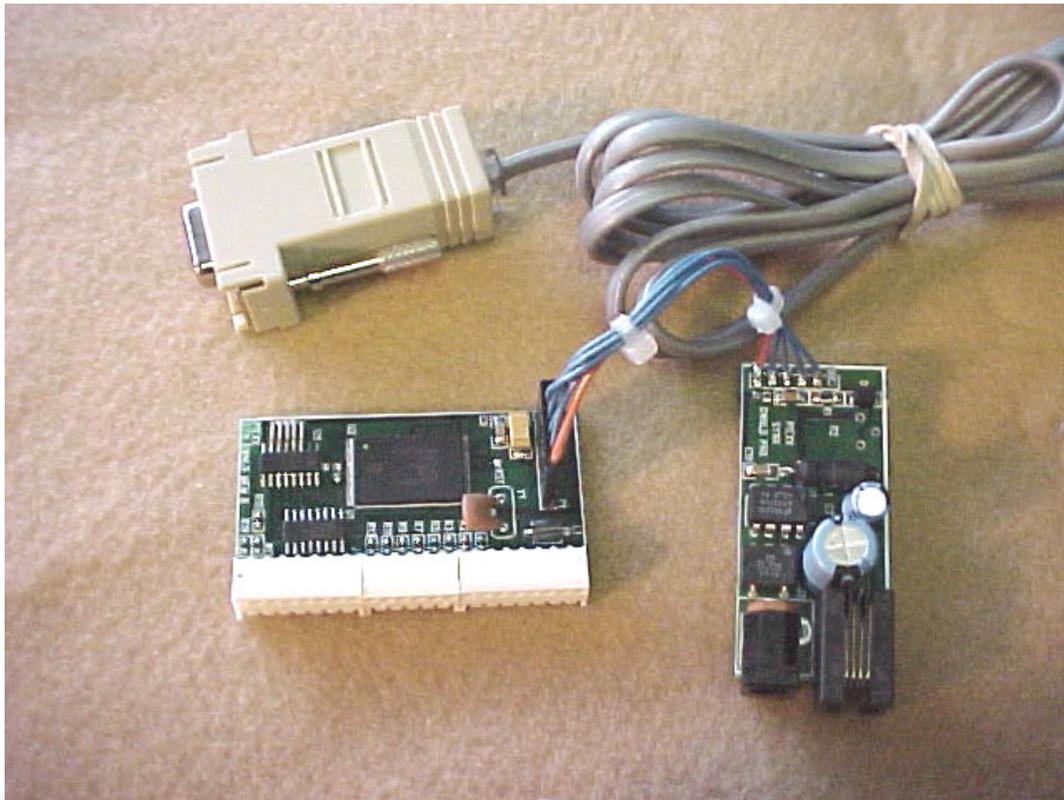




PIEXX Co.
13 Main Street
PO Box 123
Hillsboro, NH 03244
(603) 464-5411
www.piexx.com

Syntor X Flash Memory Module Revision C



The PIEXX SynXFlash memory module, along with the supplied PC software, replaces the original SyntorX code plugs and allows you to easily set modify and update your SyntorX channel memories.

Features:

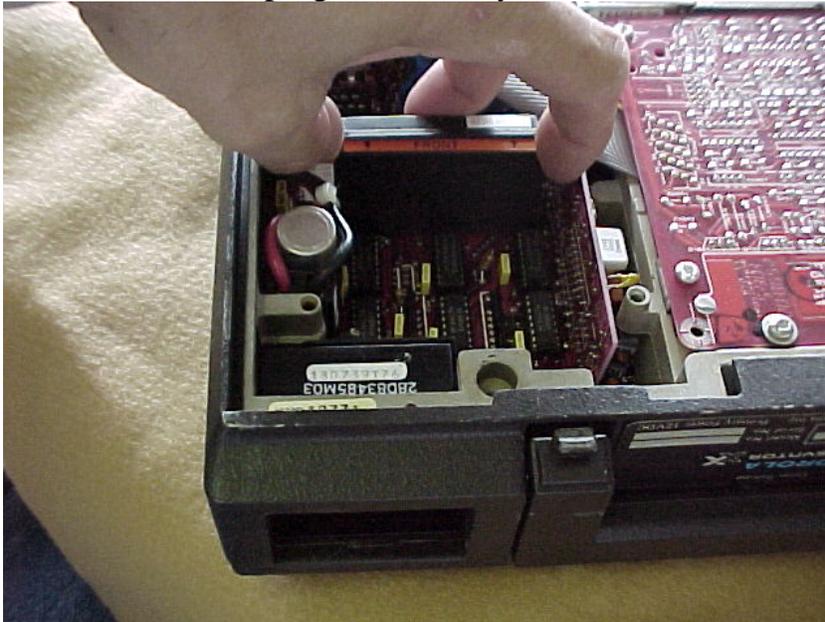
1. Plug compatible with the original code plug modules.
2. Provides 4 banks of 32 or 64 memory channel capability.
3. Bank selection can be made with a single external 10K pot.
4. Supports VHF High Band, Low Band and UHF (440) transceivers .
5. Easy to install and program.
6. Operation duplicates original Code Plug functionality.

