XB-5 HEXX BEAM

DXE-XB-5

DXE-XB-5-INS Rev. 0

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Introduction

The DX Engineering **DXE-XB-5** Hexx Beam is a lightweight directional five-band HF antenna for the 20, 17, 15, 12 and 10 Meter bands, suitable for permanent or temporary installations. Full legal power handling and high performance on all bands is achieved with full-size pre-cut wire elements. The patented (***US Patent No. 8,669,911, US Patent No. D624,060, British Patent No. GB248003 B***) rigid feeder system is fully balanced with the Maxi-Core® 20 1:1 Current Balun and mount included. Terminated heavy-duty "ice" spreader support ropes, specialized hardware, a new heavy-duty mast plate, better fiberglass and faster, easier assembly make the XB-5 model DX Engineering's best Hexx Beam ever.

In memoriam of Steve Hunt, G3TXQ (SK), who pioneered the broadband Hex Beam design, the new XB-5 Hexx Beam builds on the success of the Mark II version perfected by DX Engineering over a decade ago. The XB-5 Hexx Beam now includes simplified spacer insulators for the full-length wire elements to achieve improved SWR bandwidth and great front-to-back performance with no losses.

XB-5 Hexx Beam Features

The DX Engineering **XB-5 Hexx Beam** design has a number of important advantages over other Hex Beams and a Yagi:

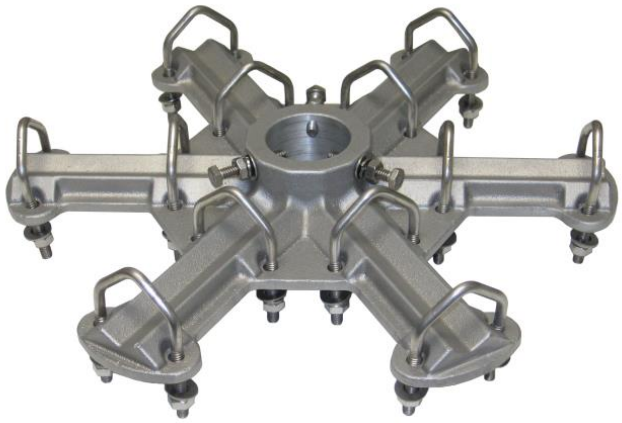
- **New, easy and fast assembly** - fewer parts to speed completion of the antenna project
- **Pre-made 4.4 mm heavy duty "ice" support ropes with thimbles and stainless steel carabiners**
- **Balun (1:1 5kW) and Mounting Bracket included**
- **New Heavy-duty Mast Plate with DXE Saddles Clamps**
- **Strong fiberglass without slits**
- **Pre-sized and pre-drilled element spacer insulators designed for simple antenna assembly and tuning adjustment**
- **Improved SWR band coverage**
- **Small turning radius -** the XB-5 Hexx Beam has a turning radius of 11'
- **Gain** - 5 dBi (3 dBd), depending on band - similar to 2 element Yagi, far exceeding the performance of multi-band mini-beams
- **Front-to-Back** – greater than 20 dB, depending on band
- **Wind balanced** - Hexx symmetry reduces torque on the rotator
- **Light weight** – about 25 lbs. fully assembled
- **Wind load** – only 5 square feet wind surface
- **Can be turned with a light duty rotator**
- **Performs well at low heights -** good results at 25 to 35 feet above ground
- **Handles full legal limit power** – no power restriction as on competing antennas
- **Low Noise results** - approaches performance of closed loop antennas
- **Full length elements** - no lossy coils or traps
- **Five-Band Stainless Steel/PTFE Rigid Feeder System** – balanced for best pattern
- **Requires no matching network** - direct single 50 ohm coax feed

The DX Engineering **XB-5 Hexx Beam** Five Band Hexx Beam Antenna Package is a complete build-it-yourself system, including pre-terminated wire elements, assembled element guides and thimble terminated spreader support ropes with carabiner attachment clamps. The revolutionary Five-Band Stainless Steel/PTFE Rigid Feeder System ***(US Patent No. 8,669,911, US Patent No. D624,060, British Patent No. GB248003 B)*** provides a weatherproof, low-loss, high power balanced connection to all five bands - 20, 17, 15, 12 and 10 meters. This revolutionary Balanced Rigid Feeder clamps around the Center Post requiring no holes that would weaken it. The use of this balanced feeder system maintains optimal pattern, while other Hex antennas have compromised unbalanced coaxial post feeders with potentially distorted patterns. The XB-5 includes the appropriate top-mount 1:1 Balun with SO-239 for a single 50-ohm feedline PL-259 connection for all five bands. The pre-assembled and tested Five Band Stainless Steel/PTFE Rigid Feeder System

also has five integral center insulators with the unique serpentine wire grip slots to assure long, reliable performance.

All hardware is high quality stainless steel. The pre-cut wire elements are 14 AWG stranded copper with relaxed black PVC insulation with single ring terminals for driven element connections to the balanced flat feeder. The unique Floating Element Wire Guides allow independent movement of the wire elements and flexible fiberglass spreaders in the wind without creating breaking stresses. These special Wire Guides are attached to the spreaders without drilling, for a stronger, longer lasting antenna. Mastrant-P 3mm with a break strength of 440 lbs. is supplied for the Front Stabilizing Ropes. The fiberglass Spreader sections are now stronger, no longer slit and are supplied precut to the proper lengths. Stainless steel band clamps are used to stop-fit them together for the antenna assembly.

At the center of the new **XB-5 Hexx Beam** is the exclusive DX Engineering cast aluminum Hexx Hub ***(US Patent No. D605,184)***. Specially designed and mechanically superior to available home-made base plate designs, the Hexx Hub has integral V-saddles and Stainless Steel V-Bolt hardware to firmly attach the fiberglass spreaders in proper alignment without drilling or crushing. The upper and lower mast mounts are integrally cast into the hub, providing a strong attachment for the Center Post, the new re-enforced post sleeve and the heavy-duty Mast Plate with DX Engineering Saddle Clamps.



The DX Engineering directional **XB-5 Hexx Beam** antenna is made with fiberglass spreaders and wire elements that looks like a very large inverted umbrella frame. Even at 22 feet wide and approximately 5 feet tall, it has a smaller turning radius than a two element 20 meter Yagi, and offers several enhanced operating characteristics. It may be mounted at the top of a rotatable mast or directly into a light to medium duty rotator. This antenna is fed at the top of the center post with a single 50 ohm feedline. This top fed feedline arrangement has been tested and proven to function better than a bottom feedpoint connection. To preserve the original design characteristics that Steve Hunt pioneered, the DX Engineering XB-5 Hexx Beam has been optimized to deliver the best possible five-band Hexx Beam performance.

Parts List - DXE-XB-5 Five-Band Hexx Beam

Part Number	Description
DXE-XB-5-INS	Assembly Manual for the DXE-XB-5 Five-Band Hexx Beam Antenna
DXE-XB-5-HUB	Hexx Hub, Cast Aluminum, machined, Integral V-Saddles. Includes Stainless Steel V-Clamps with Stainless Steel hardware. (*US Patent No. D605,184)*
DXE-XB-5-MMK	Mast Mounting Kit, Drilled Aluminum Plate, U-Bolt and V-Bolt Saddle Clamps with Stainless Steel hardware
DXE-XB-5-SCP	Spreaders and Center Post made from high quality fiberglass material, with pre assembled spreader ropes, Carabiners, Guy Ring, Cushioned P-Clamps and Stainless Steel Band Clamps, Stainless Steel Hardware
MSG-MP03031	Rope, Mastrant-P, Break Strength 440 lbs., 0.118 inch Diameter (3mm), 100 foot (31m) Roll
DXE-XB-5-FF	Rigid 5-Band Flat Feeder Assembly. Pre-Assembled, *(US Patent No. 8, 669,911, US Patent No. D624,060, British Patent Number GB248003 B)*
DXE-HEXX-BAL-K1	Balun Mounting Kit for the XB-5 Hexx Beam. Includes **DXE-BMB-4P** Balun Mounting Bracket (*US Patent No. D597,086*) and aluminum brackets, Studded Band Clamps, Pre-assembled Balun Feedpoint Wire Connections
DXE-MC20-1-1	Maxi-Core® 20 1: 1 Current Choke Balun
DXE-XB-5-EK	Hexx Beam 5-Band Wire Element and Wire Guide Kit. Pre cut 14 AWG copper stranded wire with a black relaxed PVC insulation. Color coded element wire sets and pre-assembled floating wire guides with custom length, drilled Acetal spacers

Parts Required but not supplied

JTL-12555 - Jet-Lube SS-30 Pure Copper Anti-Seize **(limited to domestic UPS Ground shipping)**

Note: Jet-Lube SS-30 Anti Seize **must** be used to prevent galling (seizing) of stainless steel hardware.

TES-2155 - 3M Temflex™ 2155 Rubber Splicing Tape
TES-06132 - Scotch® Super 33+ Tape

Tools Required

1/4", 5/16", 3/8" and 7/16" Deep Well Nut Drivers and/or Open End Wrenches
1/8" Allen Wrench
Tape Measure, 50 ft
Screwdriver
Pliers
Scissors
Wire Cutter
Lighter or flame source (to slightly melt the cut rope ends to keep them from fraying)
Use proper safety precautions for a lighter or flame producing item
Marking Pen or Pencil
Safety Glasses

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.

Working with Fiberglass

CAUTION: There are parts made from fiberglass in this kit. Take normal precautions when handling any fiberglass material. There may be fiberglass dust, slivers or particles present when the fiberglass parts were manufactured. The use of typical fiberglass handling safety gear (gloves, dust mask, eye shield, clothing, etc.) when handling and working with fiberglass is recommended. Use a damp rag to wipe the parts. **Do not** use compressed air to clean fiberglass parts. Measures can be taken to reduce exposure after a person has come in contact with fiberglass. Eyes should be flushed with water and any area of exposed skin should be washed with soap and warm water to remove fibers. Clothing worn while working with fiberglass should be removed and washed separately from other clothing. The washing machine should be rinsed thoroughly after the exposed clothing has been washed. Check with your local or state safety and/or environmental agencies for more detailed precautions.

General Antenna Installation Safety Information

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, they may cause serious injury or death. Always be aware of your surroundings. BE SAFE

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 ladders and other long tools, keep them at least 10 feet away from all overhead lines - including any lines from the power pole to your home. If you stay away from power lines, you will not have to worry about coming in contact with them. BE SAFE.**

Position the antenna system carefully. If it falls, ensure it is nowhere near 10 feet from any power lines.

Do not work alone. Always have a back-up person present in case of an accident.
Do not work on antennas if there are storms approaching - even a near hit lightning strike can kill you.

XB-5 Hexx Beam Construction

The typical build sequence is:

1. Hexx Hub Assembly
2. Mast Mount Assembly
3. Center Post Installation
4. Rigid Feeder Installation
5. Balun and Balun Mount Assembly
6. Spreader Assembly and Pre-Made Rope installation
7. Guy Ring Installation
8. Spreader Tubes and Clamps
9. Installing Spreaders in the Hub
10. Installing the Pre-Made Rope Assemblies to the Spreader and Center Post
11. Front Stabilizing (Retention) Ropes
12. Wire Elements and Spacers
13. Tuning

Assembly Tips

An outdoor clear area of a minimum 30 foot square is required for assembly of this antenna.

The use of a three foot tripod and a three foot mast pipe makes construction of the antenna easier.

Using a temporary tripod and mast for assembly at ground level

The antenna building scheme used when the XB-5 Hexx Beam was assembled for testing used a ground mounted pipe having a small length of pipe slipped inside and was used for the installation of the Mast Clamp assembly.

Sufficient space is required for the installation of the antenna on your mast or tower.

The finished antenna is approximately 22 feet (6.7m) in diameter.

Hexx Hub Assembly

The patented (***US Patent No. D605,184***) DX Engineering **Hexx Hub** provides a strong, solid base for the entire XB-5 Hexx Beam antenna system. Made from cast aluminum and machined to perfection, the XB-5 Hexx Beam Hub is far superior to available home-made base plate designs.

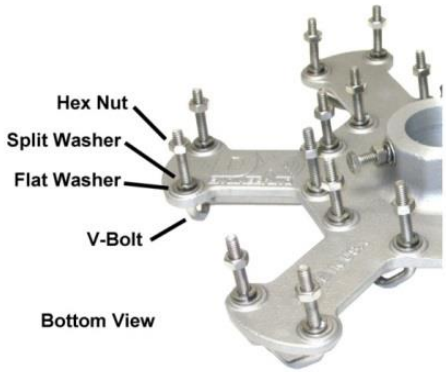
The XB-5 Hexx Hub has integral V-Saddles and with the included Stainless Steel V-Bolt hardware firmly attaches the fiberglass spreaders in proper alignment without drilling or crushing. The upper and lower mast mounts are integrally cast into the hub, eliminating the need to find separate mounting flanges, reducing assembly time, improving mast alignment and providing a far stronger heavy duty attachment for the mast.

Hexx Hub Assembly Parts List

Qty	Description
1	Machined Cast Aluminum XB-5 Hexx Hub - *US Patent No. D605,184*
12	1.5" short Stainless Steel V-Bolt
6	1/4-20 Stainless Steel Hex Head Bolt
6	1/4-20 Stainless Steel Hex Nut
6	1/4-20 Stainless Steel Flat Washer
6	1/4-20 Stainless Steel Split Washer
12	1/4-20 Stainless Steel Hardware Kit for V-Bolts Included in each:
	2 - 7/16" Hex Head Nuts
	2 - 7/16" Flat Washers
	2 -7/16" Split Lock Washers

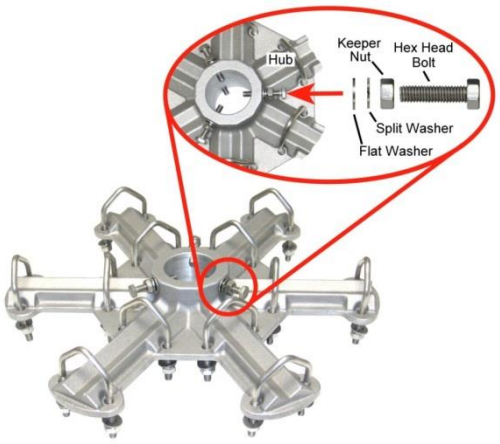
Insert the twelve Stainless Steel V-Bolts over the incorporated V-Saddles as shown. Install a flat washer, a split washer and a 1/4-20 hex nut on each V-Bolt leg, install the nuts loose. The V-Bolts will be tightened in place when the fiberglass spreaders are installed.

