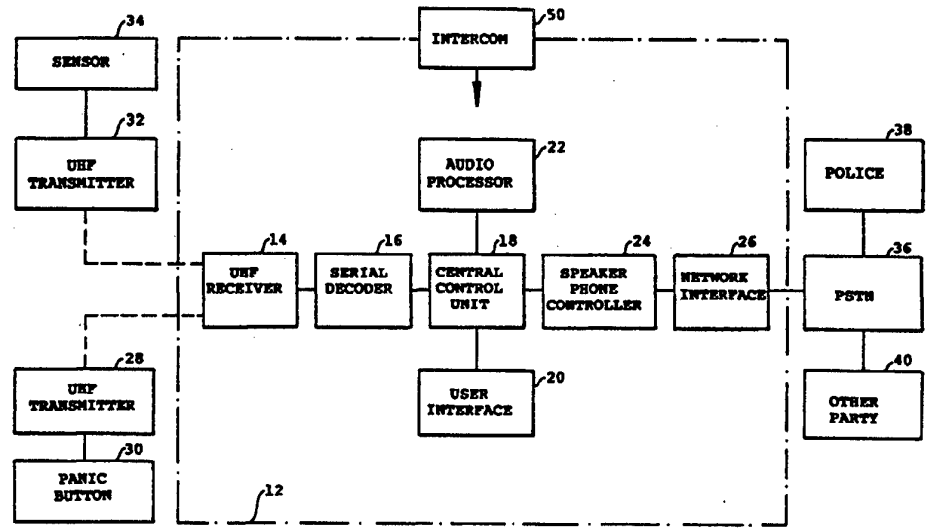




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(54) Title: SYSTEM FOR THE PROTECTION OF PEOPLE AND/OR PROPERTY



(57) Abstract

A protection system particularly suited for use in buildings such as residential properties. The system receives inputs from sensors such as a smoke/heat sensor, motion detector, pressure mat, door/window sensor, doorbell/intercom button, and establishes a telecommunications link to a predetermined telephone number at a remote location in response to a particular input. The telecommunications link can then be utilised to deliver a pre-recorded message to the remote location in accordance with the particular sensor activated. For example, if a smoke sensor is activated the system may dial a local fire station and replay a message indicating the possibility of a fire at the premises at which the system is installed. If the intercom button is activated, the system may establish a telecommunications link with the occupier of the premises at a remote location so as to place him/her in communication with the intercom. Means are also provided to enable a person at the remote location to control various functions of the system so as to, for example, effect unlocking of a door, activation of one or two communications, or activation of a siren.

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SYSTEM FOR THE PROTECTION OF PEOPLE AND/OR PROPERTY

This invention relates to systems and to methods for the protection of people
5 and/or property, wherein information is transmitted to a remote location.

Regrettably there is a continuing need for the provision of protection for people
and property. Recently there has been an increase in attacks on people living at home and
on their property.

10

Apparatus and methods have been previously proposed in which a home or an
office may be fitted with sensors which are connected to an alarm system comprising a
siren or strobe light which can be actuated to alert others to an intrusion of the home or
office by a burglar, for example. Alternatively or in addition, such an alarm system may
15 be connected to a central receiving station at the premises of a security agency.
Unfortunately, the information supplied to such an agency by the alarm system is often
insufficient to enable speedy or immediate identification of the home or office being
burgled and valuable time is often lost in obtaining the necessary identifying information.

20

Other previously proposed apparatus include alarm switches in communication
with a third party or a central receiving station. The alarm switch is usually mounted on
a wall next to a person's bed, for example, and can be activated by the person if that
person is attacked by an intruder or if a break-in is in progress. However, the time delay
between the person operating the switch and assistance being provided by the third party
25 or by the central receiving station can be considerable and therefore often futile.

According to the present invention there is provided a system for the protection
of person(s) and/or property, comprising:

sensing means for detection of a specific event; and

30

control means for transmitting a predetermined message to a remote location by
way of a telecommunications network in response to activation of said sensing means,
and including means to receive control signals by way of the telecommunications network

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from the remote location, and means for controlling operation of the system in response to said control signals, whereby a response agency may intervene to protect the person(s) and/or property.

5 In one form, the invention can operate as an intercom system whereby a person being the occupier of the property may effect remote communicate with another person seeking entry to the property, and control means selectively operable by the occupier to enable voice communication via the intercom system and via a communications link to the property to another person when the occupier is not at the property.

10

In this specification, the term "response agency" includes the owner or occupier of a premises, the police, security agencies, neighbours, friends and/or relatives of the owner or occupant of the premises. Further, in this specification the term "specific event" refers to an intrusion into or onto a premises, for example, a burglary or an attack upon
15 a person or persons on that property and can include a person simply visiting the premises and who rings a doorbell, for example, or who accesses an external intercom.

Furthermore, in this specification the term "predetermined message" refers to a pre-recorded voice message, a fax message or a code which is capable of being read by
20 a computer. It is important that the information transmitted to the response agency be sufficient to identify the location at which the specific event has occurred, or is occurring, so that the response agency may intervene swiftly.

The sensing means may comprise a motion detector, a heat sensor or a device
25 emitting an infrared beam which in the appropriate circumstances will actuate the system. Further, the sensing means may comprise a pressure mat which emits a signal when subjected to an increase in pressure such as when a person stands on the pressure mat. The sensing means may transmit its signal by radio or it may be wire connected to the system. To enable effective protection of a person at the property, a hand-held
30 transmitter or a transmitter worn by the person, such as in the manner of a pendant, may comprise one of the sensors, the transmitter being actuable by the person in the event of, for example, an assault or medical emergency.

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The system may comprise a control means in the form of a microprocessor which is connected directly to a telephone line and in communication with a number of sensors. In this example the sensors comprise reed switches, motion detectors, pressure mats, heat detectors and a device which emits a beam of infrared light which is received by a collector and which emits a signal if the beam is obstructed. The reed switches are, for example, attached to windows or to doors and will send a signal to the microprocessor to trigger an alarm if a window or door is opened or smashed. In a similar fashion, the other sensors will send a signal to the microprocessor when either motion is detected, body heat given off by an intruder is detected or the beam of infrared light is obstructed, as the case may be. Further the microprocessor may be connected to or in communication with other conventional alarm devices such as strobe lights or a siren.

The control means may include a tape recorder or solid state message recording device, by means of which a message is stored, the control means being pre-programmed so that when a specific event occurs, such as a door being opened or a motion detector sensing motion within or on the premises, a preselected telephone number of a telephone at a remote location is dialled under the control of the microprocessor. When the remote telephone is answered, the pre-recorded message is played advising the person answering the telephone that a specific event has occurred. The control means can be powered from an AC mains supply or can be powered by an internal DC electrical source or be fitted with a backup supply source such as DC batteries or a solar cell. The control means may also be coupled to a microphone which will enable the person at the remote location to listen to an event which may be occurring. Indeed, any number of microphones may be disposed about the premises, both inside and outside a dwelling or other building on the premises.

The control means may include a keypad which is accessible to the owner or occupant of the premises whereby the system may be made to operate in a selected one of its various modes of operation. For example, the system may be deactivated when the house is to be occupied, the system may be activated when the premises are to be unoccupied for a period of time, or various sensing means may be deactivated while others are maintained in their activated condition. For example, in a double-storey

residence in which the bedrooms are upstairs, the sensors on the ground floor may be activated during the night when the occupants are asleep while the sensors on the first floor may be deactivated. This allows the occupants on the first floor to move about the first floor during the night without triggering an alarm.

5

In one form of the invention, the microprocessor can be connected to a remote control unit which can be operated from a remote location by way of a keypad on the remote control unit to switch the system on or off or to alter the programming of the system from the remote location. This is achieved by way of the person at the remote location telephoning the microprocessor and keying a particular code whereby tone signals are sent to the microprocessor from the remote control unit through the telephone mouthpiece to control the microprocessor.

As mentioned above, the microprocessor may be programmable or it may contain one or more PROM or EPROM memory chips if a predetermined program is to be used. Further, the microprocessor may be adapted to receive programming cards which each define a specific mode of operation. This will avoid a potential difficulty in the case of a person who is not technically competent in that that person will be able to alter the mode of operation of the system simply by inserting a particular selected card into the microprocessor, rather than having to alter the mode of operation by keying specified codes into the microprocessor via its keypad.

In another form of the invention, an intercom unit is mounted adjacent an entrance door or at an entrance to the premises, for example mounted on a wall next to an entrance gate, and is connected directly to the microprocessor so that when a visitor to the premises accesses the intercom when the premises is unoccupied, the microprocessor will automatically dial the preselected telephone number at the remote location. The visitor will then be connected directly with the person at the remote location and will be able to converse with that person at the remote location in usual fashion. Consequently, the visitor will be unaware that the premises is unoccupied. In such a case, the microprocessor will emit an identifying signal as soon as the telephone at the remote location is answered to forewarn the person answering the telephone that the particular

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telephone call relates to a visitor to his or her premises accessing the intercom. This forewarning signal may be a tone signal or a predetermined voice message, for example.

The microprocessor can also be connected to an electrically or electronically
5 releasable latch or lock on an entrance door or gate of the premises so that the person at the remote location can, by telephoning the microprocessor and keying a particular code into the remote control unit, unlock the door or gate from the remote location. This can be particularly advantageous if, for example, another occupant of the premises does not have his or her keys and wishes to gain access. That person can simply contact the person
10 at the remote location by way of the intercom to gain access.

Further, the remote control can be used to control other aspects of the system from the remote location. The remote control can be used to reset the system if, for example, an alarm has been triggered accidentally, to switch off particular components of the
15 system, for example a siren or a strobe light, to communicate with a microphone or microphones disposed around the premises so that the person at the remote location can listen to determine if an event or disturbance is occurring at the premises or, if desired, the person at the remote location can activate or deactivate domestic lighting or other appliances at the premises from the remote location.

20

In addition, the intercom can be arranged such that it is in communication with other intercom units disposed about the premises so that they can, in combination, function as a conventional intercom system.

25 In another form of the present invention, pressure pads may be disposed at any desired location around the premises so that if a potential burglar or intruder is loitering outside the premises, the occupant of the premises will be alerted or, if the premises is unoccupied, the predetermined message will be sent to the owner of the premises at the remote location warning him or her that a burglary or damage to the property may be
30 imminent.

In a yet further development of the present invention, a pressure pad may be

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positioned under the bed of a person occupying the premises so that if that person vacates his or her bed at any time during the night, the pressure pad will sense the decrease in weight and will automatically deactivate the system. This avoids the necessity for the system to be manually deactivated by the keying of a particular code into the
5 microprocessor, for example. When the person returns to the bed, the system will then be automatically activated by the increase in weight exerted on the pressure pad.

