

Programmes After Market Services NHE-8/9 Series Transceivers

FPS-4 Flash Programmer

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General

Together with a telephone specific adapter, the FPS-4 Prommer permits updating of the basic software, i.e. programming the flash memory on the NHE-8/9 cellular telephone. The Flash Prommer is operated by means of separate DOS software installed on the PC hard disk before use. All interconnection cables necessary for connecting the unit to the PC are contained in the Prommer sales package.

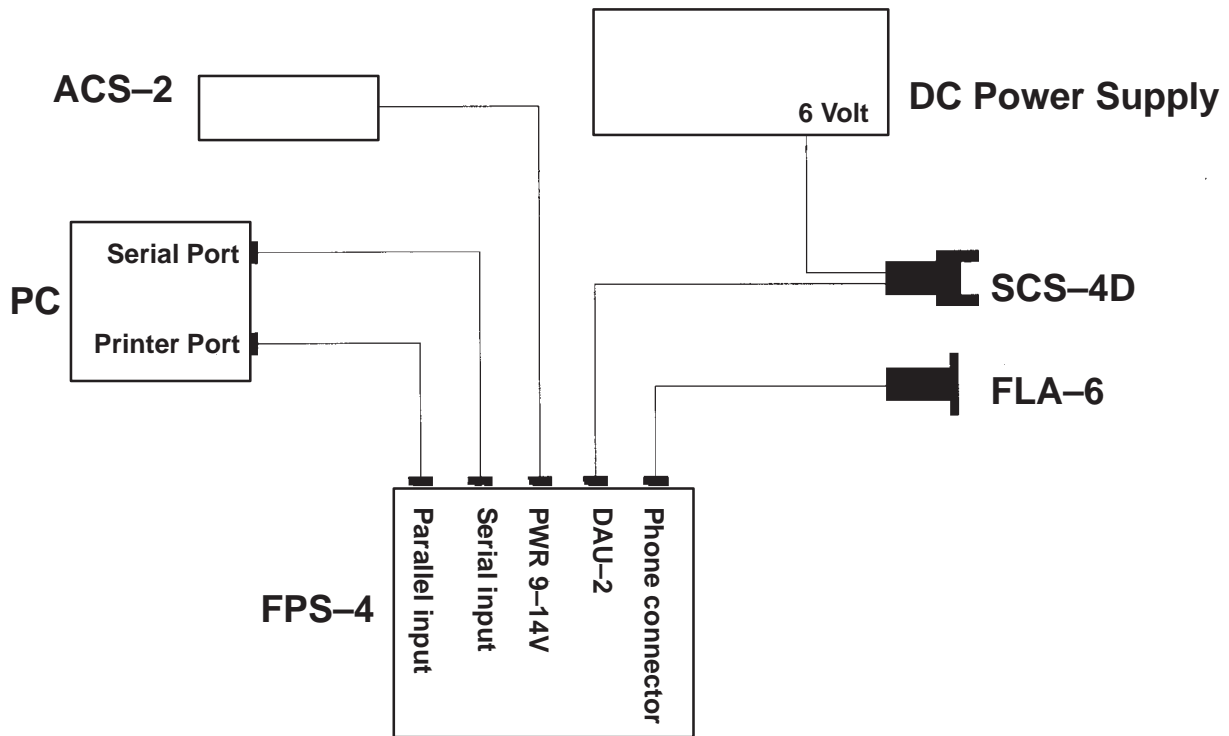
Notes :

- *FPS-4 CANNOT BE USED to program NHE-1/3/4 phone; neither can an older, FPS-3 Prommer used to program NHE-8/9 phone.*
- *Prommer program FPS4.EXE does not work under Windows.*
- *NEVER DISCONNECT FLA-6 OR SCS-4D FROM PHONE DURING PROGRAMMING!*