Hardware Installation:

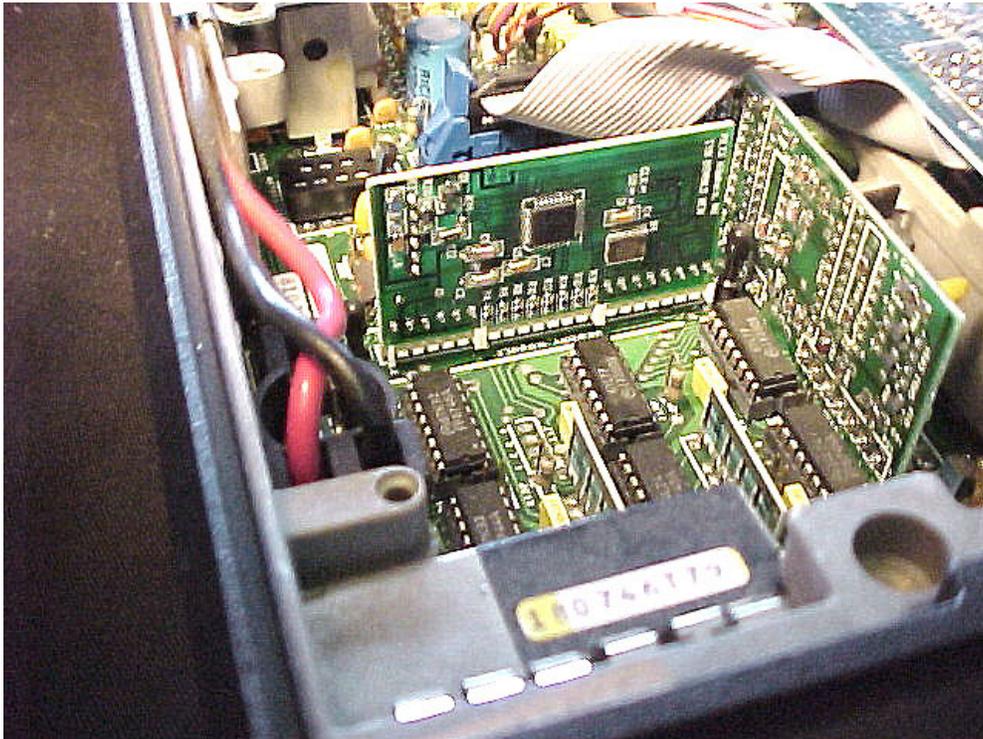
1. Loosen the four screws securing the SyntorX bottom cover, and remove the cover from the transceiver.



2. Remove the old code plug from the SyntorX.



3. The PIEXX SynXFlash can either be programmed in system or out of the system. If you wish to program the SynXFlash before installing it, go to the programming section now. Otherwise, install the SynXFlash memory module in your system as shown in the next picture. Be sure to orient the board so that the 6 pin programming connector is facing the back of the transceiver. Also, make sure that all 22 pins align with the receptacle on the SynXFlash memory module.