The invention is further described by way of example only with reference to the accompanying drawings in which:

10

Figure 1 is a diagrammatic representation of a system constructed in accordance with the invention;

Figures 2 and 3 join on line A-A to form a circuit diagram of a radio receiver, level converter and serial decoder forming part of a control device of the system of
15 Figure 1;

Figures 4 and 5 join on line B-B to form a circuit diagram of an audio processor incorporated into the control device of Figure 1;

Figures 6 and 7 join on line C-C to form a circuit diagram of a control unit incorporated into the control device of Figure 1;

20 Figures 8 and 9 join on line D-D to form a circuit diagram of a user interface incorporated into the control device from Figure 1;

Figures 10 and 11 join on the line to form a circuit diagram of a DTMF dialler and decoder and line isolation device incorporated into the system of Figure 1; and

25 Figures 12 to 16 are flow chart diagrams illustrating the operation of the control device under programmed control.

Referring now to Figure 1, the system 10 of the invention comprises a control device 12 including a UHF receiver 14, serial decoder 16, a central control unit 18, a user interface 20, an audio processor 22, a speaker phone controller 24 and a telephone line
30 interface or isolator 26. The receiver 14 receives encoded radio signals from various control devices. In particular it can receive control signals from a UHF radio transmitter 28 coupled to a panic button 30 and from UHF transmitters associated with various

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intrusion or similar detectors; in this case one such transmitter 32 is shown with its associated movement detector 34. The interface 26 provides a connection to a public subscriber telephone network 36 to enable communication between the system and response agencies, such as a police station 38 and the residence of a friend, neighbour,
5 security agency or the other party 40.

Generally, when the panic button 30 is operated or intrusion is detected by detector 34, encoded radio signals are directed from the transmitter 28 or 32 to the receiver 14, these being decoded by the decoder 16 and addressed to the unit 18. The
10 unit 18 is able to dial out on the network 36 via the speaker phone controller 24 and interface 26 to direct calls selectively to the police or to one or more other parties 40. These calls are in the nature of emergency calls and comprise voice signals generated from the audio processor 22. A different message may be selected by unit 18 depending on whether the outgoing call is to be directed to the police or to another party 40.
15

The user interface 20 permits a user to set up the system in various ways described later.

The panic button 30 may be a conventional switch or the like positioned, say, in
20 the interior of a building to be protected at a location enabling access thereto by an occupier of the building. This may be of conventional form, as may be sensors 34 which, in this case, comprise internal sensors and external sensors. The internal sensors are responsive to intrusion within a building to be protected and the external sensors are responsible to intrusive activities exterior of the building. Thus, the internal sensors may
25 comprise motion detectors in the building for detecting motion of persons or reed switches or the like, or pressure mats, able to detect displacement of objects or movement of objects such as persons in the building. The external sensors are positioned for example to detect intrusion onto the surrounds of the property such as through gates, over fences or the like or attempted intrusion into the building by opening windows, doors or
30 the like. In any event, these external sensors may be of conventional form such as reed switches, pressure mats, infrared or ultrasonic detectors.

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Figures 2 and 3 show the receiver 14, together with a level conversion device incorporated therein as well as the serial decoder 16. The receiver 14 is of conventional form, such as a 304 MHz regenerative receiver to receive pulse wave modulated signals. In that regard, signals from each of the sensors 34 or panic button 30 may be encoded
5 in the transmitters 28 or 32 in a unique fashion enabling identification of which sensor or panic button had been operated, on the basis of a unique code transmitted when actuation occurs. Output from the receiver 14 occurs via the aforementioned level conversion device which is a Schmidt trigger device of conventional form able to provide output signals of proper form for operation of the remainder of the circuitry. Output so
10 produced is passed to the serial decoder 16, which comprises a micro-controller device U1. This is associated with a set of dip switches S1 which defines a pre-set code, established for reference by the micro-controller. In addition to the code mentioned identifying each sensor 34 or the panic button 30, a further code is transmitted by the transmitters 28 or 32, which code identifies the system 10 itself. Thus, if a number of
15 systems 10 are in operation in nearby proximity, it is possible to identify whether sensors or panic buttons associated with the particular system in question have been operated, rather than ones associated with any such nearby system. Thus, the code transmitted by the transmitters 28, 32 to identify the particular system is reproduced by the settings of the dip switches S1, and the micro-controller compares this reproduced reference code
20 with incoming detected code to enable any code belonging to other systems to be disregarded.

Three lines are shown coupled to the micro-controller U1, these being denoted SCLK, SDATA and *VALID-TRANS. These are coupled to the unit 18 for, respectively
25 clocking data out of the decoder, communicating data as to which sensor 34 or panic button has operated, and communicating data as to whether any of the sensors 34 or the panic button 32 has been operated.

Turning now to Figures 4 and 5, the circuitry of the audio processor 22 is shown
30 as including a voice record and play back chip ISD1016. This communicates with the unit 18 via a bus D[0...7]. The chip is capable of storing in digital form voice messages directed thereto from a microphone coupled to the MIKE line shown. Other control

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inputs to the chip include *VCECS, VCEPD and *REC, these being respectively a chip select input, a power down select input and an input for enabling the chip in either record or playback mode.

- 5 Also shown in Figures 4 and 5 are various other control or data transfer lines including VOICE-EN being a control from the micro-controller to enable voice to be directed to the PSTN, VOICE-PB to enable a speaker amplifier 46 for reproducing at the unit 12 sound from the chip ISD1016, and SP-PHONE, an audio line from the speaker phone controller 24. LINE-PB enables playback of sound from the PSTN to the system
- 10 *AMP-CS for switching on and off the speaker amplifier.

The devices U4A, U4B, U4C, U4D, U5A, U5B, U5C, U5D are electronic switches for controlling signal paths in the audio processor.

- 15 A connector P1 is shown coupled to a line EXT-IN, to enable connection of an external microphone which may be positioned in a different room to the device 12.

Also shown is a line EXT-CS, to enable listening to the aforementioned further microphone and intercom lines ICOM-INT-PB and ICOM-LINE the first of which may go to an external intercom 50 (Figure 1) and the second of which is to enable police to

20 listen to sounds from the external microphone via the PSTN. ICOM-POWER is a control for power down of the unit. ICOM-MIKE enables communication between the intercom and the PSTN 36. SP-PHONE-O is a control for external communications to the PSTN, while ICOM-EXT-PB is to enable interconnection of the microphone through

25 to the external intercom.

Other control signals appear on line *EOM, which is an end of message signal from the ISD1016 used by the micro-controller. The RECORD line shown is coupled to the interface 26 to connect the external microphone to direct voice signal from it

30 through the speaker phone controller 34 to PSTN 36, while line ICOM enables connection between the intercom and the PSTN.

- 10 -

Figures 8 and 9 show the user interface 20. This comprises a key pad 50 comprised of sixteen switches SW1 ... SW16 which are operable manually by a user. The user interface also includes eight light emitting diodes LED1 ...LED8. In addition to these, Figure 9 shows a driver U17 which receives, on a bus AD_{0...7} from the micro-
5 controller unit, data for controlling the display of the leds. The *INDCS input to U17 also is coupled to the micro-controller for strobing data lines AD_{0...7}. Two lines ROW_{0...3} COL_{0...3} provide row and column information identifying which key is pressed in the keyboard and the *KEY PRESS line indicates back to the control unit 18 that any key has been pressed.

10

A buzzer circuit 60 is also shown, this having a *CALL input which causes the buzzer to operate when the intercom is operated. Th buzzer is also operated when a key is depressed.

15

The individual switches SW1...SW16 have functions indicated in Figure 8, as have the LEDS.

Figures 10 and 11 show components of the speaker phone controller 24 and interface 26.

20

The controller 24 includes a conventional DTMF dialler U22 effective to generate tone dial data for establishing an external call from the system. A DTMF decoder is provided in U22 and is interconnected with the micro-controller unit 18 by databuses as shown. A speech processor MC34118 is provided for controlling speech functions.

25

The isolator 26 is coupled to interconnect the dialler and the decoder U22 with the public subscriber telephone network 36 . This is of conventional form, providing two outputs 80 and 82 one for interconnection to the public subscriber telephone network (80), and the other to provide the interconnection to a normal telephone which a user may
30 wish to utilise (82).

Figures 6 and 7 show the micro-controller unit 18. This includes a power supply

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70 and a micro-controller U14. U14 provides connections with various other components as described. A program storage device U13 is utilised to provide interconnection as between the micro-controller U14 and various ones of the other components. Input/output port devices U15, U16 are also provided. The *KEYPRESS, *VALID-
5 TRANS, *CALL, and *RING connections at the lower left of Figure 6 provide wake-up prompts for setting the micro-controller in operative state when various external stimuli arise. At the bottom right of Figure 7 is shown an alarm interface 72 which provides for connection to a siren alarm to be operated by the system, for example if connection to the public subscriber telephone network is cut.

10

Although not specifically described in the circuitry above, the interconnection as between unit 18 and the intercom 50 is such that, by appropriate input of data from interface 20, a user may program the control device so that, when a caller uses the intercom 50 to communicate to the device the call is routed through the controller to the
15 speaker phone controller 24 and isolator 26 to be put out on the public subscriber telephone network to call up a pre-selected telephone number. In this way, the owner of premises may, when absent from the premises, answer an intercom call at the premises without it being known to the external caller on the intercom that the owner is not on the premises.

20

In a particular form, the panic button is in the form of a small hand held device which will allow remote operation of the alarm system by triggering the alarm. The device may preferably be of a size and shape which can be worn by a user in the form of a pendant or the like. Two buttons are provided on the device which must be pressed
25 simultaneously to activate the alarm, thus avoiding the possibility of accidental activation. Upon pressing the buttons a unique identification code is transmitted to the central processing unit.

In the particular form described, on powering up of the system it is necessary to
30 set up the system for it to function as required. This requires the user to record a voice message and to enter a valid telephone number. An adequate set up arrangement may comprise:

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1. Press the record button on the keypad. This will record a voice.
2. Select the message to be recorded by pressing the corresponding key on the keypad. It can either be a voice to be played to the police or a voice to be played to the security authorities.
- 5 3. Wait for the record lamp to start flashing.
4. Speak into the console.
5. After 10 seconds, the system will stop recording.
6. Press the playback button on the keypad.
7. Select the voice to playback by pressing the corresponding key on the keypad.
- 10 8. Re-record the voice again if unsatisfied.
9. Press the store button on the keypad. This will allow the user to enter a telephone number.
10. Select a phone number to store by pressing the corresponding key on the keypad. It can either be a police telephone number or a security telephone number.
- 15 11. Enter a telephone number by pressing the digits on the keypad. The telephone number can not be more than 12 digits.
12. Press store to finish entering the phone number.
13. Press the SETUP button on the keypad to finish setting up the system.

20 The user is able to listen to the voice messages stored for checking purposes, the message being played back via the alarm system speaker. To play back a voice message, the user must follow these steps.

1. If the alarm is not in the setup mode, press the SETUP button on the keypad to put the system in the setup mode.
- 25 2. Press the playback button on the keypad.
3. Select the voice message to playback by pressing the appropriate key on the keypad.

Each sensor is as described assigned a unique identification number to allow the
30 alarm to identify the source of the alarm trigger. The alarm system is designed so that only one number has to be selected and programmed into the various devices. These steps must be followed for the correct functioning of the alarm system.

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1. Select a base address. The base address can be any number from 0 to 31.
2. Set the switches in the panic button in binary form corresponding to the base address.
3. Set switch 1 to switch 5 in the external sensor to the base address. Switches 6 to 8 should be set to ON.
4. Set switch 1 to switch 5 in the internal sensors to the base addresses. Switch 6 to 8 should be set to ON, ON and OFF respectively.
5. Set switch 1 to switch 5 in alarm control unit according to table 1. Switch 6 to 8 should be set to ON.

