

Fig. 3 Main board.

Test gear required: multimeter, frequency counter and absorption wavemeter covering up to 1300MHz. If you don't have these you're going to be in trouble and I cannot honestly kid you that you don't really need them. Borrow them perhaps from your local club, or buy your best microwave friend a superb meal/round of drinks/year's subscription to *Ham Radio Today* as a bribe to taking on your problems.

First check the PCBs for solder splashes (but I don't need to tell you the 'wally' checks everybody is supposed to do first — and doesn't bother to do). Now ensure that the crystal oscillator is working, with the counter. Adjust the 20p trimmer if necessary but remember that after a few twiddles these plastic trimmers lose their stiffness and can no longer be relied upon. Disconnect one end of the 150R resistor in the first BFR91 collector circuit and connect the multimeter on milliamps range in series. Tune both 10p variable capacitors to draw maximum current. Use the counter to check that the frequency here is 210MHz. Adjust the trimmer on the end of the first line, and monitor with the

counter for a 418MHz signal close to the line.

Introduce the multimeter into the collector circuit of the second BFR91 in the same fashion. Trim the second line's capacitor so that the transistor draws maximum current. Now you can tune the trimmers on the two final lines for maximum signal at 1255MHz, but it won't be as easy as that. In fact the adjustments are interactive and you will find yourself monitoring TR4 collector current, absorbed power and frequency along the lines. I run a small loop as a probe around all the coils and lines to monitor that the right harmonic is being selected — it is easy to get a rock crushing output on 627MHz but this is not really what we want. Also the exact spot where you tap into and out of the lines with those tiny 12p capacitors is critical; if nothing wants to work try moving one of them 1mm in either direction. After about three hours you should hit on the right combination by acci-

dent and boy — what a feeling of elation, probably how Marconi felt when he got his first set working. Joking apart, it may be a bit of a struggle but it has got to be worth it. You will have a vital piece of test equipment which you cannot buy for any price in the shops, and what's more you made it yourself and you know how you got it to work.

No wallies please, we're British

Just as an afterthought, let's return to that concept of self training. At our local antique market I bought a book today. It was written by F J Camm and is all about becoming a radio amateur. It dates from 1945 and includes the following information to prospective amateurs: "Applicants must satisfy the Postmaster General as to their qualification to conduct experiments of scientific value or public utility. If scientific investigation is intended they should be certified as competent investigators by a Government Department or some recognised scientific body. Authority to use wireless sending apparatus, even with an artificial aerial (dummy load) can be granted only if the nature of the proposed experiments and other circumstances warrant that course." No wonder they had no wallies on the air in those days!

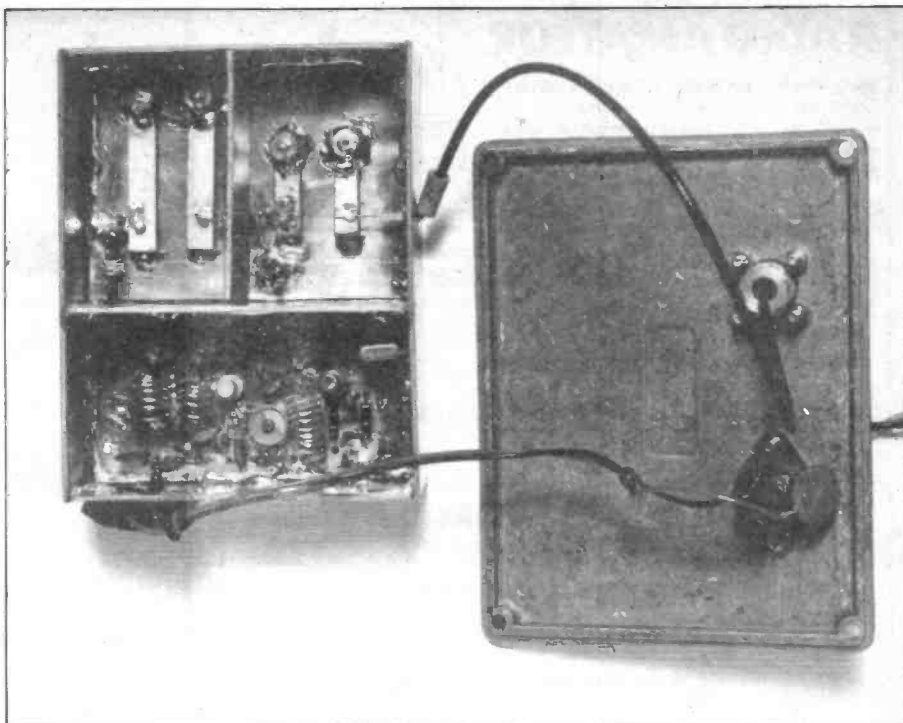


Fig. 4 Output spectrum.

