

How to turn your PRM8020(10703) into a Ham Radio for 2m.

This manual gives you an idea how to reprogram the PRM8020 type 9525 001 10703 into a Ham Radio for 2m without going into all the possibilities of this fine radio. With the settings in this manual you can program the radio and use it as a standard 2-way radio on a simplex frequency or via a repeater that uses a CTCSS and 1750Hz tone to activate. The software I used for the HW an SW configuration was the FPP PRM80 V4.0



FPP PRM80 V4.00
4313 327 80273

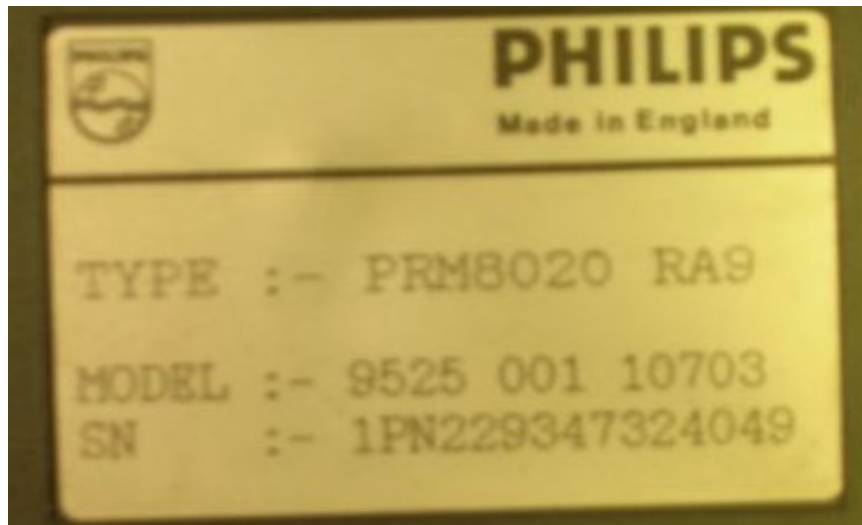
Please keep in mind that I'm not responsible for any damages to your radio if something goes wrong. I programmed 100 PRM8020 type 10703 without any problems but you never know.

Before reprogramming please make a back-up of the original settings, see further down this manual point 4.1.

Keeping all this in mind and enjoy our hobby and your new reprogrammed PRM8020.

1. How to determine the type of PRM8020 you have.

Turn your radio upside down en check the label on the radio.



The 10703 series are programmed in de range of 146MHz to 174MHz so it should be fairly easy to program a couple of MHz down without having to change a lot on the main board. The radio's I used reprogrammed were used in the 148MHz., so the RX / TX settings are acceptable for our Ham Frequencies 144 to 146MHz.

The PRM8020 is a radio with 64 channels to program so quite useful for our hobby.

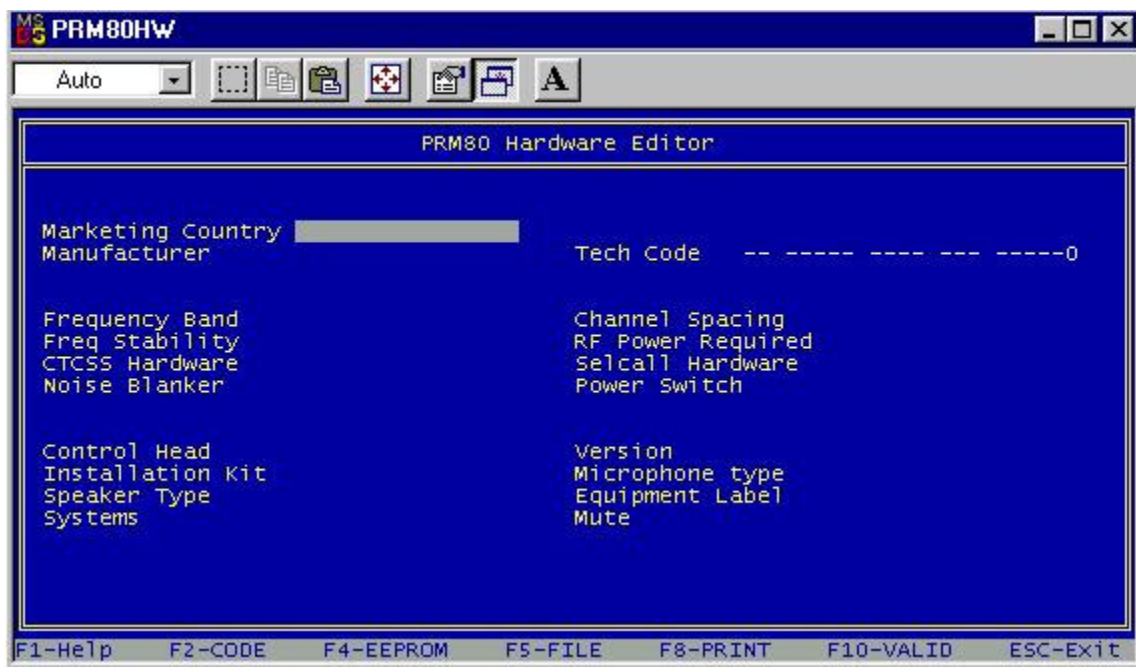
2. How to setup the new hardware configuration for the PRM8020

Start the Hardware program by clicking on the following icon if you created an



icon for the PRM80HW.exe otherwise click on the executable file in the software folder from your FPP software.

The startup screen looks something like this

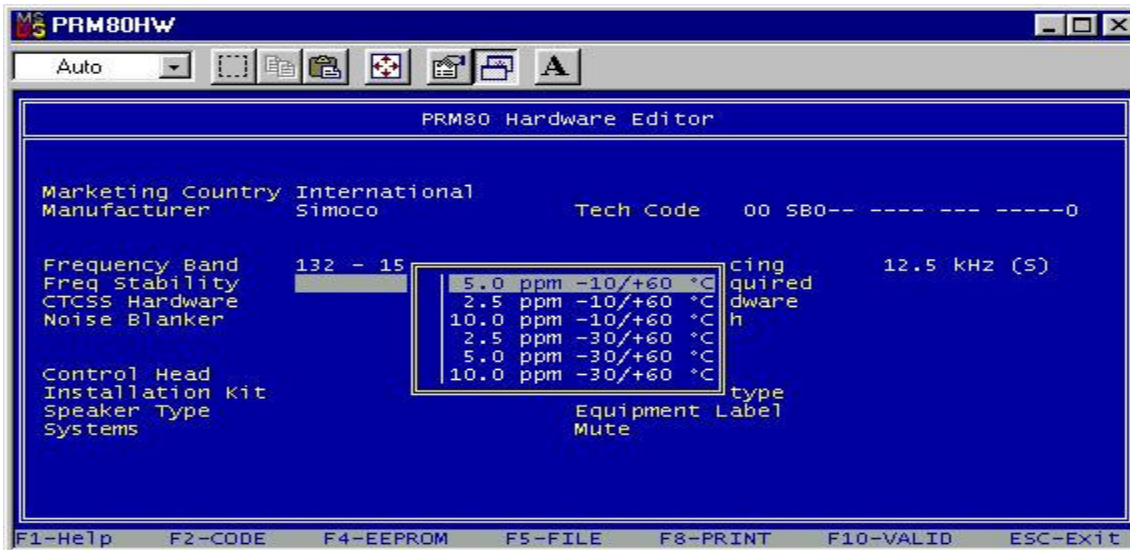


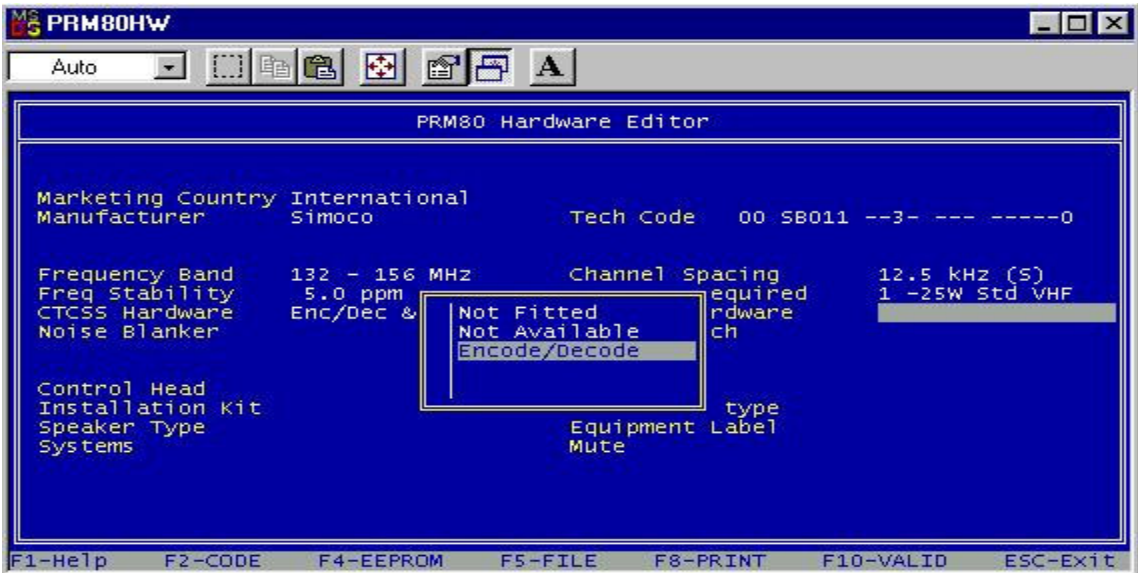
Fill in all the fields one by one, you can find all the options for each field by tapping the return button on your keyboard, and navigation between the different field by using de up and down & left & right arrows.

The next screenshots give you an idea of all the possible options for each field and the ones I used to program the PRM8020

If you want more information about the field you're about to modify just click the **F1 Help** button and you will get more info.



