least one respective secondary station increases the power of the re-transmitted requests in response to a lack of acknowledgment ~~signal~~ from the primary station.

6. (Currently amended) A radio communication system, comprising:

-a primary station and a plurality of respective secondary stations;~~,~~

-the primary station having means for allocating respective ~~a~~ time slots in an uplink channel to ~~for~~ a plurality of respective secondary stations to transmit respective ~~a~~ requests for services ~~resources~~ to the primary station~~,~~;

-wherein the respective secondary stations ~~has~~ have means for re-transmitting the respective requests in consecutive ~~at least a majority of its~~ allocated time slots until ~~it receives~~ an acknowledgement is received from the primary station.

Claims 7 and 8: (Cancelled)

9. (Currently amended) A secondary station for use in a radio communication system, comprising:

~~including a primary station, said secondary station comprising:~~

~~having means for allocating a time slot for the secondary station to~~

means for transmitting a request for services ~~resources~~ to a ~~the~~ primary station in respective allocated time slots in an uplink channel;~~,~~

wherein the ~~and~~ primary station allocates respective time slots in the uplink channel to a plurality of respective secondary stations; and

~~said secondary station comprising~~

means for re-transmitting the request for services in consecutive ~~at least a majority of the~~ allocated time slots until an acknowledgment is received from the primary station.

10. (Currently amended) The ~~A~~ secondary station of ~~as claimed in~~ claim 9, further comprising means for modifying the power of the re-transmitted requests in response to lack of ~~an~~ acknowledgement ~~signal~~ from the primary station.

Claims 11-13: (Cancelled)

14. (Currently Amended) The method of claim 1, wherein ~~further comprising examining by a~~ the primary station ~~signal strengths of said request received from said secondary station in a plurality of said allocated time slots, when one of said signal strengths is close to a detection threshold.~~ determines whether a request for services has been transmitted by the at least one respective secondary station by determining whether a signal strength of the respective transmitted request of the at least one respective secondary station exceeds a threshold value.

15. (Currently Amended) The radio communication system of claim 6, wherein said primary station determines whether a request for services has been transmitted by at least one of the respective secondary stations by determining whether a signal strength of the respective transmitted request of the at least one respective secondary station exceeds a threshold value.

~~is configured to examine signal strengths of said request received from said secondary station in a plurality of said allocated time slots, when one of said signal strengths is close to a detection threshold.~~

Claims 16-18: (Cancelled)

19. (New) The method of claim 1, wherein:

the allocating of the respective time slots comprises allocating the respective time slots in frames in the uplink channel;

each frame has a plurality of time slots; and

the at least one respective secondary station re-transmits the respective request in consecutive allocated time slots in consecutive frames until the acknowledgement is received from the primary station.

20. (New) The method of claim 1, wherein:

when the at least one respective secondary station has received the acknowledgement from the primary station, the at least one respective secondary station stops any further requests

for services from being transmitted, and begins negotiations with the primary station to define fully the requested services.

21. (New) The method of claim 1, wherein:

the requests for services comprise requests for establishing a new uplink channel for voice or data services.

22. (New) The radio communication system of claim 6, wherein:

the means for allocating allocates the respective time slots in frames in the uplink channel;

each frame has a plurality of time slots; and

the means for re-transmitting re-transmit the respective requests in consecutive allocated time slots in consecutive frames until the acknowledgement is received from the primary station.

23. (New) The radio communication system of claim 6, wherein:

when at least one of the respective secondary stations has received the acknowledgement from the primary station, the at least one respective secondary station stops any further requests for services from being transmitted, and begins negotiations with the primary station to define fully the requested services.

24. (New) The radio communication system of claim 6, wherein:

the requests for services comprise requests for establishing a new uplink channel for voice or data services.

25. (New) The secondary station of claim 9, wherein:

the primary station allocates the respective time slots in frames in the uplink channel;

each frame has a plurality of time slots; and

the means for re-transmitting re-transmit the request in consecutive allocated time slots in consecutive frames until the acknowledgement is received from the primary station.

26. (New) The secondary station of claim 9, further comprising:

means for stopping any further requests for services from being transmitted when the acknowledgement is received from the primary station; and

means for beginning negotiations with the primary station to define fully the requested services when the acknowledgement is received from the primary station.

27. (New) The secondary station of claim 9, wherein:

the request for services comprises a request for establishing a new uplink channel for voice or data services.

REMARKS

Claims 1-6, 9, 10, 14 and 15 are amended, claims 7, 8, 11-13 and 16-18 are cancelled, and claims 19-27 are new. Claims 1, 6 and 9 are independent claims. Claims 1, 6 and 9 are amended based, e.g., on the specification, page 4, lines 26-28, page 5, lines 19-28, and the Abstract. Claims 19, 22 and 25 are based, e.g., on the specification, page 4, lines 29-31. Claims 20, 23 and 26 are based, e.g., on the specification, page 5, line 30 to page 6, line 2. Claims 21, 24 and 27 are based, e.g., on the specification, page 1, lines 19-26.

Claim 1, for example, clarifies that respective time slots are allocated in an uplink channel to a plurality of respective secondary stations. Respective requests for services are transmitted from at least one of the respective secondary stations to a primary station in the respective time slots. The at least one respective secondary station re-transmits the respective request in consecutive allocated time slots until an acknowledgement is received from the primary station. Thus, successive allocated time slots are used until an acknowledgement is received. Claims 6 and 9 are amended analogously.

The independent claims are believed to clearly distinguish over the cited references.

Regarding the rejection under 35 U.S.C. §103 over Willey in view of Schwartz, Willey is concerned with providing soft handoffs in a wireless communication device. In Willey's approach, an access attempt is the process of repeatedly transmitting the message until receiving an acknowledgment for the message from the base station. Each transmission in the access attempt is called an "access probe," which is composed of an Access Channel Preamble and an Access Channel Message." Col. 2, lines 20-27. Willey further states: "The steps of measuring the pilot signal strengths, (step 220), creating an Access Channel Message that includes the most recent measured pilot strengths and identities, (step 210), and transmitting the Access Channel Message in subsequent access probes are repeated until the radiotelephone receives from the base station an acknowledgment of receipt of the Access Channel Message within a first predetermined time duration, (step 225), or a maximum number of access probes have been transmitted, (step 230)." Col. 5, lines 34-42 and Fig. 2. It is clear from Figure 2 that only one access probe is transmitted in the first predetermined time duration since a re-transmission of the access probe occurs only after an acknowledgement has not been received in the first predetermined time duration (step 225), the maximum number of attempts has not been made (step 230) and an appropriate amount of time has passed (step 235). Accordingly, Willey does

not disclose or suggest re-transmitting a request for services in consecutive allocated time slots until an acknowledgement is received from the primary station.

Regarding Schwartz, this reference is concerned with the data link layer of the Open System Interconnection model that defines a networking framework for implementing protocols in seven layers. In particular, Schwartz and the present invention are directed to different problems. Schwartz's go-back-N protocol is an error recovery protocol, whereas the present invention involves a secondary station requesting resources from a primary station. Moreover, unlike the invention, the go-back-N protocol does not involve a situation where respective time slots are allocated to a plurality of secondary stations to enable the secondary stations to transmit requests for services to a base station in consecutive allocated time slots of an uplink channel.

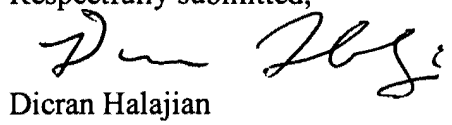
Accordingly, there is no motivation to combine Schwartz and Willey and, even if such a combination were made, it still fails to disclose or suggest the invention as claimed.

Regarding the rejection under 35 U.S.C. §103 over Willey in view of Schwartz and Tiedemann, Jr. et al., Tiedemann enables a mobile station to access a base station by transmitting a request portion of an access probe to the base station over a reverse link common control channel. In response, the base station transmits a channel assignment message to the mobile station designating a reserved access channel. In response, the mobile station transmits a message portion of the access probe over the reserved access channel. See Abstract. The channel assignment message may specify power control information that the mobile station uses to adjust its transmit power. However, this is not the same as a secondary station that modifies the power of re-transmitted requests as claimed in response to a lack of acknowledgement from a primary station. Instead, with the Tiedemann system, the channel assignment message transmitted from the base station to the mobile station acknowledges the access probe portion transmitted from the mobile station to the base station, so power is not adjusted in response to a lack of acknowledgement. The combination of Willey, Schwartz, and Tiedemann therefore fails to disclose or suggest the invention as claimed.

Applicant's dependent claims are believed to provide additional patentable features that are not disclosed or suggested by the prior art.

In view of the above, the application is believed to be in condition for immediate allowance. If the Examiner believes that a telephone conference with Applicant's attorneys would be advantageous to the disposition of this case, the Examiner is requested to telephone the undersigned.

Respectfully submitted,



Dicran Halajian
Registration No.: 39,703

Philips Intellectual Property & Standards
P.O. Box 3001
Briarcliff Manor, NY 10510

1184

PATENT APPLICATION FEE DETERMINATION RECORD
Effective November 10, 1998

Application or Docket Number: 9/435,124

CLAIMS AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA
BASIC FEE	[redacted]	
TOTAL CLAIMS	10 (10) minus 20=	*
INDEPENDENT CLAIMS	4 minus 3 =	* 1
MULTIPLE DEPENDENT CLAIM PRESENT		

SMALL ENTITY TYPE ☐		OR	OTHER THAN SMALL ENTITY	
RATE	FEE		RATE	FEE
[redacted]	380.00	OR	[redacted]	760.00
X$ 9=		OR	X$18=	
X39=		OR	X78=	78.00
+130=		OR	+260=	
TOTAL		OR	TOTAL	838.00

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

AMENDMENT A

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	* 13	Minus	**	=
Independent	* 7	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X39=		OR	X78=	
+130=		OR	+260=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT B

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	* Same	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X39=		OR	X78=	
+130=		OR	+260=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT C

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	* 18	Minus	**	=
Independent	* 7	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X39=		OR	X78=	
+130=		OR	+260=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/455,124	12/06/1999	BERNARD HUNT	PHB-34.306	4674

24737 7590 08/20/2003

PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

EXAMINER
GANTT, ALAN T

ART UNIT	PAPER NUMBER
2684	19

DATE MAILED: 08/20/2003

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

Advisory Action	Application No.	Applicant(s)	
	09/455,124	HUNT, BERNARD	
	Examiner	Art Unit	
	Alan T. Gantt	2684	

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

THE REPLY FILED 31 July 2003 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE. Therefore, further action by the applicant is required to avoid abandonment of this application. A proper reply to a final rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114.

PERIOD FOR REPLY [check either a) or b)]

a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.

b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection. ONLY CHECK THIS BOX WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

1. ☐ A Notice of Appeal was filed on _____. Appellant's Brief must be filed within the period set forth in 37 CFR 1.192(a), or any extension thereof (37 CFR 1.191(d)), to avoid dismissal of the appeal.

2. ☐ The proposed amendment(s) will not be entered because:

   (a) ☐ they raise new issues that would require further consideration and/or search (see NOTE below);

   (b) ☐ they raise the issue of new matter (see Note below);

   (c) ☐ they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or

   (d) ☐ they present additional claims without canceling a corresponding number of finally rejected claims.

   NOTE: _____.

3. ☐ Applicant's reply has overcome the following rejection(s): _____.

4. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).

5. ☒ The a)☐ affidavit, b)☐ exhibit, or c)☒ request for reconsideration has been considered but does NOT place the application in condition for allowance because: *See Continuation Sheet*.

6. ☒ The affidavit or exhibit will NOT be considered because it is not directed SOLELY to issues which were newly raised by the Examiner in the final rejection.

7. ☐ For purposes of Appeal, the proposed amendment(s) a)☐ will not be entered or b)☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.

   The status of the claim(s) is (or will be) as follows:

   Claim(s) allowed: _____.

   Claim(s) objected to: _____.

   Claim(s) rejected: *1-18*.

   Claim(s) withdrawn from consideration: _____.

8. ☐ The proposed drawing correction filed on _____ is a)☐ approved or b)☐ disapproved by the Examiner.

9. ☐ Note the attached Information Disclosure Statement(s)(PTO-1449) Paper No(s). _____.

10. ☐ Other: _____

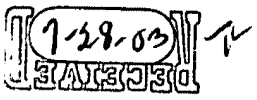
Continuation of 5. does NOT place the application in condition for allowance because: Applicant makes assumptions regarding the priorart, such as wait time for acknowledgment. This seems to inhibit applicant from providing more detail in the independent claims..

Alan Gantt

NAY MAUNG
PRIMARY EXAMINER

#12
LB
7/31/03

Official



RESPONSE UNDER 37 C.F.R. §1.116 EXPEDITED PROCEDURE EXAMINING GROUP 2834

PATENTS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Bernard Hunt	Examiner:	Alan T. Gantt
Serial No:	09/455,124	Art Unit:	2684
Filed:	December 6, 1999	Docket:	PHB 34,306 (16865)
For:	RADIO COMMUNICATION SYSTEM WITH REQUEST RE-TRANSMISSION UNTIL ACKNOWLEDGED	Date:	July 28, 2003

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

RESPONSE UNDER 37 C.F.R. §1.116

Sir:

This is a response to the Final Office Action mailed on June 16, 2003.

No claims are amended. The pending claims are set forth in the amendment mailed on March 31, 2003.

CERTIFICATE OF FACSIMILE TRANSMISSION UNDER 37 C.F.R. §1.8(a)

I hereby certify that this correspondence is being facsimile transmitted to the Commissioner for Patents at fax number 703-308-6306 on July 28, 2003.

Dated: July 28, 2003

Rosemarie J. Lamb

REMARKS

This is a response to the Final Office Action mailed on June 16, 2003.

Claims 1-3, 6-9, 11-13 and 14-18 have been rejected under 35 U.S.C. §103 as being unpatentable over Willey in view of Schwartz. Applicant respectfully traverses the rejection.

Willey discusses a system for soft handoffs that uses access probes. In particular, Willey states: "Whenever the mobile station sends a message in the System Access State, it must make an "access attempt" to the single base station it is monitoring. An access attempt is the process of repeatedly transmitting the message until receiving an acknowledgment for the message from the base station. Each transmission in the access attempt is called an "access probe," which is composed of an Access Channel Preamble and an Access Channel Message." Col. 2, lines 20-27. Willey further states: "The steps of measuring the pilot signal strengths, (step 220), creating an Access Channel Message that includes the most recent measured pilot strengths and identities, (step 210), and transmitting the Access Channel Message in subsequent access probes are repeated until the radiotelephone receives from the base station an acknowledgment of receipt of the Access Channel Message within a first predetermined time duration, (step 225), or a maximum number of access probes have been transmitted, (step 230)." Col. 5, lines 34-42 and Fig. 2. It is clear from Figure 2 that only one access probe is transmitted in the first predetermined time duration since a re-transmission of the access probe occurs only after an acknowledgement has not been received in the first predetermined time duration (step 225), the

maximum number of attempts has not been made (step 230) and an appropriate amount of time has passed (step 235).

Accordingly, Applicant respectfully disagrees with the Examiner's statement that "As the radiotelephone is sending information whenever the time period expires it follows that nearly 100% of the radiotelephone's allocated time slots are being used for the re-transmitting the request." However, the use of a waiting period (e.g., the first predetermined time duration) for receiving an acknowledgement before re-transmitting indicates that the access probe, or access attempt transmission, is not repeated in at least a majority of allocated time slots. In fact, Willey states: "The time between successive access probes is in the order of hundreds of milliseconds." Col. 3, lines 10 and 11. Referring to Applicant's specification, each frame 202 used in an uplink channel for the Universal Mobile Telecommunication System (UMTS) has a duration of 10 milliseconds, and each base station (BS) is allocated a time slot 204 in every frame 202, space permitting. Page 4, line 26 – page 5, line 2. With this example approach, the base station repeats its transmission for requesting resources every 10 milliseconds, which is dramatically shorter than hundreds of milliseconds. This rapid re-transmission can occur because, unlike the Willey system, no waiting period for receiving an acknowledgement before re-transmitting is used.

Accordingly, Willey's scheme for setting a time between re-transmitting successive access probes on the order of hundreds of milliseconds and implementing a waiting period for receiving an acknowledgement before re-transmitting an access probe clearly does not lead one of ordinary skill in the art to the present invention, and in fact teaches away from the present invention, which involves re-transmitting a request for resources in at least a majority of allocated time slots until an acknowledgement is received.

Regarding Schwartz, this reference is concerned with the data link layer of the Open System Interconnection model that defines a networking framework for implementing protocols in seven layers. In particular, Schwartz and the present invention are directed to different problems. Schwartz's go-back-N protocol is an error recovery protocol, whereas the present invention involves a secondary station requesting resources from a primary station. Moreover, unlike the invention, the go-back-N protocol does not involve transmitting data in allocated time slots, the data that is transmitted does not involve a request for resources, and the same frame of data is not re-transmitted in a majority of allocated time slots. Instead, the go-back-N protocol allows a sending station to transmit data in multiple frames without waiting for an acknowledgement from the receiving station, with the constraint that transmission stops if there are more than N unacknowledged packets.

Accordingly, there is no motivation to combine Schwartz and Willey and, even if such a combination were made, it still fails to disclose or suggest the invention as claimed.

Withdrawal of the rejection is therefore respectfully requested.

Claims 4, 5 and 10 have been rejected under 35 U.S.C. §103 as being unpatentable over Willey in view of Schwartz and Tiedemann, Jr. et al. Tiedemann enables a mobile station to access a base station by transmitting a request portion of an access probe to the base station over a reverse link common control channel. In response, the base station transmits a channel assignment message to the mobile station designating a reserved access channel. In response, the mobile station transmits a message portion of the access probe over the reserved access channel. See Abstract. The channel assignment message may specify power control information that the mobile station uses to adjust its transmit power. However, this is not the same as a secondary station that modifies the power of re-transmitted requests as claimed in response to a lack of

acknowledgement from a primary station. Instead, with the Tiedemann system, the channel assignment message transmitted from the base station to the mobile station acknowledges the access probe portion transmitted from the mobile station to the base station, so power is not adjusted in response to a lack of acknowledgement. The combination of Willey, Schwartz, and Tiedemann therefore fails to disclose or suggest the invention as claimed.

Withdrawal of the rejection is therefore respectfully requested.

In view of the above, the application is believed to be in condition for immediate allowance. If the Examiner believes that a telephone conference with Applicant's attorneys would be advantageous to the disposition of this case, the Examiner is requested to telephone the undersigned.

Respectfully submitted,

Thomas Spinelli
Registration No.: 39,533

Scully, Scott, Murphy & Presser
400 Garden City Plaza
Garden City, New York 11530

TS/RH/rl

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To:	Examiner Alan T. Gantt	**From:**	Thomas Spinelli
Fax:	(703) ~~308-6306~~ 872-9315	**Pages:**	10 (including cover sheet)
Phone:	(703) 305-0077	**Date:**	July 28, 2003
Re:	Response to Office Action dated June 16, 2003	**CC:**	

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1. Amendment Transmittal in duplicate
2. RESPONSE (Sec. 116)
3. Certificate of Transmission by Facsimile dated July 28, 2003

Applicants: Bernard Hunt
Serial No.: 09/455,124
Filed: December 6, 1999
For: RADIO COMMUNICATION SYSTEM . . .
Docket: PHB 34,306 (16865)
Dated: July 28, 2003
TS:RHL/rjl

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CERTIFICATE OF TRANSMISSION BY FACSIMILE (37 CFR 1.8) Applicant(s): Bernard Hunt			Docket No. PHB 34,306 (16865)
Serial No. 09/455,124	Filing Date December 6, 1999	Examiner Alan T. Gantt	Group Art Unit 2684

Invention:

RADIO COMMUNICATION SYSTEM WITH REQUEST RE-TRANSMISSION UNTIL ACKNOWLEDGED

I hereby certify that this **RESPONSE UNDER 37 C.F.R. SECTION 1.116**
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P18/REV01

AMENDMENT TRANSMITTAL LETTER (Large Entity) Applicant(s): **Bernard Hunt**	Docket No. **PHB-34,306 (16865)**

Serial No.	Filing Date	Examiner	Group Art Unit
09/455,124	**December 6, 1999**	**Alan T. Gantt**	**2684**

Invention:

RADIO COMMUNICATION SYSTEM WITH REQUEST RE -TRANSMISSION UNTIL ACKNOWLEDGED

TO THE COMMISSIONER FOR PATENTS:

Transmitted herewith is an amendment in the above-identified application.

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	18	-	20	=	0	x	$18.00	$0.00
INDEP. CLAIMS	7	-	7	=	0	x	$84.00	$0.00
Multiple Dependent Claims (check if applicable) ☐								$0.00
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Dated: **July 28, 2003**

Thomas Spinelli
Registration No.: 39,533

Scully, Scott, Murphy & Presser
400 Garden City Plaza
Garden City, New York 11530
(516) 742-4343

TS:RFH/rjl

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/455,124	12/06/1999	BERNARD HUNT	PHB-34.306	4674

24737 7590 06/16/2003

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EXAMINER	
GANTT, ALAN T	
ART UNIT	PAPER NUMBER
2684	10

DATE MAILED: 06/16/2003

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

Office Action Summary	Application No.	Applicant(s)	
	09/455,124	HUNT, BERNARD	
	Examiner	Art Unit	
	Alan T. Gantt	2684	

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

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

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

Disposition of Claims

4)☒ Claim(s) 1-18 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-18 is/are rejected.