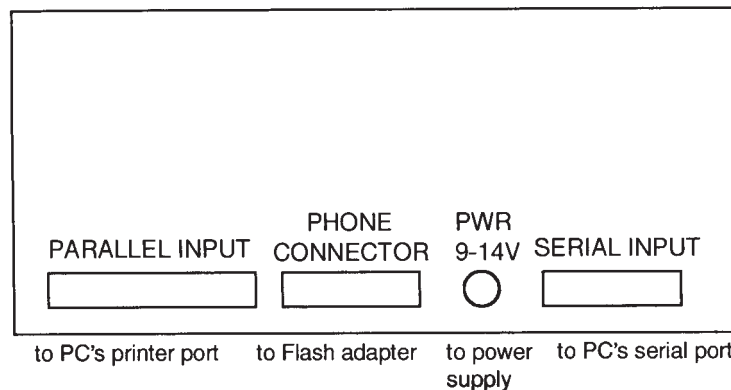
Equipment Required

- IBM compatible PC, processor 80286 or faster, approx. 1 Mb free hard disk space, at least 400 kbytes RAM, a free serial port (COM1 – COM4), a free parallel port (LPT1 – LPT3), operating system MS-DOS 5.00 or later (3.X sufficient on manual installation).
- FPS-4 Flash Prommer with cabling.
- DC power supply 9–14 V for FPS-4; e.g. ACS-2.
- FLA-6 Flash adapter for NHE-8 and NHE-9 phones.
- SCS-4D Power cable for NHE-8 and NHE-9 phones.
- Regulated 6 V power supply for SCS-4D.
- FPS-4 program.
- MCU diskette for NHE-8, MCU diskette for NHE-9.

Connections



Connecting FPS-4



Notes:

- As against earlier practice, a parallel cable can be connected also to printer port LPT2 or LPT3.
- It is also possible to hold the PKD-1 protection key (“dongle”) at the printer port at the same time.
- PC serial port can be selected freely between COM1 and COM4. With older serial port drivers (8250 UART), there may be problems in data transmission. The recommendation is to use 16450/16550 UARTs in that case.
- **BE EXTREMELY CAREFUL WHEN CONNECTING FLA-6 TO PHONE. FIRST REMOVE THE SIM CARD, THEN CAREFULLY FIT FLA-6 IN PLACE. NOW MAKE SURE THAT THE DC POWER SUPPLY IS TURNED OFF AND THEN CONNECT THE CABLE SCS-4D TO THE PHONE.**
- 6 Vdc supply for SCS-4D flash battery must be comparatively well regulated voltage.

Installing Software

The FPS-4 program diskette contains a setup utility program. Insert the diskette into drive A, change current disk drive to A: and enter command "SETUP C:\FPS4". The program starts and asks whether you want to create a subdirectory on the hard disk, copies the files and asks you to specify the equipment you are using.

```

=====
FPS-4 Setup Utility Batch Program Ver 1.28 (c) NMP 1996
=====
The directory 'C:\fps4' does not exist!
Do you want to create it[Y,N,C]? Y

-----
Copying FPS-4 prommer files to directory C:\fps4...
-----
Please Enter the Prommer Serial Port Number
COM1, COM2, COM3 or COM4 [1,2,3,4]? 2

-----
Please Enter the Prommer Parallel Port Number
LPT1, LPT2 or LPT3 [1,2,3]? 1

-----
Please Enter the Prommer Flash Adapter Type
1) FLA-1 or FLA-3 (Automatic Vpp On/Off Switch)
2) FLA-2          (Manual Vpp On/Off Switch)
[1,2]? 2

-----
Setup utility updates all FPS4 prommer codes. You can execute FPS4 memory
cleaning process before code download.
Note! All MCU codes in FPS4 prommer are removed too.
Do you want to execute the FPS4 memory cleaning process[Y,N,C]? N

```

Note : You do not have to clear the prommer memory if it is not corrupted. The default value for clearing is 'N' and this will be selected within 5 seconds.

