

REJUVENATE YOUR MOSLEY TA33

This three element tri-band Yagi antenna was one of the first commercial beams to appear on the amateur radio scene in this country, during the 1960s. Like most tribanders, it is a compromise and sometimes poses a few problems with tuning in order to obtain reasonable SWRs on each of the three bands.

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If you have one, or have recently obtained an old Mosley TA33, don't despair because with the modifications outlined in this article it will operate satisfactorily.

Firstly, if the antenna is an old one, it is recommended that the trap sections be completely overhauled for the following reasons:

Due to industrial fumes, salt laden sea breezes or tropical humidity, any triband antenna's performance will fall-off, due to corrosive effects within the traps.

Open the traps by carefully removing the plastic end covers, and separating the metal coil cover and the coil.

The coil is aluminium wire on a plastic former and connected electrically to the element tubes by steel PK screws, which will probably be rusted and corroded. It will therefore be necessary to replace the screws with new ones and whilst out shopping for these procure a tube of 'Penetrox A' or 'Aluminox' from an electrical supply house.

This material is a grease used in high voltage electrical cable jointing, and should be used where two dissimilar metals are likely to cause electrolysis and corrosion.

Clean the aluminium wire ends and element tubes, where they telescope, with steel wool or fine emery cloth and apply jointing grease before re-assembly.

If the plastic trap covers crack or crumble during disassembling, replace them with a suitable tape such as duct tape or other sealing compounds, but make sure they are non-metallic.

Take care to assemble the trap cover with the drain holes facing down, and ensure they are not blocked.

When triband beams came on the market, they were facetiously referred to as 'rotary bird perches', and indeed there can be trouble if the screws holding the inner ends of the driven element halves into the insulating blocks snap or pull out under the combined weight of large birds. The straw-necked ibis, a migratory bird from Siberia, is fairly large and visits Queensland during the summer months. It delights in landing on clear branches and beam antennas, so that it has an easy take-off.

To combat this problem it is advised to investigate the fitting of stronger screws, and also fit screws into the boom, just under the adaptor block of each element to prevent pivoting of the elements around the boom.

However, the writer has found there is one species of feathered friend, namely the mud-lark or peewit, that if they build their neat plaster nest on the boom without de-tuning it, it is better to leave them there! These particular species will not let any other bird, however large, anywhere near their nest, or your beam, for that matter. They even attack hawks with the ferocity of a pair of 'spitfires' attacking a squadron of bombers!

The problem of satisfactory tuning for all bands is overcome by the use of gamma matching sections. (See photograph for gamma matching). This system is used because it enables each band to be tuned separately.

The gamma match consists of two lengths of aluminium tubing, telescoping to form a tubular condenser and insulated from each other by plastic tubing, or other material, in the form of a sleeve. (See Figure 1 and Table 1 for dimensions).

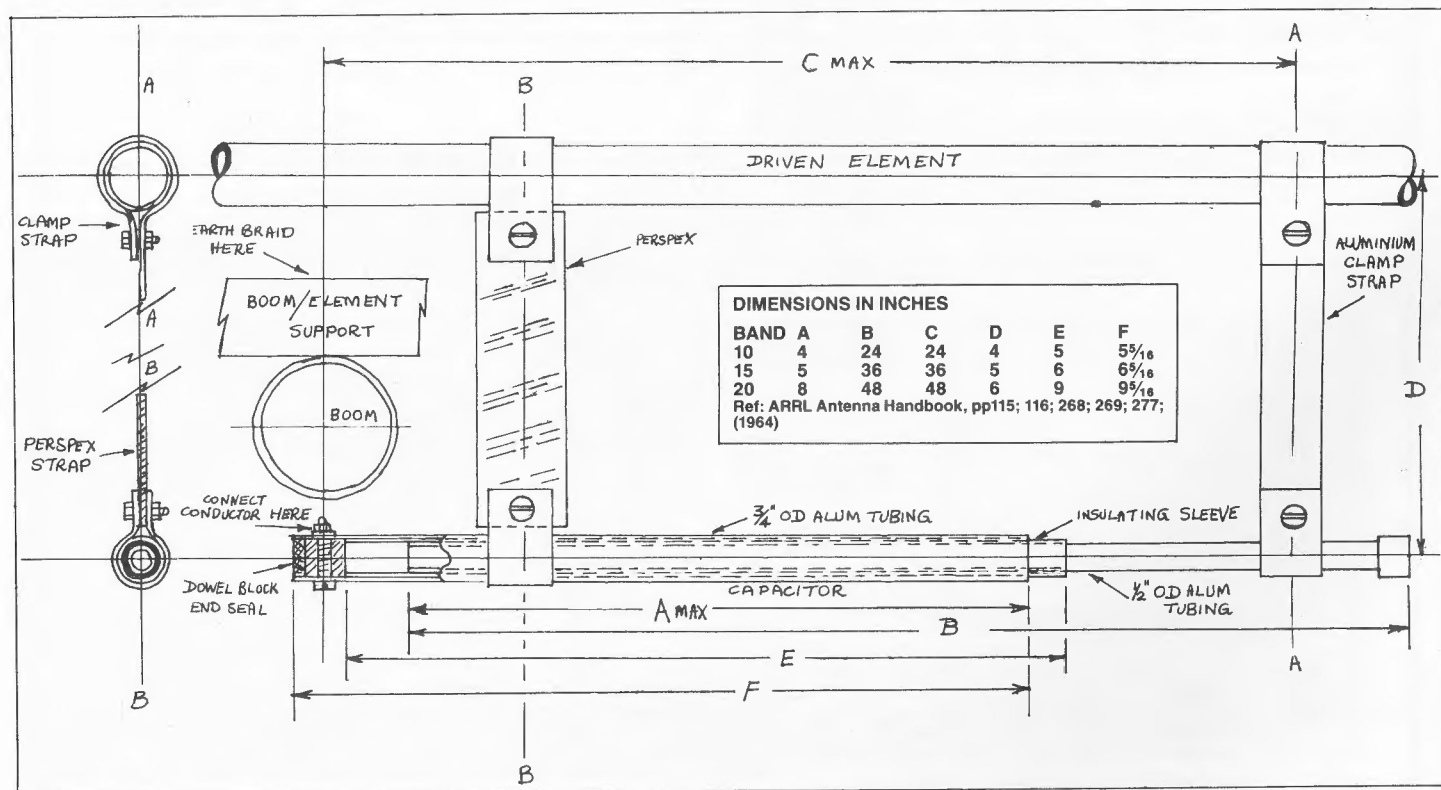
The driven element (DE) halves are joined together at the centre by a piece of copper wire and the exact centre of the DE is earthed to the base plate of an SO239 coaxial fitting, mounted on a plate attached to the DE support.