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

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

Application Papers

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

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

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

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

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

a)☒ All b)☐ Some * c)☐ None of:

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

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

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

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

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 4/9/03 have been fully considered but they are not persuasive. Applicant primarily argues that:

(a) The Willey reference utilizes an access channel message that is continuously transmitted and contains different data each time, namely different newly measured neighbor pilot strengths.

(b) The Schwartz reference also teaches retransmitting different data in each frame as is ascertained from the passage "all frames following are retransmitted". If all frames contained the same data there would be no need to retransmit all frames, as retransmitting a single frame would suffice.

Regarding (a) and (b), the language of the independent claims do not negate the two references. The Willey reference is resending the message as required and it continues to resend the message (after a predetermined time period) until the base station acknowledges and the mobile does this at each time slot allocated to it. It would seem irrelevant that the most recent neighbor pilot strengths are attached to the message. The mobile would still be seeking the attention of the base station until it gets its acknowledgement. Also, with regards to the Schwartz reference, the reference provides that "all frames following are retransmitted". Applicant assumes that there is no need to retransmit all the frames as retransmitting a single frame would suffice. However, Schwartz shows that it is possible to retransmit the same information until the base

station acknowledges regardless of the information being retransmitted as is also done by applicant's invention.

Thus, the previous Office Action Rejection is upheld.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3, 6-9, and 11-13, and 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Willey, in view of Schwartz, Telecommunication Networks, pages, 122-124.

Regarding claim 1, 6, 7, 9, and 11-13,

Willey discloses a method as applied to a radio communication system for a radiotelephone to communicate an access channel message to a serving base station that includes the most recently measured pilot strengths of neighboring base stations. The transmitting of the access channel message in subsequent access probes are repeated until the radiotelephone receives from the base station an acknowledgment within a predetermined time period or a maximum number of access probes have been transmitted (col. 5, lines 23-42). As the radiotelephone is sending the information whenever the time period expires it follows that nearly 100% of the radiotelephone's allocated time slots are being used for the re-transmitting the request. Further, it is known in the art that the base station controllers assign time slots to

secondary stations. Determining uplink signaling sequences and the allocated time slot frame based on the downlink broadcast from the base station is also known in the art. There are, however, a maximum number of retransmit attempts allowed by Willey, as the applicant's has no stated limit regarding the number of retransmit attempts.

Schwartz discloses a protocol known as G-back-N or continuous transmission. With this protocol, data frames are transmitted continuously, if available, without waiting for an acknowledgment. On receipt of a negative acknowledgment, or expiration of the timeout without receipt of an ack/nak, the frame in question and all the frames following are retransmitted. The illustrated examples show stations A and B where, by the acknowledgment tasks, B is the primary station and A is the secondary station (pages 122-124).

Willey and Schwartz are combinable because they share a common endeavor, namely, telecommunication networks requiring clearance to transmit on a time-shared channel as governed by the primary station in the form of an acknowledgment. At the time of the applicant's invention it would have been obvious to modify Willey to not limit the number of re-transmission of requests as such limits are not done by Schwartz so that the communication can weather short term fading.

Regarding claim 2, the examiner takes Official Notice that it is well-known practice for a primary station to determine whether a request has been transmitted by the base station from a combination of the received signals in a plurality of successive time slots allocated to the secondary station and it would have been obvious for Willey to utilize such a system since a

sequential numbering of the request would let the primary station know how long the secondary has been trying to make contact.

Regarding claims 3 and 8, the examiner takes Official Notice that it is well-known practice for a primary station to determine whether a request has been transmitted by the base station from a combination of the received signals in a plurality of successive time slots allocated to the secondary station if the received level is between a lower and an upper threshold [as done by Mansfield (col. 11, lines 8-30)] and it would have been obvious for Willey to use such a method since such a method indicates to the primary station the quality of the propagation path between the primary and the secondary station.

Regarding claims 14-18, Willey states that the infrastructure (i.e., the network, primary station and controller) creates a second Active Set for forward channel traffic reception and compares the first active set with this second set, which specifies more current pilot strengths. Willey further states the infrastructure begins to allocate the base stations identified in each access channel message that will transmit over their respective Paging Channel. Also, access channel messages can include the measured separately both the measured pilot strengths and corresponding identities of neighboring pilots that have sufficient measured pilot strength that an associated forward traffic channel can be successfully demodulated and the identities of neighboring pilots that have sufficient measured pilot strength that an associated paging channel could be successfully demodulated (col. 7, lines 2-20 and col. 7, lines 31-65). These passages meet the claim language of claims 14-18 which generally reads as follows:

- Examining by a primary station [controller], signal strengths of a request received from a secondary station in a plurality of allocated time slots, when one of said signal strengths is close to a detection threshold.

3. Claims 4, 5,and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Willey, in view of Schwartz, Telecommunication Networks, pages, 122-124, and further in view of Tiedemann, Jr. et al.

4. Regarding claims 4, 5, and 10; Willey and Schwartz provide for continuous of request for resources without an immediate acknowledgment by the primary station. However, the combination is silent regarding modifying the secondary station's transmit power due to a lack of acknowledgment.

Tiedemann provides for power control of the reverse channel from commands by the primary station (forward channel) when the secondary station is transmitting on the reserved access channel (col. 3, lines 30-35, col. 4, lines 50-64 and col. 13, lines 24-50).

Willey, and Schwartz, and Tiedemann are combinable because they share a common endeavor, namely, telecommunication networks requiring clearance to transmit on a time-shared channel as governed by the primary station in the form of an acknowledgment. At the time of the applicant's invention it would have been obvious to modify Willey to include the capability to keeps retransmitting without a maximum number of retransmits so that the communication can weather fades and to modify the combination to include means for modifying the power of the secondary station as done by Tiedemann such that when the primary station notices that requests are not being received, it can boost the secondary station transmission power.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication from the examiner should be addressed to Alan Gantt at telephone number (703) 305-0077. The examiner can normally be reached between 9:30 AM and 6 PM within the Eastern Time Zone. The group FAX number is (703) 308-6306.

Any inquiry of a general nature or relating to this application should be directed to the group receptionist at telephone number (703) 305-4700.

Alan T. Gantt

Alan T. Gantt

June 11, 2003

NAY MAUNG
PRIMARY EXAMINER

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

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PATENT
Serial No. 09/455,124

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	Atty. Docket
BERNARD HUNT	PHB 34,306
Serial No. 09/455,124	Group Art Unit: 2684
Filed: DECEMBER 6, 1999	Examiner: ALAN T. GANTT

Title: RADIO COMMUNICATION SYSTEM WITH REQUEST RE-TRANSMISSION UNTIL ACKNOWLEDGED (As Amended)

Honorable Commissioner for Patents
Washington, D.C. 20231

AMENDMENT

Sir:

In response to the Office Action mailed January 2, 2003, please amend the above-identified application as follows:

IN THE CLAIMS

Please amend claim 9 and add claims 14-18 as follows:

1. (previously amended) A method of operating a radio communication system, comprising a secondary station transmitting a request for resources to a primary station in a time slot allocated to the secondary station, wherein the secondary station re-transmitting the request in at least a majority of its allocated time slots until an acknowledgement is received from the primary station.

2. (previously amended) The method as claimed in claim 1, wherein the primary station determines whether a request has been transmitted by the secondary station from a combination of the received signals in a plurality of successive time slots allocated to the secondary station.

3. (previously amended) The method as claimed in claim 1, wherein the primary station determines whether a request has been transmitted by the secondary station from a combination of the received signals in a plurality of successive time slots allocated

to the secondary station only if the level of a received request is between a lower and an upper threshold.

4. (previously amended) The method as claimed in claim 1, wherein the secondary station modifies the power of re-transmitted requests in response to a lack of acknowledgment from the primary station.

5. (previously amended) The method as claimed in claim 4, wherein the secondary station increases the power of re-transmitted requests in response to a lack of acknowledgment signal from the primary station.

6. (previously amended) A radio communication system comprising a primary station and a plurality of secondary stations, the primary station having means for allocating a time slot for a secondary station to transmit a request for resources to the primary station, wherein the secondary station has means for re-transmitting the request in at least a majority of its allocated time slots until it receives an acknowledgement from the primary station.

7. (previously amended) A primary station for use in a radio communication system, the primary station having means for allocating time slots to secondary stations for requesting resources, wherein the primary station has combining means for determining from a combination of received signals having a request for resources in a plurality of successive time slots allocated to the secondary station whether the secondary station has transmitted said request.

8. (previously amended) A primary station as claimed in claim 7, wherein the combining means are only operated if the level of a received request is between a lower and an upper threshold.

9. (currently amended) A secondary station for use in a radio communication system including a primary station~~, said secondary station comprising:~~

——having means for allocating a time slot for the secondary station to transmit a request for resources to the primary station, ~~and~~ said secondary station comprising

means for re-transmitting the request in at least a majority of the allocated time slots until an acknowledgment is received from the primary station.

10. (previously amended) A secondary station as claimed in claim 9, further comprising means for modifying the power of re-transmitted requests in response to lack of an acknowledgement signal from the primary station.

11. (previously added) A radio communication system comprising: a primary station having a controller; and a plurality of secondary stations; wherein said controller allocates time slots for one of said plurality of secondary stations to transmit a request for resources to the primary station; said secondary station re-transmitting said request in at least a majority of said time slots until said secondary station receives an acknowledgement from said primary station.

12. (previously added) A primary station comprising a controller which allocates time slots to at least one secondary station for requesting resources; wherein, from a combination of received signals having a request for resources in a plurality of said time slots, said controller determines whether said at least one secondary station has transmitted said request.

13. (previously added) A secondary station comprising a controller which allocates time slots for said secondary station to transmit a request for resources to a primary station; said secondary station re-transmitting said request in a plurality of said time slots until an acknowledgement is received from said primary station.

14. (New) The method of claim 1, further comprising examining by a primary station signal strengths of said request received from said secondary station in a plurality of said allocated time slots, when one of said signal strengths is close to a detection threshold.

15. (New) The radio communication system of claim 6, wherein said primary station is configured to examine signal strengths of said request received from said secondary station in a plurality of said allocated time slots, when one of said signal strengths is close to a detection threshold.

16. (New) The secondary station of claim 9, wherein said primary station is configured to examine signal strengths of said request received from said secondary station in a plurality of said

allocated time slots, when one of said signal strengths is close to a detection threshold.

17. (New) The radio communication system of claim 11, wherein said controller is configured to examine signal strengths of said request received from said secondary station in a plurality of said allocated time slots, when one of said signal strengths is close to a detection threshold.

18. (New) The secondary station of claim 13, wherein said primary station is configured to examine signal strengths of said request received from said secondary station in a plurality of said allocated time slots, when one of said signal strengths is close to a detection threshold.

REMARKS

Reconsideration of the present application, as amended, is respectfully requested.

By means of the present amendment, claim 9 has been amended for clarification.

In the Office Action, claims 1-3, 6-9 and 11-13 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. 5,854,785 (Willey) in view Schwartz, Telecommunication Network, pages 122-124 (Schwartz). Further, claims 4-5 and 10 were rejected under 35 U.S.C. §103(a) as being unpatentable over Willey in view of Schwartz, and further in view of U.S. 6,256,301 (Tiedermann). Applicant respectfully traverses these rejections, and submits that claims 1-13, as well as new claims 11-18, are patentable over Willey, Schwartz and Tiedermann for at least the following reasons.

Willey discloses a wireless communication system that provides soft handoff. A mobile telephone measures pilot signal strengths received from various base stations including neighboring base station pilots. The mobile telephone builds an access channel message that includes strengths of the various different pilots from different base station, and continuously transmits the access channel message (step 215 in FIG 2) until the mobile telephone

receives a receipt acknowledgment from a base station within a predetermined time duration. As indicated in step 220 of FIG 2, the mobile telephone continues to measure neighbor pilot strengths. Thus, the access channel message that is continuously transmitted contains different data each time, namely, the different newly measured neighbor pilot strengths. Similarly, Schwartz teaches retransmitting different data in each frame, as clearly ascertained from line 1, page 123, which indicates that "all frames following are retransmitted." Certainly, based on the teaching of Willey, if all these frames contained the same data, there would be no need to retransmit all the frames, as retransmitting a single frame would suffice.

In stark contrast, the present invention as recited in independent claims 1, 6, 9, 11 and 13, require that the same request be re-transmitted. This feature is nowhere taught or suggested in Willey, Schwartz or combination thereof. Accordingly, it is respectfully submitted that independent claims 1, 6, 9, 11 and 13 be allowed. In addition, it is respectfully submitted that claims 2-5, 10 and 14-18 should also be allowed at least based on their dependence from independent claims 1, 6, 9, 11 and 13.

Claims 7, 12 and 14-18 also include patentable subject matter, namely, a primary station that is configured to examine a

combination of signal strengths of the request received from a particular secondary station in a multiple allocated time slots, when one of the signal strengths is close to a detection threshold. This provides substantial benefits, such as determining whether a request was sent by a particular secondary station, as indicated on page 2, lines 28-32 of the specification.

Willey, Schwartz and combination thereof, do not teach or suggest this feature. Willey is concerned with the mobile station measuring pilots of base stations and is completely silent about the base stations measuring signals received from the same mobile station in multiple frames allocated to that same mobile station.

In view of the above, it is respectfully submitted that the present application is in condition for allowance, and a Notice of Allowance is earnestly solicited.

If any informalities remain, the Examiner is requested to telephone the undersigned in order to expedite allowance.

Please charge any fee deficiencies and credit any overpayments to Deposit Account No. 14-1270.

Respectfully submitted,

By _____
Dicran Halajian, Reg. 39,703
Attorney
(914) 333-9607
March 31, 2003

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/455,124	12/06/1999	BERNARD HUNT	PHB-34.306	4674

7590 01/02/2003

CORPORATE PATENT COUNSEL
US PHILIPS CORPORATION
580 WHITE PLAINS ROAD
TARRYTOWN, NY 10591

EXAMINER	
GANTT, ALAN T	
ART UNIT	PAPER NUMBER
2684	

DATE MAILED: 01/02/2003

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

PTO-90C (Rev. 07-01)

Office Action Summary	Application No.	Applicant(s)
	09/455,124	HUNT, BERNARD
	Examiner	Art Unit
	Alan T. Gantt	2684

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *25 September 2002* .

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

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

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

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

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

Application Papers

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

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

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

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

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

a)☒ All b)☐ Some * c)☐ None of:

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

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

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

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

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 9/25/02 have been fully considered. Applicant primarily argues that:

(a) The Mansfield reference allows 79 A/N that acknowledge successful transmission of 79 data segments are included in an AACK message, i.e., all 79 data segments can be acknowledged with a single AACK message. Ultimately, the same data is not re-transmitted until acknowledgment is received. Re-transmission of the same frame only occurs when a responsive message does not indicate successful reception.

(b) Van Driel and Mansfield alone or in combination, do not teach or suggest a primary station which, from a combination of received signals having the same request for resources in a plurality of allotted time slots.

Regarding (a) and (b), the examiner accepts applicant's argument and presents new grounds of rejection utilizing the textbook Mischa Schwartz's, Telecommunication Networks and a patent by Willey.

Claim Rejections - 35 USC § 103

2. 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.

3. Claims 1-3, 6-9, and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Willey, in view of Schwartz, Telecommunication Networks, pages, 122-124.

Regarding claim 1, 6, 7, 9, and 11-13,

Willey discloses a method as applied to a radio communication system for a radiotelephone to communicate an access channel message to a serving base station that includes the most recently measured pilot strengths of neighboring base stations. The transmitting of the access channel message in subsequent access probes are repeated until the radiotelephone receives from the base station an acknowledgment within a predetermined time period or a maximum number of access probes have been transmitted (col. 5, lines 23-42). As the radiotelephone is sending the information whenever the time period expires it follows that nearly 100% of the radiotelephone's allocated time slots are being used for the re-transmitting the request. Further, it is known in the art that the base station controllers assign time slots to secondary stations. Determining uplink signaling sequences and the allocated time slot frame based on the downlink broadcast from the base station is also known in the art. There are, however, a maximum number of retransmit attempts allowed by Willey, as the applicant's has no stated limit regarding the number of retransmit attempts.

Schwartz discloses a protocol known as G-back-N or continuous transmission. With this protocol, data frames are transmitted continuously, if available, without waiting for an acknowledgment. On receipt of a negative acknowledgment, or expiration of the timeout without receipt of an ack/nak, the frame in question and all the frames following are retransmitted. The illustrated examples show stations A and B where, by the acknowledgment tasks, B is the primary station and A is the secondary station (pages 122-124).

Willey and Schwartz are combinable because they share a common endeavor, namely, telecommunication networks requiring clearance to transmit on a time-shared channel as governed by the primary station in the form of an acknowledgment. At the time of the applicant's invention it would have been obvious to modify Willey to not limit the number of re-transmission of requests as such limits are not done by Schwartz so that the communication can weather short term fading.

Regarding claim 2, the examiner takes Official Notice that it is well-known practice for a primary station to determine whether a request has been transmitted by the base station from a combination of the received signals in a plurality of successive time slots allocated to the secondary station and it would have been obvious for Willey to utilize such a system since a sequential numbering of the request would let the primary station know how long the secondary has been trying to make contact.

Regarding claims 3 and 8, the examiner takes Official Notice that it is well-known practice for a primary station to determine whether a request has been transmitted by the base station from a combination of the received signals in a plurality of successive time slots allocated to the secondary station if the received level is between a lower and an upper threshold [as done by Mansfield (col. 11, lines 8-30)] and it would have been obvious for Willey to use such a method since such a method indicates to the primary station the quality of the propagation path between the primary and the secondary station.

4. Claims 4, 5,and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Willey, in view of Schwartz, Telecommunication Networks, pages, 122-124, and further in view of Tiedemann, Jr. et al.

5. Regarding claims 4, 5, and 10; Willey and Schwartz provide for continuous of request for resources without an immediate acknowledgment by the primary station. However, the combination is silent regarding modifying the secondary station's transmit power due to a lack of acknowledgment.

Tiedemann provides for power control of the reverse channel from commands by the primary station (forward channel) when the secondary station is transmitting on the reserved access channel (col. 3, lines 30-35, col. 4, lines 50-64 and col. 13, lines 24-50).

Willey, and Schwartz, and Tiedemann are combinable because they share a common endeavor, namely, telecommunication networks requiring clearance to transmit on a time-shared channel as governed by the primary station in the form of an acknowledgment. At the time of the applicant's invention it would have been obvious to modify Willey to include the capability to keeps retransmitting without a maximum number of retransmits so that the communication can weather fades and to modify the combination to include means for modifying the power of the secondary station as done by Tiedemann such that when the primary station notices that requests are not being received, it can boost the secondary station transmission power.

Conclusion

Any inquiry concerning this communication from the examiner should be addressed to Alan Gantt at telephone number (703) 305-0077. The examiner can normally be reached

between 9:30 AM and 6 PM within the Eastern Time Zone. The group FAX number is (703) 308-6306.

Any inquiry of a general nature or relating to this application should be directed to the group receptionist at telephone number (703) 305-4700.

Alan T. Gantt

ALAN THOMAS GANTT
PATENT EXAMINER

Alan T. Gantt

December 30, 2002

Notice of References Cited	Application/Control No. 09/455,124	Applicant(s)/Patent Under Reexamination HUNT, BERNARD	
	Examiner Alan T. Gantt	Art Unit 2684	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-5,854,785	12-1998	Willey, William Daniel	370/332
	B	US-6,256,301	07-2001	Tiedemann et al.	370/342
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Schwartz, Mischa; "Telliccommunication Networks", November 1988, Pages 122-124
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Remarks 2684
#7/Suppl Amdt 13
10/16/02

PATENT
Atty. Docket: PHB34-306 A.S.

Entered

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : BERNARD HUNT

Examiner: A.T. GANTT

Serial No. : 09/455,124

Group Art Unit: 2684

Filed : December 6, 1999

For : RADIO COMMUNICATION SYSTEM WITH REQUEST RE-TRANSMISSION UNTIL ACKNOWLEDGED (As Amended)

Assistant Commissioner for Patents
Washington, D.C. 20231

SUPPLEMENTAL AMENDMENT

Sir:

In addition to the Amendment mailed on September 20, 2002, responsive to the Office Action mailed on June 20, 2002, the following remarks are presented:

REMARKS

In an Amendment mailed on September 20, 2002, the marked up version of the amended claims 1-10 showed the deletions in brackets but inadvertently did not show the additions as being underlined. The Amendment mailed on September 20, 2002, includes the proper clean versions of the amended claims 1-10.

Accordingly, a properly marked up version of the amended claims 1-10 is being submitted herewith in Appendix A. In particular, the marked up versions of the amended claims 1-10 included in Appendix A of the present Amendment shows as underlined the additions made by the Amendment mailed on September 20, 2002, as well as the deletions shown in brackets.