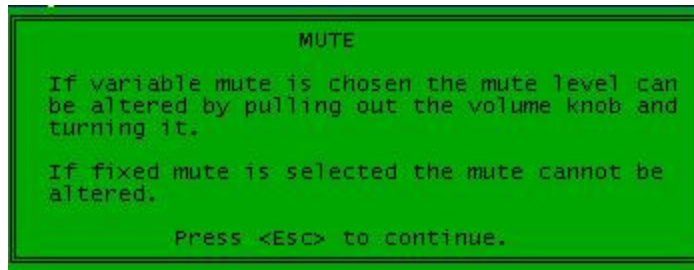






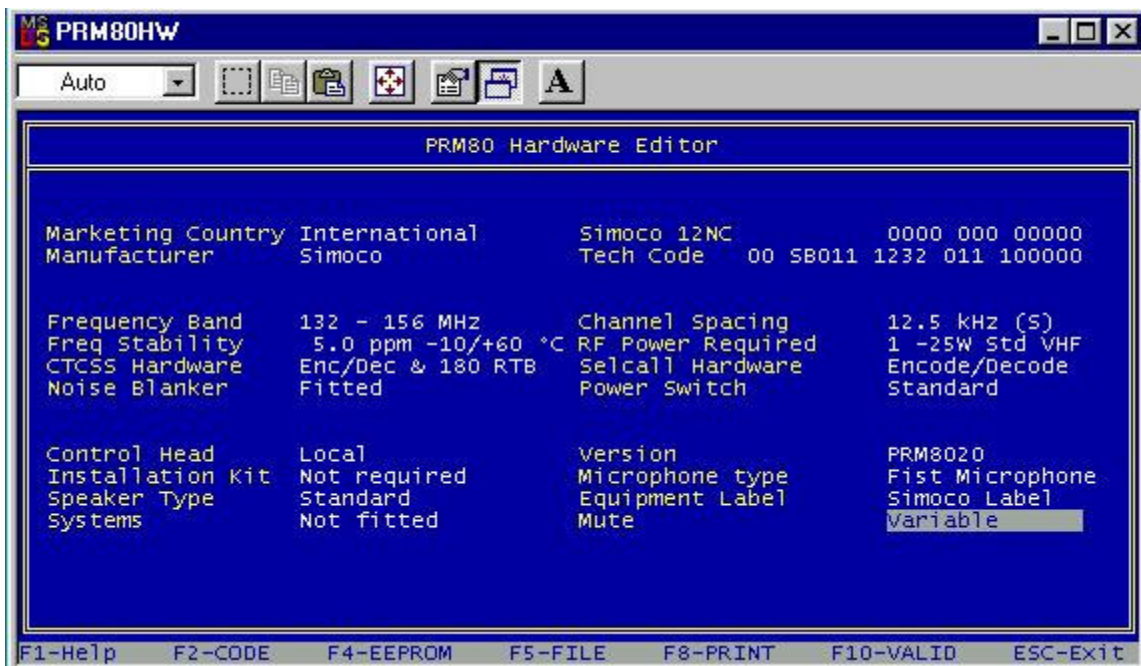






For this last option it is very important that you chose variable mute. This way you can select the squelch level as sensitive as you wish. If chosen fixed the standard squelch level is very high and you could miss important QSO's.

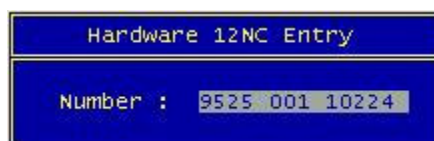
If every field is filled it should look like this:



If you try to write this info to your PRM8020 you'll get this message:



As you can see there is no valid Simoco 12NC number. You can alter this by clicking on the **F2 (code)** button and you'll get the possibility to fill in a new NC12 code.



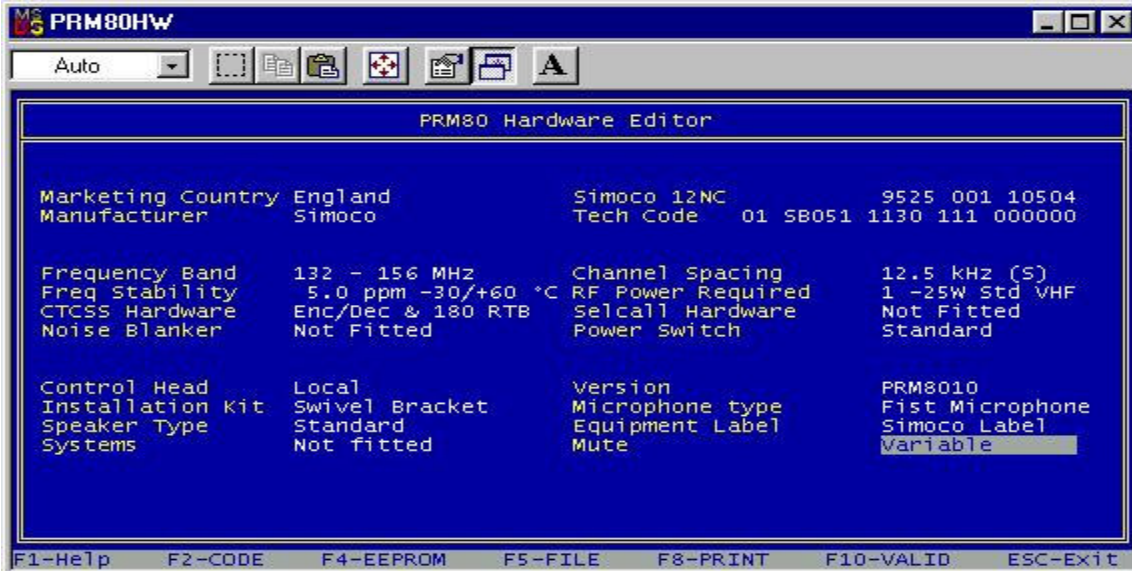
The NC12 code that works fine for me are:

9525 001 10224 (my preference)

9525 001 10604

9525 001 10504

By using the 9525 001 10504 you cannot use the selcall. Selcall Hardware is not fitted as you can see in the screenshot below



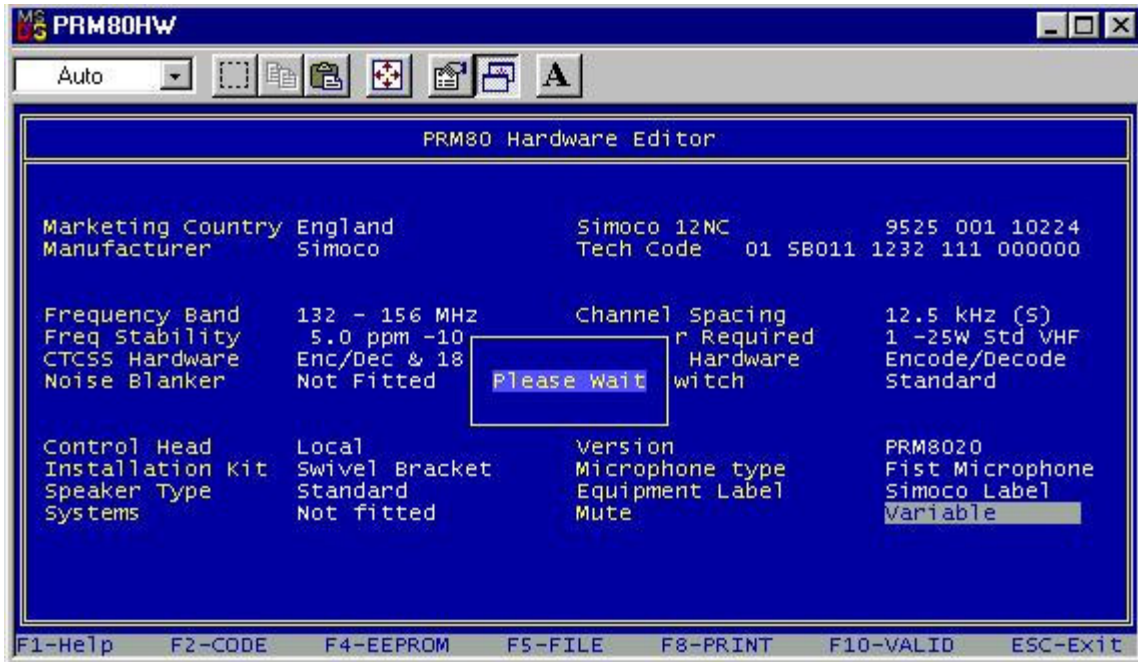
Code 9525 001 10604 is identical to the 9525 001 10224 as far as hardware is concerned



3. How to Wipe/Reprogram the new hardware configuration into the PRM8020

Once your hardware setup is ok, you can wipe the existing settings by reprogramming your radio with the new hardware settings.

This you can do by clicking on the **F4 (EEPROM)** programming button. During the programming you'll get a little pop up screen "please wait"

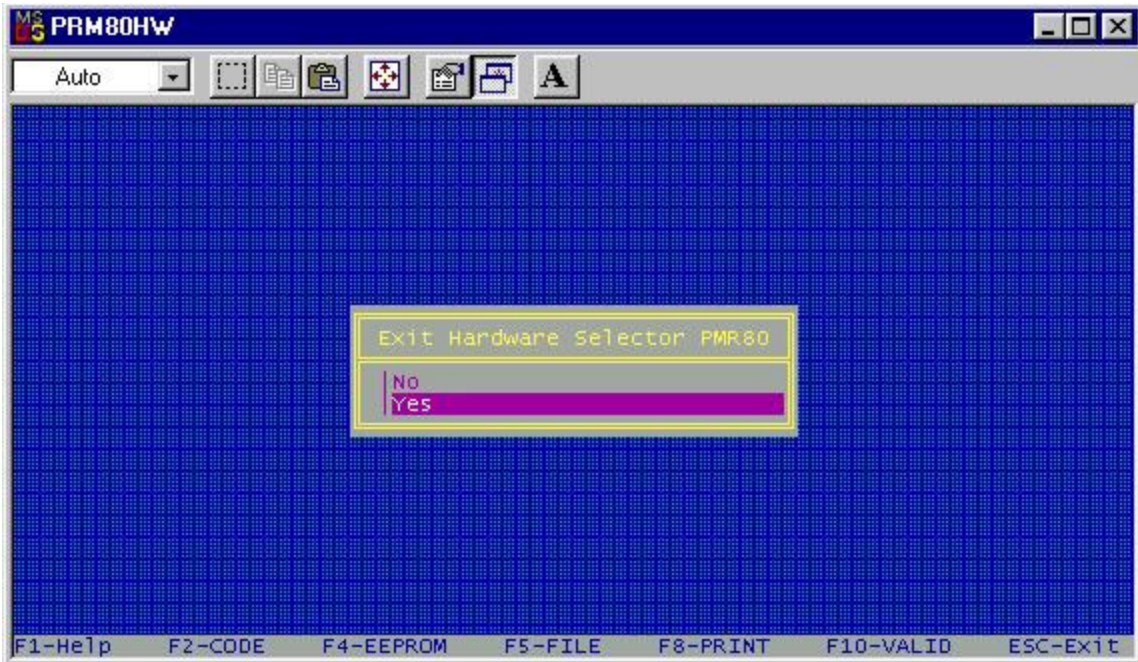


If the little pop up screen has disappeared, your radio hardware has been programmed successfully and you'll get this screen again:



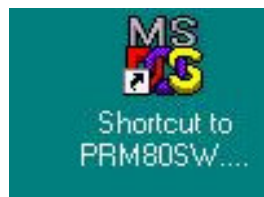
You can save these setting by clicking on the F5 FILE button and giving a name for this job.

