

Model 10/11

WARNING: INSTALLATION OF THIS PRODUCT NEAR POWER LINES IS DANGEROUS. FOR YOUR SAFETY, FOLLOW THE INSTALLATION INSTRUCTIONS.

WARNING: AT NO TIME DURING ASSEMBLY, INSTALLATION, ADJUSTMENT OR OPERATION SHOULD ANY PART OF THIS PRODUCT BE ALLOWED TO COME INTO CONTACT WITH ELECTRIC POWER LINES, NOR SHOULD THIS PRODUCT BE INSTALLED IN SUCH A WAY THAT ANY PART OF IT MAY CONTACT POWER LINES DURING NORMAL OPERATION OR IN THE EVENT OF STRUCTURAL FAILURE. FAILURE TO EXERCISE EXTREME CARE IN THIS MATTER CAN RESULT IN DAMAGE TO PROPERTY, PERSONAL INJURY OR EVEN DEATH!

CHOOSING AN INSTALLATION SITE


As with all directional antennas, care must be taken in the choice of an installation site for your Butterfly™ beam. Pick a place clear of POWER LINES or other obstructions. It should be mounted at least 20 to 25 feet above the ground for proper operation. It should also be able to rotate without hitting anything and should not be near any large masses of metal such as metal roofs or siding. If you have metal siding or a metal roof, plan to mount your beam 20 feet or more above it.


BEFORE YOU START

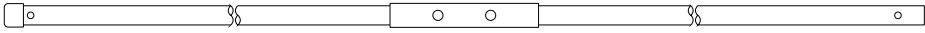
Before you start assembling the antenna, read through the instructions so that you will have a general idea of what you will have to do and what the finished antenna will look like. When you unpack the box, do so on a surface where you will not lose the small parts. Check the parts against the parts list so that you will know what each part looks when the instructions call for you to use it.


PARTS LIST

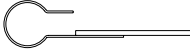
- A Tube A (1 1/8" x 5') — 4

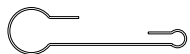

- B Tube A Insulator — 2

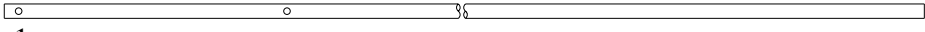

- C Tube C Spreader — 4

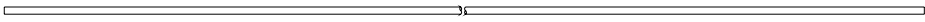

- D Wire — 8



- E Spacer E — 1

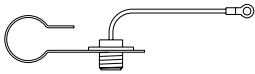

- F Clamp F — 1

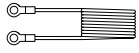

- G Tube (3/8" x 30") — 1

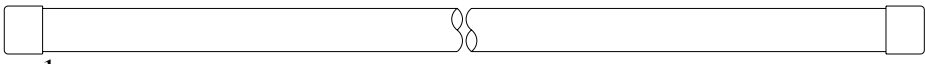

- H Rod (3/16" x 30") — 1

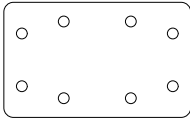

- I Rod Clamp — 2


- J Connector Assembly — 1


- K Coil K Driven Element Matching — 1

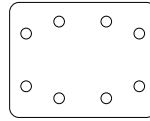

- L Tube L (1 1/8" x 4') — 1


- M Plate Boom to Mast — 1



PARTS LIST

N Plate Boom to Element — 2



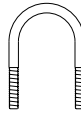
O U-Bolt 1/4-20 x 1" x 1 3/4" — 4



P U-Bolt 1/4-20 x 1 1/8" x 2" — 10



Q U-Bolt 1/4-20 x 1 1/2" x 2 3/4" — 2



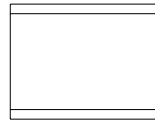
R Backing Clamp #308 — 10



S Backing Clamp #309 — 2



T Butter It's Not — 1



U Konnektor Kote — 1



V 1/4-20 Hex Nut — 32



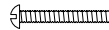
W 1/4" Split Ring Lock Washer — 32



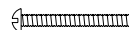
X #8-32 x 3/4" Round Head Slotted Machine Screw — 15