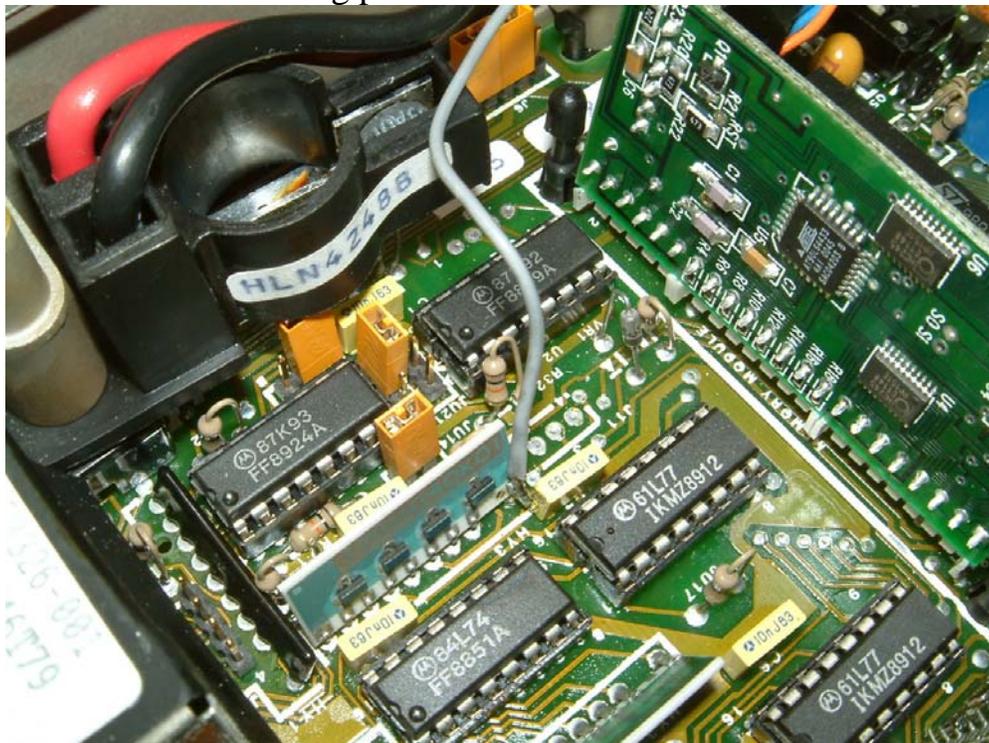
4. If you plan on downloading the memory channels into the SynXFlash memory module while it is installed in the radio, you will need to connect the serial interface adapter to the 6 pin connector on the memory module. Make sure that the plug is oriented with the orange lead connected to pin 1 of the SynXFlash module. Pin 1 is closest to the 22 pin interface connector. When you program the memory in system, you will not need to, and should not, connect the wall transformer to the serial interface adapter board. The SynXFlash, as well as the serial interface, receives its power from the system.



5. The revision C serial interface adapter has mounting holes that will allow it to be permanently installed in the radio. If you plan on leaving the serial interface adapter in the radio, you will need to make an exit hole in the case for the serial cable.

Steps 6 and 7 deals with using the advanced memory bank select features of the revision C SynXFlash module. If you don't want to use multiple memory banks, you will not need to perform these installation steps.

6. The revision C SynXFlash module has the ability to signal the radio that the flash information has been updated. The frequency change line, FCHG, is located on pin 5 of the P1 interface connector. The FCHG line has a short gray wire attached to it on the cabling supplied with the serial interface adapter. For normal operation of the transceiver, this line can be left unconnected. If you do not connect the FCHG line, and you switch memory banks or download data to the SynXFlash module, then you may need to cycle the channel switches on your control head to force the transceiver to read the updated information from the memory module. However if you plan on leaving the serial interface adapter in the radio, or you wish to use the bank switching features of the SynXFlash module, you should connect this line to the input of the line transceiver associated with the mode 1 select line. The easiest place to solder the gray FCHG wire is on pin 1 of hybrid HY3 located on the SyntorX personality board as shown in the following picture.



The FCHG signal, generated by the SynXFlash module, is usually in the high impedance state. When the SynXFlash wants to signal the transceiver that the flash data has changed, it drives the FCHG line high for 20 mS, then it drives it low for 20 mS and then returns the FCHG line to the floating state. When the FCHG line is connected to the mode 1 input transceiver, this sequence fools the SyntorX transceiver into thinking that the operator has made a mode change, there by causing it to read the memory module and update the radio parameters accordingly.

