

# Welcome to the Tampa Amateur Radio Club!

## We're glad you're here!

This guide will give you information as to the configuration of TARC's HF Operations facility.

The following information is provided:

- Configuring the antenna systems for normal operation
- Configuring the radios for normal operation
- Configuring the rotors for normal operation
- Setting up the logging software for general operation

This guide is not a substitute for the operations manuals for the equipment. It is simply a configuration guide for getting the station hooked up and ready to use for general operation.

For best results and operating enjoyment, please read the manuals for the equipment. They can be found in the upper left hand drawer of Position A. Familiarize yourself with the features and capabilities of the Icom IC-756Pro2 radios, Logic 7 Logging software and the Yaesu and M Squared rotor systems.

The more you know the more fun you will have.

If you have any questions input or comments regarding the configuration of the system, feel free to ask at a general meeting or send an email to

[info@hamclub.org](mailto:info@hamclub.org)

Your comments are always welcome!

This guide will be updated from time to time to reflect any changes to the system configuration. You will find the latest version of this guide at our website, [www.hamclub.org](http://www.hamclub.org) in the "station operations" section.

### Version History

V1.0 – First Release – 3/28/06 – LVR

V1.1 – First Public release after modifications – 3/29/06 - LVR

## Station Equipment and Nomenclature

The TARC HF operations system consists of two "identical" operating positions called "Position A" and "Position B". The two operating positions are located along the south wall of the operations center facility.



As you enter the operations center, the HF stations are to your right.

While the stations were designed to be as identical as possible, there are some slight differences. However, the layout and basic operation of the facilities is reasonably identical. If you learn how to operate one, you will be able to operate the other one.

Pictured below is HF Position A, which consists of the following equipment:



From left to right and top to bottom:

- Top Ten Devices Six Pack Band Decoder
- ICE Bandpass filter
- Icom Speaker
- 17 Inch LCD Monitor
- Yaesu Rotor Controller for Tower 2 (moved to Position B)
- M2 Rotor Controller for Tower 1
- Dell Speakers for digital modes
- Icom IC-756ProII transceiver

Also pictured is a Bencher paddle and Icom Desk microphone. Not pictured and placed to the left of the respective stations is a Compaq EN Pentium 600 computer which is interfaced with the rotor control and the transceiver.

The TARC HF Operations facility has two antenna tower “stacks” available to the stations.



Tower #1, the main tower, is 110 feet of Rohn 45 and features (from top to bottom) a Force 12 M240 2 element 40 meter beam and a Force 12 C31XR triband (10-15-20meters) array with independently fed driven elements. This arrangement allows both positions to take advantage of the stack at the same time on separate bands.



Tower #2 is 70 feet of Rohn 25 and features a Force 12 C19 Triband beam for 10, 15 and 20 meters along with a 3 element 6 meter beam. The rest of the antennas on this stack are for 144 MHz through 1.2 GHz V/U use and are beyond the scope of this manual.

## **Setting up the stations for normal operation**

Section 1 describes normal operation for the facility is through the exclusive use of Tower 1. That is, both radios are routed to the Tower 1 antennas through the ICE filters and Band Decoders for 160 through 10 meter operation. This allows the band decoder to control what antenna is available to which position so as to not allow both radios on the same band at the same time, which will cause damage to one or both of the transceivers.

Another mode is available that allows independent operation of Position A on Tower #1 and Position B on Tower #2. This mode will be discussed in Section 2 of this document.

### **Section 1:**

#### **Default Operation Set Up – Two radios on one tower.**

To configure the station(s) for normal default operation, follow the procedure described below:

*Make sure the Low Band Dipole is connected to the Six Pack*

The HF operation positions currently share a multiband dipole with the SHARES/EMCOMM station. This antenna is used by both facilities but, due to the design of the Six Pack switching system, the antenna must be “patched” at the base of the tower.



First, go to the base of Tower #1 and look at a coil of coax that is attached to the tower.