From the centre of the SO239 a copper wire is run to the end of each of the gamma match sections, which are disposed radially around one side of the driven element. Note that the 'hot' ends of the match sections are insulated from the element by perspex plates, whilst at the adjustment end, an aluminium clamp strap is fitted.

Don't be surprised when you start to tune the match sections if you find that the resonant frequency has moved up out of the top end of the band — this is corrected by fitting some pieces of $\frac{3}{8}$ " (9.5mm), TV element tubing into each end of the DE so as to lengthen it by upwards of 150mm.

Tuning can be carried out with the beam pointing upwards and resting on its reflector, or at a reasonable height, above ground.

Use a noise bridge, if one is available, or an SWR meter. Adjustment of the director and reflector must also be made and intermediate tuning screw holes can be drilled between those already provided, but measure them to be the same each side.





Mosley TA33 with Gamma Match tuning — complete with a colourful lorikeet.

Tuning of the gamma match sections is accomplished by adjusting the two dimensions, A and C, with reference to Table 1, the capacitance of the tubular condenser is approximately 15pF per inch (25mm), of engaged tubing.

When the best SWR has been obtained at the desired resonant frequency, carefully seal all ends and joints of the tubing. Do not use cheap, imported plastic tape as this will rapidly deteriorate in the sun and tends to lose its adhesive qualities. Even good quality tapes may need to be thread secured.

Remember to seal all UHF coaxial fittings as they are not waterproof.

Do not use jointing grease in the tubular condenser section of the gamma match, but use it on the end clamping strap.

If the element tubing, or the boom, show signs of surface corrosion, it is advisable to clean them thoroughly with steel wool, or fine emery cloth, and apply some coats of clear varnish.

The writers' Mosley TA33 is over 20 years old and with these modifications and regular maintenance, still gives a very good performance on all bands.

IT GREW LIKE TOPSY

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As a boy I had been bird-nesting, catching crawchies, hunting in the ti-tree scrub with my Daisy air-gun (no bee-bees) and blunt pocket knife, played football and cricket on any spare allotment, and marbles in the middle of our suburban street. I had now reached that all important stage in a boy's life when I had to decide to write my first story. Only three pages on, and a well meaning friend introduced me to his crystal set! It was the most interesting thing I had ever seen, and while having no idea how it could be done, resolved that I would make one.

NOTHING WORKS THE FIRST TIME

My parents were not impressed by my ambitions, my Dad was not into such things but gave me enough money to buy, secondhand, one pair of earphones, a variable condenser, and a crystal. Mother emptied the baking powder container prematurely (the cardboard coil former), and an old fruit case from under the house provided the timber for a cabinet. A coat of varnish to keep the dampness out, and a little work with the aid of an old soldering iron heated on the gas ring and ultimately came testing time.

Now, how was I to know that nothing works the first time, I had learned something the hard way which was to be repeated so often in the years to come. The trick, of course, was to find a good spot on the crystal with the tip of the catswhisker and bingo!

