

TW Antennas

Mono and Multi-Band

Vertical Dipole Antenna Systems

DXE-TW Series

DXE-TW-SERIES-INS Revision 0c



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Introduction

The DX Engineering TW Antenna systems are designed with 6063 corrosion-resistant aluminum tubing, tough fiberglass, easy to use assembly parts and stainless steel hardware. These antennas are very durable and attractive with their black powder coating for added stealth in an HOA or portable environment.

The TW antenna is an omni-directional center fed vertical dipole with a very low radiation take-off angle (approximately 27 degrees above the horizon), allowing for very long skip using low power on 20, 17, 15, 12 and 10 meters.

Systems include Remote or Manual switching Multi-Band operations covering 20, 17, 15, 12, and 10 meters or Mono-Band systems for 80, 60, 40 or 30 meters. You can also use one of the multi-band systems and enhance your operating capabilities by adding the mono-band components.

There are multiple packaged combinations as well as individual parts, available for customizing the best system for your specific requirements.

The TW antenna system is only 8-1/4 feet tall and 5 feet wide and can be set up easily in practically any location by one person. No more trying to string up wires or getting tangled up in trees for portable operations. You supply the coax and your own powered transceiver. It's perfect for portable operations, anywhere and anytime.

For backpacking and general camping and travel a custom travel/storage bag holds all of the antenna components for easy transportation or storage is also available.

For portable use, the lightweight Quadrastand lets you set up your DX Engineering HF Portable TW Antenna wherever you happen to be. Think about special operating events like the Scouts Jamboree On-The-Air (JOTA), Field Day, SOTA (Summits On-The-Air) and more.

One person can easily and quickly set up the antenna system allowing you to devote your time to being on the air and having fun making contacts.

Features

- Two Multi-Band models and 4 Mono-Band models
- Tough 6063 corrosion-resistant aluminum antenna components
- Black powder coat finish for stealthy operation (Quadrastand has gray legs)
- Power Handling: 1200 W SSB, 800 W CW, 500 W RTTY, 375 W AM
- Band Width 200 kHz 20 m, Entire Band on 17, 15 and 12m, 1210 kHz on 10 m*
- Typical Minimum SWR 1.1:1 on 20, 17, 15, 12 and 10 m*
- Mono-Band versions available for 80, 60, 30 and 40 meters
- Antenna is only 8-1/4 feet tall by 5 feet wide
- Permanent Ground Mount or Portable Quadrastand
- Light, easy to transport - approximately 10 pounds

* Test conditions: 100 feet of RG8/U coax, 100 W output power, antenna mounted approximately 24" above ground with no external objects, metallic or otherwise, within 25 foot radius of the antenna.

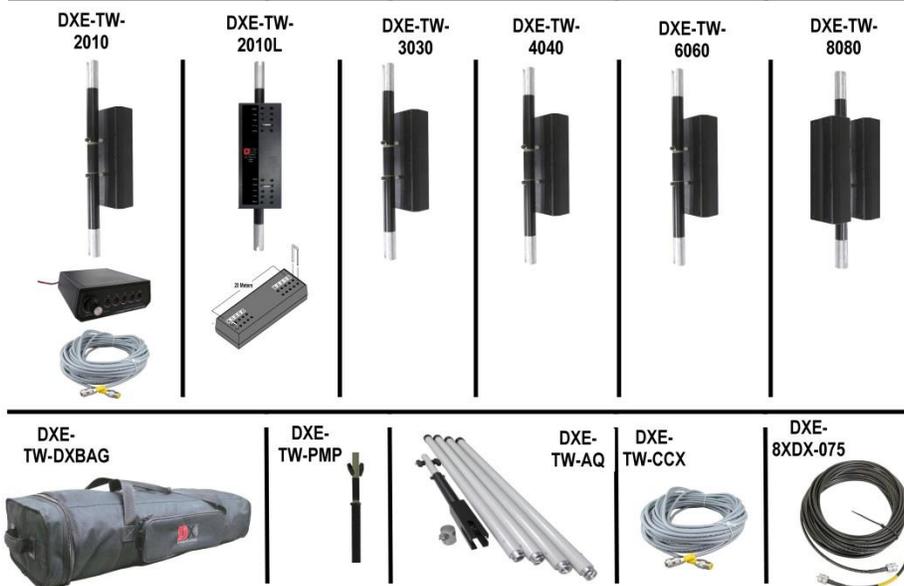
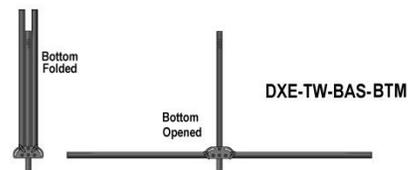
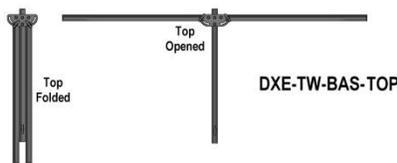
Part Numbers and Package Combinations Available

