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    GB 2248364 A   **GB 2229340 A**   **EP 0378450 A2**
    EP 0310876 A2

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    LECX
    INT CL⁵ **H04Q 7/04**
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(54) **Storing installation data in rapid dialling memory of cellular telephone**

(57) Installation data for a mobile cellular telephone is installed directly in the rapid dialling memory or short code memory (SCM) 7 or other memory of the telephone. The installation data may subsequently be stored in the Number Assignment Module (NAM) 8 after temporary storage in the rapid dialling memory or SCM. The SCM locations used are invisible to the user and installation data is transferred to the NAM after an installer has effected a short keystroke sequence. The amount of memory space required to store the installation data is reduced. The SCM locations used may not be "normal" locations. To prevent misuse a protection element or its removal may be required. Installation data may be read directly from the SCM 7 without transfer to the NAM 8.
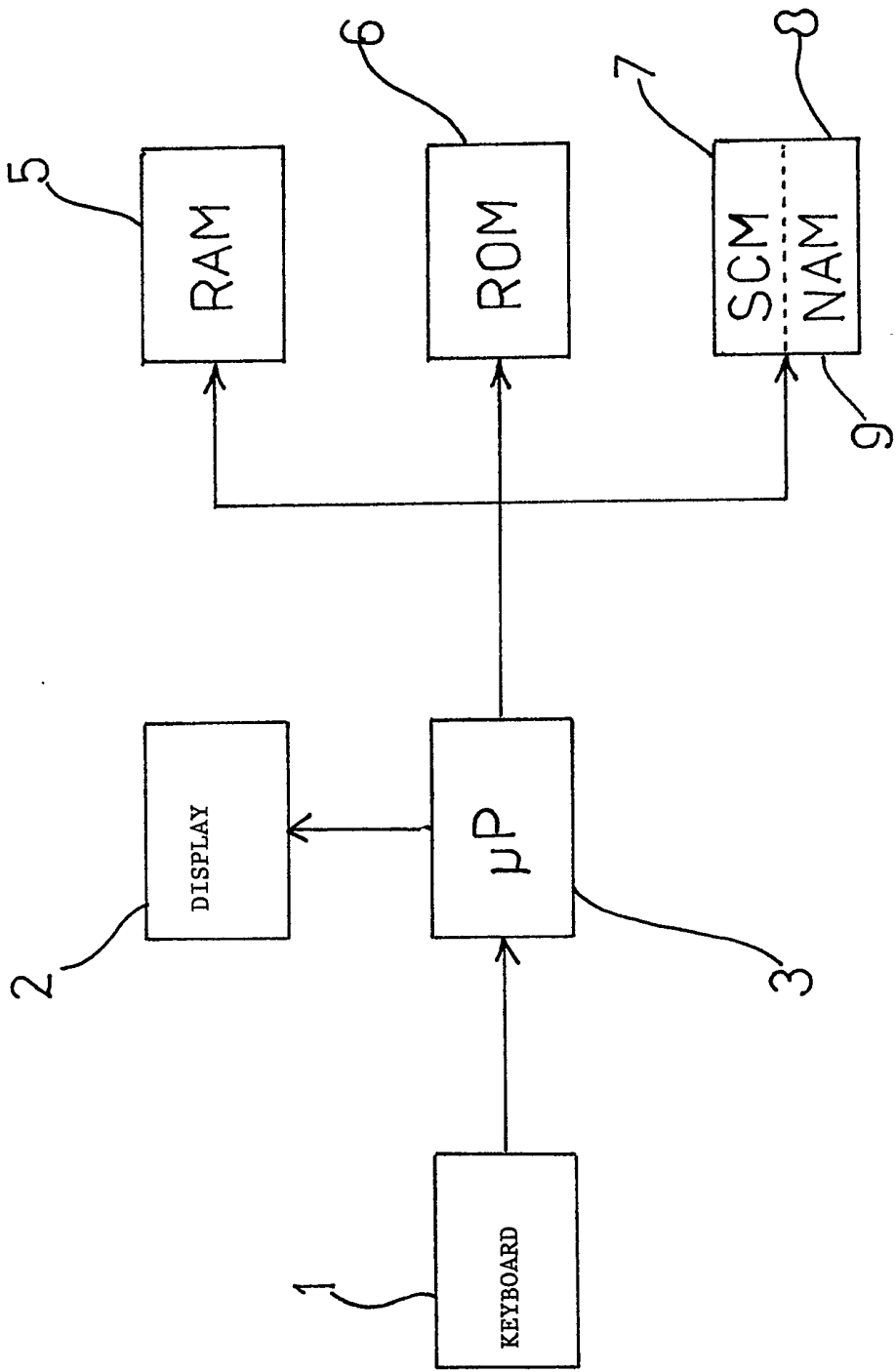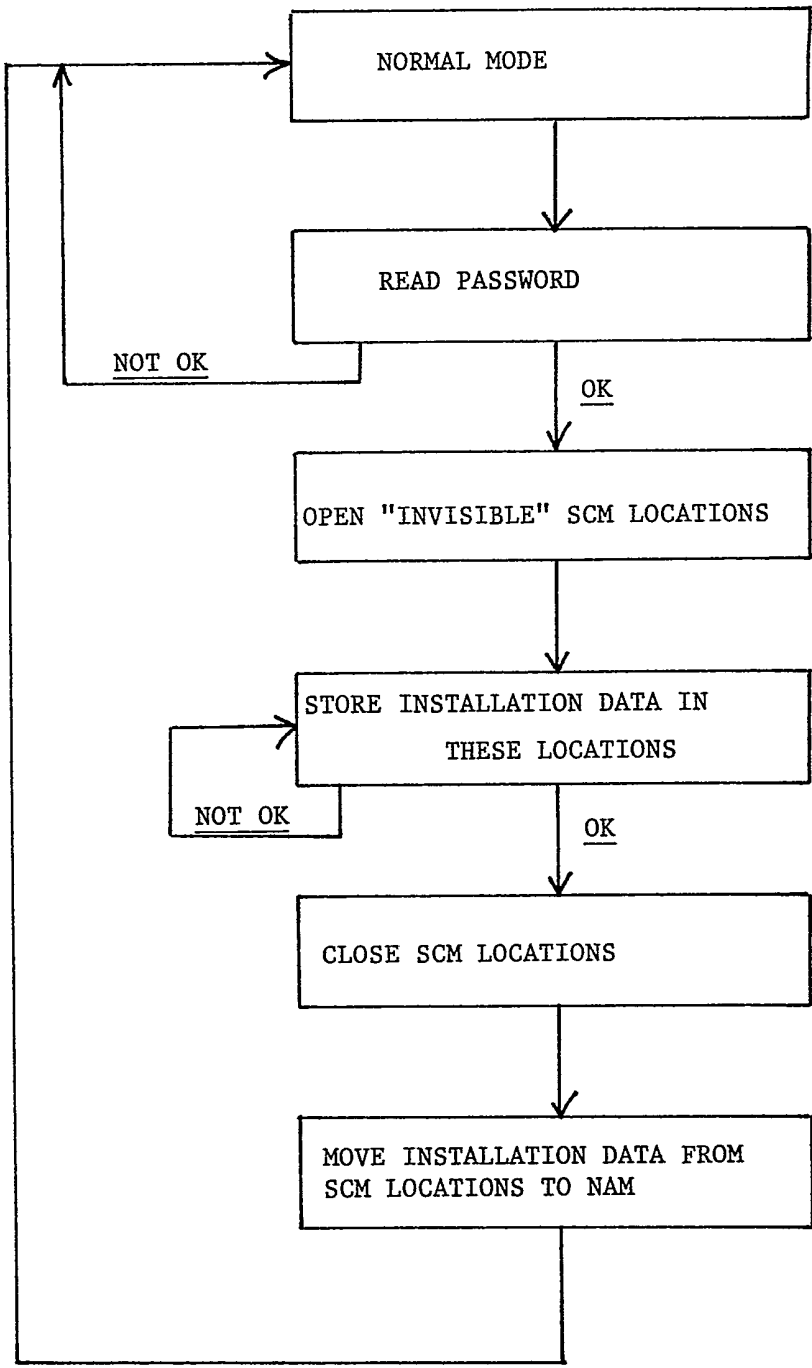
FIG.1

