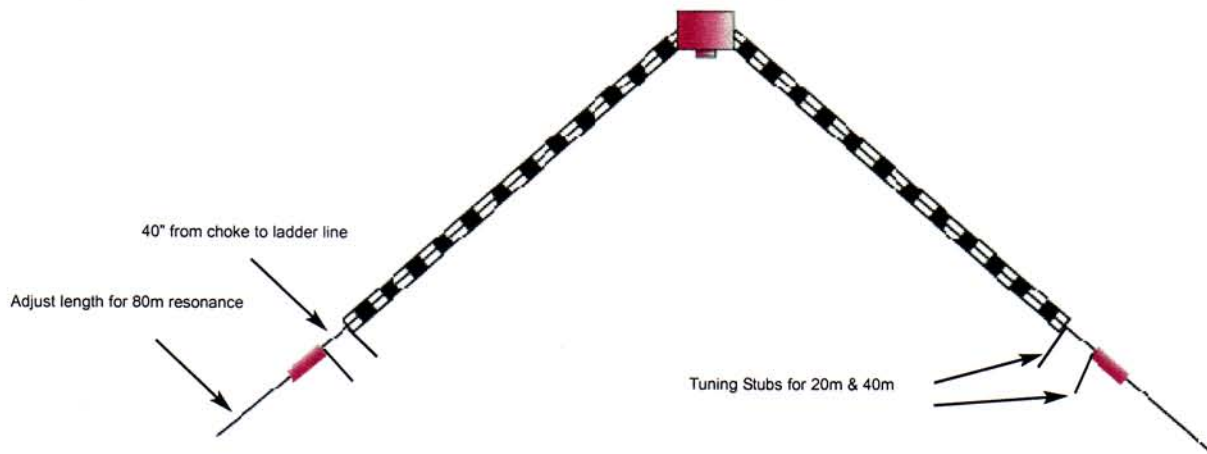


# INSTRUCTIONS FOR ASSEMBLY AND OPERATION OF G3OJV TRIBANDER

## Model 80 Plus 2



This antenna is designed to give three-band coverage with a length of around 52ft (depending on final centre frequency chosen for 80m). Installed as an inverted-V with the ends dropped down, it takes up around 40ft of space. Correctly assembled it will provide full coverage of 20m and 40m, and around 100kHz of the 80m band. Complete coverage of the 80m band is possible with most internal ATUs. Even at modest VSWRs towards the edge of the 80m band, the losses are small and with the help of an ATU, it should be found that the antenna will provide good performance.

On 20m the antenna has exceptional bandwidth due to capacity coupling to the main element and efficiency will match a standard dipole. We have used linear loading to achieve the 40m operation. This is a very efficient form of loading offering good bandwidth for a relatively short dimension. To isolate the 80m section of the antenna we have used a choke Inductor. Unlike conventional traps which have very narrow bandwidths, a choke inductor offers full bandwidth operation. Tests have shown that as the linear loading section is part of the radiator, the performance compared with a full-size 40m dipole is essentially the same. On 80 metres the choke inductor becomes a loading coil and provides an electrically short dipole. Reports show that on this band the antenna is about 3dB down on a full-size dipole. This is about the same as a G5RV but occupying half the length!

Tuning of compact antennas is more critical than full-size versions, and they are also more sensitive to nearby objects such as masts, trees and buildings. For this reason we have provided a means to fine-tune the antenna on each band. On 20m and 40m, tuning stubs are provided. As they are shortened, the frequency of the relative band moves higher. But it is not necessary to cut the stubs. Just fold them back on themselves - at least when carrying out the initial tuning. When finished you may elect to cut off the excess wire, but we strongly recommended you leave the wire bent back on its self, just in case you wish to make adjustments at a later date, when for example you may wish to re-site the antenna. On 80m the end element is simply adjusted for length, but again it can be twisted back on itself rather than cutting off the excess. Always remember to adjust both ends of the elements so as to maintain a balanced performance.

Whether you use the antenna as an inverted V or as a horizontal dipole does not really matter, although the final dimensions will differ with each method. The inverted V installation was used for the development and testing as it offered the easiest and most compact form of installation.



Read the assembly instructions carefully and remember the slogan, measure twice and cut once. In other words, always check your measurements a couple of times before cutting the wire!

The antenna is not supplied fully assembled for one very good reason. The task of threading the element through the linear loading section is time consuming! It's the kind of task that is labour intensive and would put the cost of the antenna up to an unreasonable amount. The task probably takes around an hour and most of it can be done whilst sitting in front of the television! It's not difficult, just repetitive.

Now follow the instructions below and enjoy the ability to operate from a small garden on the lower frequency bands.