Part Number	Description
DXE-TW2010	Remote Multiband Center Section, 5 Band, 20, 17, 15, 12, 10 meters
DXE-TW2010L	Manual Multiband Center Section, 5-Band, 20, 17, 15, 12, 10 meters
DXE-TW8080	80 meter Mono-band Center Section
DXE-TW6060	60 meter Mono-band Center Section
DXE-TW4040	40 meter Mono-band Center Section
DXE-TW3030	30 meter Mono-band Center Section
DXE-TW-BAS-BTM	Antenna Bottom Section
DXE-TW-BAS-TOP	Antenna Top Section
DXE-TW-AQ	Quadrastrand
DXE-TW-PMP	Permanent Mounting Pole
DXE-TW-CCX	Remote Control Extension Cable
DXE-TW-DXBAG	Custom TW Antenna Travel/Storage Bag
DXE-8XDX075	75 foot RG8X Coaxial Cable assembly



Package Part Number	Package Name	DXE-TW2010	DXE-TW2010L	DXE-TW8080	DXE-TW6060	DXE-TW4040	DXE-TW3030	DXE-TW-AQ	DXE-TW-BAS-BTM	DXE-TW-BAS-TOP	DXE-TW-CCX	DXE-TW-DXBAG	DXE-TW-PMP	DXE-8XDX-075
DXE-TW-2010-P	5-Band Adventurer	X						X	X	X	X	o	o	o
DXE-TW-2010L-P	5-Band Explorer		X					X	X	X	o	X	o	o
DXE-TW-2010P-P	5-Band Globetrotter	X						o	X	X	X	o	X	o
DXE-TW-8080-P	80 Meter Solo Explorer			X				X	X	X	o	o	o	o
DXE-TW-6060-P	60 Meter Solo Explorer				X			X	X	X	o	o	o	o
DXE-TW-4040-P	40 Meter Solo Explorer					X		X	X	X	o	o	o	o
DXE-TW-3030-P	30 Meter Solo Explorer						X	X	X	X	o	o	o	o

X = Included o = Optional



Manual Updates

Every effort is made to supply the latest manual revision with each product. Occasionally a manual will be updated between the time your DX Engineering product is shipped and when you receive it. Please check the DX Engineering web site (www.dxengineering.com) for the latest revision manual.

Additional Material Needed/Suggested but not Supplied:

- **Coaxial Cable** - Minimum of 65 feet in length. Suggested coaxial cable is the DX Engineering **DXE-8XDX075** - RG-8X, 16 AWG Copper, Type II-A Non-Contaminating PVC Jacket, with PL-259s on each end.
- **Guy Rope and Anchors** – should be used if the antenna is subjected to winds or blowing snow conditions.

Tools Required

Phillips Screwdriver - to open the center sections for fine tuning.

Although the TW antennas are tuned at the factory, you may need to fine tune your antenna for optimum efficiency and operation. The Rig Expert line of Antenna Analyzers will facilitate the fine tuning of the TW Antenna:

REU-AA-30 - <https://www.dxengineering.com/parts/reu-aa-30>

REU-AA-54 - <https://www.dxengineering.com/parts/reu-aa-54>

REU-AA-170 - <https://www.dxengineering.com/parts/reu-aa-170>

REU-AA-230 Zoom - <https://www.dxengineering.com/parts/reu-aa-230zoom>



WARNING!