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FIG.1

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                    ┌─────────────────────────┐
              ┌────▶│       NORMAL MODE       │◀────┐
              │     └─────────────────────────┘     │
              │                  │                   │
              │                  ▼                   │
              │     ┌─────────────────────────┐      │
              │     │      READ PASSWORD      │      │
              │     └─────────────────────────┘      │
        NOT OK│              │        │ OK           │
              └──────────────┘        ▼              │
                    ┌─────────────────────────┐      │
                    │ OPEN "INVISIBLE" SCM     │      │
                    │        LOCATIONS         │      │
                    └─────────────────────────┘      │
                                 │                    │
                                 ▼                    │
              ┌─────▶┌─────────────────────────┐      │
              │      │ STORE INSTALLATION DATA  │      │
              │      │      IN THESE LOCATIONS  │      │
              │      └─────────────────────────┘      │
        NOT OK│          │         │ OK               │
              └──────────┘         ▼                  │
                    ┌─────────────────────────┐       │
                    │   CLOSE SCM LOCATIONS   │       │
                    └─────────────────────────┘       │
                                 │                     │
                                 ▼                     │
                    ┌─────────────────────────┐        │
                    │ MOVE INSTALLATION DATA   │        │
                    │ FROM SCM LOCATIONS TO NAM│────────┘
                    └─────────────────────────┘
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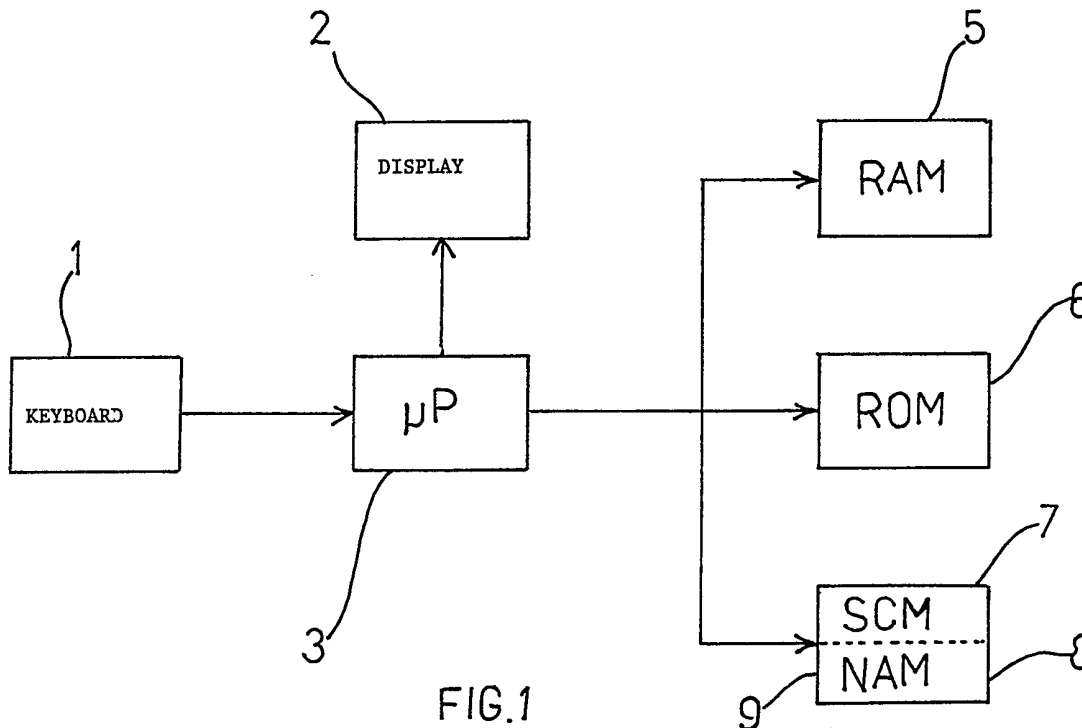
FIG. 2

Programming of installation data in a cellular radio telephone

The present invention relates to the programming of installation data in a cellular radio telephone.

Before a cellular radio telephone is put into use, initialization or installation data has to be programmed into it. This data may include the number of the telephone itself, the traffic zone, the system within which the telephone will be used, the identification code of the salesperson and/or the installer of the data, the date of the programming of the installation data, and other corresponding data which are pre-requisites for the use of the telephone.