10

The control which the answering party, such as a security company, has over the operation arises from depressing of keys such as on a telephone at the answering party's station. A typical scheme might be to employ the keypad of a telephone, assigning functions as follows:

15

Key Function

1. **Replay the voice message again**
This will allow the answering party to listen to the voice message again.
2. **Put the alarm into one way communication mode**
This will allow the answering party to listen to sound being picked up by the alarm microphone.
3. **Put the alarm into two way communication mode**
This will allow the answering party to send voice message to the alarm system, and allow the answering party to listen to the sounds being picked up by the alarm microphone.
4. **Actuate alarm at premises**
This allows remote operation of an alarm at the premises (ie from the remote telephone a siren and/or flashing light may be actuated at the premises to be protected).
5. **Hang up the telephone line and reset operation of the alarm system.**
This will disconnect the answering party from the alarm system.

30

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Figures 12 to 16 are flow chart diagrams outlining the operation of the central control unit 18 under software control of a stored computer program performed by the microprocessor. Referring to Figure 12, there is shown a flow chart 100 illustrating a procedure for controlling the alarm system by way of buttons provided on a control panel thereof. With the alarm system in one of its plurality of operation modes at step 102, the user is required to enter a personal identification number (pin number) at step 104 in order to enable control of the system from the button panel. The pin number may be set in the alarm system at the time of manufacture, or may be altered by the user either by a programming procedure involving the microprocessor or by altering a set of switches (not shown) provided with the circuitry. By entering the correct pin number, the procedure is direct to step 106, wherein if a setup button on the control panel is pressed the user may record a new voice message or enter a new telephone number for storage. If the "record" button is pressed (step 108) then a new voice message can be recorded at step 110, as described hereinbefore. After recording the new message the control procedure returns to the current operation mode at step 102. Alternatively, if one of the three programmable telephone buttons is pressed (step 112) then the user is able to enter a new telephone number for storage at step 114, also as described hereinbefore.

Step 116 of the flow chart procedure 100 checks to see if the "standby" mode button on the control panel has been pressed, in which case the alarm system enters the standby mode (step 118) in which signals from the sensors are disregarded. If the "external" mode button is pressed (step 120) then the external mode of the alarm system is activated (step 122) in which the alarm system is controlled in accordance with flow chart 150 shown in Figure 13. Similarly, if the "internal" mode button is pressed (step 124), the alarm system enters the internal mode (step 126), which is controlled in accordance with the procedure illustrated in flow chart 200 shown in Figure 14. Finally, if the "intercom" mode button is pressed (step 128), then control passes to the intercom mode (step 130) in accordance with the procedure illustrated in flow chart 250 shown in Figure 15. If more than two second delay passes after pressing of the setup button (step 106) before another button is pressed, then step 132 directs the control procedure to step 134 wherein any existing alarm condition is cancelled, and operation continues under the current operational mode at step 102.

- 15 -

Turning now to Figure 13, the flow chart diagram 150 which is shown therein illustrates the control procedure undertaken during the "external" mode of the alarm system. The central control unit 18 awaits a signal from one or more of the sensors 34 at step 152, and if a signal is received, the coded signal is identified at step 154 to ensure
5 the signal received is from one of the designated sensors (ie. to ensure the sensor is coded with the same base address as the central control unit. The particular sensor is then identified at step 156 and a selected telephone number is dialled by way of the DTMF processor at step 158. Provision is made for a plurality of telephone numbers to be stored by the central control unit, as described above, so that different telephone numbers
10 may be selected depending upon the operational mode of the alarm system and/or the identity of the sensor which is activated. For example, if a door sensor is activated and identified at step 156 as such, the selected telephone number may be that of a security company. Alternatively, if the identified sensor corresponds to a smoke alarm, the telephone number selected may be that of a fire brigade station. Furthermore, a plurality
15 of telephone numbers may be provided to be sequentially dialled in the event of no answer at the first telephone number thereof, also as described above. In this way, if no answer at the selected telephone number is received within a predetermined time interval (for example, one minute) then the procedure is directed from step 160 to step 162, which determines whether three telephone numbers have been dialled without answer. If there
20 has been no answer from the three telephone numbers dialled then the alarm siren is activated (step 166) and the current operational mode continues to operate. Otherwise, the next of the series of telephone numbers is selected at step 164 and dialled at step 158. When an answer is received at the premises of one of the selected telephone numbers, the prerecorded message is played over the telephone (step 168), after which the alarm
25 siren is activated (step 170) provision is then made for control of various functions of the alarm system remotely from the premises of the telephone number dialled. The control signals are conveniently DTMF tone codes which are generated by push button telephones, with different tones corresponding to different digits on the telephone keypad. If a DTMF code is received by way of the telephone line at the central control unit, then
30 control passes to the procedure illustrated in flow chart 300 of Figure 16.

The flow chart diagram 200 shown in Figure 14 illustrates the procedure

undertaken whilst the alarm system is in "internal" mode, and operates in a manner similar to that of flow chart 150, without activation of the alarm siren. A selected telephone number is dialled (step 206) in the event that a radio signal is received (step 202) which is identified as a signal originating from the panic button (step 204), as discussed above. After replay of the pre-recorded message (step 212) the procedure passes to flow chart 300 to await receipt of a control signal from the remote location.

Referring to Figure 15, a flow chart 250 of the procedure for the "intercom" mode is shown, beginning at step 252 which detects the activation of an intercom button. The intercom button may be in the form of a doorbell type button positioned at the entrance to the premises, in conventional form. Upon sensing of activation of the intercom button, a selected telephone number is dialled (step 254), which may correspond to, for example, a mobile telephone of the occupier of the premises. Upon receiving an answer at the other end of the telephone line (step 256) a brief tone or message is issued from the central control unit 18 to alert the listener that the alarm system has dialled the telephone, rather than being an ordinary telephone call. Two communication as between the remote telephone and a speaker and microphone positioned at the entrance to the premises is then activated at step 260, to enable the occupier of the premises to carry on a conversation as if he or she were within the premises, rather than at a remote location. A limited number of functions may also be controlled in the intercom mode, from the remote location, such as unlocking a door or gate (step 268) or resetting operation of the alarm system (step 272).

Flow chart 300 illustrated in Figure 16 shows the functions which can be controlled remotely whilst the alarm system is in the internal or external mode, by way of DTMF tone codes. Any DTMF tones received at the central control unit 18 are decoded at step 302. If a first code is received (step 304), then the control unit is effective to repeat the pre-recorded message (step 306) over the telephone line to the remote location. A second code (step 308) causes the control unit to activate the microphones at the premises (step 310) to enable persons at the remote location to listen any activities taking place at the premises. A third code (step 312) effects two way communications between the remote location and the premises by way of the

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abovementioned microphones and speakers which are similarly provided. Reception of a fourth code (step 316) activates the alarm siren at step 318, although this function may not be controllable in the case of operation in the internal mode. Finally, a fifth code (step 320) causes the alarm system to reset operation at step 322 and return to the current
5 operational mode (step 102).

In the described system all components other than the microprocessor unit are preferably provided with their own independent power supplies, eg solar cells and/or long life batteries or the like.

10

In the described system, the LEDs used to display information may be replaced by liquid crystal display devices.

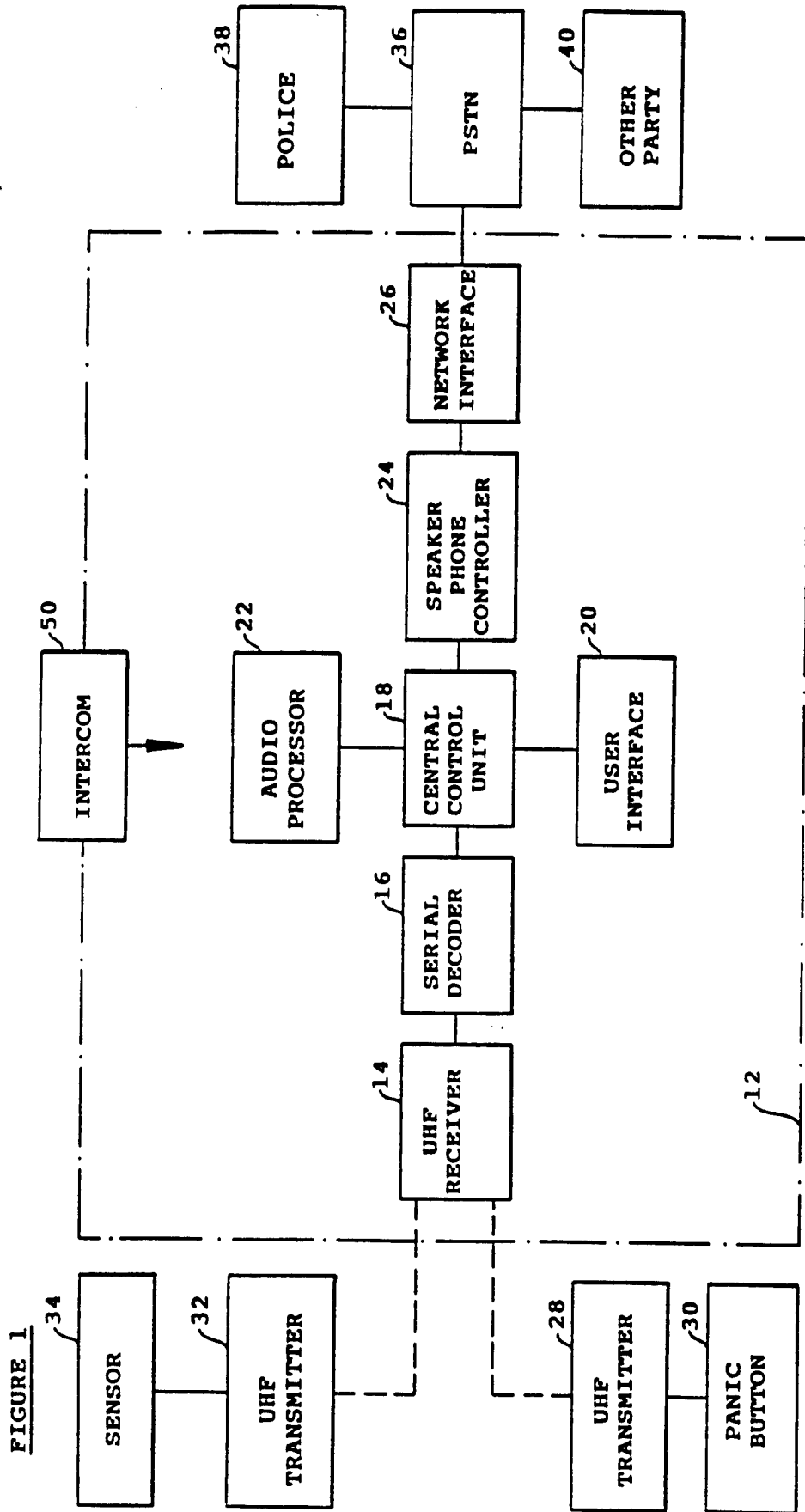
The present invention has been described by way of example only and
15 modifications are possible within the scope of the invention.