7. Another feature of the revision C SynXFlash module is its ability to select between 4 distinct memory banks with a single control line. Pin 6 of the SynXFlash P1 interface connector, labeled ANA SEL, is an input optimized for use as a bank select line. If this line is left unconnected, bank 0 will be selected. If a 10K potentiometer is connected, with its wiper to the ANA SEL line and the clockwise most leg connected to ground (pin 3 of P1), then each of the 4 memory banks may be selected with the pot. If the most counter clockwise setting of the pot is positioned at the 7 o'clock position then the banks will be selected as follows:

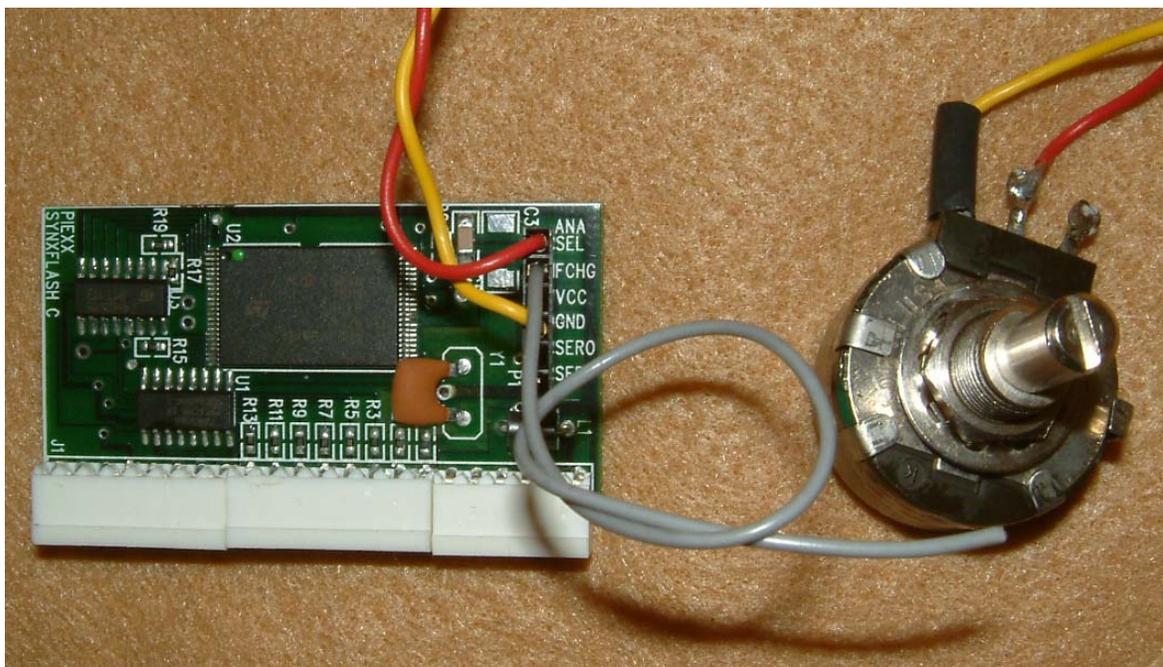
Bank 1 – 7 o'clock, or full counter clockwise position (>9K)

Bank 2 – 10 o'clock (6.8K to ground)

Bank 3 – 2 o'clock (3.3K to ground)

Bank 4 – 5 o'clock, or full clockwise position. (<1K to ground)

You can make a 2 bank selector by simply connecting a switch between the ANA SEL input and ground. When the ANA SEL is open, Bank 1 will be selected. When ANA SEL is at ground potential, Bank 4 will be selected.



The picture above shows a cable made to connect to a mode change pot. Notice the gray wire on the FCHG, pin 5, signal. For the mode change pot to work properly, the FCHG wire must be connected to HY3 pin 1 on the SyntorX personality board, as previously mentioned.

8. After the SynXFlash module is installed and programmed, reinstall the bottom plate of the transceiver.

Software Installation:

The SynControl Software is intended for operation under the Windows95/98, Windows ME or Windows XP operating system. Install the software by placing the provided CD in your CDROM drive, press the Start Icon (usually in the lower left of your desktop), proceed up to and press the Run selection of the pop-up menu. In the open dialog box type:

D:Prg\Setup

Where **D** is the drive designator for your CDROM drive. After entering the command line press enter, and the system software will be loaded.

