

## N4PY Orion Control Program Version 3.31

### Personal Computer

This program is a 32 bit windows program. Your personal computer is an integral part of the your transceiver. The minimum system requirements for your PC to operate your radio is a Windows XP system. Connect one end of the serial cable to the serial port connection of the radio and connect the other end of the serial cable to the 9 pin serial port connector on your PC. If your computer does not have a serial port, almost any USB to serial converter will work fine.

This program will work on the following Windows versions:

All versions of Windows XP (both 32 and 64 bit)  
All versions of Windows Vista (both 32 and 64 bit)  
All versions of Windows 7 (both 32 and 64 bit)  
All versions of Windows 8 and 8.1 (both 32 and 64 bit)  
All versions of Windows 10 (both 32 and 64 bit)

Screen resolution of at least 1024 X 768 is recommended.

For some versions of Windows 7 (not home premium), you must run the program in Windows XP compatibility mode. An indication that this is necessary is if each time you start the program, you get a different install number.

### PC to Orion Serial Connection

Connect a 9 pin serial port cable between the Orion and an available COM port on your PC. If your PC has only a 25 pin COM port available you will need to acquire a 25 to 9 serial port adapter. When you start the Orion control program for the first time you will need to tell the program which COM port the radio will be using. If needed, choose the appropriate COM port under the INTERFACE section of the SETTINGS panel.

It is also possible to use a USB to SERIAL PORT adapter to operate the radio over a USB port. Please refer to the adapter documentation for information on using a USB port as a Serial Port. Some USB adapters do not work very well and others work great.

### Basic Operation

Turn on the Orion using the front panel switch. You must wait until the Orion is fully operating. The Orion must always be turned on first before the program is started.

Start the N4PY Orion control program. The control program should connect to the Orion. If needed you may change the selected serial port in the INTERFACE section of the SETTINGS screen.

When using the Orion with this control program, do not attempt to use the controls on the Orion. All the program settings are then sent to the Orion.

I highly recommend getting the remote tuning pod. It enhances the use of the program a lot. It gives the user a programmable knob and 15 programmable buttons that can be configured in lot of ways

to enhance control of the Orion from the program.

The program also supports the LP-100A watt meter and LP-Pan panadapter from Telepost. See [www.telepostinc.com](http://www.telepostinc.com) for further details on these devices.

#### Direct Frequency Entry

You can enter a frequency for either VFO A or VFO B directly from the computer keyboard. Mouse click on the displayed frequency. You will see a flashing cursor on the digit you clicked. Then enter the digits from the keyboard. Once you have entered the frequency completely, press the "enter" key on the keyboard to have the frequency take effect. If you make a mistake, press the "ESC" key to cancel the entry so you can start over.

#### Mouse Wheel

There are options for the mouse wheel to be used for Frequency Tuning, Volume Control, Pod Knob, Frequency Tuning + Slider, and Pod Knob + Slider. These options are in the "Call Sign, TopTen" settings window.

You can tune the radio frequency by hovering over a displayed VFO digit and moving the mouse wheel. This allows for instant frequency tuning at almost any tuning rate you want. The supported digits are the all the digits to the right of the first decimal point in the displayed frequency area plus the MHZ digit. This works with both VFO A and VFO B.

If "Frequency Tuning" is selected, the tuning step size for the mouse wheel is the selected tuning step size.

The option called "Pod Knob" makes the mouse wheel simulate a Tentec remote tuning pod knob. If you use a mouse with a mouse wheel that can spin, this makes an excellent tuning knob. The mouse wheel can be assigned to any of the functions for the Tentec remote pod. I am using the Logitech MX 620 mouse as a pod knob with excellent results. If the mouse wheel seems a little slow, check the setting for "Tuning Knob Desense Factor" in the "Remote Pod Fkey" settings window. Set it to at 1 if you are not using the Tentec remote tuning pod. You can also make the mouse wheel have a high speed setting. In "Preferences4", you can set the "Sensitivity" to somewhere around 10 or so. This is the number of mouse wheel pulses received in 150 milliseconds. The higher this number is, the faster you have to spin the mouse wheel to go into high speed mode. The "High Speed Tuning Factor" is used as a multiplier for the frequency step. So once high speed is achieved, this factor says how much faster you move in frequency. I find a setting of 10 or so for each of these values works pretty well.

There are also two options that have "Slider" added to them. These options will allow any slider on the program radio panel to be moved with the mouse wheel when the mouse is over that slider. When the mouse wheel is not over a slider, either "Frequency Tuning" or "Pod Knob" will be in effect.

#### Remote Operation

There is now a new function called Client-Server. Read the file

"CSRemote.txt" that is included in your folder where you installed the program. This describes exactly how to do remote operation.

#### VFO Receiver Assignment

This Orion Control Program features a special mode called "Smart VFO". "Smart VFO" is an algorithm that dynamically assigns the best possible receiver to each VFO by analyzing the frequency of VFO A and VFO B. This analysis is done everytime either VFO is changed in frequency. When the VFO assignments change, they occur seamlessly with little or no awareness of this from the operator. This results is the most versatility and ease of operation possible from the Orion and RX340. The "Smart VFO" algorithm goes as follows:

If the RX340 is not to be used with the Orion, VFO A and VFO B are assigned as follows:

If VFO A frequency is within 10 khz of a ham band:

VFO A - Orion main receiver  
VFO B - Orion sub-receiver

If VFO A frequency is not within 10 khz of a ham band:

VFO A - Orion sub-receiver  
if VFO B frequency is within 10 khz of a ham band  
    VFO B - Orion Main receiver  
if VFO B frequency is not within 10 khz of a ham band  
    VFO B - no assignment

If the RX340 is used with the Orion, VFO A and VFO B are assigned as follows:

If VFO A frequency is within 10 khz of a ham band:

VFO A - Orion main receiver  
VFO B - Orion sub-receiver or RX340 (see Interface2)

If VFO A frequency is not within 10 khz of a ham band:

VFO A - RX340  
if VFO B frequency is within 10 khz of a ham band  
    VFO B - Orion Main receiver  
if VFO B frequency is not within 10 khz of a ham band  
    VFO B - Orion sub-receiver

The "Smart VFO" algorithm is in operation unless you manually override it with the "SmtVFO" button. If you click this button, then the receiver assignment steps through all the valid choices manually. The current receiver assignment can be seen just below the "SmtVFO" button. This will step through all valid combinations and finally return to "Smart VFO" being enabled again. This is indicated by the "SmtVFO" key showing the selected color.

If at any time "Smart VFO" is not enabled and a frequency is selected that is not allowed on the main receiver, "Smart VFO" will be

automatically reenabled.

For all normal operation, the "SmtVFO" button should be highlighted on. Only for very unusual situations such as frequency calibration should you click this button and go to manual receiver assignments.

The current radio assigned to each VFO is shown in small letters just under the "SmtVFO" button. The first radio listed is for VFO A, and second radio listed is for VFO B.

#### VFO Transmitter Assignment

If "split" is turned off, the Orion transmitter is always tuned to VFO A. If "split" is turned on, the Orion transmitter is always tuned to VFO B. This is, of course, only true if the transmitter frequency is within 10 khz of a ham band.

#### VFO Assignment Indicators

There is a VFO assignment status indicator in the upper left side of the program radio panel. It will show "Main", "Sub", or "RX340" first for the receiver assigned to VFO A, and then show the receiver assigned to VFO B if there is one.

#### Control Panel Buttons

##### Special Right Click on Mode Button

All the receive mode buttons (AM, LSB, USB, CW, FM, SAM, RTTY) have a special function if "DUAL" receive is turned on. If you right click the mode button, they will send the mode, default filter, and default AGC to the VFO B receiver instead of the VFO A receiver.

##### Tx Ant (Transmit Antenna)

This button controls which antenna the transmitter will use. It has two values. This key can only be used if the main receiver is using the receive only antenna. Otherwise, the transmit antenna is the same as the main receiver antenna.

In the "Tx Ant1", setting, the transmitter uses antenna 1.  
In the "Tx Ant2", setting, the transmitter uses antenna 2.

This setting is remembered in the band button settings.

##### M Ant (Main Antenna)

This button controls which antenna the main receiver uses.

In the "M Ant1" setting, the main receiver is connected to antenna 1.

In the "M Ant2" setting, the main receiver is connected to antenna 2.

In the "M AntR" setting, the main receiver is connected to the receive only antenna.

Left clicking this button will move the antenna selection from 1 to R to 2. Right clicking this button will move the antenna selection from 1 to 2 to R.

This setting is remembered in the band button settings.

There are two selections in "Preferences3" to skip antenna 2 or the receive only antenna selection if you do not have these antenna positions connected to the Orion.

S Ant (Sub Antenna)

This button controls which antenna the sub receiver uses.

In the "S Ant1" setting, the sub receiver is connected to antenna 1.

In the "S Ant2" setting, the sub receiver is connected to antenna 2.

In the "S AntR" setting, the sub receiver is connected to the receive only antenna.

Left clicking this button will move the antenna selection from 1 to R to 2. Right clicking this button will move the antenna selection from 1 to 2 to R.

There are two selections in "Preferences3" to skip antenna 2 or the receive only antenna selection if you do not have these antenna positions connected to the Orion.

This setting is remembered in the band button settings.

BinRx (Binaural Receive)

This button toggles the setting of Binaural receive in the receiver assigned to VFO A.

DUAL

This button controls the dual receive function. If this button is off the VFO B receiver will always be muted. With this button on, both the VFO A and VFO B receivers will be heard. Also, if this button is off, no data will be sent to the VFO B receiver until DUAL is turned on.

Right clicking the "DUAL" button will turn on "A=B Frequency Tracking". This mode is indicated by a "DIV" showing up just above the DUAL button. With this mode on, VFO B will automatically follow VFO A in frequency. To turn off this mode, left click on the "DUAL" button. The purpose of this mode is for diversity reception from two receivers at the same time. For true diversity reception, the two receivers must have separate antennas.

Please note that if "DUAL" is off, all updates to the VFO B receiver will be saved and not actually sent until "DUAL" is switched on.

#### ManMD (Manual Mode)

This button controls whether or not filter and step information automatically change when a new mode is selected. With this button off, when a new mode is selected, a new filter and step will automatically change according to the mode. With this button on, only the mode will change when a new mode is selected.

#### Polling

This buttons turns on Orion frequency polling. The program will send out frequency, mode, and filter requests for VFO A at 1 second intervals for version 2 and 2 second intervals for version 1. This allows the program to keep up with changes made directly on the Orion. Having "polling" turned on will cause some interference with the operation of the program front panel buttons. This is because the buttons cannot be read while a poll request is in progress. The recommended operation is to do all the control from the program front panel and have "polling" turned off. But, if you want to use the Orion controls directly, have "polling" turned on. This will allow logging programs to get and set information to and from the Orion by using the Pegasus "Ten-Tec File Interface". You must tell your logging program you are using a Pegasus. In this mode, you should never try to set any values to or from the Orion with the N4PY control program.

If you turn on polling, any frequency correction values will be ignored while polling is going on. Also, with polling on, the remote tuning pod will not be under program control but will instead be under direct Orion control. With polling turned on, the power output level is only changed when you specifically move the TX slider.

#### AM

Clicking this button will put the VFO A receiver in AM mode. Right clicking this button with DUAL on will put the VFO B receiver in AM mode. Note that on the Orion, while in AM mode, the true filter bandwidth is twice the indicated bandwidth. So a reading of 4000 for filter BW while in AM mode, is really a BW of 8000 for the Orion.

#### LSB

Clicking this button will put the VFO A receiver in LSB mode. Right clicking this button with DUAL on will put the VFO B receiver in LSB mode. If the rx340 is assigned to VFO A, right clicking this button with DUAL off will put the rx340 in ISB lower sideband mode.

#### USB

Clicking this button will put the VFO A receiver in USB mode. Right clicking this button with DUAL on will put the VFO B receiver in USB mode. If the rx340 is assigned to VFO A, right clicking this button with DUAL off will put the rx340 in ISB upper sideband mode.

## SAM (Synchronous AM)

The mode "SAM" is for synchronous AM. It is not really sync AM, but the next best thing. This mode simply turns on the BFO and sets the step size to 1 Hz. You must carefully zero beat the AM carrier by slowly tuning for this mode to be effective. This mode is much more tolerant to AM signal fade.

For the RX-340, if you click the SAM button while in another mode, you will first get SAMB which is SAM with both sidebands. If you left click again on the SAM button, you will get SAML which is SAM in lower sideband. If you then left click the SAM button again, you will get SAMU, which is SAM in upper sideband.

## CW

Left clicking this button will put the VFO A receiver in LCW mode. Normal CW mode uses LCW which causes tones to increase as the frequency is increased. CWR mode uses UCW, which causes tones to decrease when the frequency is increased. You select CWR by right clicking on the "CW" button. An interesting side effect of this mode is you can tell when you are tuned directly onto a CW signal by swapping back and forth between CW and CWR mode. If the pitch of the signal does not change, you are perfectly tuned to the signal.

If DUAL is on, right clicking this button will put the VFO B receiver in LCW mode.

There is an option in Preferences4 to reverse the use of LCW and UCW.

## FM

Clicking this button will put the VFO A receiver in FM mode. Right clicking this button with DUAL on will put the VFO B receiver in FM mode. For the RX-340, if DUAL is off and the RX340 is assigned to VFO A, right clicking the FM button will setup everything to receive DRM. This DRM setup will set the mode to USB, the filter to 16 kHz, the AGC to slow, PBT to +2000 and set the radio frequency down 12 khz from the GUI.

## RTTY

This mode is used for any digital mode you may want to run. Its default setup is for RTTY. It sets a frequency offset of 2125 hertz and turns on the accessory input for transmit audio, and uses LSB mode.

You can change the button name, frequency offset, and transmit mode through the "RTTY, KB Settings" window of the "settings" menu.

You can also reverse the selected sideband. If you click on the RTTY mode button while RTTY mode is already selected, the selection for the RTTY sideband will be reversed. This is indicated by the color of the RTTY key changing from blue to red. The same also holds true for the second RTTY mode, which is selected by right clicking the RTTY button.

If you want to use the Orion in true FSK mode, select FSK for the mode. The offset has no meaning in this mode and is ignored.

If you store an RTTY mode station in a memory, there are actually 4 RTTY modes. They are named in the memories as follows:

"RTTY" = RTTY mode 1  
"RTTY2" = RTTY mode 2  
"RTTYR" = RTTY mode 1 with reversed sideband  
"RTTY2R" = RTTY mode 2 with reversed sideband

There is a way for logging programs to select RTTY mode 1 or RTTY mode 2 automatically. If a logging program set an SSB mode that is in the CW portion of a band, if RTTY 1 real mode matches the SSB mode, then RTTY mode 1 is selected. If RTTY mode 1 does not match, then RTTY real mode 2 is checked for a match. If it matches, then RTTY mode 2 is selected. In this way, logging programs can now select RTTY mode 1 or RTTY mode 2.

If DUAL is on, right clicking this button will put the VFO B receiver in RTTY mode 1.

Sto 1 (Store to Scratch Pad 1)

This button stores the frequency, mode, and filter in temporary scratch pad memory 1 for later retrieval.

Rcl 1 (Recall from Scratch Pad 1)

This button first stores the frequency, mode, and filter in temporary scratch pad memory X and then retrieves the values of frequency, mode, and filter, last saved with the "Sto 1" button.

Sto 2 (Store to Scratch Pad 2)

This button stores the frequency, mode, and filter in temporary scratch pad memory 2 for later retrieval.

Rcl 2 (Recall from Scratch Pad 2)

This button first stores the frequency, mode, and filter in temporary scratch pad memory X and then retrieves the values of frequency, mode, and filter, last saved with the "Sto 2" button.

Sto 3 (Store to Scratch Pad 3)

This button stores the frequency, mode, and filter in temporary scratch pad memory 3 for later retrieval.

Rcl 3 (Recall from Scratch Pad 3)

This button first stores the frequency, mode, and filter in temporary scratch pad memory X and then retrieves the values of frequency, mode, and filter, last saved with the "Sto 3" button.

Rcl X (Recall from Scratch Pad X)



This button retrieves the values of frequency, mode, and filter, last saved in scratch pad X when Rcl 1, Rcl 2, or Rcl 3 was clicked.

#### STORE

STORE opens the Store Memory window and prompts you for station data. You can also add a PBT value to the saved memory. If you edit the memory window, you can add "PBT=" text to specify a PBT value to be set when the memory is recalled. For example, if you want a PBT value of 1000 hertz, anywhere in the "Notes" box add the following text:

```
PBT=1000
```

For a minus 1000 hertz PBT add the following:

```
PBT=-1000
```

Make sure not to have any spaces on either side of the "=".

#### RECALL

RECALL brings up the Recall Memory window and allows you to select stations.

#### Scan

Clicking the "Scan" key will cause the stored memory file to be scanned one frequency at a time, beginning at the current entry. The time spent on each memory is called the dwell time. The dwell time is specified in the preferences window. It must be between 1 and 99 seconds. The default dwell time is 2 seconds. All the memories in the loaded memory file will be scanned. When it gets to the last entry, it will start over at the first memory of the file. You will most likely make special memory files to use this scan feature. You can stop the memory scan by clicking again on the "Scan" button. If you add the word "skip" in lower case anywhere in the "notes" section of a memory, the memory will be skipped during the scan function.

The memory scan will be stopped if you transmit while the scan is in progress. You can configure an automatic resume time. See the "Preferences4" section.

#### VFO A

Left clicking this button will cause the main VFO A frequency to go down by one step amount. Right clicking this button will cause the main VFO A frequency to go up one step amount.

#### VFO B

Left clicking this button will cause the alternate VFO B frequency to go down by one step amount. Right clicking this

button will cause the alternate VFO B frequency to go up one step amount. You will not see the frequency change on the Orion unless DUAL and/or SPLIT is on.

#### FAST A (Fast tuning for VFO A)

Left clicking this button will cause the main VFO A frequency to go down by one step amount times the "Fast Tuning Mult". Right clicking this button will cause the main VFO A frequency to go up by one step amount times the "Fast Tuning Mult" amount. See "Fast Tuning Mult" below.

#### FAST B (Fast Tuning for VFO B)

Left clicking this button will cause the alternate VFO B frequency to go down by one step amount times the "Fast Tuning Mult". Right clicking this button will cause the alternate VFO B frequency to go up by one step amount times the "Fast Tuning Mult" amount. See "Fast Tuning Mult" below.

#### FILTER A

Left clicking this button will cause the main VFO A filter to go to the next wider filter. Right clicking this button will cause the main VFO A filter to go to the next narrower filter.

#### FILTER B

Left clicking this button will cause the alternate VFO B filter to go to the next wider filter. Right clicking this button will cause the alternate VFO B filter to go to the next narrower filter. The VFO B filter setting is displayed in the black area just to the right of the S meter. Here, there are three green indicators to show VFO B mode at the top, then VFO B filter just below mode, and finally VFO B step just below filter.

#### LO CUT

Left clicking this button will cause the next wider filter to be selected and move the pass band tuning to keep the high frequency cutoff constant causing the low frequency cutoff to move down by the change in filter bandwidth. Right clicking this button has exactly the opposite effect. The next narrower filter is selected and the passband tuning is moved to keep the high frequency cutoff constant causing the low frequency cutoff up by the change in filter bandwidth. This button is useful when QRM appears on the low side of the passband. It allows the low side of the passband to be tuned while keeping the high side of the passband constant. This button is only active in SSB mode.

#### HI CUT

Left clicking this button will cause the next narrower filter to be selected causing the high frequency cutoff to move down by the change in filter bandwidth and leaving the low frequency cutoff fixed

(the default low frequency cutoff with PBT off is 200 hertz). Right clicking this button has exactly the opposite effect. The next wider filter is selected causing the high frequency cutoff to move up by the change in filter bandwidth. This button is useful when QRM appears on the high side of the passband. It allows the high side of the passband to be tuned while keeping the low side of the passband constant. This button is only active in SSB mode.

PBT (Used with top drag window)

Clicking this button on enables pass band tuning for the VFO A receiver. Dragging the scale to the right of the button controls the amount of PBT used. You can right click on the PBT scale to zero it.

If DUAL is on, right clicking this button turns on PBT control for the VFO B receiver. The button will show "PBTb" indicating that the PBT drag window will now control PBT for the VFO B receiver.

RIT (Used with lower drag window)

Clicking this button on enables RIT for the VFO A receiver. Dragging the scale to the right of the button controls the amount of RIT used. You can right click on the RIT scale to zero it.

XIT (Used with lower drag window)

Clicking this button on enables XIT for the VFO A receiver. Dragging the scale to the right of the button controls the amount of XIT used. You can right click on the XIT scale to zero it. The XIT shares the same drag window as RIT.

A / B

Clicking this button causes the VFO A and VFO B contents to be swapped. This includes frequency, mode, filter, PBT, AGC, LOCK status, and antenna setting. You will not see the VFO B frequency change on the Orion unless DUAL and/or SPLIT is on.

A = B

Clicking this button causes the contents of VFO A to be copied into VFO B. This includes frequency, mode, filter, PBT, and AGC setting. You will not see the frequency change on the Orion unless DUAL and/or SPLIT is on.

SPLIT (Receive on VFO A, Transmit on VFO B)

Clicking this button causes the transmit frequency to shift from the VFO A frequency to the VFO B frequency.