CLAIMS

1. A system for the protection of person(s) and/or property, comprising:
sensing means for detection of a specific event; and
5 control means for transmitting a predetermined message to a remote location by way of a telecommunications network in response to activation of said sensing means, and including means to receive control signals by way of the telecommunications network from the remote location, and means for controlling operation of the system in response to said control signals, whereby a response agency may intervene to protect the person(s)
10 and/or property.
2. A system as claimed in claim 1, wherein the sensing means includes a radio frequency transmitting means which can be carried by an occupier of the property and actuable by the occupier to cause the control means to transmit said message.
15
3. A system as claimed in claim 1, wherein the control means is responsive to a said control signal issued from the remote location to cause retransmission of said predetermined message.
- 20 4. A system as claimed in claim 1, wherein the system includes a microphone and the control means is responsive to said control signal issued from the remote location to cause the microphone to be coupled via the network to enable sounds in the vicinity of the microphone to be reproduced at the remote location.
- 25 5. A system as claimed in claim 4, wherein the control means is provided with a sound transducer for causing reproduction of voice signals as sound and the control means is responsive to a said control signal to enable two way voice communication via said link between personnel at the remote location and a person in the vicinity of the sound transducer and microphone.
30
6. A system as claimed in claim 1, wherein the sensing means includes a means, such as a door bell button, actuable by a person representing access to the property.

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7. A system as claimed in claim 1, wherein the sensing means comprises a motion sensor, heat detector, pressure mat or switch device actuable pursuant to opening a door, window or other moveable part of a building or its surrounds.
- 5 8. A system as claimed in any preceding claim wherein the predetermined message comprises a pre-recorded voice message.
9. A system as claimed in claim 8, wherein the control means, in use, transmits said message to the remote location by dialling a telephone number of the remote location,
10 and wherein the control means is programmable with a plurality of remote location telephone numbers for sequential dialling thereof in the event that a telecommunications connection cannot be established to a first of said telephone numbers.
10. A system as claimed in claim 1 for protection of a person occupying a property
15 comprising a building wherein there are a plurality of said sensing means including external sensing means for detecting intrusion into the building from the exterior of the building by unauthorised means, and internal sensing means for detecting intrusion within the building, the control means being operable by the person whereby when the person is in the building the intrusion sensors are enabled but the internal sensors are disabled.
20
11. A system as claimed in claim 1, wherein said sensors communicate with the control means by way of radio frequency signals.
12. A system as claimed in any one of claims 1 to 5 wherein the control signals
25 issued from the remote location are in the form of DTMF tones which are decoded by the control means.



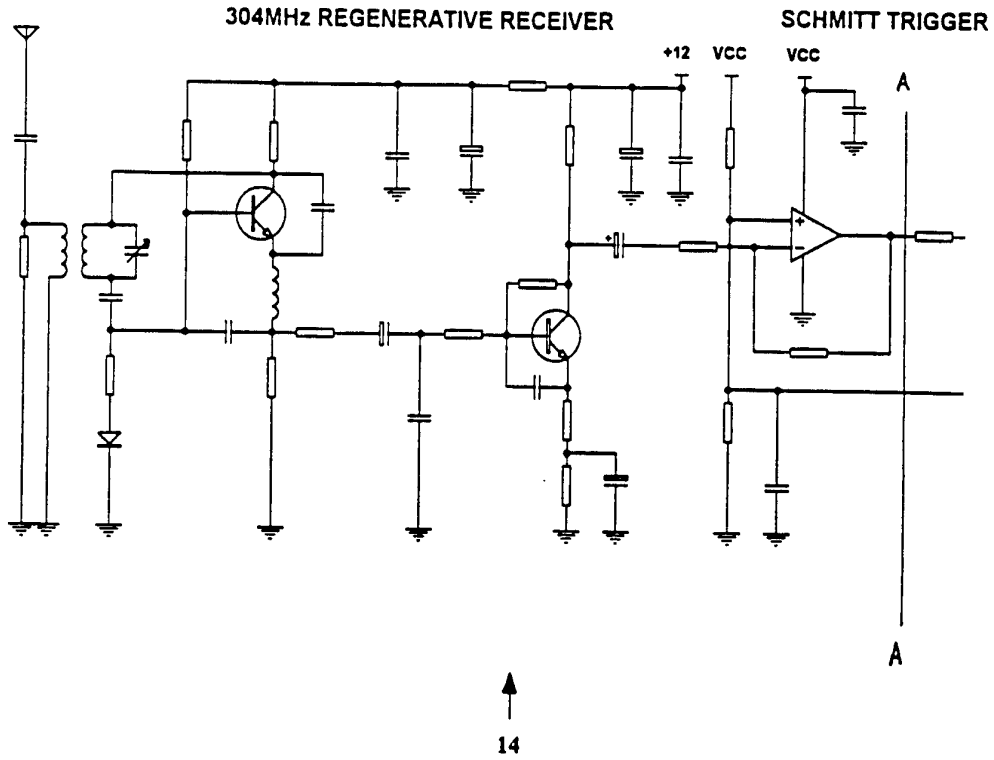


FIGURE 2

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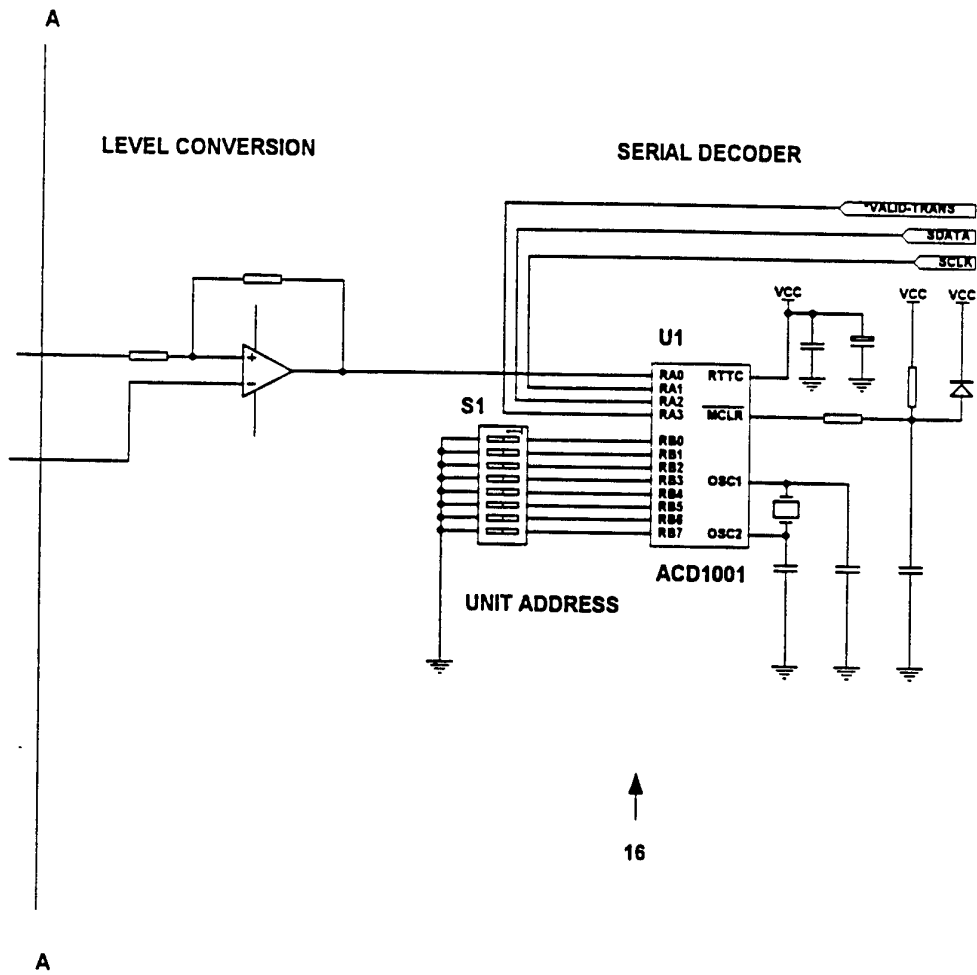


