Installation & Setup of SatPC32 & SatPC32ISS V3

Overview

Erich Eichmann, DK1TB, is the author of the software. His on-line manual at www.dk1tb.de/manual_e.htm is the basis of this paper. This is a visual summary. See the official online manual for the full treatment and all the details. This paper is written by Bruce MacAlister, W4BRU, Richmond, VA, USA.

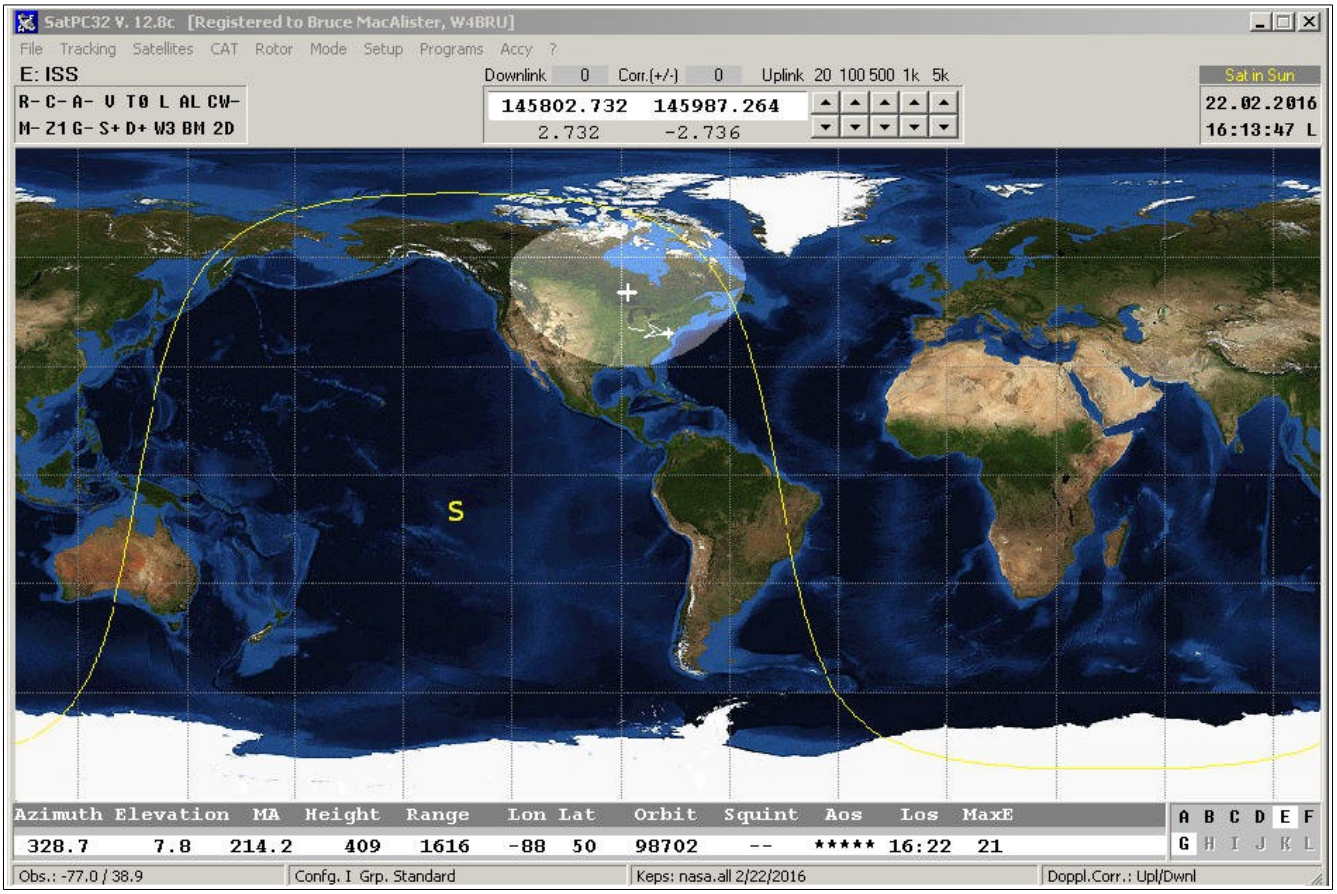

Illustration 1: ISS (+ in light circle) is approaching and is within radio-view of the museum (+ in Virginia)