Top Views



Bottom View

Install the six 1/4 -20 hex head bolts, six flat washers, six split washers and six nuts, into the top and bottom flanges of the hub, as shown. These will be adjusted to fit the center mounting post when assembling the XB-5 Hexx Beam antenna.



The patented HEXX Hub is ready for use as the solid foundation for your Hexx Beam antenna project.

Mast Mount Assembly

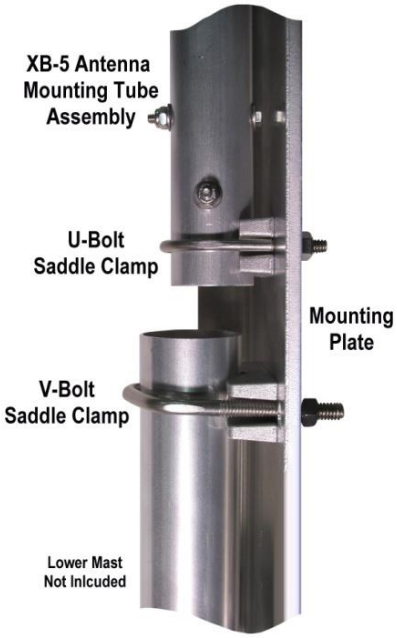
The DX Engineering Mast Mount assembly is designed for the **DXE-XB-5** Hexx Beam Antenna to mate the 1-1/2" (38.1mm) OD Hexx Beam Mounting Tube assembly to a customer supplied 1-1/4" (31.75mm) to 2" (50.8mm) OD antenna mast.

This custom made mounting system may also be used on other antennas and a larger 3"(76.2mm) diameter customer supplied mast by using two optional **DXE-SAD-300B** mast U-Bolt Saddle clamps.

Mast Mount Assembly Parts List

Qty	Description
1	XB-5 Hexx Beam Mast Mount Plate, Aluminum, 16" (406.4mm) tall x 5.125" (130.2mm) wide x .25" (6.35mm) thick
1	XB-5 Antenna Mounting Aluminum Tube, Assembled, 17" (431.8mm) long 1.5" (38.1mm) OD, nested, with Hex Bolts, Flat Washers, Nyloc Hex Nuts installed
1	**DXE-ECL-1500** Band Clamp, 1.375" (34.93mm) to 1.5" (38.1mm)
2	**DXE-SAD-150A** U-Bolt Saddle Clamp, 1.5" (38.1mm) with 1/4-20 mounting hardware
2	**DXE-CAVS-2P** V-Bolt Saddle Clamp, 1" (25.4mm) to 2" (50.8mm) with 5/16" mounting hardware

Insert the two U-Bolt Saddle Clamps and the two V-Bolt Saddle Clamps into the XB-5 mast plate as shown. Loosely install the clamp's mounting hardware (Flat Washers, Split Washers and Hex Nuts).



Slide the assembled XB-5 Antenna Mounting Tube through the top two **DXE-SAD-150A**, **U-Bolt** Saddle Clamps. The bottom of the XB-5 Antenna Aluminum Tube should be 3/4" (19.05mm) below the lower U-Bolt Saddle Clamp. Tighten both of the U-Bolt Saddle Clamps.

Slide the XB-5 Mast Plate onto the customer supplied antenna mast through the two lower **DXE-CAVS-2P**, **V-Bolt** Saddle Clamps.

Adjust both the XB-5 Mast Plate so there is approximately 1/4" (6.35mm) gap between the bottom of the XB-5 Antenna Mounting Aluminum Tube and the customer supplied mast. Tighten the two V-Bolt Saddle Clamps in place.

The included DXE-ECL-1500 Band Clamp is used on the slit tube assembly when the Mast Plate assembly is inserted into the XB-5 Hexx Hub

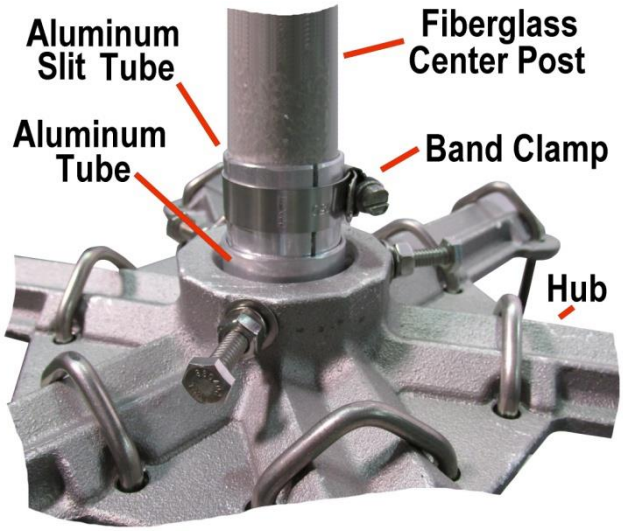
Shown mounted on customer supplied mast with mast is inserted into a pipe.

This was used when the DXE-XB-5 antenna was being assembled near ground level

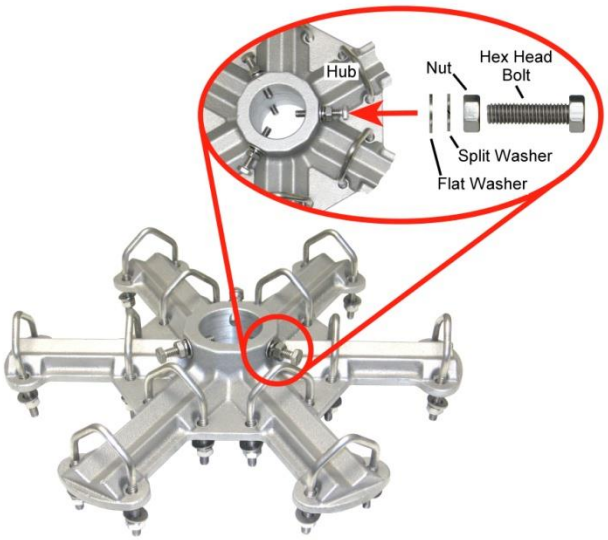
Shown with the DXE-XB-5-HUB installed

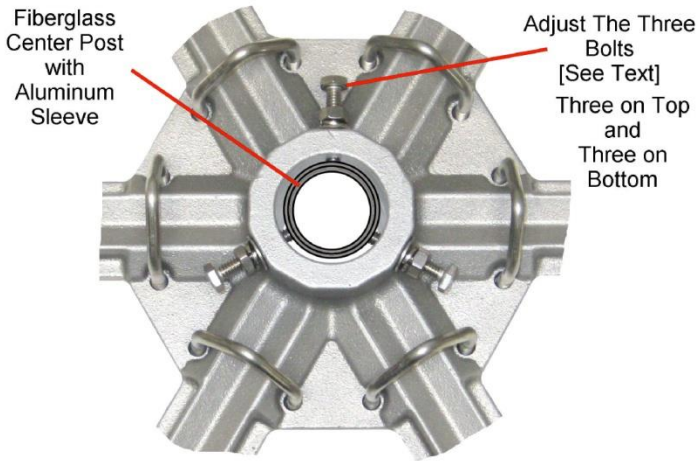
Center Post Installation

The 1.25”(31.75mm) x 58”(1.47m) long fiberglass Center Post is installed into the Hexx Beam Center Hub. Slide the Center Post in place. There is a cross bolt inside the Mast Mount Tube that will stop the fiberglass center post at the proper depth. Use the 1.25” (31.75mm) band clamp (that is included with the Mast Mount Kit) and tighten it in palace holding the fiberglass center post in position.



Install and tighten in place the six hex head bolts that hold the Center Post to the Hexx Hub as shown. Once the Hex Head Bolds are holding the Center Post evenly, tighten the Hex Nuts to lock the Hex Head bolts in place,





Hexx Hub Top View

5-Band Stainless Steel/PTFE Rigid Feeder System Installation

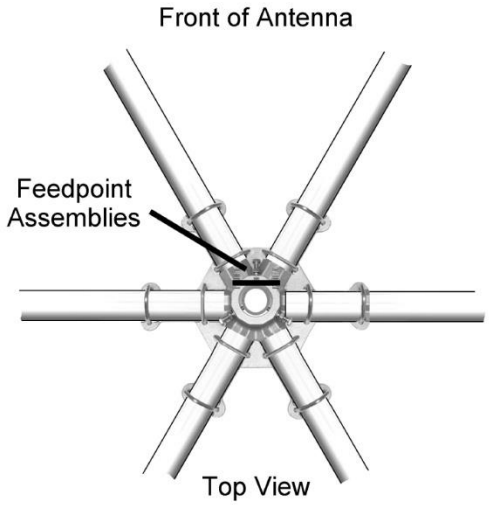
The patented **DXE-XB-5-FF** ***(US Patent No. 8, 669,911, US Patent No. D624,060, British Patent Number GB248003 B)*** XB-5 Hexx Beam 5-Band Stainless Steel/PTFE Rigid Feeder System is specifically designed to be used in constructing the DX Engineering XB-5 Hexx Beam. The Rigid Feeder System eliminates vulnerable coaxial cable feedpoint sections - providing a weatherproof, low-loss, high power balanced connection to all five bands (10, 12, 15, 17 and 20 meters) for optimum antenna pattern control. This revolutionary Rigid Feeder attaches directly to the outside of the full-size 1-1/4" fiberglass Center Post used on the DX Engineering XB-5 Hexx Beam. It is no longer necessary to drill or slice up a center post - weakening it - to protect older coaxial cable feeders with homebrew connections. The integral center wire element insulators with the unique serpentine wire grip assure long, reliable performance.

This **pre-assembled** and tested Rigid Feeder is also ideal for retrofitting to other hex beam designs using the DX Engineering wire element dimensions - or with your own testing and modifications.

SPARE hardware is included (in case you lose some when attaching the element & Balun wires):

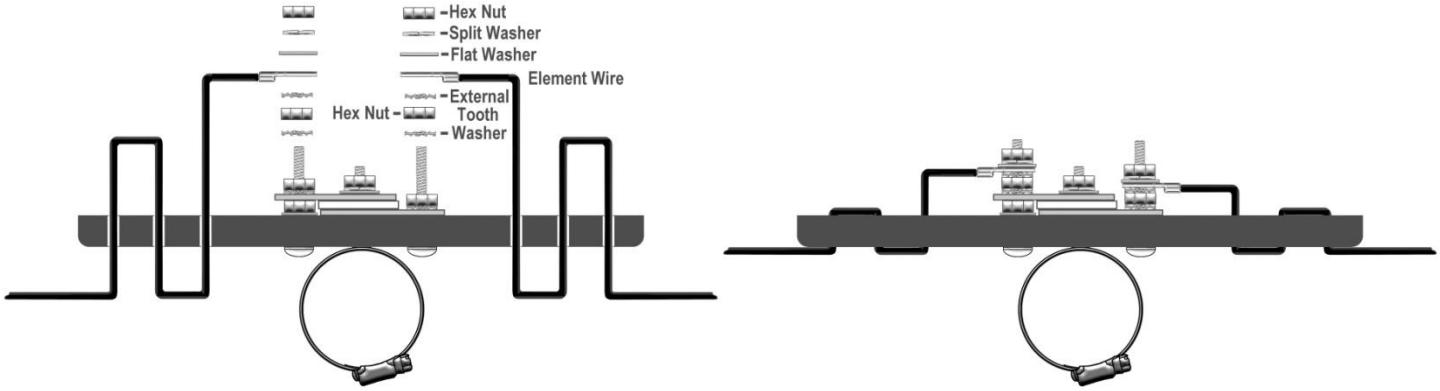
Qty	Spare Hardware Description
16	10-24 Hex Nut, Stainless Steel
18	#10 External Tooth Washer, Stainless Steel
16	#10 Flat Washer, Stainless Steel
16	#10 Split Washer, Stainless Steel

Slide the entire Rigid Feeder and Insulator assembly onto the 1-1/4" OD center post (included in the **DXE-XB-5** Antenna). Position the center of the 10 meter insulator 5" (127mm) above the optional patented Hexx Hub (**DXE-XB-5-HUB**). Tighten the insulator clamps after each of the insulators are aligned parallel with two side spreaders to face directly between the two adjacent spreaders chosen as the front of the antenna.

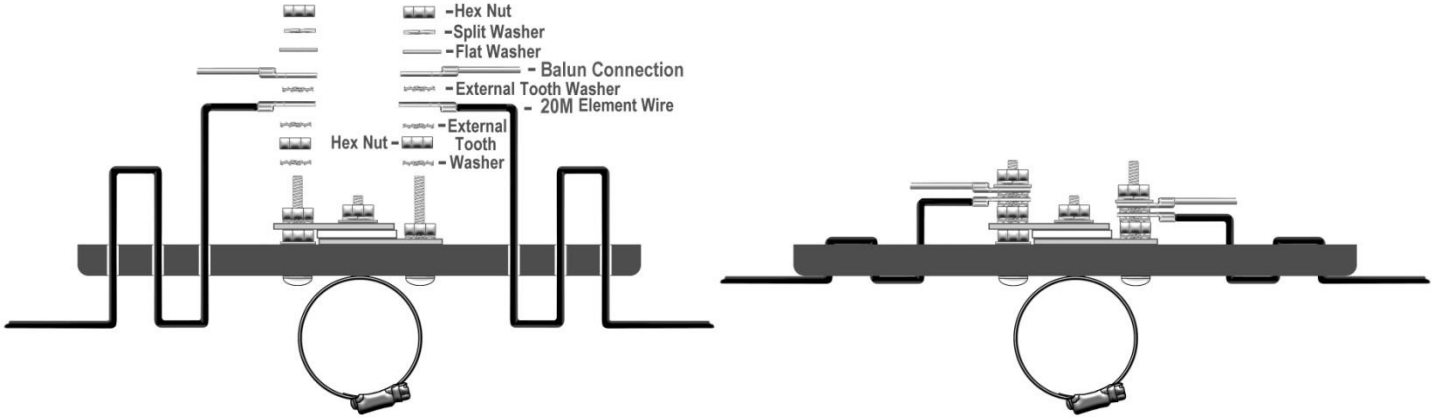


The Rigid Feeder is supplied with the hardware installed as indicated in the diagrams. The spare hardware is included in case you lose some hardware when installing the element wires or Balun connections.