INSTALLATION OF ANY ANTENNA NEAR POWER LINES IS DANGEROUS



Warning: Do not locate the antenna near overhead power lines or other electric light or power circuits, or where it can come into contact with such circuits. When installing the antenna, take extreme care not to come into contact with such circuits, because they may cause serious injury or death.

Overhead Power Line Safety

Before you begin working, check carefully for overhead power lines in the area you will be working. Don't assume that wires are telephone or cable lines: check with your electric utility for advice. Although overhead power lines may appear to be insulated, often these coverings are intended only to protect metal wires from weather conditions and may not protect you from electric shock

Keep your distance! Remember the 10-foot rule: When carrying and using other long tools, keep them at least 10 feet away from all overhead lines - including any lines from the power pole to your home.

For operational performance, the TW antenna should be a minimum of 25 feet from any objects, metallic or otherwise including power lines.

Installation

General Installation Information

Note: The TW Antenna center sections are not weatherproof and should not be subjected to rain, snow, dust storms, etc. **If you intend to use the antenna outdoors for extended periods that may subject it to harsh weather, we suggest you protect the center section. Example - wrap the center section (allowing for coax cable and control cable exits) with a plastic bag and seal with tape.**

All of the models available have similar parts and the installation of each model is almost identical. The Top and Bottom parts of the antenna are the same for all models. The center section is different depending on the model (Multi-Band or Mono-Band) and the support at the bottom of the antenna is either the permanent mount or the Quadstand.

The following installation instructions are for the 5-Band Explorer system (**DXE-TW-2010-P**) which includes the antenna, remote band switching center section, control box, control cable and the Quadstand.

An optional travel/storage bag is available from DX Engineering that will hold all of the antenna components.

Site Selection

Select a mounting location clear from power lines and structures by a minimum of 25 feet.

Consider overhead power lines, utility cables and wires. The TW Antenna should be used well away from local noise sources or other metallic objects which can re-radiate noise and affect the tuning, radiation pattern and SWR. For operational performance, the antenna should be a minimum of 25 feet from any objects, metallic or otherwise.

Support Assembly

The support used depends on your installation and preference: The Quadrastand (**DXE-TW-AQ**) is a four leg mini stand that is easy to assemble and will hold the antenna up in the proper orientation. The Permanent Mounting Assembly (**DXE-TW-PMP**) may be used if you are mounting the antenna in a location that will be permanent.

Quadrastand Assembly

Slip the four legs into the center section of the Quadrastand (**DXE-TW-AQ**) as shown.

Once in place, slip the holding bracket into the bottom of the center section as shown and hand tighten the wing nut. The holding bracket keeps the four legs from falling out of the center section when you pick it up.



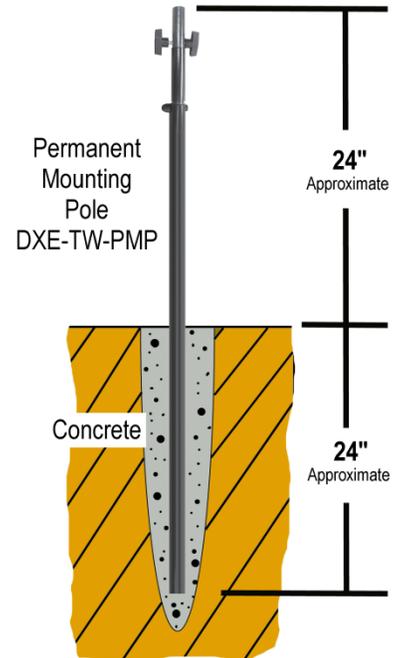
Permanent Mounting Assembly

The Permanent Mounting Assembly (**DXE-TW-PMP**) consists of insulator rod attached to an aluminum tube using stainless steel hardware. The assembly can be installed with or without the use of concrete. Though concrete will provide a more secure, permanent base for your antenna, it will be difficult to remove or re-position later. The assembly should be inserted about 24" into the ground, exposing 24" of the assembly above ground.

