

DX COMMANDER

Expedition

Version 1.1 - 8th August 2023

This document for those operators who want only 40m, 20m, 15m and 10m (6m with nudge of ATU) on 3-elements, this is the super-fast build and deployment method. You may swap say 10m with (for instance) 17m if required and to keep deployment fast.

NEW Build Video: <https://youtu.be/nbBp42bbELo>

Please see regular Unified guide for general build instructions.

Super-Speed Expedition Deployment – 3 Element System

The idea behind some changes I have made to the kit was to assist those operators who needed to build and deploy a highly efficient DX performing antenna in under 10 minutes and get on the air FAST. I learned the hard way when deploying in the dark.

With practice, this is easily achieved and will get you working 40m, 20m, 15m and 10m. 6m too, with a nudge of the ATU.

The new base housing and screw cap is made from a metal alloy which makes it more durable. To insulate the driven plate from the ground plate, we need to fit an insulator ring (supplied).



Driven Plate Insulator Clip



I have found an acceptable tension can be achieved by manually clicking the notches together whilst holding the clip firmly pressed down on the driven plate.

After the insulator ring has been secured, continue with the regular build, fitting the bolts, washers, wing nuts, and SO239.

Now we can sort out the elements.

The idea behind the fast deployment is the ability to “SNAP” each element into place using shock-cord knots. In practice, this works very well and is extremely fast to deploy.

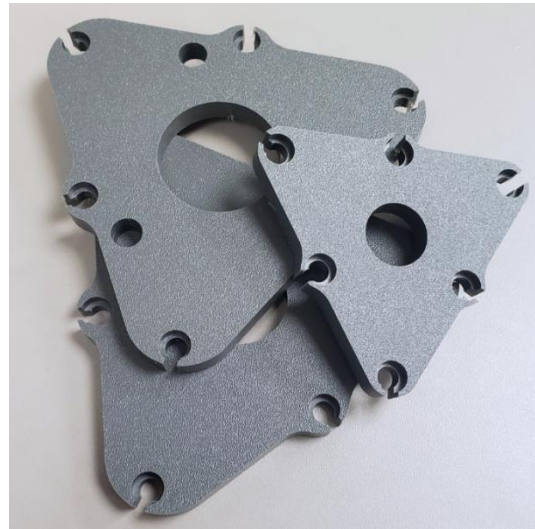
Background: Originally, I was trying to make the notches in the plastic plates “just so” at 2.1mm however in development, we discovered that it was easy to get the element to snap in, but not the shock-cord and visa-versa. We developed this cool work-around that is even faster to deploy and also stops elements from waving around in the wind.

Every time an element passes through a plate, we make a small loop approximately 75mm / 3-inches below the plate and then add some shock cord, knotted at both ends.

The shock cord will become a permanent fixture to the element so you will never lose it.

Similarly, the very end of the element also has a loop to attach shock-cord to snap into place. You will note that the Spreader Plates have an “up” and a “down” style recess.

Even in the dark, you can feel which way they go. You need the recess at the top of a plate to ensure the knot nestles in its little cup.



CUT CHART - Initially, cut your element THIS long. Don't double guess anything. Just cut.

- 10m: 2.53m (1.5:1 bandwidth is around 1MHz) (other bands available as alternative)
- 20m: 5.02m (1.5:1 bandwidth is the whole of 20m band)
- 40m/15m: 11.65 (Bandwidth is huge, around 400kHz)