Programming:

In order to download channel information into the SynXFlash module, the serial interface adapter must be connected to a free serial port on your computer and power must be applied to the SynXFlash module. There are two ways to apply power to the flash module:

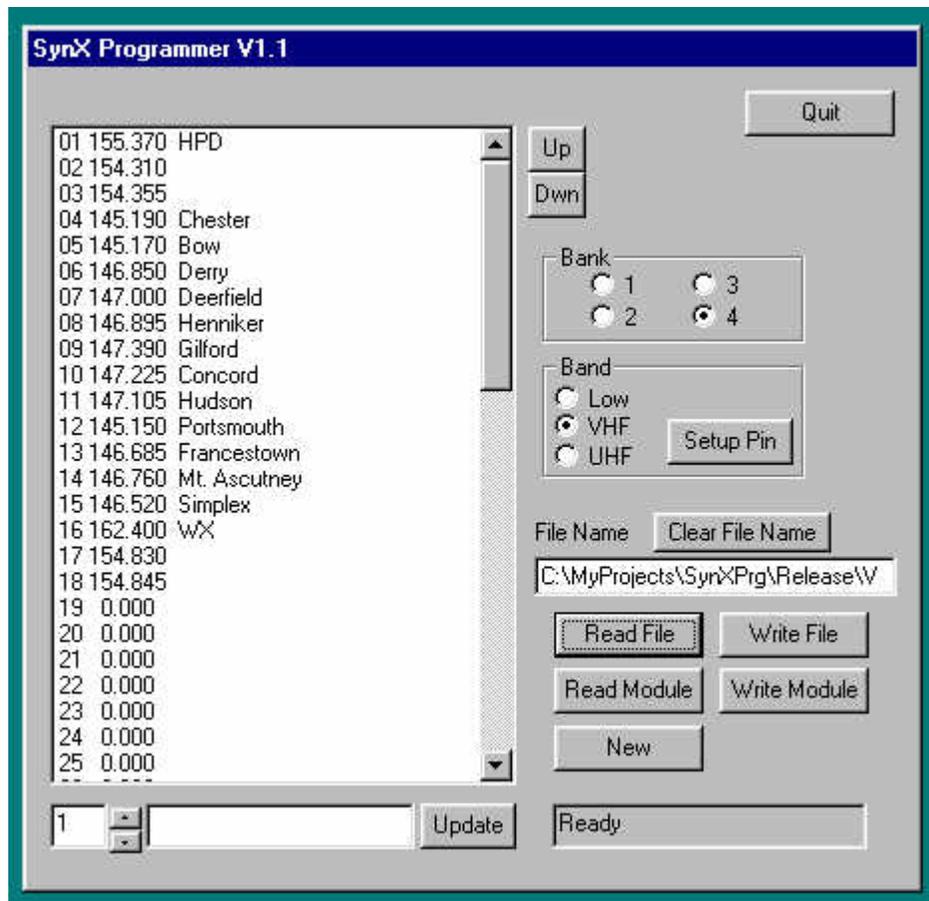
1. The SynXFlash module can be installed in the SyntorX transceiver with power applied to the radio.
2. With the SynXFlash module out of the radio, the Flash module can be powered through a wall transformer plugged into the serial interface adapter.

NOTE: If the power is applied via a wall transformer plugged into the serial interface adapter, the SynXFlash module must not be plugged into the SyntorX transceiver!

You will need to connect the serial interface adapter to the 6 pin connector on the memory module. Make sure that the plug is oriented with the orange lead connected to pin 1 of the SynXFlash module. Pin 1 is closest to the 22 pin interface connector.

It is not necessary to specify the serial port that the SynXFlash module is connected to as the SynXPrg will automatically search your computers serial ports, from COM1 to COM8, to determine the correct connection. In order for this search to be accomplished, the COM port connected to the SynXFlash module must not be in use by any other program.

With power applied to the SyntorX, or the serial interface adapter board, start the SynXPrg program executing by pressing the Start Icon and following the pop up menus to Programs, SynXPrg and finally Shortcut to SynXPrg. Click on Shortcut to SynXPrg, if all is connected properly the SynTalk Dialog box will appear on you screen.