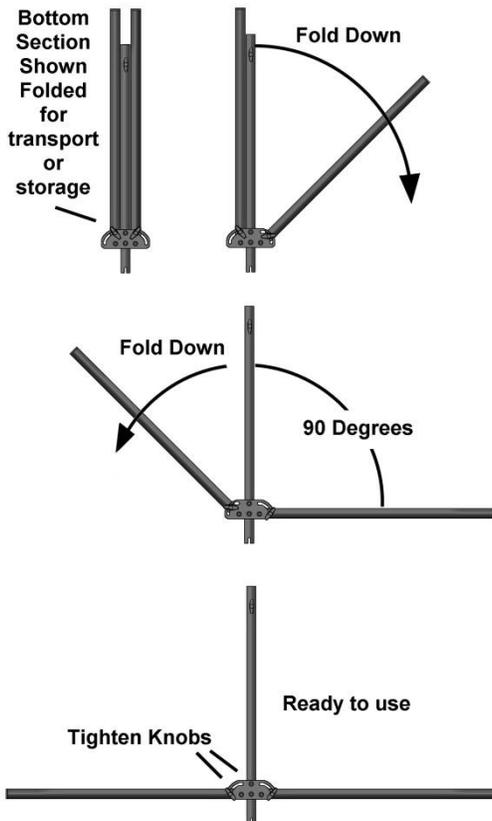
It is suggested that the antenna be tried in an area using the permanent mounting assembly in a hole in the ground before concreting, in case the antenna needs to be moved later. Once you are sure of the location for the antenna, the Permanent Mounting Assembly can be concreted into place, if desired.

Warning: The fiberglass insulating rod is *not* hammer-proof. **Do not pound the Permanent Mounting Assembly into the ground like a stake.** Permanent damage to the fiberglass insulating rod could occur.

If it is necessary to drive the assembly into the ground, first remove the fiberglass insulating rod using a 5/32" Allen wrench and a 7/16" socket. Drive the aluminum permanent mounting tube into the ground using a rubber mallet. Alternatively, a conventional hammer can be used if a wooden board is laid over the aluminum mounting tube before striking.



Antenna Bottom Section



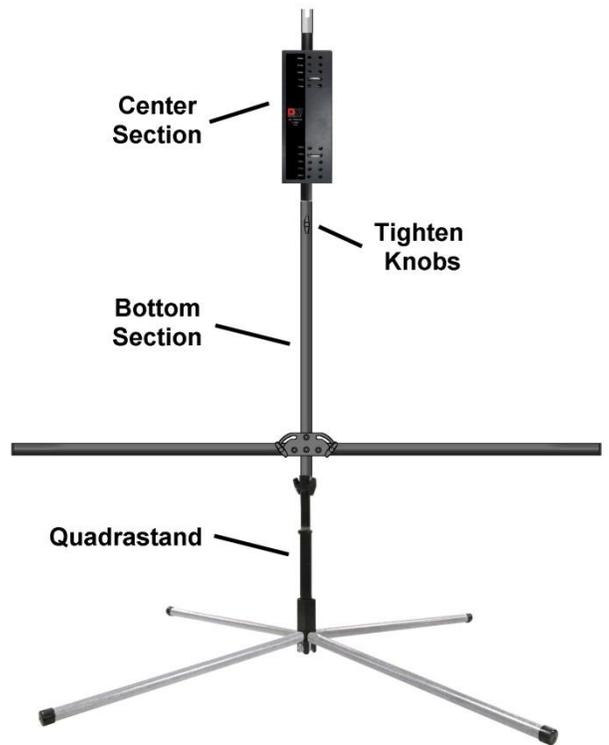
Unfold the two arms on the Antenna Bottom Section (**DXE-TW-BAS-BTM**) until they are perpendicular to the center tube as shown. Once the arms are in place, hand-tighten the knobs to keep them in place.

Insert the bottom section into the QuadraStand as shown. Once in place, hand-tighten the knobs in place to hold the bottom section securely. (This example uses the QuadraStand).