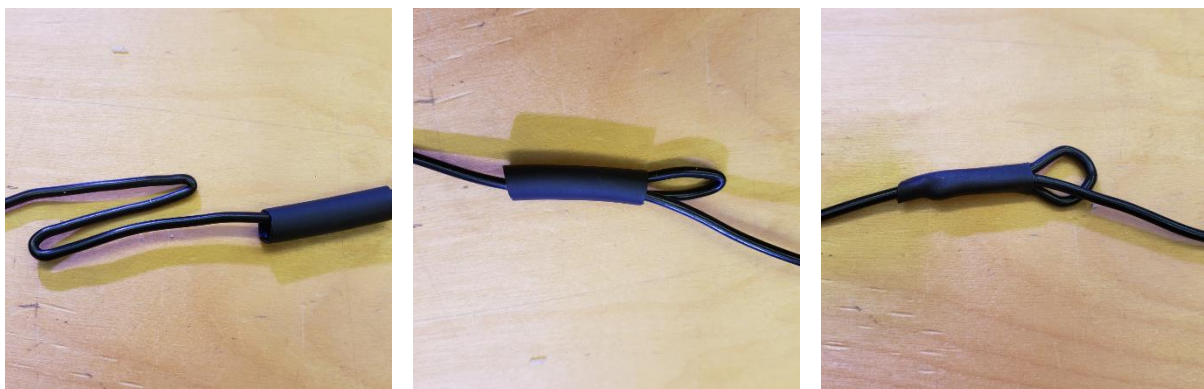
NOTE: This cut chart, loops and terminations are specific to this 3-element system. It might change a whisker if you add more elements. Not determined at time of writing.

*** Now fit your fork connector after stripping 12.5mm (half inch) off one end as per User Guide.**

Lay the pole down on work-horses or garden chairs, extend fully, add the plates and EzyClamps as per original instructions.

Now you are ready to fit the elements. Fit them to each corner of the Driven Plate.

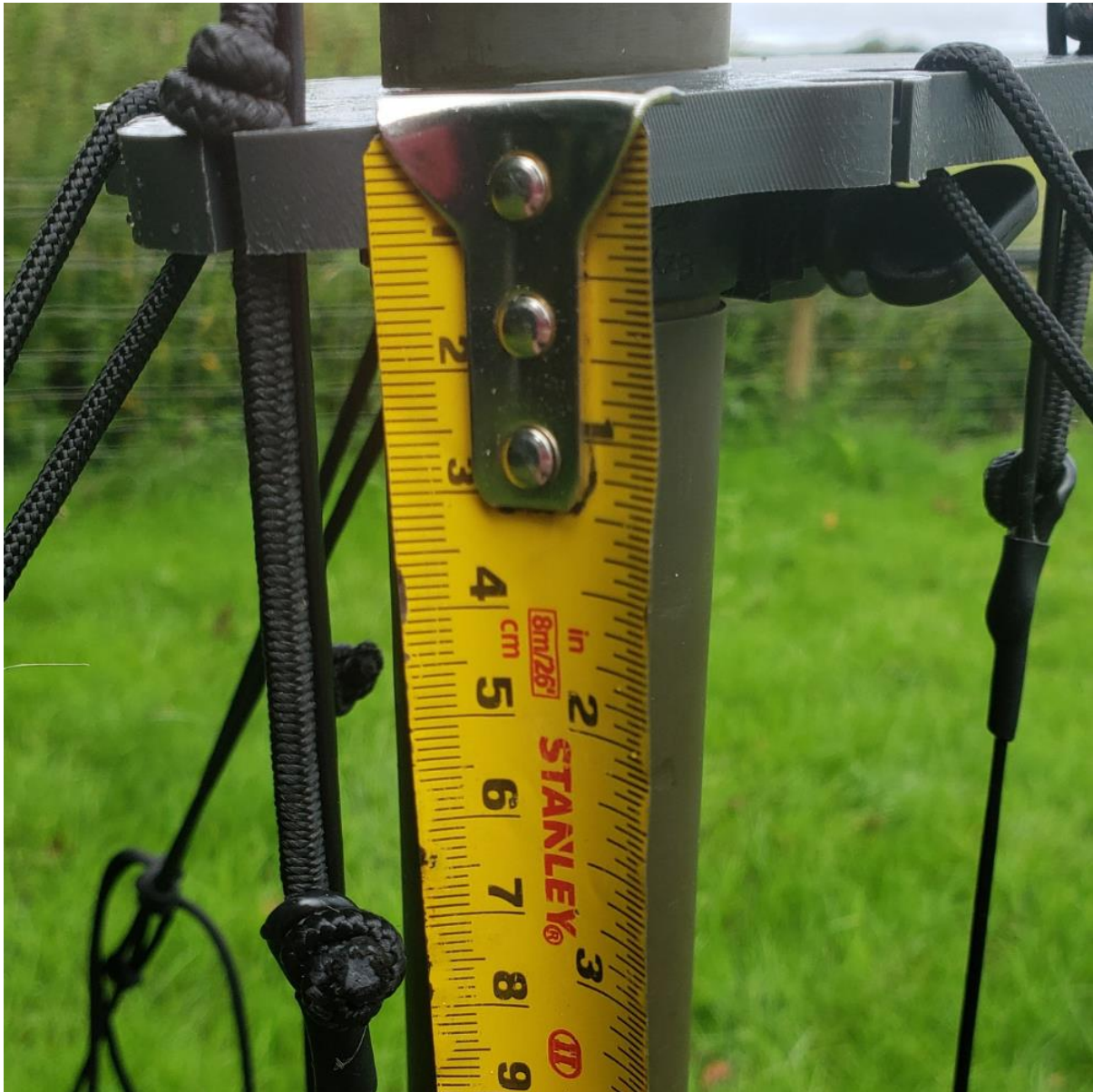
Note: It doesn't matter which order you fit three elements as long as **EVENTUALLY** you screw the SO239 flying lead to the flat side that is opposite 40m.