LOCK

Clicking this button causes VFO A to be locked so that it does not change in frequency.

FAST, MED, SLOW, Pgm1, Pgm2, AgcOff

These buttons set the AGC speed. If "DUAL" is on, you can right click to set the AGC speed of the receiver assigned to VFO B. The AGC values for all 5 AGC settings are all adjustable. They each have sliders for setting decay and hang time in the settings menu. There also is a check box in each AGC settings window that if checked will use the Orion factory default AGC for that AGC value instead of the individual slider values. Additionally the settings windows for "Prog AGC1" and "Prog AGC2" each have an edit box to change the button text on the Pgm1 and Pgm2 AGC buttons on the program radio front panel.

AccInp (Accessory Input - mic or soundcard)

This button will switch the Orion MIC input between MIC and the Aux Input. The Aux Input is the white jack on the accessory cable. This is normally used for digital modes to bring audio in from the soundcard of the computer. In order for this button to work in Acc input position, the Orion SSB menu must have "Tx Audio Source" set to "BOTH". Note that this will not cause any audio to come in from the MIC, because when this is selected, the MIC gain is set to 0. The converse is also true. You should leave the Orion setting at "BOTH" all the time. Also, when one of the RTTY digital modes is selected from the program, the program will automatically turn on AccInp. Also note, the Mic gain slider actually changes function between Mic and Aux Input gain depending on which one is selected.

Step Buttons

These buttons set the frequency step size according to their value. They are user definable in the "Steps" window of the "settings" menu. If a step other the Orion supported steps is used, the Orion will be forced to a 1 hertz step. The program will use the step you have selected. Left clicking these buttons changes the VFO A step size. Right clicking these buttons changes the VFO B step size.

Band Buttons

These buttons are band register buttons. They return you to the last frequency and mode you were using on the appropriate band section. The column labelled "CW" is for the normal "CW" section of that band. Clicking these buttons will return you to the last frequency and mode you were using when in this section of the band. The column labelled "SSB" will return you to the last frequency and mode you were using when in this section of the band. The "SWL" column will return you to the last frequency and mode you were using when in this band. The "GEN" band button is a general band register that gets used if the frequency is not in any other band. The band buttons save the frequency, mode, filter, and antenna setting for each band.

The "60" button under SSB, is a special button. In order to handle the unique requirements of this band, this button has a special click feature. Once you are on the band, you can toggle through the 5 band channels by left clicking to go down one channel or right clicking to go up one channel. New priviledges now allow CW on the center

frequency of each channel. If you set CW mode while on 60 meters, then left and right clicking the 60 meter band button will move you to each center frequency of each channel for CW.

Also, you can access the ham band buttons with the function keys. Shift F1 to Shift F9 corresponds to the 160 to 10 meter SSB band buttons and Ctrl F1 to Ctrl F9 corresponds to the 160 to 10 meter CW band buttons. You can look at the Orion keypad to remember which band each function key corresponds to. Also, remember "Shift" is for SSB, and "Ctrl" is for CW.

#### AMTN (Amp Tune)

The AMTN (AMP TUNE) button is to make tuning an amplifier easier. When you click the "AMTN" button, several steps happen automatically. They are

- 1) The current mode and frequency is saved in the scratch pad memory.
- 2) The frequency is moved up 5 kHz.
- 3) CW mode is set.
- 4) A wide filter is selected.
- 5) The Step rate is set to 1 kHz.
- 6) The remote tuning knob is set to ALC to control power.
- 7) The Orion ALC (power) level is set to the previous saved value for this band and mode.

While the "AMP TN" button is "RED", you should first make sure the frequency is clear. If it is not, tune to a clear frequency with the mouse by clicking the radio panel knob. Once a clear frequency is found, key your rig with your PTT or CW key and tune your amplifier. Use the remote tuning knob to set the Orion output power to correct drive level. When the AMP is tuned, click the "AMP TN" to exit this mode. The frequency, mode, and step will be restored to original values. The Orion power output value will be saved and used anytime "AMP TN" is again clicked. This value is kept separate by band and mode. Try this function out. It is a real time saver. The more you use it, the more you will like it. There is also an option to use amptune to just tune your tuner and not key the amplifier. See "AMPTUNE DISABLE KEYING LOOP" below.

There is also a "pulse tune" method when using Amp Tune. This feature is enabled by setting "PTT Amp Tune Pulse" check box in the "preferences3" window of the "settings" menu. When "AmTn" is on, clicking the "PTT" button will cause a pulsing action to help tune an amplifier in a 50 percent duty cycle instead of 100 percent.

There is also an option in Preferences3 to have the power restored to what it was when before amp tune was turned on when amp tune is turned off. This is useful if you are using this feature to tune a tuner instead of an amplifier.

#### TUNE

The power when the "TUNE" button is clicked is remembered. When you click "TUNE", set the power to what you want the tune power to be with the Tx slider. When you click "TUNE" off, the power will be restored to the previous value. The next time you click "TUNE", it will remember the tune power value and set it to this value. Try it, it may save your finals! This option may be overridden with the "No Tune Save" option described in the "Preferences3"

section.

## ID

The ID button is to activate a 10 minute ID timer to assist in meeting the 10 minute FCC ID requirement. Clicking this button causes it to turn blue and start a 9 minute timer (The FCC requirement is 10 minutes, this gives you 1 minute to ID). When this timer expires, a sound is emitted and the button flashes between red and blue. The next time you transmit, the button goes back to blue. To turn the timer off, click the button again and it will go black, indicating the timer is now off.

There is an option in "Preferences3" called "Auto Cw ID". Setting this check box on, will cause the ID timer to send your call sign in CW each time the timer expires if you have transmitted during the 10 minute interval. The call will be sent at a fixed speed of 20 words per minute. You must be in either LSB or USB mode, split must be off, and the CW keyboard keyer must be off for this to work. If you are transmitting at the time the ID timer expires, it will wait until you are finished transmitting before sending out the call sign.

If you right click the "ID" button and you are in SSB mode, it will send a CW ID immediately.

## Transmit Disable

This key is used to enable and disable the transmitter. If the button red, the transmitter is disabled. This is useful for CW code practice or when leaving the station to prevent the transmitter from being accidentally keyed.

## Call

This button brings up the call sign window. In order to use this feature, you must have the BuckMaster CDRom installed. Once you have installed the BuckMaster database on your hard drive, you can set the "HamCall Drive Letter or Path" in the "Preferences" window to "c:\ham0\" without the quotes. This will allow calls to be looked up without the BuckMaster CDRom in its drive.

## Calibrate

This button is at the very top of the main radio window. This button allows automatic computation of the Orion's frequency correction factor. It must be used in the following way:

- 1) Make sure Polling is turned off.
- 2) Tune in WWV at 10 MHz on VFO A.
- 3) Turn on ManMd.
- 4) Set a tune step size of 1 hertz.
- 5) Alternating between USB and LSB, tune in WWV so that it sounds the same between USB and LSB.
- 6) Once it is properly tuned, click the "Calibrate" button.

This will cause the display to change to 10.000.000 MHz and a new frequency correction factor will be saved. Please note

that this function is not available while frequency polling is being used. The frequency error at 10 mhz is used to compute the error at all other frequencies.

Additionally, after the calibrate has been done, if you wish to match the sub-receiver frequency precisely to the main receiver frequency, proceed as follows:

- 1) Make sure Polling is turned off.
- 2) Tune in WWV at 10 MHz on VFO A.
- 3) Set the step size to 1 hertz.
- 4) Set the mode to USB.
- 5) Right click on DUAL.
- 6) Tune VFO B until the flutter noise beating stops.
- 7) Once it is properly tuned, click the "Calibrate" button.
- 8) Select "No" for Calibrate.
- 9) Select "Yes" to match receivers.

There is an additional calibrate procedure if the RX340 is attached that allows the Orion to be precisely matched to the RX340. This procedure should be performed on each band segment that you want precise matching. The assumption is the RX340 has been adjusted to be exactly on frequency and this procedure will match the Orion's frequency to the RX340. I use an old crystal calibrator signal as a comparison signal to match the two receivers.

With the RX340 either assigned to VFO A or VFO B:

- 1) Make sure Polling is turned off.
- 2) Tune VFO A to a signal and then click A=B.
- 3) Now click "DUAL" receive on.
- 4) Now tune the Orion receiver until the received signal sounds exactly the same pitch in both receivers. Use a 1 hertz tuning step.
- 5) Click "Calibrate" and answer the message box question with a "Yes".

Now the two receivers are exactly matched for that band segment. Note that this procedure must be repeated for each band segment you want perfect frequency matching between the RX340 and Orion. By band segment, this means you have to do this procedure once for the SSB band segment for each band, and again for the CW band segment for each band.

In order for this procedure to operate, the two vfo's must be within one kHz of each other and you must be on a CW, SSB, or SWL band.

Please note that this function is not available while frequency polling is being used. Also, once a frequency error is determined and being used, the step on the Orion will always be set to 1. Also, if frequency polling is used, the frequency calibrate value will be ignored while polling is going on.

## Speech

This button turns the speech processor and off and on. When the speech processor is turned on, you will see the word "Sp xxx", where xxx is the level of speech processing, near the main frequency. The level of speech processing is set with a slider in the SSB settings menu. It has a range of 0 to 100 with 0 being no processing and 100 being maximum processing.

## TxLoop

This button allows the Tx Loop enable line for your amplifier to be controlled from the front panel. A "TXL" indicator comes on to tell you when TxLoop is enabled. This is to allow easy access to the TxLoop control for amplifiers that do not have a standby mode. The TxLoop setting is remembered individually by antenna setting. If you have antenna 1 as the transmit antenna, the TxLoop setting corresponds to the Amp Key 1 line. If you have antenna 2 as the transmit antenna, the TxLoop setting corresponds to the Amp Key 2 line.

## Main Display Panel

The main display area contains information about A and B VFO's, tuning steps, AGC selection and Local/UTC time. The Larger of the frequency displays is VFO-A; VFO-B the smaller. During key-down the Transmit VFO will change color.

## Mode Selection

Select the mode for the current VFO using the mode buttons. To set the transmit mode in split mode select A/B, set the mode and press A/B again. In Simplex the current VFO's mode will be both the receive and transmit mode.

## PTT (Manual PTT)

The PTT button provides manual PTT control. With Manual PTT control you can place the Orion into transmit mode from the radio panel. This is equivalent to pushing the PTT control on a microphone connected to the front panel. This control is useful for operating digital modes, such as PSK-31. This button is either a momentary function or a toggle function depending on the setting of "PTT Toggle" in "Preferences3".

## Vox

Toggle VOX operation ON and OFF. The button text will change color whenever VOX is turned ON.

## Mon

The mon button allows you to hear your transmit audio. Use it when adjusting microphone or audio input levels. The Level control for the monitor is provided in the SETTINGS panel.

## Mute

Used to temporarily silence the received audio.

## Noise Blanker

The noise blanker slider is labelled "NB". This control operates the



Orion DSP noise blanker.

The noise blanker has values of 0 to 9. Value 0 turns off the noise blanker. Value 9 is for long pulse noises, value 1 for short pulse type noise. You should use the lowest value that gives you good results.

The "NB" label is also a button. If DUAL is on or SWEEP is running, clicking the button will change its text to lower case and the slider will then control the VFO B receiver.

HNB (Hardware Noise Blanker)

The hardware noise blanker is turned on and off with the "HNB" button. This control operates the Orion hardware noise blanker.

SQ (Squelch)

This slider is labelled "SQ". It controls the squelch setting of the VFO A receiver. This slider is shared with the CW sidetone volume slider. When in CW mode, the sidetone slider is active. When not in CW mode, the squelch slider is active.

Stv (Sidetone Volume)

This slider is labelled "Stv". It controls the CW sidetone volume setting. This slider is shared with the squelch slider. When in CW mode, the sidetone slider is active. When not in CW mode, the squelch slider is active.

Main AGC TH (AGC Threshold Control)

This slider is labelled "AGC TH". It sets the AGC threshold for the main receiver for the current band. It's value is remembered by band. This control will have no effect for slow, medium, or fast AGC if the box in the corresponding AGC settings window labelled "Use Orion \*\*\* AGC" is checked. By checking this box, you can defeat use of this control and use the Orion AGC controls directly.

The slider label for this control is also a button that can toggle the control between AGC threshold and AGC decay. In the "AGC Dcy" position, this control will control the AGC decay for the selected AGC speed.

Sub AGC TH (AGC Threshold Control)

This slider is labelled "Sub AGC TH". It sets the AGC threshold for the sub receiver for the current band. It's value is remembered by band. This control will have no effect for slow, medium, or fast AGC if the box in the corresponding AGC settings window labelled "Use Orion \*\*\* AGC" is checked. By checking this box, you can defeat use of this control and use the Orion AGC controls directly.

VA (Volume VFOA)

This slider is labelled "VA". It controls the volume for the VFO A

receiver unless the VFO A receiver is the RX340. The RX340 does not have a software control for volume.

#### VB (Volume VFOB)

This slider is labelled "VB". It controls the volume for the VFO B receiver unless the VFO B receiver is the RX340. The RX340 does not have a software control for volume.

#### RF (RF Gain)

This slider controls the RF gain for the VFO A receiver. The label for the slider is "RF". This "RF" label is also a button. If dual receive is on, clicking this button changes the RF gain control to control the RF gain for the VFO B receiver. The "RF" label changes to lower case "rf" to indicate the RF gain control is now controlling the VFO B receiver.

#### Atn/Pre (Attenuator/Preamp, left click=attn, right click= Preamp)

The Atn/Pre button activates the RF attenuator and preamp associated with the VFO A receiver. Left clicking this button controls the attenuator and right clicking this button controls the preamp. The RF attenuator actually has 4 positions. They are 6 db attenuation, 12 db attenuation, 18 db attenuation, and off. Off is indicated by just seeing the letters "Atn/Pre". The Orion sub-receiver does not have a control for the preamp. It is always on. The RX340 only has one attenuator position. It is 15 db.

#### AtB/Pre (Attenuator/Preamp for VFOB, left click=attn, right click= Preamp)

The AtB/Pre button activates the RF attenuator and preamp associated with the VFO B receiver. Left clicking this button controls the attenuator and right clicking this button controls the preamp. The RF attenuator actually has 4 positions. They are 6 db attenuation, 12 db attenuation, 18 db attenuation, and off. Off is indicated by just seeing the letters "AtB/Pre". The Orion sub-receiver does not have a control for the preamp. It is always on. The RX340 only has one attenuator position. It is 15 db.

#### Filter Buttons

The radio panel provides 12 buttons for quick access to the most often used filters. Each of these 12 buttons can be programmed with your choice of filters. To see the filter options right-click on any filter. Any of the 57 filter choices may be assigned to any filter button. Note that on the Orion in AM mode, the actual filter bandwidth is twice the indicated bandwidth. Thus, in AM mode, a 4000 hertz filter is actually 8000 hertz wide.

If DUAL is turned on, then right clicking a filter button sets the filter for the sub-receiver.

#### QSK (Qsk or Semi button)

There is a Qsk/Semi button. Left clicking this button will change the CW QSK delay value. It will alternate between a QSK value and

a semi-breakin value each time you click this button. If you want to change the values used by this button for semi and QSK delays then proceed as follows:

To change the QSK button delay value for Qsk

- 1) Set the button so it says "Qsk".
- 2) Set the CW Qsk slider in the CW settings window to the desired value.
- 3) Right click on the Qsk button.  
The button will change to highlighted indicating the Qsk value has been changed. It will stay highlighted until the button is left clicked again.

To change the QSK button delay value for semi-breakin

- 1) Set the button so it says "Semi".
- 2) Set the CW Qsk slider in the CW settings window to the desired value.
- 3) Right click on the Semi button.  
The button will change to highlighted indicating the semi-breakin value has been changed. It will stay highlighted until the button is left clicked again.

AN (Auto Notch)

The automatic notch depth is set with the "AN" slider. The range is 0 to 9 with 0 being the off position. It will seek out and null all constant carriers in the receiver passband. This notch works well for SSB mode but is not useful in CW as it tends to notch out the desired signal. The "AN" label is also a button. If DUAL is on or SWEEP is running, clicking the button will change its text to lower case and the slider will then control the VFO B receiver.

NR (Noise Reduction)

The DSP noise reduction is controlled with the "NR" slider. Its range is 0 to 9 with 0 being the off position and 9 being the most aggressive. This noise reduction system mathematically identifies desired signals and tracks them with a set of adaptive filters. The "NR" label is also a button. If DUAL is on or SWEEP is running, clicking the button will change its text to lower case and the slider will then control the VFO B receiver.

MN (Manual Notch used with top drag window)

This button controls turning on and off the manual notch. The PBT slider is shared with the manual notch slider. If you click the "MNotch" button, the PBT slider becomes a notch slider. There will be a little "N" that appears near the slider. If you then select "PBT" the slider returns to PBT mode, and a "P" appears near the slider. The manual notch width is controlled with the "NW" slider. 10 hertz notch width corresponds to the bottom of the "NW" slider, and 300 hertz notch width corresponds to the top of the "NW" slider.

SAF

For firmware version 3, clicking the "SAF" button will control turning on and off the SAF (Selective Audio Filtering) setting. With SAF on,

the manual notch controls will now control the SAF center frequency and width. The PBT drag window will show an "S" when the SAF center frequency is controlled by the PBT drag window. Please note the SAF frequency and width setting are remembered by mode.

Special right click on "Split" key

Right clicking on the "split" key is used as an automatic FM repeater split function. A repeater offset is automatically set in VFO B and "split" is turned on when you right click on the "split" key and you are in an FM repeater band and in FM mode. The split offsets are calculated according to receive frequency as follows:

- 29.6 to 29.7 MHz - Down 100 kHz
- 53 to 54 MHz - Down 1 MHz
- 144.9 to 147 MHz - Down 600 kHz
- 147 to 148 MHz - Up 600 kHz

### Tuning Selections

When setting an "F" key on the remote pod to tuning selections, it will toggle between VFOA, VFOB, PBT, RIT, ALC, VOL, and RFG. VOL is for volume. Also, each key can be defined to expressly set one of the tuning knob functions. In addition to the functions that were already there you can directly define each function key to set the remote tuning knob to go to VFOA, VFOB, PBT, RIT, ALC, VOL, or RFG. This is done on the remote tuning pod configuration box. You can also make one of the function keys be a "PTT" key by selecting the "PTT" entry. There is also a "RF Gain" entry. When this is selected, the remote tuning knob will control the RF gain setting. Also, see the "Remote Pod Keyboard Definition" section.

There are sliders on the main control panel for Transmit Power (TX), and Keyer Speed (KS).

The keyer speed slider on the CW settings panel is a coarse adjustment. It has a range of 40 wpm. The KS slider on the front panel is a fine adjustment. It has a range of 15 wpm. The intended use is for you to set the speed on the CW panel one time to set the general range you want. When you do this, you should first set the front panel in the middle and then use the CW panel setting to get the middle of the range you want. You then use the KS slider on the front panel as a fine adjustment of 15 wpm of the coarse range set from the CW panel. This allows the setting of keyer speed to not be touchy. In addition, if the keyer is enabled, the keyer speed is digitally displayed below the keyer slider on the front panel.

You can also change the keyer speed one word per minute at a time. If you left click the "KS" above the "KS" slider you will go down one word per minute. If you right click the "KS", you will go up one word per minute in keyer speed.

The upper of the two front panel offset drag control is for PBT and Manual Notch setting. The tuning rate of both these drag controls may be user configured. The lower of the two front panel offset drag controls is for RIT and XIT. This controls a single offset in hertz that may be applied to RIT or XIT depending on which is turned on. This is similar to the implementation of the offset function in the OMNI VI. This allows you while listening to a DX station, to tune in the

station he is working with the RIT control, and then switch to XIT to actually work the DX station. Note that RIT and XIT only apply to VFO A.

### Frequency Slider Bar

The Frequency Slider displays a coarse view of the band. The displayed band width of the bar will depend on the selected tuning steps and the setting of "Variable Frequency Scale" in "Preferences3".

The radio can be tuned using the Slider. Click and hold the left mouse button on the Slider Bar display and drag left or right. The frequency display will show the change and the radio will follow. Double click within the Slider Bar display to jump to a new frequency.

If the area in the frequency bar has a blue background, that area is mainly for CW operation and SSB operation is not allowed. If it has a green background, that area is for SSB operation and all modes are allowed. If the area has a red background, then transmit is not allowed there. See the "License Class" feature for how to define these areas.

### S Meter

There are two S meters that can display in the S meter area. If "DUAL" is on, there is a lower red meter bar that will come on to show the S meter reading the receiver assigned to VFO B. There is also an S meter compensation value that you can define to calibrate your S meter. See "S METER COMP" in the "Preferences4" section. This compensation affects the main and sub-receiver, and also the sweep sensitivity.

### Using the Spectrum Display

The Spectrum Display or Sweep Window provides the operator with the ability to quickly scan the radio bands and produce a visual representation of station activity. Several user-selectable settings are available to control the width of the sweep, sweep center frequency and display features.

### Sweep Result Display

While the radio is sweeping through the selected frequency range the display will change to show each new point as it is processed. When the sweep is complete the radio will return to normal operation and the result window will keep the last data displayed until a new sweep is performed or the program is restarted.