Y #8-32 x 1 1/4" Round Head Slotted Machine Screw — 3



Z #8-32 x 1 1/2" Round Head Slotted Machine Screw — 4



AA #8-32 Hex Nut — 22



BB #8 Split Ring Lock Washer — 22



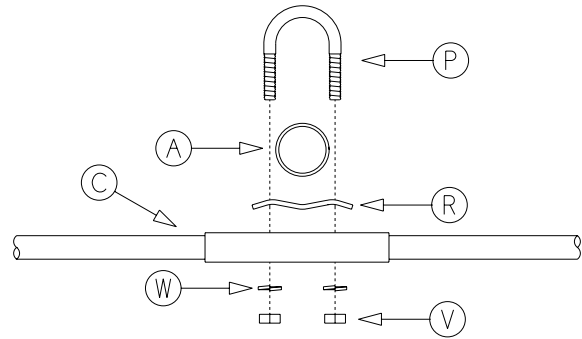
BUTTERFLY™ ASSEMBLY

The Butterfly™ elements of the antenna will be assembled first, then attached to the boom. The antenna can then be installed *fully assembled* on the mast. Although the antenna can rest on the ground for a short time, it is best to have your mast and rotor in place before assembly. **NOTE:** Mast, rotor and supporting structure are not included with the antenna.

1. Place a 1 1/8" u-bolt (P) through the holes in an M-shaped backing clamp (R), then through the holes in the center of a tube (C).
2. Slide the u-bolt from above over the end of tube (A) which does not have a hole through it. The backing clamp (R) should now be sandwiched between tubes (A) and (C). Position the edge of backing clamp (R) 3/4" (1.9 cm) from the end of tube (A). Using two lock washers (W) and two hex nuts (V) secure the u-bolt (P) finger tight.

NOTE: Over tightening the u-bolt (P) will crush tube (A).

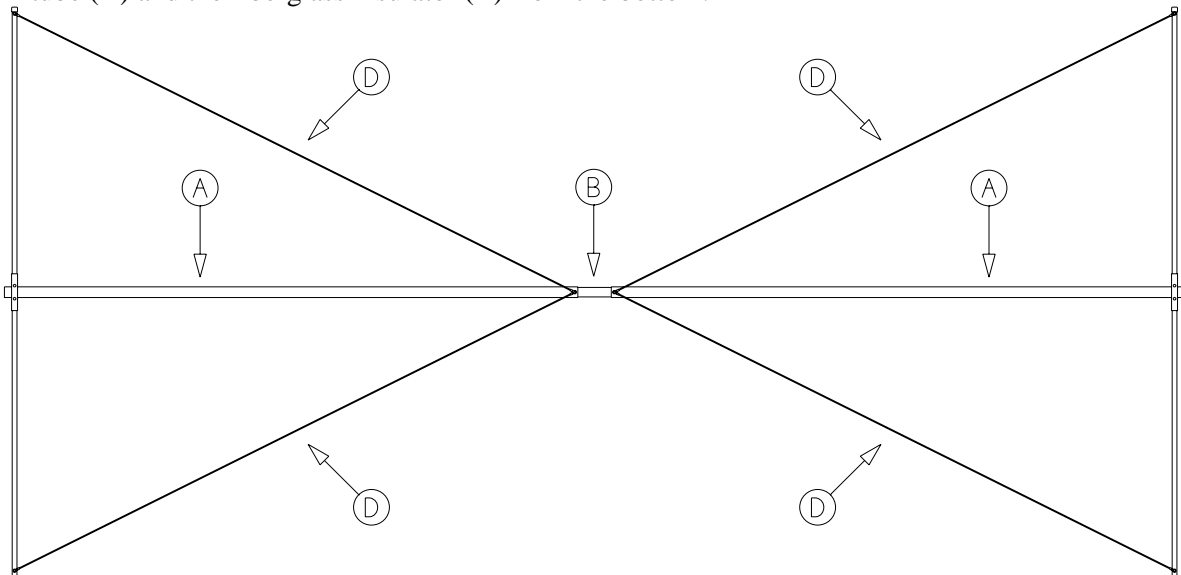
NOTE: It may be hard to start the hex nuts (V) on the u-bolt (P) with the lock washers (W) in place. If this is the case, tighten the hex nuts (V) three turns past the end of the u-bolt (P), then remove them and put the lock washers (W) on. The nuts (V) are then tightened until flush with the end of the u-bolt (P) and no further!