Now you can close this application by clicking on the **ESC-EXIT** button on your keyboard and chose **Yes**.



4. How to setup the new software settings for 2m

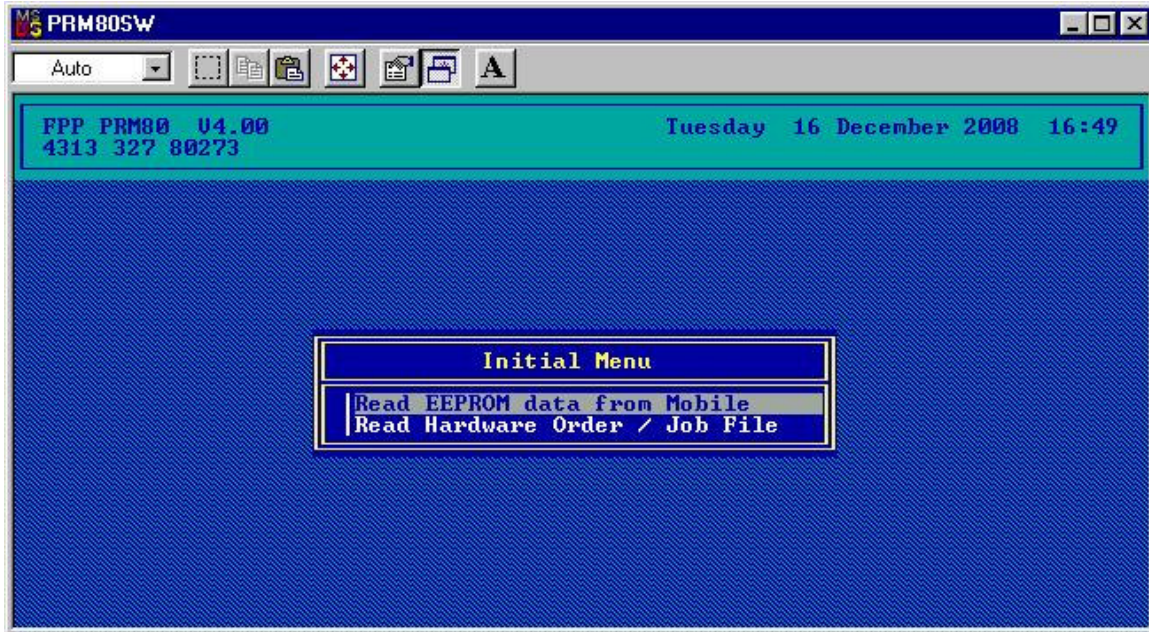
Start the Software program by clicking on the following icon if you created one



for of the PRM80SW.exe otherwise click on the executable file in the software folder from your FPP software.

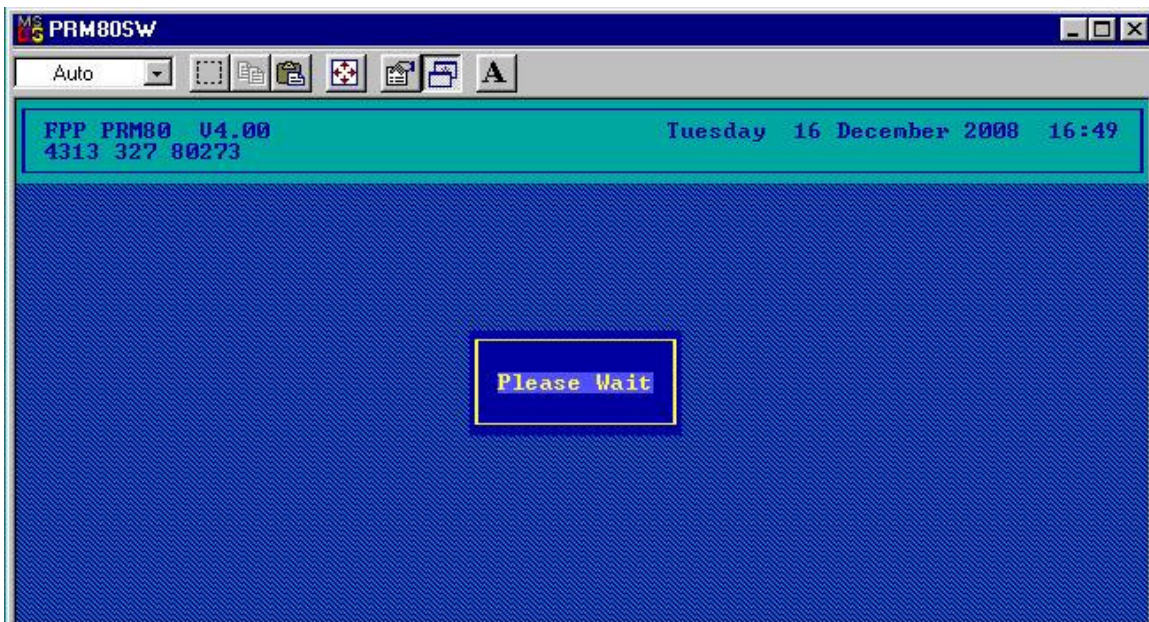
4.1 Back-up Instructions

This is the startup screen:

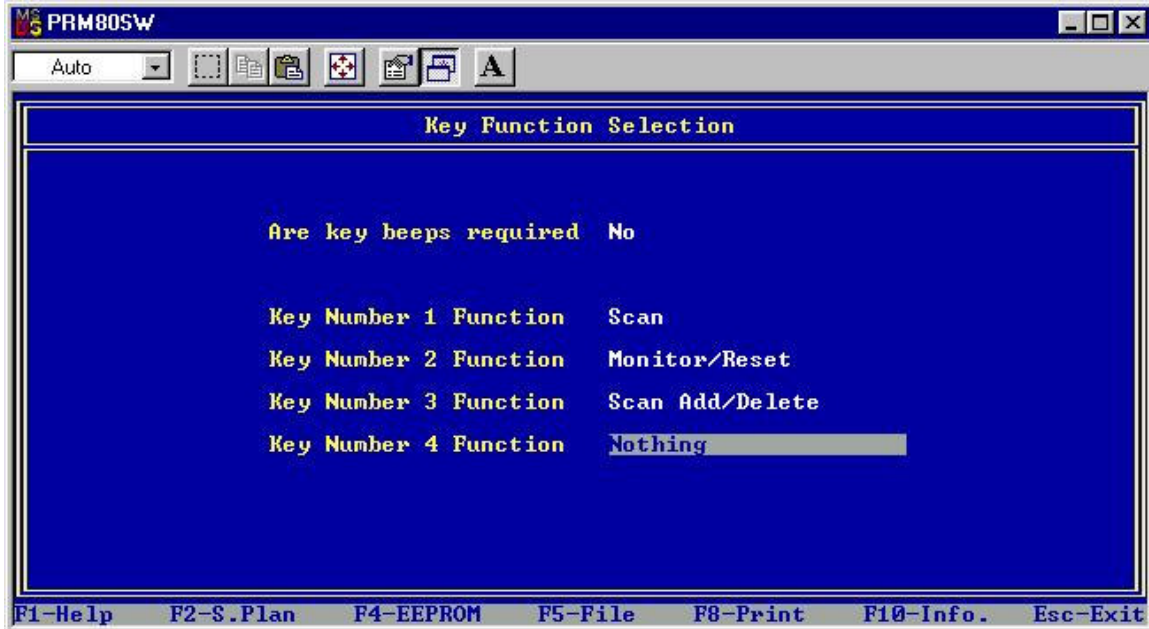


With this program you can make a back-up of the existing software / hardware configuration. This you can do by selecting the first option displayed on the screen.

“Read EEPROM data from Mobile”



Once the data has been read you get this screen:



Now save these original settings by clicking the **F5 – File** button and give a name to this JOB.

Once this is done, you can reprogram the hardware settings and if something gets wrong you can always reprogram your radio with the old settings and start again. Remember to take your time to discover and learn how your radio has been programmed before starting to reprogram and ending up with a non functional radio.

4.2 Nice to know

You can navigate between the different programming pages by using the **Page UP** and **Page Down** buttons of your keyboard.

For each field there is a very good help function integrated in the FPP 4.0 software. Just **highlight** the field and click on the **F1 Help** button. A green pop up help screen will appear and gives you the information you need.

If it is a multi page help file, you can go to the next help screen by using the page up and page down buttons of the keyboard.

Expl.:

TRANSMIT CTCSS.

This option selects what frequency will be used as a CTCSS (sub-audible) tone on this channel for TRANSMIT ONLY. The following table shows the valid CTCSS tone selection options.

Page 1 of 3.

CTCSS TONE TABLE (ALPHABETICAL ORDER).

Select.	Frequency.	Select.	Frequency.	Select.	Frequency.
' '	(disabled)	'M'	118.8 Hz	'0'	167.9 Hz
'A'	88.5 Hz	'N'	127.3 Hz	'1'	173.8 Hz
'B'	100.0 Hz	'O'	136.5 Hz	'2'	179.9 Hz
'C'	107.2 Hz	'P'	146.2 Hz	'3'	186.2 Hz
'D'	114.8 Hz	'Q'	67.0 Hz	'4'	192.8 Hz
'E'	123.0 Hz	'R'	71.9 Hz	'5'	203.5 Hz
'F'	131.8 Hz	'S'	74.4 Hz	'6'	210.7 Hz
'G'	141.3 Hz	'T'	77.0 Hz	'7'	218.1 Hz
'H'	151.4 Hz	'U'	79.7 Hz	'8'	225.7 Hz
'I'	82.5 Hz	'V'	85.4 Hz	'9'	233.6 Hz
'J'	94.8 Hz	'W'	91.5 Hz	'*'	241.8 Hz
'K'	103.5 Hz	'X'	156.7 Hz	'#'	250.3 Hz
'L'	110.9 Hz	'Y'	162.2 Hz	'-'	97.4 Hz

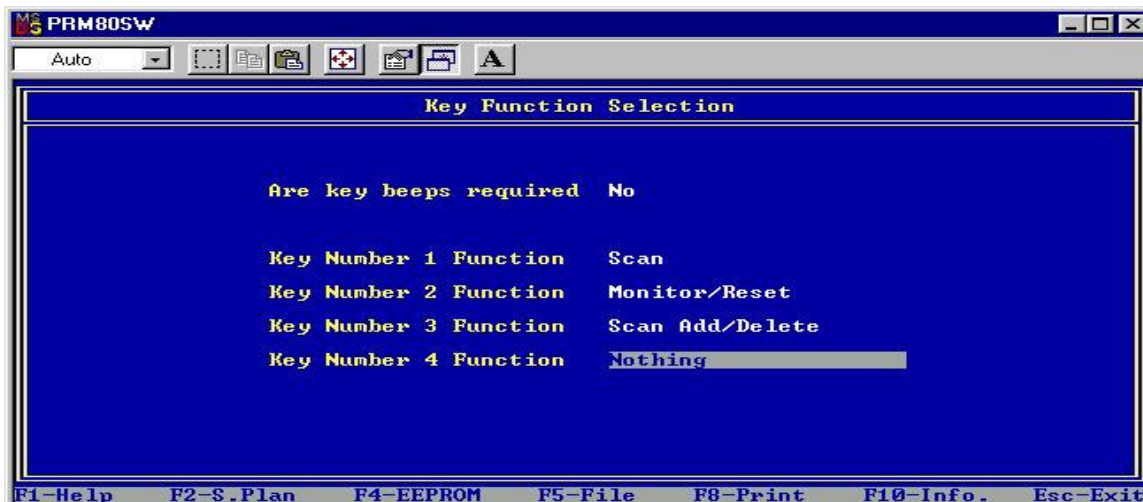
Page 2 of 3.