10, 12, 15 and 17 Meter connection hardware stack



20 Meter and Balun connection hardware stack



Assembly and Installation of the DX Engineering Maxi-Core® 20 1:1 Current Balun and Balun Mount

The following covers the installation of the MaxiCore® 20 1:1 Current Choke Balun and feedpoint wire connections at the top of your DX Engineering XB-5 Hexx Beam antenna. The Balun is mounted on the 1.250 inch OD Fiberglass Center Post, opposite the side of the Balanced Rigid Flat Feeder.

DXE-HEXX-BAL-K1 Parts List

JTL-12555 - Jet-Lube™ Anti-Seize compound must be used on the threads of all Stainless Steel Hardware to prevent galling and aid in proper tightening torque.

Part Number	Description	Qty
DXE-MC20-1-1 *	MaxiCore® 20, 1:1 Current Choke Balun, 5 kW	1
DXE-BMB-4P	Balun Mounting Bracket for MaxiCore® 20 Baluns	1
	6-32 Hex Nyloc Nut, Stainless Steel	4
	6-32 x 3/4" Hex Head Bolt, Stainless Steel	4
	#6 Flat Washer, Stainless Steel	8
	10-24 Nyloc Hex Nut, Stainless Steel	2
DXE-HEXX-BAL-K1	Balun Mounting Bracket, Aluminum	2
	ECL-1750 Element Clamp, Stainless Steel	2
	10-24 x 5/8 Flat Head Socket Cap Screw, Stainless Steel	2
	#10 Flat Washer, Stainless Steel	2
	1/4-20 Washer, Ext Tooth, Stainless Steel	2
	1/4-20 Nyloc Hex Nut, Stainless Steel	2
	4.5 inch Feedpoint Wire with 1/4" and #10 Ring Terminals Soldered in place	2

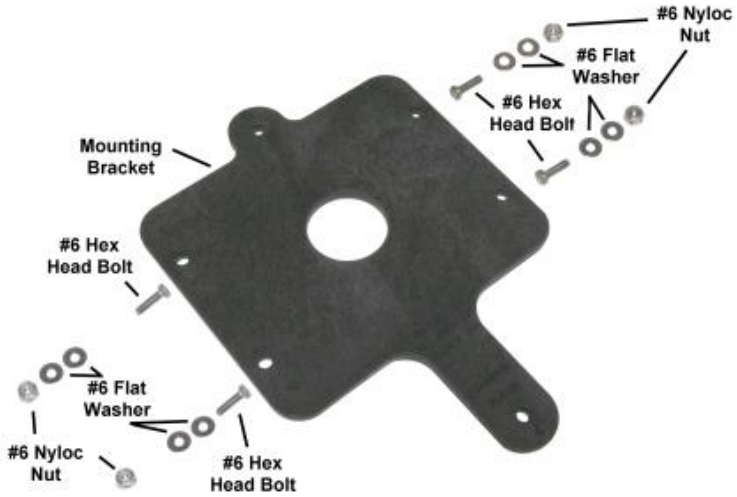
* The DXE-MC20-1-1 is an additional part of the complete antenna kit included and not part of the K1 Kit

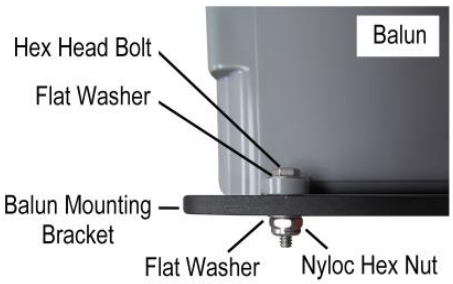
Assembly

The unique design provides minimum capacitive coupling to the wire and field surrounding the Balun core plus a special UV resistant, strong black plastic compound.

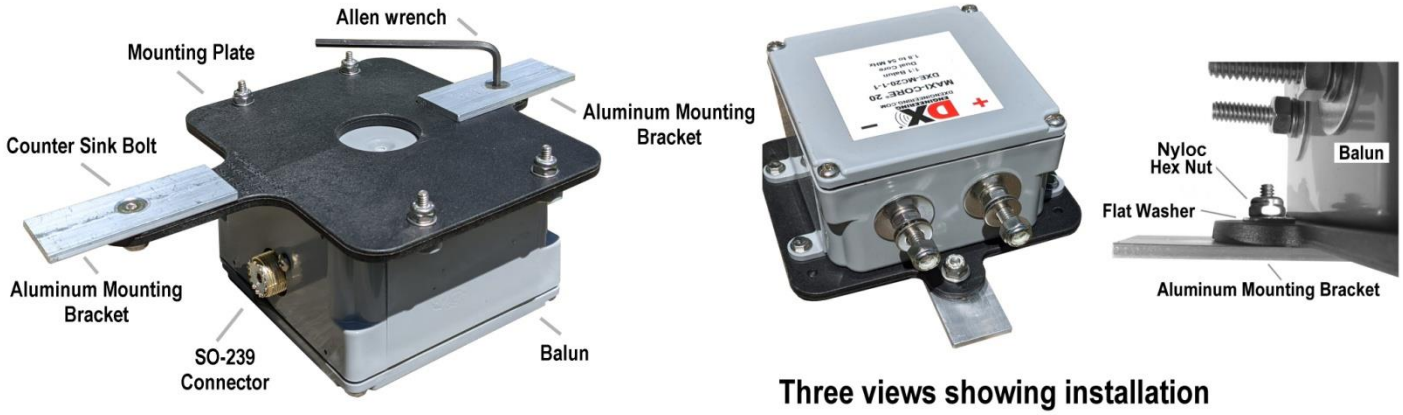
Remove the existing Wing Nuts on the Balun. Install the new 1/4-20 Stainless Steel Nyloc nuts in place, just finger tight, on the Balun. This hardware will be tightened later in the assembly process. The Wing Nuts will not be reused.

Attach the DX Engineering Balun to the Balun Mounting Bracket using the hardware as shown below. Tighten the hardware in place.





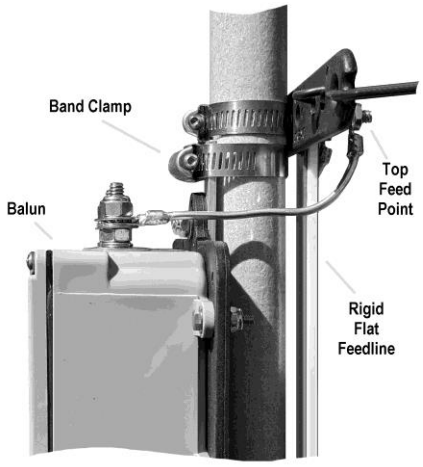
Mount the two aluminum mounting brackets with the countersunk holes facing away from the resin mounting plate using the 5/8 inch counter sink hex head bolts with a customer supplied 1/8" Allen wrench, flat washers and Nyloc nuts as shown below. Tighten in place.



Three views showing installation of aluminum brackets

Enclosed in this kit are two feedpoint connections (Tinned Copper Wire) with 1/4" and a #10 Ring terminals soldered in place. These are the feedpoint connections that are installed from the Balun to the antenna's 20 meter Driven Element connections at the top of the Rigid Flat Feeder. The larger 1/4" Ring Terminals fit the Balun connections. The smaller #10 Ring Terminals fit the Hexx Beam feedline connections.

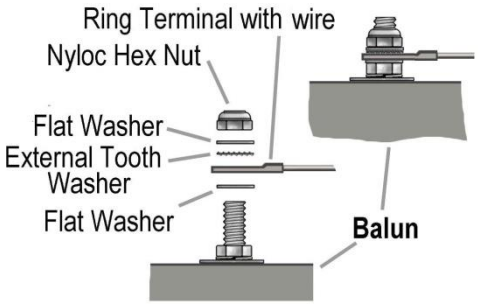
Install the two Band Clamps on the Hexx beam center post. The clamps are temporarily positioned as shown and just snug. The clamps go around the fiberglass center post - **not the Rigid Flat Feedline (Flat Feed)**.



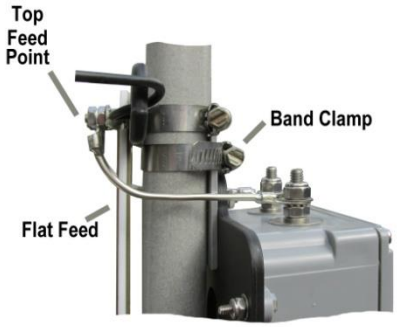
On the opposite side of the Center Post from the Rigid Flat Feedline assembly, slide the Balun assembly Aluminum Mounting Bracket pieces in place under the two band clamps as shown. Tighten the Band Clamps holding the Balun assembly firmly in place just below the 20 meter Driven Element connections.

The Feedline Wires are attached from the Balun terminals to the Hexx Beam top 20 meter Driven Element feedpoint connections.

Attach the two new Feedpoint wires (with 1/4 inch terminals attached) to the Balun terminal studs as shown below. **Leave the hardware loose.**

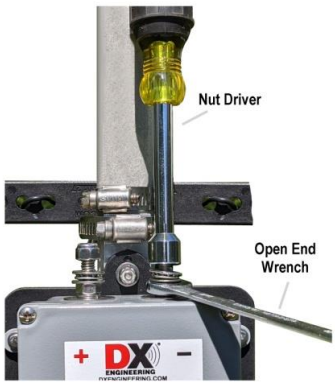


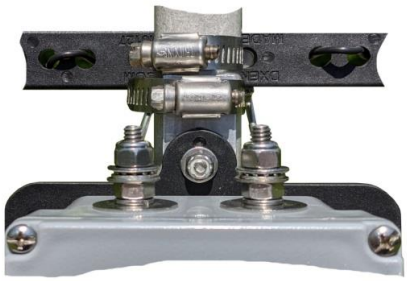
Gently bend each Feedpoint connection wire and route them to the top antenna feedpoint connections as shown leaving the hardware loose. Take care not to short out against any hardware or the Flat Feedline. There is enough slack in the wire to make a small drip loop to shed any moisture.



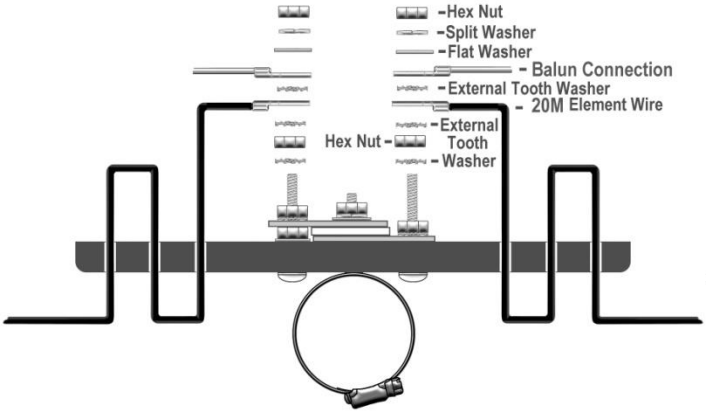
Carefully tighten the new Nyloc Nuts on the Balun using a 7/16” Nut Driver and a 7/16” Open Wrench as shown.