FIGURE 3

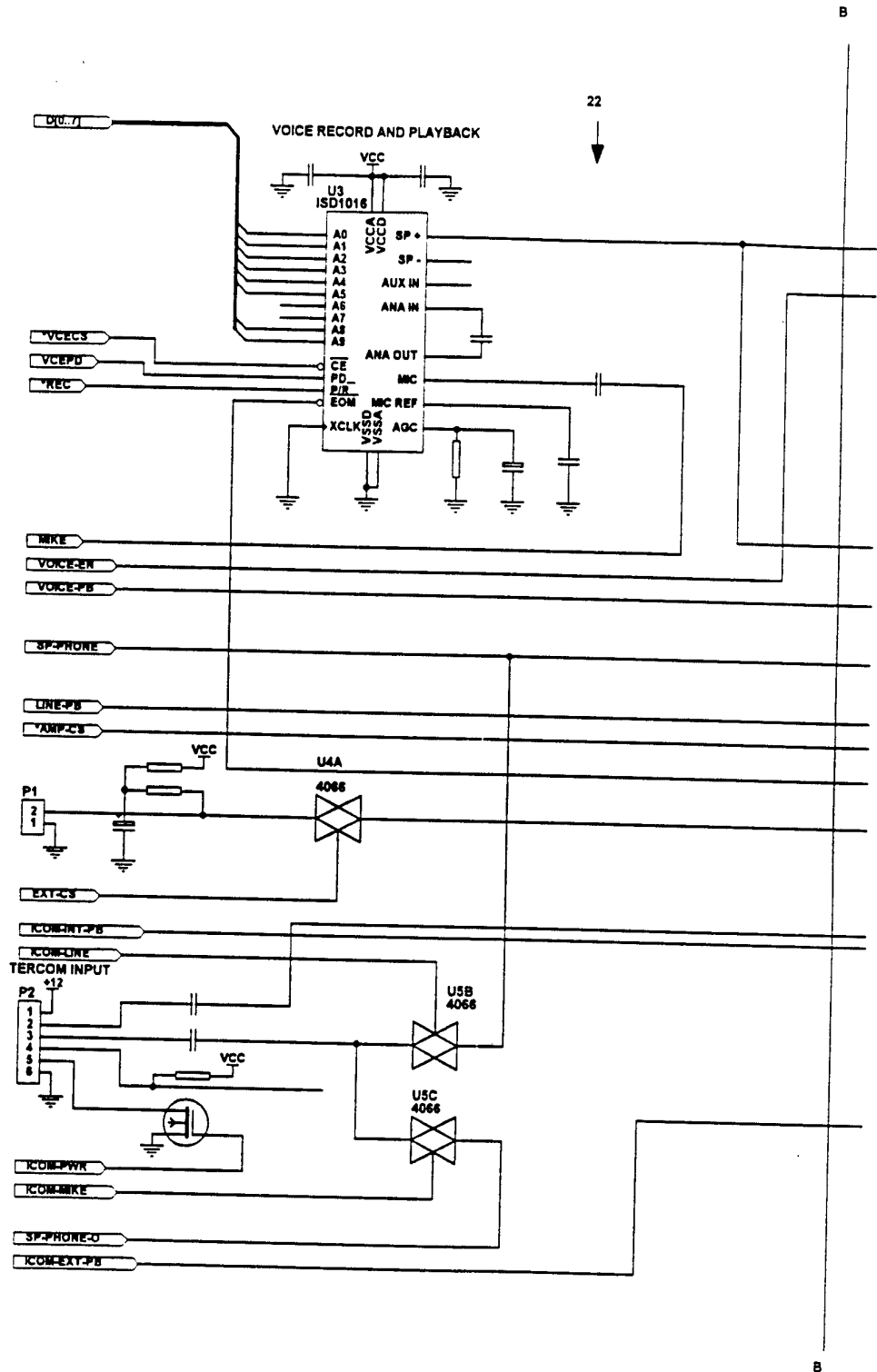


FIGURE 4

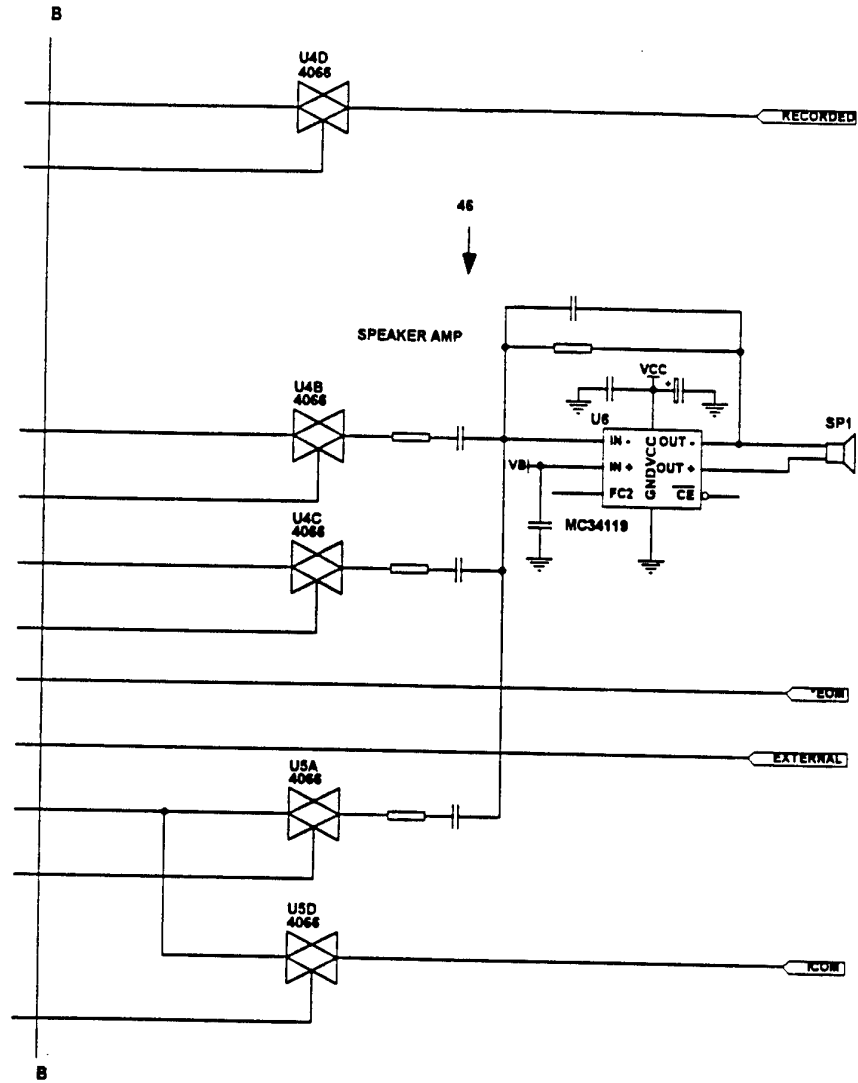


FIGURE 5

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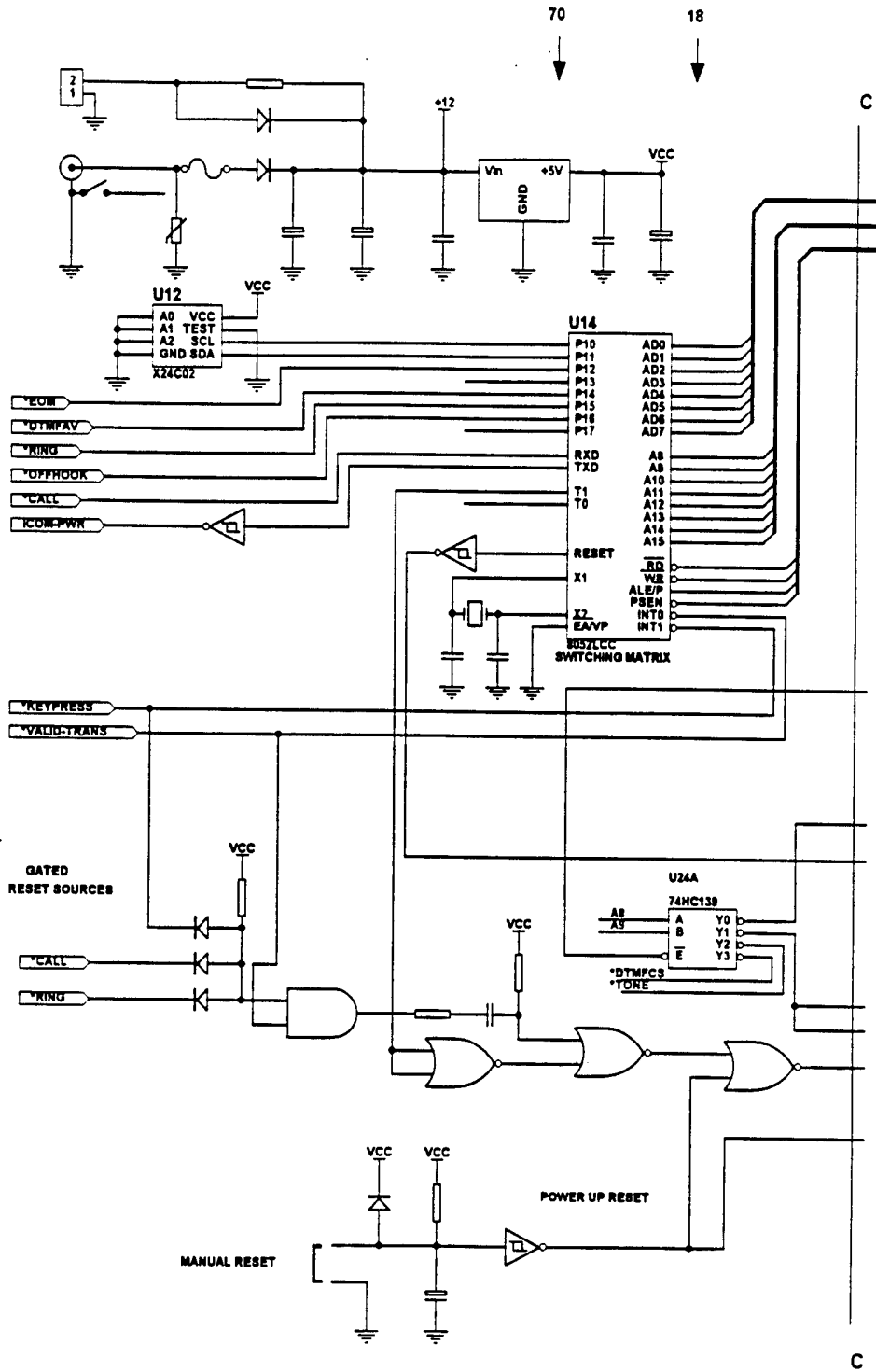


