

# Overhauling the TH3 Tri-Band Beam

Desmond Greenham VK3CO  
16 Clydesdale Court, Mooroopna, Vic. 3629

The traps were open at each end allowing water to enter.

Perhaps one of the most popular beams in recent years has been the famous TH3-Junior, made by Hi-Gain, USA. This beam is designed to operate on 10, 15 and 20 metres with a reasonable gain and yet is not too big for the

average suburban backyard. Its gain is claimed to be around 8 dB and this, combined with a good front-to-back ratio, makes the beam most attractive. Many were purchased over the last 12 years including one that has done sterling service at this location. But in recent times it has been noticed that after a shower of rain the SWR along with the performance changes dramatically. The SWR goes up and the performance goes down!!!

Peering at the beam through binoculars showed that the trap ends were, in some cases, not on the traps at all and were, in fact, quite removed from the trap and hanging loose on the elements. The beam was dropped.

An inspection revealed that the plastic ends were perished and split — no doubt due to the Australian sun. This left the traps open at each end allowing water to enter, thus ruining the tuning etc. Replacement caps are available but their life span is doubtful and they are very costly. So, some other alternative was necessary.

The ends of the traps could be sealed with silicone sealer but this idea was not attractive because of possible detuning effects and the difficulty of opening the traps at a later time. The idea of using electricians shrink-tubing was tried and proved to be most effective. Several sizes and various colours are available.

The size chosen was 33 mm. This will shrink to half its original size when heated over a flame. Prior to fitting the ends each trap was dismantled and the collection of dust, spiders, bugs, etc removed. The coil was inspected and cleaned. Connections were tightened. The tuning shield was replaced and prior to fitting the ends, the resonant frequency was checked with an accurate Dip Oscillator. Coupling was made to the GDO with a short piece of wire from the hot-end of the trap around the coil of the GDO. This enabled enough coupling to establish a dip and the frequency was checked. The 10 metre traps resonated at 28 MHz and the 15 metre traps at 21 MHz. There was no detuning due to the fitting of the new ends.

To fit the ends the procedure went like this.

Firstly, clean the trap surface with steel wool to remove corrosion. Cut the 30 mm tubing into 40 mm lengths and fit over the end allowing about five millimetres overlap on the sleeve. To shrink the tubing it must be placed over a flame. The family gas barbeque is ideal for the job! If your wife will permit the operation it can be done over the normal gas stove. The main point is to constantly rotate the trap and not allow the flame to burn the tubing.

Begin applying heat to the larger diameter, rotating all the time, and then move along to the smaller diameter as the shrinking occurs. Do not overheat as the shrinking process will be too great and the sleeve will split and it will be necessary to begin again. There is a knack to this and it will soon be acquired.

After all traps have been treated in this manner the beam should be cleaned with steel wool and reassembled again. The dimension chart should be carefully followed and the beam set up to suit your particular requirement, CW or Phone operation. Check all clamps, connections, etc, to ensure nothing is loose. When all these procedures have been carried out the beam can be put back to work. The life of the shrink-tube is unknown at this stage but, if it only last five years, that will be enough. I can repeat the entire operation again, only next time I may change the colour!

Figure 1: TH3-JR Dimensions in millimetres. (Measurements to end of tuning sleeve of trap).

From Hi-Gain Pamphlet