For ALL elements, pull the element tightly away from the Driven Plate and measure 3 inches / 75mm down from the bottom of the first plate. Now make a loop as per pictures. Each loop should be between around 25mm / 1-inch long. A tiny bit more is fine. Add around 25mm / 1-inch of glue lined heat-shrink afterwards. The element is continuing up the pole to the right of picture.

Tip: No hot-air gun? A lighter, match or a small hobby blow-lamp (Dremel) works well.

Do not cut your shock cord into random pieces. You may run out by creating waste. Instead, tie a stopper knot in the very end of the piece we sent you (see original user guide). Thread that through the loop you made (step above) and tension the shock cord at ALMOST full stretch and tie another stopper knot just above the plate (under tension).



Picture shows the (circa) 75mm / 3-inch section of shock cord (tensioned)

Don't over tighten the actual knot yet. Instead, test to make sure it's just right and can snap into place in the recess on the Spreader Plate. Once satisfied, tension the knot and cut the excess off. You can seal the ends of the shock cord with a lighter / blow torch etc.

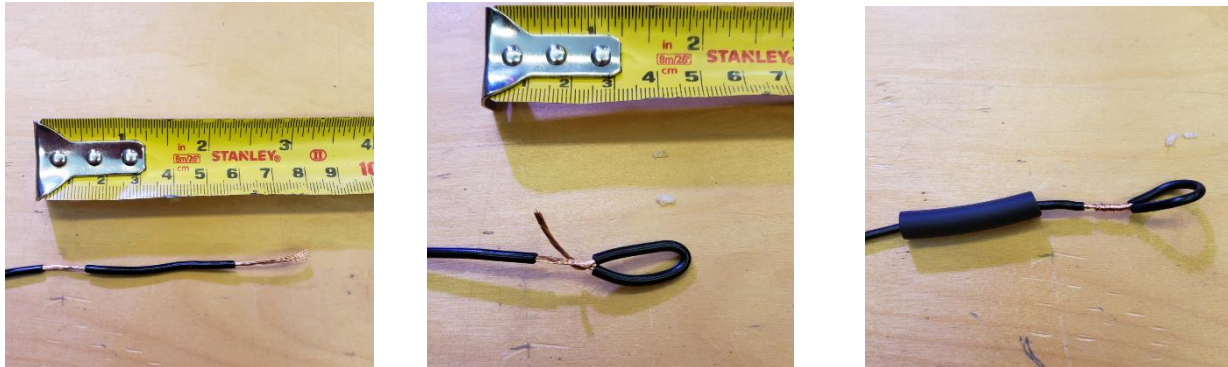
Do this for all three elements.