FIGURE 6

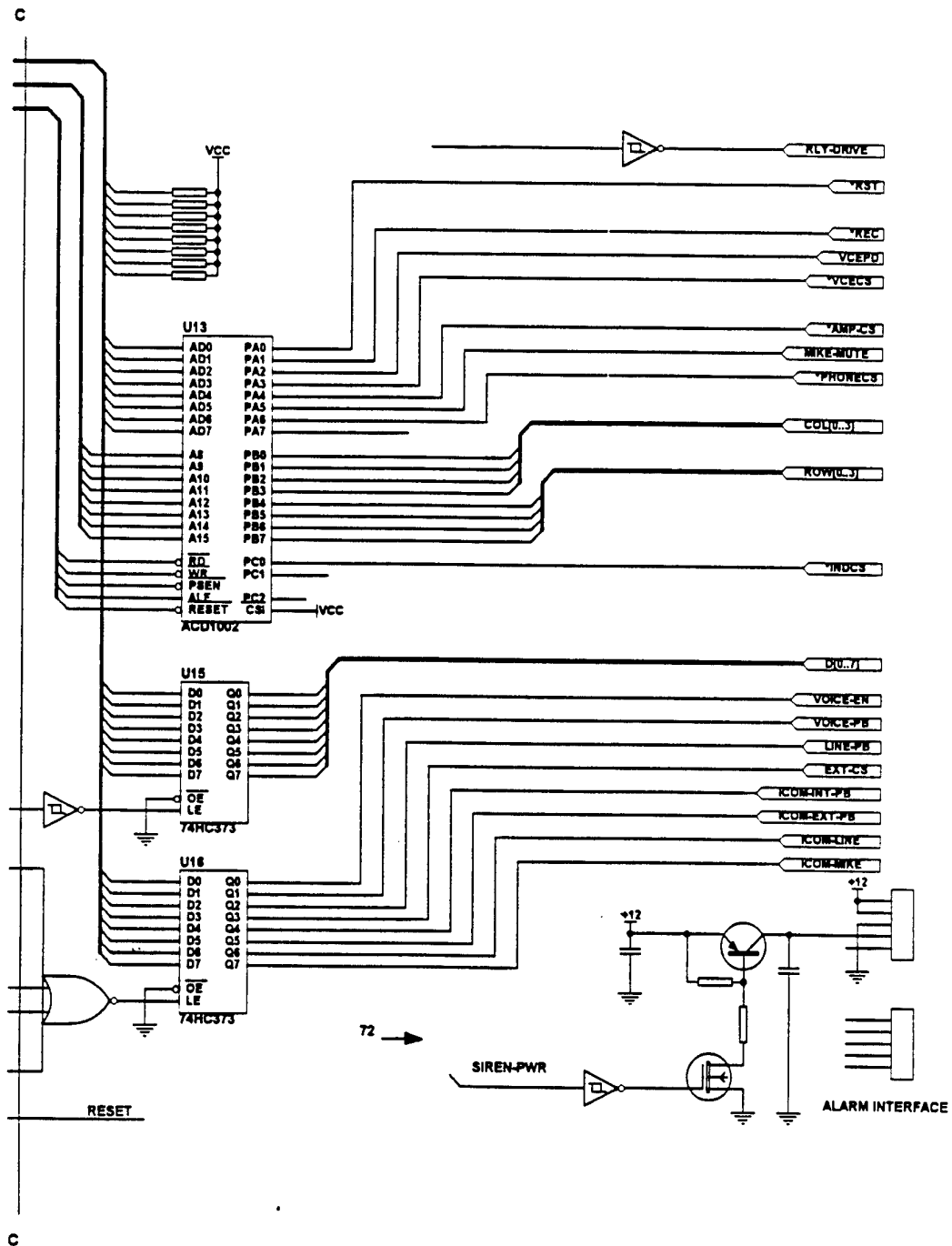


FIGURE 7

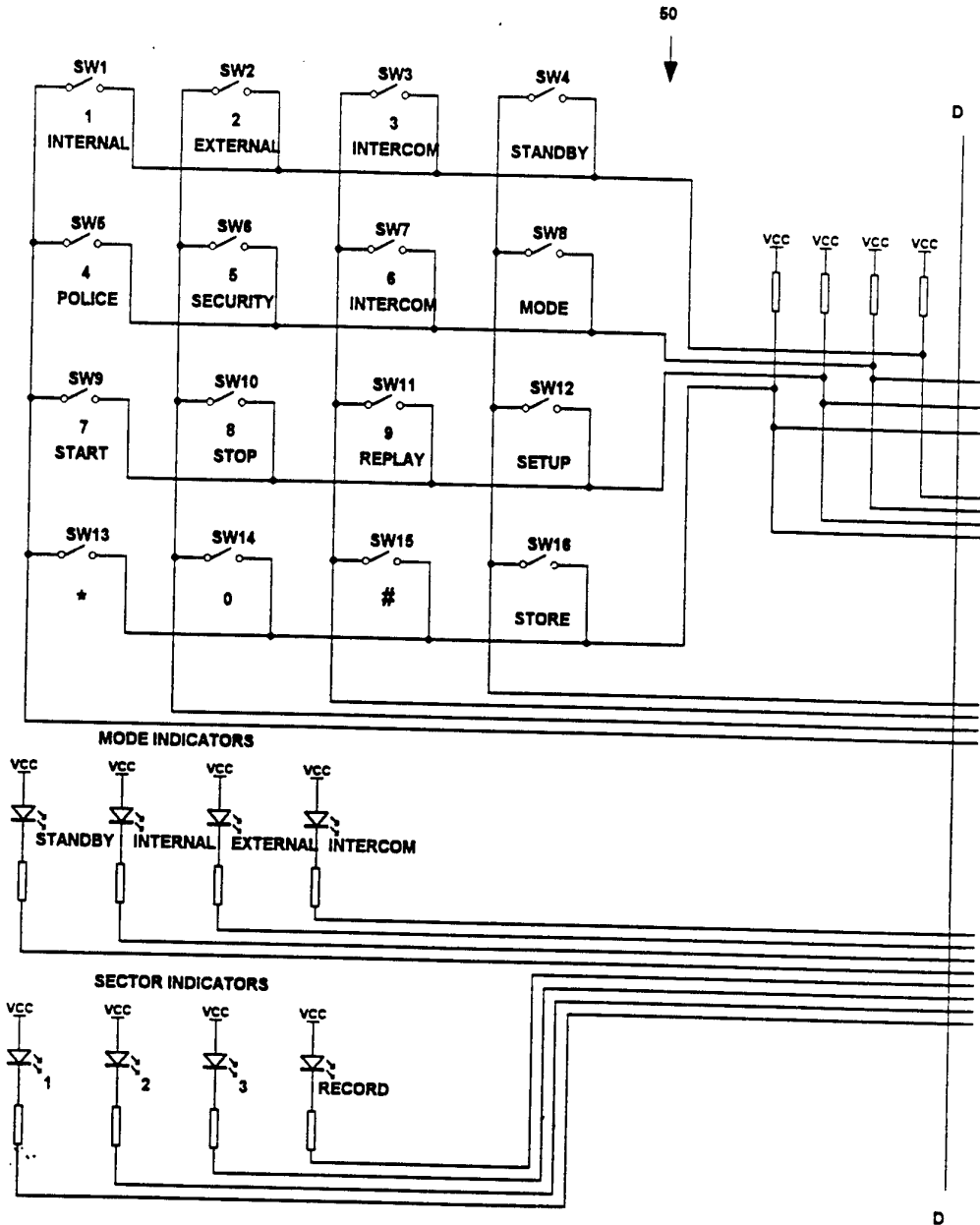


FIGURE 8

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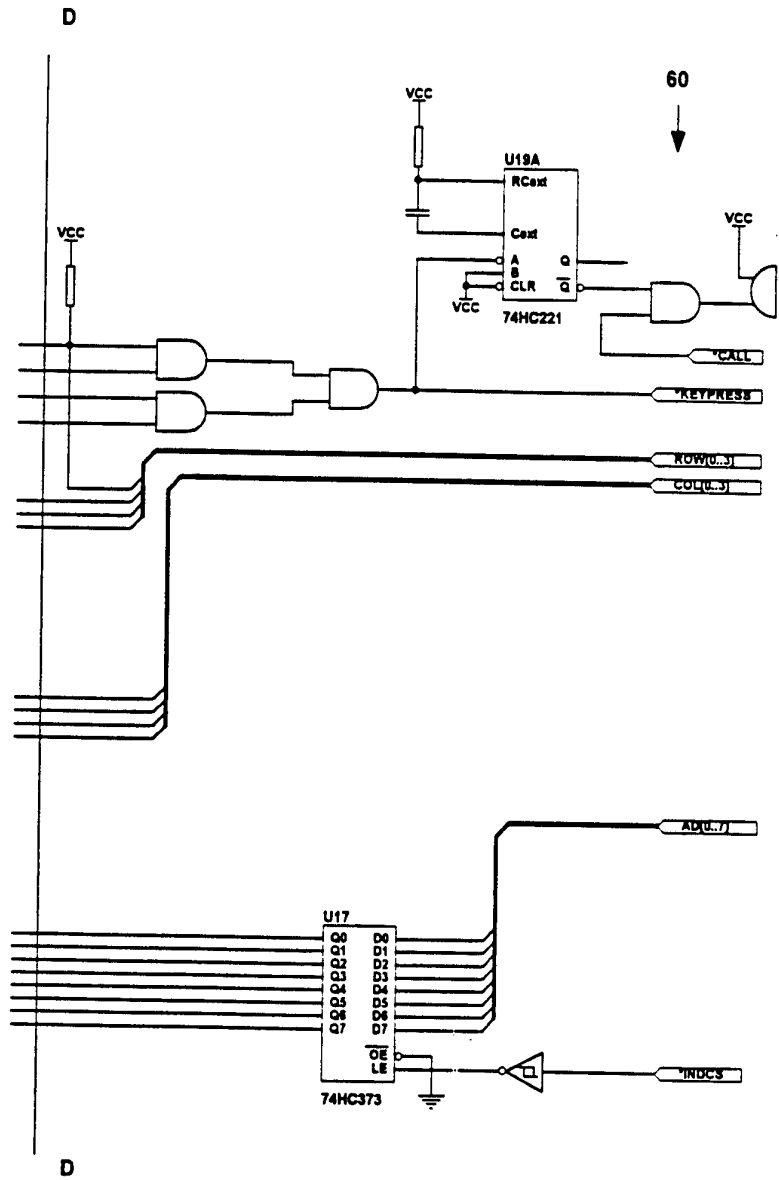
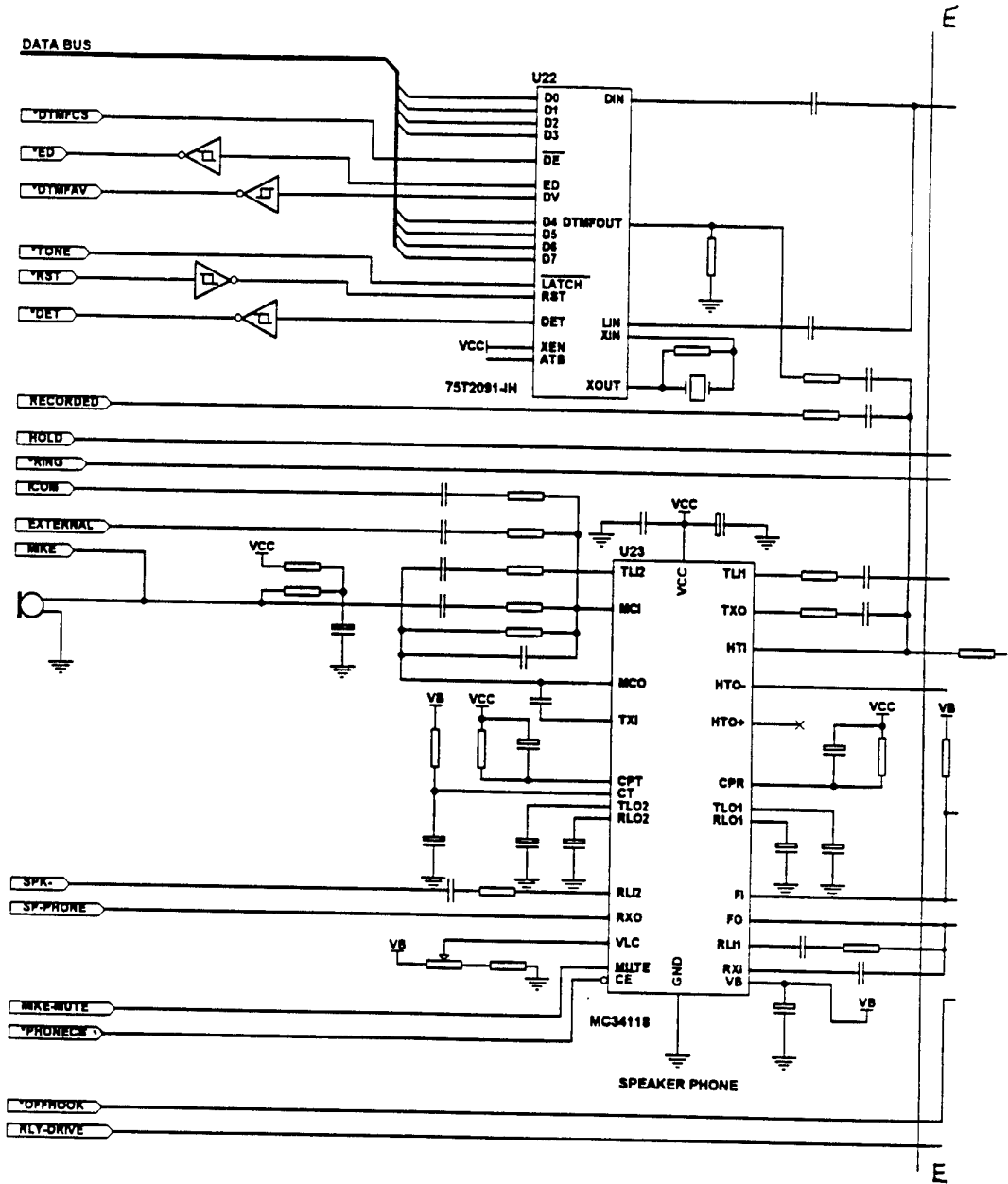


FIGURE 9

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↑
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FIGURE 10

