

**N2VZ Enterprises**

# *Turbo Tuner*<sup>TM</sup>

**Fully automatic screwdriver antenna controller  
for:**

**Yaesu FT-897 / FT-857**

Operating and Installation Instructions



### **Theory of Operation:**

The Turbo Tuner is designed to allow automatic Tuning and control of screwdriver antennas based on finding the minimum SWR for the current operating frequency. This is accomplished by using the Tune function of the radio to supply RF power while the Turbo Tuner moves the screwdriver antenna in the correct direction based on the operating frequency and looks for the minimum SWR. Once the minimum SWR is found, the transceiver is placed back in receive mode automatically.

### **INSTALLATION:**

Yaesu setup:

Yaesu Menu Settings – Menu item 20 must be set to “Tuner”. Menu item 85 must also be set to “Tuner”.

To get into Yaesu extended menu on the FT-857/897 Press and hold the “F” Key. You will now be in extended menu mode. To leave the menu press and hold the “F” key again.

Turbo Tuner Setup:

The next step is to set the dip switches to configure the Turbo Tuner to operate with your screwdriver antenna configuration.

Access to the dip switches is accomplished by removing the 4 Phillips head screws located at the bottom of the Turbo Tuner enclosure. Once the 4 screws are removed, lift off the top cover and you will see the 6 position dip switch located on the printed circuit board next to the fuse.

Dip Switch Settings:

Antenna Direction – This option sets the direction of travel for the antenna. This is normally set in the “Normal” position. If during the tuning cycle, the antenna does not move in the proper direction, change Dip SW-1 to the “Reversed” position.

Antenna Stall Current – For the Lil’ Tarheel, this option should be set to 200 MA. For Tarheel Models 100 – 400, use 900 MA. If the antenna changes direction in the middle of travel for no apparent reason, try the 300 MA option for the Lil’ TH and 1000 Ma for the TH Models 100 – 400. For High Sierra antennas with the Black Hawk motor set stall current to 900 MA.

SWR Threshold – Keep this in the Normal position unless the controller has trouble finding a match on some bands. This option will allow the controller to accept a slightly higher SWR. With the option set to “Alternate” the controller will still search and find the lowest SWR.

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### Factory Default Settings \*

Antenna Direction	Dip SW-1 = OFF Dip SW-1 = ON	Normal * Reversed
Antenna Stall Current	Dip Sw-2 = OFF Dip SW-3 = OFF Dip Sw-2 = OFF Dip SW-3 = ON Dip Sw-2 = ON Dip SW-3 = OFF Dip Sw-2 = ON Dip SW-3 = ON	200 MA * 300 MA 900 MA 1000 MA
SWR Threshold	Dip SW-4 = OFF Dip SW-4 = ON	Normal * Alternate

Once the Dip switches have been set correctly, place the top cover on the Turbo Tuner and make sure the Motor and Interface wires are positioned correctly in the enclosure cut outs before screwing the top cover into place.

### Connections:

Connect the supplied 1/8" audio cable from the Turbo Tuner to the ACC jack on the FT-857/897.

Connect the mini DIN interface cable from the Turbo Tuner to the FT-857/897 "CAT/Linear" connector located on the rear of the radio body.

Connect the Motor wire from the Screwdriver antenna to the 'Motor' connector on the Turbo Tuner. Use the supplied Molex pigtail if required.

Connect the coax from the antenna to the "Antenna" connector on the Turbo Tuner. Connect coax from the radio to "Radio" connector on the Turbo Tuner.

This completes the installation of the Turbo Tuner.

### **OPERATION:**

#### Power On:

The Turbo Tuner is powered by the radio and is powered on and off with the radio's power button.

When the radio is first powered up, the Turbo Tuner after initializing will sound a Morse code 'R' to signify that it is ready.

#### Tuning:

To initiate tuning of the antenna, select a proper operating frequency and press and hold the "Tune" Key on the Yaesu radio. This will place the radio in Tune mode and you will see the screwdriver antenna start moving in about 3 seconds. Once the antenna is tuned and a proper match is found, the Turbo Tuner will sound a Morse code 'K' and return the transceiver to receive mode.

If the antenna can not be tuned and an acceptable match found after the screwdriver antenna makes one reversal looking for a match, the Turbo Tuner will sound a series of Morse code 'E's and return the radio to receive mode.

Before changing bands press the "Tune" button to make the "Tunr" indicator go away. This will prevent the FT-857/897 from automatically initiating a tune cycle when the band is changed.

Parking the Antenna:

The Turbo Tuner also has a Park function that will automatically lower the screwdriver antenna to its minimum height. To start the Park function, press and hold the 'Tune' key just like initiating a tune cycle but press the 'Tune' key again before the tune cycle completes and the Turbo Tuner will enter Park mode. Note that there can be a 3 second delay before the park mode starts after pressing the tune button for the second time. Upon entering Park mode, the Turbo Tuner will sound a Morse code 'P'; and once the screwdriver antenna is completely lowered, the Turbo Tune will sound another Morse code 'P' to signify completion of the park cycle. Once Park mode is initiated, it can not be interrupted.

#### **TROUBLE SHOOTING:**

**Tune button does not work:**

**Make sure menu items 20 and 85 on the FT-857/897 are set per instructions.**

**Antenna reverses before reaching end of travel while tuning:**

**This is caused by the antenna stall current being set too low. Set the antenna stall current one setting higher via the dip switches.**

**Turbo Tuner gives immediate tuning error when initiating a tune cycle:**

**This is caused by the antenna stall current being set too low. Set the antenna stall current to the correct setting via the dip switches.**

**Antenna stalls at end of travel and does not reverse while tuning:**

**This is caused by the antenna stall current being set too high. Decrease the stall current by one setting via the Dip switches.**

**When changing frequency, the antenna moves in the incorrect direction:**

**This can be corrected without reversing the antenna motor wires by changing the position of Dip switch 1.**

**Can not find a proper match on one or more bands:**

**Manually check the antenna for an SWR of less than 2:1 on all bands of operation, if this is the problem check, the antenna installation and grounding. Changing Dip switch 4 to the alternate position will help the Turbo Tuner find a match if the antenna can not be tuned to better than 2:1 SWR.**

**Turbo Tuner totally dead, no audio feed back, and tuning will not initiate:**

**Check that the interface cable is connected to the Yaesu "CAT/Linear" Connector. Check the internal fuse in the Turbo Tuner which is a 20mm 3A fast blow.**