Antenna Center Section

Insert the Center Section into the bottom of the antenna as shown. Once in place, hand-tighten the knobs in place to hold the bottom section securely. (This photo shows the manual tune center section).

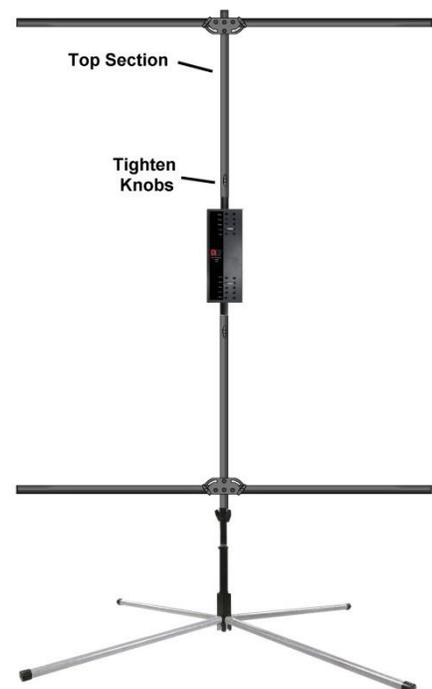
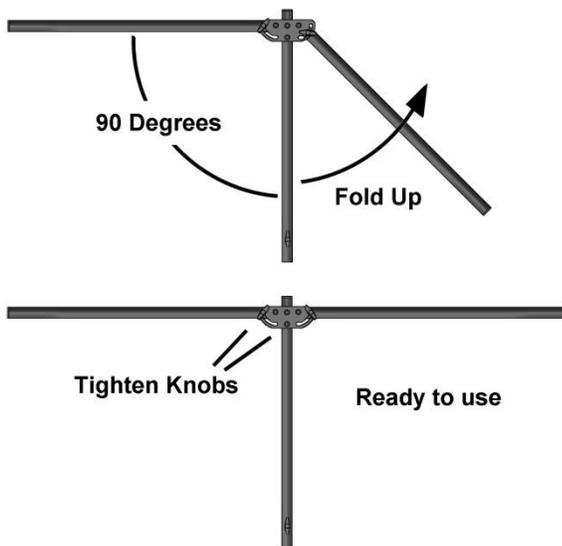


Antenna Top Section



Unfold the two arms on the Antenna Top Section (**DXE-TW-BAS-TOP**) until they are perpendicular to the center tube as shown. Once the arms are in place, hand-tighten the knobs to keep them in place.

Insert the Antenna Top Section into the Center Section as shown. Once in place, hand-tighten the knobs in place to hold the top section securely.



Control Cable and Control Console

Attach the 65 foot control cable (**DXE-TW-CCX**) to the rear of the Remote Multi-Band Center Section as shown. Align the connector and push it on and tighten the collar clockwise. (Reverse it to remove the cable.) Run the control cable (and the coaxial cable) at a 45 degree angle from the rear of the antenna as shown. **IMPORTANT: Run the coaxial cable (and the control Cable) at a 45 degree angle from the rear of the antenna as shown.** If the cable is not long enough for your installation, you can obtain an optional second control cable to make the control run 130 feet long.



Connect the Control Cable to the rear of the Control Console. Align the connector and screw on the collar in a clockwise direction. Reverse to remove. Without the cable connected, the antenna will only work on 20 meters.



Connect +12 Vdc, 200 ma minimum well filtered DC to the rear of the Control Console as shown (Stripe or White Dashed line is Positive, Black is Negative) using the included 2.1 mm power cord.



The Remote Control Console front panel has one six position rotary switch and five red LEDs.

Switch position one is OFF, the next clockwise position is ON and selects 20 meters (LED Turns ON). Continue turning clockwise and you will see which band is selected by which LED is on. Turn completely counter clockwise to turn power off.

