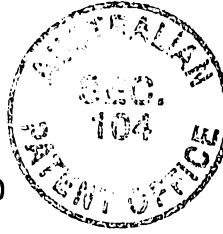


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AMENDED

AUSTRALIA
PATENTS ACT 1990



F91552
P/00/001
Section 29

3

PATENT REQUEST: STANDARD PATENT

WE, being the person identified below as the Applicant, request the grant of a patent to the person identified below as the Nominated Person, for an invention described in the accompanying standard complete specification.

Full application details follow:

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Groenewoudseweg 1,
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The Netherlands.
- [54] Invention Title: TRANSMISSION SYSTEM COMPRISING AT LEAST
TWO SUBSCRIBER DEVICES EXCHANGING
INFORMATION SIGNALS IN THE SIMPLEX MODE
- [72] Name(s) of actual Inventor (s) Pierre MAKOWSKI
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[BASIC CONVENTION APPLICATION(S) DETAILS

[00] Application No.	[33] Country	Country Code	32] Date of Applc.
9111211	FRANCE	FR	11.09.91

Drawing Number recommended to accompany the Abstract: FIG.1

For and on behalf of
PHILIPS ELECTRONICS N.V.

P. Mackenzie
P.W. Mackenzie (Attorney)

16-11-91
Date

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NOTICE OF ENTITLEMENT

(TO BE FILED BEFORE ACCEPTANCE)

WE PHILIPS ELECTRONICS (formerly named N.V. PHILIPS'
GLOEILAMPENFABRIEKEN),

of Groenewoudseweg 1, Eindhoven, The Netherlands being the
applicant in respect of Application No. 22849/92

state the following:-

1. The person nominated for the grant of the patent has entitlement from the actual inventors by virtue of a mesne assignment.
2. The person nominated for the grant of the patent has entitlement from the applicant of the basic application listed on the patent request form by virtue of assignment.
3. The basic application listed on the request form is the first application made in a convention country in respect of the invention.

Dated this *5th* Day of *December* 1994

For and on behalf of
PHILIPS ELECTRONICS N.V.

P. Mackenzie
P.W. Mackenzie
Attorney



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(12) PATENT ABRIDGMENT (11) Document No. AU-B-22849/92
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 657784

- (54) Title
TRANSMISSION SYSTEM COMPRISING AT LEAST TWO SUBSCRIBER DEVICES EXCHANGING INFORMATION SIGNALS IN THE SIMPLEX MODE
- International Patent Classification(s)
(51)⁵ **H04L 005/16**
- (21) Application No. : **22849/92** (22) Application Date : **09.09.92**
- (30) Priority Data
- (31) Number (32) Date (33) Country
91 11211 11.09.91 FR FRANCE
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- (71) Applicant(s)
PHILIPS ELECTRONICS N.V.
- (72) Inventor(s)
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- (56) Prior Art Documents
US 5231635
US 5200956
US 5091906
- (57) Claim

1. A method of operating a transmission system having a first subscriber device from which an information transmission is required and a set of at least one second subscriber devices among which at least one of these second subscriber devices is a destination for the information transmission, wherein the devices exchange information signals and control signals in a simplex mode over a common channel in time division multiplex, in which the control signals are transmitted during spaced control time intervals, the method comprising the steps of;
- permitting a transmission of a request to transmit from said first subscriber device during said one of said control time intervals,
 - broadcasting said request to transmit to all said second devices of said set,
 - responsive to receipt of the broadcasted request, preventing said second subscribers of said set from transmitting until receipt of a broadcasted release signal
 - responsive to completion of the said transmission of the said information signal, broadcasting said release signal to all said second devices of said set.

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COMPLETE SPECIFICATION

FOR A STANDARD PATENT

O R I G I N A L



Name of Applicant: Philips Electronics N.V.
~~N. V. PHILIPS' GLOEILAMPENFABRIEKEN~~

Actual Inventors: PIERRE MAKOWSKI
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Address for Service: PATENT AND TRADE MARKS DIVISION,
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Invention Title: "TRANSMISSION SYSTEM COMPRISING AT LEAST
TWO SUBSCRIBER DEVICES EXCHANGING
INFORMATION SIGNALS IN THE SIMPLEX
MODE"

The following statement is a full description of this invention including the best method of performing it known to us.

The present invention relates to a method of operating a transmission system having a first subscriber device from which an information transmission is required and a set of at least one second subscriber devices among which at least one of these second subscriber devices is a destination for the information transmission, wherein
5 the devices exchange information signals and control signals in a simplex mode over a common channel in time division multiplex, in which the control signals are transmitted during spaced control time intervals. The invention likewise relates to a subscriber device suitable for such a system.

A system of this type finds important applications, more specifically, when the
10 connections are realised by radio channel.