Conventionally, the installation data has been installed in a telephone either at the factory or by the salesperson, using programming apparatus, for example a personal computer, programmed for this purpose. The installation data is fed into a non-volatile memory of the telephone using this apparatus. A non-volatile memory is one in which the contents are retained when the power supply is disconnected. This method is expensive, since it requires a separate apparatus, and additionally, a suitable interface must be arranged between the programming apparatus and the telephone.

It could be possible to input the installation, data directly into the non-volatile memory using the telephone's keyboard. However, the software to do this would require a high memory in the telephone, thus increasing the cost of the telephone.

According to the present invention, there is provided a method for programming installation data into a

cellular radio telephone comprising a keyboard, a
memory and logic means operable to store a first set of
data, different from the installation data, and input
via the keyboard,in the memory, the method comprising
the steps of inputting the installation data via the
keyboard; and storing the installation data in the
memory using the logic means. This has the advantage
that the program for the recording of installation data
is very short, and thus it can be easily linked to the
operating memory of the telephone.

The installation data may be transferred from the
memory after storage therein to a second memory of the
telephone upon activation of a second logic means of
the telephone operable to transfer the installation
data to the second memory.

The second logic means may be activated pressing a
sequence of keys on the telephone's keypad, and, so
only a short keystroke code sequence is required for
booting up the program steps, sequences for
transferring data from one memory address to another,
and certain checking sequences.

The first memory may be the memory used for storing
abbreviated dialing codes, so space for data need not
be reserved in the operating memory, since the
installation data is fed in via the rapid dialing
memory. The rapid dialing program in the telephone may
be utilized in the recording of the data.

The invention will now be described by way of example
only, with reference to the accompanying drawings, of
which:

Figure 1 is a schematic block diagram of the features
of a telephone for implementing the invention; and

Figure 2 shows a flow chart of a sequence for inputting installation data in a mobile telephone.

A cellular radio telephone comprises a user interface including a keyboard 1 and a visual display 2 coupled to a microprocessor 3. The microprocessor 3 is coupled to an operating memory, specifically a random access memory (RAM) 5, a read-only memory (ROM) 6, and a non-volatile memory 7, specifically on electronically erasable programmable read-only memory (EEPROM) in which is stored useful telephone numbers and which can be automatically dialed by the telephone upon selection by the user upon the keying in of a keystroke sequence i.e. an abbreviated dialing code, on the keyboard 1. This is commonly referred to as an abbreviated dialing code memory, or short code memory (SCM).

The microprocessor 3 is also coupled to a second non-volatile memory 8, also specifically an EEPROM, into which is stored the installation data, this is often referred to as the number assignment module (NAM).

These two non-volatile memories 7,8 can be separate memories, or physically integrated as a single non-volatile memory 9 as shown in Figure 1.

By means of the software recorded in the ROM 6 the microprocessor 3 is able to read and execute in a conventional manner the dialing commands contained in the SCM 7. A program for processing the installation data is also recorded in the ROM 6 of the microprocessor.

According to the present invention, the installation data of a mobile telephone is recorded at predetermined

memory locations of the SCM 7 in the same way as a user
would store telephone numbers for abbreviate dialing
i.e. using the telephone. In this way, coded data
corresponding to the installation data is recorded in
telephone number locations in a table in the memory,
which are preferably the predetermined memory
locations.

After being stored in the SCM 7, the installation data
is booted up to the NAM 8 by the installer from the
keyboard 1 using a predetermined keystroke sequence so
that the installation data is transferred from the
memory locations in the SCM 7 to the NAM 8.

The keystroke or activation sequence, and the
installation data are provided over the keyboard 1.

The loading of the installation data into the NAM 8 is
achieved in the manner illustrated in Figure 2. Upon
receipt and acceptance of a password, the installation
data is stored temporarily in opened SCM locations.
These SCM locations are invisible to the normal user.
These SCM locations are then closed, and the
installation data subsequently transferred to the NAM 8
after the installer has keyed in a pre-determined
keystroke sequence.

For security, the keystroke sequence is made available
only to installers and salespersons, but not to the
users of the mobile telephones.

Usually, the SCM locations used for storing the
installation data are not the "normal" locations used
for storing abbreviated dialing numbers. For example,
a telephone may have 99 "normal" locations (1-99), and
so the locations for storing the installation data
could be 100-110. However, it would be possible for

this installer to select, after the password has been entered certain "normal" locations e.g. 1-10 for storing the installation data. It would also be possible to use these "normal" SCM locations for entering the installation data which is then transferred to the NAM after the password is given. This does however have the disadvantage that the original contents of the "normal" locations used would be destroyed when the installation data is stored therein.