Respectfully submitted,

Dicran Halajian, Reg. 39,703
Attorney
(914) 333-9607
September 26, 2002

Enclosure: Marked Up Amended Claims (Appendix A)

CERTIFICATE OF MAILING

It is hereby certified that this correspondence is being deposited with the United States Postal Service as first-class mail in an envelope addressed to:

COMMISSIONER OF PATENTS
Washington, D.C. 20231

On September 26, 2002
(Date of Mailing)

By Natalie A. Monzo
(Signature)

Appendix B

Version with Markings
to Show Changes Made to the Claims

The following are marked up versions of amended claims 1-10 where deletions are in brackets and additions are underlined:

1. A method of operating a radio communication system, comprising a secondary station transmitting a request for resources to a primary station in a time slot allocated to the secondary station, [characterized by] wherein the secondary station re-transmitting the request in at least a majority of its allocated time slots until an acknowledgement is received from the primary station.

2. The method as claimed in claim 1, [characterized by] wherein the primary station [determining] determines whether a request has been transmitted by the secondary station from a combination of the received signals in a plurality of successive time slots allocated to the secondary station.

3. The method as claimed in claim 1, [characterized by] wherein the primary station [determining] determines whether a request has been transmitted by the secondary station from a combination of the received signals in a plurality of successive time slots allocated to the secondary station only if the level of a received request is between a lower and an upper threshold.

4. The method as claimed in claim 1, [characterized by] wherein the secondary station [modifying] modifies the power of re-transmitted requests in response to a lack of acknowledgment from the primary station.

5. The method as claimed in claim 4, [characterized by] wherein the secondary station [increasing] increases the power of re-transmitted requests in response to a lack of acknowledgment signal from the primary station.

6. A radio communication system comprising a primary station and a plurality of secondary stations, the primary station having means for allocating a time slot for a secondary station to transmit a request for resources to the primary station, [characterized in that] wherein the secondary station has means for re-transmitting the request in at least a majority of its allocated time slots until it receives an acknowledgement from the primary station.

7. A primary station for use in a radio communication system, the primary station having means for allocating time slots to secondary stations for requesting resources, [characterized in that] wherein the primary station has combining means for determining from a combination of received signals having a request for resources in a plurality of successive time slots allocated to the secondary station whether the secondary station has transmitted [a] said request [for resources].

8. A primary station as claimed in claim 7, [characterized in that] wherein the combining means are only operated if the level of a received request is between a lower and an upper threshold.

9. A secondary station for use in a radio communication system including a primary station, said secondary station [having] comprising:

means for allocating a time slot for the secondary station to transmit a request for resources to the primary station, [characterized in that] and

means [are provided] for re-transmitting the request in at least a majority of the allocated time slots until an acknowledgment is received from the primary station.

10. A secondary station as claimed in claim 9, [characterized in that] further comprising means [are provided] for modifying the power of re-transmitted requests in response to lack of an acknowledgement signal from the primary station.

2684
#6A
SR
10/1/02

PATENT
Atty. Docket: PHB34-306

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

entered completely 4/9/03

Applicant : BERNARD HUNT

Examiner: A.T. GANTT

Serial No. : 09/455,124

Group Art Unit: 2684

Filed : December 6, 1999

For : RADIO COMMUNICATION SYSTEM

Assistant Commissioner for Patents
Washington, D.C. 20231

AMENDMENT UNDER 37 C.F.R. §1.111

Sir:

In response to an Office Action of the U.S. Patent and Trademark Office mailed on June 20, 2002.

IN THE SPECIFICATION

Please amend the specification as follows:

Page 1, please replace the title with the following:

A1

— RADIO COMMUNICATION SYSTEM WITH REQUEST RE-TRANSMISSION UNTIL ACKNOWLEDGED. —

CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.8(a)

I hereby certify that this Amendment and any document referred to as enclosed herein is being deposited with the United States Postal Service as first class mail, postpaid in an envelope, addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

Dated: Sep 20, 2002

Michael Scaturro
(Name of Person Mailing Envelope)

(Signature of Person Mailing Envelope)

Page 1, before the first paragraph, insert as a centered heading:

--FIELD OF THE INVENTION--;

Page 1, between the first and second paragraphs, insert as a centered heading:

--BACKGROUND OF THE INVENTION--;

Page 2, after the first paragraph, namely after line 11, insert as a centered heading:

--SUMMARY OF THE INVENTION—

Page 3, after line 25, insert as a centered heading:

--BRIEF DESCRIPTION OF THE DRAWINGS--; and

Page 4, before line 16, insert as a centered heading:

--DETAILED DESCRIPTION OF THE INVENTION --.

IN THE ABSTRACT

Please replace the abstract as follows:

-- A method of operating a radio communication system in which secondary stations use dedicated time slots to request services from a primary station. A secondary station wishing to request a service sends a request in every time slot allocated to it until it receives an acknowledgement from the primary station. The primary station can use combining techniques on multiple time slots to identify the presence or absence of a request from a secondary station with improved accuracy.- -

N.E. ABSTRACT NOT ON SEPARATE PAGE

Please replace claims 1-10, and add claims 11-13 as follows, where marked-up versions of the amended claims 1-10 are attached as Appendix A:

1. (Replaced) A method of operating a radio communication system, comprising a secondary station transmitting a request for resources to a primary station in a time slot allocated to the secondary station, wherein the secondary station re-transmitting the request in at least a majority of its allocated time slots until an acknowledgement is received from the primary station.

A2 Cont.

2. (Replaced) The method as claimed in claim 1, wherein the primary station determines whether a request has been transmitted by the secondary station from a combination of the received signals in a plurality of successive time slots allocated to the secondary station.

3. (Replaced) The method as claimed in claim 1, wherein the primary station determines whether a request has been transmitted by the secondary station from a combination of the received signals in a plurality of successive time slots allocated to the secondary station only if the level of a received request is between a lower and an upper threshold.

4. (Replaced) The method as claimed in claim 1, wherein the secondary station modifies the power of re-transmitted requests in response to a lack of acknowledgment from the primary station.

5. (Replaced) The method as claimed in claim 4, wherein the secondary station increases the power of re-transmitted requests in response to a lack of acknowledgment signal from the primary station.

6. (Replaced) A radio communication system comprising a primary station and a plurality of secondary stations, the primary station having means for allocating a time slot for a secondary station to transmit a request for resources to the primary station, wherein the secondary station has means for re-transmitting the request in at least a majority of its allocated time slots until it receives an acknowledgement from the primary station.

A2 Cont.

7. (Replaced) A primary station for use in a radio communication system, the primary station having means for allocating time slots to secondary stations for requesting resources, wherein the primary station has combining means for determining from a combination of received signals having a request for resources in a plurality of successive time slots allocated to the secondary station whether the secondary station has transmitted said request.

8. (Replaced) A primary station as claimed in claim 7, wherein the combining means are only operated if the level of a received request is between a lower and an upper threshold.

Sub B7

9. (Replaced) A secondary station for use in a radio communication system including a primary station, said secondary station comprising:

means for allocating a time slot for the secondary station to transmit a request for resources to the primary station, and

means for re-transmitting the request in at least a majority of the allocated time slots until an acknowledgment is received from the primary station.

10. (Replaced) A secondary station as claimed in claim 9, further comprising means for modifying the power of re-transmitted requests in response to lack of an acknowledgement signal from the primary station.

--11. (New) A radio communication system comprising: a primary station having a controller; and a plurality of secondary stations; wherein said controller allocates time slots for one of said plurality of secondary stations to transmit a request for resources to the primary station; said secondary station re-transmitting said request in at least a majority of said time slots until said secondary station receives an acknowledgement from said primary station.

12. (New) A primary station comprising a controller which allocates time slots to at least one secondary station for requesting resources; wherein, from a combination of received signals having a request for resources in a plurality of said time slots, said controller determines whether said at least one secondary station has transmitted said request.

13. (New) A secondary station comprising a controller which allocates time slots for said secondary station to transmit a request for resources to a primary station; said secondary station re-transmitting said request in a plurality of said time slots until an acknowledgement is received from said primary station.—

REMARKS

This application ha been reviewed in light of the Office Action mailed on June 20, 2002. Claims 1-10 are pending in this application with Claims 1, 6 and 7 being in independent form. By the present amendment, the specification, the title, the abstract and Claims 1-10 have been amended and Claims 11-13 have been added. No new matter or issues are believed to be introduced by the amendments.

By the present amendment, the current Abstract has been replaced which better conforms to U.S. practice, where the last line with reference to Figure 3 in parenthesis has been deleted. Further, the specification and claims have been amended to place them in better form, such as adding headings to the specification and changing "characterized by" to —wherein-- in the claims.

The Office Action states that the title of the invention was not sufficiently descriptive, and required a new title. In response, Applicant has replaced the title to be clearly indicative of the invention to which the claims are directed.

Claims 1-3, 6, 7 and 9 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,320,869 (Van Driel et al.) in view of U.S. Patent No. 6,301,249 (Mansfield et al.). Further, claims 4, 5 and 10 were rejected under 35 U.S.C. §103(a) as being unpatentable over Van Driel in view Mansfield, and further in view of U.S. Patent No. 6,256,301 (Tiedemann Jr. et al). In response, claim 7 has been amended and new claims 11-13 have been added for clarification. It is respectfully submitted that claims 1-13 are patentable over Van Driel, Mansfield and Tiedemann for at least the following reasons.

Van Driel is directed to a telecommunication network with improved protocol where a transmission channel is shared among secondary stations. As correctly noted by the Examiner, Van Driel does not teach or suggest a secondary station that re-transmits the same request for resources

until an acknowledgment is received from the primary station. Mansfield is cited in an attempt to remedy this deficiency in Van Driel.

Mansfield is directed to an efficient error control for wireless packet transmission, where seventy nine A/N bits that acknowledge successful transmission of seventy nine data segments are included in a an AACK message. Thus, all seventy nine data segments can be acknowledged with a single AACK message. Each data segment or frame is different, and the transmitted seventy nine data segments or A/N bits do not include re-transmissions of previously transmitted data segments or A/N bits; the transmitted seventy nine data segments or A/N bits merely include transmissions of new data different from the previously transmitted data. That is, the same data is not retransmitted until acknowledgment is received. Rather, as specifically stated in the Abstract, re-transmission of the same frame occurs only when a responsive message does not indicate successful reception. Otherwise, the same frame or message is not re-transmitted.

In stark contrast, the present invention as recited in independent claims 1, 6, 9, 11, 12 and 13, requires that the same request be re-transmitted until an acknowledgment is received. This feature is nowhere taught or suggested in Van Driel, Mansfield, and combination thereof.

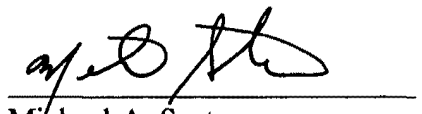
Further, Van Driel and Mansfield, alone or in combination, do not teach or suggest a primary station which, from a combination of received signals having the same request for resources in a plurality of allocated time slots, the primary station determines whether the secondary station has transmitted the same request. Mansfield merely determines from a single frame whether this frame was successfully received, and if a responsive message indicates unsuccessful reception, then the frame is re-transmitted and the successful reception of this re-transmitted frame is determined from examining this new frame by itself, not from a combination of received signals having the same request, as recited in independent claims 7 and 13.

Tiedemann is cited in rejecting claims 4, 5 and 10.and does not remedy the deficiencies in Van Driel and Mansfield. Accordingly, it is respectfully requested that independent claims 1, 6, 7, 9 and 11–13 be allowed. In addition, as claims 2-5, 8 and 10 depend from independent claims 1, 7 and 9, applicant respectfully requests that claims 2-5, 8 and 10 also be allowed over the prior art of record.

In view of the above, it is respectfully submitted that the present application is in condition for allowance, and a Notice of Allowance is earnestly solicited.

If the Examiner should have any questions concerning this communication or feels that an interview would be helpful, the Examiner is requested to call Dicron Halajian, Esq., Intellectual Property Counsel, Philips Electronics North America Corp., at 914-333-9607.

Respectfully submitted,



Michael A. Scaturro
Reg. No. 51,356
Attorney for Applicant

Mailing Address:
Intellectual Property Counsel
Philips Electronics North America Corp.
580 White Plains Road
Tarrytown, New York 10591

9. A secondary station for use in a radio communication system including a primary station, said secondary station [having] comprising:

means for allocating a time slot for the secondary station to transmit a request for resources to the primary station, [characterized in that] and

means [are provided] for re-transmitting the request in at least a majority of the allocated time slots until an acknowledgment is received from the primary station.

10. A secondary station as claimed in claim 9, [characterized in that] further comprising means [are provided] for modifying the power of re-transmitted requests in response to lack of an acknowledgement signal from the primary station.

Appendix A

VERSION AS AMENDED TO SHOW CHANGES MADE

IN THE CLAIMS

Please amend Claims 1-10 as set forth hereinbelow:

1. A method of operating a radio communication system, comprising a secondary station transmitting a request for resources to a primary station in a time slot allocated to the secondary station, [characterized by] wherein the secondary station re-transmitting the request in at least a majority of its allocated time slots until an acknowledgement is received from the primary station.

2. The method as claimed in claim 1, [characterized by] wherein the primary station [determining] determines whether a request has been transmitted by the secondary station from a combination of the received signals in a plurality of successive time slots allocated to the secondary station.

3. The method as claimed in claim 1, [characterized by] wherein the primary station [determining] determines whether a request has been transmitted by the secondary station from a combination of the received signals in a plurality of successive time slots allocated to the secondary station only if the level of a received request is between a lower and an upper threshold.

4. The method as claimed in claim 1, [characterized by] wherein the secondary station [modifying] modifies the power of re-transmitted requests in response to a lack of acknowledgment from the primary station.

5. The method as claimed in claim 4, [characterized by] wherein the secondary station [increasing] increases the power of re-transmitted requests in response to a lack of acknowledgment signal from the primary station.

6. A radio communication system comprising a primary station and a plurality of secondary stations, the primary station having means for allocating a time slot for a secondary station to transmit a request for resources to the primary station, [characterized in that] wherein the secondary station has means for re-transmitting the request in at least a majority of its allocated time slots until it receives an acknowledgement from the primary station.

7. A primary station for use in a radio communication system, the primary station having means for allocating time slots to secondary stations for requesting resources, [characterized in that] wherein the primary station has combining means for determining from a combination of received signals having a request for resources in a plurality of successive time slots allocated to the secondary station whether the secondary station has transmitted [a] said request [for resources].

8. A primary station as claimed in claim 7, [characterized in that] wherein the combining means are only operated if the level of a received request is between a lower and an upper threshold.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/455,124	12/06/1999	BERNARD HUNT	PHB-34.306	4674

7590 06/20/2002

CORPORATE PATENT COUNSEL
US PHILIPS CORPORATION
580 WHITE PLAINS ROAD
TARRYTOWN, NY 10591

EXAMINER	
GANTT, ALAN T	
ART UNIT	PAPER NUMBER
2684	

DATE MAILED: 06/20/2002

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

Office Action Summary	Application No. 09/455,124	Applicant(s) HUNT, BERNARD	
	Examiner Alan T. Gantt	Art Unit 2684	

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *06 December 1999* .

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

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

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

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

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

Application Papers

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

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

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

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

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

a)☒ All b)☐ Some * c)☐ None of:

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

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

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

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

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

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.

2. Claims 1-3 and 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Driel et al., in view of Mansfield et al.

Regarding claims 1-3, 6, 7, and 9; Van Driel discloses a telecommunications network comprising a primary station and a plurality of secondary stations. The secondary stations are linked to the primary station via a transmission medium that is at least shared for a number of secondary stations. An access protocol is employed according to which secondary stations have data to transmit and, thus, need to send transmission request signals to the primary station. The primary station then transmits to those secondary stations an allocation signal assigning respective time slots to them. The secondary stations then transmit in their assigned time slots. Directly upon completion of the transmission in its assigned time slot, the secondary station transmits a further transmission request signal to the primary station instructing it that the secondary station still has data to transmit (col. 1, line 44 to col. 2, line10). Thus, the secondary station sends requests at each of its time periods as needed. However, Van Driel does not

provide for continually retransmitting the transmission requests without some acknowledgment by the primary station.

Mansfield discloses a method of transmission error control that includes transmitting at least one frame of packet data to a receiving entity during each of a plurality of time frames and receiving a plurality of responses from the receiving entity (Abstract). An object of Mansfield is to provide a mechanism that allows for increased throughput of transmission traffic by reducing the overhead required for transmission error control. With Mansfield up to 79 data segments can be sent before the primary station has to send an acknowledgement. Thus, Mansfield teaches the secondary station as retransmitting numerous times before receiving a response from the primary. Obviously, Mansfield has means to combine the received signals in a plurality of successive time slots allocated to the secondary station. Although when the primary station does respond, it responds to each request that was previously transmitted (col. 10, line 63 to col. 11, line 23).

Van Driel and Mansfield are combinable because they share a common endeavor, namely, telecommunication networks requiring clearance to transmit on a common channel as governed by a primary station in the form of an acknowledgment. At the time of the applicant's invention it would have been obvious to modify Van Driel to include the capability to send consecutive request without a requirement for an acknowledgment after each time slot as done by Mansfield to allow for more efficient of overhead.

Regarding claim 8, the location of the Ack/Neg Ack (A/N) bitmap is indicative of a sequence number of the respective data segment of the packet, which the bit is used to

acknowledge as successfully received. Each A/N bit is set to a value of zero if the corresponding numbered segment has not been transmitted or has been transmitted in error (col. 11, lines 8-30).

3. Claims 4, 5, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Driel et al., in view of Mansfield et al., and further in view of Tiedemann, Jr. et al.

Regarding claims 4, 5, and 10; Van Driel and Mansfield provide for time slots and continuous retransmitting of request for resources without an immediate acknowledgment by the primary station. However, the combination is silent on modifying the secondary station transmit power on a lack of acknowledgment.

Tiedemann provides for power control of the reverse channel from commands by the primary station (forward channel) when the secondary station is transmitting on the reserved access channel (col. 3, lines 30-35 and col. 4, lines 50-64 and col. 13, lines 24-50).

Van Driel, Mansfield, and Tiedemann are combinable because they share a common endeavor, namely, telecommunication networks requiring clearance to transmit on a common channel as governed by a primary station in the form of an acknowledgment. At the time of the applicant's invention it would have been obvious to modify Van Driel to include the capability to send consecutive request without a requirement for an acknowledgment after each time slot as done by Mansfield and to modify the combination to utilize power control to alleviate the negative acknowledgment condition at the secondary station as done by Tiedemann to increase the likelihood of successful future communication links.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kou discloses a satellite communication system carrying out reservation of necessary time slots by prediction of reply data in remote stations.

Turina et al. discloses a process in a radio communication system arranged for packet data transmission according to a message-synchronized ALOHA protocol with reservation.

Furuya et al. discloses a repeat request signal transmission signal method for multi-station packet communication.

Any inquiry concerning this communication from the examiner should be addressed to Alan Gantt at telephone number (703) 305-0077. The examiner can normally be reached between 9:30 AM and 6 PM within the Eastern Time Zone. The group FAX number is (703) 308-6306.

Any inquiry of a general nature or relating to this application should be directed to the group receptionist at telephone number (703) 305-4700.

Alan T. Gantt

June 15, 2002

DANIEL HUNTER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

Notice of References Cited	Application/Control No. 09/455,124	Applicant(s)/Patent Under Reexamination HUNT, BERNARD	
	Examiner Alan T. Gantt	Art Unit 2684	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-6,320,869	11-2001	Van Driel et al.	370/443
	B	US-6,301,249	10-2001	Mansfield et al.	370/394
	C	US-6,256,301	07-2001	Tiedemann et al.	340/2.1
	D	US-6,097,717	08-2000	Turina et al.	370/348
	E	US-4,888,767	12-1989	Furuya et al.	370/243
	F	US-5,790,535	08-1998	Kou, Yukari	370/337
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Form PTO-1449 (REV. 7-80) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	Atty. Docket No. PHB 34,306	Serial No. 09/455,124
	Applicant BERNARD HUNT	
INFORMATION DISCLOSURE CITATION (Use several sheets if necessary)	Filing Date DECEMBER 6, 2000	Group 2749

U.S. PATENT DOCUMENTS

Ex. Int.		Document Number	Date	Name	Class	Sub-class	Filing Date If Approp.
AP	AA	4 4 1 4 6 6 1	11/8/83	KARLSTROM	370	95	
	AB						
	AC						
	AD						
	AE						
	AF						

FOREIGN PATENT DOCUMENTS

		Document Number	Date	Country	Class	Sub-class	Trans. Yes	Trans. No
	AG							
	AH							
	AI							
	AJ							
	AK							

OTHER (Including Author, Title, Date, Pertinent Pages, Etc.)

	AL		
	AM		
	AN		

Examiner Alan D Gantt — Date Considered 6/13/02

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

GP2749
K. Ward
5/19/00
#4 Right
Watch

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of | Atty. Docket

BERNARD HUNT | PHB 34,306

Serial No: 09/455,124 | Group Art Unit: 2749

Filed: DECEMBER 6, 1999 | Ex.

RADIO COMMUNICATION SYSTEM

Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. 1.97

Sir:

Enclosed is a Form PTO-1449 and copies of documents listed thereon. These documents are considered to be relevant in that they have been:

[ ] considered in drafting the specification of the above-referenced application;

[ ] cited in the specification of the above-referenced application; or

[X] cited as an "X" or "Y" document in a foreign Patent Office search report on a foreign counterpart application a copy of which report is also enclosed.