A known system of this type is described in French Patent Application No. 2 667 747 filed 9 October 1990 in the name of the Applicants. When these systems are used as private systems (as against public systems), the radio resources (reduced pass-band frequency channels) are spread parsimoniously. Therefore, the
15 communications between two subscribers are effected in the alternate mode: that is to say, when one subscriber speaks, the other listens (e.g. with a push to talk switch).

The problem then posed is caused by the simultaneous request from two subscribers or more to speak. Remains thus the risk of communication getting lost.

In order to resolve this problem a method of operating a transmission
20 system of the type mentioned in the opening paragraph comprises the steps of:

- permitting a transmission of a request to transmit from said first subscriber device during said one of said control time intervals,
- broadcasting said request to transmit to all said second devices of said set,
- responsive to receipt of the broadcasted request, preventing said second subscribers
25 of said set from transmitting until receipt of a broadcasted release signal
- responsive to completion of the said transmission of the said information signal, broadcasting said release signal to all said second devices of said set.

The following description made with reference to the annexed drawings, all this given by way of non-limiting example, will make it better understood how the
30 invention may be realised, in which:



Fig. 1 shows a diagram of the transmission system;

Fig. 2 shows the spreading of the control time intervals within a time-division multiplex;

Fig. 3 shows the diagram of a subscriber coupling station; and

5

Fig. 4 shows the protocol of the simplex control.

Fig. 1 shows a system according to the invention. This system is formed by a set of transceiver stations STB, STM1 and STM2. Self-evidently, the number of stations may be arbitrary. STB is a transceiver base station, STM1 and STM2 are sub-
10 stations, that is to say, managed by the base station. In practice the base station is a fixed station, whereas the stations STM1 and STM2 are portable stations or stations installed in vehicles. A subscriber device A1 is connected to the mobile station STM1 and a subscriber device B1 is connected to the mobile station STM2. The stations
15 communicate among themselves by radio links which utilize two frequency channels F_{BM} and F_{MB} .

In general, the channel F_{BM} is used for the communications leading from the base station STB to the mobile stations STM1 and STM2 and the channel F_{MB} for the communications leading from the mobile stations to the base station. The
20 communications established over these frequency channels are organized in a time-division multiplex mode of the TDMA type.

Fig. 2 shows in a very schematic manner the organization of this multiplex. A series of time intervals IT numbered 0, 1, 2, ..., 37, 38, ... has been shown. These time intervals are used for transmitting, for example, speech information.
25 Other time intervals XCCH are inserted before the interval "0", between the intervals 18 and 19, ..., between the intervals 37 and 38, ..., etc. These time intervals may be allocated to different tasks for the organization of the multiplex. The intervals XCCH are used by the mobile stations, either for transmitting information signals during which period of time the frequency channel centred on the carrier F_{MB} is used, or for receiving
30 information signals during which period of time the frequency channel is then centred on F_{BM} .

Fig. 3 shows the diagram of the mobile stations STM1 and STM2 having identical structures.

Each station is constituted by a set of transceivers 10 controlled by a pair of reference oscillators 12 oscillating, respectively, at the frequencies F_{MB} and F_{BM} . This set is adapted to a TDMA frame by means of a frame management circuit 17. A duplex switch 22 controlled by the control circuit 17 makes it possible *via* one and the same
5 antenna 24 both to transmit at a frequency F_{MB} and receive at a frequency F_{BM} either or not different from F_{MB} . A transmit amplifier 25 and a receive amplifier 26 are connected to this switch 22.

The set 10 is formed by a transmit section 40 cooperating with a filter 41, centred at an intermediate frequency FI, and a modulator 42. The modulator 42 centres
10 at the carrier frequency F_{MB} the information signals produced by the section 40. The section 40 arranges the information signals to be transmitted in accordance with the commands given by the management circuit 17, phase-modulates, frequency-modulates or amplitude-modulates the information signals on an intermediate frequency FI. This management circuit 17 makes it also possible to recover the different information
15 signals contained in the TDMA frame received by a receive set 44. The input of this set is connected to the output of a filter 46 centred at the frequency FI, connected to the output of a demodulator 48. This demodulator 48 receives from the amplifier 26 the signals supplied at the frequency F_{BM} . Reference numeral 60 denotes the subscriber's microphone and reference numeral 62 is his loudspeaker. The speech information,
20 previously digitized, is transmitted in one of the time intervals of the frame transmitted by the carrier F_{MB} , this time interval being allocated by the management circuit 17. The speech information signals coming from the remote subscriber, transmitted in one of the time intervals of the frame transmitted at F_{BM} are recovered at the loudspeaker after decoding. The management circuit 17 further operates so that all these XCCHs can be
25 received.