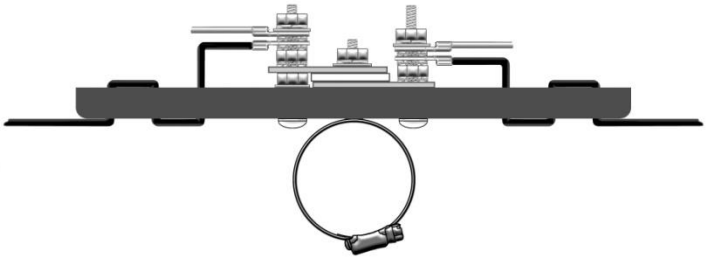
Important Note: Use the 7/16” **Open End Wrench to hold the nuts at the top of the Balun to prevent rotation of the Balun terminal studs and possible internal damage to the Balun.**

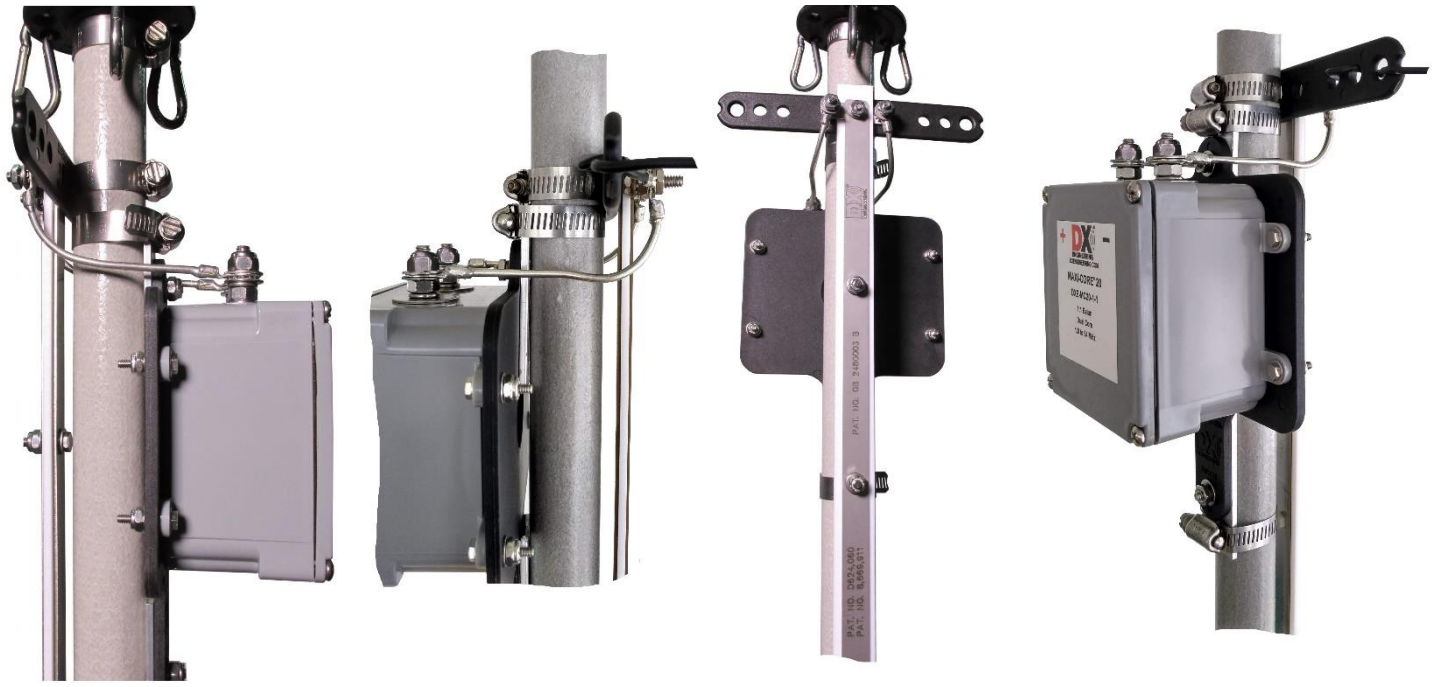




Snug the feedline hardware on the 20 meter Driven Element. Hardware will be tightened when the element wires are installed.







The coaxial cable connection at the bottom of the Balun should be weather proofed using 3M Temflex Rubber Splicing Tape with an overwrap of 3M Super 33+ Premium Vinyl Electrical Tape for UV protection. Secure the coax to the back of the fiberglass Center Post on the opposite side from the Rigid Flat Feedline with 3M Super 33+ Premium Vinyl Electrical Tape. Do not use wire ties (also called zip ties), to prevent crimping of the coax. Wire ties can squeeze too hard and change the electrical characteristics of the coaxial cable and cause damage to the jacket. Remember to leave an extra length of coax to form a rotator loop below the Hexx Hub to allow antenna rotation.

Spreader Assembly and Pre-Made Spreader Support Ropes

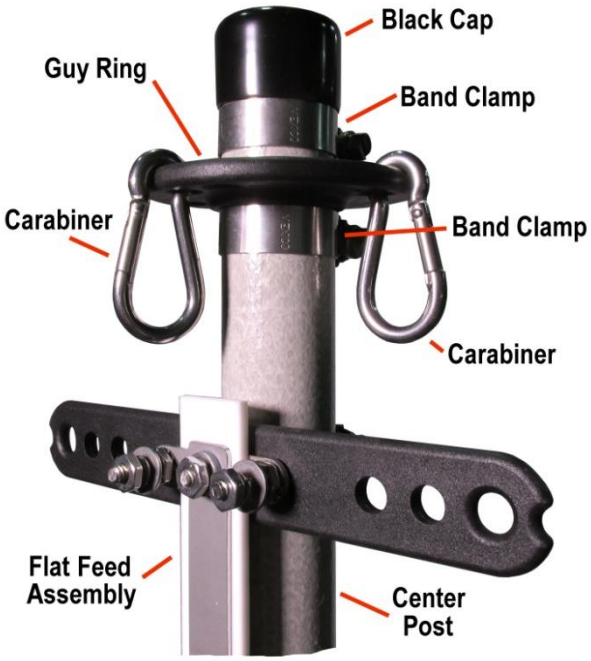
The Spreaders and Center Post are manufactured from high quality fiberglass material and all the parts are used as-is and no cutting or drilling is required. This helps to reduce the risk of stray fiberglass threads becoming a problem during assembly.

Caution: There are parts made from fiberglass in this kit. Take normal precautions when handling any fiberglass material. There may be fiberglass dust, slivers or particles present when the fiberglass parts were manufactured. The use of typical fiberglass handling safety gear (gloves, dust mask, eye shield, clothing, etc.) when handling and working with fiberglass is recommended. Use a damp rag to wipe the parts. **Do not** use compressed air to clean fiberglass parts. Measures can be taken to reduce exposure after a person has come in contact with fiberglass. Eyes should be flushed with water and any area of exposed skin should be washed with soap and warm water to remove fibers. Clothing worn while working with fiberglass should be removed and washed separately from other clothing. The washing machine should be rinsed thoroughly after the exposed clothing has been washed. Check with your local or state safety and/or environmental agencies for more detailed precautions.

DXE-XB-5-SCP Parts List

Item	QTY	Unit	Description
Re-enforcer Tubes (will be nested in 1" Spreader tubes at hub)	6	ea	Tube, Fiberglass, 0.75" OD x 5" Long, 0.120 wall
Spreader	6	ea	Tube, Fiberglass, 1.00" OD x 58" Long, 0.120 Wall
Spreader	6	ea	Tube, Fiberglass, 0.75" OD x 43" Long, 0.120 Wall
Spreader	6	ea	Tube, Fiberglass, 0.50" OD x 48" Long, 0.120 Wall
Element Clamp for 1/2" spreader clamping	6	ea	Element gear drive clamp, 0.500" x 0.313"
Element Clamp for 3/4" spreader clamping	6	ea	Element gear drive clamp, 0.875" x 0.500"
Center Post	1	ea	Tube, Fiberglass, 1.25" OD x 58" Long, 0.120 Wall
Cap for top of center post	1	ea	Vinyl End Cap 1.187" ID size, black
DXE-GR-5P Guy Ring Set (only use 1.25" Ring)	1	pkg	Guy Ring set of 5: 3/4", 1", >>only using 1.25"<<,1.5," 2.0",
Band Clamp (holds guy ring in place)	2	ea	Band Clamp, gear drive clamp, 1.125" to 1.25" dia.
Support Ropes, pre made with Thimbles on each end	6	ea	Rope, 0.17"(4.4mm) x 10.17'(3.1m) w/2 Thimbles
Carabiners for Support Ropes (6 for ropes, 3 for guy ring)	9	ea	Carabiners, Spring hook, 2" (5 mm)
Rope P-Clamps Assemblies - pre-assembled	6	ea	Cushioned P-Clamps - pre-assembled with the following:
	1	*ea*	*ECLS gear drive clamp w/stud ,0.500" x 0.313"*
	1	*ea*	*Cushioned Loop for P-Clamp, .375"*
	1	*ea*	*Hex Nut, 10-24 SS Nyloc Type*
	1	*ea*	*Flat Washer, (thin) #10 x 1/2 18-8 SS*

Guy Ring Installation



At the top of the center post slip one 1.25" dia. Band Clamp over the center post.

From the **DXE-GR-5P** Guy Ring Set slip the 1.25" Guy Ring on the Center Post.

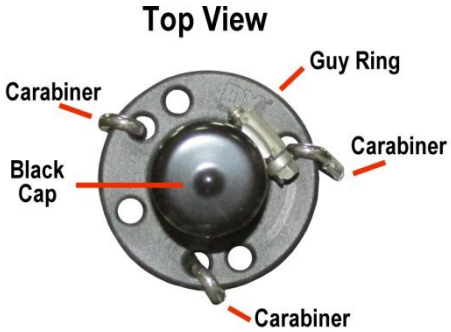
Slip the second 1.25" dia. Band Clamp over the center post.

Install the black vinyl cap on the top of the center post.

Move the top Band Clamp up to the lower edge of the Top Cap and tighten in place.

Move the Guy Ring up until it just touches the bottom the previous tightened element clamp.

Move the lower Band Clamp up until it touches the bottom of the Guy Ring and tighten the clamp in place.



NOTE: For clarity, this top image is not showing the Balun, Mount and Clamps that were previously installed on the back of the Center Post just below the 20 meter element insulator and Flat Feeder clamp.

Install three Carabiners in the Guy Ring holes as shown.
Note the opening part of the Carabiner should be facing upwards when installed.

There are 30 pre-cut black wire guide tubes included in this kit that are to be installed in the pre-assembled wire guide P-Clamps, there are 12 small P-Clamps used on the 0.5"(12.7mm) fiberglass spreader tubes and 18 larger P-Clamps used on the 0.75"(19mm) fiberglass spreader tubes. Assembly of the wire guide may require loosening of the Nyloc nut holding the P- Clamp to insert and center the small black wire guide tubing. When the black tube is centered in place, as shown below, tighten the Nyloc hex nut on the P-Clamp to hold the black wire guide tubing securely in place.

Pre-Assembled Wire Guide P-Clamp

Black Wire Guide Tube

P-Clamp tightened

Spreader Tubes and Clamps

1 - Slide the 3/4”(19mm) x 43”(1.09m) tube inside the 1”(25.4mm) x 58”(1.47m) tube with a ***4”(101.6mm) overlap***. Tighten a 3/4” Band Clamp in place to keep the 3/4” tube from sliding further into the 1” tube as shown below. The short 5”(127mm) reinforcement tubes will be installed when you mount the spreader assembly to the Hexx Hub.

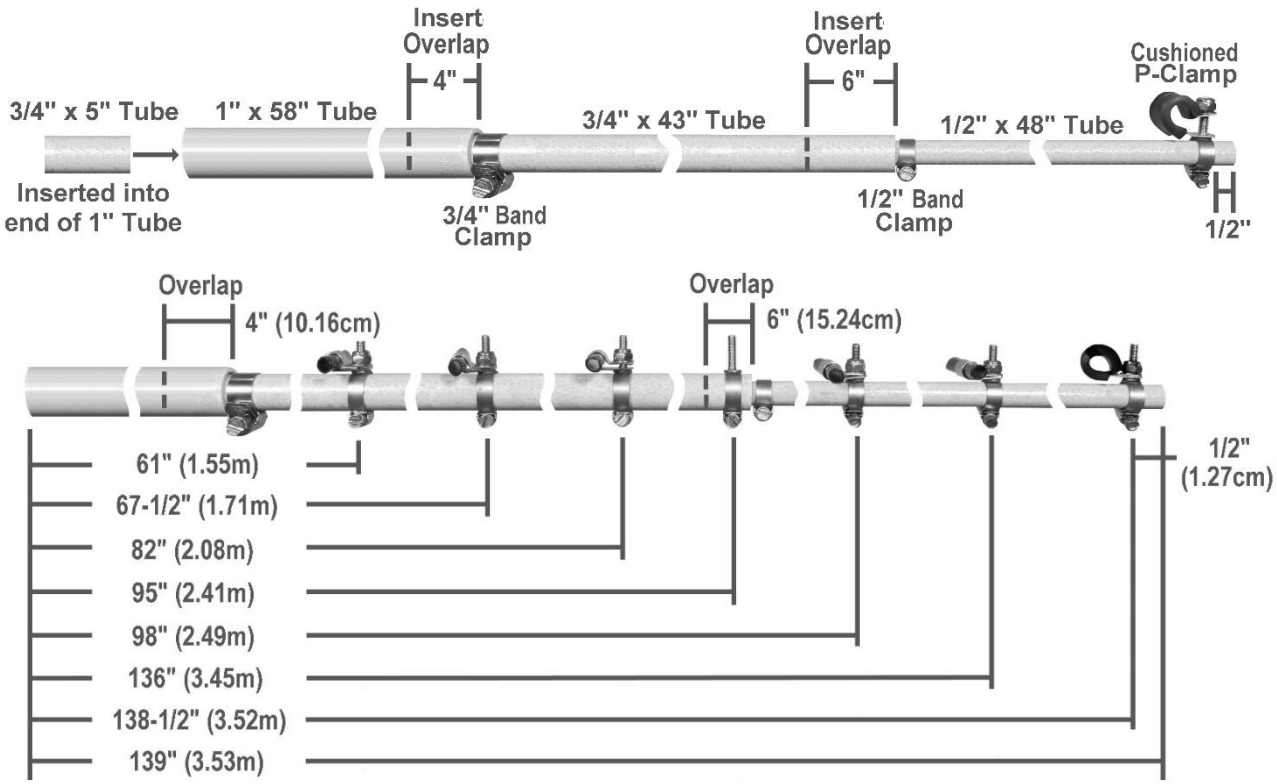
2 - Install the larger 3 element wire guide clamps and the single clamp with no P-Clamp as shown below on the 3/4” spreader positioned vertically (P-Clamp up with loop toward the Hexx Hub - center of the antenna). Snug the clamps in place. These assemblies may be moved for final positioning on your antenna during tuning. Note one clamp at the 95”(2.41) position has no P-Clamp attached.

3 - Slide the 1/2”(12.7mm) x 48”(1.22m) tube inside the 3/4”(19mm) x 43”(1.09m) tube with a ***6”(152.4mm) overlap***. Tighten a 1/2” Band Clamp in place to keep the 1/2” tube from sliding further into the 3/4” tube as shown below.

4 - Install the smaller 2 element wire guide clamps as shown below on the 1/2” spreader positioned vertically (P-Clamp up with loop toward the Hexx Hub - center of the antenna). Snug the clamps in place. These assemblies may be moved for final positioning on your antenna during tuning.

5 - Install one cushioned P-Clamp assembly 1/2”(12.7mm) from the end of the 1/2” tube as shown below and tighten in place. Tighten the P-Clamp Nyloc Nut.