Coaxial Cable Connection

Connect the suggested 75 feet of coaxial cable (**DXE-8XDX075**) to the SO-239 on the rear of the

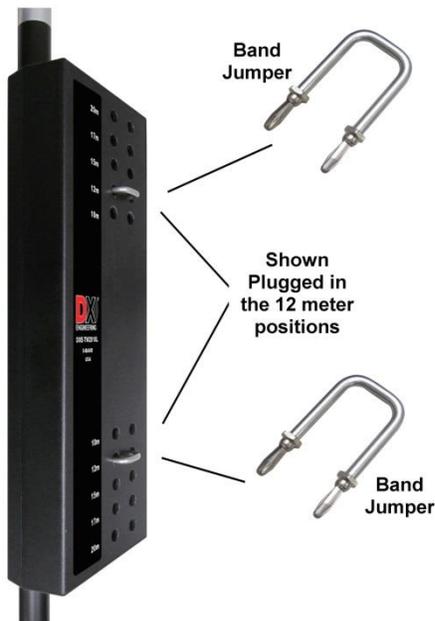


Remote Multi-Band Center Section as shown. Run the coaxial cable (and the control cable) at a 45 degree angle from the rear of the antenna as shown. **Run the coaxial cable (and the control Cable) at a 45 degree angle from the rear of the antenna as shown.**

Connect the coaxial cable to your transceiver RF output. Transceivers that have an internal tuner should be able to handle any slight mismatch with no problem.



Manual Center Section Band Switching



When using the Manual Tune Center Section (**DXE-TW-2010L**) select the band of operation by inserting the two jumpers in their appropriate holes (one in the top band selection and one in the bottom band selection). **Make sure the power is OFF and there is no RF being transmitted!**

The Jumpers have banana plugs on the ends and plug into the printer circuit board. Make sure they are pushed in all the way. There are two jumpers - one for the top part of the antenna and one for the bottom part of the antenna. Both of the jumpers must be plugged in and **must** be on the same band.

Fine Tuning

Even though the antenna center sections (all models) are factory tuned, you may find that additional tuning may be required for your particular installation. Some minor adjustments may be necessary to tune the antenna to the desired center frequency for each band. Check the tuning of the antenna using an antenna analyzer before performing the tuning process. Tuning is accomplished by varying the distance between the turns on the coils internal to the center section.

A quality antenna analyzer should be used, not your transceiver's SWR meter. Disconnect the coaxial cable from the transceiver.

All of the coils on the top half of the switching array are series connected. A relay shorts the signal to the metal structure, bypassing all of the coils above a given band (the bottom half of the switching array is effectively a mirror image of the top half). The tuning for each band depends on the tuning for the previous band. Therefore, tuning must start at the 10 m coil pair and progress in order up to the 20 m band.

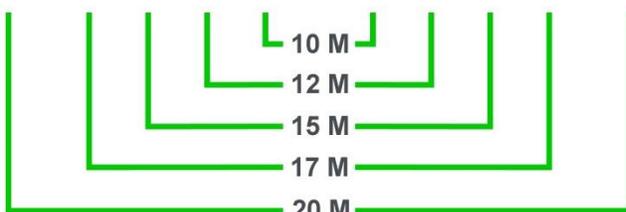
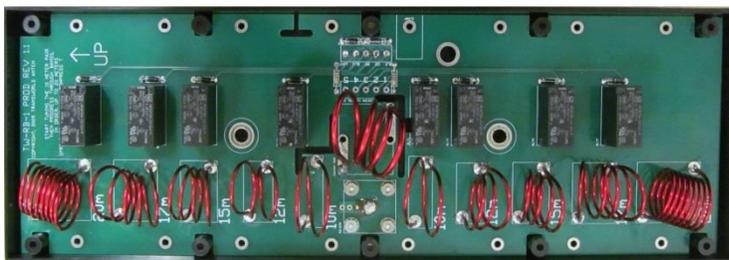
The tuning process requires Voltage Standing Wave Ratio (VSWR) measurement. These measurements can be accomplished using most any antenna analyzer. However, these devices typically generate a very small signal (less than 0.2 W), and may show higher than expected VSWR readings. A reading of 1.3:1 at the tuned frequency is typical at this low power. The VSWR readings should decrease once the antenna is used with 5 W of power or more. The VSWR reading on your transceiver will likely show a lower VSWR than a low-power antenna analyzer.