According to the invention such a system comprises means for transmitting in a time interval XCCH a speak signal for a remote subscriber, means for detecting this request to speak for the remote subscriber and means for denying the remote subscriber access to transmission.

30 The means for transmitting the request to speak may be realised by a simplex button 70 connected to the section 40, in a time interval XCCH allocated to the connection of the near subscriber to the remote subscriber.

The means for detecting this request to speak for the remote subscriber

are constituted by the reception of the interval XCCH allocated to the communication, with the aid of a request-to-speak receiver 72 which influences the management circuit 17.

The means for denying access to transmission may be constituted by a
5 luminous signal signalling to the remote subscriber that he cannot transmit speech because the management circuit 17 prevents this command, or also by the remote subscriber's automatic change to the receive mode.

Fig. 4 shows the procedure which permits the simplex communications in a satisfactory manner.

10 To begin with, an XCCH is assumed to be allocated by the station STB for the connection of subscriber A1 to subscriber B1.

- At instant t1, by depressing the button 70, the subscriber A1 makes known to the station STB his request to transmit to the subscriber B1 in the interval XCCH.
- 15 - At instant t2 the station STB, once it has verified that it is possible while avoiding conflicts of simultaneity, authorizes subscriber A1 to transmit. STM1 is put in position T (transmission as regards speech).
- At instant t3 (which may be mixed up with instant t2) STB transmits this request to the station STM2.
- 20 - At instant t4 the station STM2 has received this signal, which brings the station into the receive position R.
- At instant t5 the subscriber A1 releases his simplex button, station STB is then transmitted to.
- At instant t6 the station STB acknowledges reception of this release to station
25 STM1.
- At instant t7 (which may be mixed up with instant t6) the station STB removes any obstacles for the station STM2.

This procedure may be further simplified as required, for example, by cancelling the instant t2, t5, t6, t7. In that case one the transmission priority is given to
30 the last transmitter (t1, t3, t4).

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A method of operating a transmission system having a first subscriber device from which an information transmission is required and a set of at least one second subscriber devices among which at least one of these second subscriber devices is a destination for the information transmission, wherein the devices exchange information signals and control signals in a simplex mode over a common channel in time division multiplex, in which the control signals are transmitted during spaced control time intervals, the method comprising the steps of;

- permitting a transmission of a request to transmit from said first subscriber device during said one of said control time intervals,
- broadcasting said request to transmit to all said second devices of said set,
- responsive to receipt of the broadcasted request, preventing said second subscribers of said set from transmitting until receipt of a broadcasted release signal
- responsive to completion of the said transmission of the said information signal, broadcasting said release signal to all said second devices of said set.

2. A method as claimed in claim 1, comprising the step of providing a base station for managing communications between the subscriber devices and for allocating said control time intervals.

3. A first subscriber device for communicating over a transmission system comprising at least a second subscriber device, wherein the devices exchange information signals and control signals in a simplex mode over a common channel in time division multiplex, in which the control signals are transmitted during spaced control time intervals, and one of said control time intervals being allocated for a request to transmit by said first subscriber device, characterized in that said first subscriber device comprises:

- means for detecting said one of said control time intervals,
- means for enabling a subscriber using said first subscriber device to obtain transmission priority for transmitting information to another of said subscriber devices,
- said means for enabling including means for generating a first request to transmit

signal, and means, responsive to said means for detecting, for transmitting said first request to transmit signal during said one of said control time intervals, and
- means, responsive to completion of transmission of said information, for transmitting a release signal.

- 5 4. A method of operating a transmission system substantially as described herein with reference to the accompanying drawings.

Dated this second Day of December 1994

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PHILIPS ELECTRONICS N.V.

ABSTRACT:

Transmission system comprising at least two subscriber devices exchanging information signals in the simplex mode.

This transmission system comprises at least a remote and a near subscriber device (A1, B1) exchanging information signals in the simplex mode by means of a multiplex of the time-division type in which a control time interval is provided. For a communication between a remote subscriber and a near subscriber, a
5 control time interval (XCCH) is allocated for the transmission of a request to speak made by one of the subscribers. The request to speak received by the other subscriber is used for preventing him from transmitting.

Application: Mobile radio networks.

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Reference: Fig. 1.