- 1) Take each section of the 450-Ohm ladder line and identify the end with the crimped tag attached. Pass this through the balun strain hole and secure back on itself with a tie wrap supplied. Now fasten the crimped tag to the balun terminal using the bolt, nut and washer supplied. Make sure these are tightened. If you intend to use the antenna as an inverted V, make sure that the balun terminals do not come into contact with the metal support mast.
- 2) Now pass the stranded copper element through the slots and the holes in the 450-Ohm line. It should be woven in and out from the balun end to the far end of the 450-Ohm line. Make sure that it is pulled tight regularly as you go so that there is no slack and the path of the element is central the whole way along the ladder line. Failure to observe this will result in tuning problems.
- 3) Carefully measure off 45 inches of the copper stranded wire from the point at which it exits the ladder line (by the 12" 20m tuning stub). Cut it and bare back around half an inch.
- 4) Identify one of the 12" tuning stubs of stranded copper wire with crimped tag. Place the end of the stranded copper element and the 12" stub wire into one end of one of the choke inductors. Make sure that they are properly seated and will make good electrical connection. Now clamp them firmly and make sure that the nut passing through the former is tight and secure. Repeat the procedure for the other antenna element.
- 5) Now take an 8ft length of stranded wire fitted with a crimped tag at one end and attach it to the free end of the loading coil. Repeat this for the other element. The exact length is not critical at this stage but should be identical at both ends.
- 6) Connect 50 Ohm cable to the balun feedpoint and hoist the antenna into position, making sure to dress the element stubs so that they are at right angles to the element. Make off the insulators to support points and then check for VSWR.
- 7) Tuning is most easily accomplished using an antenna analyser such as the MFJ-259 or MFJ-269 model. However, a normal VSWR meter can be used although it will take longer. Establish resonance on the 20m band. It should be near the bottom or perhaps below the bottom of 14MHz. Adjust the tuning stubs at the end of the ladder line by bending them back on themselves to effectively shorten them. Check resonance and adjust as necessary to get the VSWR at minimum for 14.00MHz. Do not try and adjust for any frequency above 14.00MHz at this time.
- 8) Now check around 40m and adjust the stubs adjacent to the choke coils for resonance at 7.00MHz. Finally adjust the end sections for resonance at either 3.500MHz (if you want to operate in the CW section) or adjust for 3.650MHz if you want phone operation.
- 9) Finally adjust the end sections for the part of the 80m band you wish to operate in. As the bandwidth without ATU is only 100kHz, think carefully about where you want to establish the cen-



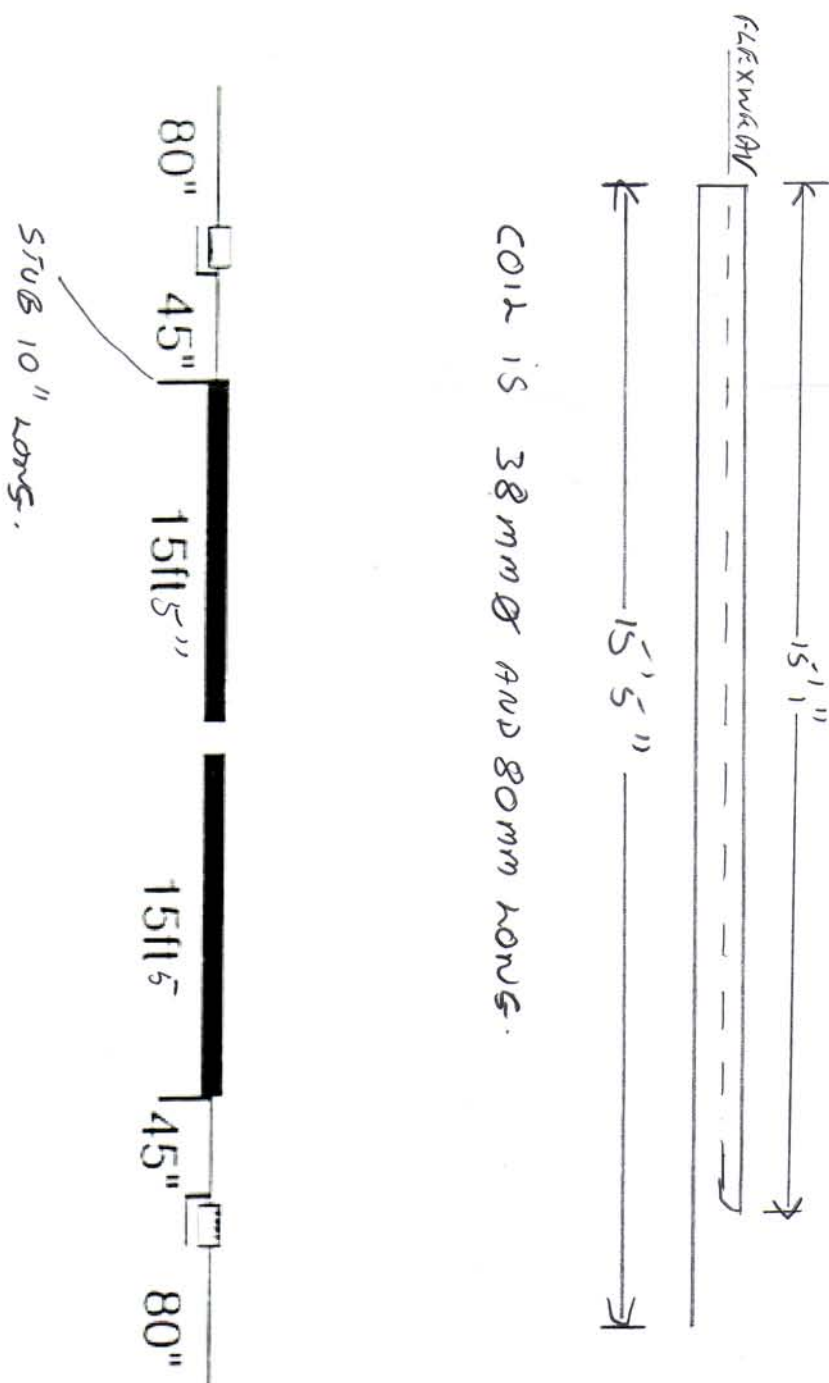
tre of resonance. Remember, you don't need to cut the excess wire when shortening, just twist it back on itself. That way you can easily lengthen it again if you overshoot.