[X] I hereby certify that these documents were cited in said search report not more than three (3) months ago.

[ ] Please charge any fee under 1.17(p) for this Information Disclosure Statement to be considered, not exceeding $240.00, to Account No. 14-1270.

If readily available, English-language counterparts have been substituted for foreign-language patent documents. This disclosure is not an admission that any of these documents is material to or even prior art with respect to the above-referenced application.

Respectfully submitted,

PTO-1449
References: (1)

By _____
Dicran Halajian, Reg. 39,703
Attorney
(914) 333-9607

CERTIFICATE OF MAILING

It is hereby certified that this correspondence is being deposited with the United States Postal Service as first-class mail in an envelope addressed to:
COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

On May 15, 2000

By Natalie A. Manzo

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12-07-99

A

Case Docket No. PHB 34,306

THE COMMISSIONER OF PATENTS AND TRADEMARKS, Washington, D.C. 20231

Enclosed for filing is the patent application of Inventor(s):
BERNARD HUNT

For: RADIO COMMUNICATION SYSTEM

ENCLOSED ARE:

[X] Appointment of Associates;
[ ] Information Disclosure Statement, Form PTO-1449 and copies of documents listed therein;
[ ] Preliminary Amendment;
[X] Specification (12 Pages of Specification, Claims, & Abstract);
[X] Declaration and Power of Attorney:
(1 Page of a [X]fully executed [ ]unsigned Declaration);
[X] Drawing (3 sheets of [ ]informal [X]formal sheets);
[X] Certified copy of GREAT BRITAIN application Serial No.9827182.8;
[X] Authorization Pursuant to 37 CFR §1.136(a)(3)
[ ] Other: ;
[X] Assignment to U.S. PHILIPS CORPORATION.

FEE COMPUTATION

CLAIMS AS FILED				
FOR	NUMBER FILED	NUMBER EXTRA	RATE	BASIC FEE - $760.00
Total Claims	12 - 20 =	0	X $18 =	0.00
Independent Claims	4 - 3 =	1	X $78 =	78.00
Multiple Dependent Claims, if any			$260 =	0.00
TOTAL FILING FEE			=	$838.00

Please charge Deposit Account No. 14-1270 in the amount of the total filing fee indicated above, plus any deficiencies. The Commissioner is also hereby authorized to charge any other fees which may be required, except the issue fee, or credit any overpayment to Account No. 14-1270.

[ ]Amend the specification by inserting before the first line as a centered heading --Cross Reference to Related Applications--; and insert below that as a new paragraph --This is a continuation-in-part of application Serial No. , filed , which is herein incorporated by reference--.

CERTIFICATE OF EXPRESS MAILING

Express Mail Mailing Label No. EL335550845US
Date of Deposit December 6, 1999
I hereby certify that this paper and/or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Natale A. Manzo Natale A. Manzo
Typed Name **Signature**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of — Atty. Docket

BERNARD HUNT — PHB 34,306

Serial No. — Group Art Unit

Filed: CONCURRENTLY — Examiner:

Title: RADIO COMMUNICATION SYSTEM

Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

APPOINTMENT OF ASSOCIATES

Sir:

The undersigned Attorney of Record hereby revokes all prior appointments (if any) of Associate Attorney(s) or Agent(s) in the above-captioned case and appoints:

DICRAN HALAJIAN **(Registration No. 39,703)**

c/o U.S. PHILIPS CORPORATION, Intellectual Property Department, 580 White Plains Road, Tarrytown, New York 10591, his Associate Attorney(s)/Agent(s) with all the usual powers to prosecute the above-identified application and any division or continuation thereof, to make alterations and amendments therein, and to transact all business in the Patent and Trademark Office connected therewith.

ALL CORRESPONDENCE CONCERNING THIS APPLICATION AND THE LETTERS PATENT WHEN GRANTED SHOULD BE ADDRESSED TO THE UNDERSIGNED ATTORNEY OF RECORD.

Respectfully,

Jack E. Haken, Reg. 26,902
Attorney of Record

Dated at Tarrytown, New York
this 3RD day of December, 1999.
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DESCRIPTION

RADIO COMMUNICATION SYSTEM

The present invention relates to a method of operating a radio communication system, and further relates to such a system and to primary and secondary stations for use in such a system. While the present specification describes a system with particular reference to the emerging Universal Mobile Telecommunication System (UMTS), it is to be understood that such techniques are equally applicable to use in other mobile radio systems.

In a radio communication system it is generally required to be able to exchange signalling messages between a Mobile Station (MS) and a Base Station (BS). Downlink signalling (from BS to MS) is usually realised by using a physical broadcast channel of the BS to address any MS in its coverage area. Since only one transmitter (the BS) uses this broadcast channel there is no access problem.

In contrast, uplink signalling (from MS to BS) requires more detailed considerations. If the MS already has an uplink channel assigned to it, for voice or data services, this signalling can be achieved by piggy-backing, in which the signalling messages are attached to data packets being sent from the MS to the BS. However, if there is no uplink channel assigned to the MS piggy-backing is not possible. In this case a fast uplink signalling mechanism should be available for the establishment, or re-establishment, of a new uplink channel.

In conventional systems, for example those operating to the Global System for Mobile communication (GSM) standard, fast uplink signalling is enabled by the provision of a random access channel using a slotted ALOHA or similar protocol. However, such a scheme works satisfactorily only with a low traffic load, and is not believed to be capable of handling the requirements imposed by third-generation telecommunications standards such as UMTS.

To meet these requirements one UMTS embodiment includes a dedicated signalling channel, which comprises frames including a time slot for each MS registered with the controlling BS. If a MS requires a service from the BS it transmits a request in its allocated slot then waits for an acknowledgement from the BS setting up the required service. Parameters which characterise the performance of the signalling channel include the false alarm rate (where the BS erroneously identifies a MS as requesting a service), the missed detection rate (where the BS does not detect a request from a MS), and the delay between a request for a service by the MS and the provision of that service by the BS.

An object of the present invention is to improve the efficiency of the method by which a MS requests resources from a BS.

According to a first aspect of the present invention there is provided a method of operating a radio communication system, comprising a secondary station transmitting a request for resources to a primary station in a time slot allocated to the secondary station, characterised by the secondary station re-transmitting the request in at least a majority of its allocated time slots until an acknowledgement is received from the primary station.

This scheme improves the typical time for a response by the primary station to a request by a secondary station. Because there is no possibility of requests from different secondary stations colliding, a secondary station can retransmit requests in each allocated time slot. In contrast, in prior art systems a secondary station has to wait at least long enough for the primary station to have received, processed and acknowledged a request before it is able to retransmit.

Further, the primary station can improve the accuracy with which it determines whether a request was sent by a particular secondary station if the received signal strength is close to the detection threshold by examining the received signals in multiple time slots allocated to the secondary station in question.

According to a second aspect of the present invention there is provided a radio communication system comprising a primary station and a plurality of secondary stations, the primary station having means for allocating a time slot for a secondary station to transmit a request for resources to the primary station, characterised in that the secondary station has means for re-transmitting the request in at least a majority of its allocated time slots until it receives an acknowledgement from the primary station.

According to a third aspect of the present invention there is provided a primary station for use in a radio communication system, the primary station having means for allocating time slots to secondary stations for requesting resources, characterised in that the primary station has combining means for determining from a combination of received signals in a plurality of successive time slots allocated to the secondary station whether the secondary station has transmitted a request for resources.

According to a fourth aspect of the present invention there is provided a secondary station for use in a radio communication system including a primary station having means for allocating a time slot for the secondary station to transmit a request for resources to the primary station, characterised in that means are provided for re-transmitting the request in at least a majority of the allocated time slots until an acknowledgement is received from the primary station.

The present invention is based upon the recognition, not present in the prior art, that in a system having time slots allocated to a secondary station for requesting resources, improved performance can be obtained by the secondary station repeating the request until an acknowledgement is received.

Embodiments of the present invention will now be described, by way of example, with reference to the accompanying drawings, wherein:

Figure 1 is a block schematic diagram of a radio communication system;

Figure 2 illustrates a possible frame format for a dedicated uplink signalling channel;

Figure 3 is a flow chart illustrating a method in accordance with the present invention of a mobile station requesting a service from a base station;

Figure 4 is a complex phasor plot showing the output of a matched filter in a BS in the presence of noise;

Figure 5 is a graph of missed detection rate (MDR) in percent against signal to noise ratio (SNR) in dB for a fixed signal magnitude, the solid line indicating results with no combining at the BS and the dashed line indicating results with combining at the BS; and

Figure 6 is a graph of missed detection rate (MDR) in percent against signal to noise ratio (SNR) in dB for a signal subject to Rayleigh fading, the solid line indicating results with no combining at the BS and the dashed line indicating results with combining at the BS.

In the drawings the same reference numerals have been used to indicate corresponding features.

Referring to Figure 1, a radio communication system comprises a primary station (BS) 100 and a plurality of secondary stations (MS) 110. The BS 100 comprises a microcontroller (μC) 102, transceiver means 104 connected to radio transmission means 106, and connection means 108 for connection to the PSTN or other suitable network. Each MS 110 comprises a microcontroller (μC) 112, transceiver means 114 connected to radio transmission means 116, and power control means 118 for altering the transmitted power level. Communication from BS 100 to MS 110 takes place on a downlink channel 122, while communication from MS 110 to BS 100 takes place on an uplink channel 124.

The present invention is concerned with an uplink channel 124 dedicated to the transmission of requests for services by a MS 110 to a BS 100. One arrangement of such a channel for UMTS is illustrated in Figure 2. The uplink channel 124 is divided into a succession of frames 202, each of length 10ms, and each MS 110 registered with the BS 100 is allocated a time slot 204 in each frame in which it can transmit a request for service. Although

only ten time slots 204 are shown in each frame 202, in practice there may be many more per frame.

Although it is anticipated that a single dedicated uplink channel 124 will provide sufficient capacity in normal situations, it is possible for there to be more mobile stations 110 registered with a BS 100 than there are available time slots in each frame. In such circumstances the BS 100 can either make another uplink channel 124 available for fast signalling purposes or increase the capacity of the existing channel by not allocating a time slot for every MS 110 in every frame.

In traditional signalling schemes, for example that used for the random access channel in GSM, a MS 110 makes a request for service to a BS 100 and then waits for an acknowledgement from the BS 100. If no acknowledgement is received after a predetermined period of time, the MS 110 assumes that the request was not correctly received and schedules another request. This scheme minimises traffic on the channel to minimise collisions between requests from different mobile stations 110 thereby avoiding loss of channel capacity.

However, in a dedicated uplink channel 124 having time slots allocated to each MS 110 collisions will not normally occur. A more effective signalling scheme, in accordance with the present invention, is that shown in Figure 3. The process starts at 302 when the MS 110 determines that it requires a service from the BS 100. The MS 110 then makes a request for service 304 in the next time slot 204 (Figure 2) allocated to it. In a Code Division Multiple Access (CDMA) system, the request 304 is made by transmitting a predetermined code sequence. Requests 304 continue to be made in successive allocated time slots 204 until a first test 306 determines that no further requests should be made, for example by examining the value of a flag that was set to true at the start 302 of the process.

A second test 308 determines whether the MS 110 has received an acknowledgement from the BS 100. When the second test 308 determines that an acknowledgement has been received from the BS 100, the MS 110 at 310 stops any further requests from being sent, for example by setting to false

a flag that is checked by the first test 306. The MS 110 then begins negotiations 312 with the BS 100 to define fully the required services. Finally, at 314, the required services are set up by the BS 100.

This scheme has the advantage that if a request is not received correctly by the BS 100 it can be repeated at the frame rate (100 Hz for the 10ms frame defined in UMTS), or at least in every allocated time slot if the system is busy and a time slot is not allocated in every frame. In a traditional scheme it is not guaranteed that a request could be received and processed by the BS 100 sufficiently rapidly for an acknowledgement to be scheduled for the immediately following frame, so the time that a MS 110 has to wait before re-transmitting the request is substantially longer.

A further advantage of the signalling scheme in accordance with the present invention is that the quality of detection at the BS 100 can be improved by combining requests. Since the BS 100 knows that requests will be repeated in every frame, it can postpone making a decision about a possible received request when this request is near to the decision threshold and use information from the next (and subsequent) frames to improve the confidence of the decision. This amounts to a form of time diversity, and will improve the robustness of the signalling scheme to the effects of fading, near-far effect and other interference.

In one embodiment of UMTS, the dedicated uplink channel employs a CDMA technique. Using information transmitted on a downlink broadcast channel 122 by the BS 100, each MS 110 is able to determine the uplink signalling sequence it should use (thereby defining the dedicated uplink channel 124) and the time slot 204 it is allocated in a frame 202. The uplink signalling sequence is detected at the BS 100 by a matched filter, and the time at which a peak appears in the output of the matched filter indicates which MS 110 issued the request.

Simulations have been performed to investigate the advantages of combining successive transmitted requests at the BS 100. Figure 4 is a complex phasor plot illustrating a model for the effect of noise on the output of the matched filter in the BS 100. Noise was modelled as complex Gaussian

noise, with the result that the output 402 of the matched filter is the vector sum of a signal peak 404 and a complex Gaussian noise vector 406. In the absence of a signal 402, the filter output is simply complex Gaussian noise.

In a first simulation the level of the signal 404 was held fixed and varying levels of noise 406 applied. In a scheme with no combining the magnitude of the filter output vector 402 is compared to a threshold value, and if it exceeds this value a signal is assumed to be present. Two different error rates were measured: the False Alarm Rate (FAR), which is the probability of detecting a signal when only noise is present; and the Missed Detection Rate (MDR), which is the probability of failing to detect a signal which is present.

A simple combining scheme was also simulated, in which the magnitudes of two successive matched filter outputs were added together and compared to a (different) threshold to determine whether a signal was present. For both schemes the threshold was set as a multiple of the rms noise magnitude such that the FAR remained constant at 1%.

The results are shown in Figure 5, which is a plot of the MDR in percent against the ratio of the signal magnitude to mean noise magnitude (SNR) in dB. The solid curve shows the results for the scheme without combining and the dashed curve the results with combining. The results of the combining scheme show a significant improvement in MDR, equivalent to an improvement of typically 2dB in SNR.

In a second simulation the level of the signal 404 was subjected to Rayleigh fading, to provide a more realistic mobile environment. The results are shown in Figure 6, which is a plot of the MDR in percent against the SNR in dB. The solid curve shows the results for the scheme without combining and the dashed curve the results with combining. In both cases the results show significantly higher MDR for a given signal to noise ratio than the simulation without fading, as might be expected. Again the results of the combining scheme show a significant improvement in MDR, equivalent to an improvement of between 2 and 5dB in SNR.

Alternative combining schemes could be used in a method in accordance with the present invention. The results discussed above

demonstrate the improved accuracy resulting from combining two successive filter outputs. Further improvements could be obtained by combining more outputs, although at the cost of increased delay in the BS 100 responding to the requests from the MS 110.

A multiple threshold scheme could offer further advantages. Such a scheme would operate by examining the magnitude of the filter output. If it is above an upper threshold then a request has been detected which the BS 100 can acknowledge immediately, while if it is below a lower threshold no request has been detected. If the output lies between the two thresholds then signal combining schemes such as those described above can be used to resolve the question of whether a request was sent.

Some form of power control is also desirable. If a MS 110 transmits a request at too high a power level it may swamp other signals at the BS 100, while if it transmits at too low a power level the request will not be detected. Closed loop power control is not available until the requested services are set up. Open loop power control is possible if the MS 110 uses the characteristics of a broadcast channel from the BS 100 to determine the initial power at which to transmit its requests. If no acknowledgement is received from the BS 100 the power at which the requests are transmitted could be gradually increased, subject to appropriate maximum power limits.

In a Rayleigh fading environment there could also be advantages in having random or other variations in the transmitted power level.

A further application of a method in accordance with the present invention is in the provision of paging or other services, where a BS 100 transmits messages on a downlink channel 122 to a MS 110, and continues retransmitting until an acknowledgement is received from the MS 110. In this application therefore the BS 100 functions as a secondary station and the MS 110 as a primary station.

From reading the present disclosure, other modifications will be apparent to persons skilled in the art. Such modifications may involve other features which are already known in radio communication systems and

component parts thereof, and which may be used instead of or in addition to features already described herein.

In the present specification and claims the word "a" or "an" preceding an element does not exclude the presence of a plurality of such elements. Further, the word "comprising" does not exclude the presence of other elements or steps than those listed.

CLAIMS

1. A method of operating a radio communication system, comprising a secondary station transmitting a request for resources to a primary station in a time slot allocated to the secondary station, characterised by the secondary station re-transmitting the request in at least a majority of its allocated time slots until an acknowledgement is received from the primary station.

2. A method as claimed in claim 1, characterised by the primary station determining whether a request has been transmitted by the secondary station from a combination of the received signals in a plurality of successive time slots allocated to the secondary station.

3. A method as claimed in claim 1, characterised by the primary station determining whether a request has been transmitted by the secondary station from a combination of the received signals in a plurality of successive time slots allocated to the secondary station only if the level of a received request is between a lower and an upper threshold.

4. A method as claimed in claim 1, characterised by the secondary station modifying the power of re-transmitted requests in response to lack of an acknowledgement signal from the primary station.

5. A method as claimed in claim 4, characterised by the secondary station increasing the power of re-transmitted requests in response to lack of an acknowledgement signal from the primary station.

6. A radio communication system comprising a primary station and a plurality of secondary stations, the primary station having means for allocating a time slot for a secondary station to transmit a request for resources to the primary station, characterised in that the secondary station

has means for re-transmitting the request in at least a majority of its allocated time slots until it receives an acknowledgement from the primary station.

7. A primary station for use in a radio communication system, the primary station having means for allocating time slots to secondary stations for requesting resources, characterised in that the primary station has combining means for determining from a combination of received signals in a plurality of successive time slots allocated to the secondary station whether the secondary station has transmitted a request for resources.

8. A primary station as claimed in claim 7, characterised in that the combining means are only operated if the level of a received request is between a lower and an upper threshold.

9. A secondary station for use in a radio communication system including a primary station having means for allocating a time slot for the secondary station to transmit a request for resources to the primary station, characterised in that means are provided for re-transmitting the request in at least a majority of the allocated time slots until an acknowledgement is received from the primary station.

10. A secondary station as claimed in claim 9, characterised in that means are provided for modifying the power of re-transmitted requests in response to lack of an acknowledgement signal from the primary station.

ABSTRACT

RADIO COMMUNICATION SYSTEM

A method of operating a radio communication system in which secondary stations use dedicated time slots to request services from a primary station. A secondary station wishing to request a service sends a request in every time slot allocated to it until it receives an acknowledgement from the primary station. The primary station can use combining techniques on multiple time slots to identify the presence or absence of a request from a secondary station with improved accuracy.