The prommer setup utility starts and begins to download prommer code from PC hard disk into prommer memory

```

Nokia FPS-4 Flash Prommer User Interface Ver 1.12
(c) Nokia Mobile Phones 1996

FPS-4 Prommer Software Download
-----
Updating FPGA Code...
Transferring File via MBUS Cable
-----
0 . 100

Alt-F1 - Help

> Reading Setup Data from File 'c:\fps4\SETUP.FPS'... <DONE>
> Counting code check sum... <DONE>
> Downloading file 'c:\fps4\FPGA0100.MCS'...

```

The program downloads four different types of code (FPGA code, Application code, Secondary boot code and Flash algorithm code) on the prommer, after which you will receive notice of a successful update:

```
-----  
FPS-4 Prommer Software Updated Successfully!  
-----  
Note! You can change any hw setup settings from prommer setup menu.  
      If you need to change serial/parallel port numbers, start  
      prommer with '-s' parameter (FPS4 -s) or run this setup again.  
-----  
  
A:\>
```

In case you want to change connections on the PC, it is not necessary to re-run the setup program: just start the program with command `FPS4 -S` to get the setup menu and change settings as necessary.

Now it will only be necessary to copy the phone model's specific MCU software from the diskette to the hard disk. Change the MCU diskette into the drive and enter command `"XCOPY A:\. C:\FPS4"`.

The program is now ready for use.

Using the Prommer

To download the Prommer software, go to subdirectory FPS4 (CD C:\FPS4) and enter command FPS4. You will see the main menu:

```

Nokia FPS-4 Flash Prommer User Interface Ver 1.12
(c) Nokia Mobile Phones 1996

Main Menu
F1 Help on Help
F2 Program Phone by Type
F3 Program Phone by File Name
F4 Advanced Options Menu...
F5 Setup (PC HW & Prommer SW)...
ESC Exit to DOS

Alt+key to Quick Flash
*****
* No Entrys on List *
*****

> Reading Setup Data from File 'C:\FPS4\SETUP.FPS'... <DONE>
> Application code check... <DONE>
> FPS4 MCUSW list request
> New Flash Alias List File, Updating to FPS4... <DONE>

```

As against the earlier Flash Prommer, the FPS-4 preserves an MCU program once loaded into the flash memory over power outages. For this reason, the prommer program examines during power-up whether there is already an MCU program loaded on the Prommer. During the first power-up, this is naturally not the case. Therefore, just load the MCU software for the NHE-8 phone from the PC hard disk to the Prommer. **BE CAREFUL** (see *Installing Software* section), connect the phone to the FLA-6 Flash Adapter and the SCS-4D power cable and press F3:

```

Nokia FPS-4 Flash Prommer User Interface Ver 1.12
(c) Nokia Mobile Phones 1996

Path: C:\FPS4\*. * k Flash

F1
F2 Program Phone by Type
F3 Program Phone by File Name
F4 Advanced Options Menu...
F5 Setup (PC HW & Prommer SW)...
ESC Exit to DOS

Alt-F1 - Help

> Reading Setup Data from File 'C:\FPS4\SETUP.FPS'... <DONE>
> Application code check... <DONE>
> FPS4 MCUSW list request
> New Flash Alias List File, Updating to FPS4... <DONE>

```

The program suggests a path via which the MCU software is to be found. Accept the suggestion by pressing ENTER. You will see a list of files.

Point the cursor to the MCU program file you want to flash the phone with, e.g. the "NHE8_06.00S" and select it by pressing ENTER.

The program starts to move the MCU software to the Prommer:

```

Nokia FPS-4 Flash Prommer User Interface Ver 1.12
(c) Nokia Mobile Phones 1996

Main Menu
F1 Help on Help
F2 Program Phone by Type
F3 Program Phone by File Name
F4 Advanced Options Menu...
F5 Setup (PC HW & Prommer SW)...
ESC Exit to D Transferring File via Parallel Cable
0 . 100

Alt+key to Quick Flash
*****
* No Entrys on List *
*****

Alt-F1 - Help

> FPS4 MCUSW list request
> Wait while moving MCUSW file to prommer SRAM...
> Counting file check sum... <DONE>
> Downloading file 'nhe8_06.00s'...
```

Once the file transfer is complete, you will see, on the right edge of the screen, a note on the version of the program just downloaded. After downloading, the programming procedure starts and due to the nature of the FLA-6, this procedure needs some action from the operator of the FPS4 program.