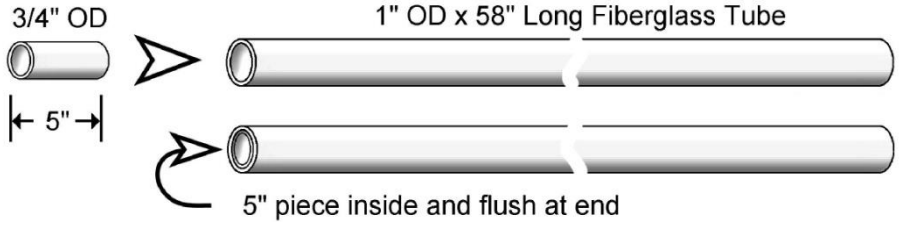
NOTE: In steps 2 and 4, Element Wire Guide Clamps are temporarily positioned at the starting positions indicated below. **DO NOT** tighten them. Simply snug the clamps in place. These assemblies will be moved for final positioning on the spreaders by band to take up slack or relieve tension on element wires and possibly during tuning.



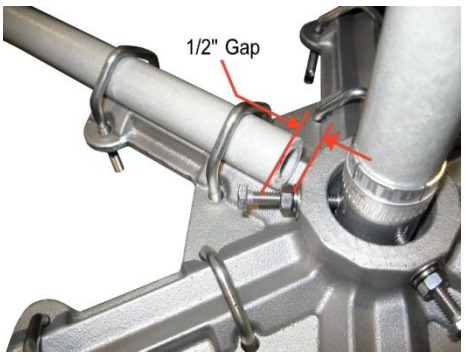
Repeat the last steps **1-, 2-, 3-,-4** and **5** for the other five spreaders.

Installing Spreaders in the Hub

Insert a 3/4"(19mm) OD x 5"(127mm) long fiberglass reinforcement tube flush into the end of the a 1"(25.4mm) OD x 58"(1.47m) long fiberglass tube. When the 1" OD is slid into the one of the six Hexxagonal Hub V-Saddle channels, under the V- Bolts ensure the smaller 5" long tube inside stays at the end. These short 5" pieces are being used to re-enforce the 1" tube under the Hexx Hub V-Bolts.

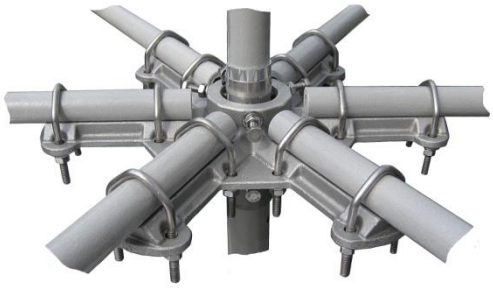


Leave a space of about 1/2"(12.7mm) to 3/4"(19mm) between the upper mast mount surface of the hub and the end of each 1" OD spreader section.

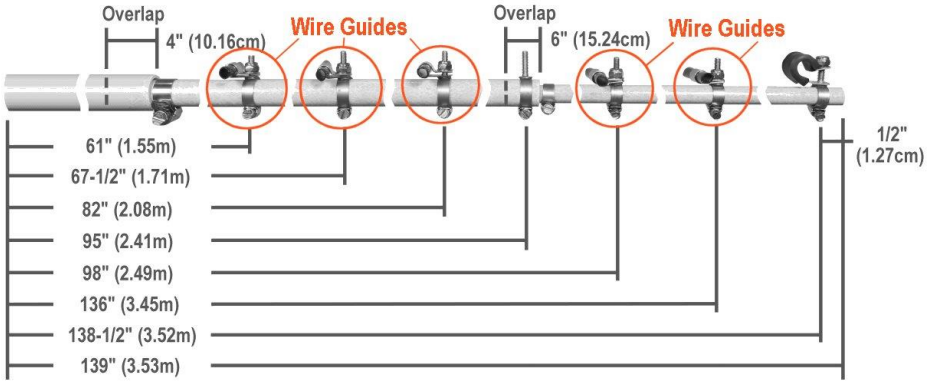


The clamps must be facing upward. Ensure the inside tube does not move, tighten the V-bolt nuts evenly until the lock washers are flattened, without crushing the tubing as shown.

Repeat the above process for the other 5 spreaders.

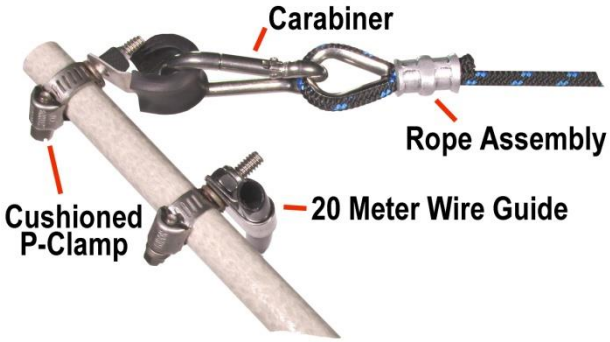


Install the spreaders into the fiberglass tubes that you just mounted to the center Hexx Hub. Note the 4” overlap that should be there when the band clamp was installed.

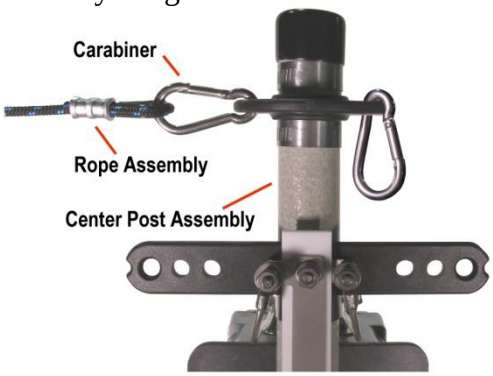


Installing the Pre-Made Rope Assemblies to the Spreader and Center Post

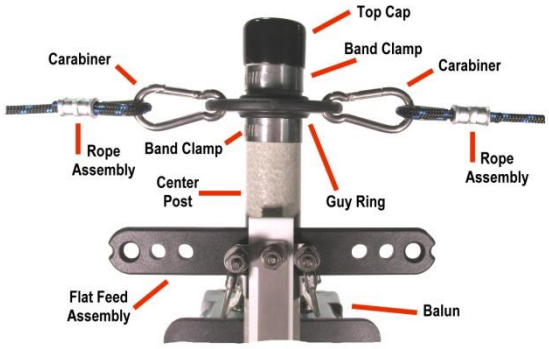
Install a Carabiner in a Pre-Made Rope Assembly. These rope assemblies also act as Ice Guards due to their robust assembly. Attach it to the cushioned P-Clamp as shown.

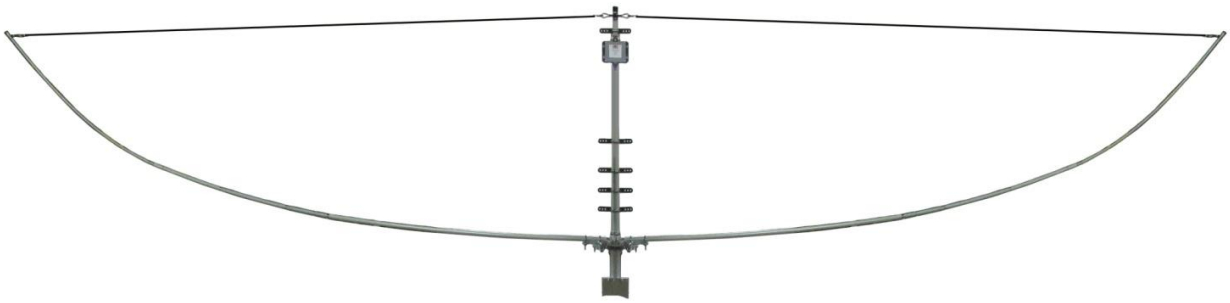


Carefully pulling the other end of the Spreader Support Rope Assembly toward the top of the Center Post, bowing the spreader upwards, clip the rope thimble into the top of one of the three carabiners on the Center Post Guy Ring as shown.



Repeat the above for the opposite spreader and rope assembly, and the other spreaders. When completed there will be two pre-made rope assemblies connected to each of the three carabiners on the guy ring.





Front Stabilizing (Retention) Ropes

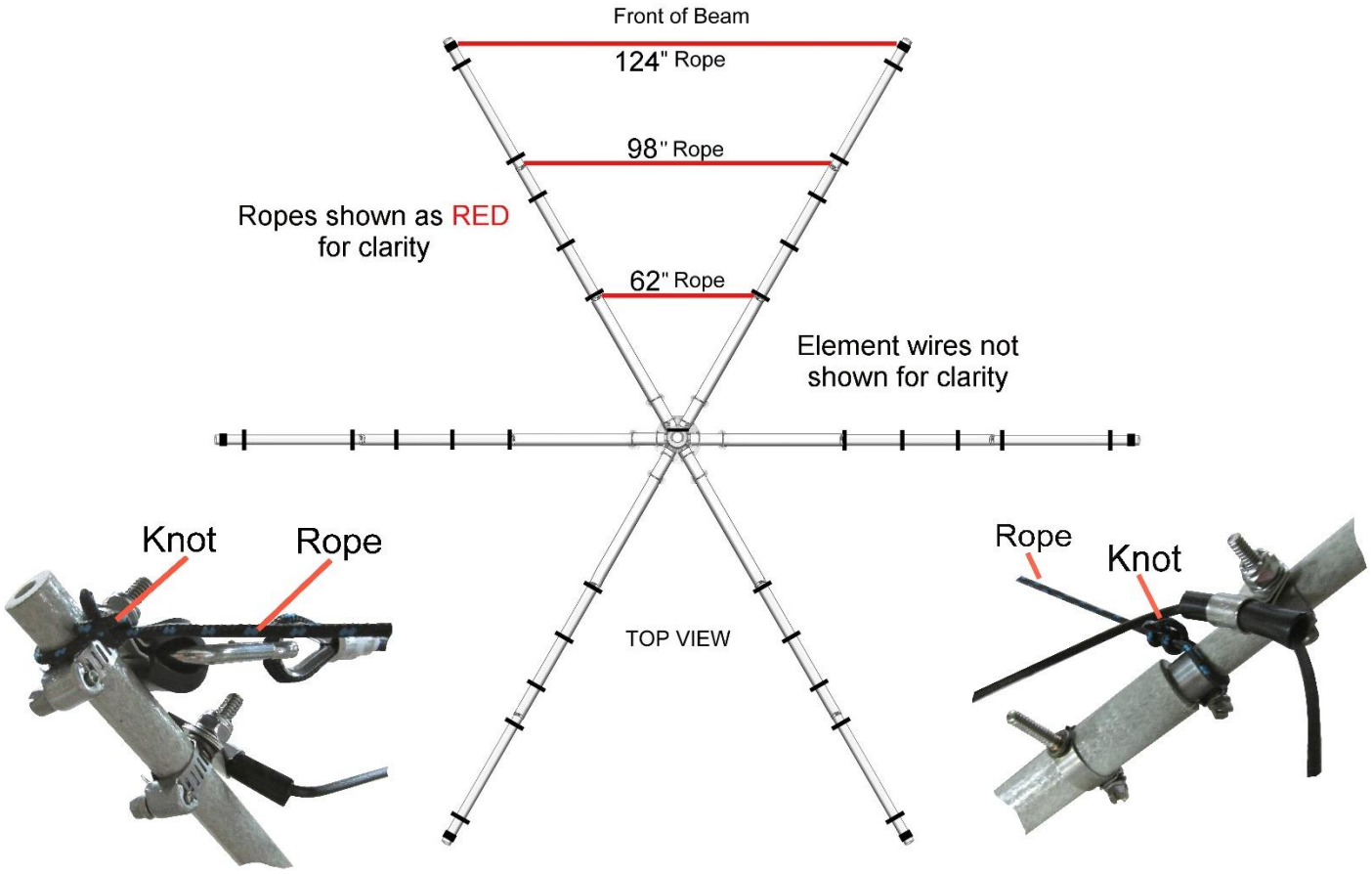
Using the included roll of **MSG-MP03031** Mastrant Rope, cut three lengths of rope used as front stabilizing, or retention ropes. These stabilizing ropes are tied between the two spreaders that are at the front of the Hexx Beam, to maintain their position when element wires are installed.

Cut Rope 1 length = 136”(3.45m) This rope will go between the spreaders at the 20 meter location
Cut Rope 2 length = 110”(2.79m) This rope will go between the spreaders at the 17 meter location
Cut Rope 3 length = 74” (1.88m) This rope will go between the spreaders at the 10 meter location

The ropes (listed above) are cut 12”(0.30m) longer than the spreader distances (shown below) to allow some extra rope for knots at each end.

When the ropes are **tied in place** - the **final rope lengths** between the spreaders will be:

Rope 1 length = 124”(3.15m) This rope will go between the spreaders at the 20 meter location
Rope 2 length = 98”(2.49m) This rope will go between the spreaders at the 17 meter location
Rope 3 length = 62”(1.57m) This rope will go between the spreaders at the 10 meter location



Note: When all the wires and ropes are in place, you may adjust the P-clamp positions to snug up the wire elements as needed. Make small adjustments evenly on each set of wire guides.

