In a radio telephone (100, 200) having a keypad (206) for receiving the first information (302), a memory (112) for storing the second information (313), control circuitry for appending (314) the second information (313) after the first information (302) to form a complete phone number (315), and transmit circuitry transmitting (102, 104, 105, 106) the complete phone number (315). The method of transmitting information representing the complete phone number comprises the steps of receiving first information (302) from a keypad (206) representing at least one digit of the phone number, appending (314) second information (313) representing additional digits stored in a memory (112) to the first information (302), and transmitting the first and second information (306).
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DIALING EDITING METHOD AND APPARATUS

Field of the Invention

This invention relates in general to telephone communication systems, and more particularly to the appending and editing of a stored access number to a manually entered prefix number for accessing a public switched telephone network (PSTN).

Background of the Invention

In contemporary telephone systems, the telephone user addresses other radio telephone units or land-line telephones by entering a telephone number that corresponds to the phone system address of the user to be contacted. Once the connection is complete, two way voice or data communications can take place.

With the widespread use of cellular telephone systems in automobiles and other transportation means as a mode of communication, there have been a number of accidents or near accidents caused by cellular telephone users that have had to look at their set for an extended period of time while dialing a phone number. In order to make the task of dialing an access number easier, manufacturers added a memory feature to their telephones. This memory feature enables a user to recall pre-programmed numbers for automatic dialing. The present memory dialing method works fine when the user is in the geographic region covered by his or her primary service carrier. However, when the user is "roaming," that is, the user leaves the area in which the user's primary carrier is operating, the user is sometimes required to prefix the stored numbers with an additional access code. With typical PSTN (public switched telephone network) access numbers being seven digits in length and area codes being three digits, cellular telephone users generally program their unit's memory with a seven or ten digit number. When additional digits, such as a system access code are needed, the user must either enter the
entire number manually or by storing multiple numbers, thus wasting valuable memory slots. As can be appreciated, none but the most talented users can safely enter a long phone number while driving in rush hour traffic without risking an accident.

Some cordless telephones, particularly those conforming to the Pan-European CT-2 specification, are capable of receiving a selective call numeric message representing a phone number where the message originator can be reached. This can be used to create a "pseudo" inbound calling capability by utilizing the received number presented in the message to originate a return call when the user reaches a Telepoint. Upon receiving the page, the user would see the call-back number, travel into range of a call-point, then activate a transmitter to originate a call to the number specified by the displayed message. However, this simple scenario does not address the requirements of modifying the received number to include toll, area, or other access codes. Regrettably, the only method available in a contemporary cordless telephone technology to modify a number is to delete the current last digit (at the cursor pointer) or complete telephone number.

Summary of the Invention

In carrying out the above, there is provided a method of transmitting information representing a phone number comprising the steps of receiving first information from a keypad representing at least one digit of the phone number, appending second information representing additional digits stored in a memory to the first information, and transmitting the first and second information.

This method is implemented in a radio telephone comprising a keypad for entering first information representing at least one digit of a phone number, a memory for storing second information representing additional digits of the phone number, means for appending the first information
to the second information to form a complete phone number, and means for transmitting the complete phone number.

Brief Description of the Drawings

FIG. 1 is a block diagram of the radio telephone. FIG. 2 is a front isometric view of the radio telephone. FIG. 3 is a flow diagram of the method for entering a prefix code and recalling a stored telephone number.

FIG. 4 is a flow diagram of a method for editing a displayed telephone number using the digit keys in accordance with the present invention.

FIG. 5 is a flow diagram of a method for editing a displayed telephone number using the CLR key in accordance with the present invention.

FIG. 6 illustrates conventional clear and digit key editing of a manually entered telephone number.

FIG. 7 illustrates clear and digit key editing of a received or recalled telephone number performed in accordance with the present invention.