This coil leads from the multiband dipole balun and is either connected to the Six Pack 80 meter input or to another coax that runs into the clubhouse via a barrel connector.



If the antenna is connected to the Six Pack, you need do nothing more. If it is connected to the Barrel connector, disconnect it.

Look at the bottom of the Six Pack box on the tower and find the "80" socket.



Plug the coax coming from the antenna in to this socket. This socket is located in the center row of connectors. The two outside connectors feed coax to the radios. All antenna switching is done outside of the clubhouse in the Six Pack relay box. This allows for only two coax feeds into the building, one for each operating position in the above illustration, the hand is grasping the coax that is plugged in to the 80 meter socket. This is how the box should look after plugging in the multiband dipole. Normal operation has all the available sockets on

the Six Pack relay box filled with coax feeders. Note that there is currently no 160m antenna, but the coax feeder is "prewired" for when we do.

### Connecting the Band Decoders, Filters and Antennas

Now, proceed inside to set up the auxiliary devices that control the facility switching from the Operating positions.

The first step is to connect the power and control leads to all the equipment. The above are normally disconnected so as to prevent static and lightning damage to the equipment.

Find the ICE Filter and band decoder interface cables. They are a Molex plug and socket set normally looped on the upper left hand side of the operating positions.



Plugging these in will provide power and control signals to the ICE filter system from the band decoder and filter system. They are keyed so that they only go in one way.

Next, plug in the rotor control boxes for the particular operating position.

### *For Position A*

Find the Cinch Jones plug and socket set behind the rotor control box and plug them together. One end is marked by brown tape; the other has a silver mating bracket on the plug side.



These cables are keyed so they only go in one way. Make sure that the serial cable and power cable on the back of the M2 controller is plugged into the control box.

### *For Position B:*

Plug the white Mini Plug with the multi colored cable into its socket on the rear of the Yaesu control box.

## Plugging in the antennas



Locate the two cables usually on the top of the 756 Pro2 transceivers. These are the antenna leads from the system. The thin cable, (RG58) is the lead from the ICE filter. The thick cable (RG8) is the lead from the antenna patch panel. You might as well plug them both in.

### **WARNING! IMPORTANT PROCEEDURE!**

*Make sure you ground the center pin of both cables on the ground lug of the radio **BEFORE** you plug them in to dissipate any static charge! Failure to do this may destroy the transceiver's final amplifier transistors!*

Plug the thin cable into the left hand, or "Antenna 1" socket on the transceiver. Plug the thick cable into the right hand, or "Antenna 2" socket of the transceiver.



A correct cable installation should look like this:



### Powering up the Computer and Rotor Control Boxes

After making sure that all the above connections are complete and ready, we can now proceed to powering up the computer and Rotor controllers.

First, power on the rotor controllers.

### *On the M2 in Position A*

Find the power switch on the front and turn it on.



The controller should light and the display should show the current beam heading of the antenna on the digital display.

### *On the Yaesu in Position B:*

Find the power switch on the front and turn it on. The controller analog display lighting should now light up.



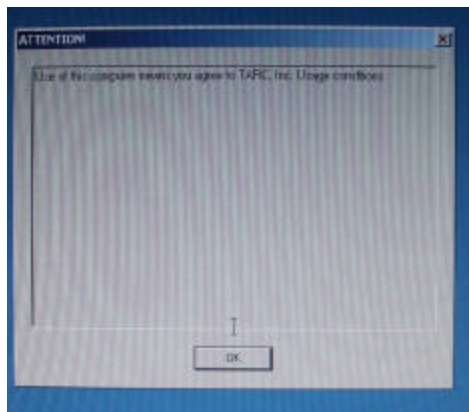
### *Powering up the computer systems*

After connecting all the cables as above you can proceed to power up the computer.

The speakers and monitor are usually left on and there is no need to power them (the speakers don't use much power and have the levels set and the monitor has auto power down management). All you need to do is turn the computer on using the front panel power switch.