Preferably, therefore for protection, certain predetermined SCM locations are provided for the installation data. These are released, only when the program for the processing of installation data is booted up and the locations are then visible on the display 2 of when installation data is being loaded. Thereafter the programming continues as described above. At the end of the programming, the use of these memory locations used for the installation data is prevented before the telephone reverts to the normal operating mode.

In order to prevent the inadvertent programming of installation data or misuse, a base for a protection element may be arranged on the telephone's printed circuit board upon which are mounted elements of the telephone's electronic circuitry. This protection element may be, for example, a suitable resistor element and/or an active element which, when installed in the base, allows the installation data to be loaded.

Thus the salesperson or installer will install the protection element in the mobile telephone for the duration of the programming. Before recording the data in the non-volatile memory, a check is made to see if the protection element has been correctly installed in

the base. If it is not there, installation data will not be recorded. Alternatively, the recording of installation data could be prevented when the protection element is installed in the base.

The recording program and the rapid dialing program are preferably placed in the non-volatile memory, in which case a disturbance possibly occurring in electricity supply will not affect the programs.

In addition, if the rapid dialing memory itself is located in the non-volatile memory, the sequence may be further simplified so that the installation data need not be transferred from the SCM 7 to the NAM 3 - they are left programmed at memory addresses, invisible to the user in the manner described above. When the telephone is switched on, the installation data are in this case read directly from the addresses in the SCM, or they are first transferred to the operating memory 5.

As before, the password is keyed in to open the invisible SCM locations and the installation data keyed in. No further keystroke is required, but the software may only read the installation data when the telephone is switched on or when NAM is changed from the menu.

It will be evident to a person skilled in the art from the foregoing description, that various modifications are possible, within the scope of the present invention.

Claims

1.   A method for programming installation data
into a cellular radio telephone comprising a keyboard,
a memory and logic means operable to store a first set
of data, different from the installation data, and
input via the keyboard, in the memory, the method
comprising the steps of:

inputting the installation data via the keyboard; and

storing the installation data in the memory using the
logic means.

2.   A method according to claim 1 wherein the
installation data is stored at pre-determined locations
in the memory.

3.   A method according to claim 2 wherein the
installation data is input and stored at the
pre-determined locations after receipt of a password
keyed in via the keypad.

4.   A method according to claim 3 wherein the
pre-determined locations are other than those used for
storing the different first set of data.

5.   A method according to claim 3 wherein the
pre-determined locations are selected after receipt of
the password.

6.   A method according to any of claims 2 to 5
wherein the installation data is transferred from the
memory, after storage therein, to a second memory of
the telephone upon activation of a second logic means
of the telephone operable to transfer the installation

data to the second memory.

7.   A method according to claim 6 wherein the
second logic means is activated by pressing a sequence
of keys on the keypad.

8.   A method according to claim 6 or claim 7
wherein storage of further data in the pre-determined
locations is prevented after transfer of the
installation data from the memory.

9.   A method according to claim 1 wherein
installation data is stored at locations in the memory
available to store the different first set of data.

Examiner's report to the Comptroller under Section 17 (The Search Report)

9211296.0

Relevant Technical fields	**Search Examiner**
(i) UK Cl (Edition K) H4K (KFD, KYR, KYX); H4L (LECX, LDSX)	
(ii) Int Cl (Edition 5) H04Q 7/04	G N CHAPMAN

Databases (see over)

(i) UK Patent Office

(ii)   ONLINE DATABASES: WPI

Date of Search

28 JULY 1992

Documents considered relevant following a search in respect of claims

1 TO 9

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
A,P	GB 2248364 A (TECHNOPHONE) - note Figure 1	
A	GB 2229340 A (TECHNOPHONE) - note page 4 line 31 to page 5 line 17	
A	EP 0378450 A2 (TECHNOPHONE) - note Column 5 lines 26 to 43	
A	EP 0310876 A2 (MOTOROLA) - note Column 5 lines 17 to 41	

SF2(p)

SW - doc99\fil000315

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

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E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

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