4.3 Setting up the new software parameters

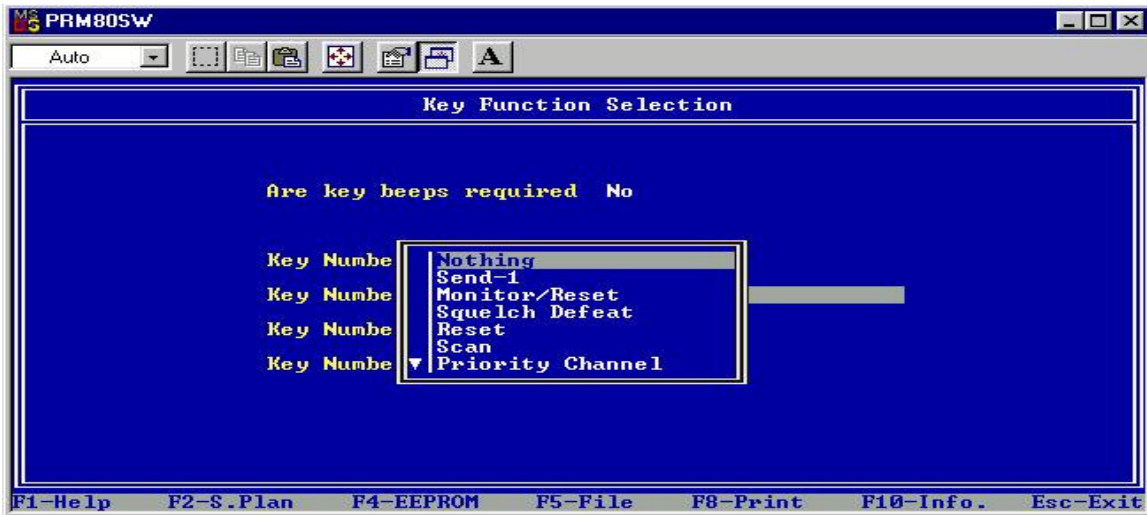
4.3.1 Programming the 4 Function Keys

What I wanted is the possibility to scan, add and remove scan channels and remove the squelch value to 0 and no beeps
 The first screen is the “Key Function Selection” you can program the 4 function buttons under the display.

These are my settings for the Key Function Selection:



If you select a field, click the **ENTER** button from your Keyboard you get all the possible settings for the selected field. By using the up & down arrow you can scroll trough the menu

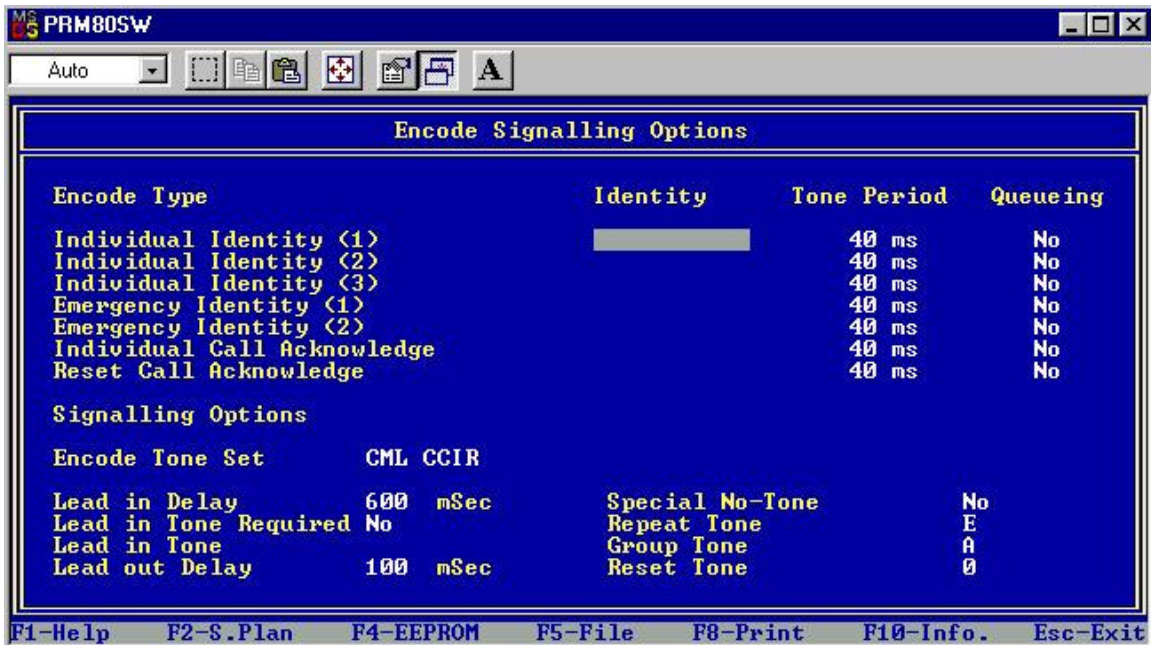
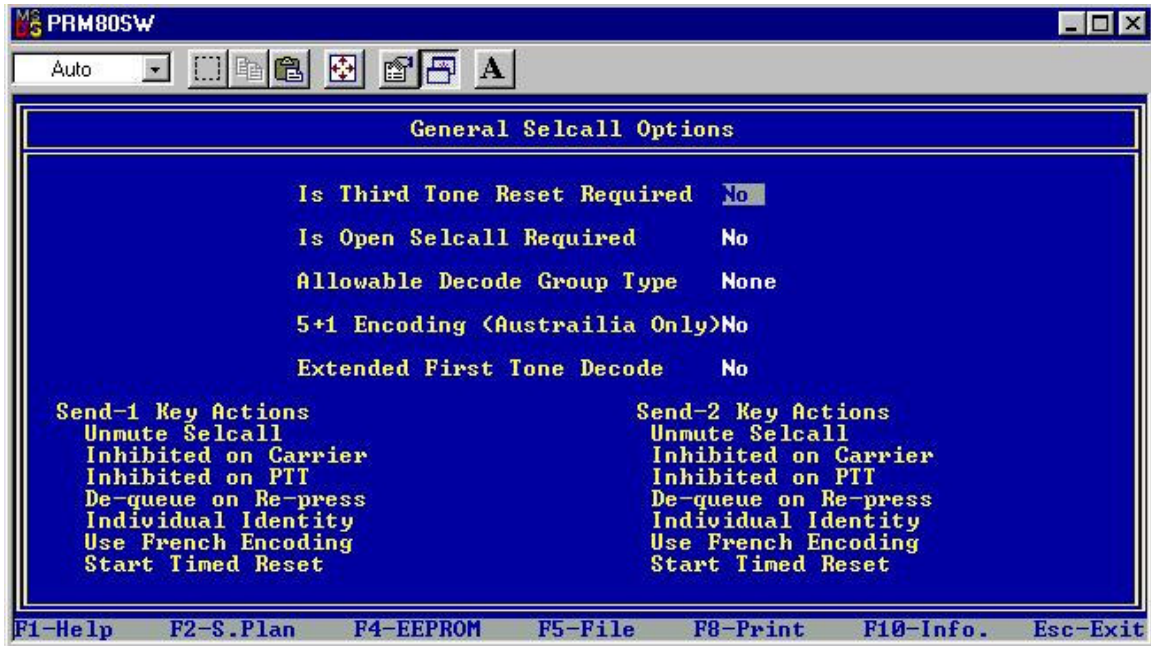


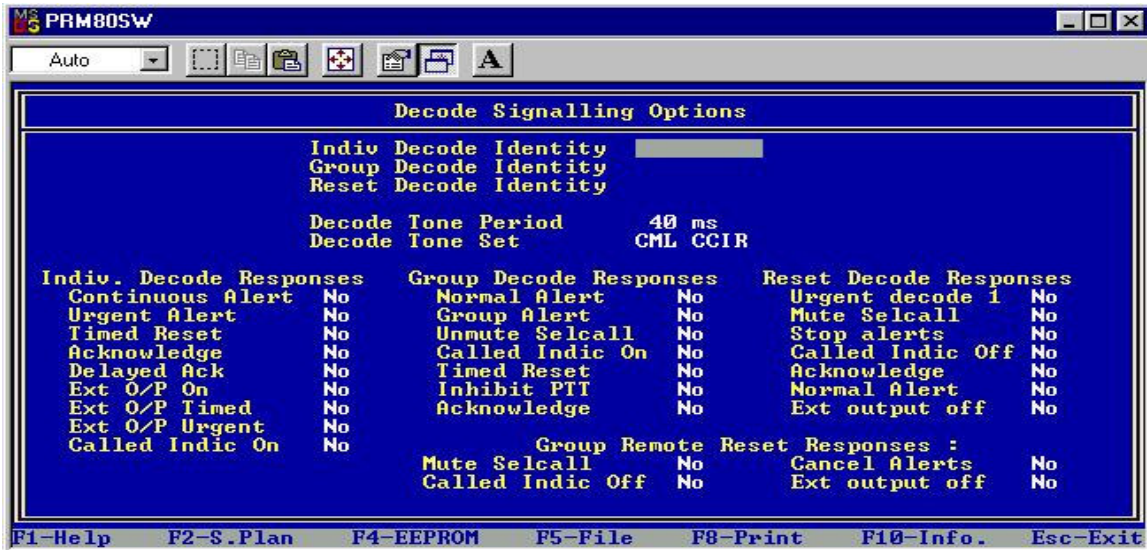
If you want an explanation for the selected field just click the **F1 Help** button.