Make sure that the coax used for the tuning process is at least 65 feet long, and that both the coax and control cable are installed at a 45 degree angle as described earlier in this manual.

To tune each band, each of two coils in the coil pair for that band must be spread or compressed (see photographs below). By spreading each coil in the coil pair, the tuned frequency for that band will increase. Likewise, compressing the coils in a coil pair will decrease the band's tuned frequency. You should try to spread or compress each of the two coils in a coil pair by the same amount. Warning:

1) Preparation. (Photos shown show the interior of the **DXE-TW2010**) To begin the tuning process, remove the center section switching array cover, and connect the control and coax cables to the switching array box, as described earlier in this manual. The coax you use for the tuning process should ideally be the coax you plan to use for the antenna during normal use. Connect the coax cable to the device you wish to use to measure VSWR, and connect the control cable to your controller.

2) Start with 10 meters. Switch your controller to the 10 m band and



the 12m band and tune the 12m band in a similar fashion as you tuned the 10 m band in step 2.



determine to what frequency the antenna is best tuned. If you wish to increase the tuned frequency, spread open each of the two coils labeled “10 m” on the switching array circuit board, as shown in the photos.

3) Tune next band. Once the 10 m band is tuned, switch your controller to

4) Repeat for remaining bands. Repeat the tuning process for the 15 m, 17 m, and 20 m bands, in that order.

For the manual tune center section the testing is the same as described above. The only difference is that the two jumpers for the specific band must be installed. For the mono-band center section there is only one band to adjust and the number of coils will vary depending on the model.

Guy Rope and Anchor Installation

In cases where the antenna may be subject to winds or conditions that may cause the antenna to be blown down, guying is suggested. For temporary installations if the conditions are not harsh, you may find that putting rocks or weights (example: gallon jugs with water) on the Quadstand legs will provide the security needed. If conditions are a bit harsher, you may want to use rope and screw-in earth anchors. Screw-in earth anchors and sufficient antenna rope are available from DX Engineering to allow guying of the antenna.

Technical Support

If you have questions about this product, or if you experience difficulties during the installation, contact DX Engineering at (330) 572-3200. You can also e-mail us at:

DXEngineering@DXEngineering.com

For best service, please take a few minutes to review this manual before you call.

Warranty

All products manufactured by DX Engineering are warranted to be free from defects in material and workmanship for a period of one (1) year from date of shipment. DX Engineering's sole obligation under these warranties shall be to issue credit, repair or replace any item or part thereof which is proved to be other than as warranted; no allowance shall be made for any labor charges of Buyer for replacement of parts, adjustment or repairs, or any other work, unless such charges are authorized in advance by DX Engineering. If DX Engineering's products are claimed to be defective in material or workmanship, DX Engineering shall, upon prompt notice thereof, issue shipping instructions for return to DX Engineering (transportation-charges prepaid by Buyer). Every such claim for breach of these warranties shall be deemed to be waived by Buyer unless made in writing. The above warranties shall not extend to any products or parts thereof which have been subjected to any misuse or neglect, damaged by accident, rendered defective by reason of improper installation, damaged from severe weather including floods, or abnormal environmental conditions such as prolonged exposure to corrosives or power surges, or by the performance of repairs or alterations outside of our plant, and shall not apply to any goods or parts thereof furnished by Buyer or acquired from others at Buyer's specifications. In addition, DX Engineering's warranties do not extend to other equipment and parts manufactured by others except to the extent of the original manufacturer's warranty to DX Engineering. The obligations under the foregoing warranties are limited to the precise terms thereof. These warranties provide exclusive remedies, expressly in lieu of all other remedies including claims for special or consequential damages. SELLER NEITHER MAKES NOR ASSUMES ANY OTHER WARRANTY WHATSOEVER, WHETHER EXPRESS, STATUTORY, OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS, AND NO PERSON IS AUTHORIZED TO ASSUME FOR DX ENGINEERING ANY OBLIGATION OR LIABILITY NOT STRICTLY IN ACCORDANCE WITH THE FOREGOING.

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