The sweep result window provides several types of information. The left and right hand boundaries indicate the start and stop points for the sweep. The range is determined by the range setting. The vertical scale provides a relative comparison between different signals. The higher the point the bigger the signal.

## Sweep Pulse Width

This box is used to select how many pixels wide each plotted sweep pulse is. Wide pulses yield a fast sweep time but low resolution. Narrow pulses yield high resolution but slow sweep times. The first selection is called "Default Pulse Width" and lets the program decide the width. This box has no effect if "High Resolution" is checked since that size uses a fixed 1 pixel width size.

## Sweep Center Frequency

The operator may choose to let the sweep center frequency be the same as the receiver tuned frequency with the TRACK\_RECEIVER option or select MANUAL and enter the center frequency in the box provided. The MANUAL operation allows for the sweep of frequencies removed from where the radio is tuned. There is also an option called "Band Center". This option puts the center of the band you are currently tuned to in the center of the sweep window and automatically adjusts the width to match the band segment.

## Sweep Range

The amount of spectrum covered in each sweep can be set using the Sweep Range control. The default range is 300 kHz.

## Starting and Stopping a Sweep

Pressing the SWEEP button will begin the sweep acquisition of data for the sweep display. The process involves tuning the receiver to each frequency and getting a signal strength reading. The display is updated with each new point as it is gathered. To stop a sweep in progress press STOP at any time.

There is a selection for spectrum sweep called "MaxHold". When this is selected, only signals that are stronger than what is already displayed at that location will be changed. This allows the presence of strong signals that come and go to remain on the sweep screen.

There is a selection for spectrum sweep called "Integrate". When this is selected, the sweep display is integrated over several passes with the formula:

$$\text{Displayed Value} = \text{Previous Value} - \text{Previous Value}/4 + \text{New Value}/4$$

Thanks to KH7T for this formula.

There is also a "High Resolution" check box on the spectrum sweep. Selecting it causes the sweep display to show a large increase in resolution. However, the sweep speed is significantly slowed down when this is on. You can decide between speed and resolution with this setting.

There is a "Wide Sweep" check box on the spectrum sweep. Selecting it causes the sweep display width to double. A program restart is required for the sweep panel to change size.

There is a "Use Main Receiver" check box. Checking this will cause the sweep to be performed using the main receiver instead of the sub-receiver. The audio will be muted while this sweep is running. Use of the main receiver can produce a greater dynamic range than the sub-receiver.

#### Main Window Title

The VFO A frequency is displayed on the main window title. This allows the frequency to be seen when the radio control panel window is minimized. This is very useful as it allows you to tune with the remote tuning knob and see the frequency while minimized.

#### Local/UTC time Display

The local time and UTC are displayed in the lower right hand corner of the black display area to the right of the frequency. There is a Local/UTC time correction in the Preferences window of the settings menu. This is the amount of time in hours to be added to local time to get UTC. There is also a check box for local time to be displayed in 24 or 12 hour format. Some common time zone values for this Local/UTC correction are as follows:

ADT	+3
AST	+4
EDT	+4
EST	+5
CDT	+5
CST	+6
MDT	+6
MST	+7
PDT	+7
PST	+8

The program calculates local time by first getting GMT from the windows system time. It then subtracts the above hours to get local time. You must have your windows time zone set correctly for this to work properly.

There is also a check box that says "Automatic DST". When you turn this check box on, local time and UTC will be calculated automatically. With this setting on, the above time zone correction values are ignored by the program. For this to work properly, your Windows time zone must be defined properly. This setting has no effect if you have turned on the setting "PC Keeps time in UTC".

#### License Class

You can define your license class and have your transmit privileges displayed on the frequency scale. You define your license class in the "preferences" section of the settings menu. You can also decide to have your transmitter follow your license class with a check box in this same area. When you define your license class, the background of the frequency scale will be blue for CW and digital mode only operation, green for phone operation, and burgundy for operation not allowed. If you select to have your transmitter follow your license class selection,

transmit will be blocked when your transmit frequency is tuned to a non-authorized frequency for your class.

When you select your license class, the last selection is called "foreign". This selection is for foreign countries that have different operating privileges than the U.S. It allows you to define your operating privileges via an ASCII file called "foreign.dat". Each line of this file defines a band segment you are authorized to operate in. There are 3 entries in each line. The first entry should be either "cw" or "phone". If "cw" is specified, it means the band is restricted to CW or digital modes. If "phone" is specified, it means the band has no bandwidth restrictions. The second entry defines the starting frequency for the band segment in MHz. The third entry defines the band segment end in MHz. There is a limit of 29 entries for the entire "foreign.dat" file. The supplied "foreign.dat" is an example of how one would define a file for a foreign country that had privileges identical to a U.S. general class license.

There are also entries in the orion.ini file to control the point that the band button segments for the 160, 80, 40, 20, 15, and 10 meter bands switch from CW to SSB. There is also one entry to control the switchover point between 40 SSB and the 41 meter SWL band. These entries are as follows with defaults as shown:

```
160 meter line=1.840
80 meter line=3.750
40 meter line=7.150
4041 meter line=7.300
20 meter line=14.150
15 meter line=21.200
10 meter line=28.300
```

You can change these values to the appropriate value for your countries usage in these bands.

There is also a "SSBRTTY.DAT" file that can be used to define the frequencies you want RTTY or SSB mode selected automatically when doing direct frequency entry. This file can have up to 28 lines for RTTY and 28 lines for SSB. Each line for RTTY must start with "RTTY", and each line for SSB must start with "SSB". Follow the mode name with a comma, followed by the starting frequency in mhz, followed by the ending frequency for the mode in mhz. This file can be edited with notepad or any ASCII text editor. Examining the file will show the exact format. The USA SSB and CW band limits are built into the program. This file is used to override those values.

#### Scratch Pad Memory Window

There is a scratch pad memory window. This window is toggled on and off using Alt-V. This window has a repeat of the Sto and Rcl buttons to manage the scratch pad memories and also shows you the frequency memory contents of each of the 3 scratch pad memories. The "SP Bkgnd" setting in the "Colors" settings window controls the background color for this window.

#### CW Keyboard Keyer

There is a CW keyboard keyer. It is turned on with the "Alt-K" key sequence. When the keyboard keyer is enabled, the letters "Cw Kb" will



appear to the right of the frequency scale. Pressing "Alt-K" again will turn off the keyboard keyer. Some buttons may cause the keyboard focus to move from the main radio panel causing the keyboard keys to not send CW. When this happens, either click on the radio front panel with the mouse or do Alt-K twice to restore the keyboard focus. Using the CW Keyboard will force the Orion internal keyer to be enabled. If you accidentally press the "enter" key while using the CW keyboard, it will put you into "direct frequency entry" mode. Press the "Esc" key to get back to CW keyboard mode or key in a frequency and press "enter" again.

The keyed characters will not be sent until a full word is typed. The space bar is necessary to define the end of a word. This allows words to be transmitted smoothly and also gives you an opportunity to correct a keying error before the word is transmitted. This full word feature can be turned off by un-checking the check box labelled "Transmit full words only" located in the "CW Keyboard" window.

The setting "Pop Out Window" when turned on allows the CW Keyboard window to go outside the main program window. This allows you to place it anywhere on the screen. However when this window is a pop out window, you will not be able to edit the CW memory text. In order to edit this text, you will need to first turn off the pop out selection.

The F12 key will toggle the CW Keyboard buffer between pause and transmitting. This key will allow you to type ahead while you are receiving. If the buffer is stopped, the "Cw Kb" will appear RED. If the buffer is transmitting, it will be black.

The speed and weight of the keyboard keyer are controlled with CW keyer speed and weight controls. Typing at the keyboard will cause the appropriate character to be transmitted in CW.

Special CW characters are as follows:

- BT is sent with the "-".
- SK is sent with the "\$".
- AR is sent with the "+".
- KN is sent with the "^".
- AA for traffic handling is sent with the "\*".

The above special character keys can be redefined with orion.ini parameters. To redefine these keys, with the program not running, find the following lines:

```
BT CHAR=(-)
SK CHAR=($)
AR CHAR=(+)
KN CHAR=(^)
AA CHAR=(*)
```

You can then change the key value that is in parentheses to change the key for the special character.

The "escape" key will immediately end sending and empty the CW internal keyboard buffer.

There is a CW Keyboard window for showing the contents of the CW keyboard buffer. This window is visible when the CW Keyboard is turned on. It may be hidden by clicking the "X" in the upper right hand corner of the window. You can make the window visible again by doing Alt-K twice. The

keyboard buffer is 500 characters long.

There are 5 memories that can be used with the keyboard keyer. The memories are loaded with the edit boxes on the "CW Keyboard" window. The memories are transmitted by pressing F1 for memory 1, F2 for memory 2, F3 for memory 3, F4 for memory 4, and F5 for memory 5. There are also 5 mouse buttons at the bottom of the radio panel labelled "M1" to "M5" to transmit the memories. There are also 5 CW Memory Tag edit boxes located in the "RTTY, KN Settings" window. These edit boxes will change the labels on the M1 through M5 memory buttons. You can use these tags to help remember what is in each memory. They are limited to 3 characters.

The special character "#" followed by a number from 1 to 5 can be placed in a memory to cause the contents of the memory number to be sent in place of the "#" character. This is useful to increase the size of a memory for a longer message.

The special character " (double quote) can be placed at the beginning of a memory to send a file instead of the text in the memory. When you start a memory with a " (double quote), you directly follow the " with the name of the file you want to send text from. The internal CW keyboard buffer is limited to 511 characters so the file cannot be larger than 511 characters. You can never be more than 511 characters ahead of what is being transmitted. The file must be built with an ascii text editor such as notepad. If you build the file with notepad, the actual name of the file will have a ".txt" added to it. The basic name itself must be 8 characters or less and not have spaces or special characters in it. The file must be located in the c:\n4py folder or wherever you have the program installed.

The special character "%" followed by a number from 1 to 9 can be placed at the end of a memory to cause a delayed repeat of the memory. The number 1 to 9 is the delay in seconds before the memory is resent. When the repeat function is active, a capital "R" will show in the keyboard display buffer. The repeat function is cancelled when any new character is added to the keyboard buffer or a new memory is selected with the F keys.

#### K1EL Keyer

The program has full support for the K1EL Winkey keyer version 4 or later. Information on getting this keyer can be found at [www.k1el.com](http://www.k1el.com). There is a check box in the CWsettings window labelled "K1EL Keyer". Checking this box causes all the CW setting controls to change to the K1EL settings controls. Using this keyer allows the keying to be much smoother, especially for Windows XP, NT, and 2000. The controls are as follows:

Additionally, if you are using the Winkey 2 keyer, the 4 buttons on top of the keyer will can be defined to be any function key on the computer keyboard. See section on modifying the Orion.ini file for details on how to do this.

#### "Key Spd" -

This slider sets the minimum range for the K1EL speed pot. The speed pot low end is set to this value and the high end is set to this value plus 15. Thus the range of the speed pot is always 15 wpm. Note that the actual keying speed of the K1EL is always set with the speed pot on the keyer itself. The "KS" slider on the program front panel will show the current speed but the "KS" slider cannot be used to change

the K1EL keyer speed. If you do not have a speed pot on your keyer, check the "No Speed Pot" box and the KS slider will control the keyer speed.

"Wgt" -

This slider controls the keyer weighting. A value of 50 is no weighting.

"Ptt Lead" -

This slider controls the lead time the PTT line is energized before keying begins. The values are in 10 millisecond increments. This is useful to control an amplifier to ensure the amplifier relay comes up before RF is applied.

"Ptt Tail" -

This slider controls how long PTT stays energized after keying stops. The value is in 10 millisecond increments.

"Key Comp" -

This slider controls the amount of keying compensation applied to all keying elements. It is in milliseconds and adds a fixed amount of milliseconds to all character elements.

"Dit Dah" -

This slider controls the dit/dah ratio and allows you to change it from the standard 1:3 ratio. A value of 50 corresponds to the normal 1:3 ratio. The range of the control is 33 to 66, with 33 being a 1:2 ratio and 66 being a 1:4 ratio.

"AutoSpace" -

This check box enables or disables the keyer's autospace function.

"CT Spacing" -

This check box enables or disables the keyer's contest spacing option.

"No Speed Pot" -

Turn this check box on if you do not have or do not wish to use the speed pot on your WinKey keyer.

"Reverse Paddle" -

This check box allows you to use a paddle with the dit and dah connections reversed.

"Iambic B" -

This list box selects between Iambic B, Iambic A, Ultimatic, and Bug operation.

"COM setting box" -

This box allows you to define the correct comport the K1EL keyer is connected to.

Consult the K1EL manual for more explanation of these controls. If you have the CW Keyboard turned on, you will get character echos from the paddle in the CW Keyboard window. This will show you what you the last 20 characters you have sent with the paddles.

#### Using direct entry from the keyboard

Keyboard frequency entry is always active while on the main radio panel unless the CW keyboard is active. If the CW keyboard is active,

you should first press the "enter" key to get into direct frequency mode. Entry works by simply typing in the frequency. You may also click inside the frequency display to edit the frequency as in a normal text box. If you enter a frequency that is above 1000, the program assumes you have entered the frequency in kHz. If the value is below 1000, the program assumes you have entered the frequency in MHz. If you begin the entry with a ".", the program assumes you are only entering the kHz portion of the current MHz you are tuned to. To enter a frequency below 1 MHz, start the entry with a "0" followed by the "." and then the kHz value. To enter 680 kHz, key in "0.680".

#### Remote Pod Keyboard Definition

All the keys on the remote pod are programmable. There are three entries in the settings window to define the keys. The entry "Remote Pod" is used to define the three function keys. The entry "Remote Pod 4-9" is used to define the 4 through 9 keys. The entry "Remote Pod 0-3" is used to define the 0 through 3 keys and the period key.

Most of the values you can select are self-explanatory. An entry labelled "5" would be for the "5 key" to define it just for direct frequency entry. An entry labelled "up 5" would be for the "5 key" to define it to turn on split and make VFO B be up 5 from VFO A. The entry marked "Band Bottom" takes you to the bottom of the band.

The entry labelled "AccInp Xmit" is a special one for slow-scan TV users. Clicking this button will cause the mike input to switch to accessory input, the Orion to go into transmit mode, and the monitor audio to come on. Clicking this again, will switch AccInp back to mike input, turn off transmit, and turn off monitor audio. This is extremely useful during slow scan TV sessions when you are changing from sending pictures to SSB to describe them. Also, when in this mode, the main program title adds additional text to note you are transmitting.

If you have the pod in RIT tune mode and RIT is on, if you press the pod RIT button again, it will set the RIT value to zero.

If you have the pod in PBT tune mode and PBT is on, if you press the pod PBT button again, it will set the PBT value to zero.

The entry marked "Up Numeric" causes that key to set "up numeric mode". When you follow this key with a numeric key it sets VFO B equal to VFO A plus the numeric value of the key and then turns on "split". Note that the zero key causes you to go up 10. This allows you have a "quick split" ability of 1 to 10 kHz without having to use all your numeric key definitions for this feature.

There are selections to define the pod keys as CW memory keys. Pressing keys defined this way will start the corresponding CW memory.

The nice part of all this is you do NOT lose direct frequency entry from the remote pod when you define the numeric keys for other things. All you have to do is press the "E" key first, and the pod is then put into numeric mode for direct frequency entry.

I leave it up to the creativity of the user to come up with a really nice remote pod key definition.

The following example is how I use my remote tuning pod to work a

Split DX pileup:

I tune the dx station in on VFO A. I soon find out he is listening say up 5. I press the "Up" key on the pod followed by the "5" key. Now VFO B is tuned 5 kHz higher than VFO A. This is a starting point. Next I press the "dual" button I have defined on the pod and I set the pod to tune VFO B only by pressing the pod's VFO B key. I don't need to lock VFO A because the pod is now only tuning VFO B. I also press the pod's "SPLIT" key at this time. Now anytime I tune the pod knob, I am only tuning the DX listening frequency and not the DX transmitting frequency. As soon as I hear the DX transmitting, I press DUAL to turn it off so I don't hear all the callers. When the DX listens to a calling station, I turn dual back on and tune the pod knob to find the caller. If I find the caller, then I call at the next opportunity. Because I am now transmitting right where the DX station was listening, I have a greatly increased probability of getting through. It works pretty well.

The "Remote Pod Fkey" window also has two entries to control the knob sensitivity for frequency tuning. They are:

"Tuning Knob Desense Factor" - This controls how much the tuning knob pulses are divided by to desensitize the tuning.

"Tuning Knob Desense Step Threshold" - This controls the minimum step size that the desense factor comes into play. I set this at 500 and use a desense factor of 10. The end effect is when I set my step size to 500 or greater, the knob pulses are divided by 10. This results in much easier tuning when using large steps.

"Pod Knob keys are Toggles" - With this check box turned on, all the pod knob functions are toggles. For example, if you press and hold a key defined for RIT, then while holding the RIT button, the pod knob will move RIT. Once the key is released, the pod knob will always return to VFO A control.

#### Pod Function Keys Without a Pod

There are over 25 pod functions that can be assigned to keyboard keys. You can get pod functions from the keyboard without having a griffin knob or TenTec remote pod. The pod functions for numeric 6 to 9 can be done with F6 to F9 on the keyboard. The pod function for the zero key can be done with F10. The pod function for F1 can be done with F11. You can also use the numeric 1 to 5 for pod functions 1 to 5 if the CW keyboard is turned off and you have defined that you have a griffin powermate. Additionally, if the CW keyboard is off, F1 to F5 will operate as pod functions for 1 to 5. Also, if the CW keyboard is turned on and the memory for the F key is empty, then the F key will work as a pod key. Please note the F keys only work as pod keys when the griffin powermate option is selected.

#### Preferences Menu Window

Local-UTC Correction - Enter in this box the difference in hours between your local time and UTC. If you are west of Greenwich, the values are positive. If you are east of Greenwich, the values are negative. If you have selected "PC Kepps Time in UTC", these values are reversed.

Mute Radio on Exit - This box sets what you want the radio speaker to do when you exit the program.

Local time uses 24 hour Format - this box selects if you want local time displayed in 12 or 24 hour format.

HamCall Drive Letter or Path - Use this box to define the location if your Buckmaster ham call data base. It can simply be your CD drive letter or if you have installed the database on your C drive it should read "c:\ham0\".

Memory Scan Dwell Time - this box defines how long the program stays on one frequency during a memory scan.

Dual Main in Left - Turn this box on if you want to hear the main receiver in the left headphone when dual is turned on.

Dual Main in Right - Turn this box on if you want to hear the main receiver in the right headphone when dual is turned on.

Dual Sub in Left - Turn this box on if you want to hear the sub receiver in the left headphone when dual is turned on.

Dual Sub in Right - Turn this box on if you want to hear the sub receiver in the right headphone when dual is turned on.

Note the above 4 audio routing boxes must have both the main and sub receiver selected somewhere. Also, the left headphone must have at least one setting and the right headphone must have at least one setting. Failure to set it this way will force the main in the left headphone and the sub in the right headphone.

License Class is described in it own section.

#### Preferences2 Menu Window

The default SSB PBT value can be used to set a default value of PBT that gets set anytime LSB or USB mode is selected. If this value is 0, then PBT will not be changed on a mode change.

The default filter positions for each mode are defined with numbers from 1 to 12. Number 1 refers to the top left filter button, number 2 refers to the top center button, and so on to number 12 for the bottom right filter button.

The default AGC setting for each mode is also defined in this window. The entry labelled "Do Not Use Auto AGC" simply means to not change the AGC setting when going to that mode.

The value of the "Fast Tuning Mult" can be set using the "Fast Tuning Mult" edit box in this window. This value controls the amount of step multiplication used when the "FAST A" and "FAST B" buttons are used. The default value is 10. If the step being used is 50 hertz and this has a value of 10, then when the "FAST A" and "FAST B" buttons are used, the step would become 500 hertz. This controls how much tuning speed up is invoked when using these buttons.

#### Preferences3 Menu Window

The second decimal point in the displayed frequency can be removed. This is useful if you are doing a lot of cut and paste operations. Use the "Remove Extra Decimal" check box.

The "Duplicate SAF in Sub" check box will cause the SAF settings for the main to be duplicated in the Sub if the mode for the main and sub are the same.

Setting the "Do not Restart Sweep" check box will prevent the spectrum sweep from restarting after transmit is finished if the sweep was on before transmit started.

Setting the "No Tune Save" check box will cause the tune power to always be whatever the ALC power slider is set to. Setting it unchecked will cause it to remember the value last set while tune was in progress.

When the "Variable Frequency Scale" check box is checked, the analog frequency scale will vary with the step size. For steps less than 100 hertz, the scale is multiplied by 100. For steps between 100 and 1000 hertz, the scale is multiplied by 10. For steps above 1000 hertz, the scale is unchanged. This scale change is primarily for people that do not have the remote tuning pod to aid in dragging the frequency. With this option unchecked, the analog frequency scale is fixed.

The "PTT Amp Tune Pulse" check box causes a "pulse tune" method when using Amp Tune. When "AmTn" is on, clicking the "PTT" button will cause a pulsing action to help tune an amplifier in a 50 percent duty cycle instead of 100 percent.