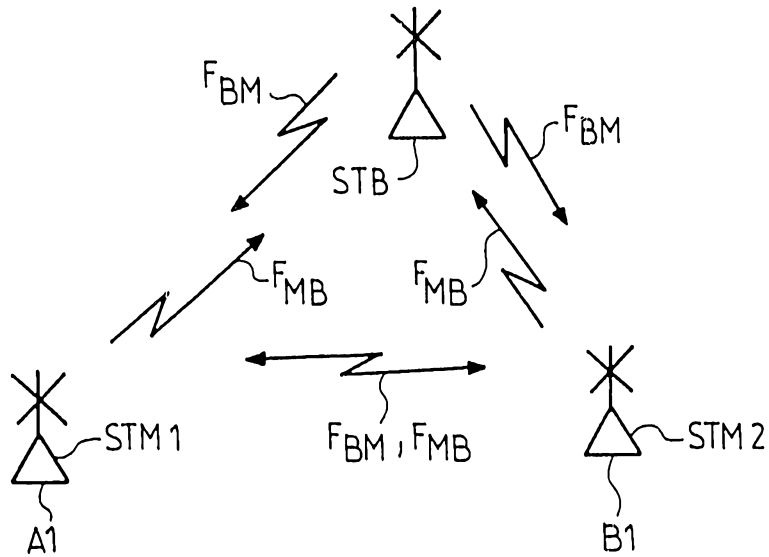


FIG. 1

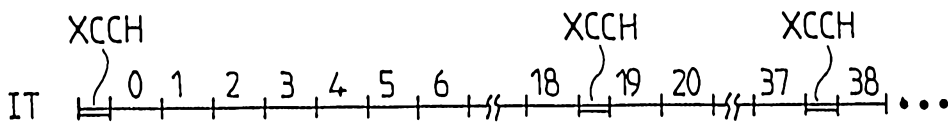


FIG. 2

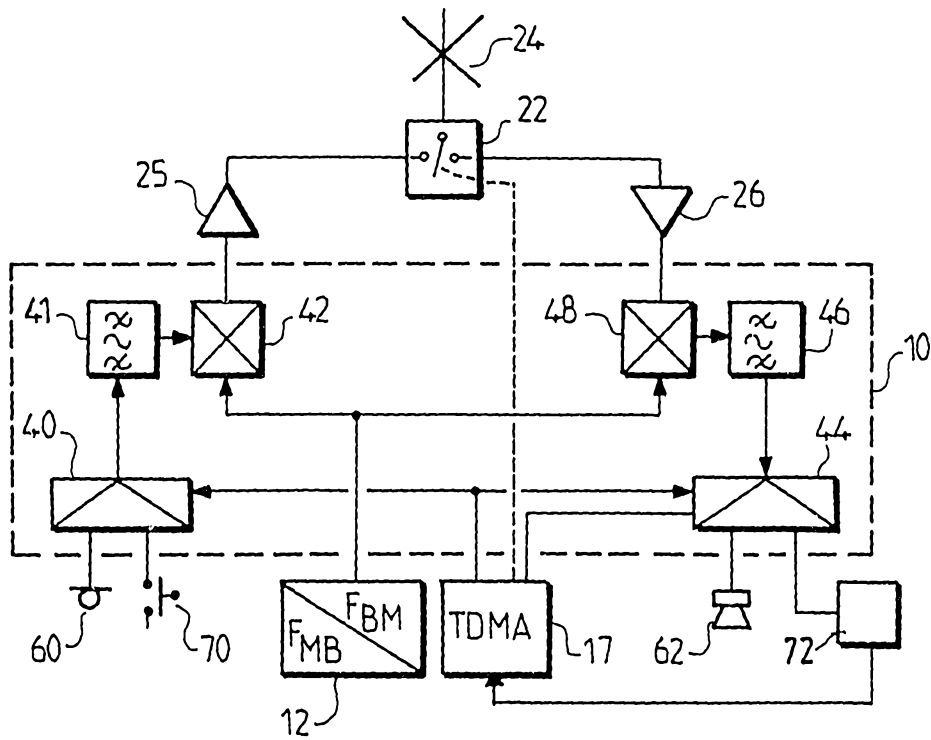


FIG. 3

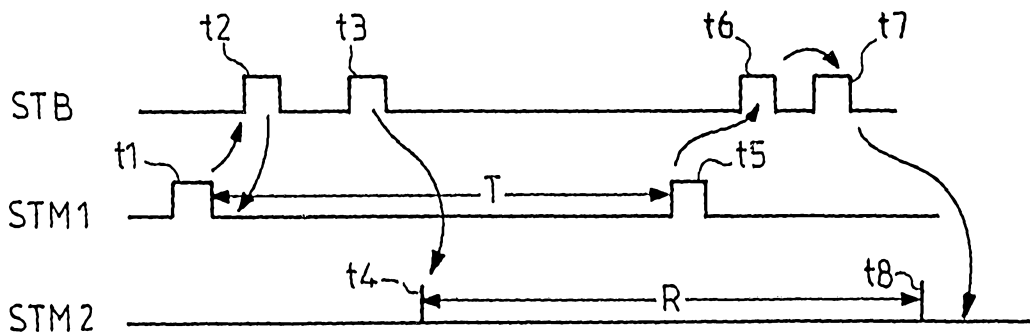


FIG. 4