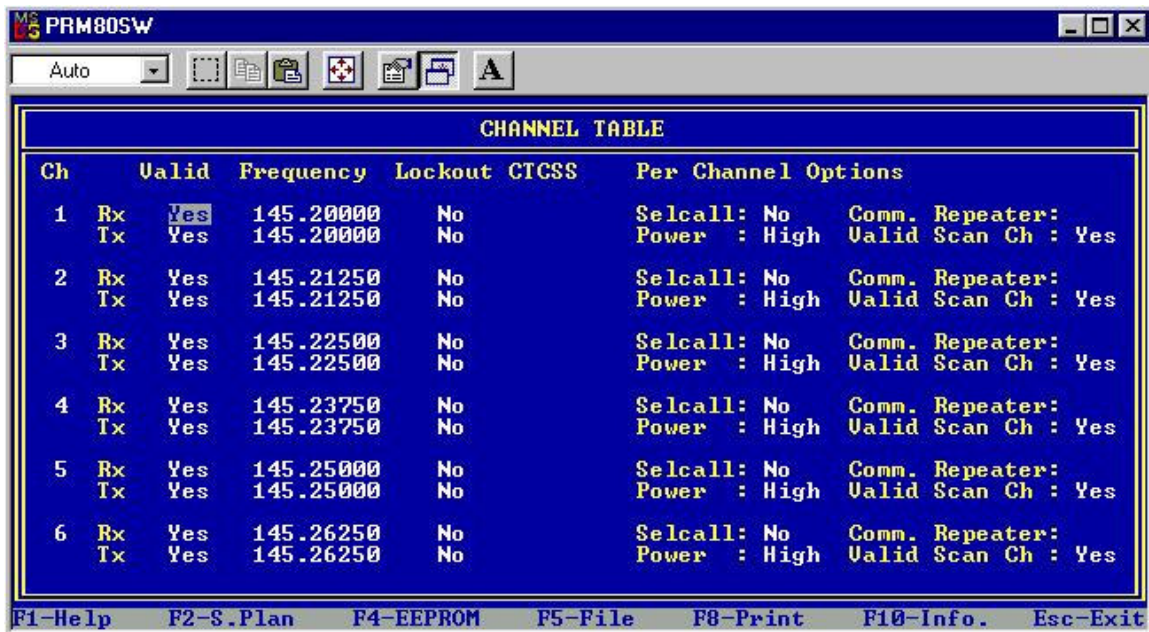


4.3.2 Programming the Frequency Table

You can navigate between the different windows by using the [page up](#) and [page down](#) buttons of your keyboard the “**Channel Tabel.**” window.







In this screen you have the possibility to put in all channel and frequency data you like.

These are the columns we need:

- CH 1 = channel 1
- Valid Yes or No = activate the channel or delete channel settings
- Frequency = Frequency
- Lockout Yes / No = Yes deactivate channel without loss of data
- CTCSS = selects the sub tone you want to use.
- SelCall Yes / No = Yes to activate the 1750 Hz tone on this channel
- Power High or Low = High or Low power output for this channel
- Valid Scan Ch. Yes / No = Yes so we can select this channel to be scanned
- Rx = receive data
- Tx = transmit data

The PRM 8020 has up to 64 channels you can use.

Ch	Valid	Frequency	Lockout	CTCSS	Per Channel Options
59	Rx: No Tx: No				Selcall: : Power : Comm. Repeater: Valid Scan Ch :
60	Rx: Yes Tx: Yes	145.63750 145.03750	No No	Q	Selcall: No Power : High Comm. Repeater: Valid Scan Ch : Yes
61	Rx: Yes Tx: Yes	145.66250 145.06250	No No		Selcall: No Power : High Comm. Repeater: Valid Scan Ch : Yes
62	Rx: Yes Tx: Yes	145.65000 145.05000	No No	S	Selcall: No Power : High Comm. Repeater: Valid Scan Ch : Yes
63	Rx: Yes Tx: Yes	145.71250 145.11250	No No	Q	Selcall: No Power : High Comm. Repeater: Valid Scan Ch : Yes
64	Rx: Yes Tx: Yes	145.77500 145.17500	No No	F	Selcall: No Power : High Comm. Repeater: Valid Scan Ch : Yes

F1-Help F2-S.Plan F4-EEPROM F5-File F8-Print F10-Info. Esc-Exit

As you can see in the window above I programmed a few repeater frequencies. Unfortunately in a standard PRM8020 there is no 1750 Hz tone but fortunately the radio I use has the selcall option which I use for 1750Hz see point 9. Most of our repeaters can be activated by using a CTCSS tone. We need the CTCSS tone on our transmit signal so we must apply this in the Tx line. Each letter stands for a specific CTCSS sub tone. To find out what each letter stands for use the **F1 Help** function and you'll get this:

Ch	Valid	Frequency	Lockout	CTCSS	Per Channel Options
59	Rx: No Tx: No				Selcall: : Power : Comm. Repeater: Valid Scan Ch :
60	Rx: Yes Tx: Yes				Repeater: Scan Ch : Yes
61	Rx: Yes Tx: Yes				Repeater: Scan Ch : Yes
62	Rx: Yes Tx: Yes				Repeater: Scan Ch : Yes
63	Rx: Yes Tx: Yes	145.11250	No	Q	Power : High Valid Scan Ch : Yes
64	Rx: Yes Tx: Yes	145.77500 145.17500	No No	F	Selcall: No Power : High Comm. Repeater: Valid Scan Ch : Yes

F1-Help F2-S.Plan F4-EEPROM F5-File F8-Print F10-Info. Esc-Exit

CTCSS TONE TABLE (ALPHABETICAL ORDER).					
Select.	Frequency.	Select.	Frequency.	Select.	Frequency.
' '	(disabled)	'M'	118.8 Hz	'0'	167.9 Hz
'A'	88.5 Hz	'N'	127.3 Hz	'1'	173.8 Hz
'B'	100.0 Hz	'O'	136.5 Hz	'2'	179.9 Hz
'C'	107.2 Hz	'P'	146.2 Hz	'3'	186.2 Hz
'D'	114.8 Hz	'Q'	67.0 Hz	'4'	192.8 Hz
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'H'	151.4 Hz	'U'	79.7 Hz	'8'	225.7 Hz
'I'	82.5 Hz	'V'	85.4 Hz	'9'	233.6 Hz
'J'	94.8 Hz	'W'	91.5 Hz	'*'	241.8 Hz
'K'	103.5 Hz	'X'	156.7 Hz	'#'	250.3 Hz
'L'	110.9 Hz	'Y'	162.2 Hz	'='	97.4 Hz

Page 2 of 3.

CTCSS TONE TABLE (FREQUENCY ORDER).					
Frequency.	Select.	Frequency.	Select.	Frequency.	Select.
67.0 Hz	'Q'	107.2 Hz	'C'	167.9 Hz	'0'
71.9 Hz	'R'	110.9 Hz	'L'	173.8 Hz	'1'
74.4 Hz	'S'	114.8 Hz	'D'	179.9 Hz	'2'
77.0 Hz	'T'	118.8 Hz	'M'	186.2 Hz	'3'
79.7 Hz	'U'	123.0 Hz	'E'	192.8 Hz	'4'
82.5 Hz	'I'	127.3 Hz	'N'	203.5 Hz	'5'
85.4 Hz	'V'	131.8 Hz	'F'	210.7 Hz	'6'
88.5 Hz	'A'	136.5 Hz	'O'	218.1 Hz	'7'
91.5 Hz	'W'	141.3 Hz	'G'	225.7 Hz	'8'
94.8 Hz	'J'	146.2 Hz	'P'	233.6 Hz	'9'
97.4 Hz	'='	151.4 Hz	'H'	241.8 Hz	'*'
100.0 Hz	'B'	156.7 Hz	'X'	250.3 Hz	'#'
103.5 Hz	'K'	162.2 Hz	'Y'	(disabled)	' '

Page 3 of 3.

Once you have found the sub tone you need, close the help window by using the **ESC** button of your keyboard.
 Put the right symbol in the CTCSS column of the Tx line.
 There is no more to it then this.

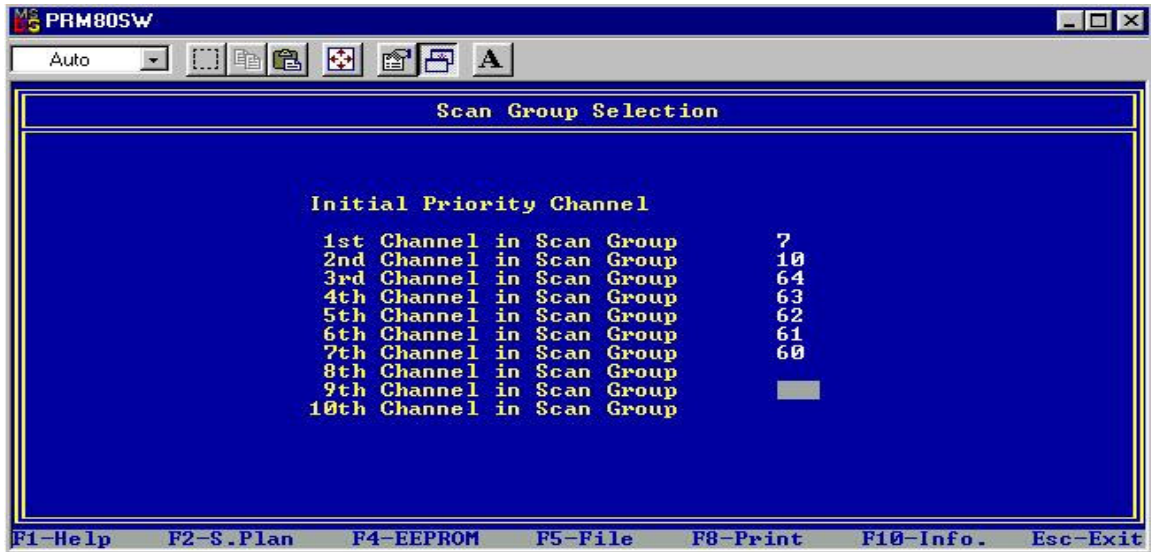
4.3.3 Programming the scan function

There are 2 ways of programming the scan function:

- *Input in the software*
- *Using the Scan Add / Delete Function Key.*

You can program up to 10 channels to be scanned

- Programming the 10 channels using the Scan Group selection window:



Fill in the channel number(s) you want to be scanned just as shown in the above window.