The "Amp Tune Restore Power" check box is for using the Amp Tune feature with a tuner instead of an amplifier. It will restore the power to whatever it was before amp tune was turned on when you turn off amp tune.

The "PTT Toggle" check box allows operation of the PTT functions from the PTT mouse button, space bar, and remote pod PTT button in 2 different ways. With PTT Toggle on, clicking the PTT button, pressing the space bar, or pressing the remote pod PTT button causes transmit. Transmit remains until this button is clicked or pressed again. With PTT Toggle off, these buttons operate as momentary functions. The PTT mouse button will cause transmit as long as the button is clicked, and transmit ends when the button is released. The space bar and remote pod PTT button when pressed will cause transmit and transmit will end when the key is released.

The "Use Space for PTT" check box allows the space bar to be used as a PTT button. The action of the space bar depends on the settings of "PTT Toggle" above.

For the Eagle and Argonaut VI, the "BW Two Ways" check box allows the BW knob on the radio to be used along with the Filter settings control in the program. The last one to be changed (i.e., radio BW Knob or program filter controls) is the BW you get. One word of caution with this option turned on - once in a while the BW may change to the radio knob setting if for any reason the knob setting changes value ever so slightly.

Setting the "Manual MIC AccInp" check box stops automatic changing between MIC input and acc input when changing between RTTY and other modes.

Setting the "Amp Tune Power Only" check box causes amp tune to only change the power setting. This is only useful for amplifiers that do not need to be tuned. Note that in order to set the correct power level for each band, this option must be turned off. Once all band power settings for the amplifier are set, then this option can be turned on giving you a one click operation for setting amplifier drive power.

Setting "Antenna 2 Active" off will stop the antenna 2 position from being a selection when you click the "M Ant" or "S ant" button. Set this off if you do not have an antenna 2 connected to the Orion.

Setting "Receive Ant Only Active" off will stop the receive only position from being a selection when you click the "M Ant" or "S ant" button. Set this off if you do not have a receive only antenna connected to the Orion.

Setting the "PC keeps time in UTC" check box assumes time on your PC is kept in UTC time. Un-checking this box assumes time in your PC is kept in local time. This value is used in displaying local and UTC time in the radio panel.

When the "Using Touch Screen" is checked, the buttons that require a left and right click such as "VFO A", "VFO B", "FAST A", and "FAST B", will be split in the center. On a touch screen you cannot quickly right click, so when you want to right click, instead you press the right side of a split button. Please note that when turning this setting on, a program exit and restart is required so the screen can be redrawn.

Setting "Round off Frequency when Step Changes" causes the frequency to be set to a multiple of the step size when the step size changes.

Setting "Auto Mode Determination from Transfer File" will cause the program to determine the mode entirely from the frequency information supplied in the transfer file when using the tentec file interface from an external program such as a logging program. This setting bypasses the mode information in the transfer file and lets the program determine the mode from its own frequency to mode algorithm. This setting is useful when the logging program supplying the input file does not have the correct mode in the file.

The "Auto Memory File Entry Select" check box, when on, causes an entry in the memory file that corresponds to the current tuned frequency to be automatically selected. This automatic selection only occurs if the memory file has been sorted by frequency. With this check box off, this selection does not occur. The reason for setting this off is a performance reason. Under some circumstances, this automatic selection can slow down tuning of the radio.

The option "Frequency Event Timer" is explained in the "Frequency Event Timer" section.

There are scale factors for the main radio window to control its size. For horizontal scaling use the SCALE X edit box. It is a multiplier for the horizontal scale.

For vertical scaling use the SCALE Y edit box. It is a multiplier for the vertical scale.

The scale factors are used as multipliers of all coordinates in the



program. With these values set to 1, the size of the main radio window will be unchanged. To make the window 10% larger in both axis use a value of 1.1 for each scale factor. To make the window 10% smaller, use 0.9 for each scale factor. You must exit and restart the program for the change to take effect.

#### Preferences4 Menu Window

The "PBT Drag Scale" and "RIT Drag Scale" are used for setting the fine tuning rate of RIT/XIT and PBT. You can set the fine tuning rates to 1, 2, 4, 8, 16, or 32. Changes to these values do not go into effect until the program is restarted.

The "Transfer Folder" box is used to set the folder for the Ten-Tec file interface. Some logging programs using the Ten-Tec file interface are not configurable for the location of "pegasus.out" and "pegasus.in". This parameter allows you to specify the folder for these files.

Setting TRANSFER FOLDER C:\Orion

would cause the location of the "pegasus.out" and "pegasus.in" files to be in the "c:\Orion" folder. The default for this parameter is the folder the N4PY control program runs in. The default is in effect if the window shows all blanks.

The "High Speed tuning Factor" box causes the tuning rate when the pod tuning knob is turned at a high rate to be multiplied by this factor's amount. Legal values for this factor are 1 to 100. Use the value of 1 to disable this feature. Once the high speed tuning factor kicks in, it will stay in effect until the pod tuning knob is stopped for 1 full second.

The "High Speed Sensitivity" value controls the point where the high speed tuning factor kicks in. A low value causes the high speed tuning factor to easily kick in. A high value makes the high speed tuning factor kick rarely and only when the knob is turned very fast. The default value for this is 3. The legal range is 1 to 90.

The "S Meter Compensation" box is an S meter compensation value that you can select to adjust the calibration of your S meter. This value is expressed in + or - dB. Remember each S unit is 6 dB. For example, to make your S meter always read 12 dB lower (2 S units), you would set the value as follows:

S Meter Compensation -12

To make your S meter always read 12 dB higher (2 S units), you would set the value as follows:

S Meter Compensation 12

If the "RED Frequency Display on Transmit" check box is on, when transmitting the frequency is displayed in RED. If this box is set off, the frequency is always displayed in yellow. If split is on, the VFO B frequency box will always display the transmit frequency in red as a reminder that split frequency operation is being used.

If the "S Meter Display Only" check box is on, the S meter display will not change when transmitting.

The option "AMPTune Disable Keying Loop" is for people that use the amptune feature not to tune their amplifier, but instead to set their antenna tuner. With this option checked on, your amplifier will NOT be keyed when amptune is on and you transmit.

The Orion "Sweep Delay" setting may be configured. Because the AGC in the Orion receiver is not extremely fast even in fast mode, a delay needs to be added when the sweep is running to allow time for the AGC to react to the new frequency as the frequency is swept. The normal value for this parameter is 10 millisecond. You can experiment with increased delays for more sweep resolution. Valid values are 0 to 500. Watch out for the zero setting!

The box "Use UCW for Normal CW" allows you to set your normal CW mode to UCW instead of LCW. If checked, normal CW mode is UCW. If inchecked, normal CW is LCW.

The box "Scan resume after transmit time" allows you to configure a scan automatic resume time. If the scan was stopped because the transmitter came on, this value controls how long transmit has to be off before scan comes back on again. A zero value means no automatic scan resume is used. The value of the resume time is in seconds.

#### VOX Controls

The VOX controls are in the settings menu in the "VOX Controls" window. They are self explanatory. The Orion Vox gain control works backward from normal intuition. The lower the setting, the easier it is to trip VOX. This is just the way the Orion firmware is programmed.

#### Frequency Scan Window

Selecting this window will show the frequency scan controls. The scan will start at the "Frequency Start" setting. When the radio reaches the "Frequency Stop" setting, it will loop back to the "Frequency Start" setting. The "Frequency Increment" controls how much is added to the scan frequency for each dwell time. The "Dwell Time" setting controls how long the radio remains on each frequency. To start the scan, "click" the "Start Frequency Scan" button. To stop the scan, "click" the "Stop Frequency Scan" button. The scan will not start if a memory scan or spectrum sweep is in progress. The scan will be stopped if the radio goes into transmit mode.

You can control the direction of the scan. If the start frequency is less than the stop frequency, the scan will go up in frequency. If the start frequency is greater than the stop frequency, the scan will go down in frequency.

#### Colors Window

In order to help out hams with sight difficulties, the color of the button text can be configured. There are three settings to control the text colors of the buttons. Additionally, you can also define the color for local time display and UTC time display. There are 8 standard colors that can be selected. They are BLACK, WHITE, RED, GREEN, BLUE, YELLOW, PURPLE, and CYAN. There are also 6 low intensity colors. They are LO RED, LO GREEN, LO BLUE, LO YELLOW,

LO PURPLE, and LO CYAN. Additionally, there are also 2 user definable colors that can be selected with the names COLOR1 and COLOR2.

#### Local Time

This entry sets the color of the text for the display of local time.

#### UTC Time

This entry sets the color of the text for the display of UTC time.

#### Button Text

This entry sets the color of the text for all non-selected buttons.

#### Button Sel Text

This entry sets the color of the text for all selected buttons.

#### Special Button Sel Text

This entry sets the color of the selected text for the five special buttons LOCK, TUNE, DUAL, AMPTN, and SPLIT.

#### CW Bkgnd

This entry sets the color of the background for the CW keyboard window.

#### Settings Bkgnd

This entry sets the color of the background for the settings window.

#### Radio Bkgnd

This entry sets the color of the background for the radio panel window.

#### SP Bkgnd

This entry sets the color of the background for the scratch pad memory window.

Radio Small Font (default 14)

Radio Micro Font (default 12)

These are font sizes for the radio panel window buttons. You can change these values for font sizing to go with the scale factors. Experiment with making these numbers a little larger depending on your SCALEX and SCALEY size.

#### CW Text

This entry sets the color of the text for the CW keyboard window.

To define the user color called COLOR1, three settings are used to specify the amount of red, green, and blue to make up the color. The range for the amount of each color is 0 to 255.

#### Color1 Red

This entry controls the amount of red in the Color1 color.

#### Color1 Green

This entry controls the amount of green in the Color1 color.

#### Color1 Blue

This entry controls the amount of blue in the Color1 color.

To define the user color called COLOR2, three settings are used to specify the amount of red, green, and blue to make up the color.

The range for the amount of each color is 0 to 255.

#### Color2 Red

This entry controls the amount of red in the Color2 color.

#### Color2 Green

This entry controls the amount of green in the Color2 color.

#### Color2 Blue

This entry controls the amount of blue in the Color2 color.

### SWL Band Assign Window

This window allows the 11 SWL band buttons to be defined to any frequency range you like. If you do not use the SWL bands and prefer to make these buttons be RTTY buttons or if you just want to make these buttons be any band you desire, you can do it here. The first column is labelled "Caption". The 11 edit boxes in this column allow you to name the button text for the SWL band buttons. The second column labelled "Lower Limit", allows you to set the lower frequency limit for the band you are defining. The third column labelled "Upper Limit", allows you to set the upper frequency limit for the band you are defining. Be careful when you set up your band ranges not to have any bands overlap. The first time you go to the new band you have defined, you should set the mode you desire for this band. The button will now remember the frequency, mode, and filter when you return to this band.

You can change the column name for the SWL band buttons. This is the box at the bottom labelled "Column Name" in the "SWL Band Assign" window.

### Call Sign, TopTen Window

Your call sign can be displayed on the control panel. You set your call sign in the "Call Sign" box in this window.

You can define the color of the text of your call sign on the radio panel. They are BLACK, WHITE, RED, GREEN, BLUE, YELLOW, PURPLE, and CYAN. There are also 2 user definable colors that can be selected with the names COLOR1 and COLOR2. The default is BLACK.

You can also define the relative size of the characters by using the "Call Sign Size" box. You can set the relative size from a value of 1 (the default), to a value of 15 (probably too large).

For the boxes labelled "TopTen Devices", see the section on using Top Ten devices antenna control near the end of this file.

There is also a setting to turn on or off mouse wheel frequency tuning.

### 6 & 2 Transverters Window

#### 6m Crystal Correction

If you use the Ten-Tec 6 meter transverter, you can get the display to show the frequency very accurately by specifying the amount

of error in the transverter crystal frequency. Specify this error in hertz with a plus or minus sign in the edit box.

#### 6M Drive Power Max (0-100)

You can specify the maximum amount of ALC drive to the transverter with this parameter. Its range is 0 to 100 with 100 corresponding to 100 watts. Use caution when setting this. 5 watts is the recommended setting which corresponds to a setting of 5. The scale of the TX slider is adjusted so that full scale corresponds to this value. If you are going to use the Orion's transverter output, set this value to zero. This will then automatically toggle the Orion transverter function in the Orion TX menu.

#### 6M IF

This parameter controls the internal IF frequency to the Orion will be set at when using the converter. The Ten-Tec transverter uses a 14 MHz IF. This is the default value. If you are using some other transverter that uses a different IF, you can specify it in this edit box.

#### 2m Crystal Correction

If you use the Ten-Tec 2 meter transverter, you can get the display to show the frequency very accurately by specifying the amount of error in the transverter crystal frequency. Specify this error in hertz with a plus or minus sign in the edit box.

#### 2M Drive Power Max (0-100)

You can specify the maximum amount of ALC drive to the transverter with this parameter. Its range is 0 to 100 with 100 corresponding to 100 watts. Use caution when setting this. 5 watts is the recommended setting which corresponds to a setting of 5. The scale of the TX slider is adjusted so that full scale corresponds to this value. If you are going to use the Orion's transverter output, set this value to zero. This will then automatically toggle the Orion transverter function in the Orion TX menu.

#### 2M IF

This parameter controls the internal IF frequency to the Orion will be set at when using the converter. The Ten-Tec transverter uses a 28 MHz IF. This is the default value. If you are using some other transverter that uses a different IF, you can specify it in this edit box.

If the "Suppress Transverter Warnings" check box is on, no warnings will be issued when leaving a transverter band.

### User Configurable Transverters Window

There are 5 user configurable transverter setups that the user can setup to work with virtually any transverter. These transverters are in addition to the 6 and 2 meter transverter setups that are built in. These transverters are configured in the "User 1 & 2 TranV" window, the "User 3 & 4 TranV" window, and the "User 5 TranV" window. The transverter must not be in the 1.7 MHz to 30 MHz range (the Orion can transmit in this range) and the transverter must tune in the same direction as the IF frequency. That is to say, as you tune the transverter to a higher frequency, the Orion IF frequency must also go higher as well. You cannot use an inverting transverter.

For each transverter, there are 6 parameters to configure. They are:

#### User N Lower Limit

This sets the lower frequency limit for the transverter. It also enables the transverter and makes its band button appear after and program restart.

#### User N Upper Limit

This sets the upper frequency limit for the transverter.

#### User N IF

This tells the program what frequency to set the Orion to at the lower limit of the transverter range.

#### User N Button Text

This tells the program what text to display on the band button for this transverter. It is limited to 4 characters.

#### User N Drive Pwr Max (0-100)

This sets the maximum drive power the Orion will run at to drive the transverter. Its range is 0 to 100. 100 corresponds to 100 watts. 5 is the default which corresponds to 5 watts. Great care should be used in setting this value. The scale of the TX slider is adjusted so that full scale corresponds to this value. If you are going to use the Orion's transverter output, set this value to zero. This will then automatically toggle the Orion transverter function in the Orion TX menu.

#### User N Crystal Correction

You can get the display to show the frequency very accurately by specifying the amount of error in the transverter crystal frequency. Specify this error in hertz with a plus or minus sign in the edit box.

The band buttons for these transverters only appear when the particular transverter is configured. The buttons are in the lower right corner of the radio window. Care must be taken when setting up these parameters, as bad values can cause strange problems.

### RTTY, KB Settings Menu Window

The "RTTY, KB Settings" window of the "settings" menu contains options to control the RTTY and digital mode operations. The RTTY button is configurable. The label for the button can be specified, the actual operating mode can be set to USB or LSB, and the frequency offset in hertz can be specified. If an offset of zero is specified, the mode will operate just like USB or LSB. For example, you can define this button for use for PSK31 as follows:

```
RTTY Label    PSK31
RTTY Mode     USB
RTTY Offset   0
```

You can also define a second RTTY mode. You select your second RTTY mode by right clicking on the "RTTY" button. To define a second RTTY mode set the following settings:

```
RTTY Label 2  RTTY
RTTY Mode 2   LSB
RTTY Offset 2 2100
```

The RTTY Label 2 parameter being defined activates RTTY mode 2.

The bottom line is if you are using any of the newer digital modes, use the PSK31 example above. If they are using the older RTTY standard RTTY, use the example above for RTTY Mode 2.

When the "Output RTTY Mode is RTTY Label" check box is set, the text for the mode in the pegasus.out file for the RTTY modes will show as the value you have defined for your RTTY label. With this check box set to off (the default), either USB or LSB will show as the mode text for the RTTY modes in the pegasus.out file.

If you are using RTTY in real FSK mode, the offsets above are not used. But if you have a need for an offset value that will move both PBT and RIT in equal amounts to change the pitch of the RTTY signal, you can put in an offset value in the RTTY offset field. To enable RTTY offsets in real FSK mode, open the orion.ini configuration settings file and find the line:

```
USE FSK OFFSET=0
```

and change it to

```
USE FSK OFFSET=1
```

and save the change.

#### Step Window

The "step buttons" are user configurable to any step between 1 and 10000. They are configured in the "step" window of the "settings" menu.

The default values for the operating modes can be configured to any step between 1 and 10000. They are also configured on the "step" window of the "settings" menu.

Note that MW Step defines the step value for the American AM broadcast band.

The actual step that is used in the Orion will always be set to 1 unless frequency polling is turned on.

#### Transmitter Window

This window contains the sliders to control the delay for the Amp Key1 line and Amp Key2 line. These sliders actually remember a separate setting for CW mode versus all other modes. If you are in CW mode when they are set, this will not effect the setting while in other modes. The converse is also true. The range is zero delay at the bottom and 1 second delay at the top.

See sections on "Internal Tuner" and "External LDG Tuner" later in this document.

There is also a check box labelled "Extended Main Receiver Coverage". When this box is checked, the main receiver is selected for VFO A when "Smart VFO" is selected anytime it is possible for the main receiver to be used on that frequency. The main receiver is capable of being used on many more frequencies than just the ham bands and

this option exploits this as much as possible. This setting has nothing to do with transmit coverage and is only in this window because there is plenty of room for it here.

With "Extended Main Receiver Coverage" selected, the main receiver covers the following ranges:

- 1.780 to 2.017 mhz
- 2.100 to 4.074 mhz
- 4.790 to 7.429 mhz
- 8.800 to 10.167 mhz
- 13.899 to 15.030 mhz
- 17.999 to 30.000 mhz

#### SSB Settings Window

This window allows you to set mic gain, speech processor value, monitor volume, and mic gain when in AM mode. The AM mic gain slider is only used when in AM mode. This value is remembered by band. The Mic Gain slider is used for mic gain in all other modes and is also remembered by band.

#### Interface Window

This window allows you to configure your primary comport. The listbox on this window defines the comport number used as the primary radio port for the Orion.

If you check the box labelled "Get Orion at Start", the program will get the Orion VFO A and VFO B frequency, mode, filter, PBT setting, RIT setting, antenna setting, and output power setting at startup and use these as initial values instead of the last used settings by the program. This check box is not available if you have the RX-340 configured with the Orion.

#### "Using Tentec Eagle"

Turning this setting on says you are using a Tentec Eagle transceiver instead of an Orion. Once you turn on this setting, you must exit and restart the program for the change to take effect. If you already have the program configured for your Orion or Orion II, Install the program a second time in a different folder. Do not use the same copy of the program for both the Orion and Eagle. The command set in the Eagle is limited and not as complete as the Orion.

Only the following functions will work with the Eagle:

- Frequency setting from the radio or program.
- Split setting from the radio or program.
- AGC setting from the program.
- Preamp setting from the program.
- Auto notch setting from the program.
- Noise reduction setting from the program.
- Attenuator setting from the program.
- Power output setting from the program.
- Transmit Disable from the program.
- Sweep
- Filter setting from the radio or program.



The Eagle does not have any software volume control. There are no software RIT or PBT controls available with the current Eagle firmware.

#### "Using Tentec Argonaut VI"

Turning this setting on says you are using a Tentec Argonaut transceiver instead of an Orion. Once you turn on this setting, you must exit and restart the program for the change to take effect. If you already have the program configured for your Orion or Orion II, Install the program a second time in a different folder. Do not use the same copy of the program for both the Orion and Argonaut VI. The command set in the Argonaut VI is limited and not as complete as the Orion.

Only the following functions will work with the Argonaut VI:

- Frequency setting from the radio or program.
- Split setting from the radio or program.
- AGC setting from the program.
- Preamplifier setting from the program.
- Auto notch setting from the program.
- Noise reduction setting from the program.
- Attenuator setting from the program.
- Power output setting from the program.
- Transmit Disable from the program.
- Sweep
- Filter setting from the radio or program.

The Argonaut VI does not have any software volume control. There are no software RIT or PBT controls available with the current Argonaut VI firmware.

#### "WriteLog Multiple Radio Interface" -

This feature should only be turned on when using WriteLog and running multiple instances of the N4PY program with each instance controlling a separate Orion. This feature allows WriteLog to log each instance of each N4PY program to a separate log file in WriteLog. Each instance is associated with the primary comport number the N4PY program is using.

#### "Using Microham Band Decoder or USB Router" -

Set this checkbox when you are using the Microham band decoder or their USB router. It causes the Orion to be polled for frequency and mode once every 2 seconds even if POLLING is off so the band decoder or router can keep track of settings.