Description of a Preferred Embodiment

Referring to FIG. 1, a block diagram is shown of the battery (energy source) 101 powered radio telephone 100. A radio frequency signal is received or transmitted by the antenna 102. The antenna is coupled to the receiver 103 and transmitter 104 by a diplexer 105. The received signal is routed from the receiver 103 to the control circuitry 106 that recovers any information represented by the received signal. The recovered information is then used to activate functions within the radio telephone 100 such as the alert 107 (a ringer in the case of a radio telephone), and after answering the call, sustain the connection. When a connection is established, the user aurally communicates with the other party via the speaker 108 and a microphone 109. Recovered audio from the control circuitry 106 is routed to the speaker 108 which converts electrical energy into acoustical energy.
thus enabling the user to hear any communications. The microphone 109 is used to convert acoustic energy into electrical energy for use by the control circuitry 106 in modulating the radio frequency carrier produced by the transmitter 104. The user may initiate a call by selecting on a keypad 205 the proper controls 110 representing the number of a party to be contacted. In this embodiment, the user may enter first information representing an access code (or prefix) such as those needed by long distance PSTN carriers to access their system, then recall a local number containing second information from one of a plurality of memory locations available within the control circuitry 106. The recall of the second information from the memory 112 associated with the control circuitry 106 is accomplished by entering third information that is processed by the control circuitry 106. The control circuitry 106 then reads a stored number from the memory 112 and forms a complete number.

The formation of the complete number is accomplished by appending the alternate access code to the number recalled from the memory 112. Before dialing, the complete number is presented on a display 111 which provides visual feedback for the user. If desired, the user may either place the call, edit the number, or abort the dialing operation. When a call is initiated, the transmitting means 106, 104, 105, 102, broadcasts a modulated radio frequency carrier having information representative of the PSTN access codes, both alternate (limited or controlled access) and standard (local). The radio telephone base or an alternate unit then establishes a communication link once the proper identification is confirmed.

Referring to FIG. 2, the front isometric view of the radio telephone 200 shows the antenna 201, radio telephone housing 202, loudspeaker 203, display 204, control pad including a dialing keypad 206 and associated operational controls 205 such as a clear key, function key, recall key, and function key, and a microphone 207. Electrical contacts (not shown) located on the back of the radio telephone 200 are provided for charging the removable power source in the radio
telephone. For example, charging is accomplished by folding
the lower articulated portion upward against the control pad
205 then inserting the folded unit into a charging apparatus
(not shown). Alternatively, a portable power adapter can be
coupled into a power jack located on the radio telephone 200
for charging the power source or supplying external power.

Referring to FIG. 3, when the user invokes the call mode
301 on the radio telephone 200, the controller circuitry 106
scans the controls 110. The user may abort the call mode at
any time by entering an "escape" keystroke or waiting for the
entry mode to "time out." When the user enters initial digits
302, the controller processes this first information for
acceptance as valid digits and displays 303 the digits. When
a valid access code or number has been entered, it is
presented 303, thus providing feedback and allowing the user
to accept or reject the code entered 304. If the digits
entered are incorrect the user may press the CLR (clear)
function key 305 clearing the present entry and returning to
step 302 to enter new digits. If the digits displayed in step
303 are correct, the user may choose to dial the number 306 by
depressing the SND (send) function key which initiates
transmission 308 of the call information. The user may
optionally append a stored number 309 to the number displayed
in step 303 or replace the displayed number with another
stored number 316 by activating the RCL (recall) function key
317, entering the stored number's code or memory number 318,
determining if the code is correct and valid 319, and
displaying the newly recalled stored number 320. If the user
wants to append a stored number to the number displayed in
step 303, the user would, for example, activate the FCN
(function) then the RCL (recall) keys in sequence 310, enter a
stored number code 311. If the memory recall entry number is
tested for validity in step 312 and if valid the stored number
code 311 representing second information is read from memory
313 and sequentially assembled into a complete phone number by
appending the second information to the first information.
The complete number to be dialed is then presented 315 on a
display to the user for verification 306. The user can then
accept or reject the transmission 308 of the complete number. If the user rejects transmission or after dialing has been completed, the call initiation sequence returns control to normal standby radio telephone functions 322.

When the user is ready to transmit the number (initiate a call), step 321 tests for the activation of any other radio function. If no other function has been selected and the user wants to dial the number displayed 306, the SND (send) function is selected 307 and transmission 308 of the of the call information takes place. After transmission control returns to step 321 awaiting another function 322 or subsequent transmissions.