Interpreting the display

The satellite is selected as described in “Configuration” on page 9. In Illustration 2 the light-shaded area is footprint of the radio signal. A sensitive ground receiver should be able to receive the signal within this area. As the arrow shows the satellite is moving southeast away

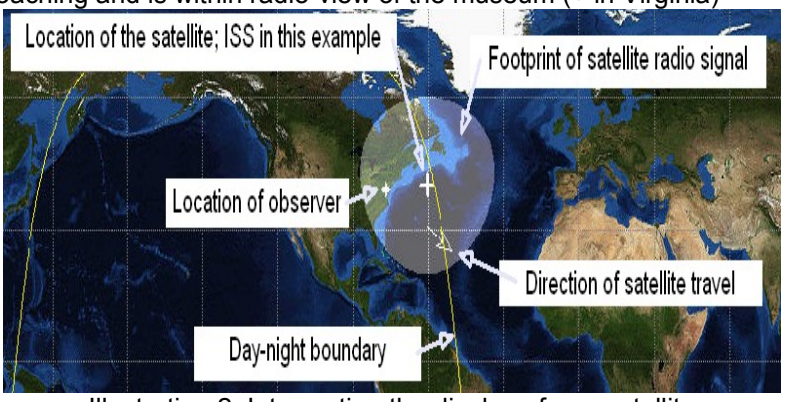

Illustration 2: Interpreting the display of one satellite

from the Observer (see page 6).

Key information and controls at the top

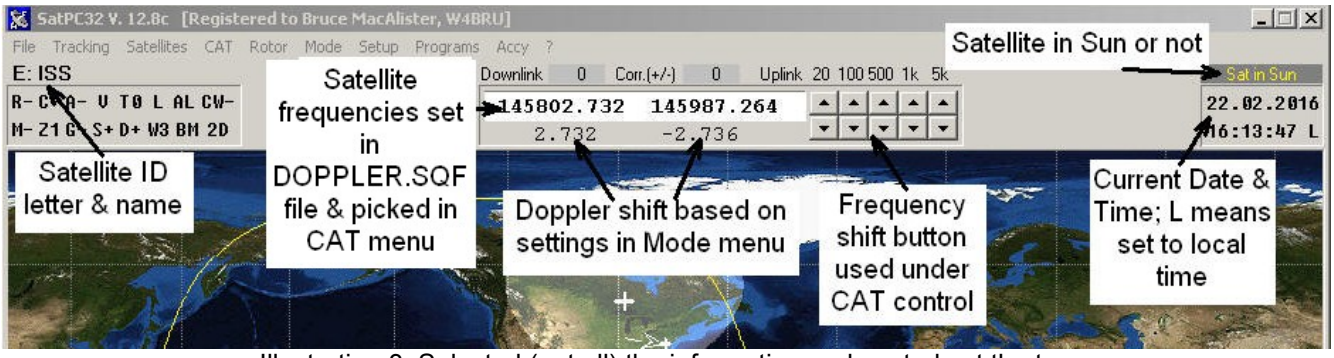

Illustration 3: Selected (not all) the information and controls at the top

Illustration 3 Shows the information and some of the controls at the top of the display. You select which satellite is shown on the top left with the “Satellites” control at the top as illustrated in Illustration 5. The letters in the box beneath the Satellite ID are controls explained in “Operation” on page 4.

The satellite frequencies are the standard ones for each satellite. They come with SatPC32. Frequencies can be changed in the file described on page 9.

Doppler shift is used with “CAT” (computer control of the transceiver) options. Standard Doppler shift settings for each satellite come with SatPC32.

Under transceiver CAT control the frequency shifts can be made manually with the arrows shown.

The far right shows whether or not the satellite is in the sun. For some amateur radio satellites, the output power level varies by whether or not it is in the sun.

The date and time in the upper right is important for planning to acquire a satellite signal. These can be changed from local to UTC depending on what is needed. If the information on an expected satellite pass is in UTC then that is the setting to use.