First the program asks the operator to "Switch Target Power OFF and Press Any Key". Normally target power is already off, then just press any key.

```

Nokia FPS-4 Flash Prommer User Interface Ver 1.12
(c) Nokia Mobile Phones 1996

Main Menu
F1 Help on Help
F2 Program Phone by Type
F3 Program Phone by File Name
F4 Advanced Options Menu...
F5 Setup (PC HW & Prommer SW)...
ESC Exit to D

Switch Target Power OFF and Press Any Key...

Alt+key to Quick Flash
A nhe8_06 00s 07.03.1997 09:36

TAB - Change List Display Mode
Phone Configuration
Wait...

Alt-F1 - Help

> Counting file check sum... <DONE>
> Downloading file 'nhe8_06.00s'... <DONE> <DONE>
> Checking MCU code in pPrommer SRAM... <DONE>
> FPS4 MCUSW list request
```

When this has been checked and done, the program asks the operator to "Switch Target Power ON and Press Any Key". Please note that after turning power on, the time before pressing any key should be less than 6 seconds, otherwise the programming will fail.

```

Nokia FPS-4 Flash Prommer User Interface Ver 1.12
(c) Nokia Mobile Phones 1996

Main Menu
F1 Help on Help
F2 Program Phone by Type
F3 Program Phone by File Name
F4 Advanced Options Menu...
F5 Setup (PC HW & Prommer SW)...
ESC Exit to

Alt+key to Quick Flash
A nhe8_06 00s 07.03.1997 09:36

Switch Target Power ON Again and Press Any Key
after the Prommer 'Vpp Target' is Light Up...

TAB - Change List Display Mode

Phone Configuration

Wait...

Alt-F1 - Help

> Counting file check sum... <DONE>
> Downloading file 'nhe8_06.00s'... <DONE> <DONE>
> Checking MCU code in prommer SRAM... <DONE>
> FPS4 MCUSW list request

```

Now the prommer will start programming. First it erases the flash in the phone and then programs the new MCU software into it. All this will typically take less than one minute depending of the flash rom type.

```

Nokia FPS-4 Flash Prommer User Interface Ver 1.12
(c) Nokia Mobile Phones 1996

Main Menu
F1 Help on Help
F2 Program Phone by Type
F3 Program Phone by File Name
F4 Advanced Options Menu...
F5 Setup (PC HW & Prommer SW)...
ESC Exit to DOS

Alt+key to Quick Flash
A nhe8_06 00s 07.03.1997 09:36

Programming...

TAB - Change List Display Mode

Phone Configuration
V 04.80 29-01-97 NHE-8 (c) NMP.
CSUM B417 ASIC GSM Version 3
Flash Intel 28F008SA-L, size 8M»

Alt-F1 - Help

> Check connections to phone and that MCU power is on!
> FPS4 MCUSW list request
> MCU Configuration OK
> Prommer Erasing Target Flash (may take 7 minutes max)...

```

After completion of programming, the operator will be asked to "Switch Target Power OFF and Press Any Key".

```

Nokia FPS-4 Flash Prommer User Interface Ver 1.12
(c) Nokia Mobile Phones 1996

Main Menu
F1 Help on Help
F2 Program Phone by Type
F3 Program Phone by File Name
F4 Advanced Options Menu...
F5 Setup (PC HW & Prommer SW)...
ESC Exit to D

Alt+key to Quick Flash
A nhe8_06 00s 07.03.1997 09:36

Switch Target Power OFF and Press Any Key...

TAB - Change List Display Mode

Phone Configuration
V 06.00 06-03-97 NHE-8 (c) NMP.
CSUM 121E ASIC GSM Version 3
Flash Intel 28F008SA-L, size 8M»

> FPS4 MCUSW list request
> MCU Configuration OK
> Prommer Erasing Target Flash (may take 7 minutes max)... <DONE>
> Prommer Programming Target Flash... <DONE>
    
```