#### "Using SteppIR Controller" -

Set this checkbox when you are using the SteppIR controller. It causes the Orion to be polled for frequency once every 2 seconds even if POLLING is off so the SteppIR can keep track of the current frequency.

If you are using the Tentec Eagle or TenTec Argonaut VI, since there is no comport on these radios, Steppir control must be done from a separate comport dedicated to Steppir. First, do not turn on the "Using SteppIR Controller" check box. Instead, go to the special Steppir settings in the "Usr5 TrnsV" settings window. Here you will find a "Separate Steppir Comport" check box and comport list box. If you are using the Steppir and need to use a separate comport for Steppir, this is where you define the comport number for the

Steppir controller. The program will run the Steppir comport at 57600 baud and use a TenTec Orion interface to communicate with the Steppir controller. Connect the serial cable to the steppir "data in" port, not the data out port.

#### Interface2 Window

This window allows you to configure your secondary comport for the RX340. The listbox on this window defines the comport number used as the secondary radio port for the RX340. If you do not have an RX340 attached, select "NONE" for the comport.

Use RX340 for VFO B in Ham Bands -

Checking this box will cause the RX340 to be used as VFO B when VFO A is tuned to the ham bands. Not checking this box will cause the Orion sub-receiver to be used as VFO B when VFO A is tuned to the ham bands.

Use RX340 for VFO A in Ham Bands -

Checking this box will cause the RX340 to be used as VFO A all the time. This allows the Orion just to be used as the transmitter and the Orion main receiver to be used as the VFO B sub-receiver in the ham bands.

Reinitialize RX340 -

Checking this box will cause a full reinitialize of the rx340. I have seen times when serial communication with the rx340 is lost. This button will restore serial communication. If DUAL is on when this is run, DUAL needs to be shut off and then back on.

When VFO A is not tuned to the ham bands, the RX340 will always be used for VFO A and the Orion sub-receiver or main receiver will be used for VFO B.

#### Button Setup Window (Argonaut VI Only)

This settings window allows you to configure the Argonaut VI programmable buttons. At program startup it will read the current settings from the Argonaut VI and show them on the six list boxes for the buttons.

You can then change them to any values you wish.

#### Frequency Event Timer

This option is selected with a check box in "Preferences3". This feature allows you to define frequency events and have the radio go to those frequencies when the time for the event occurs. This is very useful for unattended operation with a receiving radio on the internet. The frequency events are defined in a special file called "events.txt". This file is created the first time you turn this option on with its check box. The file is located in the c:\n4py folder or wherever you have the program installed.

Once you have turned on the option the first time, exit the program, and edit the "events.txt" file to create frequency events. Do not edit the file with the program running. The file is column sensitive. Each time must be 2 numeric characters followed by a colon, followed by 2 numeric characters. There should then be one space followed by a frequency expressed in megahertz.

The events are defined by the day of the week. There can be up to 24 events for each day of the week. The file has a section for each day of the week and 24 events for each day. You should carefully edit the default lines with the values you want. All the default lines have a time of 00:00 and a frequency of 00.000. These times are in the local time of your computer and not in UTC. The times must be in 24 hour time with a range from 00:00 to 23:59. When program finds a match with the day of the week, hour, and minute, the program will change to the indicated frequency and set the corresponding default mode and filter.

#### Internal Tuner

Setting the "Enable Intrnl Tuner" check box in the "Transmitter" window of the "settings" menu will cause the Orion internal tuner controls to appear at the lower left side of the radio panel. There are 2 buttons. They are:

- 1) "Auto Tnr" - Left clicking this button will cause the internal tuner to go into auto tune mode. When the SWR stabilizes or 8 seconds go by, it will automatically stop.
- 2) "Bypass" - Left clicking this button will put the internal tuner into bypass mode, thus removing it from the output circuit.

There is also a slider in the "transmitter window" of the settings window. This slider is labelled "Tuner Pwr" and controls the amount of power used when the internal tuner is tuning. The range is 10 to 50 watts.

Please note that you must have purchased the Orion internal tuner from Ten-Tec for this to work.

#### LDG Electronics AT-200PC Autotuner

Setting the "Enable AT-200PC" check box in the "Transmitter" window of the "settings" menu will cause the memory tuner controls to appear at the lower left side of the radio panel. You must also set the correct comport for the AT-200PC. When using the Jupiter with the AT-200PC, you must be in pegasus emulation mode. The Jupiter cannot be keyed from the program while in front panel mode.

The LDG AT-200PC must be at firmware version 1.9 or later for correct operation. See the LDG website for how to upgrade your tuner to this version.

When using this tuner, the program will remember the tuner antenna settings by band. In addition, when changing bands with the program band buttons, the last tuner setting for that band will be recalled automatically without transmitting. If for some reason, it is ever necessary to clear out the EEPROM in the LDG tuner, the "Clear Mem" button in the "Transmitter" section of the settings menu can be used for this purpose. This will clear out all tuner memories. This is necessary if you have changed antennas and want to setup new tuner memories. Also, it is recommended that you perform an "Auto Tnr" on each band you will operate. For bands 7 mhz and up, you should do one "Auto Tnr" in the CW portion and another one in the SSB portion

for the band you use. For 80 meters, you should do an "Auto Tnr" for at each 100 khz interval. For 160 meters, you should do one at each 50 khz interval for the portion of the band you intend to use. All these "Auto Tnr" operations must be done with the correct antenna selected. Once these "Auto Tnr" functions have been done, it will not be necessary to do them again unless your antennas change.

There are 8 buttons. They are:

- 1) "Auto Tnr" - Left clicking this button will cause the memory tuner to go into auto tune mode. When the tune completes or 20 seconds go by, it will automatically stop. When it completes, the store memory routine will automatically run to save the current settings for the particular memory range you are in. If the "Auto Tnr" button turns red after the tune operation is over, it indicates the tune operation failed and the tune needs to be done again. Also, if the "Auto Tnr" button remains blue, it indicates the program 20 second timer timed out without getting a response from the tuner. If you click the "Sto" button, the program will accept the settings from the failed tune.
- 2) "Bypass" - Left clicking this button will put the memory tuner into bypass mode, thus removing it from the output circuit. Click the "Rcl Tuner" button to put the tuner back in use.
- 3) "Ant1" - Left clicking this button will toggle between the tuner's antenna 1 and antenna 2 connection.
- 4) "Cap" - Left clicking this button will tweak the capacitor setting of the tuner "down" in value. Right clicking this button will tweak the capacitor setting "up" in value.
- 5) "Ind" - Left clicking this button will tweak the inductor setting of the tuner "down" in value. Right clicking this button will tweak the inductor setting "up" in value.
- 6) "HiZ" - Left clicking this button will cause to tuner to go to its "Lo Z" or low impedance setting. Left clicking again will cause the tuner to go to its "Hi Z" or high impedance setting. The descriptor on the button indicates the current impedance setting of the tuner.
- 7) "Sto" - Left clicking this button will cause to memory tuner to save its current settings for this frequency to memory. It is only necessary to use this button if the "touch up" cap and ind buttons have been used.
- 8) "Rcl Tnr" - Left clicking this button will cause the memory tuner to recall the last settings for this frequency from the tuner's memory. If the SWR is greater than 2.0, the "Auto Tnr" procedure will automatically be started to try and find a better match. If the "Auto Tnr" button turns red after the tune operation is over, it indicates the tune operation failed and the tune needs to be done again. If you click the "Sto" button, the program will accept the settings from the failed tune.

There is a tuning paramter in the orion.ini file to set the SWR threshold. Look for the line that says:

```
LDG SWR THRESH=50
```

To change the SWR threshold, change the value to one of the following:

50 = 1.1  
51 = 1.3  
52 = 1.5  
53 = 1.7            This one seems to work the best for me  
54 = 2.0  
55 = 2.5  
56 = 3.0

The default is 53 for 1.7 to 1 threshold.

#### External LDG Model AT-11MP Tuner

Thanks go to Mark Erbaugh, N8ME, for information on this feature.

Please note that some computer's serial port will not work with the DTR line turned off. Turn on the external tuner feature and then exit and restart the program. If the program still communicates properly with the radio, then you can use the external tuner feature.

You can now use the LDG external tuner model AT-11MP by making a simple wiring change to your serial port cable for the Orion. If you wire the DTR line (pin 4) of the serial cable to the "Tune" line of the LDG external tuner, automatic tuning is possible. This is done as follows:

You must modify the serial cable for your Orion. You will need the extra following parts:

- a female DB9 connector to plug into the tuner
- 2N2222 transistor
- 1000 ohm 1/4 watt resistor
- 5 feet of RG-174 thin coax (RG-58 will work also)

Carefully remove the insulation from the cable to expose the individual wires inside the cable. You need to determine the wire that goes to pin 4. This is the DTR line. You can use a small pin and an ohm meter to determine this. You also need to find the wire that goes to pin 5. This is ground on the serial cable.

Solder the pin 4 wire the 1000 ohm resistor.

Solder the other end of the resistor to the base of the 2N2222 transistor.

Solder the pin 5 wire to the emitter of the transistor.

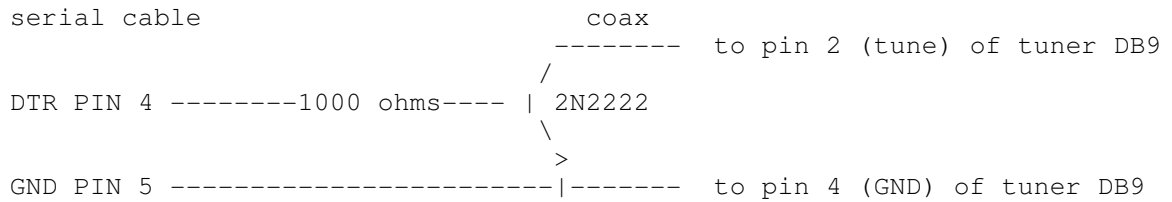
Now take the RG-174 coax and solder the center lead of the coax to the collector of the transistor.

Solder the shield of coax to the emitter of the transistor.

Now, using the DB9 female connector, solder pin 2 (tune) of the DB9 to the other end of the coax.

Solder the shield of the coax to pin 4 of the DB9.

This is shown schematically below.



The above will allow DTR of the serial cable to control the "Tune" function of the tuner.

#### Program settings:

Setting the "Enable Extrnl Tuner" check box in the "Transmitter" window of the "settings" menu will cause the Orion external tuner control to appear at the lower left side of the radio panel. There is 1 button for this. It is labelled "Auto Tnr". Left clicking this button will cause the external tuner to go into auto tune mode. When the SWR stabilizes or 8 seconds go by, it will automatically stop.

There is also a slider in the "transmitter window" of the settings window. This slider is labelled "Tuner Pwr" and controls the amount of power used when the external tuner is tuning. The range is 10 to 50 watts.

#### Alpha 87A Amplifier

There are special settings in the orion.ini file for using an Alpha 87A amplifier. If you have an this amplifier, with the program NOT running, open the orion.ini configuration settings file and find the line that says:

```
ALPHA 87A COMPORT=NONE
```

and change it to

```
ALPHA 87A COMPORT=COMx
```

where COMx is the actual comport number for the amplifier. Then save the change.

Now when you start the program, use "Alt-J" to bring up the Amp Window. Here you will see a line that is labelled "Alpha 87A".

There is an "Off" button, Clicking this button will change the button text to "On" and turn on the amplifier. Clicking this button button again will change the button text to "Off" and turn the amplifier off. If the amplifier is already on at program start, you can click this button to the on state and the amplifier will just stay on.

There is a "Oper" button. Clicking this will cause the button to turn red and set the amplifier in operate mode. Clicking it again will cause the button to go back to black and put the amplifier back in standby mode.

The amplifier will be polled once a second for power output. This value will be displayed just to the right of the "Oper" button.

The default baud rate for the amp is 4800. This can be change in the orion.ini configuration setting file by change the line

```
ALPHA 87A BAUD=4800
```

with the program NOT running.

#### Elecraft KPA500 Amplifier

There are special settings in the orion.ini file for using an Elecraft KPA500 amplifier. If you have an this amplifier, with the program NOT running, open the orion.ini configuration settings file and find the line that says:

```
KPA500 COMPORT=NONE
```

and change it to

```
KPA500 COMPORT=COMx
```

where COMx is the actual comport number for the amplifier. Then save the change.

Now when you start the program, use "Alt-J" to bring up the Amp Window. Here you will see a line that is labelled "KPA500".

There is an "Off" button, Clicking this button will change the button text to "On" and turn on the amplifier. Clicking this button button again will change the button text to "Off" and turn the amplifier off.

There is a "Oper" button. Clicking this will cause the button to turn red and set the amplifier in operate mode. Clicking it again will cause the button to go back to black and put the amplifier back in standby mode.

The amplifier will be polled once a second for power output. This value will be displayed just to the right of the "Oper" button and also on the S meter display during transmit.

The KPA500 must be set to 38400 baud. This is the only baud rate that allows the amp to be powered on.

There is a fault button at the end of the KPA500 line. If the KPA500 sends any faults, they will be displayed in this button. You can click this button to clear the fault condition.

The temperature of the KPA500 power output section is displayed just to the left of the fault button. The temperature is displayed in degrees C.

#### Acom 2000 Amplifier (Older Acom specific command set)

There are special Acom 2000 settings in the "Usr5 TrnsV, Steppir" settings window. Here you will find an "Acom 2000 Comport" check box and comport list box. If you are using the Acom 2000 Amplifier this is where you define the comport number for the

amplifier. The program will run the comport at 1200 baud and send frequency information to the Acom 2000 amplifier. Connect the serial cable to the Acom amplifier serial connection. The serial cable must be a null modem cable and only use pins 2, 3, and 5. That is to say that pin 2 on one end goes to pin 3 on the other and vice versa. This will cause the Acom 2000 to follow the frequency of the radio without the need to transmit to set the frequency. Once you have made these changes to the program settings, exit and restart the program for these changes to take full effect.

Now when you start the program, go to the "Call Sign, TopTen" settings window. Here you will see a line that is labelled "Acom 2000". There is a "Oper" button. Clicking this will cause the button to turn red and set the amplifier in operate mode. Clicking it again will cause the button to go back to black and put the amplifier back in standby mode.

Tokyo High Power Amplifier HL-1.5KFX and  
Acom 2000 Amplifier (using Newer Acom Kenwood command set)

There are special Tokyo High Power settings in the "Usr5 TrnsV, Steppir" settings window. Here you will find a "Tokyo High Power Comport" check box and comport list box. If you are using the Tokyo High Power Amplifier HL-1.5KFX or the newer Acom 2000 amp, this is where you define the comport number for the HL-1.5KFX amplifier. The program will run the comport at 9600 baud and use a Kenwood interface to communicate with the amplifier. Connect the serial cable to the Kenwood amplifier serial connection and set the band control on the amplifier to "Kenwood". The program will send out the operating frequency to the amplifier once a second.

The serial cable for the Tokyo High Power and Acom amp needs to be a null modem cable. That is pin 3 (transmit data) on the computer end needs to go to pin 2 (receive data) on the amp end. Also pin 5 for ground on the computer end needs to go to pin 5 on the amp end.

Palstar AT-Auto Tuner

The Palstart AT-Auto tuner can be controlled from the program. Set it up as follows:

With the N4PY Orion program NOT running, open the orion.ini configuration file. It is in the c:\n4py folder or wherever you installed the program.

Find the line

BOB COMPORT=NONE

and change it to

BOB COMPORT=COMx where COMx is the physical comport that is connected to the Palstar AT-Auto Tuner

Find the line

PALSTAR=0

and change it to



PALSTAR=1

Find the line

PALSTAR BAUD=4800

and change it to the actual baud rate you have selected in the tuner. Also, in the tuner make, set it to Kenwood CAT only. Save the changes.

The program will send out the operating frequency to the amplifier once a second.

The serial cable for the tuner needs to be a standard straight through cable. That is pin 3 (transmit data) on the computer end needs to go to pin 3 (receive data) on the tuner end. Also pin 5 for ground on the computer end needs to go to pin 5 on the tuner end.

#### External Ports for other Programs Overview

The N4PY Control program has 5 external ports for hooking up digital programs, logging programs, panadapter programs, and CW skimmer. These external ports are called THP ports. The name "THP" comes from the first use of external ports for the Tokyo High Power amplifiers. The idea on hooking up programs through these ports is to simulate a Kenwood radio operating on a different comport. The ports are actually connected with a software cable called a virtual comport pair. Don't let the name scare you, it's just a fancy word for programs to share memory and communicate with each other. Virtual comports will work with any baud rate and serial settings so don't worry about the comport settings. Again this is simply because they are just memory transfers and not real serial ports at all. Anyway, all you need to make them is a program called VSPManager. This is a free program and there's a link on my "Previous Versions" page to send the author an email and ask him for it. Once you create a virtual comport pair (again it's really a software cable with a comport on each end), you put one of the comports as the radio comport in one program and the other comport in the N4PY control program as a THP port. The first THP port is set in the "Usr5 TransV" settings window. If you need more ports for more programs, the second to 5th port are set in the INI configuration settings file.

#### Third Party Logging Programs

The easiest way to interface a logging program with an N4PY control program is to use the Tentec File Interface. This can be done with any logging program that has a Tentec Pegasus listed as a supported radio. What you do is in the logging program, select the Tentec Pegasus as the radio type. Also, in the logging program you must set its transfer folder to c:\n4pyor of wherever you installed the N4PY control program. Once you do this, the logging program will no longer use a comport to communicate to the radio. Instead, it will communicate with the N4PY control program via a file. This is a very easy way to connect logging programs.

If the logging program does not support the Tentec Pegasus, then you can still hook up the logging program to the N4PY control program via a virtual comport pair. There is where for the Tokyo HP comport comes in. If you have a logging program such as N1MM or a digital program such as FLDigi that does not support the Tentec file interface, you can use this port in conjunction with the VSP Manager virtual comport driver to get the

third party program to work with your radio and the N4PY control program at the same time. First, you need to install the virtual comport driver. You can get it on my website at [www.n4py.com](http://www.n4py.com). Go to the "Previous Versions" page and there is a link to ask the author for it.

Please note VSPManager and MicroHam are not compatible. If you are using MicroHam, see the section "MicroHam and VSPManager".

Once this virtual comport driver is installed, it will give you a pair of comports to use. Use VSP Manager to define these comport pairs. In your logging program, set it for one of these comports and select a radio type of Kenwood TS-570 (Kenwood TS-50 for HRD, just "Kenwood" for N1MM). Set the other comport in the USR5 settings window for the Tokyo HP comport. Also turn on the check box "Tokyo HP Comport" and "Use THP Comport for EXT Logging Program". After these changes are made, exit and restart the program. Your third party logging program should now see the N4PY Orion program as though it was a Kenwood radio, regardless of the actual radio you are using.

If your third party logging program supports the K1EL winkey keyer, you can get it to send its CW messages to the N4PY program. This is done through K1EL keyer emulation in the N4PY program. First you make a virtual comport pair for this function. You can use any virtual comport program. If you don't have one, there is a link to VSP Manager on the "Previous Versions" page of the N4PY website. This is an excellent virtual comport program.

Once you have the virtual comport pair, define one of the pairs in the third party logging program as the K1EL keyer comport. Then with the N4PY program NOT running, open the orion.ini configuration file.

Find the line that says

```
EMUL K1EL=0
```

and change it to

```
EMUL K1EL=1
```

Next find the line that says

```
BOB COMPORT=NONE
```

and change it to

```
BOB COMPORT=COMx where COMx is the other half of the virtual comport pair. Then save the changes.
```

Now when you run the N4PY program, the CW messages sent in the third party logging program will come to the N4PY program. This is very useful when running remotely using the Client-Server function since this will cause the CW message characters to get sent to the N4PY server for transmission.

#### MicroHam and VSPManager

MicroHam and VSPManager are not compatible with each other. If you are using MicroHam you cannot create virtual comport pairs with VSPManager. Instead, you create a "virtual cable" and turn on the TX check box in the "Create Virtual Cable" dialog of MicroHam. This action will give

you a virtual comport pair just like VSPManager. You may need to reboot your computer after doing this so that Windows can get everything straight.

#### Using LP-Pan and NaP3 with your Radio

The Tokyo HP comport can also be used with your radio and N8LP's panadaptor. To use the N8LP panadaptor, several steps must be done. This setup interfaces the N4PY program directly to NaP3. The N4PY program will emulate a K3 and appear as a K3 to NaP3.

They are as follows:

- 1) Install the hardware mod to bring out the Orion 9 mhz wide band IF to the spare jack. Details for this mod can be found at [http://www3.telus.net/ve7tk/9MHz\\_IF.pdf](http://www3.telus.net/ve7tk/9MHz_IF.pdf)
- 2) Install VSP Manager. I have a link on my "Previous Versions" page for it. Please note VSPManager and MicroHam are not compatible. If you are using MicroHam, see the section "MicroHam and VSPManager".
- 3) Use VSP Manager to define these comport pairs.
- 4) Install NaP3. Configure its setup comport for one half of the virtual comport pair defined in VSP Manager. Also, configure NaP3 for a K3, regardless of the radio you are using.
- 5) Configure the N4PY Orion program's Tokyo HP comport for the other virtual comport in the USR5 settings window for the Tokyo HP comport. Also turn on the check box "Tokyo HP Comport", "Use THP Comport for EXT Logging Program", and "NaP3 Panadaptor". After these changes are made, exit and restart the program.