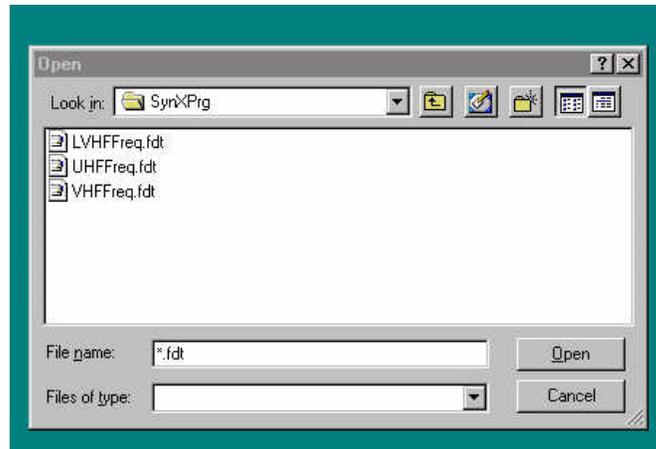


The Bank select radio buttons manually select 1 of 4 different radio channel banks. Each bank contains 64 possible memory channels and is unique. Each bank needs to be completely specified, including band and Pin data. Although it probably doesn't make much sense, the different banks could be setup to work with completely different radios. Selecting a bank does not automatically update the channel information. If you change to a different bank, and want to see what info is loaded in it, you must press the Read Module button. The default bank for the SyntorXFlash module is bank 1. **If you haven't connected the ANA SEL line to anything, make sure you program bank 1 as it will be the selected bank!**

You have 3 options for loading a channel list into the SynXPrg:

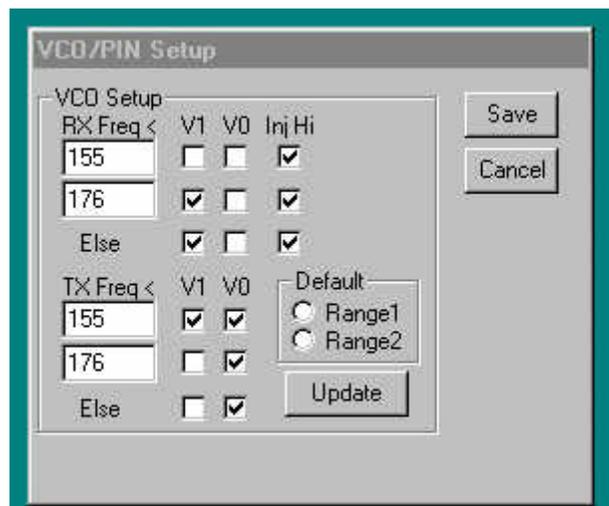
1. To load an existing filed channel list press the Read File button. If the File Name data box is empty at the time you press the Read File button, an Open file dialog box will appear prompting you to select a file name.

If you have entered the name of a frequency definition file in the File Name dialog box, the specified file will be opened if it exists.



2. You can load a channel list by uploading the current channel information from the SynXFlash module by pressing the Read Module button. You should press one of the Band radio buttons (Low, VHF or UHF) before pressing the Read Module button so that the program can be certain how to handle the frequency list returned from the module.
3. If you want to start a new list from scratch, press the New. This will set up a new, blank list of frequencies that you can update. You should press one of the Band radio buttons (Low, VHF or UHF) before pressing the New button.

After loading the channel list, you can make changes to it. The first thing you may want to check is the setting for the PIN switches as they are applied to the VCO. The VCO/PIN information can be modified by pressing the Setup Pin button.