10) Now finally check 20m and 40m and make any fine adjustments necessary.

The final thing to do is to wrap the joints on the antenna with some form of tape to make them weatherproof.

You should now have a very compact, yet efficient antenna system for three of the most popular ham bands. Tuning may change slightly lower in frequency during rain. This is normal, and indeed all antennas are so affected. Ice will have a similar effect. However, once the rain stops or the ice melts the original resonance points will again be established.

Remember that the position of your antenna will have an effect on the resonant points. If you re-site it or significantly change the height, expect to have to make some tuning adjustments by altering the stubs and end sections.



## Parts Supplied

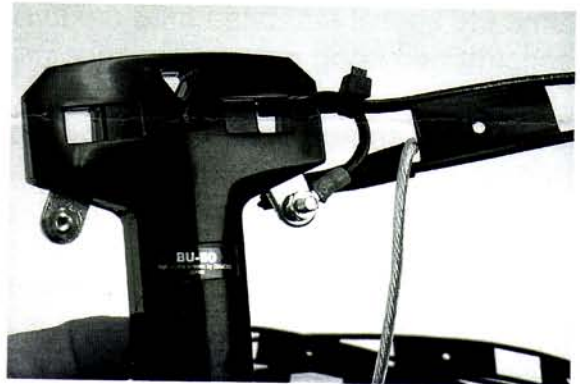
- 2 x Linear Loaded Ladder Lines pre-drilled and slotted. Main element attached at balun end.  
Tuning stub for 20m already attached at far end.
- 2 x Stranded wire element Assemblies around 20ft long.
- 1 x Balun Dipole centre with SO-239 socket.
- 2 x Choke Coils
- 2 x 80m stranded wire element sections around 8ft long.
- 2 x 40m 12" long Wire Tuning Stubs
- 4 x Tie-wraps for use with main element when attaching to balun.
- 2 x Crimp connectors for attaching end of 40m Element to Choke Coil
- 2 x Crimp connectors for attaching ends of 80m 8ft sections to Choke Coil
- 2 x Insulators

## NOTE

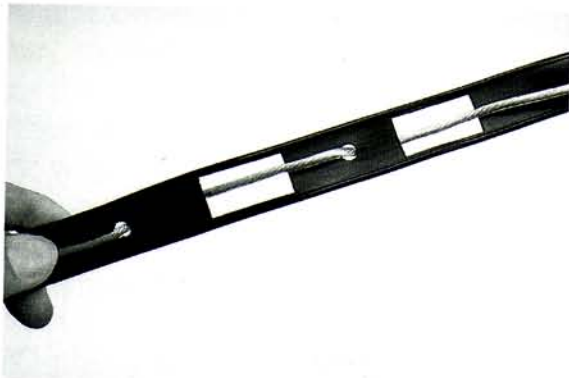
Tests have indicated that capacitive coupling has resulted in a fairly low VSWR from 14MHz up to 30MHz. Although not as efficient as dedicated antennas, with the aid of an ATU, operation may be possible of HF bands above 20m. However, performance is not guaranteed.



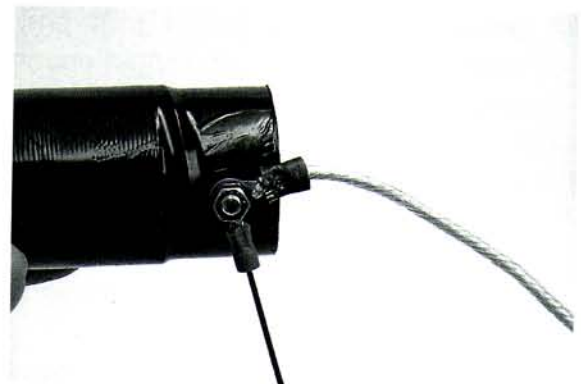
The picture shows the complete kit of parts of the antenna.



Terminating the element on to the balun in conjunction with a tie wrap. The wire element hangs down prior to threading on the ladder line.



This shows how the element is threaded onto the ladder line.



One of the loading coils with the element wire going off to the right and the 12" tuning stub hanging down vertically.