The THP comport will now communicate with NaP3 and act as a K3 radio. This will allow the N8LP panadaptor to work very nicely with the radio and run the N4PY program at the same time.

#### Using LP-Pan and TRX-Pan with your Radio

If you have LP-Pan, there is a much simpler panadapter program that can be used with it. TRX-Pan is available with direct interface from N4PY that does not use any virtual comport or LP-Bridge. This interface does not use any virtual comports at all. Instead, it uses a unique interface through the Windows Registry.

If you have TRX-Pan installed, all you need to do in N4PY is go to the "Usr5 TransV" settings window and turn on the check box labelled "TRX-Pan Panadapter". This will cause frequency, mode, and filter settings to be sent to TRX-Pan and also allow clicking on signals in TRX-Pan to change the radio frequency.

In the TRX-Pan program, turn on the "N4PY" for CAT control setting. You must have TRX-Pan V2.0.5 or later for N4PY. TRX-Pan does not run on Windows Vista.

Using LP\_Pan directly with NaP3 or TRX-Pan and also using N1MM

and CW Skimmer all at the same time

The program has 4 additional THP comports that can be configured along with the main THP comport described above to allow other programs to operate with the N4PY program. These 2 additional comports can be used to run N1MM and CWSkimmer. These comports emulate a K3 radio to the other programs.

After you have setup the main THP comport for NaP3 or TRX-Pan, create a second virtual comport pair. Configure one of these pairs in the N1MM comport setting. Configure the other half of this second comport pair in N4PY as follows:

With the N4PY program NOT running

- 1) Open the orion.ini configuration file
- 2) Find the line that says

```
THP2 COMPORT=NONE
```

and change it to

```
THP2 COMPORT=COMx where COMx is the other half of this second  
comport pair.
```

Then save the change.

If you then also want to use CWSkimmer, create a third virtual comport pair. Configure one of these pairs in the CWSkimmer comport setting. Configure the other half of this third comport pair in N4PY as follows:

With the N4PY program NOT running

- 1) Open the orion.ini configuration file
- 2) Find the line that says

```
THP3 COMPORT=NONE
```

and change it to

```
THP3 COMPORT=COMx where COMx is the other half of this third  
comport pair.
```

Then save the change. You will now be able to run the N4PY Orion program along with NaP3 or TRX-Pan, N1MM, and CWSkimmer all at the same time with the no need to use LP Bridge.

There is also THP4 COMPORT=NONE and THP5 COMPORT=NONE that can be setup for more combinations.

Also if you want a THP port to send out VFO B frequency information for a THP port, find the line

```
THP VFOB PORT=0
```

and change it to

```
THP VFOB PORT=X where X is 1 to 5 depending on which THP port you  
want to follow VFO B. This is useful if you have a radio that has  
two receivers and you want CW Skimmer to follow the second receiver.
```

Setting this to 0 turns this feature off.

VE7TK has done a great writeup at putting this all together. It is at <[http://www3.telus.net/ve7tk/LP\\_PAN.pdf](http://www3.telus.net/ve7tk/LP_PAN.pdf)>

Using any Flex Radio or SDR-IQ with your Orion or Orion II as a Panadapter

The Tokyo HP comport can also be used with your radio and Flex Radio's Flex 1500 (or any other Flex radio, or SDR-IQ) as a panadapter and sub-receiver. This radio is a great one to use because the Flex-1500 is only \$579 from Flex Radio. To use the Flex-1500 as a panadapter, several steps must be done. This setup is built around the current version PowerSDR version from Flex Radio. Please note all panadapters are muted unless Dual receive is turned on. They are as follows:

1) Install VSP Manager. I have a link on my "Previous Versions" page to it.

Please note VSPManager and MicroHam are not compatible. If you are using MicroHam, see the section "MicroHam and VSPManager".

2) Use VSP Manager to define these comport pairs.

for Flex radios:

3) Install the Flex radio with all its supporting software.

Configure PowerSDR for CAT using one of the comport pairs. In PowerSDR, turn on "Allow Kenwood AI Command". When running with PowerSDR, changing the mode or filter from the PowerSDR program does not change anything in the N4PY program. Mode changes in the N4PY program are sent to PowerSDR. Filter values are not sent to PowerSDR.

Or for SDR-IQ

3) Install all the SDR-IQ supporting software. This is the SDR-RADIO program from SDR-RADIO.COM

Configure the SDR-IQ software for HF Tracking using one of the VSP Manager comport pairs.

OR

Use Spectravue with "External Radio Setup" as Kenwood TS850/870/950. Keep Same Center Frequency, HF Tracking Mode, and Mode Tracking are check/enabled.

4) Configure the N4PY program's Tokyo HP comport for the other virtual comport in the USR5 settings window for the Tokyo HP comport. Also turn on the check box "Tokyo HP Comport", and "Use THP Comport for EXT Logging Program". For Flex Radios also turn on "PowerSDR Panadapter". For SDR-IQ radios, also turn on "SDR-IQ/HSDR Pan".

After these changes are made, exit and restart the program.

The THP comport will now communicate directly with powerSDR or SDR-IQ. This will allow the Flex or SDR-IQ radio panadapter to work very nicely with your Orion.

## Using any HSDR Radio with your Radio as a Panadapter

The Tokyo HP comport can also be used with your radio and any radio controlled with HSDR as a panadapter and sub-receiver. The setup requires several steps.

They are as follows:

- 1) Install VSP Manager. I have a link on my "Previous Versions" page for it.

Please note VSPManager and MicroHam are not compatible. If you are using MicroHam, see the section "MicroHam and VSPManager".

- 2) Use VSP Manager to define a comport pair. Let's assume you define COM10 and COM20. They can be anything as long as they are not used by anything else.

- 3) Install HSDR and the panadapter radios drivers.

In HSDR, in F7 Options, select "CAT to HSDR".

Set the PORT to one of the comport pairs (like COM10 in this example).

Select "Activate". Make sure it shows a check mark.

The baud rate does not matter with a virtual comport.

- 4) In "User5 TransV", configure the N4PY Orion program's Tokyo HP comport for the other half of the virtual comport pair (like COM20 in this example) for the Tokyo HP comport. Also turn on the check box "Tokyo HP Comport", "Use THP Comport for EXT Logging Program".  
If you are using an antenna connection to the SDR radio, turn on "SDR-IQ/HSDR Pan".  
If you are using a a fixed IF output to the SDR radio, turn on "HSDR Fixed IF".  
After these changes are made, exit and restart the program.

The THP comport will now communicate directly with HSDR. This will allow the HSDR radio panadapter to work very nicely with your radio.

## Using WSJT-X with N4PY Software

- 1) Install VSP Manager. I have a link on my "Previous Versions" page for it.

Please note VSPManager and MicroHam are not compatible. If you are using MicroHam, see the section "MicroHam and VSPManager".

- 2) Use VSP Manager to define a comport pair. Let's assume you define COM10 and COM20. They can be anything as long as they are not used by anything else.

- 3) Download and install OmniRig.

- 4) In OmniRig, set the radio type to "Kenwood".

- 5) Set the PORT to one of the comport pairs (like COM10 in this example).

- 6) The other OmniRig parms do not matter for virtual comports.

- 7) In "User5 TransV", configure the N4PY Orion program's Tokyo HP comport for the other half of the virtual comport pair (like COM20 in this example)

for the Tokyo HP comport. Also turn on the check box "Tokyo HP Comport", "Use THP Comport for EXT Logging Program". After these changes are made, exit and restart the program.

8) In WSJT-X, set the radio to "OmniRig Rig 1".

9) Use VOX or CAT PTT for keying.

The THP comport will now communicate directly with OmniRig and OmniRig will communicate with WSJT-X.

Using any SDRConsole Radio with your Radio as a Panadapter

The Tokyo HP comport can also be used with your radio and any radio controlled with SDRConsole as a panadaptor and sub-receiver. The setup requires several steps.

They are as follows:

1) Install VSP Manager. I have a link on my "Previous Versions" page for it.

Please note VSPManager and MicroHam are not compatible. If you are using MicroHam, see the section "MicroHam and VSPManager".

2) Use VSP Manager to define a comport pair. Let's assume you define COM10 and COM20. They can be anything as long as they are not used by anything else.

3) Install SDRConsole and the panadapter radios drivers.

In SDRConsole, in "Options", select Controllers and then "CAT" and then Port Selection.

Set the PORT to one of the comport pairs (like COM10 in this example). The baud rate does not matter with a virtual comport.

4) In "User5 TransV", configure the N4PY Pegasus program's Tokyo HP comport for the

other half of the virtual comport pair (like COM20 in this example) for the Tokyo HP comport. Also turn on the check box

"Tokyo HP Comport", "Use THP Comport for EXT Logging Program".

If you are using an antenna connection to the SDR radio, turn on "SDR-IQ/HSDR Pan".

If you are using a a fixed IF output to the SDR radio, turn on "HSDR Fixed IF".

After these changes are made, exit and restart the program.

The THP comport will now communicate directly with SDRConsole. This will allow the SDRConsole radio panadaptor to work very nicely with your radio.

Using the Microtelecom Perseus Receiver your Radio as a Panadapter

The Tokyo HP comport can also be used with your Orion and Microtelecom's Perseus receiver as a panadaptor and sub-receiver. This radio is a great one to use because of its excellent receive characteristics. To use Perseus as a panadaptor, several steps must be done. They are as follows:

1) Install VSP Manager. I have a link on my "Previous Versions page to it.

Please note VSPManager and MicroHam are not compatible. If you are using MicroHam, see the section "MicroHam and VSPManager".

2) Use VSP Manager to define a comport pair.

3) Install the Perseus radio with all its supporting software.

Configure the Perseus program for one of the virtual comport pairs. When running with Perseus, changing the mode or filter from the Perseus program does not change anything in the N4PY program. N4PY only picks up the frequency from the Perseus program. Frequency, mode, and filter changes in the N4PY program are sent to the Perseus program.

4) Configure the N4PY Orion program's Tokyo HP comport for the other virtual comport in the USR5 settings window for the Tokyo HP comport. Also turn on the check box "Tokyo HP Comport", "Use THP Comport for EXT Logging Program", and "Perseus Panadapter". After these changes are made, exit and restart the program.

The THP comport will now communicate directly with the Perseus program. This will allow the Perseus program panadaptor to work very nicely with your radio. Please note when split or dual is turned on in N4PY, the VFO B frequency will be sent to the perseus program. Likewise, with split or dual on in N4PY, N4PY will get the frequency from Perseus and put it in VFO B.

#### SPE 1.3K, 1K-FA and 2K-FA Amplifiers

There are special Tokyo High Power settings in the "Usr5 TrnsV, Steppir" settings window. Here you will find a "Tokyo High Power Comport" check box and comport list box. Also turn on the setting "Use THP Comport for EXT Logging Program. If you are using the SPE amps, this is where you define the comport number for the amplifier. The program will run the comport at 9600 baud and use a Flex radio interface to communicate with the amplifier. Connect the serial cable to the amplifier serial connection and set the band control on the amplifier to "Flex". The program will send out the operating frequency to the amplifier once a second. Using the Flex radio interface allows the amplifier to send the radio power drive level. This drive level is received from the amplifier and sent to the radio. This allows the drive level to be automatically set for those radios that do not have an ALC input from the amplifier. If your radio does use ALC for the amplifier, then set the band control in the amplifier to "Kenwood".

Make a special cable with just 3 wires in it. The cable will have a female DB9 and a male DB15.

Connect the pins together as follows:

DB9	DB15
pin 2	pin 9
pin 3	pin 1
pin 5	pin 4

The program will run the comport at 9600 baud and use a Kenwood radio interface to communicate with the amplifier. The program will respond to queries from the amplifier as though the radio were a Kenwood radio



no matter what radio you are actually using.

If you use this program with more than one radio, there is a method whereby you can use the same amplifier power input settings with different radios. There are two ways to use this.

Method 1 (One global multiplier for all bands) - This method allows you to set one percentage multiplier for the second radio. The idea is the expert amp has been set to change the power out from the radio for each band. Now with a second radio, you may find that every band is a little high or a little low.

Go to the settings window and select the "Transmitter Settings". Turn off the check box "Expert Amp Drive by Band". Put the multiplier in the "Expert Amp Drive Factor" edit box for the correct drive level.

Change this to a little higher or a little lower depending on whether power output is high or low. This value will be the same for all bands.

Method 2 (A different multiplier for each band segment) - This method allows you to set a percentage multiplier for the second radio for each band. The idea is the expert amp has been set to change the power out from the radio for each band. Now with a second radio, you may find that each band is either a little high or a little low.

First, with the amp running and connected to Pegasus Plus, open the settings window and in the "Transmitter Settings" window, turn on the check box "Expert Amp Drive by Band". Then go to each band and adjust the edit box "Expert Amp Drive Factor" for the correct drive level to the amp for that band segment.

Tokyo High Power Amplifier HL-1.5KFX and  
Acom 2000 Amplifier (using Newer Acom Kenwood command set)  
Ameritron ALS-1306

There are special Tokyo High Power settings in the "Usr5 TrnsV, Steppir" settings window. Here you will find a "Tokyo High Power Comport" check box and comport list box. If you are using the Tokyo High Power Amplifier HL-1.5KFX or the newer Acom 2000 amp, or any of the SPE amps, this is where you define the comport number for the HL-1.5KFX amplifier. The program will run the comport at 9600 baud and use a Kenwood interface to communicate with the amplifier. Connect the serial cable to the amplifier serial connection and set the band control on the amplifier to "Kenwood". The program will send out the operating frequency to the amplifier once a second.

The serial cable for the Tokyo High Power SPE, and Acom amp needs to be a null modem cable. That is pin 3 (transmit data) on the computer end needs to go to pin 2 (receive data) on the amp end. Also pin 5 for ground on the computer end needs to go to pin 5 on the amp end.

For the Ameritron ALS-1306, you can use the Ameritron Kenwood cable with a null modem adapter on the serial port end. Or you can make your own cable which is what I did. I made a cable with two female DB9's. I connected them as follows:

PC END                      ALS-1306 END  
  
pin 3      to                      pin 3

pin 2     to           pin 4  
pin 5     to           pin 6

Nothing else should be connected.

#### Bob S Meter

Woodbox radio at [www.woodbox.com](http://www.woodbox.com) has a little program that produces a very nice looking analog S meter. This program can be run with N4PY software.

To use this Bob Smeter software, first go to [www.woodbox.com](http://www.woodbox.com) (the exact link is on my website on the "Previous Versions" page) and download and install this program.

Then using any virtual comport program such as VSPManager, make virtual comport pair for the Bob Smeter. Set one of these pairs in the Bob Smeter program.

With the Orion program not running, go to the c:\n4pyor folder or wherever you installed the program and open the orion.ini configuration file.

Find the exact line that says:

```
BOB COMPORT=NONE
```

And change it to

```
BOB COMPORT=COMx
```

where COMx is the other comport for the virtual comport pair. Then save the change.

You start and stop the Bob Smeter with the second button from the left on the Bob Smeter window. Always start N4PY before starting the Bob Smeter. Always stop the Bob Smeter before stopping N4PY.

Change the timeout of 20 milliseconds in the Bob Smeter to 100.

#### S Meter Lite

There is also an interesting S meter program provided by W8WWV. There's a link for this on my previous versions page.

To use this S Meter software, first from my "Previous Versions" page download and install this program.

Then using a virtual comport program such as VSPManager, make virtual comport pair for the S Meter Lite. Set one of these pairs in the S Meter Lite program. Configure S Meter Lite for an Icom 756Pro, regardless of what radio you are actually using.

With the orion program not running, go to the c:\n4pyor folder or wherever you installed the program and open the orion.ini configuration file.

Find the exact line that says:

BOB COMPORT=NONE

And change it to

BOB COMPORT=COMx

where COMx is the other comport for the virtual comport pair.

Find the Line

SMETER LITE=0

and change it to

SMETER LITE=1

Then save the change.

The S Meter Lite program will now work with the N4PY program.

#### 403A Antenna Genius

The 403A Antenna Genius can be used as a software controlled antenna switch.

To setup the program for the 403A Antenna Genius:

1) With the program NOT running, open the orion.ini file and find the line that says:

403A AG=0

and change it to

403A AG=1

Also set the following line to the correct port and IP Address

403A AG PORT=9007

403A IP AG=192.168.1.250

3) Find the lines that say:

ANT 1 LOW=0

ANT 1 HIGH=0

ANT 2 LOW=0

ANT 2 HIGH=0

Etc.,

and set the ranges for each antenna in mHz.

For example if antenna 3 was to cover the 20 meter band, you should put

ANT 3 LOW=14.0

ANT 3 HIGH=14.35

If you have an antenna that needs more than one frequency range such as using an 80 meter antenna also on 30 meters. you can change the antenna that is assigned to each range.

Find the series of lines that say:

```
ANT RANGE 1=1
ANT RANGE 2=2
ANT RANGE 3=3
ANT RANGE 4=4
ANT RANGE 5=5
ANT RANGE 6=6
ANT RANGE 7=7
ANT RANGE 8=8
```

These lines assign the same range to the corresponding antenna by default. But if for example you wanted both range 3 and range 6 to control antenna 3, you would change

```
ANT RANGE 6=3
```

Save the changes to the orion.ini file.

The controls for Antenna Genius will show up in the "transmitter" window of the settings menu. With "Auto" selected, the frequency ranges above will cause the particular antenna for that range to be selected. If you select any antenna by clicking on its button, the auto function is turned off and that antenna will remain selected even if you change frequencies. Just click the auto button again to restore automatic antenna selection back.

In the transmitter setting window, there is also a drop down box for Radio 1 and Radio 2. Use this to select which side of Antenna Genius is connected to a radio.

#### LDG Electronics DTS-4 and DTS-6 Coax Antenna Switch

The LDG DTS-4 and DTS-6 coax antenna switches are supported  
To setup the program for LDG coax switch:

1) With the program NOT running, open the orion.ini file and find the line that says:

```
LDG COAX COMPORT=
```

And change it to

```
LDG COAX COMPORT=COMx  where x= the com number from 1 to 20
```

2) Find the lines that say:

```
ANT 1 LOW=0
ANT 1 HIGH=0
ANT 2 LOW=0
ANT 2 HIGH=0
Etc.,
```

and set the ranges for each antenna in MHz. For example if antenna 3 was to cover the 20 meter band, you should put

```
ANT 3 LOW=14.0
ANT 3 HIGH=14.3
```

Save the changes to the orion.ini file.

The controls for the switch will show up in the "transmitter" window

of the settings menu. With "Auto" selected, the frequency ranges above will cause the particular antenna for that range to be selected. If you select any antenna by clicking on its button, the auto function is turned off and that antenna will remain selected even if you change frequencies. Just click the auto button again to restore automatic antenna selection back.

#### LDG 1000Pro Automatic Tuner

The LDG 1000Pro Auto Tuner setting for antenna 1 or 2 can be controlled if you are using my LDG tuner program version 1.02. This version is available for free on my test page on my website.

To setup the Orion program for LDG 1000Pro Tuner:

1) With the program NOT running, open the orion.ini file and find the line that says:

```
LDG1000=0
```

And change it to

```
LDG1000=1
```

2) Find the lines that say:

```
ANT 1 LOW=0  
ANT 1 HIGH=0  
ANT 2 LOW=0  
ANT 2 LOW=0  
Etc.,
```

and set the ranges for each antenna in mHz. For example if antenna 2 was to cover the 20 meter band, you should put

```
ANT 2 LOW=14.0  
ANT 2 HIGH=14.3
```

```
ANT RANGE 1=1  
ANT RANGE 2=2  
ANT RANGE 3=3  
ANT RANGE 4=4  
ANT RANGE 5=5  
ANT RANGE 6=6  
ANT RANGE 7=7  
ANT RANGE 8=8
```

A selection for ANT3 will select ANT 1 with bypass enabled.  
A selection for ANT4 will select ANT 2 with bypass enabled.

These lines assign the same range to the corresponding antenna by default. If for example you wanted both range 3 and range 6 to control antenna 2, you would change

```
ANT RANGE 3=2  
ANT RANGE 6=2
```

Save the changes to the orion.ini file.

The controls for the switch will show up in the "transmitter" window of the settings menu. With "Auto" selected, the frequency ranges above will cause the particular antenna for that range to be selected. If you select any antenna by clicking on its button, the auto function is turned off and that antenna will remain selected even if you change frequencies. Just click the auto button again to restore automatic antenna selection back.

Orion.ini file Parameters for the [OPERATING STATUS] section

The value for each parameter below is set to the default value. This is the value you get when the parameter is not defined. The text will indicate what other values are legal.

LP100 COMPORT=COM2

If you have the Telepost LP-100A watt meter and want to use it, you can use this option. Find the line "LP100 COMPORT=NONE" in the "Interface" section of the orion.ini file. Set this line for the comport you are going to use for the LP-100A watt meter. The program will read this watt meter during transmit and display the results in the S meter window during transmit. If you have the older LP-100, in addition to this comport setting, change LP100=0 to LP100=1.

LP500=1

If you have the Telepost LP-500 or LP-700 watt meter and want to use it, you can use this option. Find the line "LP500=0" in the orion.ini file. Set this line to LP500=1 and save the change. The program will read this watt meter during transmit and display the results in the S meter window during transmit.