- Using the Scan Add / Delete function key (the easy way)

If a channel is already programmed to be scanned, you will be able to see a "V"-marker appear above the Scan Add / Delete function key (3rd key from the left)



The "V"-marker above the 2nd function key, MONITOR indicates that the squelch level is at 0 (zero) and you monitor this channel

To remove channel 64 from the scan list just push the Scan Ad / Delete function key once and the “V”-marker disappears

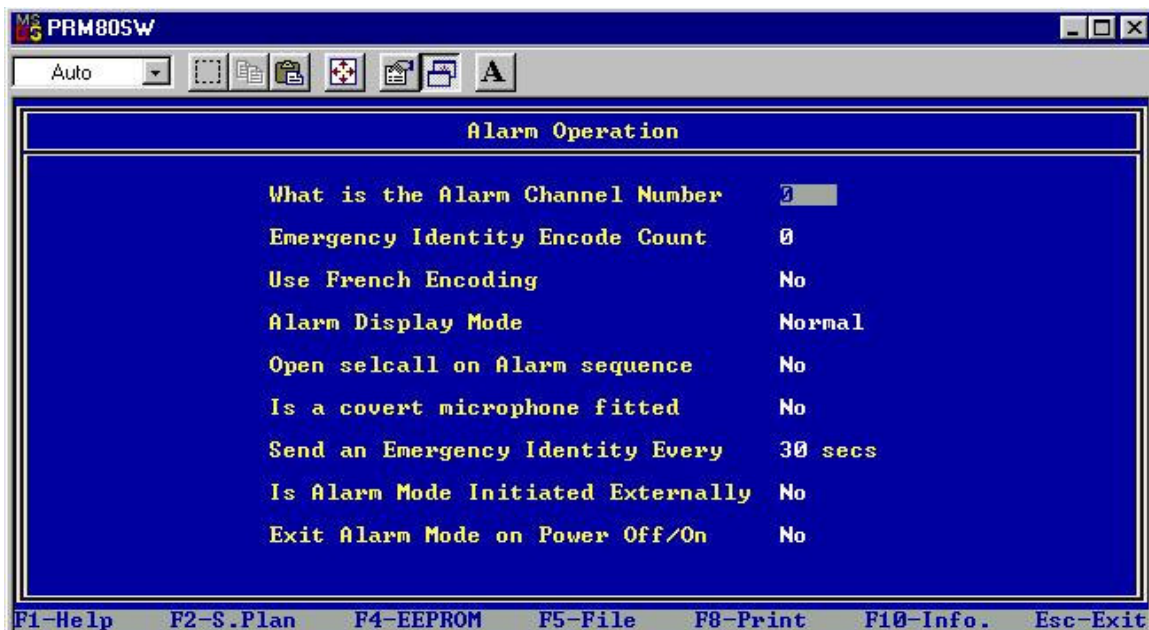


4.3.4 General channel settings



The only parameter I changed was the default Power-on channel or Home channels as it is called on other radio's.
In the above window it is Channel 7.

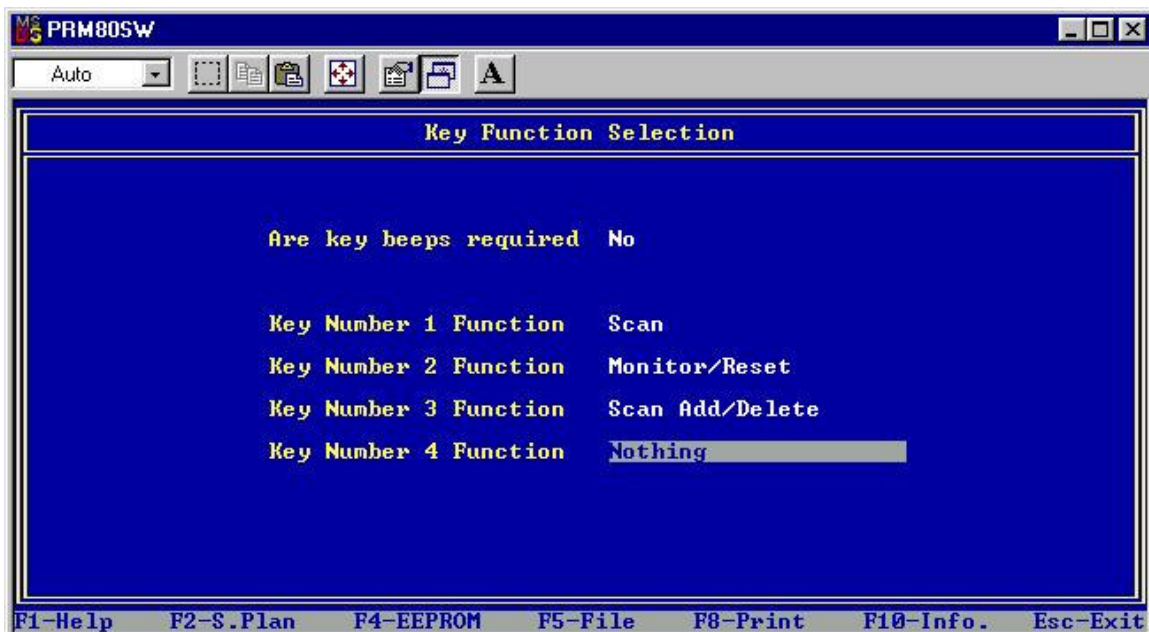
The next screen is not of use to use at this time.



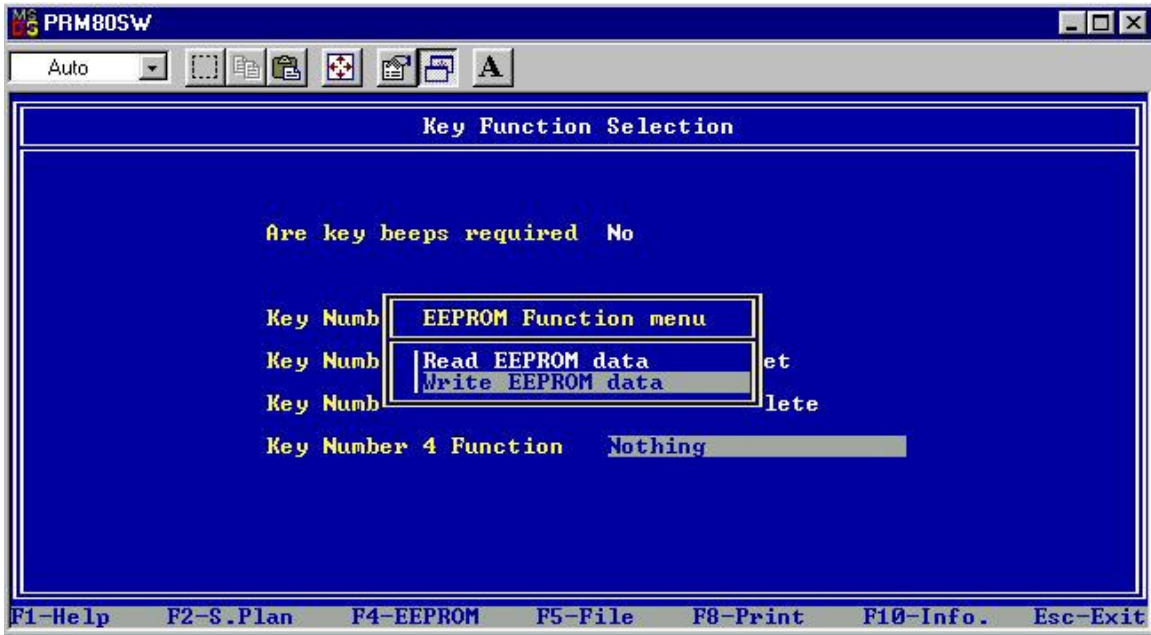
This is the last of the software settings windows.

5. How to program your PRM8020 with the new software settings

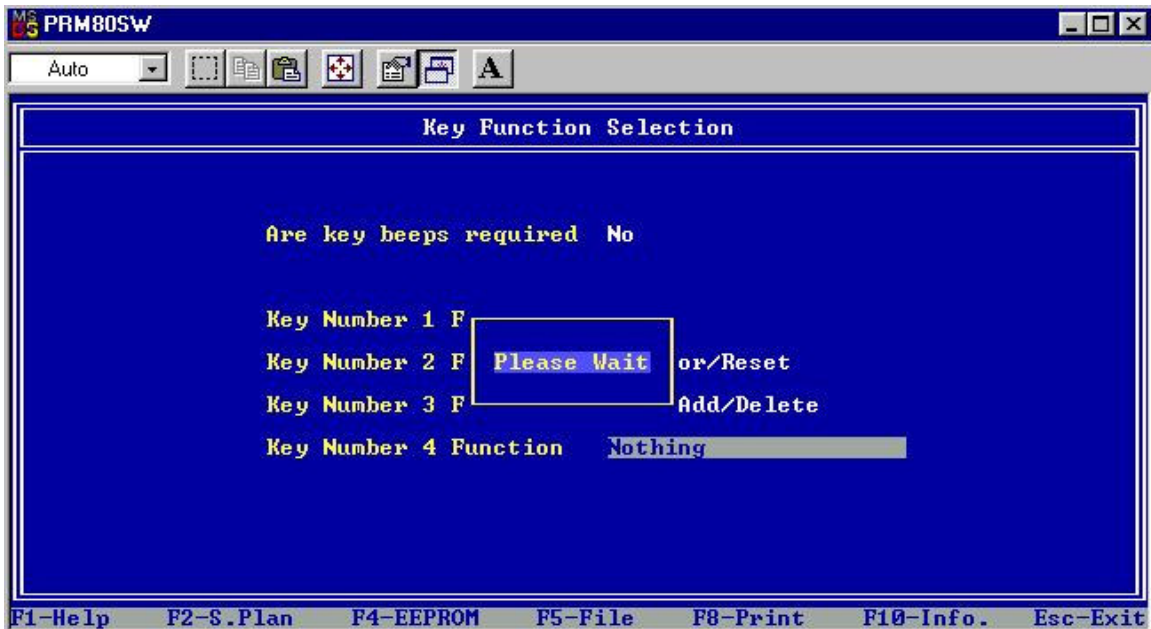
Go back to the first window. (Key Function Selection)



To program you PRM8020 with the new software settings click on the **F5-File** button to save you new software settings into a job.
Once you've made de back-up click on the **F4-EEPROM** button.