Key information and controls at the bottom

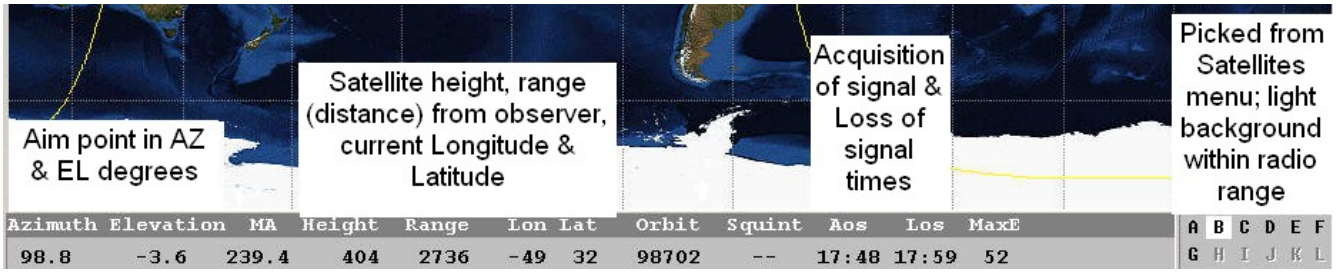

Illustration 4: Selected (not all) the information and controls at the bottom

The data and controls in Illustration 4 are at at the bottom of the display.

The Azimuth and Elevation are where to point the antenna. Obviously negative numbers mean the satellite is below the horizon.

Acquisition of signal (Aos) and Loss of signal (Sol) are key to knowing when to tune in and when the contact will no longer be possible. The times are local or UTC depending on your setting. That setting is describe in “Operation” on page 4.

The letters A, B, C, D, etc. at the bottom right are the satellites picked using the “Satellite” menu at the top. (See “Controls on the top, left to right” on page 9.)

Illustration 5 shows the selection available when “Satellite” at the top is clicked. See the online manual for instruction on moving satellites in this table.

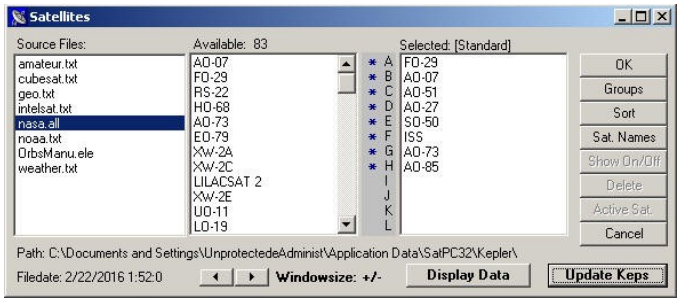

Illustration 5: Selecting which satellites to track

The letters in the “Selected” column in Illustration 5 are the A, B, C, D, etc. that shows at the bottom right of Illustration 4.

If a letter in the bottom right of Illustration 4 has a light background, that satellite is within receiving range even if it is not shown on the map display.

Click a letter if you want that satellite to be the one displayed. There is a glitch however. If one of the satellites in the “Selected” list is not active, that letter will not be active. When these screen captures were made, “E SO-50” was not active. To track “F ISS” the letter “E” had to be clicked. No matter; click until you get the satellite you want.

Information at the bottom

Illustration 6: Information at the bottom

At the very bottom of Illustration 1 is some information shown here in Illustration 6. Reading it left to right:

- The satellite being tracked is the International Space Station (ISS).
- The Observer is at longitude -77.0, latitude 38.9, information I entered in the "Settings" for "Observer". See page 6.
- The tracking information – the Kepler files – are from February 22, 2016.
- Doppler frequency adjustments are used for both up frequency and down frequency correction.

Operation

In the official manual (see page 1) this is called "a. Real time operation." The letter are in the top left as shown at the top of Illustration 1 and in the figure on the right. Click the letter to toggle it from on (+) to off (-). Copying directly from the official manual:

R Rotor control (automatic antenna tracking).

C CAT tuning (automatic Doppler tuning).

A Automatic satellite switching.

V VFO tuning (for tuning across the passband of a transponder while Doppler tuning is enabled).

M Multiple satellite display.

D Direction arrows indicating the movement of satellite footprints.

3D 3D world maps (toggles between 2D and 3D map display). The 3D map is not available when the smallest program window size is selected.