POWERMASTER COMPORT=COM2

If you have the PowerMaster watt meter and want to use it, you can use this option. Find the line "POWERMASTER COMPORT=NONE" in the "Interface" section of the orion.ini file. Set this line for the comport you are going to use for the PowerMaster watt meter. The program will read this watt meter during transmit and display the results in the S meter window during transmit. Make sure the watt meter is set to 38400 baud.

AUTO PROGRAM START=  
AUTO PROGRAM START FOLDER=

These two parameters are used to define a program that you want started each time the program starts. For AUTO PROGRAM START, set this to the full path and file name of the executable you wish to start. Set AUTO PROGRAM START FOLDER to the full path name of the folder to be the default folder for the program.

Example:  
AUTO PROGRAM START=c:\abc\def.exe  
AUTO PROGRAM START FOLDER=c:\abc

The above example starts a program called def.exe in the c:\abc

folder

K1EL F1=1  
K1EL F2=2  
K1EL F3=3  
K1EL F4=4

These 4 entries define the function of the four K1EL winkey 2 buttons. Each of these 4 buttons will call the pod function assigned to corresponding computer function key. For example to make the left most keyer button (K1EL F1) perform the pod function assigned to the computer keyboard F8 key set

K1EL F1=8

This allows 4 functions to be performed even if the N4PY program does not have the keyboard focus.

SUB AS VFOA=0

Set this to "1" when you have the 366 sub-receiver and are using the 366 sub-receiver for a 9 mhz IF with LPPan. When this on, VFO A will be set to the 366 sub-receiver by the Smart VFO function.

ADJUST CWSSB=1

This setting controls whether or not to adjust the frequency by the CW offset when changing between CW and SSB using the mode buttons.

#### Syncing CW Sidetone Volume with Main Volume

The CW sidetone volume can now be synced with the main volume control. This is the "VA" slider. This is accomplished by first going to the CW settings window. There's an edit box there called "Sidetone Factor". If this is zero, this feature is turned off. To turn it on, first try 100 for this factor. Now when you move the VA slider, the sidetone volume slider (Stv) will move in the opposite direction. This is to give you a constant sidetone volume as you move the main volume. Experiment with this sidetone factor to find the correct value to give you a nice constant volume for your headphones or speaker. Each different headphones or speaker that you use will require a different sidetone factor.

#### Memory File Usage

Memories are saved in files that are "RMY" file types. RMY files are binary files and are not editable with an editor. They save all the significant parameters for the station including "split status" and the transmit frequency. If you want to edit an RMY file, you must first export the file. See "Importing and Exporting Files" below. The "File" menu has several entries to control memory file usage. The memory file entries in the "File" menu are as follows:

New - Clicking this entry will allow you to start a brand new memory file. If the current memory file has not been saved to disk, you will be asked if you want to save it before the current memory is cleared.

Open - Clicking this entry will allow you to open a memory file that has been previously saved. You will be shown all the RMY file types that exist in the program working folder.

Close - Clicking this entry will save the current memory file contents to disk and end usage of this memory file.

Save - Clicking this entry will save the current memory file contents to disk but still keep the memory contents in memory. This is useful to do just after you add a memory and want the disk to be updated with the new entry.

Save As - Clicking this entry will save the current memory file contents to disk but still keep the memory contents in memory. This is useful to do just after you add a memory and want the disk to be updated with the new entry. It also allows you to give the disk file a new file name.

### Importing and Exporting Files

On the file menu, there is an Import and Export. These functions allow the ability to import and export files that are text files. This allows you to export the current memory files as a text file and then add more stations to it. You may get these files from any source and simply combine them by following the file format. Later, you may import this file back into memory and assign an RMY file name to it.

The format of the file is straight forward. An entry simply occupies a single line. Each line has ASCII text for the station name, station frequency in MHz, station mode, filter in hertz, country, language and optionally split frequency. Each value is separated by a comma with no extra spaces. Inspection of an existing file will show the format clearly.

To export an RMY file, first open the RMY file as follows:

- 1) Click on "File"
- 2) Click on "Open"
- 3) Select the RMY file you wish to open
- 4) Select OK

The above opens and loads the RMY file in memory.

To export the RMY file, proceed as follows:

- 1) Click on "File"
- 2) Click on "Export"
- 3) Type in the name you wish for the CDF file
- 4) Select OK

To import a CDF text file, proceed as follows:

- 1) Click on "File"
- 2) Select "Import"
- 3) You should see the files of type CDF.
- 4) Select the file you wish to import and click OK.

If you then want to create an "RMY" file so that when you run the N4PY program next time you can get this file automatically selected, proceed as follows:

- 1) With the CDF loaded into memory as above, click "File".
- 2) Select "Save As"



- 3) Type in the name such as "NEWFILE.RMY"
- 4) Select OK

This will save the data in the RMY format. You can now make this file name the default memory file as follows:

- 1) Select "File"
- 2) Select "Open"
- 3) You should see "NEWFILE.RMY"
- 4) Select this file as click OK.

If you are a member of the ILG database ([www.ilgradio.com](http://www.ilgradio.com)), you can download an ASCII text version of their data. This is a file called "ilgstext.zip". I have a DOS utility program that can convert this database to a "CDF" file which can then be imported into the Orion control program. Send me an email if you would like to have this file converting program.

#### Saving and Restoring Orion Memories

On the file menu, there are three entries for saving and restoring the Orion memories. They are as follows:

Save Orion Memories - Clicking this button will allow you to select a "CDF" file to save the memories in. The memories will be saved in a standard CDF file that can be used later to import files. It takes about 2 minutes to save the 200 memories. The Orion memories are numbered 1 to 200. Please note that because the Orion returns a frequency of 15.0 mhz if a memory is empty, you can use 15.0 mhz for an Orion memory and have it saved in the "CDF" file.

Restore Orion Memories - Clicking this button will allow you to select a "CDF" file to restore memories from the file to the Orion.

Abort Sav/Res Mems - Clicking this button while a "save memory" or "restore memory" operation is underway will abort the save or restore memory operation.

During the Save and Restore memory operations, the current memory will show as the text on the "Store" below, just to the left of the "Recall" button.

Using the RX-340 or Panadapter (such as SDRplay) with the Orion

If you wish to run the RX-340 as an AUX receiver for the Orion, or use a panadapter such as SDRplay that runs in parallel to the Orion with a shared antenna connection to the Orion, you need to add an AUX receiver output to the Orion.

To modify the Orion to have an AUX receiver output at the "spare" jack:

- 1) Remove the Orion top cover.
- 2) Prepare a 5 inch piece of RG-174 cable. On one end, make a center and ground pair of connections. On the other end, remove all the shield and just make a center pin connection.
- 2) With the top cover removed and viewing from the top rear of the Orion,

locate the board that has the 12 phono connectors coming out of the rear of the Orion. On this board, you will see a small coax connector labeled "1" near the left top of the board. The female part of the connector is soldered to the board with 3 very small pins. The outside 2 pins are ground, and the center pin is the antenna output to the sub-receiver.

- 3) With the 5 inch piece of RG-174 coax cable, tack solder one end of the center conductor to the center pin for coax connector "1".
- 4) Solder the shield of the RG-174 to either one of the ground pins of coax connector "1". Make these connections as short as possible.
- 5) Locate the "spare" jack on the back of the Orion. On this same board you will find a pin from the spare jack that comes right through the board. Tack solder the other end of the RG-174 5 inch cable to this spare pin. There is no connection of the shield of the 5 inch coax on this end.
- 6) Check your connections with an ohm meter. With coax "1" removed, you should now see continuity between the female "1" connector and the spare jack. Make sure this is not shorted to ground.
- 7) Replace the Orion top cover.

The spare jack on the Orion is now an AUX receiver output that is connected to the sub-receiver antenna. This can be run to the antenna input of the RX-340 or Panadapter SDR. This jack is fully protected from high transmit power when transmitting.

To mute the RX-340 when the Orion transmits, connect the Amp Key 1 line of the Orion to pin 11 of the DB-15 on the RX-340. Use coax cable for this connection and connect the shield to pin 1 of the DB 15. Set an SSB delay for AMP KEY1 in the program to zero and use about 50 for CW setting of the AMP KEY1 line.

For a serial cable for the RX-340, I made a cable with a male DB 25 that plugs into the RX-340 and a female DB 9 on the other end that plugs into the PC serial port. The cable is 2 RG/174 cables. The first cable has the center lead going to pin 2 on the DB 25 and pin 3 on the DB 9. The second cable has the center lead going to pin 3 on the DB 25 and pin 2 on the DB 9. The shields on both cables are connected together and go to pin 7 on the DB 25 and pin 5 on the DB 9.

#### RX340 Switch Settings

The RX340 jumpers on the back must be set for 9600 Baud, 8 bit, no parity. The receiver address must be set to 1.

Set the jumpers on the back of the RX340 as follows:

##### Switch S1

- 1 down
- 2 up
- 3 up
- 4 down
- 5 up
- 6 down

7 down  
8 down

Switch S2

1 up  
2 down  
3 down  
4 down  
5 down  
6 down  
7 down  
8 up

### Modifying the Tentec Eagle for an Aux Receiver Antenna Connection

I have a simple mod to allow a second receiver such as a panadapter receiver to share the same antenna with the Eagle. The idea is to simply splice into cable #2 in the Eagle and add an RCA jack that is an AUX receiver antenna connection.

- 1) Splice into cable #2 on the bottom of the Eagle near the point where it comes through the chassis by cutting and stripping the ends and soldering the center conductors and braids of the two ends of the cut cable to the stripped ends of the extra provided cable that came with the Eagle.
- 2) Note how the cable for AUX 1 is routed to the rear panel AUX 1 jack.
- 3) There is an extra square hole in the bulkhead where the cable for AUX 1 goes through. Use the provided rubber grommet and run the cable spliced into #2 through this hole to the rear panel AUX hole.
- 4) Remove the plug from the AUX 2 hole and install the provided RCA jack.
- 5) Cut the cable to length. Strip the leads and solder to the AUX 2 jack.

Now the Aux 2 jack is an Aux Receiver connection that will allow antenna sharing with the Eagle. This connection is fully protected from Eagle transmit power. Because this is in parallel with the Eagle antenna connection, there will be a 3 DB drop in signal level. This will not affect performance because both the signal and noise drop 3 DB, resulting in the same signal to noise ratio.

### Antenna Rotor Control

Rotor control is available for all antenna rotors that use the HyGain DCU-1 serial protocol and also the M2 Rotor series. This includes the following rotors:

Green Heron Engineering RT-20 and RT-21  
HyGain DCU-1  
Idiom Press - RotorCard DXA  
Idiom Press - RotorCard SDX  
Idiom Press - RotorEZ  
MDS RC1 series digital rotor control box  
M2 Rotor series  
403A Rotator Genius

For the 403A Rotator Genius see the next section "403A Rotator Genius" and disregard the rest of this section.

To turn on rotor control, with the program not running, open the "orion.ini" configuration settings file. Find the line that says:

```
ROTOR COMPORT=NONE
```

and change it to

```
ROTOR COMPORT=COMx
```

where COMx is the serial port that is connected to the rotor control box.

If you have the M2 rotor series, find the line that says:

```
M2 ROTOR=0
```

and change it to

```
M2 ROTOR=1 for the older M2 rotors and M2 ROTOR=2 for the newer ones.
```

also there are two lines to set software rotor limits. They are

```
ROTOR LOW LIMIT=0  
ROTOR HIGH LIMIT=359
```

You can change these lines if you need to have a different range.

There is also a setting for rotor polling. It is

```
ROTOR POLL=1
```

Set this to 0 if rotor polling causes a calibration problem with your rotor.

There is an edit box in the "Call Sign, TopTen" configuration settings window that is labelled "Rotor Bearing". You can key in the value for the rotor bearing that you want here. Once you key this in, the rotor will turn to that location. If your rotor supports bearing feedback, the rotor display box (just to the right of the edit box) will always show the current rotor bearing. The edit box will show the last target bearing you typed in. This value is updated once every 5 seconds.

You can stop the rotor at any time by clicking on the "Stop" check box. This box is located to the right of the Rotor Bearing edit box. The check mark will go out almost immediately when the stop command is sent to the rotor.

For the M2 rotor series, there is also a "Moving" label that will appear to the right of the Rotor Bearing edit box when the rotor is moving.

If you also use the N4PY DXSpots program, you can click on the displayed bearing for any country in the DXSpots check window and this will also cause the rotor to move to that bearing.

## ADR2200 Used as a Coax Antenna Switch

The ADR2200 serial port switch can be used as a software controlled antenna switch.

To setup the program for the ADR2200 coax switch:

1) With the program NOT running, open the orion.ini file and find the line that says:

```
LDG COAX COMPOR=
```

And change it to

```
LDG COAX COMPOR=COMx  where x= the com number from 1 to 99
```

2) Find the line that says:

```
ADR2200=0
```

and change it to

```
ADR2200=1
```

3) Find the lines that say:

```
ANT 1 LOW=0  
ANT 1 HIGH=0  
ANT 2 LOW=0  
ANT 2 LOW=0  
Etc.,
```

and set the ranges for each antenna in mHz. For example if antenna 3 was to cover the 20 meter band, you should put

```
ANT 3 LOW=14.0  
ANT 3 HIGH=14.35
```

If you have an antenna that needs more than one frequency range such as using an 80 meter antenna also on 30 meters. you can change the antenna that is assigned to each range.

Find the series of lines that say:

```
ANT RANGE 1=1  
ANT RANGE 2=2  
ANT RANGE 3=3  
ANT RANGE 4=4  
ANT RANGE 5=5  
ANT RANGE 6=6  
ANT RANGE 7=7  
ANT RANGE 8=8  
ANT RANGE 9=9  
ANT RANGE 10=10
```

These lines assign the same range to the corresponding antenna by default. But if for example you wanted both range 3 and range 6 to control antenna 3, you would change

```
ANT RANGE 6=3
```

Save the changes to the orion.ini file.

The controls for the switch will show up in the "transmitter" window of the settings menu. With "Auto" selected, the frequency ranges above will cause the particular antenna for that range to be selected. If you select any antenna by clicking on its button, the auto function is turned off and that antenna will remain selected even if you change frequencies. Just click the auto button again to restore automatic antenna selection back.

Additionally, there is a second range for selecting antennas that is controlled with the "A Ant"/"B Ant" button under the user buttons. If this button says "A Ant" then all the ranges as listed above are used to select the antenna position. If the "A Ant" button is clicked it will change to "B Ant" and a second set of ranges will be used. These ranges have names exactly like the above ranges but have a "B" added to them. The names are as follows:

```
ANTB 1 LOW=0
ANTB 1 HIGH=0
ANTB 2 LOW=0
ANTB 2 HIGH=0
etc.
```

```
ANTB RANGE 1=1
ANTB RANGE 2=2
ANTB RANGE 3=3
ANTB RANGE 4=4
ANTB RANGE 5=5
ANTB RANGE 6=6
ANTB RANGE 7=7
ANTB RANGE 8=8
ANTB RANGE 9=9
ANTB RANGE 10=10
```

Again, this second set of ranges is used if the "A Ant"/"B Ant" button is set to "B Ant". The setting for this button is remembered by band.

#### ADR2100 Used as a Coax Antenna Switch

The ADR2100 serial port switch can be used as a software controlled antenna switch.

To setup the program for the ADR2100 coax switch:

1) With the program NOT running, open the orion.ini file and find the line that says:

```
LDG COAX COMPORT=
```

And change it to

```
LDG COAX COMPORT=COMx  where x= the com number from 1 to 99
```

2) Find the line that says:

```
ADR2200=0
```

and change it to

```
ADR2200=2
```

3) Find the lines that say:

```
ANT 1 LOW=0
ANT 1 HIGH=0
ANT 2 LOW=0
ANT 2 HIGH=0
Etc.,
```

and set the ranges for each antenna in mHz. These settings will be for port A on the ADR 2100.

For example if antenna 3 was to cover the 20 meter band, you should put

```
ANT 3 LOW=14.0
ANT 3 HIGH=14.35
```

If you have an antenna that needs more than one frequency range such as using an 80 meter antenna also on 30 meters. you can change the antenna that is assigned to each range.

Find the series of lines that say:

```
ANT RANGE 1=1
ANT RANGE 2=2
ANT RANGE 3=3
ANT RANGE 4=4
ANT RANGE 5=5
ANT RANGE 6=6
ANT RANGE 7=7
ANT RANGE 8=8
ANT RANGE 9=9
ANT RANGE 10=10
```

These lines assign the same range to the corresponding antenna by default. But if for example you wanted both range 3 and range 6 to control antenna 3, you would change

```
ANT RANGE 6=3
```

Save the changes to the orion.ini file.

The controls for the switch will show up in the "transmitter" window of the settings menu. With "Auto" selected, the frequency ranges above will cause the particular antenna for that range to be selected. If you select any antenna by clicking on its button, the auto function is turned off and that antenna will remain selected even if you change frequencies. Just click the auto button again to restore automatic antenna selection back.

For port B on the ADR 2100, you will find another set of settings that all end in "PB" for port B. Only port A and port B are currently implemented in this program. The manual antenna controls only change the port A settings. The port B settings are always in automatic mode.

Denkovi USB 8 Relay Board used as a coax Antenna Switch

The Denkovi USB 8 relay board can be used as a software controlled

antenna switch.

To setup the program for the Denkovi device:

With the program NOT running, open the orion.ini configuration settings file and find the line that says:

1) Find the line that says:

```
DENKOVI=0
```

and change it to

```
DENKOVI=1
```

3) Find the lines that say:

```
ANT 1 LOW=0  
ANT 1 HIGH=0  
ANT 2 LOW=0  
ANT 2 HIGH=0  
Etc.,
```

and set the ranges for each antenna in mHz.

For example if antenna 3 was to cover the 20 meter band, you should put

```
ANT 3 LOW=14.0  
ANT 3 HIGH=14.35
```

If you have an antenna that needs more than one frequency range such as using an 80 meter antenna also on 30 meters. you can change the antenna that is assigned to each range.

Find the series of lines that say:

```
ANT RANGE 1=1  
ANT RANGE 2=2  
ANT RANGE 3=3  
ANT RANGE 4=4  
ANT RANGE 5=5  
ANT RANGE 6=6  
ANT RANGE 7=7  
ANT RANGE 8=8  
ANT RANGE 9=9  
ANT RANGE 10=10
```

These lines assign the same range to the corresponding antenna by default. But if for example you wanted both range 3 and range 6 to control antenna 3, you would change

```
ANT RANGE 6=3
```

Save the changes to the orion.ini file.

The controls for the switch will show up in the "transmitter" window of the settings menu. With "Auto" selected, the frequency ranges above will cause the particular antenna for that range to be selected. If you select any antenna by clicking on its button, the auto function is turned off and that antenna will remain selected even if you change frequencies. Just click the auto button again to restore automatic antenna selection back.



## 403A Rotator Genius

The 403A rotator Genius is configured in the Orion.ini configuration settings file. Here's the setup.

Find the line that says:

```
403A RG=0
```

and change it to

```
403A RG=1
```

Also set the following line to the correct port and IP Address

```
403A RG PORT=9006  
403A IP RG=192.168.1.250
```

Also ROTOR 403A=1 setting can be set to 1 or 2 to control the first or second rotator used by Rotator Genius.

There is an edit box in the "Call Sign, TopTen" configuration settings window that is labelled "Rotor Bearing". You can key in the value for the rotor bearing that you want here. Once you key this in, the rotor will turn to that location. Bearing feedback is shown in the rotor display box (just to the right of the edit box) and will always show the current rotor bearing. The edit box will show the last target bearing you typed in.

There is also a "Moving" label that will appear to the right of the Rotor Bearing edit box when the rotor is moving.

You can stop the rotor at any time by clicking on the "Stop" check box. This box is located to the right of the Rotor Bearing edit box. The check mark will go out almost immediately when the stop command is sent to the rotor.

There are special considerations for setting this up if Client-Server operator is used. See "Special Considerations for 403A Devices" in the CSRemote.pdf documentation file.

### Using Top Ten Devices Antenna Control

There is an automatic antenna selection feature provided to allow users to use the automatic band decoder provided by Top Ten Devices. This unit allows you to have either an external amplifier or external antenna switch automatically follow the Orion frequency settings. This program offers full support for the parallel port with all windows versions.

Information on this band decoder can be found at

[www.qth.com/topten/bdecoder.htm](http://www.qth.com/topten/bdecoder.htm)

Parallel port 1 is used to control the Top Ten device controller. This is enabled in one of two configurations by going to the "Call Sign, TopTen" window of the "settings" menu. Selecting "TopTen Devices Option 1", causes the bands marked on the Top Ten Devices controller to follow the Orion frequency precisely.

In option 1, the bands are selected as follows:

```
Frequency < 2 MHz selects band 1
Frequency >=2 MHz and < 4 MHz selects band 2
Frequency >=4 MHz and < 8 MHz selects band 3
Frequency >=8 MHz and < 12 MHz selects band 4
Frequency >=12 MHz and < 16 MHz selects band 5
Frequency >=16 MHz and < 20 MHz selects band 6
Frequency >=20 MHz and < 24 MHz selects band 7
Frequency >=24 MHz and < 26 MHz selects band 8
Frequency >=26 selects band 9
```

Selecting "TopTen Devices Option 2" causes a unique setup for controlling the device.