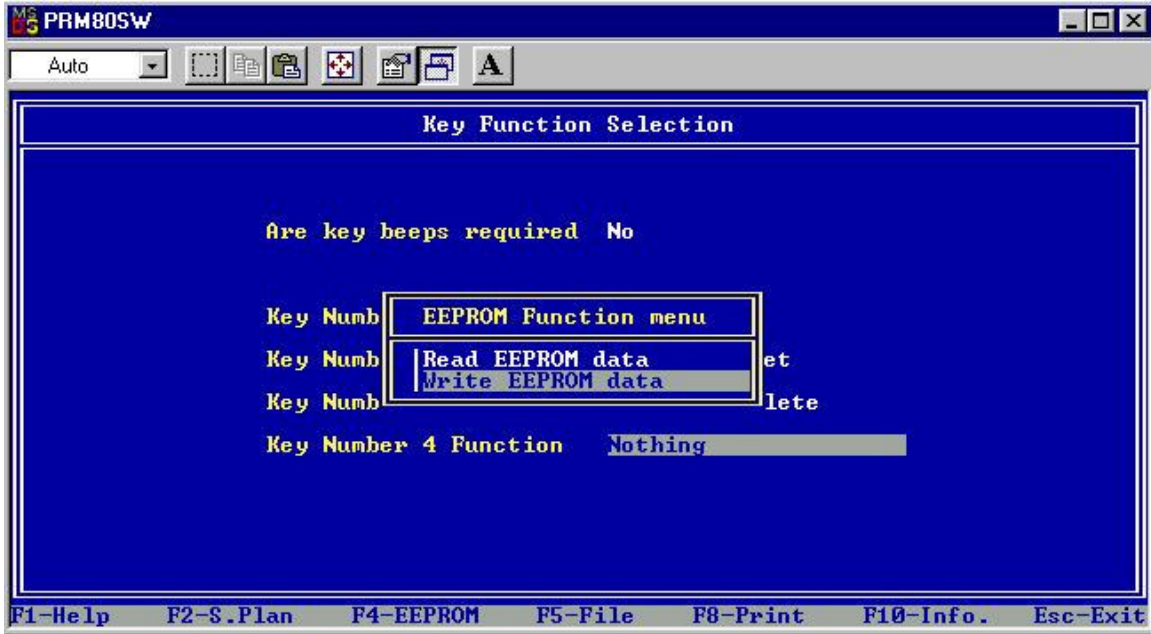
Chose Write EEPROM data and push the RETURN button of the keyboard and wait.



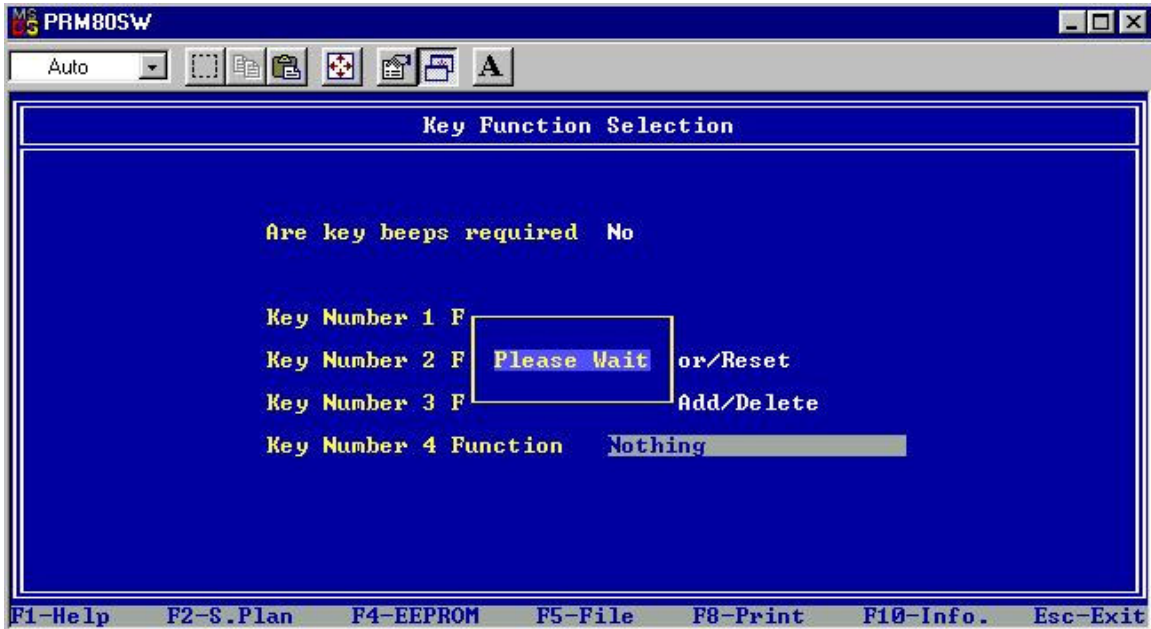
Once the “Please Wait” pop up screen has disappeared, you radio is programmed and ready to use.

6. How to program other PRM8020 with the same Hardware and Software

It is very easy, just connect your programming cable to the 2nd radio and repeat the steps in point 5.

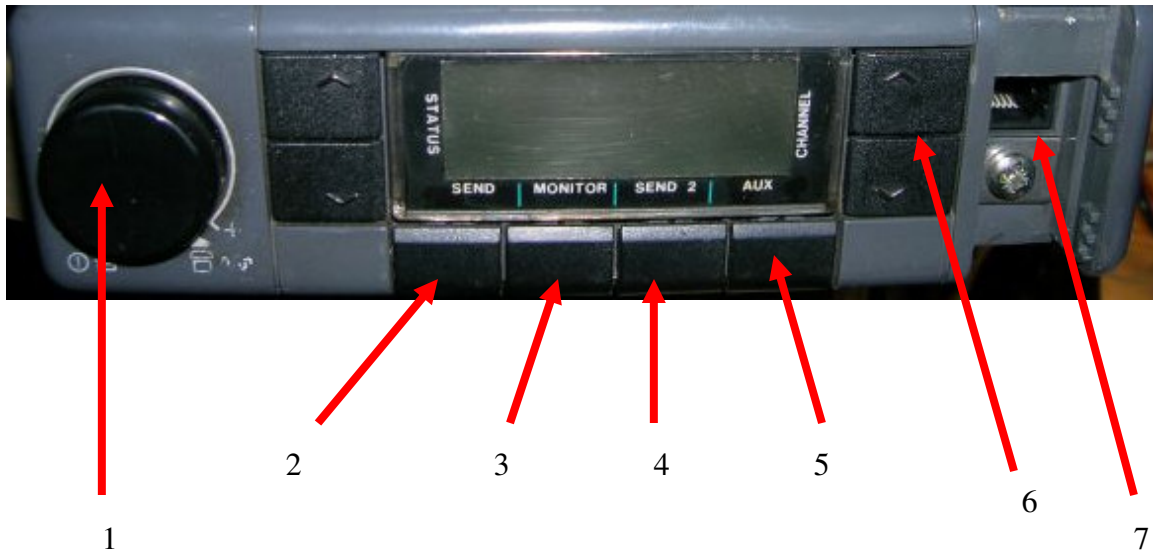


Chose Write EEPROM data and push the RETURN button of the keyboard and wait.



Once the “Please Wait” pop up screen has disappeared, you radio is programmed and ready to use.

7. Buttons on the PRM8020



1. Power ON / OFF – Volume – Squelch button
2. 1st Function Key : Scan
3. 2nd Function Key : Monitor (Squelch on / off)
4. 3rd Function Key : Scan Add / Delete
5. 4th Function Key : 1750Hz tone
6. Channel up & down buttons
7. RJ45 Microphone / Programming connector

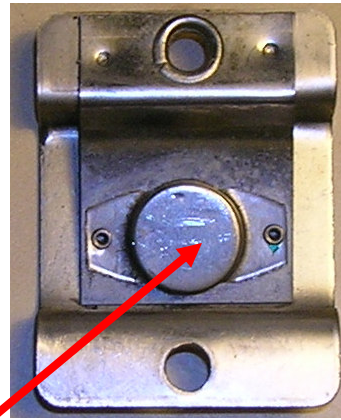
8. Scan problem

When you have the original microphone from Philips connected, it is possible that the scanning isn't working.

Check if scanning works if you disconnect the microphone or if the microphone hangs in the original microphone holder.

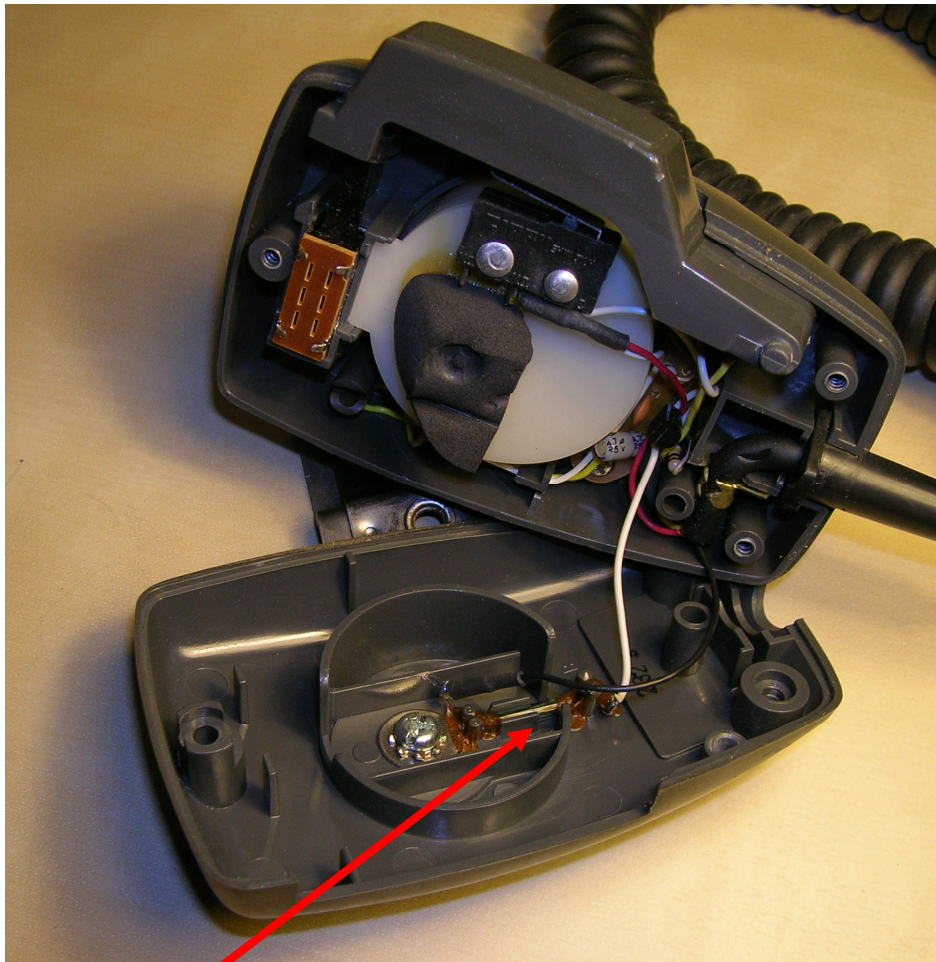
If so the problem will be solved in 10 minutes.

In some original hand microphones one has build in a safety to prevent the radio from scanning if the microphone is in use (read of the hook). This is done by building a very little magnetic switch in the microphone at the back.



Magnet

At the back of the original microphone holder you can find a little round magnet that closes the scan switch in the microphone if it hangs in the microphone holder.