After completion of programming, you will see a prompt in lower left corner that "You Can Disconnect the Phone Now":

```

Nokia FPS-4 Flash Prommer User Interface Ver 1.12
(c) Nokia Mobile Phones 1996

Main Menu
F1 Help on Help
F2 Program Phone by Type
F3 Program Phone by File Name
F4 Advanced Options Menu...
F5 Setup (PC HW & Prommer SW)...
ESC Exit to DOS

Alt+key to Quick Flash
A nhe8_06 00s 07.03.1997 09:36

TAB - Change List Display Mode

Phone Configuration
V 06.00 06-03-97 NHE-8 (c) NMP.
CSUM 121E ASIC GSM Version 3
Flash Intel 28F008SA-L, size 8M»

> MCU Configuration OK
> Prommer Erasing Target Flash (may take 7 minutes max)... <DONE>
> Prommer Programming Target Flash... <DONE>
> You Can Disconnect the Phone Now!
    
```

At the lower right corner, you will see the software version designation read from the phone.

In case another phone should be flashed with the same software, the above programming sequence can be started again by pressing <ALT>+<A>.

There is one significant difference between the FPS-4 Prommer and earlier devices: the prommer memory can contain more than one software version. For example in the future, MCU programs will be for the NHE-8, NHE-9 phones and also NHE-6. In theory, the FPS-4 can hold up to 50 different program versions although such amounts would require additional memory capacity on the prommer. The basic prommer has 1 Mbyte of fast SRAM and 3 Mbytes of flash memory. The SRAM will lose its contents whenever power for the prommer is disconnected, whereas the flash memory will hold its contents until separately deleted.

Note, the very small power consumption of the FPS-4 makes it possible to supply sufficient power via the cables connected to the PC if the latter is kept powered up.

Whenever a new program is loaded on the Prommer, it will invariably be fed into SRAM. The transfer into the flash memory is done manually from the "Advanced Options" (see above) menu. Manual transfer is recommendable also because there is only 1 Mbyte of SRAM: Loading an MCU program of more than 4 Mbits (= 0.5Mbyte) will in practice remove all MCU programs from the Prommer SRAM.

You can naturally download an MCU program into the Prommer without programming it to the phone. To do this, select F4 from the main menu to get the sub-menu "Advanced Options Menu":

```

Nokia FPS-4 Flash Prommer User Interface Ver 1.12
(c) Nokia Mobile Phones 1996

Main Menu
-----
Advanced Options Menu
F1 Read Phone SW & HW ID
F2 Download MCUSW to Prommer Box
F3 Program Phone with Code in Box
F4 Move MCUSW Prommer SRAM->Flash
F5 Delete MCUSW from Prommer
ESC Return

Alt+key to Quick Flash
A.nhe8_06 00s 07.03.1997 09:36

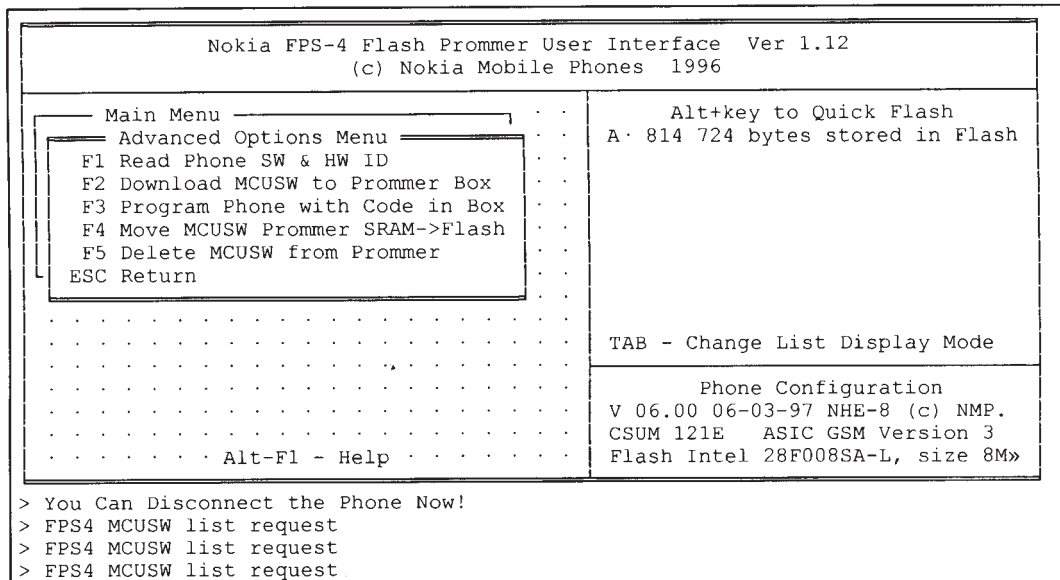
TAB - Change List Display Mode

Phone Configuration
V 06.00 06-03-97 NHE-8 (c) NMP.
CSUM 121E ASIC GSM Version 3
Flash Intel 28F008SA-L, size 8M>

> MCU Configuration OK
> Prommer Erasing Target Flash (may take 7 minutes max)... <DONE>
> Prommer Programming Target Flash... <DONE>
> You Can Disconnect the Phone Now!
    
```