Wire Elements and Spacers

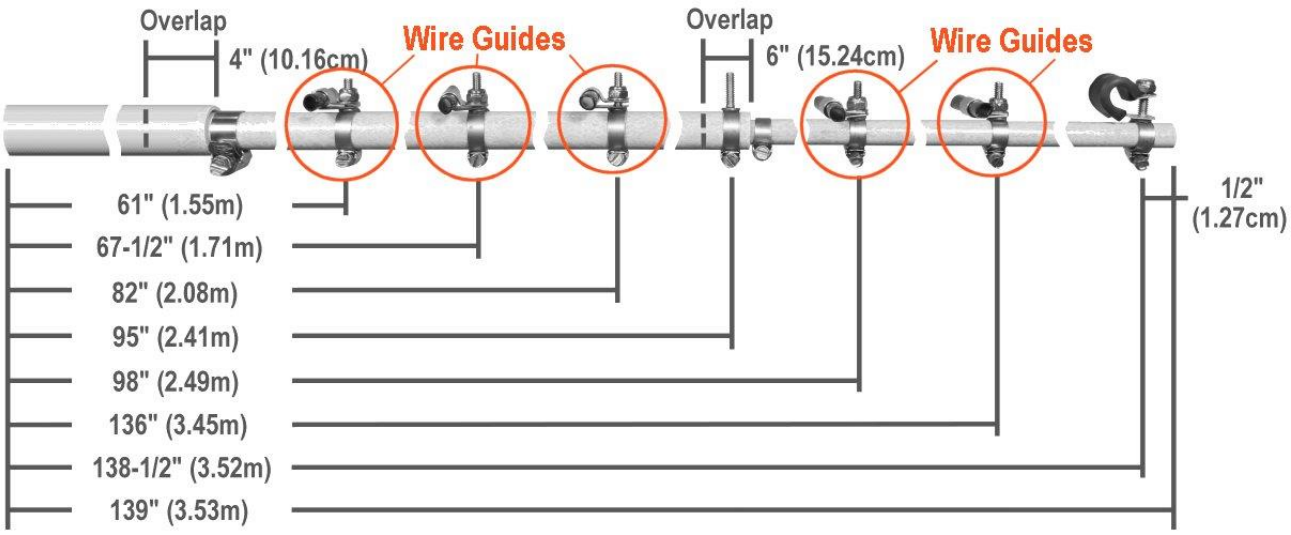
The Wire Elements are made from high quality 14 gauge stranded copper wire with a relaxed black PVC insulation for long lasting element assemblies. Each pair of driven elements has a ring terminal installed on one end. The reflector element does not use ring terminals. The Element Wires (two driven element wires for each band and one reflector wire for each band) are bagged and have color coded and printed shrink tubing near one end so they are easy to identify.

The wire elements are attached to an XB-5 Hexx Beam using our unique floating element wire guides. The exclusive DX Engineering stainless steel band clamps with welded studs and P-clamp wire guides provide a secure attachment for the element wire sets. The floating wire guides allow your spreaders to have independent movement during windy conditions reducing stress and strain on the element wires and spreaders.

The Element Spacers are made from black Acetal in the correct lengths for each band and are drilled to accept the element wires using a serpentine wire routing to ensure the element wires are properly held in place and yet allow for easy adjustment in element lengths.

DXE-XB-5-EK Parts List

QTY		Description
2		10 meter Driven Wire Element with one Ring Terminal - **Blue label - 106" (2.69m)**
1		10 meter Reflector Wire Element - **Blue label - 203" (5.16m)**
2		12 meter Driven Wire Element with one ring terminal - **White label - 118.5" (3.01m)**
1		12 meter Reflector Wire Element - **White label - 222.75" (5.66m)**
2		15 meter Driven Wire Element with one ring terminal - **Red label - 141.25" (3.59m)**
1		15 meter Reflector Wire Element - **Red label - 268.5" (6.82m)**
2		17 meter Driven Wire Element with one ring terminal **- Yellow label - 166.25" (4.22m)**
1		17 meter Reflector Wire Element - **Yellow label - 311.5" (7.91m)**
2		20 meter Driven Wire Element with one ring terminal - **Green label - 215" (5.46m)**
1		20 meter Reflector Wire Element - **Green label - 406.5" (10.33m)**
All element wires are 14 AWG, Stranded Copper with Relaxed PVC Insulation		
2		10 meter Element Spacer Rod, **15.50" (393.7mm)**
2		12 meter Element Spacer Rod - **17.00" (431.8mm)**
2		15 meter Element Spacer Rod - **19.25" (489.0mm)**
2		17 meter Element Spacer Rod - **21.75" (552.5mm)**
2		20 meter Element Spacer Rod - **27.25" (692.2mm)**
All Spacer Rods are Black Acetal material 0.5" (12.7mm) Dia. with three holes drilled in each end		
30		Tubing, 0.3125" (81.7mm) black nylon - **2" (50. 8mm) each - used on 30 wire guide clamps**
24		Floating Wire Guide for 0.75" (19.05mm) Spreader - **pre-assembled** with the following hardware
	24	Element drive clamp with stud ,0.750" (19.05mm) x 0.313" (7.95mm) wide
	24	Clamp, Loop type, .3125" (7.94mm), Stainless Steel
	24	Hex Nut, 10-24, Nyloc Type, Stainless Steel
	24	Flat Washer, #10 x 0.5", thin, 18-8, Stainless Steel
12		Floating Wire Guide for 0.5" (12.7mm) Spreader - **pre-assembled** with the following hardware
	12	Element drive clamp with stud ,0.500" (12.7mm) x 0.313" (7.95mm) wide
	12	Clamp, Loop type, .3125" (7.94mm), Stainless Steel
	12	Hex Nut, 10-24, Nyloc Type, Stainless Steel



Wire guides show on one of the six XB-5 Hexx Beam spreaders.

Wire Element and Spacer Installation

The Wire Elements are made from high quality 14 gauge stranded copper wire with a relaxed black PVC insulation for long lasting element assemblies. Each pair of driven elements has a ring terminal installed on one end. The reflector element does not use ring terminals.

The Element Wires (two driven element wires for each band and one reflector wire for each band) are bagged and have color coded and printed shrink tubing near one end so they are easy to identify.

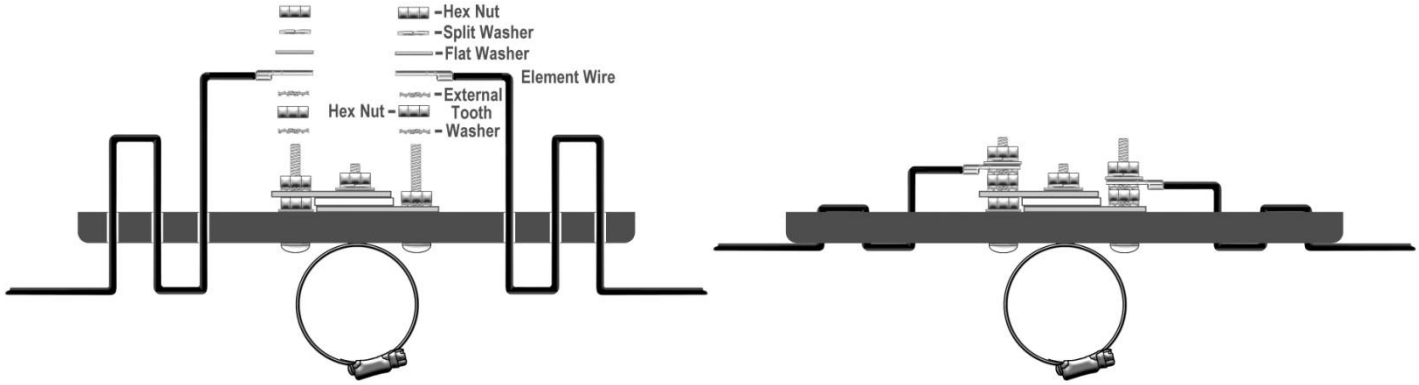
The suggested installation for the wire elements is start on the 10 meter elements first. Then 12, 15, 17 and finally 20 meters.

QTY	Description
2	10 meter Driven Wire Element with one Ring Terminal - **Blue label - 106" (2.69m)**
1	10 meter Reflector Wire Element - **Blue label - 203" (5.16m)**
2	12 meter Driven Wire Element with one ring terminal - **White label - 118.5" (3.01m)**
1	12 meter Reflector Wire Element - **White label - 222.75" (5.66m)**
2	15 meter Driven Wire Element with one ring terminal - **Red label - 141.25" (3.59m)**
1	15 meter Reflector Wire Element - **Red label - 268.5" (6.82m)**
2	17 meter Driven Wire Element with one ring terminal **- Yellow label - 166.25" (4.22m)**
1	17 meter Reflector Wire Element - **Yellow label - 311.5" (7.91m)**
2	20 meter Driven Wire Element with one ring terminal - **Green label - 215" (5.46m)**
1	20 meter Reflector Wire Element - **Green label - 406.5" (10.33m)**

(Chart on page 34 has the measurements in feet and inches)

To ensure proper starting configuration - measure the 10 meter wire lengths (see chart showing element wire lengths above). When the wire sets are manufactured, they are measured and cut using a machine. The lengths may be a bit long and should be trimmed to the lengths in the above chart (if needed) before installing. For the two driven wires with ring terminals, measure from the center of the round ring terminal to the other end of the wire. The reflector wire is measured from end to end.

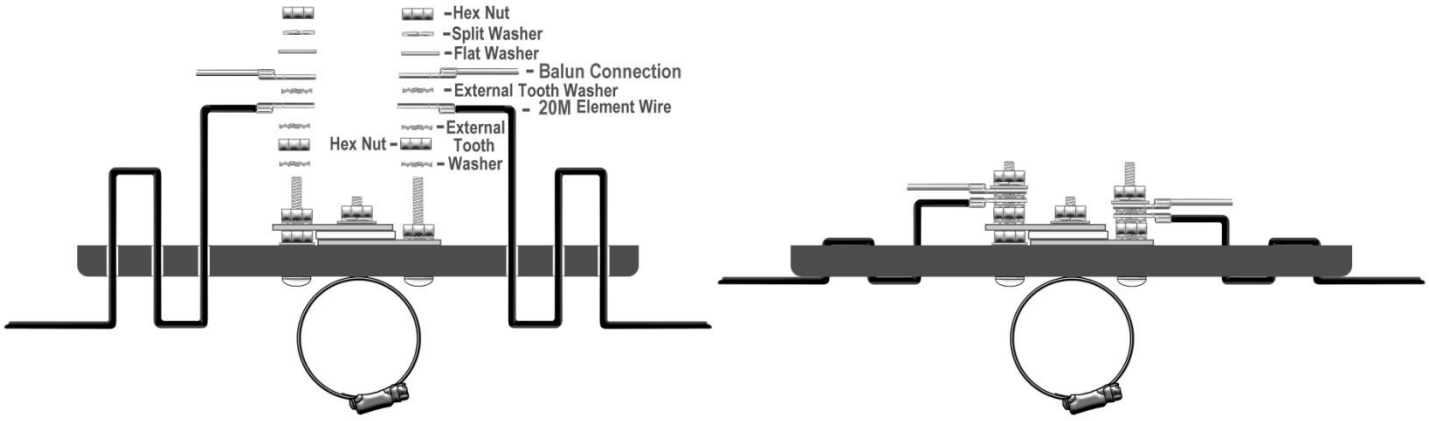
Install the driven wire elements through and onto the XB-5 center flat feed in the serpentine fashion shown for strain relieving grip. Attach the driven element ring terminals using the hardware that is pre-installed. When each ring terminal is installed, tighten the hardware in place.



Element wire connections to the XB-5 Flat Feeder for 10, 12, 15 and 17 meters

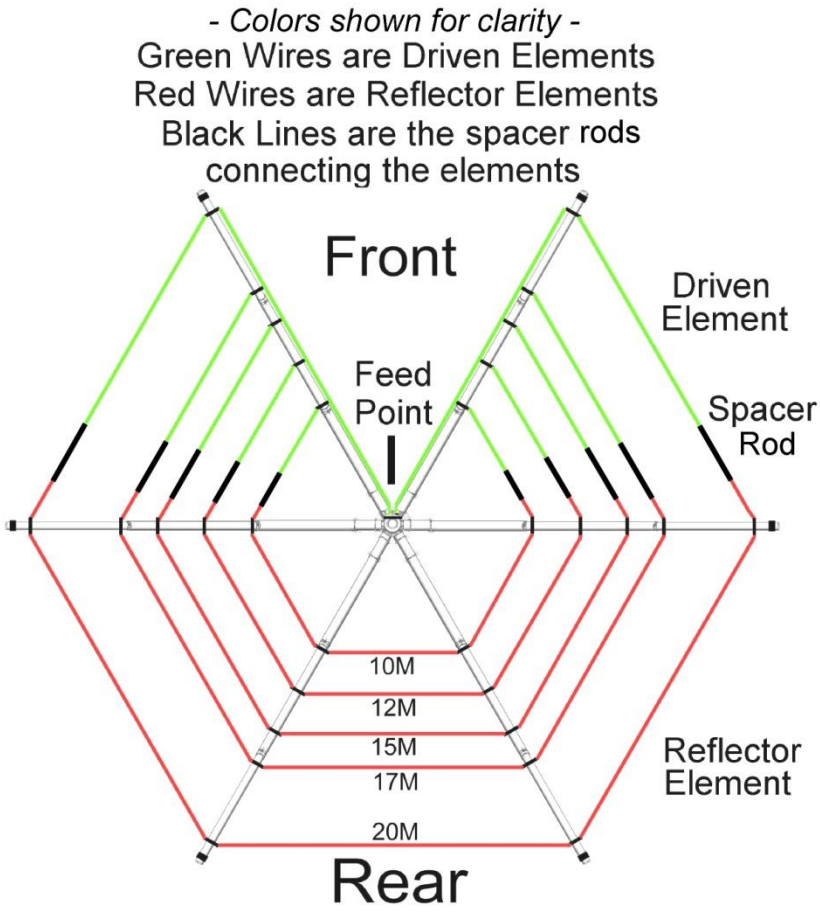
Repeat the same element wire measurements and installation sequence for 12, 15, and 17 meters.

For the two 20 meter driven element wires use the below drawing for installation (the Balun connections are on the 20 meter element). When installed, tighten the hardware in place.