(Figure 3)

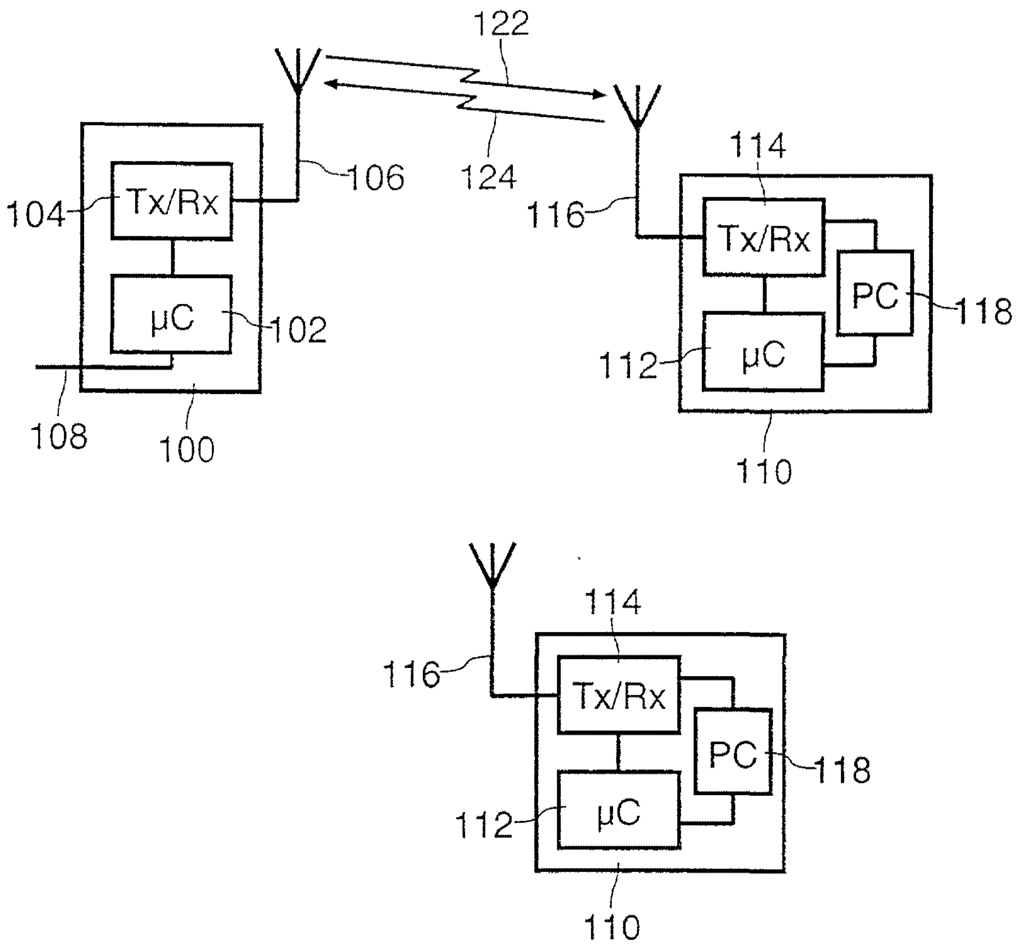
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FIG. 1

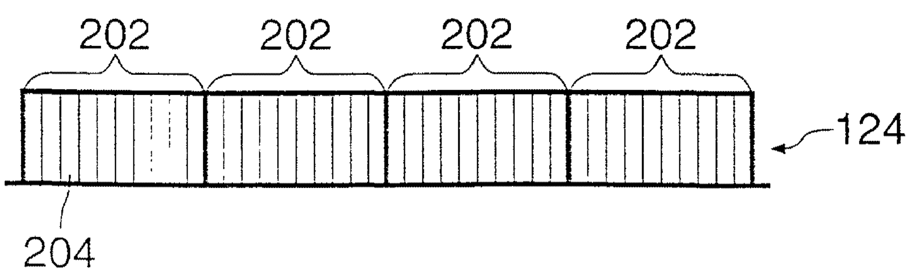
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FIG. 2

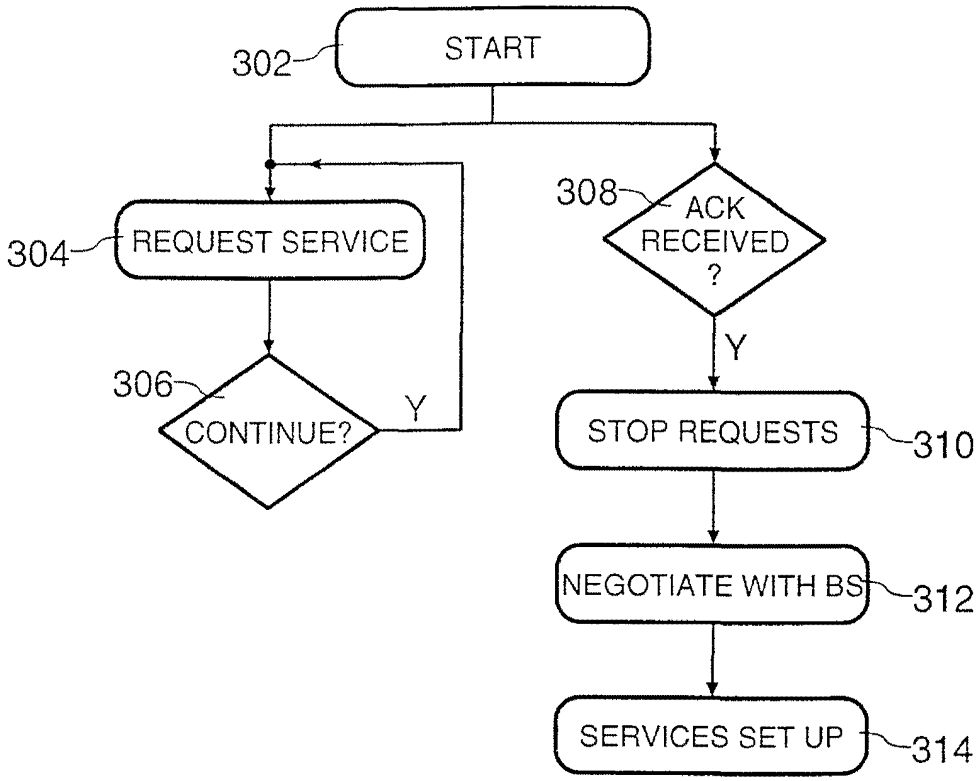

FIG. 3

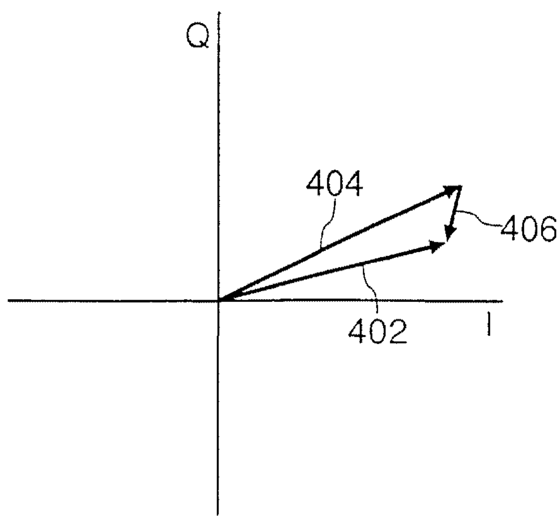

FIG. 4

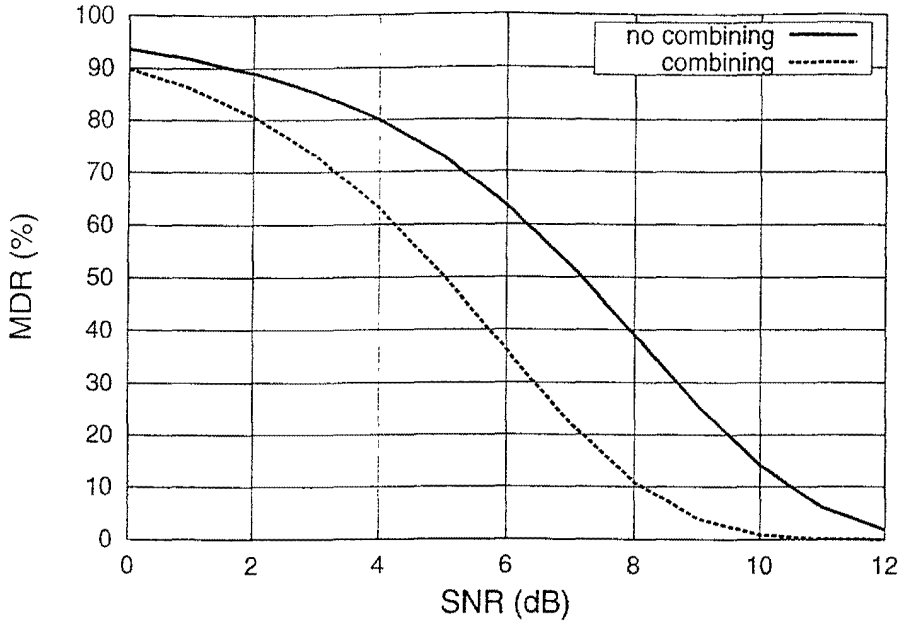

FIG. 5

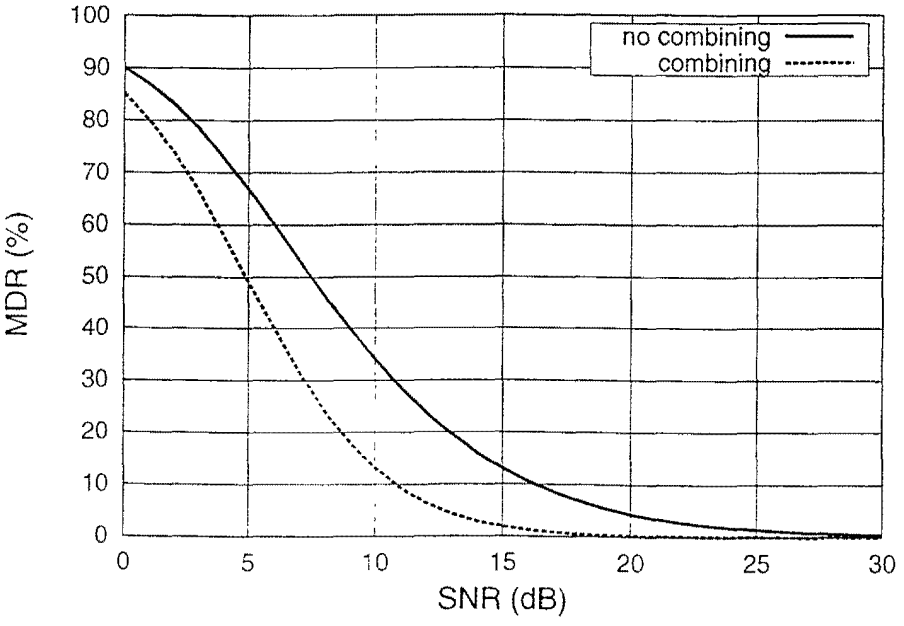

FIG. 6

DECLARATION AND POWER OF ATTORNEY

Sole/Joint

Attorney's Docket No: PHB34306US

As a below named inventor, I hereby declare that:
My residence, post office address and citizenship are as stated below next to my name
I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

RADIO COMMUNICATION SYSTEM

the specification of which (check one)

☒ is attached hereto

☐ was filed on ..... as Application Serial No: ..... and was amended on

..... (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.
I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56 (a).
I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

PRIOR FOREIGN APPLICATION(S)

COUNTRY	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY Claimed Under 35 U.S.C. 119
GREAT BRITAIN	9827182.8	10-12-1998	Yes X No
			Yes No

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35 United States Code §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

PRIOR UNITED STATES APPLICATION(S)

APPLICATION SERIAL NUMBER	FILING DATE	STATUS (PATENTED, PENDING, ABANDONED)

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

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

Jack E. Haken, Reg. No 26,902
Algy Tamoshunas, Reg. No 27,677

SEND CORRESPONDENCE TO:	DIRECT TELEPHONE CALLS TO: (Name and telephone number)
Corporate Patent Counsel U.S. Philips Corporation 580 White Plains Road Tarrytown, New York 10591	(914) 332-0222

Dated: 26 OCTOBER 1999		Inventor's Signature.		
FULL NAME OF INVENTOR	Last name: HUNT	First Name: Bernard	Middle Name:	
RESIDENCE & CITIZENSHIP	City: REDHILL	State or Foreign Country: GREAT BRITAIN	Country of Citizenship: GREAT BRITAIN	
POST OFFICE ADDRESS	Street & No. FLAT 1, RANMORE HOUSE, 17 ST JOHNS TERRACE ROAD	City: REDHILL	State or Country: GREAT BRITAIN	Zip Code: RH1 6HS

Dated:		Inventor's Signature:		
FULL NAME OF INVENTOR	Last name	First Name.	Middle Name:	
RESIDENCE & CITIZENSHIP	City	State or Foreign Country:	Country of Citizenship:	
POST OFFICE ADDRESS	Street & No	City	State or Country	Zip Code:

JC490 U.S. PTO
09/455124
12/06/99

ISSUE CLASSIFICATION	
Class	Subclass
370	345

PATENT NUMBER

U.S. **UTILITY** Patent Application

O.I.P.E.	PATENT DATE
SCANNED Wo Q.A. mc	

CLASS	SUBCLASS	ART UNIT	EXAMINER
~~455~~ 370	345.000	~~2777~~ ~~2737~~ 2684	

TITLE OF INVENTION:

APPLICANT(S):

ISSUING CLASSIFICATION								
ORIGINAL		CROSS REFERENCE(S)						
CLASS	SUBCLASS	CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					
370	345	370	328	336	343	347		
INTERNATIONAL CLASSIFICATION								
H04J	3/14							
			☐ Continued on Issue Slip Inside File Jacket					

☐ **TERMINAL DISCLAIMER**	**DRAWINGS**			**CLAIMS ALLOWED**	
	Sheets Drwg.	Figs. Drwg.	Print Fig.	Total Claims	Print Claim for O.G.
	3	6	3	13	6
☐ The term of this patent subsequent to ____________ (date) has been disclaimed.	Alan T. Gantt (Assistant Examiner) 12/15/02 (Date)			**NOTICE OF ALLOWANCE MAILED**	
☐ The term of this patent shall not extend beyond the expiration date of U.S Patent. No. ____________	(Primary Examiner) (Date)			**ISSUE FEE** Amount Due	Date Paid
☐ The terminal ____months of this patent have been disclaimed.	(Legal Instruments Examiner) (Date)			**ISSUE BATCH NUMBER**	

WARNING:
The information disclosed herein may be restricted. Unauthorized disclosure may be prohibited by the United States Code Title 35, Sections 122, 181 and 368. Possession outside the U.S. Patent & Trademark Office is restricted to authorized employees and contractors only.

Form PTO-436A
(Rev. 6/99)

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(FACE)

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SEARCHED

Class	Sub.	Date	Exmr.
370	328	6/14/02	AS
	329		
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	337		
	343		
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↓	230		
370	347		
714	[redacted]	↓	
	[redacted]	6/14/02	AS
	748		
re-searched the above		12/12/02	AS
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455	471	12/14/02	AS
455	435	12/14/02	AS

INTERFERENCE SEARCHED

Class	Sub.	Date	Exmr.
~~370~~	~~328~~	~~12/15/02~~	~~AS~~
	329	↓	↓
	343		
	345		
370	347	12/15/02	AS

SEARCH NOTES
(INCLUDING SEARCH STRATEGY)

	Date	Exmr.
Talked to Primary in 370	6/13/02	AS
Searched EAST	6/6-14/02	AS
Chau Nguyen	12/13/02	AS
Talked to Conyle	12/30/02	AS
Talked to William Cuming	12/16/02 [redacted]	AS
Search EAST	4/26-30/04	AS

(RIGHT OUTSIDE)

MM EX

ISSUE SLIP STAPLE AREA (for additional cross references)

POSITION	INITIALS	ID NO.	DATE
FEE DETERMINATION	BA	72385	
O.I.P.E. CLASSIFIER		2	12/20/99
FORMALITY REVIEW	M.M.	71637	1-10-00
RESPONSE FORMALITY REVIEW			

INDEX OF CLAIMS

✓ .... Rejected		N .... Non-elected	
= .... Allowed		I .... Interference	
— (Through numeral)... Canceled		A .... Appeal	
÷ .... Restricted		O .... Objected	

Claim Final	Claim Original	Date 6/13/02	12/15/02	6/14/03	8/15/03	10/9/03	[illegible]				
	1	✓	✓	✓	✓	✓	✓				
	2	✓	✓	✓	✓	✓	O				
	3	✓	✓	✓	✓	✓	O				
	4	✓	✓	✓	✓	✓	✓				
	5	✓	✓	✓	✓	✓	✓				
	6	✓	✓	✓	✓	✓	✓				
	7	✓	✓	✓	✓	[illegible]					
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	16			✓	✓	[illegible]					
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12-07-99

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Case Docket No. PHB 34,306

THE COMMISSIONER OF PATENTS AND TRADEMARKS, Washington, D.C. 20231

Enclosed for filing is the patent application of Inventor(s):
BERNARD HUNT

For: RADIO COMMUNICATION SYSTEM

jc675 U.S. PTO 12/06/99

jc490 U.S. PTO 09/455124 12/06/99

#2

ENCLOSED ARE:

[X] Appointment of Associates;
[ ] Information Disclosure Statement, Form PTO-1449 and copies of documents listed therein;
[ ] Preliminary Amendment;
[X] Specification (12 Pages of Specification, Claims, & Abstract);
[X] Declaration and Power of Attorney:
(1 Page of a [X]fully executed [ ]unsigned Declaration);
[X] Drawing (3 sheets of [ ]informal [X]formal sheets);
[X] Certified copy of GREAT BRITAIN application Serial No.9827182.8;
[X] Authorization Pursuant to 37 CFR §1.136(a)(3)
[ ] Other: ;
[X] Assignment to U.S. PHILIPS CORPORATION.

FEE COMPUTATION

CLAIMS AS FILED				
FOR	NUMBER FILED	NUMBER EXTRA	RATE	BASIC FEE - $760.00
Total Claims	12 - 20 =	0	X $18 =	0.00
Independent Claims	4 - 3 =	1	X $78 =	78.00
Multiple Dependent Claims, if any			$260 =	0.00
TOTAL FILING FEE			=	$838.00

Please charge Deposit Account No. 14-1270 in the amount of the total filing fee indicated above, plus any deficiencies. The Commissioner is also hereby authorized to charge any other fees which may be required, except the issue fee, or credit any overpayment to Account No. 14-1270.

[ ]Amend the specification by inserting before the first line as a centered heading --Cross Reference to Related Applications--; and insert below that as a new paragraph --This is a continuation-in-part of application Serial No. , filed , which is herein incorporated by reference--.

CERTIFICATE OF EXPRESS MAILING

Express Mail Mailing Label No. EL335550845US
Date of Deposit December 6, 1999
I hereby certify that this paper and/or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Natale A. Manzo
Typed Name

Natale A. Manzo
Signature

Dicran Halajian, Reg. 39,708
Attorney
(914) 333-9607
U.S. Philips Corporation
580 White Plains Road
Tarrytown, New York 10591

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of | Atty. Docket

BERNARD HUNT | PHB 34,306

Serial No. | Group Art Unit

Filed: CONCURRENTLY | Ex.

RADIO COMMUNICATION SYSTEM
Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

AUTHORIZATION PURSUANT TO 37 CFR §1.136(a)(3)
AND TO CHARGE DEPOSIT ACCOUNT

Sir:

The Commissioner is hereby requested and authorized to treat any concurrent or future reply in this application requiring a petition for extension of time for its timely submission, as incorporating a petition for extension of time for the appropriate length of time.

Please charge any additional fees which may now or in the future be required in this application, including extension of time fees, but excluding the issue fee unless explicitly requested to do so, and credit any overpayment, to Deposit Account No. 14-1270.

Respectfully submitted,

By _____
Dicran Halajian, Reg. 39,703
Attorney
(914) 333-9607

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12-07-99

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Case Docket No. PHB 34,306

THE COMMISSIONER OF PATENTS AND TRADEMARKS, Washington, D.C. 20231

Enclosed for filing is the patent application of Inventor(s):
BERNARD HUNT

For: RADIO COMMUNICATION SYSTEM

jc490 U.S. PTO 09/455124 12/06/99

jc675 U.S. PTO 12/06/99

#2

ENCLOSED ARE:

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[X] Declaration and Power of Attorney:
(1 Page of a [X]fully executed [ ]unsigned Declaration);
[X] Drawing (3 sheets of [ ]informal [X]formal sheets);
[X] Certified copy of GREAT BRITAIN application Serial No.9827182.8;
[X] Authorization Pursuant to 37 CFR §1.136(a)(3)
[ ] Other: ;
[X] Assignment to U.S. PHILIPS CORPORATION.

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CLAIMS AS FILED				
FOR	NUMBER FILED	NUMBER EXTRA	RATE	BASIC FEE - $760.00
Total Claims	12 - 20 =	0	X $18 =	0.00
Independent Claims	4 - 3 =	1	X $78 =	78.00
Multiple Dependent Claims, if any			$260 =	0.00
TOTAL FILING FEE			=	$838.00

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Natale A. Manzo
Typed Name

Natale A. Manzo
Signature

Dicran Halajian, Reg. 39,708
Attorney
(914) 333-9607
U.S. Philips Corporation
580 White Plains Road
Tarrytown, New York 10591

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of | Atty. Docket

BERNARD HUNT | PHB 34,306

Serial No. | Group Art Unit

Filed: CONCURRENTLY | Ex.

RADIO COMMUNICATION SYSTEM
Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

AUTHORIZATION PURSUANT TO 37 CFR §1.136(a)(3)
AND TO CHARGE DEPOSIT ACCOUNT

Sir:

The Commissioner is hereby requested and authorized to treat any concurrent or future reply in this application requiring a petition for extension of time for its timely submission, as incorporating a petition for extension of time for the appropriate length of time.

Please charge any additional fees which may now or in the future be required in this application, including extension of time fees, but excluding the issue fee unless explicitly requested to do so, and credit any overpayment, to Deposit Account No. 14-1270.