- F2 By selecting F2, you can download the MCU software into the Prommer without programming the phone at the same time. The file is selected as detailed above. Note that the software is downloaded into SRAM, so it will be lost when power for the Prommer is disconnected.
- F5 With this selection, you can remove the selected MCU program from the Prommer memory. This will be necessary e.g. when installing new-version software due to the limited memory capacity available. Note that this function is also usable for removing the MCU program from the SRAM as well as out of the flash memory.
- F4 This selection is used to transport MCU software downloaded into SRAM into the flash memory of the Prommer:

If necessary, you can make a check to ensure that the program now really resides in the flash memory: Press Tab three times; the above text should appear in the upper right corner of the screen. The program in the SRAM is naturally given away by the text "... stored in SRAM". (The dot after 'A' means the flash memory as well.)



An MCU program once downloaded into the flash memory cannot be brought back into the SRAM. The software first has to be manually deleted from the flash memory and loaded normally into the SRAM.

User Errors

Problems in the connections between the phone and the PC are indicated by error messages. (see notes in *Connections* section).

If the Prommer is unable to establish contact with the phone, the following message will appear on the screen:

```

Nokia FPS-4 Flash Prommer User Interface Ver 1.12
(c) Nokia Mobile Phones 1996

Main Menu
F1 Help on Help
F2 Program Phone by Type
F3 Program Phone by File Name
F4 Advanced Options Menu...
F5 Setup (PC HW & Prommer SW)...
ESC Exit to DOS

Alt+key to Quick Flash
A.nhe8_06 00s 07.03.1997 09:36

MCU boot timeout.
Check connections and MCU power.
Press any key... List Display Mode

Phone Configuration
Wait...

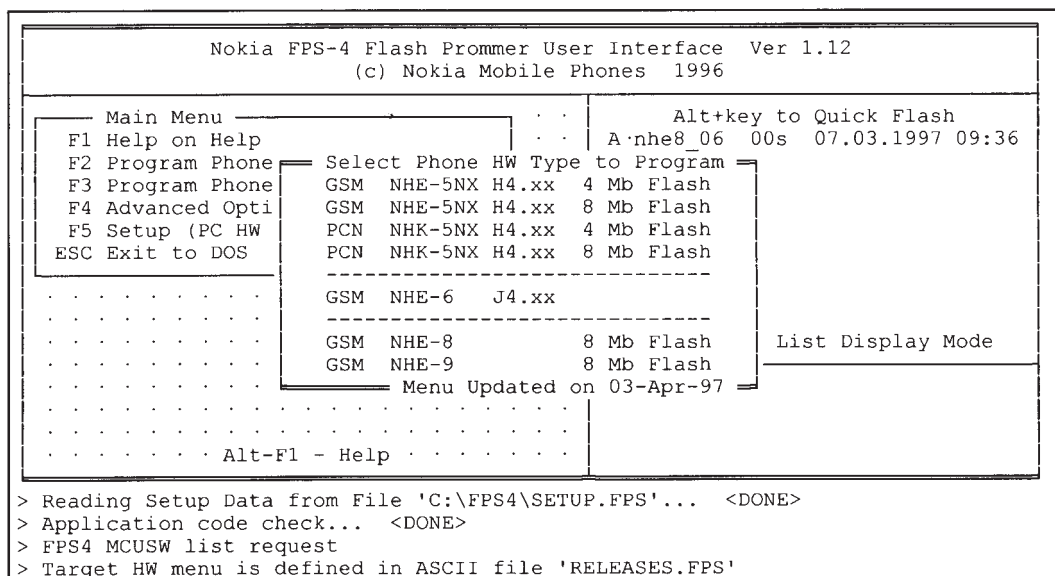
> Application code check... <DONE>
> FPS4 MCUSW list request
> FPS4 Flash Box is Buzy (Timeout = 10 s).