3. Place the "T" just formed above on a flat surface with the nut side of the u-bolt (P) facing upward.

NOTE: A couple of 2 x 4 wood scraps may be used under tube (C) to provide support.

4. Insert one end of a fiberglass insulator (B) into the end of tube (A) with the hole through it. Line up the hole in the fiberglass insulator (B) with the holes in tube (A) and pass a 1 1/2" bolt (Z) through tube (A) and the fiberglass insulator (B) from the bottom.



5. Lay out two spreader wires (D). Place one lug end of each spreader wire (D) over the 1 1/2" bolt (Z). Place one lug of coil (K) over the 1 1/2" bolt (Z). Secure with a lock washer (BB) and hex nut (AA).
6. Pass a 3/4" bolt (X) up through the hole in one end of tube (C). Place the other lug end of spreader wire (D) previously installed, over the 3/4" bolt (X). Secure with a lock washer (BB) and hex nut (AA).
7. Repeat procedure 6 for the other end of tube (C) and the remaining spreader wire (D).

NOTE: Make sure the alignment of tubes (A) and (C) is correct before proceeding!

BUTTERFLY™ ASSEMBLY

8. Make a final alignment of tubes (A) and (C), u-bolt (P) and spreader wires (D). Tighten nuts (V) until flush with the ends of u-bolt (P) and no further.

NOTE: A slight bowing of tube (C) should be expected and will not harm anything.

9. At this point a second tube (A), tube (C), u-bolt (P) and a set of spreader wires (D) may be assembled as in the preceding steps and attached to the other end of fiberglass insulator (B) to form a complete Butterfly™ element.

Once all the parts are properly aligned, the hardware may be given a final tightening and the whole element may be set aside temporarily.

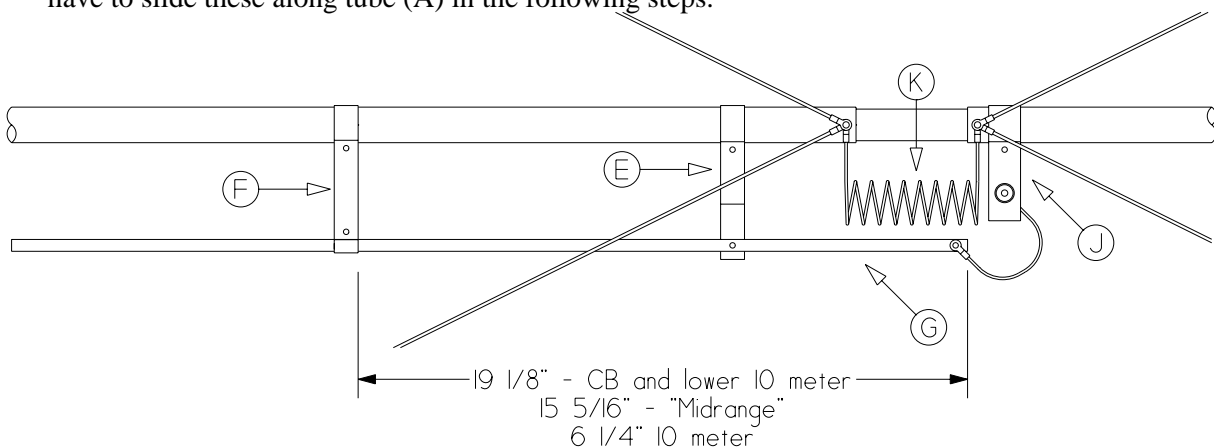
10. Repeat procedures 1 through 9 for the assembly of the second Butterfly™ element, except that there is no coil to be installed.

This completes the first part of the assembly process. Check your work to see that all parts are properly aligned and that all of the hardware is tight. Note that the *capped* ends of the tubes (C) will be pointing upward when the antenna is finished.

DRIVEN ELEMENT ASSEMBLY

NOTE: In the following steps, when you install clamps, apply a light coating of anti-oxide compound at the spot where the clamp attaches to the tubing.