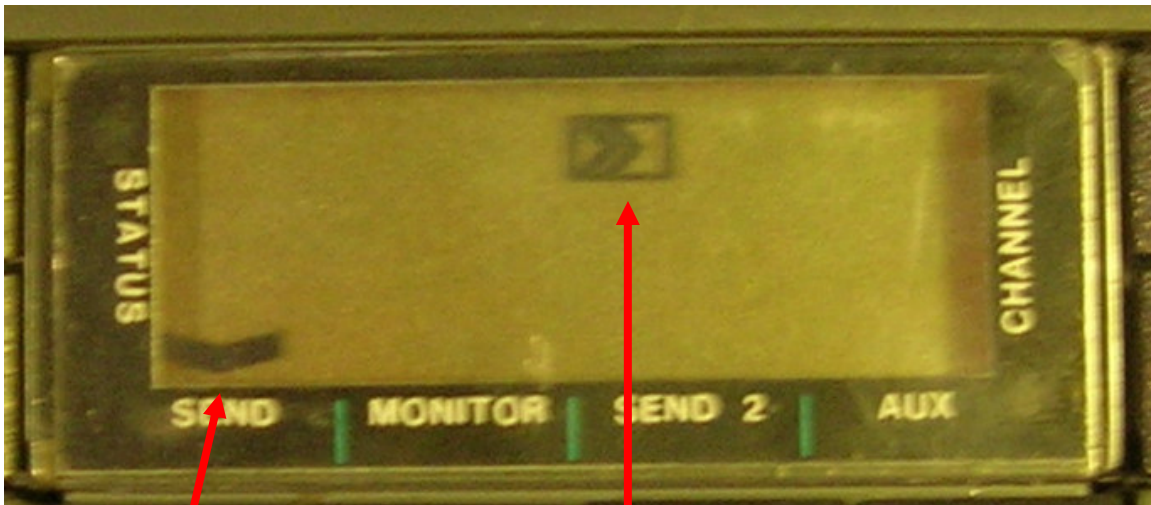


Little switch that controls the scan options.

There are at least 3 possible solutions:

1. Put the microphone in the original holder before you start scanning
2. Remove or close the little switch in the microphone, this has no influence on the audio of the microphone
3. Connect another microphone to the radio.

When the radio is scanning the display looks like this:



This indicates that the radio is scanning.

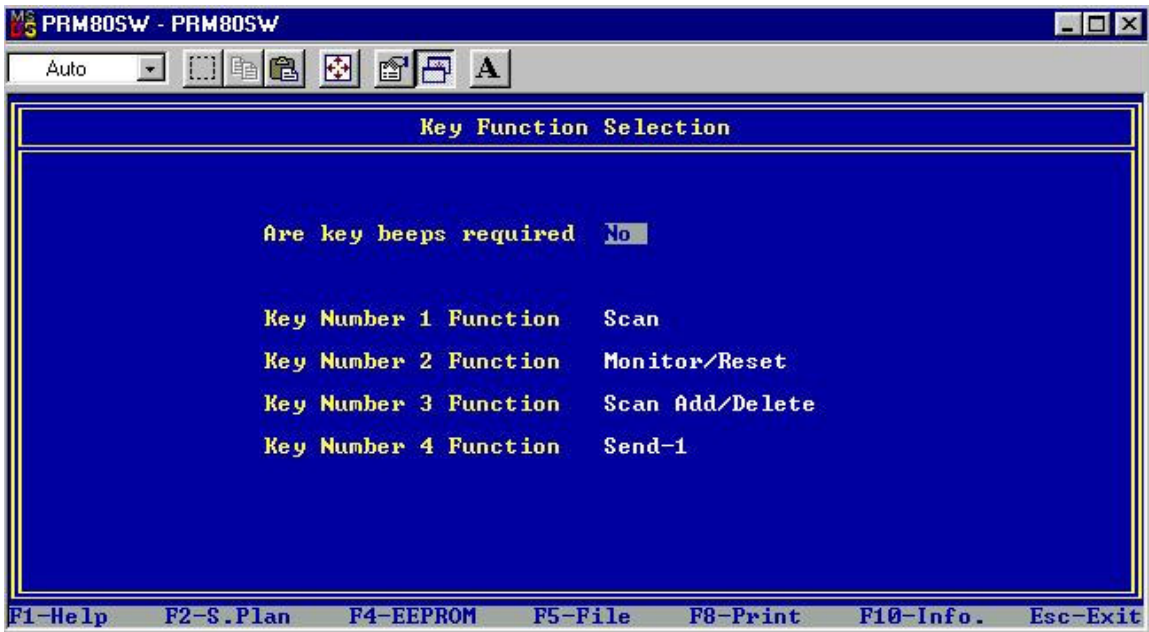
This indicates that the scanning function is activated by push the first Function Key.

9. Setting Up the 1750Hz tone

First of all I need a Function Key to be programmed for the activation of the 1750Hz tone. I still have the 4th function key and I program it to run the send-1 option.

Because I will be using the selcall option to generate the 1750Hz tone I will need to program the right options.

The following windows will give you an idea on how I did that.



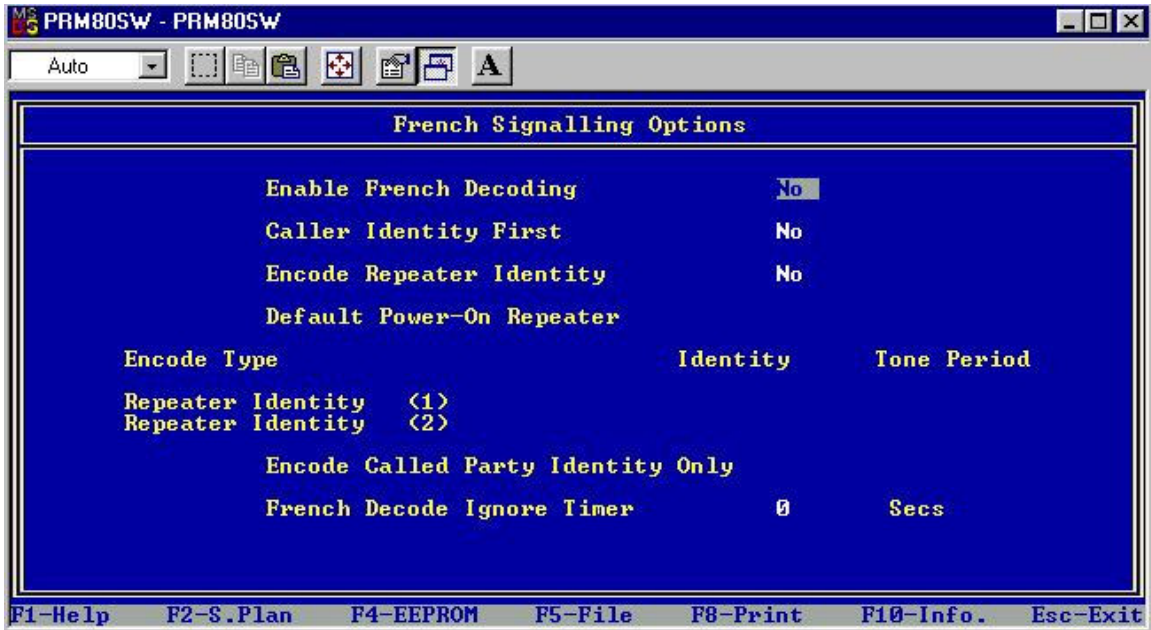
Open Selcall Required = Yes
 Unmute Selcall = Yes
 Individual Identity = 1



Individual Identity = 8
 Lead in Delay = 1000msec
 Lead in tone Required = yes
 Lead in Tone = 8
 Lead out Delay = 20



Nothing to change



Nothing to change



Nothing to change



Nothing to change



Nothing to change

Ch	Valid	Frequency	Lockout	CTCSS	Per Channel Options	
59	Rx No Tx No				Selcall:	Comm. Repeater:
					Power :	Valid Scan Ch :
60	Rx Yes Tx Yes	145.63750 145.03750	No No	Q	Selcall: No Power : High	Comm. Repeater: Valid Scan Ch : Yes
61	Rx Yes Tx Yes	145.66250 145.06250	No No		Selcall: Yes Power : High	Comm. Repeater: Valid Scan Ch : Yes
62	Rx Yes Tx Yes	145.65000 145.05000	No No	S	Selcall: No Power : High	Comm. Repeater: Valid Scan Ch : Yes
63	Rx Yes Tx Yes	145.71250 145.11250	No No	Q	Selcall: No Power : High	Comm. Repeater: Valid Scan Ch : Yes
64	Rx Yes Tx Yes	145.77500 145.17500	No No	F	Selcall: No Power : High	Comm. Repeater: Valid Scan Ch : Yes

F1-Help F2-S.Plan F4-EEPROM F5-File F8-Print F10-Info. Esc-Exit

The only thing that you need to change is the Selcall option needs to be on Yes if you want the 1750Hz tone to be activated. This you can see in the above screenshot for channel 61

10. Frequency list (ON4HP & ON6NU)

PHILIPS PRM 8020

Frequentie	Chan		Frequentie	Chan
144,500	1		145,400	33
144,525	2		145,4125	34
144,550	3		145,425	35
144,575	4		145,4375	36
144,600	5		145,450	37
144,625	6		145,4625	38
144,700	7		145,475	39
144,725	8		145,4875	40
144,750	9		145,500	41
144,775	10		145,5125	42
144,800	11		145,525	43
144,825	12		145,5375	44
144,850	13		145,550	45
144,875	14		145,5625	46
144,900	15		145,575	47
144,9125	16		145,5875	48
144,950	17		145,600	49
145,2125	18		145,6125 79,7 ON0GB	50
145,225	19		145,625	51
145,2375	20		145,6375 131,8 ON0ZK	52
145,250	21		145,650 74,4 ON0LG	53
145,2625	22		145,6625 (1750) ON0NL	54
145,275	23		145,675 131,8 ON0BT	55
145,2875	24		145,6875 74,4 ON0LTV	56
145,300	25		145,700 ON0OV	57
145,3125	26		145,7125 131,8 ON0DST	58
145,325	27		145,725 71,9 PI3ZLB	59
145,3375	28		145,7375 79,7 ON0KTK	60
145,350	29		145,750 ON0LU	61
145,3625	30		145,7625 67,0 ON0AN	62
145,375	31		145,775 131,8 ON0LB	63
145,3875	32		145,7875 DB0WA	64

Versie 2

11. Display Lay-out

STATUS				CHANNEL
	SCAN	MONITOR	SCAN A/D	

12. Final

I hope this manual is of use to you and lets you enjoy this radio on our 2m band. I know that this radio has a lot more options than can be used but the purpose of this manual was to reprogram this radio as simple as possible for simplex and repeater communications.

Feel free to experiment with the other options but please before changing anything, make a back-up of the existing configuration you never know.

Best to be at the safe side.

73
Erwin (ON3BWE)