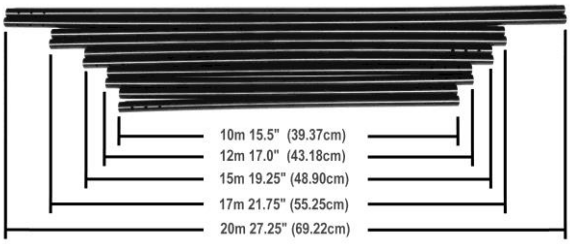


Element wire connections to the XB-5 Flat Feeder for 20 meters

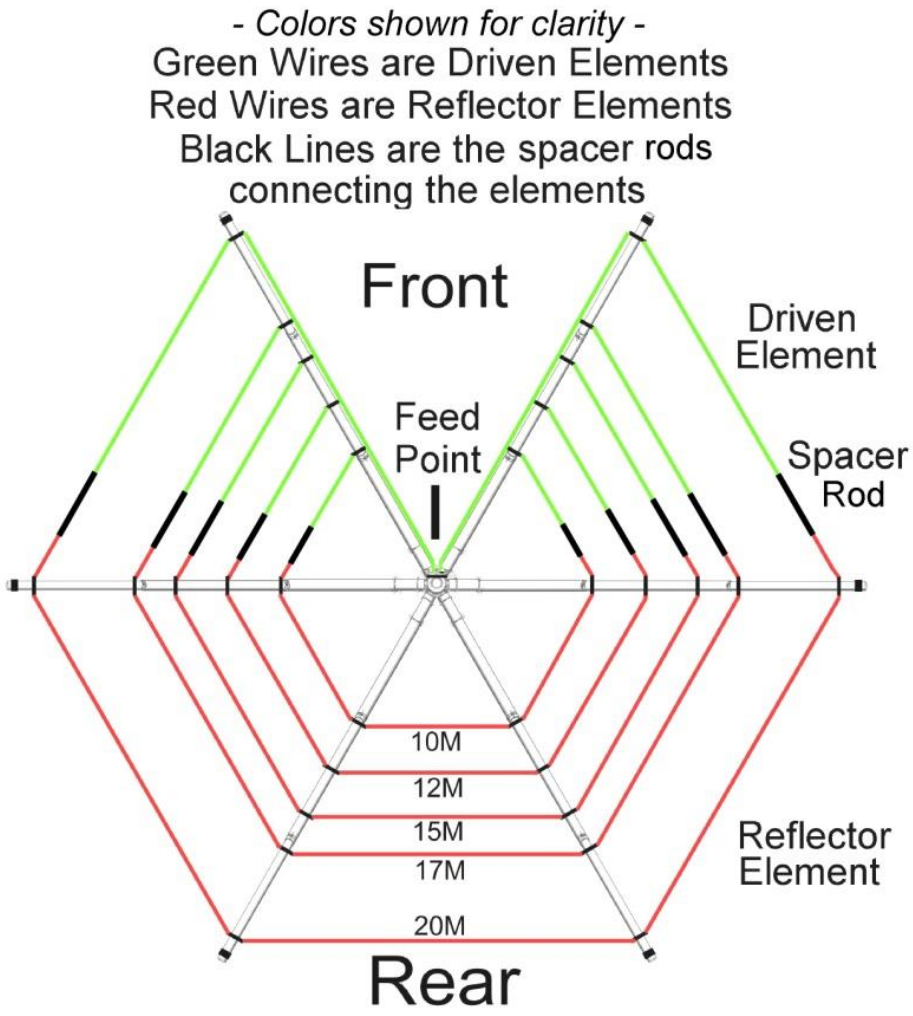
The driven element wires are routed through the installed wire guides for each band on the front spreaders only. The reflector element wire is strung through the installed wire guides on through the side and rear element wire guides for each band on each of the spreaders.

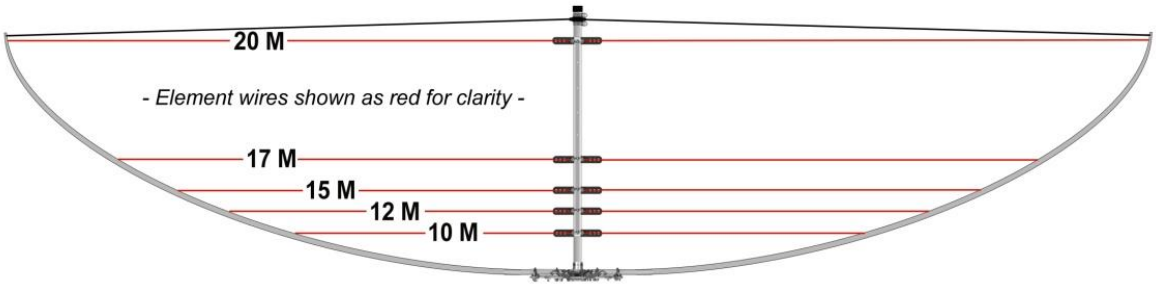


Ten Spacer Rods are installed between the ends of the reflector element wires and driven element wires, two Spacers Rods on each band. Element wires are secured into each Spacer Rod by routing the applicable un-terminated wire end through the middle (2nd) and inner (3rd) holes in a serpentine manner (as shown below). The outer (1st) holes in each end of the Spacer Rods are not used unless tuning is necessary.



Element Wire Guide Clamps that were temporarily positioned at the starting positions on the spreaders may be moved, all six equally by band, during the element installation to relieve excessive tension and to take up slack on element wires. The goal is for relatively parallel, loose but not droopy elements wires. Overly tensioned element wires for one band can distort the spreaders and cause other band wires to droop. It is still recommended to NOT tighten these element wire guide clamps, but just re-snug the clamps in place, in case tuning adjustments are required. Once tuning is checked and finished, tighten all element wire guide clamps.





Views from the top and side of the XB-5 Hex Beam when all of the element wires and spacers are installed.

Tuning

After the DX Engineering XB-5 Hexx Beam assembly has been completed, reposition element wire guides and snug them into identical positons so element wires are made basically parallel, not taught. The fully assembled antenna should be temporarily installed into the normal operating position for testing of the SWR response for each band. **Do not test the SWR of the antenna when it is near the ground or near metal objects or structures.** Doing so will result in erroneous SWR readings that cannot be trusted to indicate the status of the newly assembled XB-5 Hexx Beam.

The antenna should be checked in a normal operating with a reliable antenna analyzer. For the most accurate readings, the test coax cable assembly should be as short as possible to reach the test position. Use any length test cable calibrated by open, short, load feature on analyzers so equipped.

Erroneous readings can occur by testing the antenna SWR with a meter or an analyzer in the shack, or at the end of a very long coaxial cable. Do not test antennas on cables that are running through protectors, switches, relays or other devices that can distort SWR measurements.

Refer to the typical installation XB-5 Hexx Beam SWR curves in the following pages. Compare your individual band SWR sweeps. On some bands, like 20 meters, the higher the antenna, the lower the frequency of minimum SWR. See the chart on page 32.

Given that each element was measured and compared to the lengths in the chart on pages 26, as directed during assembly, if one band on your antenna has a minimum SWR too low in the band or below the band, adjustment can be made to the wire elements of that band.

A small upward shift of the frequency of minimum SWR can be made by rerouting the applicable driven and reflector element wires through all three holes at each end of both of the Spacer Rods for that band only. As stated on page 28, the #1 outer holes are used for tuning, in this manner. When element wires are changed in this manner, all six element wire guides for the band being retuned will need to be repositioned inward, toward the Hex Hub to provide sufficient slack. They may then be repositioned to take up slack as needed.

If required, a greater shift of the minimum SWR point upward in frequency is accomplished by shortening (pruning) of the driven element ends and of both ends of the reflector element wire. Careful removal of 1/4” to 1/2” increments (6.3 to 12.7 mm) and retesting the antenna in the reinstalled position can demonstrate whether any additional pruning may be required. Smaller pruning increments are recommended for higher bands and greater pruning increments are needed for lower frequency bands.

Pruning of element wires is simplified with the DX Engineering XB-5 Element Spacer Rods. Simply readjust the six element wire guides inward toward the Hexx Hub to provide slack. Then push additional driven element and reflector element wire through each hole at each end of the Spacer Rods and trim off the amount desired. Redress each element wire on the Spacer Rods and

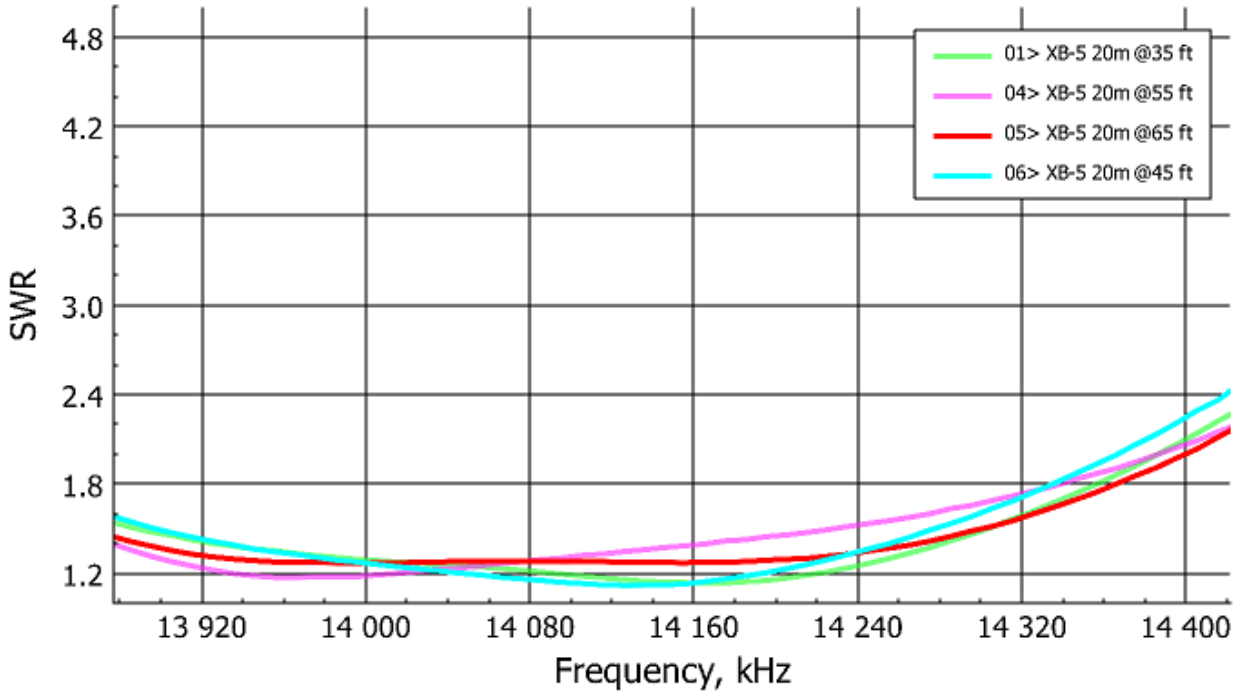
reposition Element Wire Guides to take up element wire slack. Retest the antenna in the normal operating position.

When all bands of a XB-5 Hexx Beam are indicating high SWR or shifted SWR curves, that is a likely indication of nearby metal causing detuning of the entire antenna. Relocation of the antenna to greater height or away from metal should remedy the detuning issue.

If detuning of all bands of the XB-5 Hexx Beam occurs in the only possible operating position for the antenna, then careful retune all of the elements. Starting with 20 meters, prune as instructed above, then retest SWR on all bands in operating position. Then, if necessary, prune 17 meters and retest all bands with the XB-5 installed in operating position, and then determine if additional pruning is necessary on the higher bands, starting with 15 meters, and so on.

Call DX Engineering for technical assistance to discuss the assembly and installation location whenever there are any questions or troubles.

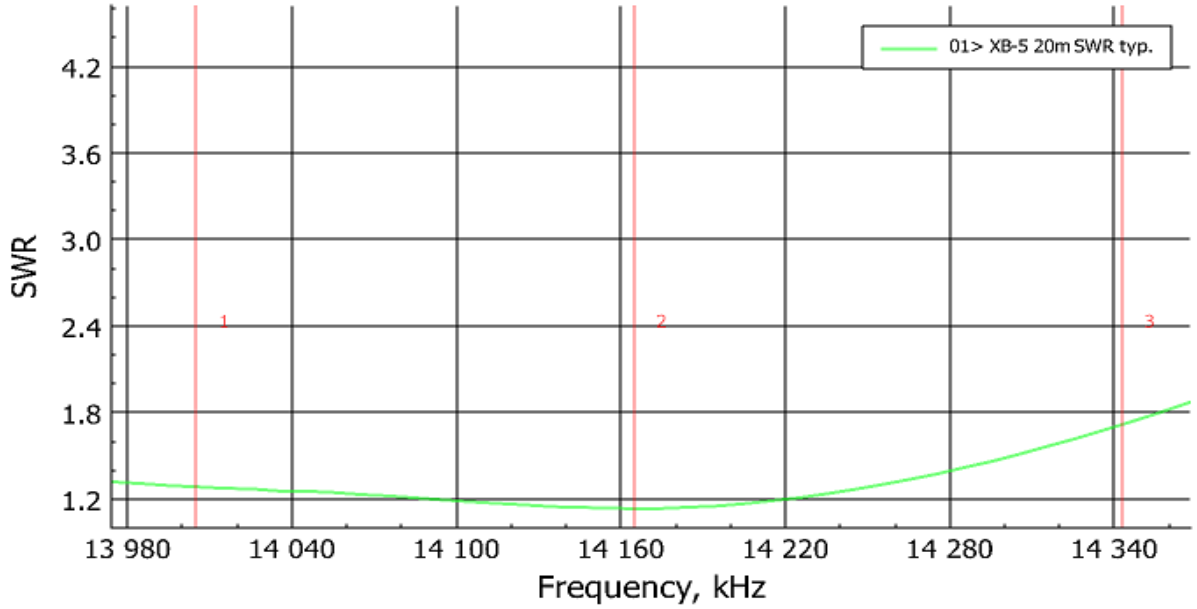
XB-5 20 Meter Band SWR at different heights



The following pages have single band SWR curves for each of the five bands, 20, 17, 15, 12 and 10 meters with the XB-5 at 35 feet, the recommended minimum installation height that provides a very good SWR compromise on all bands and achieves very good operational results.