Z Zoom map display (only window sizes W1 – W3).

S Sun terminator and satellite eclipse indicator.

G Ground Track for the next orbit. Clicking once (Gt) displays the ground track for

a few seconds. Clicking twice (G+) displays the ground track continuously. The distance between 2 points corresponds to a 2-minute time interval.

CW Toggles between SSB and CW mode. This control is deactivated when the radio is in FM mode.

T Subaudible tone. For satellites such as SO-50 that require a subaudible tone on the uplink. Refer to the manual to determine if/how your radio model supports this function.

U (or **L**) Toggles the time display between UTC and Local time.

AL (or **Ct**) Toggles the display of AOS/LOS times and remaining times until next AOS (Countdown).

W Window size. Scrolls through the 5 available program window sizes. For additional Graphics choices, please refer to the instructions in the 'Options' menu (C II 7b).

Pl (or **BM**) Toggles between political and Blue Marble world maps.

Setting up the computer ports for the radio and rotor

To this author this was very confusing unlike N1MM and Ham Radio Deluxe that I was familiar with. Here is more detail than others may need but it is here for those similarly confused. This was done in Windows 7 Pro. Administrator privileges are required for setup. Other Microsoft Windows versions may work differently.

Device connection through device manager

The computers used had one serial port and many USB ports, see Illustration 7.

The serial port was connected to the serial input of an Icom CT-17 interface.

A USB port was connected to the EA4TX Yaesu G-232 compatible controller.

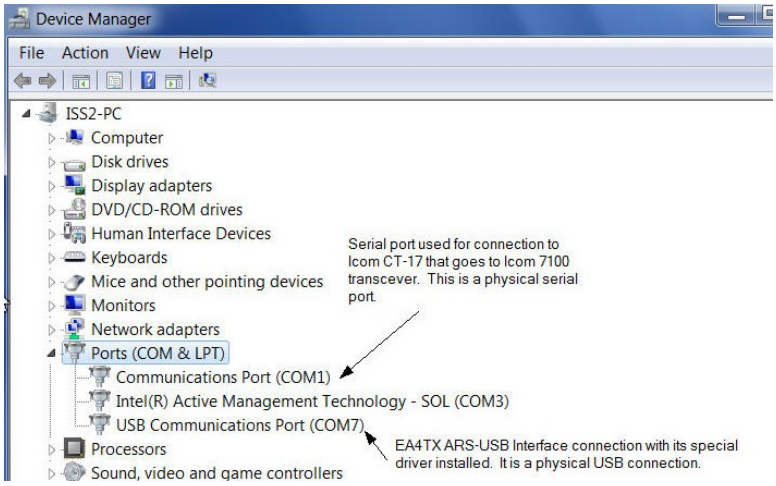

Illustration 7: Ports set for transceiver (serial) and rotor (USB)

The network (Ethernet) port should be disconnected before any of these devices are connected. Otherwise Windows will go on-line looking for a driver and, in this my experience, it was the wrong one that then has to be

deleted.

Put the driver CD for each device in the reader before connecting the device and point to it when Windows asks where to find the driver. Illustration 8 confirms that the driver installed is the one needed.

Illustration 8: Rotor device driver confirmed

Sat32PC Setup – the menu

With a summary of the displays above, here are the setup instructions.

The setup menu item on the top bar (Illustration 1) give the choices shown in Illustration 9.

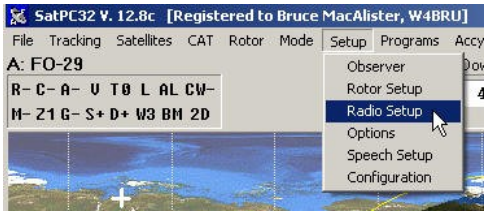

Illustration 9: Setup menu choices

In each setup display

1. The “Store” button must be pressed to save your entries.
2. The “Quit” button under “File” **must be used** to close Sat32PC for the change to take effect.
3. If the “X” in the upper right is used to close the program, **the changes do not take effect**, they are discarded.