MORE MONEY FORTHCOMING WHEN IT WORKED

It would not be easy for me to describe the reaction exhibited by my parents and myself following this amazing break-through. Sufficient to say that an additional five shillings was forthcoming for the purchase of another set of earphones to be shared by two of the family, while the third person had a complete set.

The Great Depression was making its presence felt at this time and people were giving things to one another as an almost every day occurrence, which is how I came by a good cabinet with a Bakelite front panel and wooden baseboard. Included was a few ceramic covered resistors with lead ends, some capacitors, and three battery type valves. The circuit diagram was a bit of a mystery, but putting it together was a "piece of cake" as all the connections were made with terminals. The Reinartz coil used some more round food package "tins" from the kitchen. Two 1.5 volt "telephone" batteries were the 'A' supply, and one 45 volts 'B' battery was the HT.

A potentiometer in the 'A' supply to the valve filaments was the volume control.

UNTOLD JOY UNTIL ELECTRIC MANTEL RADIO ARRIVES

This very humble beginning brought untold joy to our home bringing news, sport (the cricket tests), Charley Lawrence and his community singing (a modern innovation), Jim Davidson and his ABC Dance Band, to mention a few highlights, with a special bonus for me as the builder.

Soon after the beginning of my apprenticeship to the electrical trade, my parents purchased an "all electric" mantel radio. That part of the industry was starting to boom and radio looked as though it was here to stay.

The arrival of this new device put an end to the practical side of my radio activities for the time being. I kept the crystal set in my bedroom for many years and enjoyed the evening programs after technical school until the 11pm closing-down time.

After marriage, building a new home and virtually "settling-down" I found time to get out the ARRL Handbook. At this stage I knew very little about amateurs and their activities, but had built a number of single band receivers and had done a little listening.

An article in the local newspaper led to my meeting my first amateur on what was to be my lucky day. He gave me all the advice and information I needed at the time to get started.

GETTING INTO AMATEUR RADIO

With difficulty I was able to buy three Morse training records (78s) and by adjusting the governor on an old hand wound turntable, was able to get up to 18WPM. I had, by now, met another amateur who lived close by and he was most helpful in providing a variation in practice, from the "groups of five" on the records. Requirement at that time was 14WPM.

The issue of the "Experimental Licence" and a call sign on 2nd June 1948, was a day to remember, as I am sure it must be to most aspirants.

By now, I had accumulated enough receiver type components, together with some disposals junk of great value, and I was well on the way with the new transmitter.

It was to be home-built, of course, as there was no choice, and I had already decided on a single 807 in the final to be driven by a 6V6G crystal oscillator on the 40 metre band, and modulated by a pair of 807s. The antenna, after a little "try it and see" was a half-wave end fed Zepp, fed with home-made 600 ohm line with five inch Bakelite spacers. The modulation transformer was a receiver power transformer, until I was able to wind a more permanent one, and for a start the microphone was a carbon insert with the traditional wooden match connection at the rear, into a speaker transformer in reverse.

Metering was provided with milli-ammeters from disposal sources, with added multipliers or shunts as required. This provided up to 30 watts of plate and screen modulation AM.

Receivers were a bit of a headache, but in the meantime, I had bought a BC-312 receiver, ex US Signal Corps.

OUT OF THE CUPBOARD, INTO THE ROOM

As can be imagined, by this time I had moved out of the cupboard in the whole of the spare room and had taken over the spare room and was to an "all systems go" situation and enjoying myself immensely.

With this type of equipment experimentation was a keyword and I spent much time doing just that. Modification of circuitry, making bits and pieces, and construction of test gear to check and adjust modifications made the hobby more than a pastime. Being crystal locked soon rated high in the unpopularity stakes. Fortunately, at that time, the Clapp Oscillator was being advertised as a simple VFO. I built a rough one for a try-out. Frequently, this has been the wrong thing to do, but on this occasion there was both good and bad. The good was that on testing it worked reasonably well with just a little drift, which was encouraging. The bad was the house had to be held steady whilst transmitting. When any of the family banged the "fly-door" the thin, but comparatively large area tuning condenser plates would vibrate, which didn't do anything for the carrier. The second version was a great improvement with ceramic insulation where possible, a change of condenser, a vernier dial (from disposals) with a bandspread of about nine inches, a pentode oscillator followed by an isolating stage, and no crystal.

With a thirst for DX, and with limited space, the antenna was replaced with a two element wire fixed beam which was fed by the 600 ohm line and Delta matched. It was unavoidably directed to the NW, which provided me with a bonanza of memorable QSOs.

Everything was getting bigger! The transmitter, it seemed, would ultimately engulf us, the junk box did, and book and magazine storage was becoming a problem.

1985 WINNER OF THE RON WILKINSON ACHIEVEMENT AWARD see page 3.



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