The system will boot up to the following screen:



If you agree with the statement, click OK. If you don't, don't use the computer system.

You will then be presented with the opportunity to log on to the system, as the computer will present you with the following screen:



The password is TARC. Note that standard users do not have save and install rights on the computers. This means that you can't go out on to the internet, download stuff and install it on the club machines.

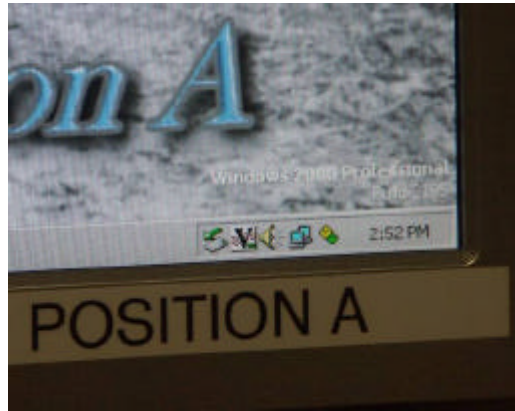
This was done to keep stability, consistency and control of the software at the Clubhouse and to prevent viruses and configuration headaches we have had in the past.

Remember, the idea is for BOTH stations to remain as identical as possible. If you think that additional software is required to be loaded on these two machines, please email [k4lvr@hamclub.org](mailto:k4lvr@hamclub.org) so that Lu can evaluate your needs and install the software on both systems in a consistent and identical manner.

After logging in to the computer, the main screen will be displayed.



This page displays all the software that is available on the machines for your use in operating the HF stations. To make sure that you have internet connectivity (for logging, DX spots and callsign lookups), look on the systray (the lower right hand side of the Windows Task Bar) and find the "clock" logo.



It should look like the above (yellow clock face over a green clock face). If this logo has a red X over the clock faces, then internet connectivity is probably down. If it is grayed out, this means that the clock has not been refreshed with the time server in a while. The software is programmed to sync time with the NIST server every 30 minutes or so.

**IMPORTANT NOTE!** *Please leave the time on the Windows Systray alone and set to Local Time. DO NOT change it to GMT time. Both Logic 7/8 and N1MM Contest Logger have time offsets to generate GMT time from the system clock and DO NOT require the local Windows clock to be set to GMT. Both programs automatically adjust to Daylight Savings Time changes as well, so you don't need to mess with time on the clock any more.*

You are now ready to power the transceiver on.

## Powering up the station

First, find the station power supply. At Position A, the power supply is under the bench. At Position B, the power supply is on the overhead shelf on the top of the cubicle.



Turn the power switch on the Astron power supply to the ON position. The switch should light red (and the voltmeter on Position A's supply should read between 13 and 14 volts DC).

**NOTE!** *It is normal for the power supplies to emit a "groan" when they are being turned on.*

Next, power up the 756Pro2. Find the power switch on the upper left side of the radio and press it.



The radio should now begin its calibration sequence.

When all the lights on the LCD display are green, the display will change and look likes this:



At this point you should check the following parameters to ascertain the system's operational status:

- Antenna 1 is selected on the 756.
- You hear activity on the band selected.
- There are signal peaks on the spectrum scope.
- A red LED is lit on both the ICE filter and the Band Decoder.
- The same band is indicated on the above devices as on the radio active VFO display.
- When you press another band on the radio bandswitch, both the decoder and the filter change and the bands indicated match.



If all the above are OK, chances are you have successfully set up the station.