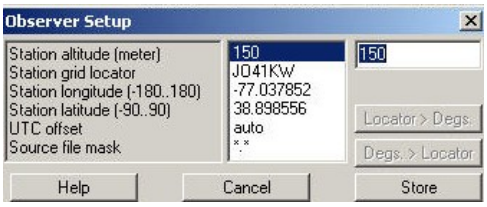

Illustration 10: Observer setup

Observer

This is the location of the **antenna** that will receive from and transmit to the satellite. Longitude and latitude are the most common entries. Grid locator is an option. The official manual (see page 1) gives all the choices.

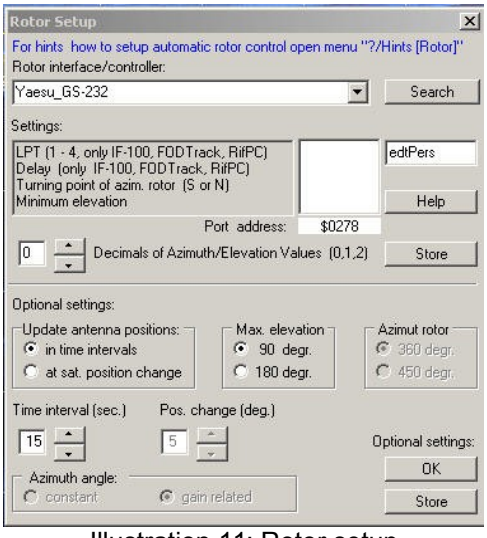

Illustration 11: Rotor setup

Rotor

Here you choose from the set of supported rotor interfaces. Besides choosing the rotor, you need to give other data. A combination of reading “2. Rotor Setup” in the official SatPC32 manual and checking the rotor manufacturer and/or rotor interface-box specifications will reveal the settings needed. The setting may also need to reflect obstructions to antenna movement. Under the “?” menu item at the top (see Illustration 20) there is a list of files. They give specific guidance for each rotor.

Here is a summary of the process:

1. You pick the rotor from the pulldown menu shown in Illustration 11.
2. Click the Store button. You get a message to close and restart Sat32PC for the changes to take effect.
3. Usually on the first restart you get an error message like that in Illustration 12 that the COM port is not working. It appears and then disappears; it is hiding behind the the Sat32PC display!
4. Minimize the Sat32PC display to see the error message.
5. Click OK to the error message.

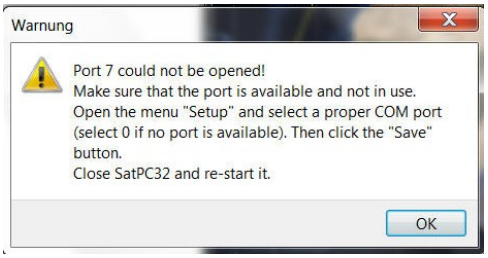

Illustration 12: Rotor port error


Illustration 13: Sat32PC icon left, SDX Server icon right

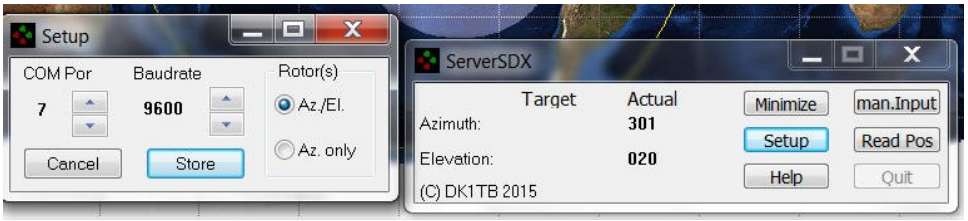

Illustration 14: SDX display right, left display from clicking "Setup" in right display

6. At that point the either the SDX display will appear (Illustration 14) or the SDX icon will appear at the bottom of the Windows display (Illustration 13). If only the icon appears, click it so that the SDX display appears.
7. In the SDX display, click setup. Here you specify the COM port you set up for the rotor (Illustration 7) as shown in Illustration 14.
8. Use the “Quit” option under “File” to close Sat32PC and the restart it. You should not get the error message and the program should have access to the rotor controller.

Radio

Pick the radio from the list in Illustration 15. The exact transceiver may not appear in that list. In this example the radio to be used is an IC-7100. Checking “3. Radio Setup” in the official manual showed that the IC-7000 was the same from a control point of view. COM ports, voltages and other entries depend on the computer to be used and the radio's CAT interface. Under the “?” control at the top (see Illustration 20) there is a list of files. They give specific guidance for each radio.