1. Take the Butterfly™ element with the coil (K) and place it on a flat surface with the threads of all bolts facing upward.
2. Install connector assembly (J) on the right side of the element with the threaded side of the connector facing you. Secure the connector assembly (J) to (A) with a 1 1/4" bolt (Z), lock washer (BB) and hex nut (AA). Face the bolt upward, in the same direction as the others. The edge of connector assembly (J) should be within 1/4" (6 mm) of the bolt holding the spreader wires (D).
3. Install spacer assembly (E) and gamma tap (F) on the left side of the element using 1 1/4" bolts (Z), lock washers (BB), and hex nuts (AA). Point the threads upward and finger tighten only as you will have to slide these along tube (A) in the following steps.



4. Attach tube (G) to the driven element as shown. Secure with 3/4" bolt (X), lock washer (BB) and hex nut (AA).
5. Bend the wire coming from connector assembly (J), being careful not to break the soldered joint and attach the lug to tube (G) with a 3/4" bolt (X), lock washer (BB) and hex nut (AA).
6. Align the tube (G) assembly so it does not contact spreader wire (D)

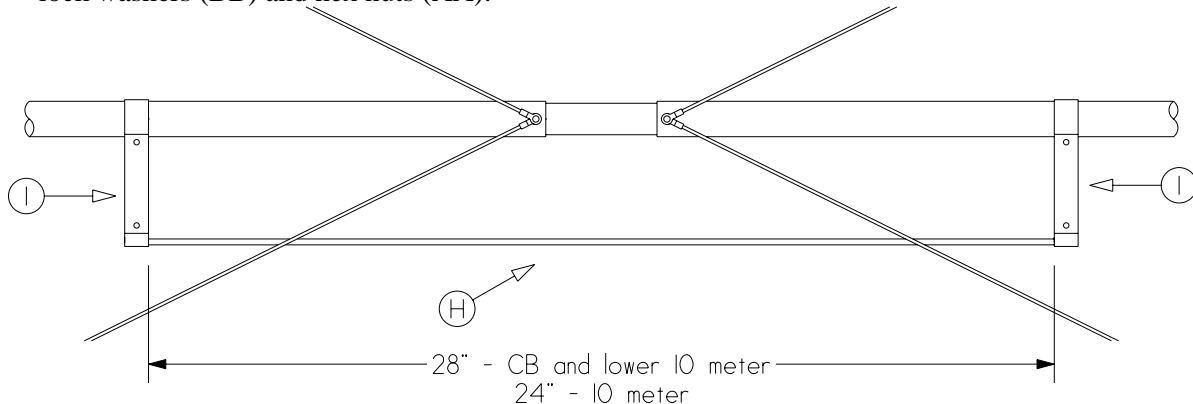
DRIVEN ELEMENT ASSEMBLY

This completes assembly of the driven element. Check to see that all hardware is tight but do not over tighten the clamps and bend them out of shape. Set the driven element aside.

REFLECTOR ASSEMBLY

In the following steps you will complete assembly of the reflector element. Again, use a light coating of anti-oxide compound where clamps attach to tubes or rods.

1. Find rod (H) and two clamps (I). Attach the clamps (I) to the rod (H) as shown using 3/4" bolts (X), lock washers (BB) and hex nuts (AA).



2. Attach the above assembly to the tubes (A) as shown, using 1 1/4" bolts (Z), lock washers (BB) and hex nuts (AA). Make sure the assembly is centered and rod (H) does not contact spreader wires (D).

REFLECTOR ASSEMBLY

This completes assembly of the reflector. Check all hardware to be sure that it is tight, but do not over tighten the clamps and bend them out of shape.

FINAL ASSEMBLY

Whether the antenna is to be carried to its final destination atop the supporting structure in one piece or several pieces, whether the structure is supported by guy wires, etc. depends on your particular installation. The Butterfly™ beam is not very heavy, but it can be hard to handle if you have to hold it with one hand while trying to snake it past guy wires while holding on for dear life! A good safety belt is a must for tower work. Be sure that the tower can support the weight of the antenna, rotating system and the weight of the person doing the installation. For the sake of safety, be guided by the recommendations of the tower manufacturer

and such information as may be found in the American Radio Relay League Handbook, the A.R.R.L. Antenna Book and other publications relating to the installation of antenna systems. Before installing, you should consult local and national electrical codes as well as local ordinances relating to such structures.