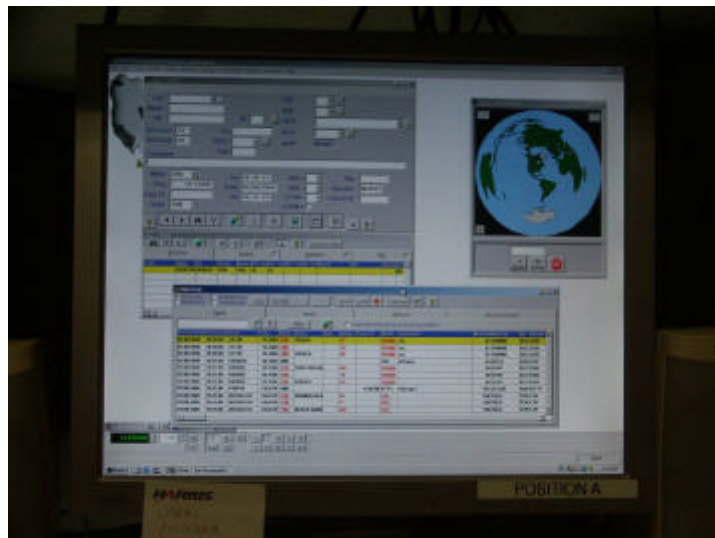
Now lets move on to starting the logging program.

## Setting up for computer logging

On the computer screen, select the LOGic program Icon and double click on it.

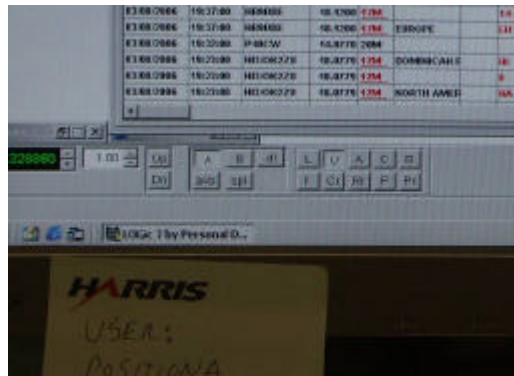


The program should open and look like this:



You log contacts on the logging form, spots are seen on the spot form and the Tower 1 antenna array, when under computer control, can be turned using the antenna rotor control panel. Just click on the area of the world where you want to turn the antenna to and it will be turned there automatically.

As you tune the radio, you should see the frequency change in the box located at the lower left of the Logic screen.



Further instructions on using Logic are beyond the scope of this document. A manual for the software is located on the top shelf of the station(s).

You are now ready to tune the radio.

### Changing mode and frequency on the 756 Pro2

To change the mode on the radio, look to a row of buttons on the bottom side of the LCD display.



You can select the mode using these buttons. The mode on the logging program will change along with these as well.

We use the built in antenna tuner full time on both these station setups. To tune the radio to the antenna, set the meter select on the front panel to SWR and press the tune button.



The radio will automatically adjust the antenna tuner to match the antenna.

You can input a frequency directly into the radio by using the input pad on the right hand side of the rig.



Select ENT (in red) on the keypad. Enter the frequency you want to operate using the RED markings on the keys. Hit ENT again. The VFO will change to the frequency entered.

If you want to change bands, simply press the respective key with the frequency bands listed with WHITE markings. The radio, along with the ICE filter and Band Decoder unit, will change bands to the band selected.

Switch the meter switch to ALC and set your mic gain so that the ALC meter deflects within the ALC zone.

Switch to the COMP position and set compression level with the control to the appropriate meter reading.

Switch to Power Out position and adjust output power as needed (most leave this switch full clockwise for CW/SSB, but it must be adjusted to no more than 25 watts for PSK and other high average power digital modes).

The station is fully adjusted and ready for use.

Other IC-756Pro2 Operating information is beyond the scope of this document. It can be found in the 756 Pro2 manual located in the upper left hand drawer of the desk.

## Section 2:

### Using both antenna stacks on both stations.

As discussed above, the normal operating procedure is that the stations share a single stack for transmission. The Band Decoders and ICE Filters make sure that only one radio is capable of accessing each respective band.