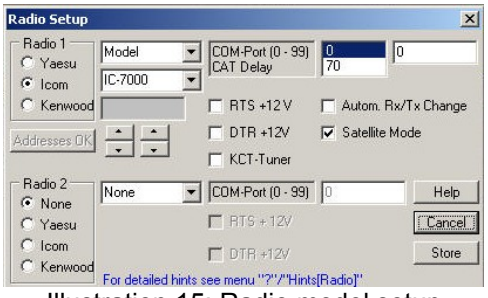

Illustration 15: Radio model setup

Here is a summary of the process:

1. Click the top pulldown menu, click Model and then choose the radio, Illustration 15.
2. Click the top pulldown menu, click Addresses and then choose the address, Illustration 16. **The addresses must be ones set of those seen in Mode** as shown in Illustration 19 on page 9. For Icom radios the internal address within the radio setup must be set to this address.The default the IC-7100 is 88 so it had to be changed to 60.

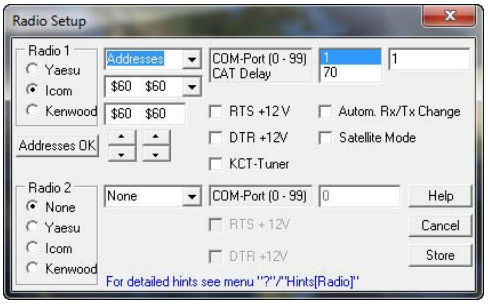

Illustration 16: Radio address setup

3. Click the top pulldown menu, click Baud and then choose the Baud rate set in the radio. The default of 19200 is the default for the IC-7100.
4. Check the setup of the radio to make sure the setting for it are compatible with what is entered in Sat32PC.

Options

This covers the display, what is to be activated when SatPC32 is started, and other such choices.

Speech

As an observed satellite gets close to Aos or approaches Los, a disembodied computer voice announces it. Depending on the language being used, there may be some choice of voice.

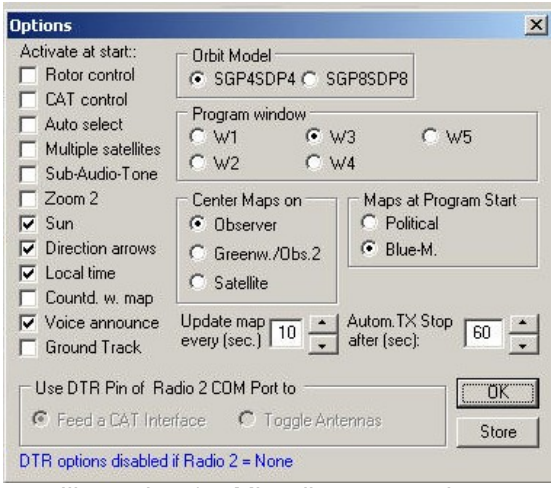

Illustration 17: Miscellaneous options

Configuration

Different configurations of radios, etc. can be set and then desired configuration can be chosen.

Controls on the top, left to right

File is mostly about the “Quit” choice. With it, changes you have made are saved. Using the “X” on the top left quits but does not save the current status.

Tracking will usually be “Realtime.” Check the official manual for other choices.

Satellites brings up the choices seen in Illustration 5 on page 3. The “Update Keps” button is most important. Satellites shift their orbits and this update makes sure the track stored in SatPC32 is up to date.

CAT is needed where the tuning of the radio is to be done by SatPC32. As shown in Illustration 18, you see the frequencies for the satellite you selected with the letter shown in Illustration 5 on page 3. When you select a frequency, its data are shown in Illustration 5.

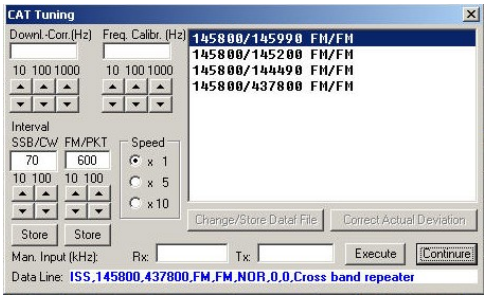

Illustration 18: CAT choices

The frequencies are in the file “Doppler.SQF.” It is shown in Illustration 21 on page 10. That is the place to add new frequencies for a satellite or add a new satellite not included in the SatPC32 list.