Referring to FIG. 4, the flow diagram illustrates the operation of an intelligent editing function using the digit keys that allows the user to either append and correct digits to a manually entered number or prefix and delete digits from a received or recalled (automatically entered) number. The decision as to the placement of the editing cursor and its function (append or delete) is determined by the origin of the displayed number. Upon sensing the entry of a digit (step 401), control is passed to decision 402. If the number is manually entered (i.e. the display has been previously cleared), decision 402 fails, a new digit is displayed (403), and control is passed to step 404, which waits for the next user action. If no number is displayed in decision 402, decision 405 tests for the origination mode of any part of the displayed number. In the case where the number has been completely entered in a manual mode, decision 405 fails and passes control to step 406, which appends the new digit to the right end of the displayed number. After the display operation in step 406 is complete control is passed to step 404 that waits for the next user action. If the number tested in decision 405 contained any digits that where either recalled from memory or received in a selective call message, control is passed to decision 407 which checks for a "new" part of the number. If there is no new part of the number, decision 407 fails and step 408 creates a new part consisting of the new digit entered in step 401. If there is a new part
in decision 407, step 409 appends a new digit to the rightmost end of the existing "new" part of the displayed number. In both cases of adding a new digit, step 410 displays the new digit in inverse contrast followed by the remainder of the received or retrieved portion of the number. Step 410 then passes control to step 404 to wait for the next user action.

Referring to FIG. 5, the flow diagram illustrates the operation of an intelligent editing function using the clear key that allows the user to either append and correct digits to a manually entered number or prefix and delete digits from a received or recalled (automatically entered) number. Upon sensing the activation of the CLR key (step 501), control is passed to decision 502. If there are no digits on the display, the activation is ignored (step 503). If digits are present on the display, decision 502 is true and control is passed to step 504, which tests for the activation of the CLR key for more than one second. If the CLR key is activated for more than one second, decision 504 is true, the display is cleared (step 505), and control is passed to step 506 that waits for the next user action. If decision 504 fails, decision 507 tests for any part of the displayed number having been recalled from memory or received as a message. If decision 507 fails, the most recent manually entered digit (rightmost) of the displayed number is cleared and control is passed to step 506 to wait for the next user action. When decision 507 is true, decision step 509 tests for a "new" part of the number is discussed in reference to FIG. 4. If there is no "new" part (decision 509 fails), step 510 clears the first (leftmost) digit of the displayed number and control is passed to step 506 to wait for the next user action. When decision 509 is true, step 511 clears the last (rightmost) digit of the "new" part, step 512 displays the remaining "new" part in inverse contrast followed on the right by the remainder of the received or recalled portion of the telephone number, and step 506 waits for the next user action.

Referring to FIG. 6, the sequence (601-610) a conventional clear and digit key editing of a manually entered telephone number. In this example, the user desires to change
a manually entered telephone number of "4073642632" to "407364232." The display (601) preferably comprises a twelve digit presentation device showing the manually entered telephone number "4073642632." When the user activates a CLR key (602, 603, 604), the last digit at each respective activation "2", "3", and "6" is erased. The user then may activate the "9", "3", and "3" keys (605, 606, 607) causing the display to append the digits "933" to the number "4073642" resulting in the number "4073642933" (607). In this example, the "3" key was accidentally activated one to many times resulting in the number "4073642933" (607). To correct the last digit, the user again activates the CLR key (608) clearing the last "3," then the "2" key appending a new "2" to result in the number "4073642932" (609) being displayed. If the user desires to clear the complete number, the CLR key must be activated and held for more than one second resulting in the display being cleared (610).

Referring to FIG. 7, the sequence (701-709) illustrates the preferred clear and digit key editing of an automatically entered telephone number. In this example, assume that the user desires to change a received or retrieved telephone number of "4073642632" to "913642632." The display (701) preferably comprises a twelve digit presentation device displaying the automatically entered telephone number "4073642632." When the user activates the CLR key (702, 703, 704), the first digit at each respective activation "4", "0", and "7", is deleted. The user the activates the "9" and "2" keys (705, 706) causing the display to insert the digits "92" in front (to the left) of the number "3462632" resulting in the number "923642632" (706). In this example, the "2" key was accidentally activated resulting in the number "923642632" (706). To correct the last entered digit, the user again activates the CLR key (707) deleting the last "2", then the "1" key prefixing a new "1" after the "9" and resulting in the number "913462632" (708) being displayed. If the user desires to clear the complete number, the CLR key must be activated and held for more than one second resulting in the display being cleared (709).
CLAIMS

1. A method of transmitting information representing a phone number, comprising the steps of:
   receiving first information from a keypad representing at least one digit of the phone number;
   appending second information representing additional digits stored in a memory to the first information; and
   transmitting the first and second information.