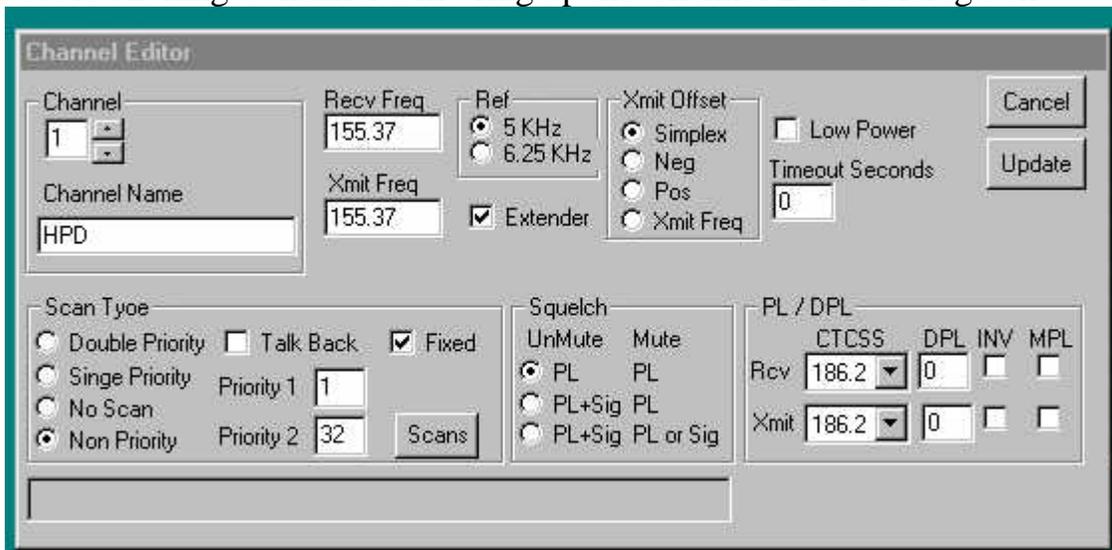
The VCO/PIN Setup dialog controls which of the SyntorX's pin switches will be applied as a function of frequency and mode (transmit or receive). For example, with the PIN setup shown in the picture above, if a receive

frequency less than 155 MHz is called for neither pin switch will be turned on and the VCO will be commanded to a frequency equal to the receive frequency plus the IF offset. The high side offset is indicated by the Inj. Hi check box being checked. If a receive frequency less than 176 MHz, but greater than 155 MHz, is requested the V1 PIN switch will be turned on. In general, the default setting of the pin switch table should be acceptable, but the program does allow for modifications to the table for non standard operations. Pressing the Default radio buttons will cause preset ranges to be displayed. The significance of the V0,V1 pin switches changes with different frequency SyntorX transceivers. That is, in the receive mode on a VHF radio the V1 pin switch is off to select the lower frequency ranges and on for higher frequency ranges, but this is not the case with a Low Band Syntor X.

Once a VCO/PIN setting has been made, and saved by pressing the Save button, this VCO/PIN setting will be linked with the channel list, so if you save the channel list with the Write File button the update pin table will be saved with it.

The Order of channels may be modified by highlighting a channel in the channel list, single left click on the channel, and then pressing the Up or Down buttons to move the position of the channel in the list.

To modify a channels setup, double click the channel in the channel list. Double clicking a channel will bring up the Channel Editor dialog box



The Channel Editor dialog allows you to modify the frequency and operational modes of a given channel. After making changes to a specific channel you must press the Update button for these changes to be saved. If you leave the Channel Editor dialog by pressing the Cancel button, any changes to that channel will be lost.

After the channel information is changed, and you have exited the channel editor, you will probably want to save your changes by pressing the Write File button. As with the Read File command, if there is a file name in the File Name data box, the file will be written with that file name. If the File Name box is blank when you press the Write File button, you will be prompted to browse for an appropriate file name to save the information to.

To save the updated channel information to the SynXFlash nodule, press the Write Module button. It takes about 15 seconds to erase and write the new channel information to the SynXFlash module.

Programming Notes:

The easiest way to familiarize yourself with the operation of the SynXPrg program is to install the kit into your radio with the computer attached and try out the various features while the radio is in operation. If you do this, after accessing the SynXFlash module, either with a read or write command, you may need to cycle the channel buttons on your control head for a given channel to be recognized. The SyntorX reads channel information when it wants to, and the upload / download of information may temporarily confuse the radio. The Revision C SynXFlash modules FCHG (Frequency Change) output line, if connected to the appropriate point on your SyntorX's personality board, will fool the radio into thinking that the channel buttons have been cycled automatically.