Under “4. 'CAT' menu” in the official manual (page 1) the other settings are used to fine-tune the controls based on the unique features of the radio combined with the frequencies and modes of the satellite. There are five pages describing the options and how they might be used.

Rotor is described on page 6.

Mode sets how Doppler shift is to be used with CAT control of the radio. Note the name of the radio in Illustration 19. When you set up the radio, the standard data in this display is set.

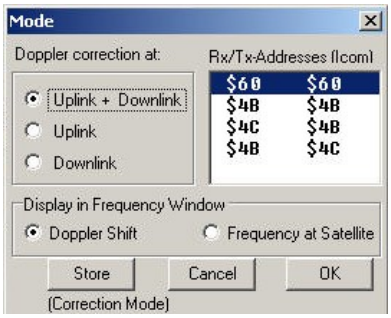

Illustration 19: Mode choices

Not all satellites require a Doppler shift for some QSOs. See the official manual under “6. 'Mode' menu” for the one and a half page description.

Radio is described on page 7.

Programs lets you select the other optional programs delivered with SatPC32.

Accy sets some parameters for an “Observer 2.”

? provides a list of files used by SatPC32. You see them in Illustration 20. “Hints” are important because they give detailed information for specific radios and rotors as well as recommendations for set up.

You can open and modify these files but ***you should first backup any file you choose to change***.

DopperSQF is where the frequencies for each satellite are kept. Illustration 21 shows a part of the list. Entries for a satellite can be changed.

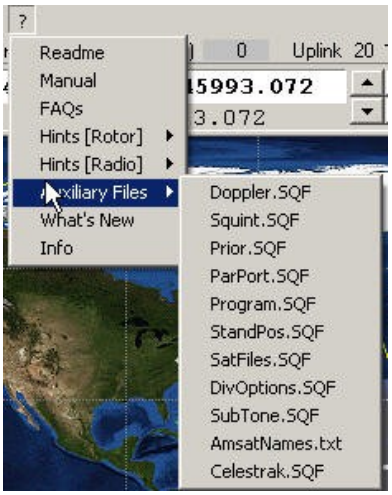

Illustration 20: ? menu

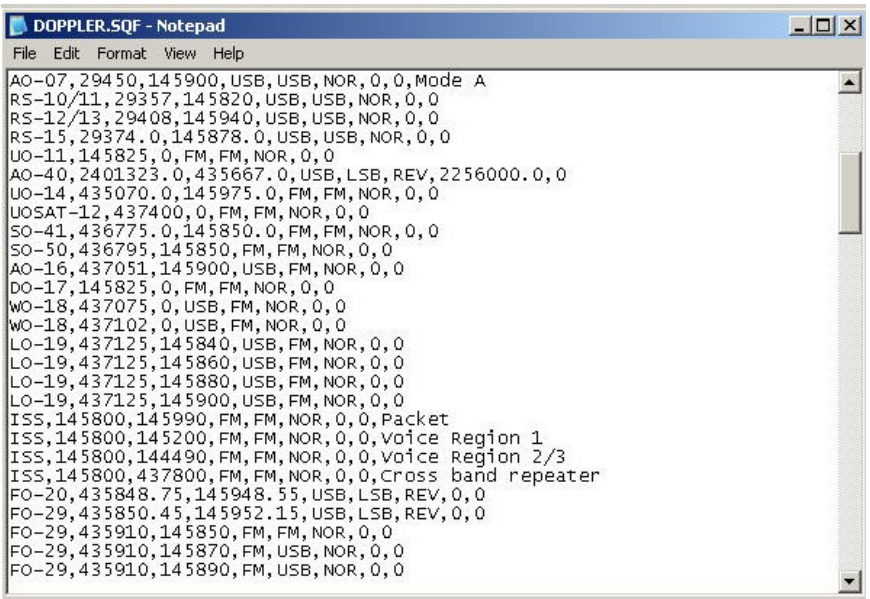

Illustration 21: Doppler.SQF satellite frequencies file