2. The method according to claim 1 wherein the receiving step further comprises the steps of:
   processing the first information upon entry from the keypad; and
   providing feedback to a user allowing acceptance of the first information.

3. The method according to claim 2 wherein the providing step further comprises the steps of:
   presenting the first information to the user; and
   allowing the user to override acceptance of the first information and enter new first information.

4. The method according to claim 1 wherein the appending step further comprises the steps of:
   receiving third information from a keypad representing a phone number stored in a memory;
   processing the third information upon entry; and
   providing feedback to a user indicating acceptance of the third information.

5. The method according to claim 4 wherein the providing step further comprises the steps of:
   presenting the second information to the user; and
   allowing the user to override acceptance of the second information and enter new second information.
6. A radio telephone comprising,
a keypad for entering first information representing at
least one digit of a phone number;
a memory for storing second information representing
additional digits of the phone number;
means for appending the second information after the
first information to form a complete phone number; and
means for transmitting the complete phone number.

7. The radio telephone according to claim 6 wherein the
first information comprises an access code required for access
to an alternate public switched telephone network exchange.

8. The radio telephone according to claim 6 wherein the
second information comprises an access code required for
access to a standard public switched telephone network
exchange.

9. The radio telephone according to claim 6 wherein the
means for appending comprises a controller that processes the
first information from the keypad, reads the memory and
retrieves the second information representing additional
digits of the phone number in response to processing third
information entered from the keypad, and assembles in sequence
the first and third information into the complete phone
number.
10. The radio telephone according to claim 6 further comprising:
   a receiver;
   a controller for:
   means for controlling the operation of the receiver and a transmitter;
   means for processing the first information from the keypad;
   means for reading the memory and retrieving the second information representing additional digits of the phone number in response to processing third information entered from the keypad; and
   means for assembling in sequence the first and second information into the complete phone number;
   an energy source for powering the radio telephone;
   a speaker for presenting aural communications to a user;
   a microphone for receiving audio communications from the user;
   a display for providing feedback to the user by presenting information entered by the user; and
   an alert transducer capable of providing a signal to the user indicating the operational status of the radio telephone.

11. A method of transmitting information representing a phone number, comprising the steps of:
   displaying at least a portion of the information representing a phone number on a display;
   selecting a prefix mode when the information representing a phone number has been automatically entered and selecting an appending edit mode when the information representing a phone number has been manually entered;
   editing the information representing a phone number; and
   transmitting the information representing a phone number.
12. The method according to claim 11 wherein the displaying step further comprises the steps of:
   receiving a selective call message comprising a selective call address and the information representing a phone number; and
   automatically entering the information representing a phone number.

13. The method according to claim 11 wherein the displaying step further comprises the steps of:
   recalling the information representing a phone number from a memory; and
   automatically entering the information representing a phone number.

14. The method according to claim 11 wherein the displaying step further comprises the step of:
   manually entering the information representing a phone number.

15. The method according to claim 11 wherein the editing step further comprises the steps of:
   in the prefixing edit mode:
      inserting or deleting digits in front of the information representing a phone number, subsequent digits after a first entered digit being inserted from left to right in front of the information representing a phone number; and
   in the appending edit mode:
      appending or deleting digits at the end of the information representing a phone number, subsequent digits after the first entered digit being appended from left to right at the end of the information representing a phone number.
16. A radio telephone comprising,
means for entering first information representing at
least one digit of a phone number;
a memory for storing second information representing at
least a portion of the phone number;
a receiver for correlating a selective call address
associated with the radio telephone and upon correlating the
selective call address with the radio telephone, providing a
received message comprising at least a portion of the phone
number;
means for editing at least a portion of the phone
number to form a complete phone number; and
means for transmitting the complete phone number.

17. The radio telephone according to claim 16 wherein the
first information comprises an access code required for access
to an alternate public switched telephone network exchange.

18. The radio telephone according to claim 16 wherein the
first information comprises an access code required for access
to a standard public switched telephone network exchange.