There are times that the radios need to be "split". For example, someone might want to work South American stations on 10 meters on Position B when another operator is working Eastern Europe on Position A. Since both stations share one tower and rotor, one of the stations will not be able to point their antenna in the correct direction.

In this case, the Position B station can use the stack on Tower 2 and its attendant Triband antenna.

There are two very important caveats to this style of operation.

- Position B will only have access to the triband antenna, and
- Because the band decoders are bypassed, TWO RIGS CAN BE ON THE SAME BAND WITH POSSIBLY DISASTROUS RESULTS!

**IMPORTANT NOTE** *Operators must be very aware of where the other station is operating and avoid using the same band. Failure to do this will result in severe damage to both receivers in the HF station facility. You have been warned!*

Here is the procedure to set up the stations with independent towers:

## *Connecting the Antenna system*

On the patch panel, patch the C19 tribander to the Antenna 2 connector for the radio in Position B. Simply jack the output of the antenna to the radio input as marked on the patch panel.



Disable the ICE filter by turning the power off on the front panel.

Disable the Band Decoder by moving it from the AUTO position to an unused band, say 160m.

Then, select Antenna 2 on the 756 Pro2's front panel antenna selector switch (the push button on the upper left hand side of the LCD panel).

If you turned on the Yaesu rotor control, turn the C19 tribander to the azimuth you want.

Ask the operator at Position A what band he is on. **DON'T GO TO THAT BAND!**

Select 10, 15 or 20 meters on the 756 Pro2, tune up and you're ready to go!

You can also use the same technique and set up to use Position B for 6 meter work. Instead of patching the C19 into Antenna 2, patch the 6 meter beam into Antenna 2.



All other parameters stay the same.

Remember that you can go back to single tower mode at any time by simply selecting Antenna 1 on the front panel of the 756, turning the Band Decoder switch to Auto and turning the power on to the ICE filter system.

### **Section 3:**

## **General Troubleshooting**

Troubleshooting the system is simple. There is not much that can go wrong.

The key items are to make sure that you hear band activity on the receiver and see band activity on the LCD panel of the rig BEFORE you attempt to transmit. While this might be difficult on 10 and 6 meters, if you have the setup working correctly for the lower bands, chances are good that it will work for higher bands.

Be especially aware of making sure that the patch panel and external dipole connections are made correctly.

When operating in two tower mode, be especially aware of where the other station is operating and make sure that the two radios are not on the same band on different antennas.

## **Section 4:**

### **FCC Station Operating Requirements**

#### **Callsigns:**

As a club station, the W4DUG call sign has been assigned to this location. Per FCC regulations, and Club rules, you **MUST** use the station's callsign when operating ANY transmitting equipment at the clubhouse. Please do not use your own callsign, only use the Club callsign – W4DUG – from the clubhouse when using “clubhouse infrastructure”.

TARC holds another callsign – N4TP. This callsign is assigned to the repeaters and **WILL ONLY** be used on HF for contest purposes, or other special, non-contest purposes as determined by the Board of Directors in conjunction with and with the approval of, the station trustees.

#### **Operator Privileges:**

When transmitting, W4DUG control operator duties will only be performed within the License class structure as described in Part 97 of the FCC Amateur Radio Service Rules.

Using the club's callsign does not automatically grant you Extra-Class privileges! As the “control operator” of W4DUG, you may only operate the station under the privileges granted to you by your class of FCC license.

You can, however, operate the station on frequencies not granted to you by your license class *ONLY WHEN SUPERVISED BY A CONTROL OPERATOR WITH THE HIGHER PRIVILEGES*. The control operator must sign the log and be present at the “control point” (the radio room itself), where he can SEE and HEAR you operating under his control. This control operator is then responsible for the legal operation of the equipment by you per FCC Part 97 rules.

If you change frequency to a band segment where operation is granted by your personal license class, you then become the control operator “of record” and do not need to be supervised by another person.

If you require additional information, please refer to FCC Part 97.7 and 97.9 for specific information regarding control operator requirements.