Respectfully submitted,

By _____
Dicran Halajian, Reg. 39,703
Attorney
(914) 333-9607

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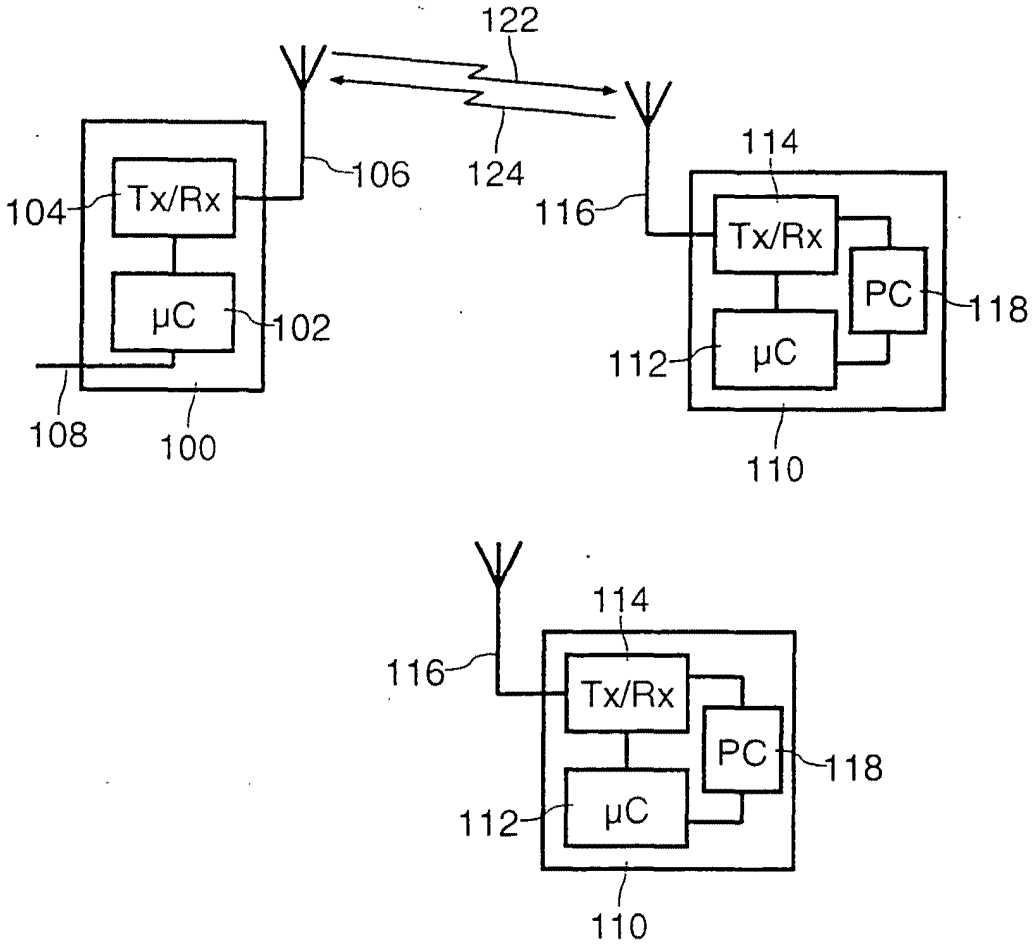

FIG. 1

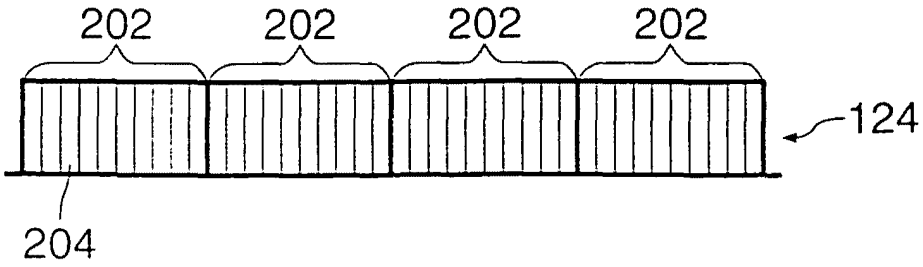

FIG. 2

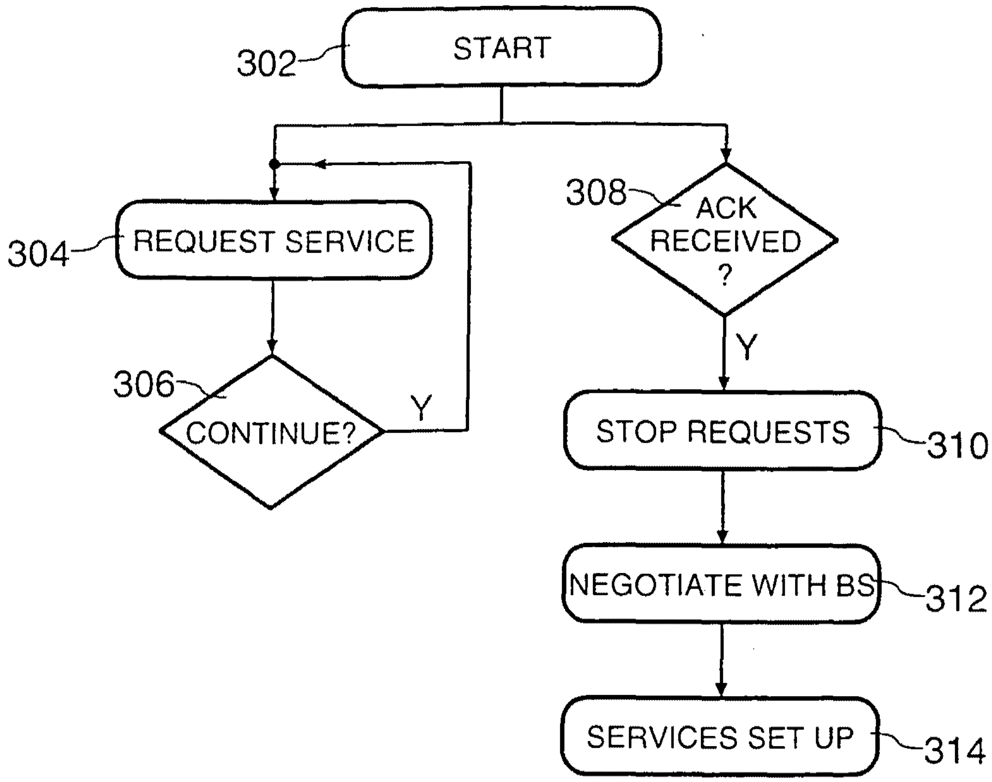

FIG. 3

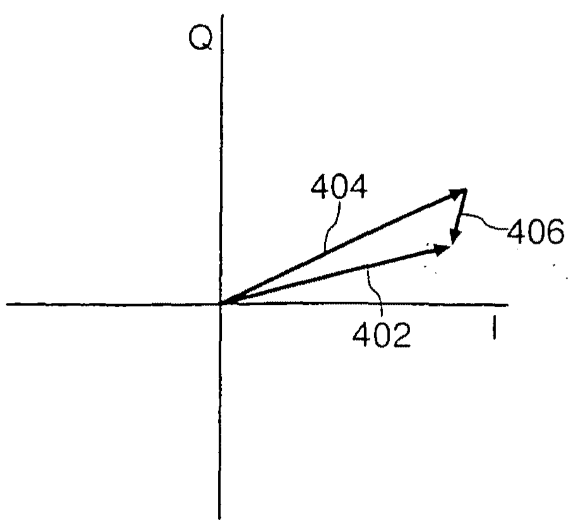

FIG. 4

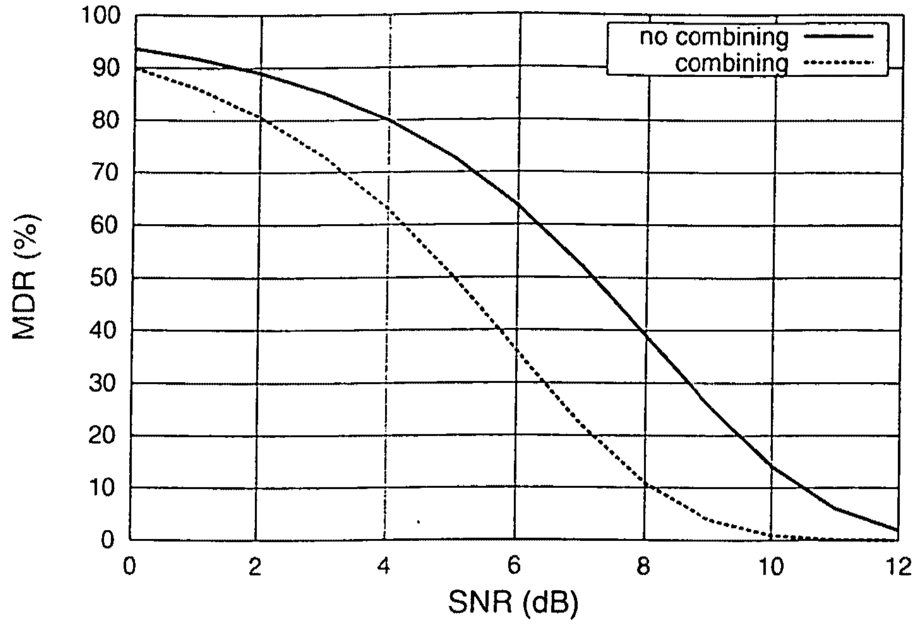

FIG. 5

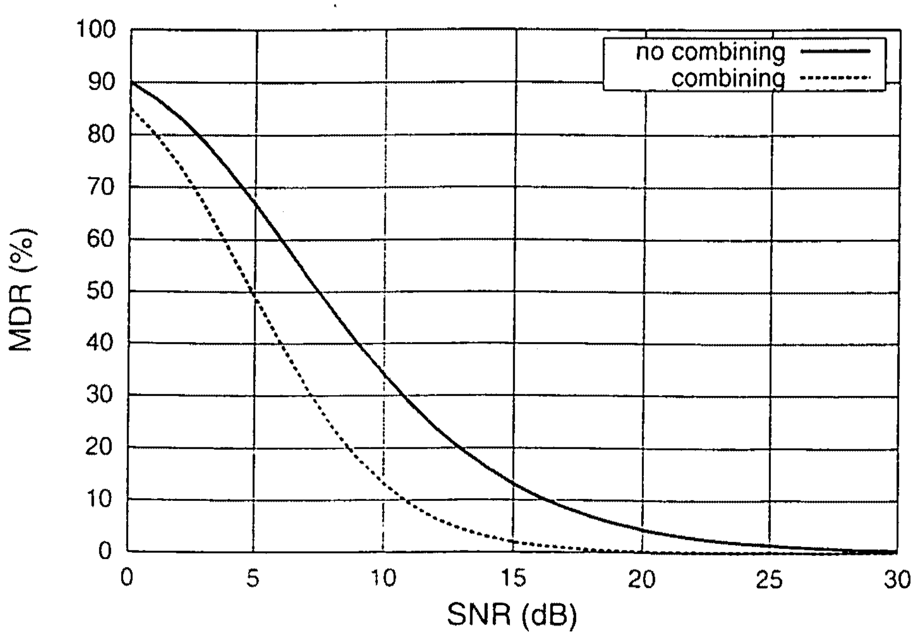

FIG. 6

DESCRIPTION

~~RADIO COMMUNICATION SYSTEM~~

FIELD OF THE INVENTION

The present invention relates to a method of operating a radio communication system, and further relates to such a system and to primary and secondary stations for use in such a system. While the present specification describes a system with particular reference to the emerging Universal Mobile Telecommunication System (UMTS), it is to be understood that such techniques are equally applicable to use in other mobile radio systems.

BACKGROUND OF THE INVENTION

In a radio communication system it is generally required to be able to exchange signalling messages between a Mobile Station (MS) and a Base Station (BS). Downlink signalling (from BS to MS) is usually realised by using a physical broadcast channel of the BS to address any MS in its coverage area. Since only one transmitter (the BS) uses this broadcast channel there is no access problem.

In contrast, uplink signalling (from MS to BS) requires more detailed considerations. If the MS already has an uplink channel assigned to it, for voice or data services, this signalling can be achieved by piggy-backing, in which the signalling messages are attached to data packets being sent from the MS to the BS. However, if there is no uplink channel assigned to the MS piggy-backing is not possible. In this case a fast uplink signalling mechanism should be available for the establishment, or re-establishment, of a new uplink channel.

In conventional systems, for example those operating to the Global System for Mobile communication (GSM) standard, fast uplink signalling is enabled by the provision of a random access channel using a slotted ALOHA or similar protocol. However, such a scheme works satisfactorily only with a low traffic load, and is not believed to be capable of handling the requirements imposed by third-generation telecommunications standards such as UMTS.

To meet these requirements one UMTS embodiment includes a dedicated signalling channel, which comprises frames including a time slot for each MS registered with the controlling BS. If a MS requires a service from the BS it transmits a request in its allocated slot then waits for an acknowledgement from the BS setting up the required service. Parameters which characterise the performance of the signalling channel include the false alarm rate (where the BS erroneously identifies a MS as requesting a service), the missed detection rate (where the BS does not detect a request from a MS), and the delay between a request for a service by the MS and the provision of that service by the BS.

SUMMARY OF THE INVENTION

An object of the present invention is to improve the efficiency of the method by which a MS requests resources from a BS.

According to a first aspect of the present invention there is provided a method of operating a radio communication system, comprising a secondary station transmitting a request for resources to a primary station in a time slot allocated to the secondary station, characterised by the secondary station re-transmitting the request in at least a majority of its allocated time slots until an acknowledgement is received from the primary station.

This scheme improves the typical time for a response by the primary station to a request by a secondary station. Because there is no possibility of requests from different secondary stations colliding, a secondary station can retransmit requests in each allocated time slot. In contrast, in prior art systems a secondary station has to wait at least long enough for the primary station to have received, processed and acknowledged a request before it is able to retransmit.

Further, the primary station can improve the accuracy with which it determines whether a request was sent by a particular secondary station if the received signal strength is close to the detection threshold by examining the received signals in multiple time slots allocated to the secondary station in question.

According to a second aspect of the present invention there is provided a radio communication system comprising a primary station and a plurality of secondary stations, the primary station having means for allocating a time slot for a secondary station to transmit a request for resources to the primary station, characterised in that the secondary station has means for re-transmitting the request in at least a majority of its allocated time slots until it receives an acknowledgement from the primary station.

According to a third aspect of the present invention there is provided a primary station for use in a radio communication system, the primary station having means for allocating time slots to secondary stations for requesting resources, characterised in that the primary station has combining means for determining from a combination of received signals in a plurality of successive time slots allocated to the secondary station whether the secondary station has transmitted a request for resources.

According to a fourth aspect of the present invention there is provided a secondary station for use in a radio communication system including a primary station having means for allocating a time slot for the secondary station to transmit a request for resources to the primary station, characterised in that means are provided for re-transmitting the request in at least a majority of the allocated time slots until an acknowledgement is received from the primary station.

The present invention is based upon the recognition, not present in the prior art, that in a system having time slots allocated to a secondary station for requesting resources, improved performance can be obtained by the secondary station repeating the request until an acknowledgement is received.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments of the present invention will now be described, by way of example, with reference to the accompanying drawings, wherein:

Figure 1 is a block schematic diagram of a radio communication system;

Figure 2 illustrates a possible frame format for a dedicated uplink signalling channel;

Figure 3 is a flow chart illustrating a method in accordance with the present invention of a mobile station requesting a service from a base station;

Figure 4 is a complex phasor plot showing the output of a matched filter in a BS in the presence of noise;

Figure 5 is a graph of missed detection rate (MDR) in percent against signal to noise ratio (SNR) in dB for a fixed signal magnitude, the solid line indicating results with no combining at the BS and the dashed line indicating results with combining at the BS; and

Figure 6 is a graph of missed detection rate (MDR) in percent against signal to noise ratio (SNR) in dB for a signal subject to Rayleigh fading, the solid line indicating results with no combining at the BS and the dashed line indicating results with combining at the BS.

In the drawings the same reference numerals have been used to indicate corresponding features.

DETAILED DESCRIPTION OF THE INVENTION

Referring to Figure 1, a radio communication system comprises a primary station (BS) 100 and a plurality of secondary stations (MS) 110. The BS 100 comprises a microcontroller (μC) 102, transceiver means 104 connected to radio transmission means 106, and connection means 108 for connection to the PSTN or other suitable network. Each MS 110 comprises a microcontroller (μC) 112, transceiver means 114 connected to radio transmission means 116, and power control means 118 for altering the transmitted power level. Communication from BS 100 to MS 110 takes place on a downlink channel 122, while communication from MS 110 to BS 100 takes place on an uplink channel 124.

The present invention is concerned with an uplink channel 124 dedicated to the transmission of requests for services by a MS 110 to a BS 100. One arrangement of such a channel for UMTS is illustrated in Figure 2. The uplink channel 124 is divided into a succession of frames 202, each of length 10ms, and each MS 110 registered with the BS 100 is allocated a time slot 204 in each frame in which it can transmit a request for service. Although

only ten time slots 204 are shown in each frame 202, in practice there may be many more per frame.

Although it is anticipated that a single dedicated uplink channel 124 will provide sufficient capacity in normal situations, it is possible for there to be more mobile stations 110 registered with a BS 100 than there are available time slots in each frame. In such circumstances the BS 100 can either make another uplink channel 124 available for fast signalling purposes or increase the capacity of the existing channel by not allocating a time slot for every MS 110 in every frame.

In traditional signalling schemes, for example that used for the random access channel in GSM, a MS 110 makes a request for service to a BS 100 and then waits for an acknowledgement from the BS 100. If no acknowledgement is received after a predetermined period of time, the MS 110 assumes that the request was not correctly received and schedules another request. This scheme minimises traffic on the channel to minimise collisions between requests from different mobile stations 110 thereby avoiding loss of channel capacity.

However, in a dedicated uplink channel 124 having time slots allocated to each MS 110 collisions will not normally occur. A more effective signalling scheme, in accordance with the present invention, is that shown in Figure 3. The process starts at 302 when the MS 110 determines that it requires a service from the BS 100. The MS 110 then makes a request for service 304 in the next time slot 204 (Figure 2) allocated to it. In a Code Division Multiple Access (CDMA) system, the request 304 is made by transmitting a predetermined code sequence. Requests 304 continue to be made in successive allocated time slots 204 until a first test 306 determines that no further requests should be made, for example by examining the value of a flag that was set to true at the start 302 of the process.

A second test 308 determines whether the MS 110 has received an acknowledgement from the BS 100. When the second test 308 determines that an acknowledgement has been received from the BS 100, the MS 110 at 310 stops any further requests from being sent, for example by setting to false

a flag that is checked by the first test 306. The MS 110 then begins negotiations 312 with the BS 100 to define fully the required services. Finally, at 314, the required services are set up by the BS 100.

This scheme has the advantage that if a request is not received correctly by the BS 100 it can be repeated at the frame rate (100 Hz for the 10ms frame defined in UMTS), or at least in every allocated time slot if the system is busy and a time slot is not allocated in every frame. In a traditional scheme it is not guaranteed that a request could be received and processed by the BS 100 sufficiently rapidly for an acknowledgement to be scheduled for the immediately following frame, so the time that a MS 110 has to wait before re-transmitting the request is substantially longer.

A further advantage of the signalling scheme in accordance with the present invention is that the quality of detection at the BS 100 can be improved by combining requests. Since the BS 100 knows that requests will be repeated in every frame, it can postpone making a decision about a possible received request when this request is near to the decision threshold and use information from the next (and subsequent) frames to improve the confidence of the decision. This amounts to a form of time diversity, and will improve the robustness of the signalling scheme to the effects of fading, near-far effect and other interference.

In one embodiment of UMTS, the dedicated uplink channel employs a CDMA technique. Using information transmitted on a downlink broadcast channel 122 by the BS 100, each MS 110 is able to determine the uplink signalling sequence it should use (thereby defining the dedicated uplink channel 124) and the time slot 204 it is allocated in a frame 202. The uplink signalling sequence is detected at the BS 100 by a matched filter, and the time at which a peak appears in the output of the matched filter indicates which MS 110 issued the request.

Simulations have been performed to investigate the advantages of combining successive transmitted requests at the BS 100. Figure 4 is a complex phasor plot illustrating a model for the effect of noise on the output of the matched filter in the BS 100. Noise was modelled as complex Gaussian

noise, with the result that the output 402 of the matched filter is the vector sum of a signal peak 404 and a complex Gaussian noise vector 406. In the absence of a signal 402, the filter output is simply complex Gaussian noise.

In a first simulation the level of the signal 404 was held fixed and varying levels of noise 406 applied. In a scheme with no combining the magnitude of the filter output vector 402 is compared to a threshold value, and if it exceeds this value a signal is assumed to be present. Two different error rates were measured: the False Alarm Rate (FAR), which is the probability of detecting a signal when only noise is present; and the Missed Detection Rate (MDR), which is the probability of failing to detect a signal which is present.

A simple combining scheme was also simulated, in which the magnitudes of two successive matched filter outputs were added together and compared to a (different) threshold to determine whether a signal was present. For both schemes the threshold was set as a multiple of the rms noise magnitude such that the FAR remained constant at 1%.

The results are shown in Figure 5, which is a plot of the MDR in percent against the ratio of the signal magnitude to mean noise magnitude (SNR) in dB. The solid curve shows the results for the scheme without combining and the dashed curve the results with combining. The results of the combining scheme show a significant improvement in MDR, equivalent to an improvement of typically 2dB in SNR.

In a second simulation the level of the signal 404 was subjected to Rayleigh fading, to provide a more realistic mobile environment. The results are shown in Figure 6, which is a plot of the MDR in percent against the SNR in dB. The solid curve shows the results for the scheme without combining and the dashed curve the results with combining. In both cases the results show significantly higher MDR for a given signal to noise ratio than the simulation without fading, as might be expected. Again the results of the combining scheme show a significant improvement in MDR, equivalent to an improvement of between 2 and 5dB in SNR.

Alternative combining schemes could be used in a method in accordance with the present invention. The results discussed above

demonstrate the improved accuracy resulting from combining two successive filter outputs. Further improvements could be obtained by combining more outputs, although at the cost of increased delay in the BS 100 responding to the requests from the MS 110.

A multiple threshold scheme could offer further advantages. Such a scheme would operate by examining the magnitude of the filter output. If it is above an upper threshold then a request has been detected which the BS 100 can acknowledge immediately, while if it is below a lower threshold no request has been detected. If the output lies between the two thresholds then signal combining schemes such as those described above can be used to resolve the question of whether a request was sent.