19. The radio telephone according to claim 16 wherein the
means for editing comprises a controller that processes the
first information from the keypad to:
in the prefixing edit mode:
insert or delete digits in front of the phone number,
subsequent digits after a first entered digit being inserted
from left to right in front of the phone number; and
in the appending edit mode:
append or delete digits at the end of the phone number,
subsequent digits after the first entered digit being appended
from left to right at the end of the phone number.
20. The radio telephone according to claim 16 further comprising:
   a receiver;
   a controller for:
   means for controlling the operation of the receiver and
   a transmitter;
   means for processing the first information from the
   keypad;
   means for reading the memory and retrieving the second
   information representing at least a portion the phone number
   in response to processing third information entered from the
   keypad; and
   means for assembling in sequence the first and second
   information into the complete phone number;
   an energy source for powering the radio telephone;
   a speaker for presenting aural communications to a
   user;
   a microphone for receiving audio communications from
   the user;
   a display for providing feedback to the user
   by presenting information entered by the user; and
   an alert transducer capable of providing a signal to
   the user indicating the operational status of the radio
   telephone.
FIG. 3
A DIGIT KEY HAS BEEN DEPRESSED (NEW DIGIT)

IS THERE A NUMBER ALREADY ON THE DISPLAY?

N

DISPLAY THE NEW DIGIT

Y

WAS ANY PART OF THE DISPLAY NUMBER RECEIVED AS A PAGE OR RETRIEVED FROM MEMORY? (FLAG SET)

N

MANUALLY ENTERED #. APPEND THE NEW DIGIT TO THE RIGHT END OF THE DISPLAYED NUMBER

Y

DOES THERE ALSO EXIST A "NEW" PART OF THE NUMBER?

N

CREATE A "NEW" PART CONSISTING OF THE NEW DIGIT

Y

APPEND THE NEW DIGIT TO THE RIGHT END OF THE EXISTING "NEW" PART OF THE NUMBER

DISPLAY THE "NEW" PART IN INVERSE CONTRAST, FOLLOWED ON THE RIGHT BY THE REMAINDER OF THE RECEIVED OR RETRIEVED PART

WAIT FOR THE NEXT USER ACTION

FIG. 4
501  THE CLR KEY HAS BEEN DEPRESSED

502  ARE ANY DIGITS ON THE DISPLAY?  N  503  DO NOTHING

504  WAS THE CLR KEY HELD DEPRESSED FOR LONGER THAN ONE SECOND?  Y

505  CLEAR THE ENTIRE DISPLAY

507  WAS ANY PART OF THE DISPLAYED NUMBER RECEIVED AS A PAGE OR RETRIEVED FROM MEMORY? (FLAG SET)  N

508  MANUALLY ENTERED #. CLEAR THE LAST (RIGHTMOST) DIGIT OF THE DISPLAYED NUMBER

509  DOES THERE ALSO EXIST A "NEW" PART OF THE NUMBER?  Y

510  CLEAR THE FIRST (LEFTMOST) DIGIT OF THE DISPLAYED NUMBER

511  CLEAR THE LAST (RIGHTMOST) DIGIT OF THE "NEW" PART  Y

512  DISPLAY THE REMAINING "NEW" PART (IF ANY) IN INVERSE CONTRAST, FOLLOWED ON THE RIGHT BY THE REMAINDER OF THE RECEIVED OR RETRIEVED PART

506  WAIT FOR THE NEXT USER ACTION

FIG. 5
USER ACTION

USER ENTERED NUMBER

CLR KEY DEPRESSED

CLR KEY DEPRESSED

CLR KEY DEPRESSED

0 KEY DEPRESSED

3 KEY DEPRESSED

3 KEY DEPRESSED (BY MISTAKE)

CLR KEY DEPRESSED

2 KEY DEPRESSED

CLR KEY HELD DOWN > 1 SEC.

DISPLAY

601

4 | 0 | 7 | 3 | 6 | 4 | 2 | 6 | 3 | 2

602

4 | 0 | 7 | 3 | 6 | 4 | 2 | 6 | 3

603

4 | 0 | 7 | 3 | 6 | 4 | 2 | 6

604

4 | 0 | 7 | 3 | 6 | 4 | 2

605

4 | 0 | 7 | 3 | 6 | 4 | 2 | 9

606

4 | 0 | 7 | 3 | 6 | 4 | 2 | 9 | 3

607

4 | 0 | 7 | 3 | 6 | 4 | 2 | 9 | 3 | 3

608

4 | 0 | 7 | 3 | 6 | 4 | 2 | 9 | 3

609

4 | 0 | 7 | 3 | 6 | 4 | 2 | 9 | 3 | 2

610

FIG. 6
USER ACTION

RECALLED OR RECEIVED NUMBER

CLR KEY DEPRESSED

CLR KEY DEPRESSED

CLR KEY DEPRESSED

9 KEY DEPRESSED

2 KEY DEPRESSED (BY MISTAKE)

CLR KEY DEPRESSED

1 KEY DEPRESSED

CLR KEY HELD DOWN > 1 SEC.