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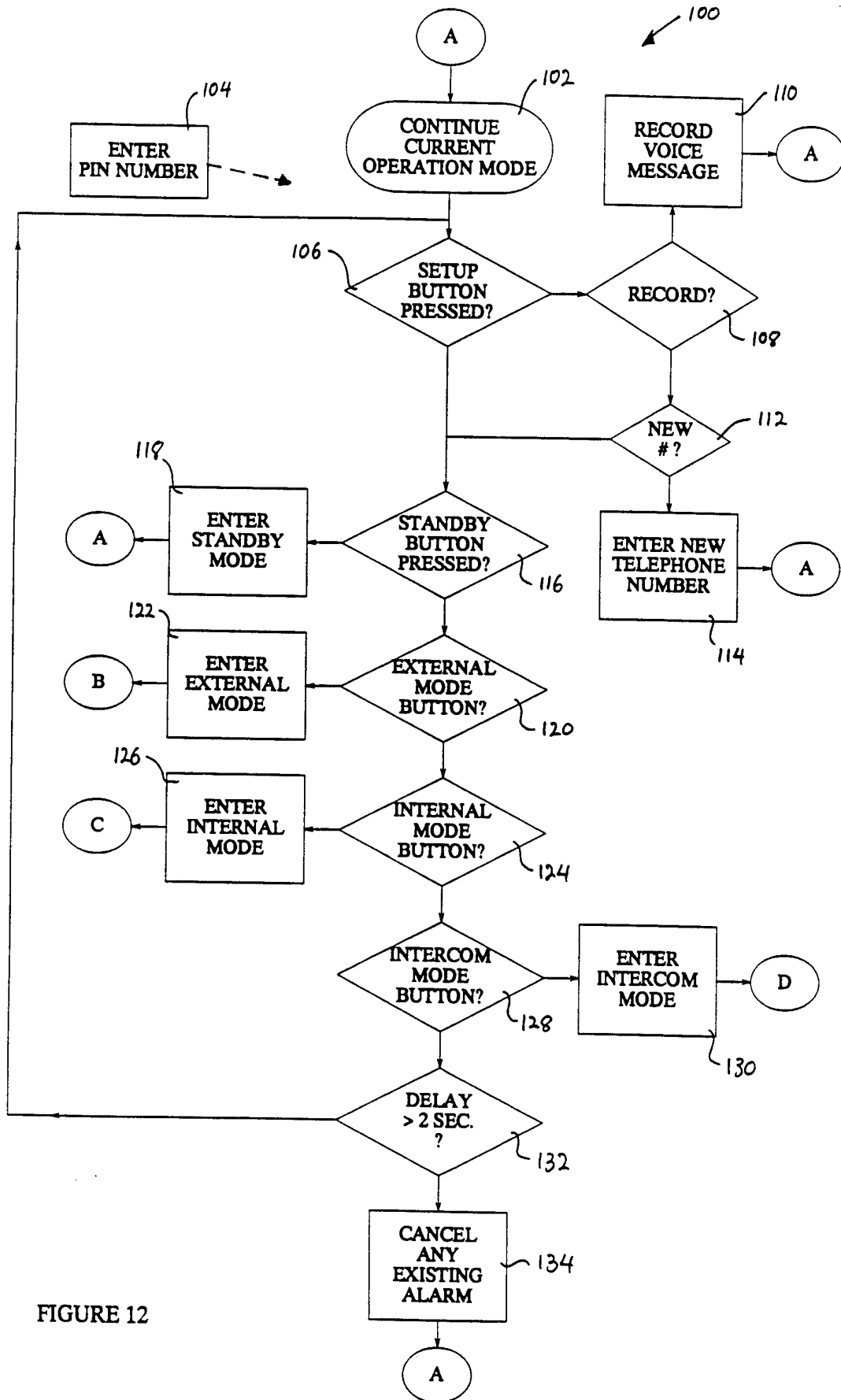


FIGURE 12

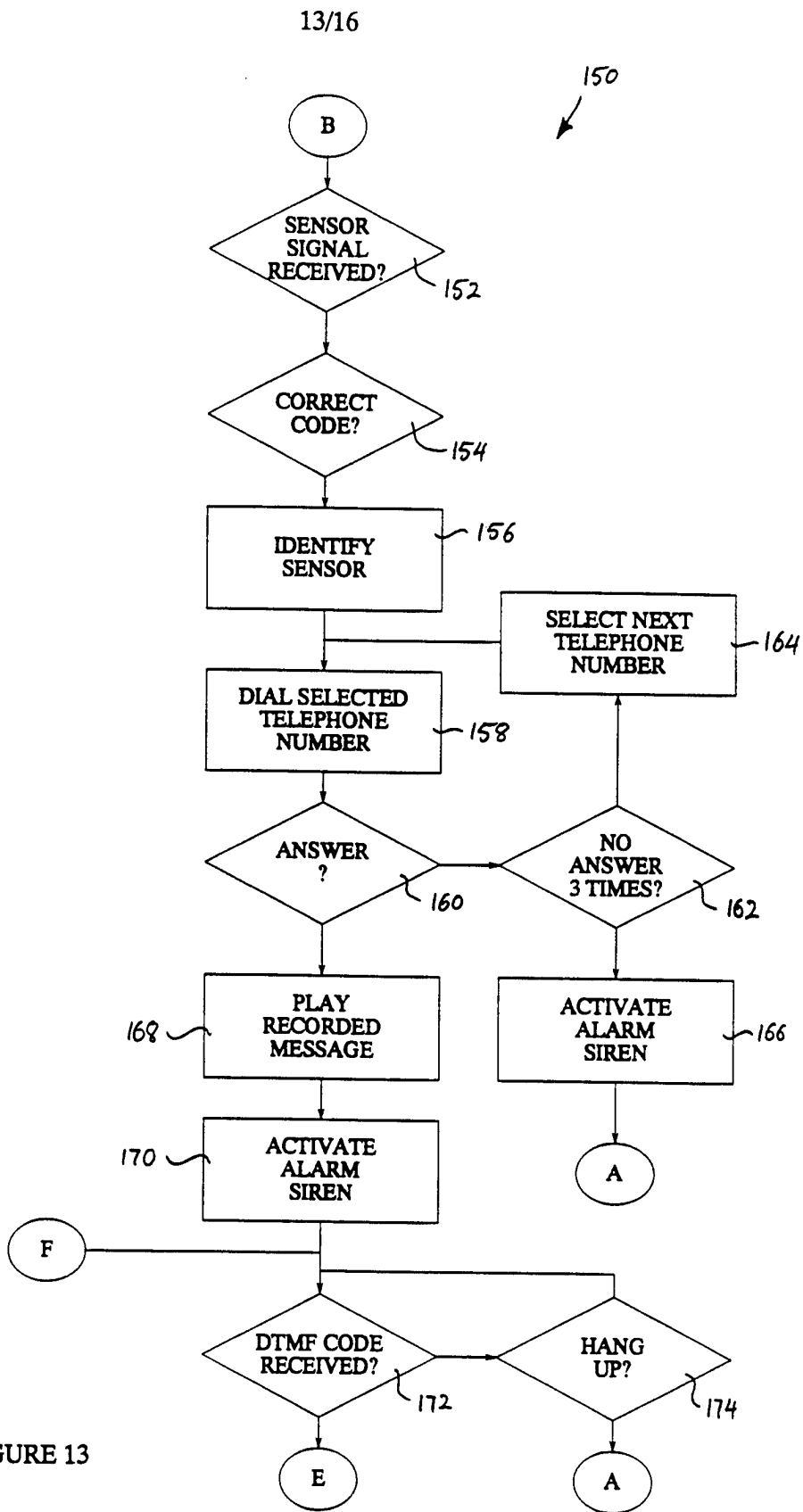


FIGURE 13

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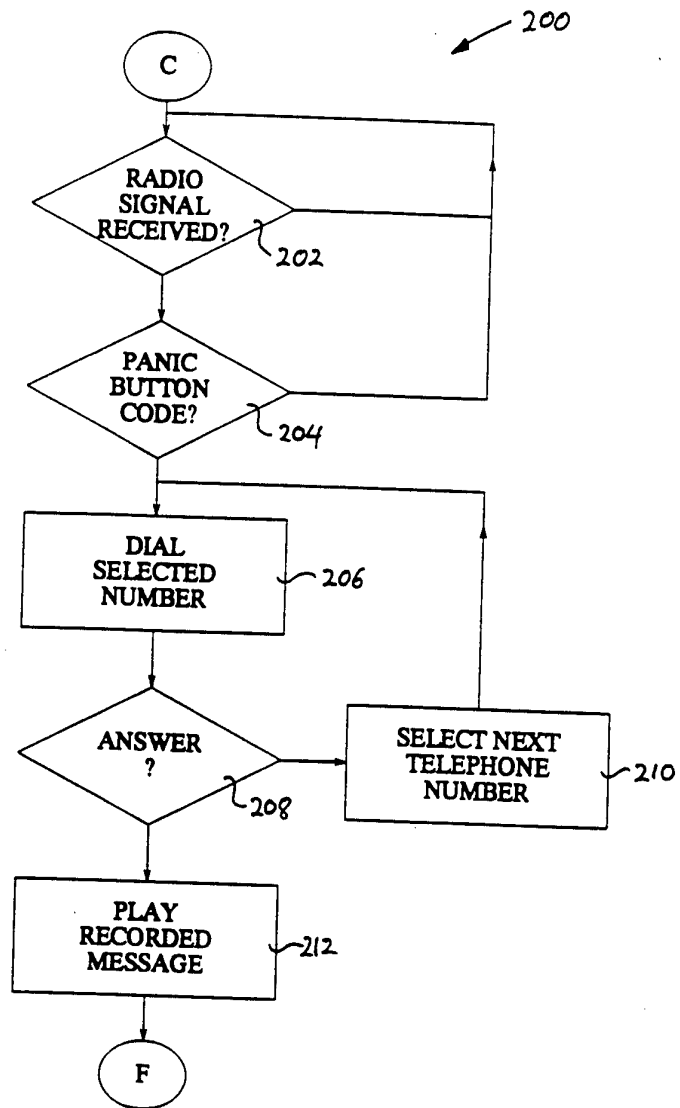