Some form of power control is also desirable. If a MS 110 transmits a request at too high a power level it may swamp other signals at the BS 100, while if it transmits at too low a power level the request will not be detected. Closed loop power control is not available until the requested services are set up. Open loop power control is possible if the MS 110 uses the characteristics of a broadcast channel from the BS 100 to determine the initial power at which to transmit its requests. If no acknowledgement is received from the BS 100 the power at which the requests are transmitted could be gradually increased, subject to appropriate maximum power limits.

In a Rayleigh fading environment there could also be advantages in having random or other variations in the transmitted power level.

A further application of a method in accordance with the present invention is in the provision of paging or other services, where a BS 100 transmits messages on a downlink channel 122 to a MS 110, and continues retransmitting until an acknowledgement is received from the MS 110. In this application therefore the BS 100 functions as a secondary station and the MS 110 as a primary station.

From reading the present disclosure, other modifications will be apparent to persons skilled in the art. Such modifications may involve other features which are already known in radio communication systems and

component parts thereof, and which may be used instead of or in addition to features already described herein.

In the present specification and claims the word "a" or "an" preceding an element does not exclude the presence of a plurality of such elements. Further, the word "comprising" does not exclude the presence of other elements or steps than those listed.

CLAIMS

1. A method of operating a radio communication system, comprising a secondary station transmitting a request for resources to a primary station in a time slot allocated to the secondary station, characterised by the secondary station re-transmitting the request in at least a majority of its allocated time slots until an acknowledgement is received from the primary station.

2. A method as claimed in claim 1, characterised by the primary station determining whether a request has been transmitted by the secondary station from a combination of the received signals in a plurality of successive time slots allocated to the secondary station.

3. A method as claimed in claim 1, characterised by the primary station determining whether a request has been transmitted by the secondary station from a combination of the received signals in a plurality of successive time slots allocated to the secondary station only if the level of a received request is between a lower and an upper threshold.

4. A method as claimed in claim 1, characterised by the secondary station modifying the power of re-transmitted requests in response to lack of an acknowledgement signal from the primary station.

5. A method as claimed in claim 4, characterised by the secondary station increasing the power of re-transmitted requests in response to lack of an acknowledgement signal from the primary station.

6. A radio communication system comprising a primary station and a plurality of secondary stations, the primary station having means for allocating a time slot for a secondary station to transmit a request for resources to the primary station, characterised in that the secondary station

has means for re-transmitting the request in at least a majority of its allocated time slots until it receives an acknowledgement from the primary station.

7. A primary station for use in a radio communication system, the primary station having means for allocating time slots to secondary stations for requesting resources, characterised in that the primary station has combining means for determining from a combination of received signals in a plurality of successive time slots allocated to the secondary station whether the secondary station has transmitted a request for resources.

8. A primary station as claimed in claim 7, characterised in that the combining means are only operated if the level of a received request is between a lower and an upper threshold.

9. A secondary station for use in a radio communication system including a primary station having means for allocating a time slot for the secondary station to transmit a request for resources to the primary station, characterised in that means are provided for re-transmitting the request in at least a majority of the allocated time slots until an acknowledgement is received from the primary station.

10. A secondary station as claimed in claim 9, characterised in that means are provided for modifying the power of re-transmitted requests in response to lack of an acknowledgement signal from the primary station.

ABSTRACT

RADIO COMMUNICATION SYSTEM

A method of operating a radio communication system in which secondary stations use dedicated time slots to request services from a primary station. A secondary station wishing to request a service sends a request in every time slot allocated to it until it receives an acknowledgement from the primary station. The primary station can use combining techniques on multiple time slots to identify the presence or absence of a request from a secondary station with improved accuracy.

(Figure 3)

DECLARATION AND POWER OF ATTORNEY

Sole/Joint

Attorney's Docket No: PHB34306US

As a below named inventor, I hereby declare that:
My residence, post office address and citizenship are as stated below next to my name
I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

RADIO COMMUNICATION SYSTEM

.....

.....

the specification of which (check one)

☒ is attached hereto

☐ was filed on as Application Serial No: ..... and was amended on

..... (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.
I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56 (a).
I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

PRIOR FOREIGN APPLICATION(S)

COUNTRY	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY Claimed Under 35 U.S.C. 119
GREAT BRITAIN	9827182.8	10-12-1998	Yes X No
			Yes No

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35 United States Code §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

PRIOR UNITED STATES APPLICATION(S)

APPLICATION SERIAL NUMBER	FILING DATE	STATUS (PATENTED, PENDING, ABANDONED)

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

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

Jack E. Haken, Reg. No 26,902
Algy Tamoshunas, Reg. No 27,677

SEND CORRESPONDENCE TO:	DIRECT TELEPHONE CALLS TO: (Name and telephone number)
Corporate Patent Counsel U.S. Philips Corporation 580 White Plains Road Tarrytown, New York 10591	(914) 332-0222

Dated: 26 OCTOBER 1999		Inventor's Signature:		
FULL NAME OF INVENTOR:	Last name: HUNT	First Name: Bernard	Middle Name:	
RESIDENCE & CITIZENSHIP	City: REDHILL	State or Foreign Country: GREAT BRITAIN	Country of Citizenship: GREAT BRITAIN	
POST OFFICE ADDRESS	Street & No: FLAT 1, RANMORE HOUSE 19 ST JOHNS TERRACE ROAD	City: REDHILL	State or Country: GREAT BRITAIN	Zip Code: RH1 6HS

Dated:		Inventor's Signature:		
FULL NAME OF INVENTOR:	Last name	First Name:	Middle Name:	
RESIDENCE & CITIZENSHIP	City	State or Foreign Country:	Country of Citizenship:	
POST OFFICE ADDRESS	Street & No:	City:	State or Country:	Zip Code:

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of | Atty. Docket

BERNARD HUNT | PHB 34,306

Serial No. | Group Art Unit

Filed: CONCURRENTLY | Examiner:

Title: RADIO COMMUNICATION SYSTEM

Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

APPOINTMENT OF ASSOCIATES

Sir:

The undersigned Attorney of Record hereby revokes all prior appointments (if any) of Associate Attorney(s) or Agent(s) in the above-captioned case and appoints:

DICRAN HALAJIAN (Registration No. 39,703)

c/o U.S. PHILIPS CORPORATION, Intellectual Property Department, 580 White Plains Road, Tarrytown, New York 10591, his Associate Attorney(s)/Agent(s) with all the usual powers to prosecute the above-identified application and any division or continuation thereof, to make alterations and amendments therein, and to transact all business in the Patent and Trademark Office connected therewith.

ALL CORRESPONDENCE CONCERNING THIS APPLICATION AND THE LETTERS PATENT WHEN GRANTED SHOULD BE ADDRESSED TO THE UNDERSIGNED ATTORNEY OF RECORD.

Respectfully,

Jack E. Haken, Reg. 26,902
Attorney of Record

Dated at Tarrytown, New York
this 3RD day of December, 1999.

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SERIAL NUMBER	FILING DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
09/455,124	12/06/99	455	2749	PHB-34.306

APPLICANT

BERNARD HUNT, REDHILL, GREAT BRITAIN.

CONTINUING DOMESTIC DATA********
VERIFIED

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371 (NAT'L STAGE) DATA********
VERIFIED

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FOREIGN APPLICATIONS********
VERIFIED GREAT BRITAIN 9827182.8 12/10/98

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Foreign Priority claimed / 35 USC 119 (a-d) conditions met / Verified and Acknowledged	STATE OR COUNTRY	SHEETS DRAWING	TOTAL CLAIMS	INDEPENDENT CLAIMS
☒ yes ☐ no / ☒ yes ☐ no ☐ Met after Allowance / Examiner's Initials _____ Initials	GB3	3	12	4

ADDRESS

CORPORATE PATENT COUNSEL
US PHILIPS CORPORATION
580 WHITE PLAINS ROAD
TARRYTOWN NY 10591

TITLE

RADIO COMMUNICATION SYSTEM

FILING FEE RECEIVED	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT NO. _____ for the following:	
$838		☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

1184

PATENT APPLICATION FEE DETERMINATION RECORD
Effective November 10, 1998

Application or Docket Number

CLAIMS AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA
BASIC FEE		
TOTAL CLAIMS	12 minus 20=	*
INDEPENDENT CLAIMS	4 minus 3 =	* 1
MULTIPLE DEPENDENT CLAIM PRESENT		

SMALL ENTITY TYPE ☐	RATE	FEE	OR	OTHER THAN SMALL ENTITY	RATE	FEE
		380.00	OR			760.00
	X$ 9=		OR		X$18=	
	X39=		OR		X78=	78.00
	+130=		OR		+260=	
	TOTAL		OR		TOTAL	838.00

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

AMENDMENT A

	(Column 1)		(Column 2)	(Column 3)
	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

SMALL ENTITY	RATE	ADDI-TIONAL FEE	OR	OTHER THAN SMALL ENTITY	RATE	ADDI-TIONAL FEE
	X$ 9=		OR		X$18=	
	X39=		OR		X78=	
	+130=		OR		+260=	
	TOTAL ADDIT. FEE		OR		TOTAL ADDIT. FEE	

AMENDMENT B

	(Column 1)		(Column 2)	(Column 3)
	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

RATE	ADDI-TIONAL FEE	OR	RATE	ADDI-TIONAL FEE
X$ 9=		OR	X$18=	
X39=		OR	X78=	
+130=		OR	+260=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT C

	(Column 1)		(Column 2)	(Column 3)
	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

RATE	ADDI-TIONAL FEE	OR	RATE	ADDI-TIONAL FEE
X$ 9=		OR	X$18=	
X39=		OR	X78=	
+130=		OR	+260=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
***If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

FORM PTO-875
(Rev. 11/98)
*U.S. Government Printing Office: 1999 — 459-072/19142
Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION SERIAL NO. _____

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

12/20/1999 BALEXAND 00000026 141270 09455124

01 FC:101 760.00 CH
02 FC:102 78.00 CH

PTO-1556
(5/87)

*U.S. GPO: 1998-433-214/80404

MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET (FOR USE WITH FORM PTO-875)	SERIAL NO.	FILING DATE
	APPLICANT(S)	

CLAIMS

	AS FILED		AFTER 1st AMENDMENT		AFTER 2nd AMENDMENT	
	IND.	DEP.	IND.	DEP.	IND.	DEP.
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TOTAL CLAIMS	8					

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TOTAL DEP.						
TOTAL CLAIMS						

The Patent Office

PHP34306
U.S.A.

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INVESTOR IN PEOPLE

The Patent Office
Concept House
Cardiff Road
Newport
South Wales
NP10 8QQ

jc490 U.S. PTO
09/455124
12/06/99

CERTIFIED COPY OF PRIORITY DOCUMENT

I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

In accordance with the Patents (Companies Re-registration) Rules 1982, if a company named in this certificate and any accompanying documents has re-registered under the Companies Act 1980 with the same name as that with which it was registered immediately before re-registration save for the substitution as, or inclusion as, the last part of the name of the words "public limited company" or their equivalents in Welsh, references to the name of the company in this certificate and any accompanying documents shall be treated as references to the name with which it is so re-registered.

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Dated 09 AUG 1999

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Patents Form 1/77

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1/77

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10 DEC 1998
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Request for grant of a patent
(See notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

The Patent Office

Cardiff Road
Newport
Gwent NP9 1RH

10 DEC 1998

1. Your reference — PHB 34306

2. Patent application number
(The Patent Office will fill in this part) — **9827182.8**

10DEC98 E411039-3 D02879
P01/7700 0.00 - 9827182.8

3. Full name, address and postcode of the or of each applicant (*underline all surnames*)

KONINKLIJKE PHILIPS ELECTRONICS N.V.
GROENEWOUDSEWEG 1
5621 BA EINDHOVEN
THE NETHERLANDS

Patents ADP Number (*if you know it*) — 06828487001

If the applicant is a corporate body, give the country/state of its incorporation — THE NETHERLANDS

4. Title of the invention — RADIO COMMUNICATION SYSTEM

5. Name of your agent (*if you have one*) — COLIN JAMES MOODY

"Address for service" in the United Kingdom to which all correspondence should be sent (*including the postcode*)

Philips Electronics
Patents & Trade Marks Department
Cross Oak Lane
Redhill
Surrey RH1 5HA

Patents ADP number (*if you know it*) — 07830516 01

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (*if you know it*) the or each application number

Country	Priority Application number	Date of filing

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing (*day/month/year*)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (*Answer "Yes" if:*
a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body.
See note (d)) — YES

Patents form

9. Enter the number of sheets for any of the following items you are filing with this form.
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Description	9x2
Claims(s)	4x2
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Drawings	3x2

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Translations of priority documents

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Request for preliminary examination and search (*Patents Form 9/77*)

Request for substantive examination (*Patents Form 10/77*)

Any other documents (*Please specify*)

11. I/We request the grant of a patent on the basis of this application.

Signature C J Moody Date 9th December 1998

12. Name and daytime telephone number of person to contact in the United Kingdom 01293 81 5278 C J MOODY

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After an application for a patent has been filed, the Comptroller of the Patent Office will consider whether publication or communication of the invention should be prohibited or restricted under Section 22 of the Patents Act 1977. You will be informed if it is necessary to prohibit or restrict your invention in this way. Furthermore, if you live in the United Kingdom, Section 23 of the Patents Act 1977 stops you from applying for a patent abroad without first getting written permission from the Patent Office unless an application has been filed at least 6 weeks beforehand in the United Kingdom for a patent for the same invention and either no direction prohibiting publication or communication has been given, or any such direction has been revoked.

Notes

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DESCRIPTION

RADIO COMMUNICATION SYSTEM

The present invention relates to a method of operating a radio communication system, and further relates to such a system and to primary and secondary stations for use in such a system. While the present specification describes a system with particular reference to the emerging Universal Mobile Telecommunication System (UMTS), it is to be understood that such techniques are equally applicable to use in other mobile radio systems.

In a radio communication system it is generally required to be able to exchange signalling messages between a Mobile Station (MS) and a Base Station (BS). Downlink signalling (from BS to MS) is usually realised by using a physical broadcast channel of the BS to address any MS in its coverage area. Since only one transmitter (the BS) uses this broadcast channel there is no access problem.

In contrast, uplink signalling (from MS to BS) requires more detailed considerations. If the MS already has an uplink channel assigned to it, for voice or data services, this signalling can be achieved by piggy-backing, in which the signalling messages are attached to data packets being sent from the MS to the BS. However, if there is no uplink channel assigned to the MS piggy-backing is not possible. In this case a fast uplink signalling mechanism should be available for the establishment, or re-establishment, of a new uplink channel.

In conventional systems, for example those operating to the Global System for Mobile communication (GSM) standard, fast uplink signalling is enabled by the provision of a random access channel using a slotted ALOHA or similar protocol. However, such a scheme works satisfactorily only with a low traffic load, and is not believed to be capable of handling the requirements imposed by third-generation telecommunications standards such as UMTS.

To meet these requirements one UMTS embodiment includes a dedicated signalling channel, which comprises frames including a time slot for each MS registered with the controlling BS. If a MS requires a service from the BS it transmits a request in its allocated slot then waits for an acknowledgement from the BS setting up the required service. Parameters which characterise the performance of the signalling channel include the false alarm rate (where the BS erroneously identifies a MS as requesting a service), the missed detection rate (where the BS does not detect a request from a MS), and the delay between a request for a service by the MS and the provision of that service by the BS.

An object of the present invention is to improve the efficiency of the method by which a MS requests resources from a BS.

According to a first aspect of the present invention there is provided a method of operating a radio communication system, comprising a secondary station transmitting a request for resources to a primary station in a time slot allocated to the secondary station, characterised by the secondary station re-transmitting the request in at least a majority of its allocated time slots until an acknowledgement is received from the primary station.

This scheme improves the typical time for a response by the primary station to a request by a secondary station. Because there is no possibility of requests from different secondary stations colliding, a secondary station can retransmit requests in each allocated time slot. In contrast, in prior art systems a secondary station has to wait at least long enough for the primary station to have received, processed and acknowledged a request before it is able to retransmit.

Further, the primary station can improve the accuracy with which it determines whether a request was sent by a particular secondary station if the received signal strength is close to the detection threshold by examining the received signals in multiple time slots allocated to the secondary station in question.

According to a second aspect of the present invention there is provided a radio communication system comprising a primary station and a plurality of secondary stations, the primary station having means for allocating a time slot for a secondary station to transmit a request for resources to the primary station, characterised in that the secondary station has means for re-transmitting the request in at least a majority of its allocated time slots until it receives an acknowledgement from the primary station.

According to a third aspect of the present invention there is provided a primary station for use in a radio communication system, the primary station having means for allocating time slots to secondary stations for requesting resources, characterised in that the primary station has combining means for determining from a combination of received signals in a plurality of successive time slots allocated to the secondary station whether the secondary station has transmitted a request for resources.

According to a fourth aspect of the present invention there is provided a secondary station for use in a radio communication system including a primary station allocating a time slot for the secondary station to transmit a request for resources to the primary station, characterised in that the secondary station has means for re-transmitting the request in at least a majority of its allocated time slots until an acknowledgement is received from the primary station.

The present invention is based upon the recognition, not present in the prior art, that in a system having time slots allocated to a secondary station for requesting resources, improved performance can be obtained by the secondary station repeating the request until an acknowledgement is received.

Embodiments of the present invention will now be described, by way of example, with reference to the accompanying drawings, wherein:

Figure 1 is a block schematic diagram of a radio communication system;

Figure 2 illustrates a possible frame format for a dedicated uplink signalling channel;

Figure 3 is a flow chart illustrating a method in accordance with the present invention of a mobile station requesting a service from a base station;

Figure 4 is a complex phasor plot showing the output of a matched filter in a BS in the presence of noise;

Figure 5 is a graph of missed detection rate (MDR) in percent against signal to noise ratio (SNR) in dB for a fixed signal magnitude, the solid line indicating results with no combining at the BS and the dashed line indicating results with combining at the BS; and

Figure 6 is a graph of missed detection rate (MDR) in percent against signal to noise ratio (SNR) in dB for a signal subject to Rayleigh fading, the solid line indicating results with no combining at the BS and the dashed line indicating results with combining at the BS.

In the drawings the same reference numerals have been used to indicate corresponding features.

Referring to Figure 1, a radio communication system comprises a primary station (BS) 100 and a plurality of secondary stations (MS) 110. The BS 100 comprises a microcontroller (μC) 102, transceiver means 104 connected to radio transmission means 106, and connection means 108 for connection to the PSTN or other suitable network. Each MS 110 comprises a microcontroller (μC) 112, transceiver means 114 connected to radio transmission means 116, and power control means 118 for altering the transmitted power level. Communication from BS 100 to MS 110 takes place on a downlink channel 122, while communication from MS 110 to BS 100 takes place on an uplink channel 124.

The present invention is concerned with an uplink channel 124 dedicated to the transmission of requests for services by a MS 110 to a BS 100. One arrangement of such a channel for UMTS is illustrated in Figure 2. The uplink channel 124 is divided into a succession of frames 202, each of length 10ms, and each MS 110 registered with the BS 100 is allocated a time slot 204 in each frame in which it can transmit a request for service. Although

only ten time slots 204 are shown in each frame 202, in practice there may be many more per frame.

Although it is anticipated that a single dedicated uplink channel 124 will provide sufficient capacity in normal situations, it is possible for there to be more mobile stations 110 registered with a BS 100 than there are available time slots in each frame. In such circumstances the BS 100 can either make another uplink channel 124 available for fast signalling purposes or increase the capacity of the existing channel by not allocating a time slot for every MS 110 in every frame.

In traditional signalling schemes, for example that used for the random access channel in GSM, a MS 110 makes a request for service to a BS 100 and then waits for an acknowledgement from the BS 100. If no acknowledgement is received after a predetermined period of time, the MS 110 assumes that the request was not correctly received and schedules another request. This scheme minimises traffic on the channel to minimise collisions between requests from different mobile stations 110 thereby avoiding loss of channel capacity.

However, in a dedicated uplink channel 124 having time slots allocated to each MS 110 collisions will not normally occur. A more effective signalling scheme, in accordance with the present invention, is that shown in Figure 3. The process starts at 302 when the MS 110 determines that it requires a service from the BS 100. The MS 110 then makes a request for service 304 in the next time slot 204 (Figure 2) allocated to it. In a Code Division Multiple Access (CDMA) system, the request 304 is made by transmitting a predetermined code sequence. Requests 304 continue to be made in successive allocated time slots 204 until a first test 306 determines that no further requests should be made, for example by examining the value of a flag that was set to true at the start 302 of the process.

A second test 308 determines whether the MS 110 has received an acknowledgement from the BS 100. When the second test 308 determines that an acknowledgement has been received from the BS 100, the MS 110 at 310 stops any further requests from being sent, for example by setting to false

a flag that is checked by the first test 306. The MS 110 then begins negotiations 312 with the BS 100 to define fully the required services. Finally, at 314, the required services are set up by the BS 100.

This scheme has the advantage that if a request is not received correctly by the BS 100 it can be repeated at the frame rate (100 Hz for the 10ms frame defined in UMTS), or at least in every allocated time slot if the system is busy and a time slot is not allocated in every frame. In a traditional scheme it is not guaranteed that a request could be received and processed by the BS 100 sufficiently rapidly for an acknowledgement to be scheduled for the immediately following frame, so the time that a MS 110 has to wait before re-transmitting the request is substantially longer.