In option 2, the bands are selected as follows:

```
Frequency < 200 kHz selects band 1
Frequency >=200 kHz and < 30 MHz selects band 2
Frequency >=30 MHz and < 55 MHz selects band 3
Frequency >=55 MHz and < 149 MHz selects band 4
Frequency >=149 MHz selects band 9
```

When a frequency change is detected, the new band setting is output to the parallel port. The Top Ten Automatic Band Decoder is plugged into this parallel port and responds to the information sent to the port.

#### Woodbox Radio Tmate 2

Woodbox radio sells a very nice 3 knob pod with 6 buttons that is now supported in N4PY programs. To configure this pod, go to the "Remote Pod Fkeys" settings window and turn on the check box "Using Woodbox Radio Tmate2". Assuming the Tmate2 is already plugged into a USB port and it's drivers are installed, that's all you have to do.

Once the knob is configured and working, you can now customize the N4PY program to your liking. There are 3 pod setup windows to allow you to define the actions of the FlexControl buttons.

There are 9 buttons on the Tmate2 device. They are F1, F2, F3, F4, F5, F6, and the 3 knobs themselves.

The 3 pod settings windows allow you to select the actions for these buttons. These 3 pod settings windows are named "Knob Settings", "Function Keys", and "Knob Buttons". The main right knob, and the center knob are setup for single function. You define these single functions in their settings list box in the "Knob Settings" settings window. The left hand knob is meant to be a multi use knob. It's initial function is set with the "Left Multi Knob" list box. The current setting for the multi knob is always shown in the upper right hand corner of the black frequency area.

The "Function Keys" settings window contains the settings for the six F1 to F6 keys. Any knob function setting set from an F key will be assigned to the left multi knob only.

The "Knob Buttons" settings window contains the settings for the 3 knob buttons. Any knob function setting set from a knob button

will be assigned to the left multi knob only. Please note that I found that the right Main tuning knob is very easy to accidentally push its button. I added a new pod setting called "No Op". Selecting this setting causes no operation to be done. That's what I now use for the Main knob button.

The selections "UP B+1" and "UP B+5" are very nice for split DX pileups. "UP B+1" and "UP B+2" selections work together to give you a very nice UP frequency function. By setting say "F6" to "UP B+1" and "F5" to "UP B+2" (these are the default settings), when a DX station announces he is listening say "up 3", you can simply press the "F6" button 3 times and VFO B will now be VFO A plus 3 and Split will now be on. Therefore, you can instantly set split operation for an exact amount by how many times you rapidly click "F6".

The exact action for "UP B+1" is if SPLIT is off, perform an A equal B and then add 1 to VFO B. If SPLIT is already on, then just add 1 to VFO B. And the "UP B+5" also does the same thing except it adds 5.

The "Tune Lock" LED on the pod is used as a "Split" indicator. When on "Split" is on. When off, "Split" is off.

There's an option in the "Knob Buttons" settings window to have the Tmate 2 S meter just read Peak readings.

There are also tuning parameters in the Orion.ini configuration settings file. They are as follows:

```
TM2 RED=255      This controls how much red color is in the backlight.
                  The range is 0 to 255.

TM2 GREEN=255    This controls how much green color is in the backlight.
                  The range is 0 to 255.

TM2 BLUE=255     This controls how much green color is in the backlight.
                  The range is 0 to 255.

TM2 CONTRAST=0   This controls how much contrast is on the screen.
                  The range is 0 to 255 with max contrast at 0.

TM2 SPEED 1=1    This controls the speed of the main tuning knob. It should
always
                  be set to 1.

TM2 SPEED 2=20   This controls the multiplier when turning the main knob at speed
2.

TM2 SPEED 3=100 This controls the multiplier when turning the main knob at speed
3.

TM2 THRESH 1 2=5 This controls the amount of counts that occur during the
                  evaluation time period to where speed 2 kicks in.

TM2 THRESH 2 3=10 This controls the amount of counts that occur during the
                  evaluation time period to where speed 3 kicks in when
                  already at speed 2.

TM2 EVAL MS=100  This sets the evaluation time in milliseconds to decide on
                  changing the knob speed to speed 2 or speed 3.
```

#### FlexControl Knob

Flex Radio sells a very nice knob that can be used to control any N4PY supported radio. This knob has a big advantage over the Griffin and Shuttle Pro knob because it tunes much nicer

and does not have the "Focus" problem. That means this knob will still control the radio even when N4PY is running in the background. You can purchase this knob on the Flex radio website. Go to the Online Store and select "Accessories" to find it. N4PY Software has no connection with Flex Radio.

To install this FlexControl Knob Software Driver from the CD -

- 1) Insert the CD that came with the FlexControl device.
- 2) When it asks what you want to install, uncheck all the boxes except "FlexControl". This is the only selection you want to make.
- 3) Run this installer to its completion.

OR

To install this FlexControl Knob Software Driver from the Internet -

- 1) Go to [www.flex-radio.com](http://www.flex-radio.com)
- 2) Scroll down and find "PowerSDR 2.x Integrated Installer".
- 3) Download and run this installer.
- 4) When it asks what you want to install, uncheck all the boxes except "FlexControl". This is the only selection you want to make.
- 5) Run this installer to its completion.

Now plug in the FlexControl USB connection to any USB connector on your computer.

For Windows Vista or 7, the computer should display a message saying "Installing Device Driver." A few moments later a message will appear that says "FlexControl Driver is successfully installed" and "The device is ready for use."

For Windows XP, after plugging in the FlexControl for the first time, (or anytime in the future that a new USB port is used) the "Welcome to the Found New Hardware Wizard" will appear explaining that the "Wizard helps you install software for: FlexControl USB Control Knob".

Check "Install the software automatically." Then press "Next." This will result in a message that the "Wizard has finished installing the software for FlexControl USB Control Knob." Now press "Finish" to close the Wizard.

Once the Wizard completes the install, you must check to make sure there are no comport conflicts. You do this as follows.

- 1) Double click on "My Computer"
- 2) Click "View System Information".
- 3) Click the "Hardware" tab.
- 4) Click the "Device Manager" button.
- 5) Slide down to ports and see what comport was assigned for "FlexControl USB Control Knob".
- 6) If this comport conflicts with anything else you have installed previously, you must change it.
- 7) To change the FlexControl comport,
  - A) Double click on "FlexControl USB Control Knob"
  - B) Click the "Port Settings" tab.
  - C) Click the "Advanced" button.
  - D) Click the down arrow next to "COM Port Number".
  - E) Select an unused comport. A high one is a good one to select.

- F) Click "Ok" on all opened windows.
- G) Reboot your computer and all should be well.

If there is ever a need to manually tell Windows where to find the driver files, tell Windows that the drivers are in:

C:\Program Files\FlexRadio Systems\PowerSDR v2.1.x\FlexControl\yy

Where x is the dot release for the version of PowerSdr V2.1, and where yy is either 32 or 64, as is appropriate for the version of the Windows Operating system.

Operation of the FlexControl Knob in the N4PY program -

Once the driver and Flex knob are fully installed, start the N4PY program. Go to the settings window and then select "Remote Pod Fkeys". Check the box "Using FlexControl Knob".

Once you select this box, the N4PY program will search for the FlexControl device. If it finds it, the knob will now control your radio. If you get the error "FlexControl Knob not found" something is wrong with the software driver setup above.

Once the knob is configured and working, you can now customize the N4PY program to your liking. There are 3 pod setup windows to allow you to define the actions of the FlexControl buttons.

There are 4 buttons on the FlexControl device. They are Aux1, Aux2, Aux3, and the knob itself. Each button can be used with 3 different actions. A single click, a double click (like a mouse), and a long click (greater than a half second).

The 3 pod settings windows allow you to select the actions for these buttons. These 3 pod settings windows are named "Aux Single", "Aux Double, Long", and "Knob Clicks". The default action for the knob itself is a single click will set the knob to control VFO A. A double click will set the knob to control VFO B. A long click will set the knob to control pass band tuning. You can see the action for the knob in the upper right hand corner of the black frequency area.

There are special selections for the Aux Single, Double, and Long selections. These are "UP B+1", "UP B+2", and "UP B+5". The "UP B+1" and "UP B+2" selections work together to give you a very nice UP frequency function. By setting Aux3 Single to "UP B+1" and Aux3 Double to "UP B+2" (these are the default settings), when a DX station announces he is listening say "up 3", you can simply press the Aux3 button 3 times (fast but not so fast as to get a double click) and VFO B will now be VFO A plus 3 and Split will now be on. Therefore, you can instantly set split operation for an exact amount by how many times you rapidly click Aux3.

The exact action for "UP B+1" is if SPLIT is off, perform an A equal B and then add 1 to VFO B. If SPLIT is already on, then just add 1 to VFO B. The "UP B+2" does the same thing except it adds 2 instead of 1. And the "UP B+5" also does the same thing except it adds 5. Once the "UP" operation is complete, the knob action is automatically set to VFO B. A single click of the knob itself get the knob action back to VFO A.

I recommend you use a label maker and label the 3 Aux buttons on the FlexControl device as an aid to remember their settings.

The 3 lights on the FlexControl knob are used to show the status for the single click actions for Aux1, Aux2, and Aux3. They will light only if Split, Dual receive, RIT, or PBT is on for that button. For example, if you have Aux1 Single defined for Split, the light above Aux1 will be on when Split is on and off when Split is off.

Ignore the text on these 3 lights as it is meaningless for this program.

You can also setup a fast tuning increase in step size to allow for very fast tuning.

To set this up, do the following:

- 1) In "Aux Single", make sure "Tuning Knob Desense Step Threshold" is at least 500.
- 2) In "Preferences4", set the "High Speed Tuning Factor" to a value that you want the step size increased to. If you step size is normally 10, a value of 50 would increase the step size to 500 for very fast tuning.
- 3) In "Preferences4", set the sensitivity for how fast you move the knob before high speed kicks in. Normally, you will set this to a value between 2 and 20. The higher numbers are lower sensitivity.

#### Behringer CMD Micro MIDI DJ Controller

Behringer has a very nice DJ controller that is well suited as a ham radio controller. This device has 10 knobs and 20 buttons. To configure this pod, go to the "Remote Pod Fkeys" settings window and turn on the check box "Using Behringer MIDI Controller". Assuming the device is already plugged into a USB port, that's all you have to do.

Once the device is working, you can now customize the N4PY program to your liking. All the control setup is done using the cmdmicro.ini configuration settings file. This file is located in the folder where you installed the N4PY program and is not built until you turn on the "Using Behringer" option the first time. This file can be setup with the N4PY program either running or not running. If changes are made to the cmdmicro.ini file while the N4PY program is running, you can click the button "Reload Behringer Settings" once the changes have been saved in the file.

You can edit this file with notepad. The sliders are defined as "SLIDER1" being the left most slider and "SLIDER5" being the right most slider. All the other controls use the text as shown on the device itself. You can use a label maker and add labels to the controls as you like. I have provided a picture of an unmodified controller to allow you to see the original names on the controller. It is "picturecmemicro.jpg" and is in the folder where you installed the N4PY program.

The settings text must be exact from the list below for buttons but upper or lower case can be used freely.

Tuning Selections  
Tuning Steps

Reverse Steps  
 Split Reverse  
 A/B Toggle  
 Knob A/B Toggle  
 A = B  
 VFOA  
 PBT  
 TX POWER    This controls the TX slider for power output  
 RIT  
 XIT  
 VOL  
 SUB VOL  
 VFOB  
 PTT  
 VOX  
 Bin RX  
 RF Gain  
 Split Key  
 Amp Tune  
 Band Bottom  
 Up Numeric  
 Down Numeric  
 Keyer Speed  
 Up Filter  
 Down Filter  
 Filter Tune  
 AccInp Xmit  
 Mute  
 Dual Receive  
 UP B+1  
 UP B+5  
 Freq Scan  
 ST Volume  
 CW Mem1  
 CW Mem2  
 CW Mem3  
 CW Mem4  
 CW Mem5  
 Tune  
 SAF/NOTCH  
 Speech Proc

For the large left knob, large right knob, and the browse knob, the settings text is below.

\* VFOA  
   PBT  
   ALC            This controls the TX slider for power output  
 \* RIT  
 \* XIT  
   VOL  
   SUB VOL  
 \* VFOB  
   RF Gain  
   Keyer Speed  
 \* Filter Tune  
   ST Volume  
   Speech Proc

\* Only the large left knob, large right knob, and browse knob can do

these functions.

The browse knob is actually used as a multi function knob. If you define a button with a knob function setting, the browse button function will change to that function. The browse button current function is shown as small text in the upper right hand corner of the black frequency area.

The 5 sliders, the main level knob, and cue level knob cannot do all the above functions. They cannot do the ones labelled with an asterisk above.

Not all functions above are available on all radios.

The selections "UP B+1" and "UP B+5" are very nice for split DX pileups. "UP B+1" and "UP B+5" selections work together to give you a very nice UP frequency function. By setting say "-" to "UP B+1" and "+" to "UP B+5" (these are the default settings), when a DX station announces he is listening say "up 3", you can simply press the "-" button 3 times and VFO B will now be VFO A plus 3 and Split will now be on. Therefore, you can instantly set split operation for an exact amount by how many times you rapidly click "-".

The exact action for "UP B+1" is if SPLIT is off, perform an A equal B and then add 1 to VFO B. If SPLIT is already on, then just add 1 to VFO B. And the "UP B+5" also does the same thing except it adds 5.

#### Behringer Studio 2A MIDI DJ Controller

Behringer has a very nice DJ controller that is well suited as a ham radio controller. This device has 54 controls consisting of knob and buttons. To configure this pod, go to the "Remote Pod Fkeys" settings window and turn on the check box "Using Behringer MIDI Controller". Assuming the device is already plugged into a USB port, that's all you have to do.

Once the device is working, you can now customize the N4PY program to your liking. All the control setup is done using the studio2a.ini configuration settings file. This file is located in the folder where you installed the N4PY program and is not built until you turn on the "Using Behringer" option the first time. This file can be setup with the N4PY program either running or not running. If changes are made to the studio2a.ini file while the N4PY program is running, you can click the button "Reload Behringer Settings" once the changes have been saved in the file.

You can edit this file with notepad. You can use a label maker and add labels to the controls as you like. I have provided a picture of an unmodified controller to allow you to see the original names on the controller. It is "picturestudio2a.jpg" and is in the folder where you installed the N4PY program.

The settings text must be exact from the list below for buttons but upper or lower case can be used freely.

- Tuning Selections
- Tuning Steps
- Reverse Steps
- Split Reverse
- A/B Toggle
- Knob A/B Toggle
- A = B



VFOA  
 PBT  
 TX POWER            This controls the TX slider for power output  
 RIT  
 XIT  
 VOL  
 SUB VOL  
 VFOB  
 PTT  
 VOX  
 Bin RX  
 RF Gain  
 Split Key  
 Amp Tune  
 Band Bottom  
 Up Numeric  
 Down Numeric  
 Keyer Speed  
 Up Filter  
 Down Filter  
 Filter Tune  
 AccInp Xmit  
 Mute  
 Dual Receive  
 UP B+1  
 UP B+5  
 Freq Scan  
 ST Volume  
 CW Mem1  
 CW Mem2  
 CW Mem3  
 CW Mem4  
 CW Mem5  
 Tune  
 SAF/NOTCH  
 Speech Proc

For the large left knob, large right knob, and the two pitch bend knobs, the settings text is below.

\* VFOA  
   PBT  
   ALC            This controls the TX slider for power output  
 \* RIT  
 \* XIT  
   VOL  
   SUB VOL  
 \* VFOB  
   RF Gain  
   Keyer Speed  
 \* Filter Tune  
   ST Volume  
   Speech Proc

\* Only the large left knob, large right knob, and the 2 pitch bend knobs can do these functions.

The left pitch bend knob is actually used as a multi function knob. If you define a button with a knob function setting, this button function will change to that function. The left pitch bend button current function is shown

as small text in the upper right hand corner of the black frequency area.

The 3 sliders and the knobs that have limits on how far they can turn cannot do all the above functions. They cannot do the ones labelled with an asterisk above.

Not all functions above are available on all radios.

The selections "UP B+1" and "UP B+5" are very nice for split DX pileups. "UP B+1" and "UP B+5" selections work together to give you a very nice UP frequency function. By setting say pitch bend minus to "UP B+1" and pitch bend plus to "UP B+5" (these are the default settings), when a DX station announces he is listening say "up 3", you can simply press the "-" button 3 times and VFO B will now be VFO A plus 3 and Split will now be on. Therefore, you can instantly set split operation for an exact amount by how many times you rapidly click "-".

The exact action for "UP B+1" is if SPLIT is off, perform an A equal B and then add 1 to VFO B. If SPLIT is already on, then just add 1 to VFO B. And the "UP B+5" also does the same thing except it adds 5.

Program Support for the Griffin Technology PowerMate And  
also the Contour ShuttlePro Multifunction Controller

The Griffin Technology PowerMate and also the Contour ShuttlePro Multifunction Controller can be used for tuning the radio. However, I have found that a mouse with a spinning scroll wheel such as the Logitech MS 620 works better than either of these keyboard simulator controllers.

Either keyboard controller should be configured as follows:

- RotateRight - SendKey with key value of Alt-G
- RotateLeft - SendKey with key value of Alt-B
- Click - SendKey with key value of Alt-I
- LongClick - SendKey with key value of Alt-Y

Also, set the PowerMate sensitivity all the way to "Fast".  
The active application when the Orion control program is running is Orion.EXE.

The numeric keypad on the keyboard becomes the keys that go along with the PowerMate. If the keys are not reacting properly, you may have to click on the program radio panel to get the keyboard focus to the radio panel. Once the PowerMate is properly setup, you can now configure "Remote Pod 0-3" and "Remote Pod 4-9" to operate from the numeric keypad of the computer keyboard. Pressing the PowerMate knob down quickly will produce a click that the program will interpret as "F1" and follow the setting for "F1". Likewise, pressing the PowerMate knob for a long click will cause an "F2" operation to be performed. There is no operation for the F3 key.

Once properly setup, you can use the PowerMate to change frequency, filters, RIT, PBT and many other things. You can still use the numeric keypad for direct frequency entry by pressing the "ENTER" key first.

You can purchase the PowerMate by going to [www.griffintechology.com](http://www.griffintechology.com).

## WaveNode Watt Meter

The WaveNode watt meter is now supported. If you have a WaveNode watt meter, you can define this for use by opening the orion.ini configuration settings file. Find the line

```
WAVENODE=0
```

and change it to

```
WAVENODE=1
```

Then save the change.

Before starting the N4PY program, you must first start the wavenode program WN2.EXE, supplied by WaveNode. This is necessary since the wavenode program will send power and SWR messages to N4PY.

In the N4PY program, you can press Alt-Z to get the wavenode window. This window shows the SWR, average power, and peak power from the wavenode sensors. It also allows you to select which sensor will be shown in the S meter window during transmit. And it has a selection for "Use Peak Power". With this box checked, peak power will be shown in the S meter window during transmit. With this box not checked, average power will be shown.

## Diagnostic Tracing

There is a check box in the "Preferences" window labelled "Diagnostic Tracing". This is used to gather trace information for Carl to debug a problem. When changing this setting, you have to exit and restart the program for the new setting to take effect. Turning this on causes tracing information to be written to the 3 trace files "comms.txt", "comms2.txt", and "comms3.txt". Only turn this on when you have been asked to by Carl.

## Hot Keys on the keyboard

<Up-Arrow>	Increase step size
<Down-Arrow>	Decrease step size
<Left-Arrow>	Tune Down
<Right-Arrow>	Tune Up
<Shft-Left-Arrow>	Fast Tune Down
<Shft-Right-Arrow>	Fast Tune Up
<Ctl-Left-Arrow>	Decrease Speaker Volume
<Ctl-Right-Arrow>	Increase Speaker Volume
<Ctl-Up-Arrow>	PBT Up
<Ctl-Down-Arrow>	PBT Down
<->	Decrease Speaker Volume
<+>	Increase Speaker Volume
<Alt =>	A=B
<Alt />	A/B
<Alt-A>	AM Mode
<Alt-C>	CW Mode
<Alt-E>	Speech Proc
<Alt-F>	FM Mode
<Alt-H>	Show Message Box with this Menu
<Alt-J>	Amp Window

<Alt-K>	CW Keyboard Keyer
<Alt-L>	LSB Mode
<Alt-M>	Mute Audio
<Alt-P>	TxLoop
<Alt-P>	PTT Toggle
<Alt-R>	RTTY Mode
<Alt-S>	Split
<Alt-T>	ATTN
<Alt-U>	USB Mode
<Alt-W>	Calibrate
<Alt-X>	Quit
<Alt-Z>	Wave Node
<Alt-space>	Accessory Input Toggle
0 - 9	Begin Entering Frequency
F1	CW Keyboard Keyer Memory 1
F2	CW Keyboard Keyer Memory 2
F3	CW Keyboard Keyer Memory 3
F4	CW Keyboard Keyer Memory 4
F5	CW Keyboard Keyer Memory 5
<Shift F1> to <Shift F9>	SSB Band Buttons
<Ctrl F1> to <Ctrl F9>	CW Band Buttons

For comments and suggestions email to  
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Please do not email or call Ten-Tec regarding this software.