FIGURE 14

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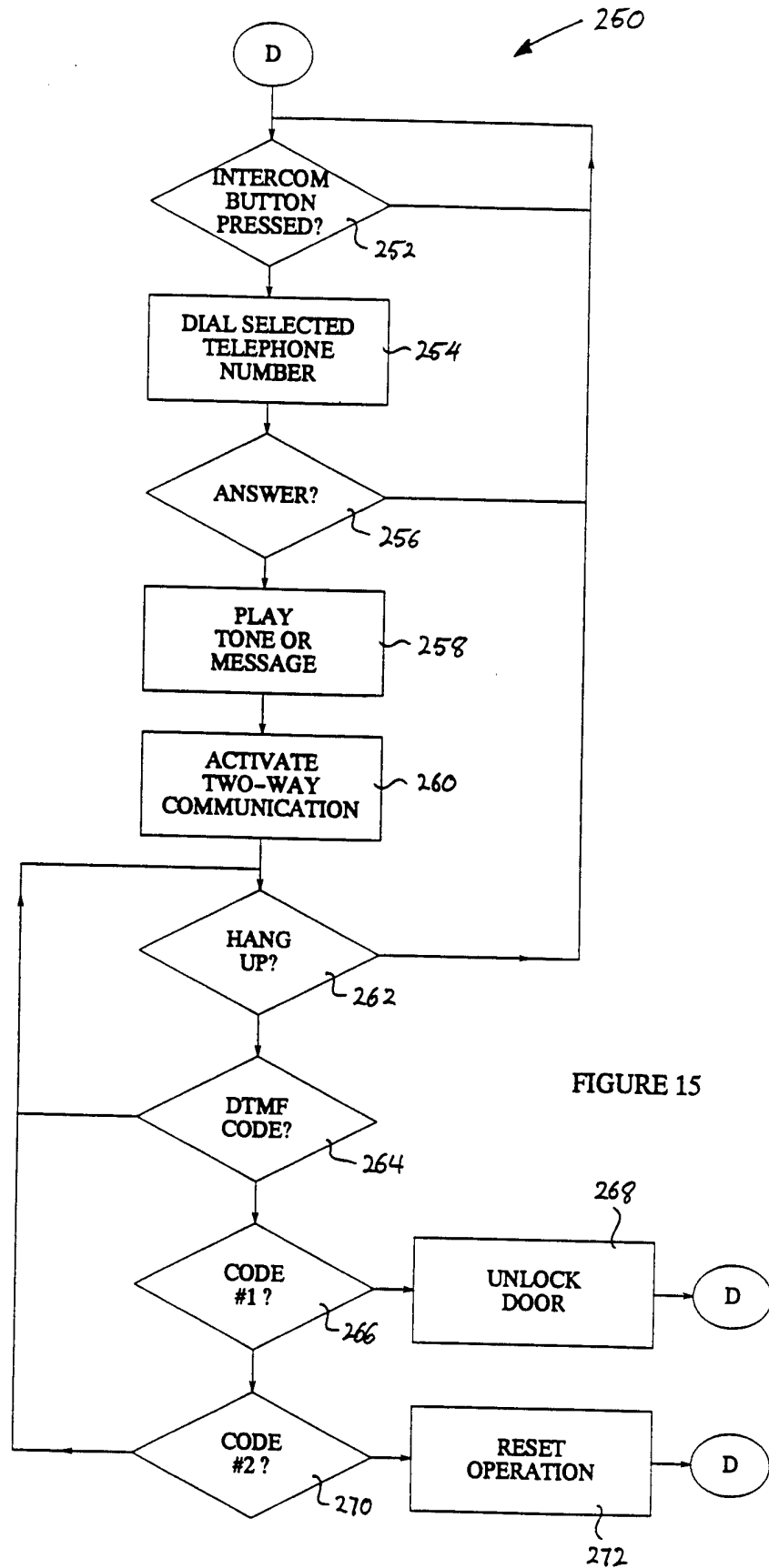


FIGURE 15

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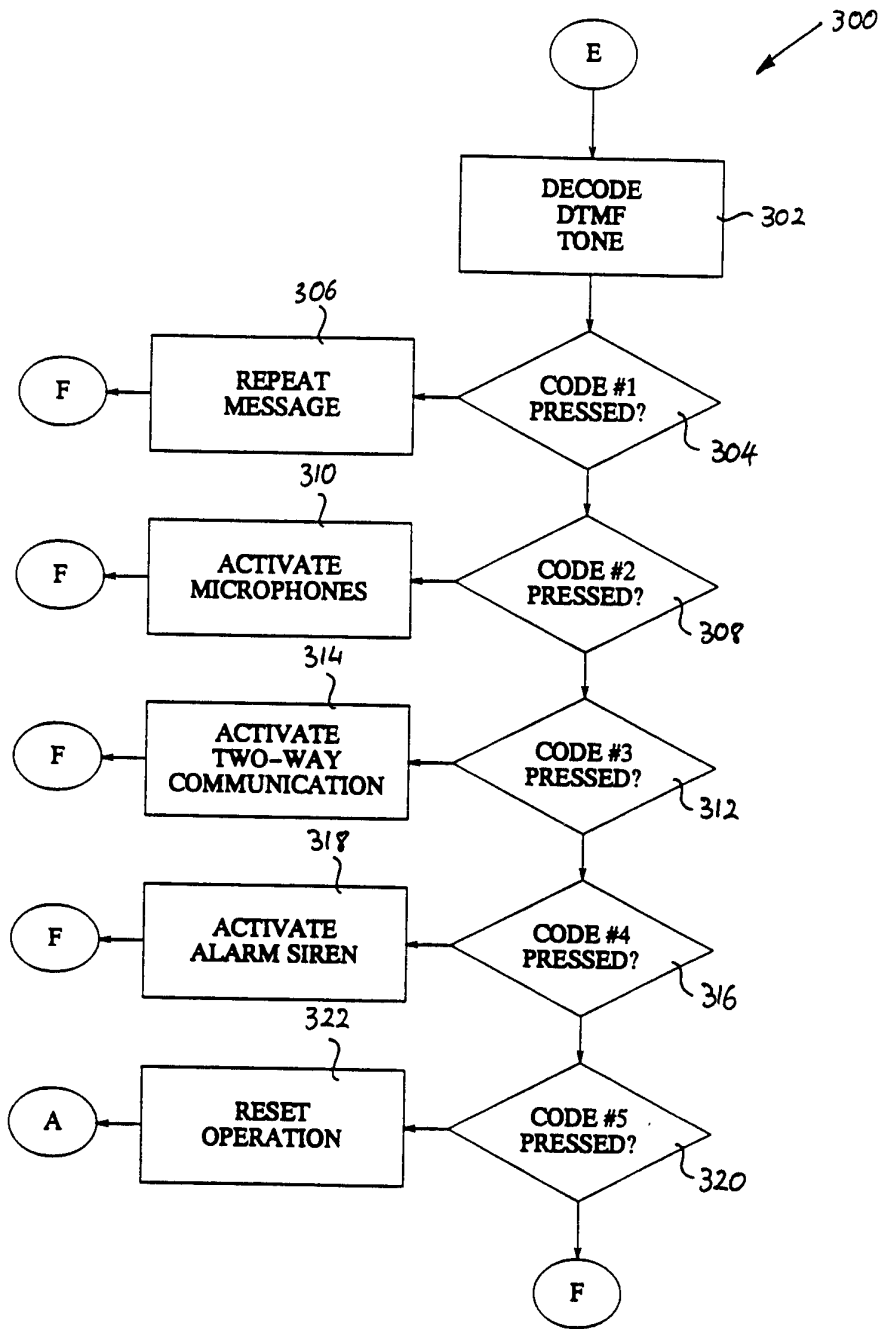
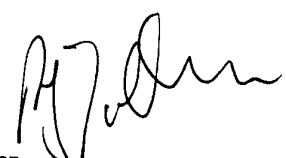


FIGURE 16

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU 94/00091

<p>A. CLASSIFICATION OF SUBJECT MATTER Int. Cl.⁵ G08B 13/00, 25/00</p> <p>According to International Patent Classification (IPC) or to both national classification and IPC</p>																	
<p>B. FIELDS SEARCHED</p> <p>Minimum documentation searched (classification system followed by classification symbols) IPC G08B 13/00, 25/00</p> <p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched AU : IPC as above</p> <p>Electronic data base consulted during the international search (name of data base, and where practicable, search terms used) DERWENT : Information or Message</p>																	
<p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:10%;">Category *</th> <th style="width:70%;">Citation of document, with indication, where appropriate, of the relevant passages</th> <th style="width:20%;">Relevant to Claim No.</th> </tr> </thead> <tbody> <tr> <td style="text-align:center;">X</td> <td>EP,A1, 77668 (SUNDERLAND & SOUTH SHIELDS WATER COMPANY) 27 April 1983 (27.04.83) Pages 2-9</td> <td style="text-align:center;">1,2,4,8,9,11</td> </tr> <tr> <td style="text-align:center;">X</td> <td>US,A, 4155042 (PERMUT et al.) 15 May 1979 (15.05.79) Columns 3-7</td> <td style="text-align:center;">1,2,4,11</td> </tr> <tr> <td style="text-align:center;">P,X</td> <td>AU,A, 44991/93 (SPA DARO) 3 March 1994 (03.03.94) The whole document</td> <td style="text-align:center;">1-12</td> </tr> <tr> <td colspan="3" style="text-align:right;">(continued)</td> </tr> </tbody> </table>			Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.	X	EP,A1, 77668 (SUNDERLAND & SOUTH SHIELDS WATER COMPANY) 27 April 1983 (27.04.83) Pages 2-9	1,2,4,8,9,11	X	US,A, 4155042 (PERMUT et al.) 15 May 1979 (15.05.79) Columns 3-7	1,2,4,11	P,X	AU,A, 44991/93 (SPA DARO) 3 March 1994 (03.03.94) The whole document	1-12	(continued)		
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X	US,A, 4155042 (PERMUT et al.) 15 May 1979 (15.05.79) Columns 3-7	1,2,4,11															
P,X	AU,A, 44991/93 (SPA DARO) 3 March 1994 (03.03.94) The whole document	1-12															
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<p><input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.</p> <p><input checked="" type="checkbox"/> See patent family annex.</p>																	
<p>* Special categories of cited documents :</p> <table style="width:100%;"> <tr> <td style="width:50%; vertical-align: top;"> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </td> <td style="width:50%; vertical-align: top;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p> </td> </tr> </table>			<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p>													
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<p>Date of the actual completion of the international search 8 June 1994 (08.06.94)</p>		<p>Date of mailing of the international search report 16 June 1994 (16.06.94)</p>															
<p>Name and mailing address of the ISA/AU AUSTRALIAN INDUSTRIAL PROPERTY ORGANISATION PO BOX 200 WODEN ACT 2606 AUSTRALIA Facsimile No. 06 2853929</p>		<p>Authorized officer  R. TOLHURST Telephone No. (06) 2832187</p>															

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU 94/00091

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate of the relevant passages	Relevant to Claim No.
X	AU,A, 29828/92 (PARRY) 10 June 1993 (10.06.93) Pages 2-5	1,2
X	AU,A1, 20226/92 (RUSS, Jan) 23 December 1992 (23.12.92) Pages 4-16	1,2,8,9,11
X	AU,B, 88216/91 (636258) (SAMSUNG ELECTRONICS CO) 14 January 1993 (14.01.93) Pages 3,4	1,2,11
X	AU,A1, 86640/91 (NORDIC TECHNOLOGY A/S) 16 April 1992 (16.04.92) Pages 1,2	1,4
X	AU,A, 11290/88 (MORI) 22 September 1988 (22.09.88) Pages 3-13	1,4,5
X	AU,A1, 10463/88 (KIM SANG-ROK) 18 May 1989 (18.05.89) Pages 3-11	1,2,4,8,9
X Y	AU,A, 65359/89 (QUINN et al.) 19 May 1988 (19.05.88) The whole document	1,2 4
X Y	US,A, 4794368 (GROSSHEIM et al.) 27 December 1988 (27.12.88) The whole document	1 9

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Information on patent family mem:

International application No.

PCT/AU 94/00091

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Patent Document Cited in Search Report		Patent Family Member					
EP	77668	CA	1207840	DE	3262061	GB	2108300
		US	4539557				
END OF ANNEX							