The 10m element stops before you get to the second plate. The following technique will guarantee zero heating via strong RF currents at the end of the 10m element (for instance if you ever run FT8 at full power) and I recommend it for 12m and 10m bands anyway. However, it's a permanent solution and you won't be able to change the element length (easily) in future (for tuning). I say this but forgive me, I am forever lengthening and shortening elements. There is enough spares supplied (fork

connectors / glue lined heat shrink etc) to make adjustments - and the bandwidth on 10m is very wide anyway at well over 1MHz in this configuration. Have confidence. You will get CW, FT8 and right through SSB portion of 10m with this cut chart.

Continuing with 10m element: With the loop made for the first plate, tension the element up the pole and measure exactly 2.39m from the alloy Driven Plate - and fold over the element here (Google tells me, this is more or less 94 inches). This is the top of the loop. It is a “closed” loop, so the end of the element is effectively the “end” of this loop. So the top of the loop on picture on right measures 2.39m.

Slip some glue lined heat shrink over and heat up to seal (soldering optional).



Making the tensioning loop for 10m element

We will create a piece of shock cord to connect the end of the 10m element to the 2nd plate. Tension this length appropriately with a stopper knot and “snap” it into place.

20m and 40m (and 15m)

Again, like previous, we will make intermediate tension loops for both 40m and 20m on the 2nd Spreader Plate. Same as before, at around 75mm / 3-inches from the plate. And continue to the 3rd Spreader Plate. 20m will finish just under this. You can finish this just as we did for the 10m element at the 2nd Spreader Plate.

BUT NOT LIKE the end of 10m element, there is no need to make a closed loop. Instead, just fold over the end of the element by 6cm (2 ¼ inches) and make good for the time being with tape (you can seal it up permanently with glue lined heat-shrink once you have checked the tuning later).

40m Element (and 15m element too – more about that later)

Let me be pedantic here. How you extend your pole might be different to how I do it. To make your 40m element perfectly that will cover from 7.0MHz through to 7.3MHz at negligible SWR, measure exactly 9.36m (Google tells me this is exactly 368.5 inches) from the driven plate to this point and make a loop for your foldback. Just fold whatever you have back down the pole for the time being and linear load the “up” and the “down” together, strapped with small amount of electrical tape on a temporary basis.

NOW, using some shock cord, connect the loop at the top of the 40m element and with a very mild pulling tension, raise to top of tip of the pole. Use the small tube that comes in the box and slip that over the shock-cord. Tension the shock-cord lightly.

You will find the knot and tubing is enough to keep the top of the element at just the right place.



40m element: This is what we're aiming for.



(Excuse my tape and temporary build pictures)

There is no need to dismantle any of the shock-cord pieces from any of the elements in future. Also, there is no need to ever take off the Driven Plate and Ground Plate.

- To deploy, just lay pole down, assemble the EzClamps and plates in order and tighten the EzClamps. Screw the three elements on to the Driven Plate. Snap each element into position. Push over the small tubing at the end of the 40m element.
- Erect and guy off
- Fit the radials

TIP: Use some cord to permanently keep your Spreader Plates and EzClamps in the right order on a little carabiner. That way, you can slip the lot over the end of the pole in the right order.

15m Tuning: I spent a long-time sorting this cut chart out, you SHOULD find no tuning is required however if you do need to raise or lower 15m, cutting 10cm (about 4 inches) off the foldback will be ABOUT 100kHz in change on 15m band with almost zero change to 40m band. In any case, the 40m bandwidth is plenty enough to accommodate CW right through to the top of 40m in USA at well under 1.5:1 SWR.

And regardless, the 15m band SWR curve is gigantic and almost goes up to 22MHz.

Performance on 15m. I am always astonished how well a top-loaded (40m) $\frac{3}{4}$ wave on 15m element performs, delivering slightly more gain, low to horizon than a straight quarter wave. I have demonstrated that many times on my livestreams making runs into USA from England.

Here is a short video of a run on 15m band Friday 4th August 2023:

<https://www.youtube.com/live/20nHkVTig7k?feature=share&t=2436> (starts at 40 minutes).

Have fun and enjoy!

73, Callum - M0MCX



Picture of the 1st Spreader with all elements fitted