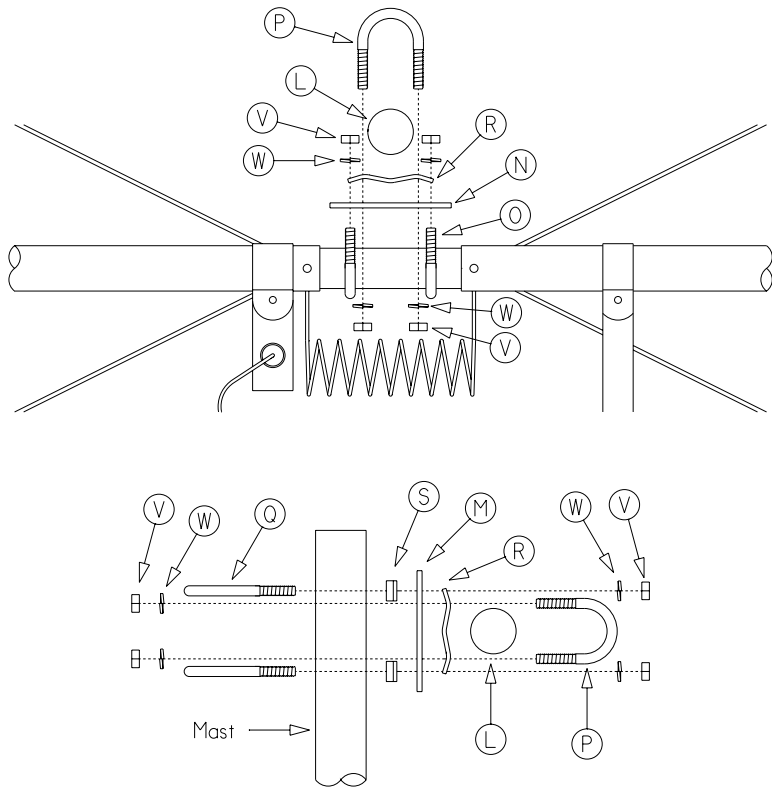
WARNING: UNDER NO CIRCUMSTANCES SHOULD THE ANTENNA BE INSTALLED IN ANY PLACE WHERE IT CAN COME INTO CONTACT WITH POWER LINES DURING INSTALLATION, NORMAL OPERATION, REMOVAL OR IN THE EVENT OF MECHANICAL FAILURE OF THE ANTENNA OR ITS SUPPORTING STRUCTURE. NOR SHOULD THE ANTENNA BE INSTALLED IN ANY PLACE WHERE STRUCTURAL FAILURE CAN RESULT IN DAMAGE OR INJURY TO PERSONS.

The following detail show the way the two elements are attached to tube (L).

1. Locate the boom to element plates (N), u-bolts (O) and u-bolts (P).

REFLECTOR ASSEMBLY

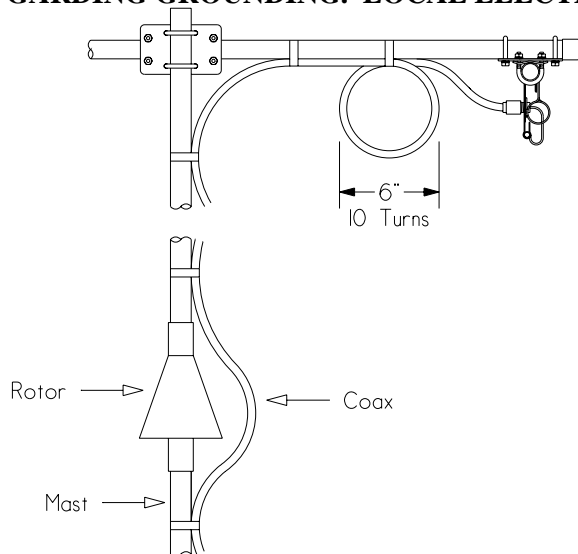
- Attach a boom to element plate (N) to the fiberglass insulator (B) on the driven element using u-bolts (O), lock washers (W) and hex nuts (V). Center the plate so it does not contact tubes (A). Tighten securely.
- Attach the remaining boom to element plate (N) to the reflector as per step 2.
- Fasten each boom to element plate (N) to tube (L) using u-bolts (P), M-shaped backing clamp (R), lock washers (W) and hex nuts (V).
- Install the boom to mast plate (M) at the center of tube (L). Secure with the u-bolts (P), M-shaped backing clamp (R), lock washers (W) and hex nuts (V). Boom to mast plate (M) will be 90° to the boom to element plates (N).