```

If this happens, you have to recheck the installation, cabling and power supply of the FLA-6 and SCS-4D. It is also advisable to check the FLA-6 contact pins for condition and insertion. This error message can reappear sometimes. This problem may be solved by removing the FLA-6 and then replace it and try again.

Programming in case of Memory Failure or Loss

Phones of the type NHE-8/9 (and NHE-6) do not provide a “minimum mode” option similar to earlier types; this was used to reprogram the phone after corruption of the flash memory or loss of its contents. As for the FPS-4, the unit first reads from the flash memory the Flash ID bytes, which indicate, among others, the size and type of the flash memory. On a failed or an empty flash memory, these bytes may contain anything, so it is not certain that the Prommer will be successfully programmed by way of the standard procedure. Therefore, the program has been enhanced by the possibility to download the MCU software into the flash memory without reading the Flash-ID bytes at all. Such forced programming is accomplished by selecting the option “F2, Program Phone by Type” from the main menu.



Just select the type of the phone from the list which appears. When programming the NHE-8, GSM phone, select the option “GSM NHE-8 8 Mb Flash” from the list.

NOTE! To get the “GSM NHE-8 8 Mb Flash” and “GSM NHE-9 8 Mb Flash” options up in the “Select Phone HW Type to Program “ menu, the following two lines;

GSM NHE-8 8 Mb Flash; DCT2_FLASH_ID= A5FFCB8C;
nhe8_???.??S

GSM NHE-9 8 Mb
Flash;DCT2_FLASH_ID=A5FFCB8C;nhe9a_???.??F

MUST be added to the RELEASES.FPS file in the FPS4 directory.

If several MCU programs suitable for this phone have been copied into the FPS4 directory, the software asks you to select the most suitable one.

```

Nokia FPS-4 Flash Prommer User Interface Ver 1.12
(c) Nokia Mobile Phones 1996

C:\FPS4\NHE8_???.??S
.. \
F NHE8_04.80S      817540 29.01.97 14:20 ...A
F NHE8_06.00S      814724 07.03.97 09:36 ...A
F [-A-]
F [-B-]
F [-C-]
ES [-D-]
  [-E-]
  [-F-]
  [-G-]
  [-H-]
  [-I-]
  [-J-]
  [-K-]
  [-L-]
  . . .

to Quick Flash
0s 07.03.1997 09:36

List Display Mode

> Reading Setup Data from File 'C:\FPS4\SETUP.FPS'... <DONE>
> Application code check... <DONE>
> FPS4 MCUSW list request
> Target HW menu is defined in ASCII file 'RELEASES.FPS'

```

Point the cursor to the software version required (i.e the most recent one) and press ENTER. Programming begins and proceeds normally. Finally the program returns to the main menu.

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