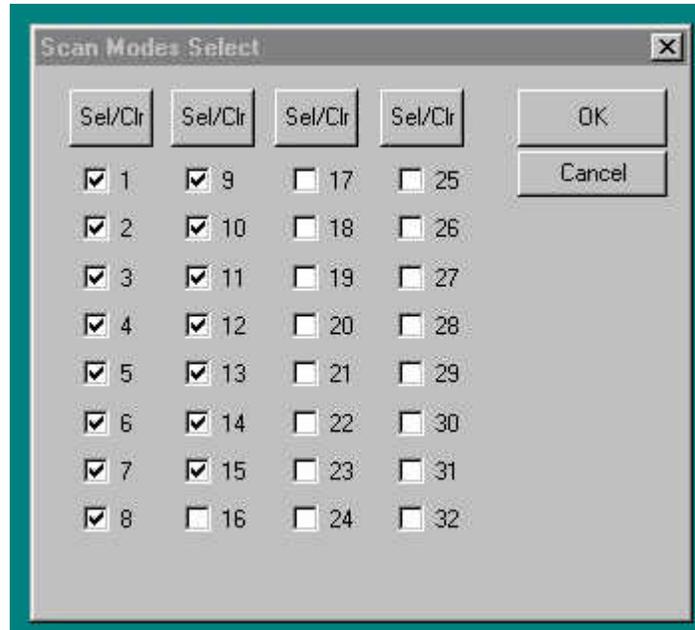
Ref- I generally like to use a reference frequency of 5 KHz, but the frequency generating algorithms will work with either. If a given frequency can't be achieved with the specified reference frequency the algorithm will get as close as it can, but this operation is not desirable. You should choose the reference frequency that is evenly devisable into the operating frequency.

Low Power- The low power check box, when checked, will command the transmitter to operate in a low power setting on the specified channel if the transceiver is equipped with the low power option hardware. Not many of the radios that I have used have been so equipped.

Timeout Seconds- Indicates the maximum allowed key down time for a given channel. If you enter 0 seconds, the transmission will continue as long as the radio is keyed. If you don't want to allow the transmitter to operate on a given channel, set the transmit frequency to 0 and select the Xmit Freq radio button in the Xmit Offset group.

Scan Type- There are quite a few option here and the operation is dependent on the accessory group (control head) connected to the radio. If you don't want to scan at all, just press the No Scan radio button and you are finished.

If you want to set up a channel to have scanning capability, you will need to select one of the three scan modes, Single Priority, Double Priority or Non Priority, and then select which channels will be included in the scan. Priority channels are set up on the Channel Editor dialog in the Priority 1 and 2 data boxes. Put the first priority in Priority 1 and the second, if used in Priority 2. Non priority scan channels to include are selected by pressing the Scans button.



Each channel that has a check mark in its box will be included in the non-priority scan. In the above example, channels 1-15 will be scanned, channel 16-32 are excluded. I excluded channel 16 because, in my channel setup, it is programmed to a weather channel that would always cause the scanning to stop when it chosen. Finish entering the Scan Modes selected and press OK to save and continue.

Selecting the Fixed check box will cause the radio to scan all selected non-priority channels. If you have the System 90s scanning control head, and you uncheck the Fixed check box, then the scan controls on the Systems 90 accessory will be able to select / deselect scannable channels.

Channel scanning is enabled by either a control wire in the cable set or Jumper JU1 on the SyntorX personality board. If you want to enable channel scanning and you don't have the Systems 90 accessories, you will need to install JU1 on the personality board. If you do have the Systems 90 accessories, remove JU1 and its function will be controlled by the Pri button on the scan head. If the Pri button is pressed in, scanning will be enabled as long as the scanning criteria for the selected mode is properly set.

When the Talk Back check box is selected, the channel that is currently selected becomes the transmitting channel when the transmitter is keyed up.

Squelch- There are three possible squelch modes. The first, PL-PL is the standard selection and allows the given channel to mute and unmute if the selected squelch tone is present or not. The second, PL+Sig-PL will cause the radio to unmute if the appropriate tone is detected and the receive signal strength exceeds the squelch threshold. In this mode, the receiver will mute when the PL tone is no longer detected. The last squelch mode, PL+Sig – PL or Sig will cause the radio to unmute if the appropriate tone is detected and the receive signal strength exceeds the squelch threshold, the radio will mute if the receive signal strength falls below threshold or the PL tone is no longer detected.

Power Adapter – If you wish to program the SynXFlash out of the radio, you will need to apply power from an appropriate wall transformer. The Wall transformer can be either an AC or DC type with the following specs:

AC, 6-13 VAC @ 50 mA or greater.

DC 8-18 VDC @ 50 mA or greater, either tip polarity.