A further advantage of the signalling scheme in accordance with the present invention is that the quality of detection at the BS 100 can be improved by combining requests. Since the BS 100 knows that requests will be repeated in every frame, it can postpone making a decision about a possible received request when this request is near to the decision threshold and use information from the next (and subsequent) frames to improve the confidence of the decision. This amounts to a form of time diversity, and will improve the robustness of the signalling scheme to the effects of fading, near-far effect and other interference.

In one embodiment of UMTS implementation, the dedicated uplink channel employs a CDMA technique. Using information transmitted on a downlink broadcast channel 122 by the BS 100, each MS 110 is able to determine the uplink signalling sequence it should use (thereby defining the dedicated uplink channel 124) and the time slot 204 it is allocated in a frame 202. The uplink signalling sequence is detected at the BS 100 by a matched filter, and the time at which a peak appears in the output of the matched filter indicates which MS 110 issued the request.

Simulations have been performed to investigate the advantages of combining successive transmitted requests at the BS 100. Figure 4 is a complex phasor plot illustrating a model for the effect of noise on the output of the matched filter in the BS 100. Noise was modelled as complex Gaussian

noise, with the result that the output 402 of the matched filter is the vector sum of a signal peak 404 and a complex Gaussian noise vector 406. In the absence of a signal 402, the filter output is simply complex Gaussian noise.

In a first simulation the level of the signal 404 was held fixed and varying levels of noise 406 applied. In a scheme with no combining the magnitude of the filter output vector 402 is compared to a threshold value, and if it exceeds this value a signal is assumed to be present. Two different error rates were measured: the False Alarm Rate (FAR), which is the probability of detecting a signal when only noise is present; and the Missed Detection Rate (MDR), which is the probability of failing to detect a signal which is present.

A simple combining scheme was also simulated, in which the magnitudes of two successive matched filter outputs were added together and compared to a (different) threshold to determine whether a signal was present. For both schemes the threshold was set as a multiple of the rms noise magnitude such that the FAR remained constant at 1%.

The results are shown in Figure 5, which is a plot of the MDR in percent against the ratio of the signal magnitude to mean noise magnitude (SNR) in dB. The solid curve shows the results for the scheme without combining and the dashed curve the results with combining. The results of the combining scheme show a significant improvement in MDR, equivalent to an improvement of typically 2dB in SNR.

In a second simulation the level of the signal 404 was subjected to Rayleigh fading, to provide a more realistic mobile environment. The results are shown in Figure 6, which is a plot of the MDR in percent against the SNR in dB. The solid curve shows the results for the scheme without combining and the dashed curve the results with combining. In both cases the results show significantly higher MDR for a given signal to noise ratio than the simulation without fading, as might be expected. Again the results of the combining scheme show a significant improvement in MDR, equivalent to an improvement of between 2 and 5dB in SNR.

Alternative combining schemes could be used in a method in accordance with the present invention. The results discussed above

demonstrate the improved accuracy resulting from combining two successive filter outputs. Further improvements could be obtained by combining more outputs, although at the cost of increased delay in the BS 100 responding to the requests from the MS 110.

A multiple threshold scheme could offer further advantages. Such a scheme would operate by examining the magnitude of the filter output. If it is above an upper threshold then a request has been detected which the BS 100 can acknowledge immediately, while if it is below a lower threshold no request has been detected. If the output lies between the two thresholds then signal combining schemes such as those described above can be used to resolve the question of whether a request was sent.

Some form of power control is also desirable. If a MS 110 transmits a request at too high a power level it may swamp other signals at the BS 100, while if it transmits at too low a power level the request will not be detected. Closed loop power control is not available until the requested services are set up. Open loop power control is possible if the MS 110 uses the characteristics of a broadcast channel from the BS 100 to determine the initial power at which to transmit its requests. If no acknowledgement is received from the BS 100 the power at which the requests are transmitted could be gradually increased, subject to appropriate maximum power limits.

In a Rayleigh fading environment there could also be advantages in having random or other variations in the transmitted power level.

A further application of a method in accordance with the present invention is in the provision of paging or other services, where a BS 100 transmits messages on a downlink channel 122 to a MS 110, and continues retransmitting until an acknowledgement is received from the MS 110. In this application therefore the BS 100 functions as a secondary station and the MS 110 as a primary station.

From reading the present disclosure, other modifications will be apparent to persons skilled in the art. Such modifications may involve other features which are already known in radio communication systems and component parts thereof, and which may be used instead of or in addition to

features already described herein. Although claims have been formulated in this application to particular combinations of features, it should be understood that the scope of the disclosure of the present application also includes any novel feature or any novel combination of features disclosed herein either explicitly or implicitly or any generalisation thereof, whether or not it relates to the same invention as presently claimed in any claim and whether or not it mitigates any or all of the same technical problems as does the present invention. The applicants hereby give notice that new claims may be formulated to such features and/or combinations of features during the prosecution of the present application or of any further application derived therefrom.

CLAIMS

1. A method of operating a radio communication system, comprising a secondary station transmitting a request for resources to a primary station in a time slot allocated to the secondary station, characterised by the secondary station re-transmitting the request in at least a majority of its allocated time slots until an acknowledgement is received from the primary station.

2. A method as claimed in claim 1, characterised by the primary station determining whether a request has been transmitted by the secondary station from a combination of the received signals in a plurality of successive time slots allocated to the secondary station.

3. A method as claimed in claim 1, characterised by the primary station determining whether a request has been transmitted by the secondary station from a combination of the received signals in a plurality of successive time slots allocated to the secondary station only if the level of a received request is between a lower and an upper threshold.

4. A method as claimed in any one of claims 1 to 3, characterised by the secondary station modifying the power of re-transmitted requests in response to lack of an acknowledgement signal from the primary station.

5. A method as claimed in any one of claims 1 to 3, characterised by the secondary station increasing the power of re-transmitted requests in response to lack of an acknowledgement signal from the primary station.

6. A radio communication system comprising a primary station and a plurality of secondary stations, the primary station having means for

allocating a time slot for a secondary station to transmit a request for resources to the primary station, characterised in that the secondary station has means for re-transmitting the request in at least a majority of its allocated time slots until it receives an acknowledgement from the primary station.

7. A system as claimed in claim 6, characterised in that the primary station has combining means for determining whether a request has been transmitted by the secondary station from a combination of the received signals in a plurality of successive time slots allocated to the secondary station.

8. A system as claimed in claim 7, characterised in that the combining means are only operated if the level of a received request is between a lower and an upper threshold.

9. A system as claimed in any one of claims 6 to 8, characterised in that the secondary station has means for modifying the power of re-transmitted requests in response to lack of an acknowledgement signal from the primary station.

10. A system as claimed in any one of claims 6 to 8, characterised in that the secondary station has means for increasing the power of re-transmitted requests in response to lack of an acknowledgement signal from the primary station.

11. A primary station for use in a radio communication system, the primary station having means for allocating time slots to secondary stations for requesting resources, characterised in that the primary station has combining means for determining from a combination of received signals in a plurality of successive time slots allocated to the secondary station whether the secondary station has transmitted a request for resources.

12. A primary station as claimed in claim 11, characterised in that the combining means are only operated if the level of a received request is between a lower and an upper threshold.

13. A secondary station for use in a radio communication system including a primary station allocating a time slot for the secondary station to transmit a request for resources to the primary station, characterised in that the secondary station has means for re-transmitting the request in at least a majority of its allocated time slots until an acknowledgement is received from the primary station.

14. A secondary station as claimed in claim 13, characterised in that means are provided for modifying the power of re-transmitted requests in response to lack of an acknowledgement signal from the primary station.

15. A secondary station as claimed in claim 13, characterised in that means are provided for increasing the power of re-transmitted requests in response to lack of an acknowledgement signal from the primary station.

16. A method of operating a radio communication system substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

17. A radio communication system substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

18. A primary station for use in a radio communication system substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

19. A secondary station for use in a radio communication system substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

ABSTRACT

RADIO COMMUNICATION SYSTEM

A method of operating a radio communication system in which secondary stations use dedicated time slots to request services from a primary station. A secondary station wishing to request a service sends a request in every time slot allocated to it until it receives an acknowledgement from the primary station. The primary station can use combining techniques on multiple time slots to identify the presence or absence of a request from a secondary station with improved accuracy.

(Figure 3)

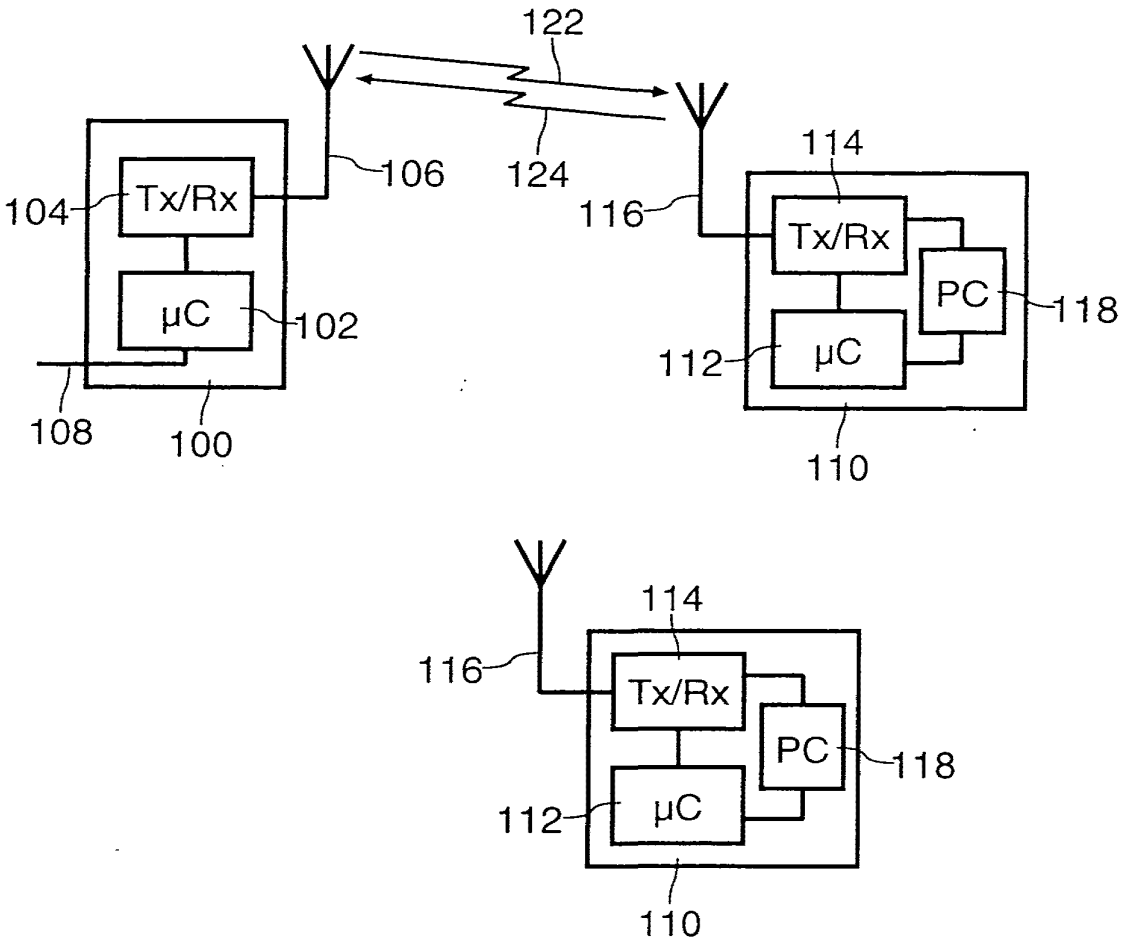
122
124
106
104
Tx/Rx
µC
102
108
100
114
116
Tx/Rx
PC
118
112
µC
110
114
116
Tx/Rx
PC
118
112
µC
110

FIG. 1

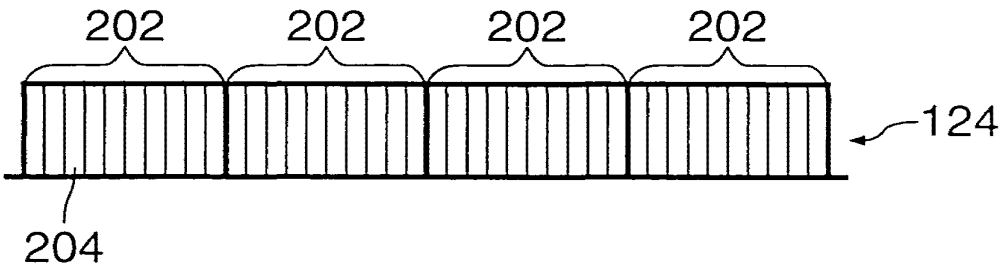
202
202
202
202
124
204

FIG. 2

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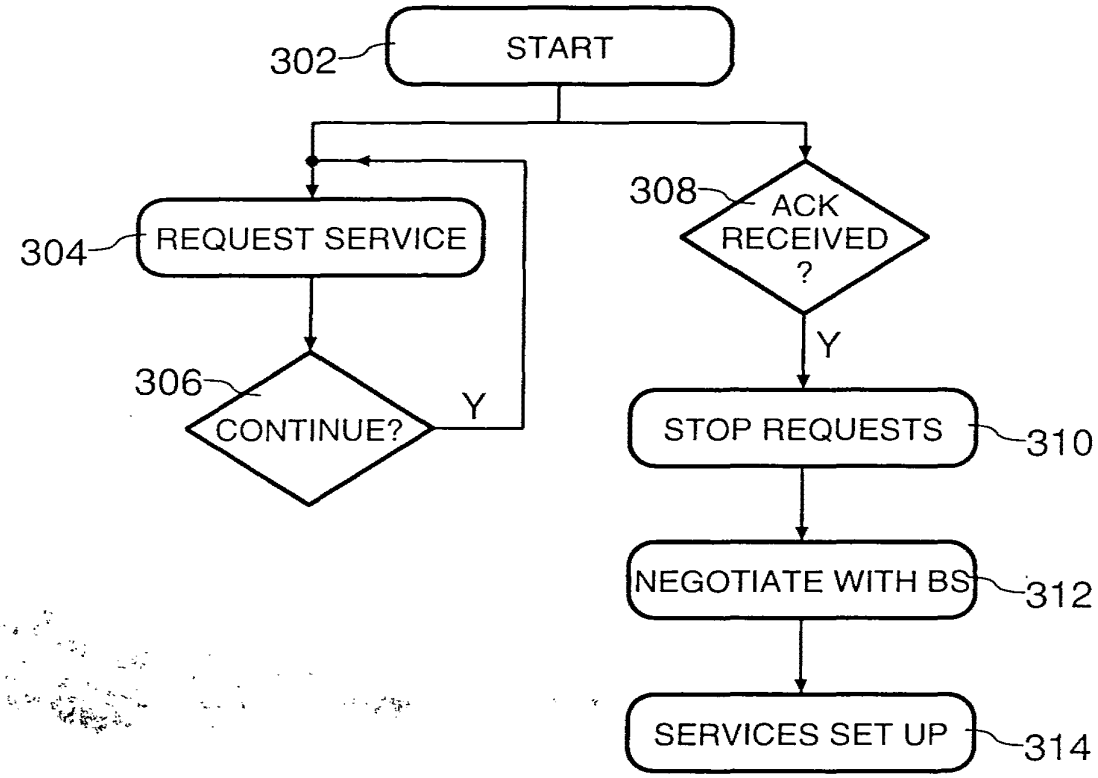
302
START
304
REQUEST SERVICE
306
CONTINUE?
Y
308
ACK RECEIVED ?
Y
STOP REQUESTS
310
NEGOTIATE WITH BS
312
SERVICES SET UP
314

FIG. 3

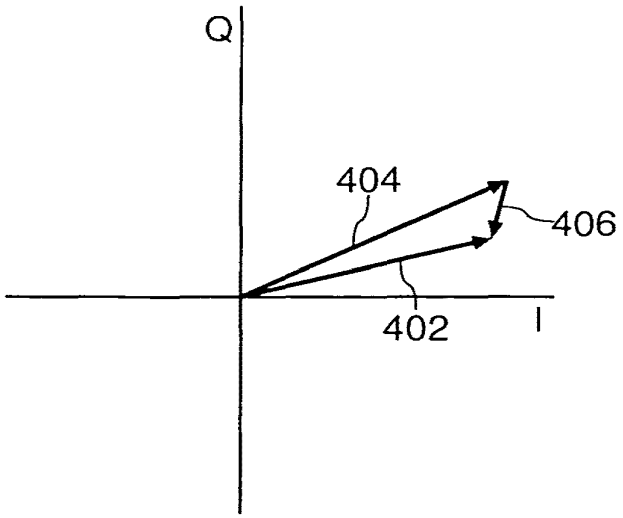
Q
404
406
402
I

FIG. 4

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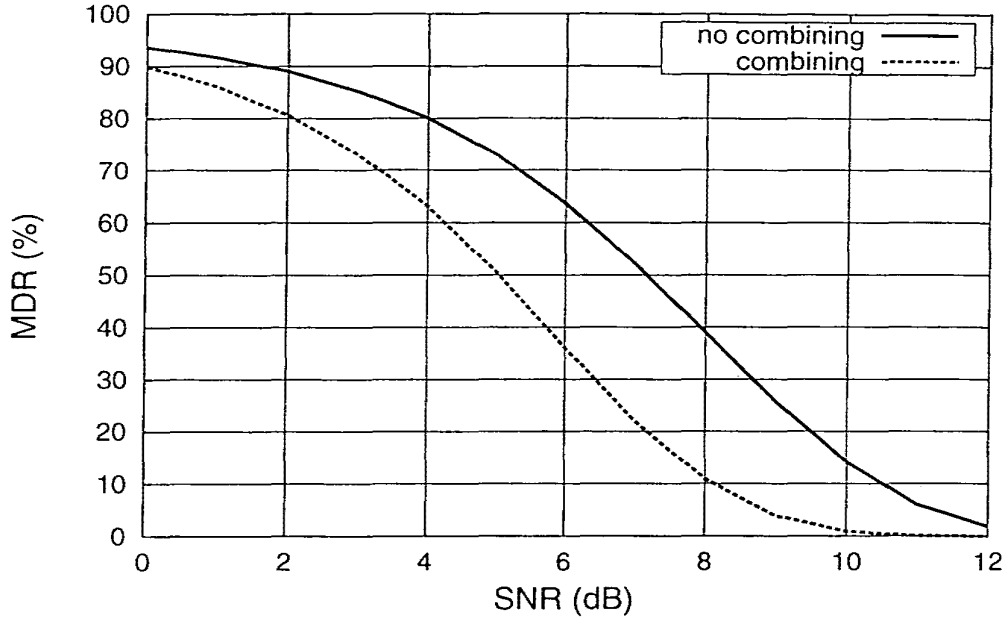
100
90
80
70
60
50
40
30
20
10
0
MDR (%)
0
2
4
6
8
10
12
SNR (dB)
no combining
combining

FIG. 5

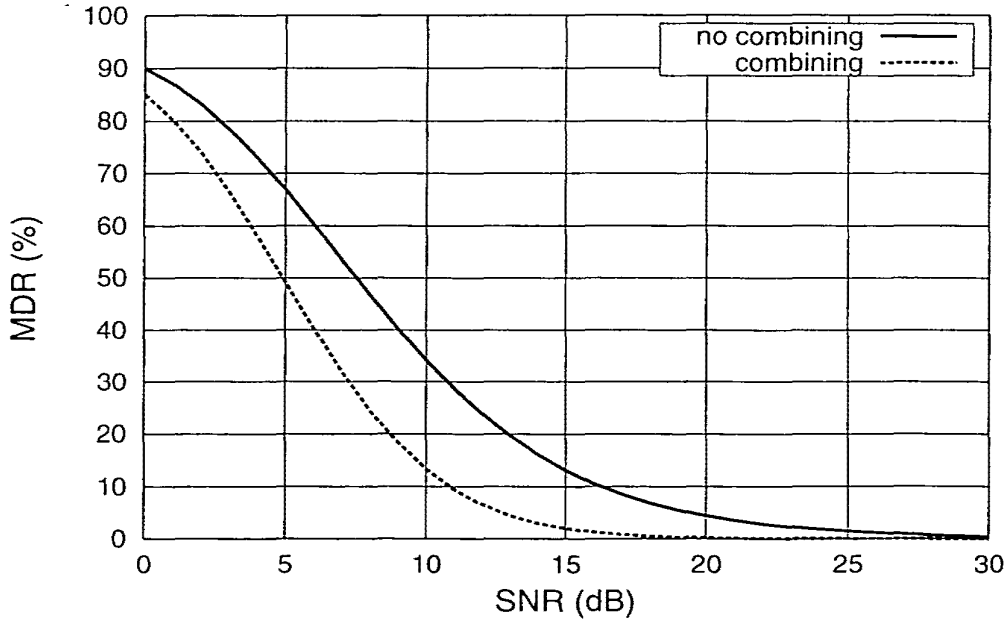
100
90
80
70
60
50
40
30
20
10
0
MDR (%)
0
5
10
15
20
25
30
SNR (dB)
no combining
combining

FIG. 6