DISPLAY

701

4 0 7 3 6 4 2 6 3 2

702

0 7 3 6 4 2 6 3 2

703

7 3 6 4 2 6 3 2

704

3 6 4 2 6 3 2

705

9 3 6 4 2 6 3 2

706

9 2 3 6 4 2 6 3 2

707

9 3 6 4 2 6 3 2

708

9 1 3 6 4 2 6 3 2

709

FIG. 7
# INTERNATIONAL SEARCH REPORT

## I. CLASSIFICATION OF SUBJECT MATTER

According to International Patent Classification (IPC) or to both National Classification and IPC

<table>
<thead>
<tr>
<th>IPC(5):</th>
<th>HO4M 11/00, 1/26</th>
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<tr>
<td>U.S. CL.:</td>
<td>379/58, 355</td>
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## II. FIELDS SEARCHED

<table>
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<tr>
<td>U.S.</td>
<td>379/56, 58-60, 63, 354-357</td>
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## III. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of Document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to Claim No.</th>
</tr>
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<tbody>
<tr>
<td>X</td>
<td>US, A, 4,800,582 (D'AGOSTO, III ET AL.) 24 January 1989, see Abstract, lines 12-15; column 3, lines 8-11; column 8, lines 38,39,44 to column 9, line 7.</td>
<td>1-5,11-15</td>
</tr>
<tr>
<td>Y</td>
<td>US, A, 4,868,862 (RYOICHI ET AL.) 19 September 1989, Figures 8,12; column 7, lines 3-41; column 1, lines 44-58.</td>
<td>6-10,16-20</td>
</tr>
<tr>
<td>Y</td>
<td>US, A, 4,682,357 (IRINO) 21 July 1987, See Abstract; column 1, lines 51-62; column 2, lines 5-19.</td>
<td>6-10,16-20</td>
</tr>
<tr>
<td>Y</td>
<td>US, A, 4,707,854 (MAYER) 17 November 1987, See Abstract; column 1, lines 17-23.</td>
<td>3,5,11,14-16,19</td>
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<td>X,P</td>
<td>US, A, 4,980,910 (OBA ET AL.) 25 December 1990, See column 1, lines 19-22, 25-29; column 3, lines 1-7, 26-29,33-38,48-50; column 4, lines 54-61; column 5, lines 44-67; column 6, lines 34-43.</td>
<td>1,2,4, 3,5-20</td>
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* Special categories of cited documents:
  - "A" document defining the general state of the art which is not considered to be of particular relevance
  - "E" earlier document but published on or after the international filing date
  - "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)
  - "O" document referring to an oral disclosure, use, exhibition or other means
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  - "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an obvious step
  - "Y" document of particular relevance; the claimed invention cannot be considered to involve an obvious step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
  - "A" document member of the same patent family

## IV. CERTIFICATION

<table>
<thead>
<tr>
<th>Date of the Actual Completion of the International Search</th>
<th>Date of Mailing of this International Search Report</th>
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<tr>
<td>24 APRIL 1991</td>
<td>17 MAY 1991</td>
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<tr>
<td>International Searching Authority</td>
<td>Signature of Authorized Officer</td>
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<tr>
<td>TSA/TIS</td>
<td>Dwayne Bost</td>
</tr>
</tbody>
</table>

Form PCT/ISA/210 (second sheet) (May 1986)
US, A, 4,850,009 (ZOOK ET AL.) 18 July 1989, See column 3, lines 12-21; column 4, lines 6-21; column 10, Under key and Description: "ERASE SCRNV", and on column 13: "Right arrow", "Left arrow", and abstract.

V. OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. Claim numbers , because they relate to subject matter not required to be searched by this Authority, namely:

2. Claim numbers , because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claim numbers because they are dependent claims not drafted in accordance with the second and third sentences of PCT Rule 6.4(a).

VI. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This International Searching Authority found multiple inventions in this international application as follows:

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.

2. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

4. As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest
☐ The additional search fees were accompanied by applicant's protest.
☐ No protest accompanied the payment of additional search fees.