This completes assembly of your Butterfly™ antenna. Check to see that all hardware is tight.

OPERATION

CAUTION: TO AVOID ELECTRICAL SHOCK, BE SURE THAT ALL TRANSCEIVERS AND ACCESSORIES ARE UNPLUGGED FROM THE POWER MAINS BEFORE YOU CONNECT THE FEED LINE. FOLLOW THE TRANSCEIVER MANUFACTURE'S DIRECTIONS REGARDING GROUNDING. LOCAL ELECTRICAL CODES MAY APPLY.



Install the coax feedline as shown. Make a 10 turn coil of coax 6" in diameter and tape it to the boom. This takes place of a balun and keeps RF off of the outside of the feedline and tower. Then tape the feedline to the boom and mast. Be sure that the coax is not free to swing in the wind, putting stress on the coax connector!

The Butterfly™ is a directional antenna. That means that most of the signal will be transmitted in one direction, off the end with the driven element. The antenna must be pointed toward the other station for best results, so you should provide some method of turning it. A TV rotor will do, but you must not mount the antenna more than a few inches above the top of the rotor. A good FEED LINE to use is RG-8U. You may also use RG-8X. RG-58 is NOT recommended as it breaks easily and causes signal loss.

If you install a rotor, remember to leave enough slack in the FEED LINE so that the antenna can turn 360°.

The FEED LINE may be taped to the boom of the antenna and to the supporting structure.

A lighting arrestor is a good idea. Follow local codes and the instructions with the arrestor.

Your 10/11 Butterfly™ beam is horizontally polarized. This provides the best results for long distance operation and reduced noise. Do not attempt to mount the antenna except as directed.

OPERATION

The polarization is fixed and may not be changed. Band conditions vary daily, seasonally and through the 11 year sunspot cycle. One day you may hear many distant stations because the conditions for *skip* are good. Another day or even a few minutes later, conditions may change and nothing will be heard. Amateur radio magazines such as CQ and QST may be consulted for propagation predictions.

TROUBLESHOOTING

If your antenna is not operating properly, check the following before calling or writing for service.

No signals heard	Poor band conditions. Coax shorted, open or not connected. Check coax.
High SWR	Antenna misadjusted. Coax not connected or shorted, open, etc. Antenna installed too close to the ground or near metal.
TVI (Interference with TV)	Transmitter, TV set or TV antenna amplifier. Install low pass filter on transmitter. See A.R.R.L. Radio Amateur's Handbook for further details.
Noisy reception	Band conditions. Power lines in vicinity leaking or arcing (only the power co. can fix this). Appliances with electric motors running nearby or TV sets turned on nearby. Loose connections on antenna (Be sure everything is tight).

If you need help, you may call or write us. Before you do, be sure that:

1. You have assembled the antenna correctly.
2. You have followed installation instructions and have the antenna at the proper height and clear of other conductors.
3. Your coax is not shorted or open.
4. All hardware is tight (but not so tight that the aluminum clamps are bent out of shape).
5. You have read the entire troubleshooting section.
6. You are prepared to describe your installation, including height above ground, feed line and so on.
7. You are ready to tell us exactly what the symptoms are and what you have done to correct them so far.
8. If SWR is a problem, you are ready to tell us what the readings are across the entire operating range.
9. Missing Parts: Do not call unless you have checked each part off on the parts list! Each antenna is carefully packed with all of the parts! If you cannot locate a part, check the packing material and inside the tubes (A).
10. Defective Parts: If a part is defective, Butternut will repair or replace it free for a period of one year from date of purchase. Return the defective part with an explanation of the defect and a copy of your purchase slip. Butternut is not responsible for shipping costs. Neither is Butternut responsible for damage caused by the customer's failure to follow instructions or for any modifications the customer makes to the antenna.