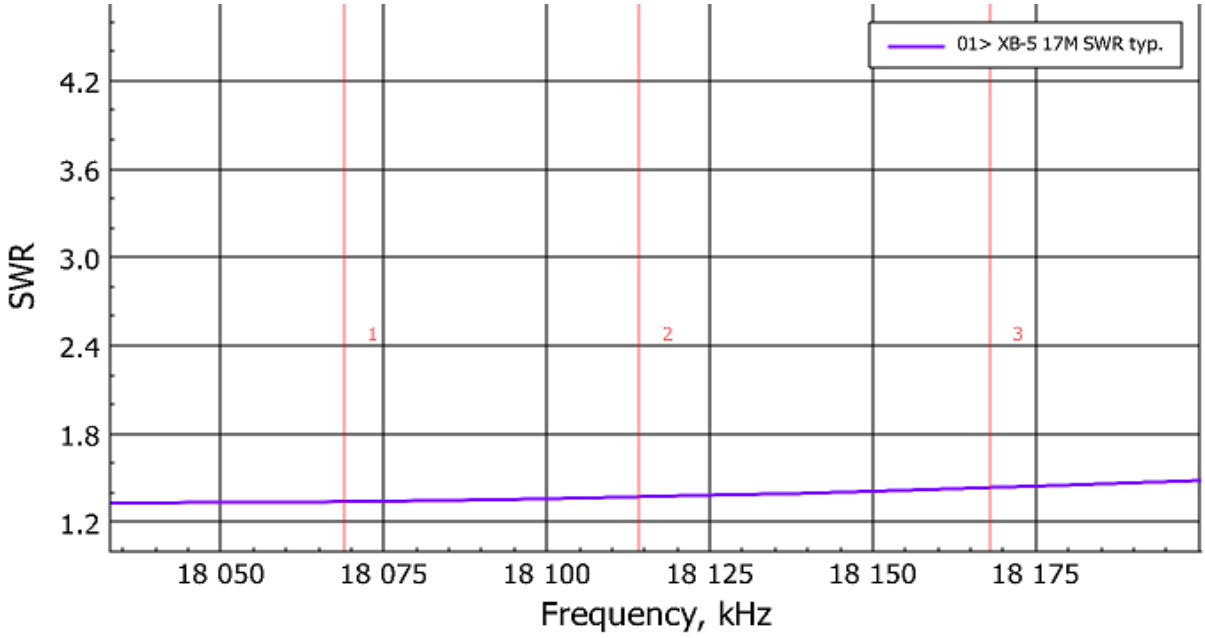
Compromised performance and much higher SWR can result with **DXE-XB-5** Hexx Beam installation at lower height above the ground or near structures with metal, including awnings, gutters, downspouts, electrical wiring, metal ductwork, flashing. Install this and any HF antenna as far away as possible from those RF impediments.

XB-5 20 Meter Band SWR @ 35 ft. above ground



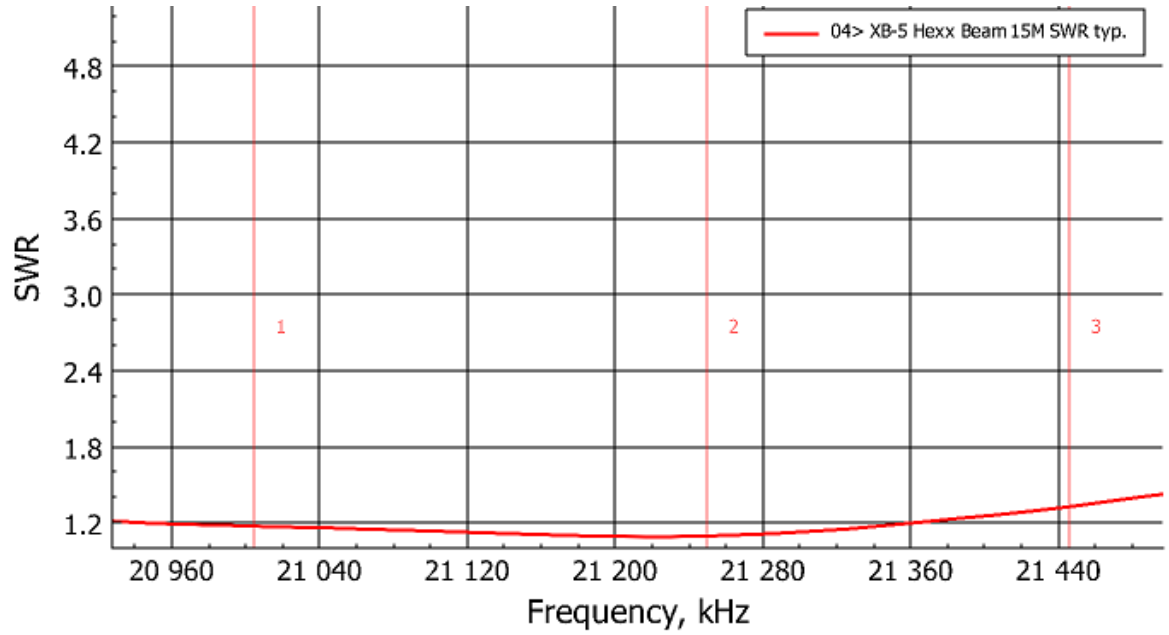
Marker	#	FQ, kHz	SWR	RL, dB	Phase°	R, Ohm	X, Ohm	Z, Ohm
1	1	14005.01	1.29	17.94	159.50	39.25	3.54	39.25 + j3.54
2	1	14164.64	1.14	23.79	-138.70	45.21	-3.87	45.21 - j3.87
3	1	14342.69	1.72	11.52	-79.28	47.83	-26.84	47.83 - j26.84

XB-5 17 Meter Band SWR @ 35 ft. above ground



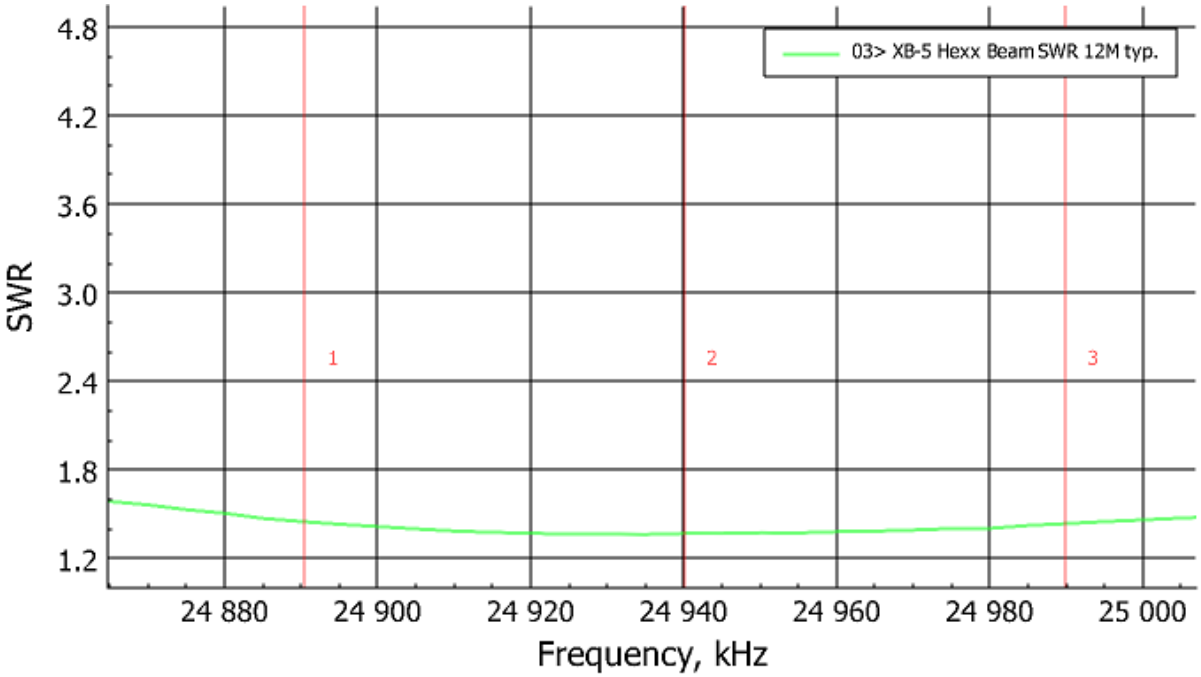
Marker	#	FQ, kHz	SWR	RL, dB	Phase°	R, Ohm	X, Ohm	Z, Ohm
1	1	18068.98	1.35	16.64	-75.24	51.67	-15.04	51.67 - j15.04
2	1	18114.21	1.38	15.96	-87.62	48.15	-15.71	48.15 - j15.71
3	1	18167.93	1.44	14.86	-96.80	44.97	-16.69	44.97 - j16.69

XB-5 15 Meter Band SWR @ 35 ft. above ground



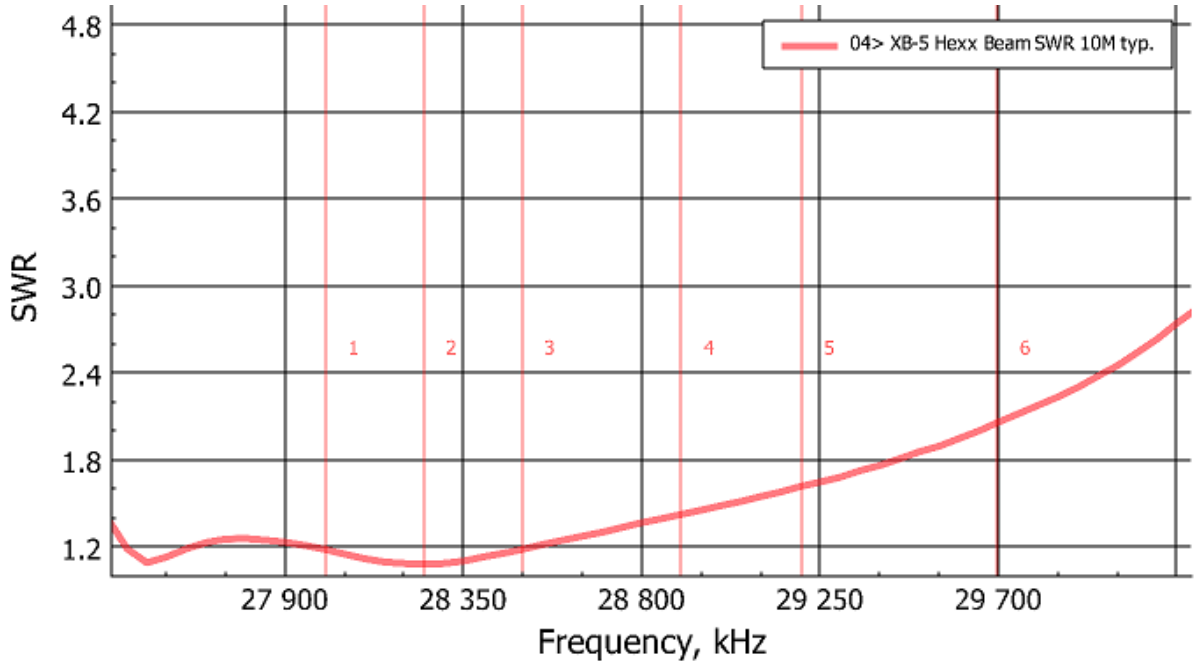
Marker	#	FQ, kHz	SWR	RL, dB	Phase°	R, Ohm	X, Ohm	Z, Ohm
1	4	21004.62	1.18	21.70	17.47	58.43	2.90	58.43 + j2.90
2	4	21249.53	1.10	26.31	83.59	50.30	4.84	50.30 + j4.84
3	4	21445.69	1.33	16.91	114.62	43.00	11.39	43.00 + j11.39

XB-5 12 Meter Band SWR @ 35 ft. above ground



Marker	#	FQ, kHz	SWR	RL, dB	Phase°	R, Ohm	X, Ohm	Z, Ohm
1	3	24890.52	1.45	14.66	-58.71	57.35	-18.76	57.35 - j18.76
2	3	24940.03	1.38	16.03	-110.94	42.85	-12.97	42.85 - j12.97
3	3	24989.82	1.44	14.85	-152.26	35.75	-6.22	35.75 - j6.22

XB-5 10 Meter Band SWR @ 35 ft. above ground



Marker	#	FQ, kHz	SWR	RL, dB	Phase°	R, Ohm	X, Ohm	Z, Ohm
1	4	28003.50	1.19	21.33	169.46	42.21	1.32	42.21 + j1.32
2	4	28249.59	1.09	27.46	71.37	51.20	4.11	51.20 + j4.11
3	4	28497.47	1.19	21.19	-23.08	58.56	-4.05	58.56 - j4.05
4	4	28899.83	1.43	14.99	-91.43	46.53	-17.10	46.53 - j17.10
5	4	29203.39	1.63	12.44	-136.52	33.60	-11.70	33.60 - j11.70
6	4	29697.36	2.07	9.17	155.82	25.04	8.12	25.04 + j8.12

DX Engineering XB-5 Hexx Beam Mechanical Dimensions				
Band	Driven Element Half		Reflector	
	Inches (m)	Feet and Inches	Inches (m)	Feet and Inches
10 meters	106.000 (2.69m)	8' 10"	203.000 (5.16m)	16' 11"
12 meters	118.500 (3.01m)	9' 10-1/2"	222.750 (5.66m)	18' 6-3/4"
15 meters	141.250 (3.59m)	11' 9-1/4"	268.500 (6.82m)	22' 4-1/2"
17 meters	166.250 (4.22m)	13' 10-1/4"	311.500 (7.91m)	25' 11-1/2"
20 meters	215.000 (5.46m)	17' 11"	406.500 (10.33m)	33' 10-1/2 "

NOTES

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.

Specifications subject to change without notice.

DXE-XB-5-INS