IMPROVEMENTS TO THE YAESU-MUSEN FRG-7 RECEIVER

ADDING A 2.6 kHz BANDWIDTH SSB FILTER

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ALL designs have compromises and shortcomings. In general we live with them; however when a little thought and a few pounds are applied to these shortcomings, improvements are possible.

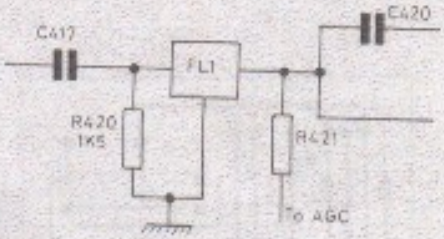

Fig.1 PART OF FRG-7 ORIGINAL CIRCUIT

The FRG-7 is an excellent design in most respects. Indeed it is still holding its own despite the availability of the broadband, digital breeds. However since purchasing and using the FRG-7 I found the selectivity at 6 kHz simply too broad for SSB/CW reception on the very crowded amateur bands, particularly now the diminishing sunspot cycle tends to drive everybody down to the lower frequencies.

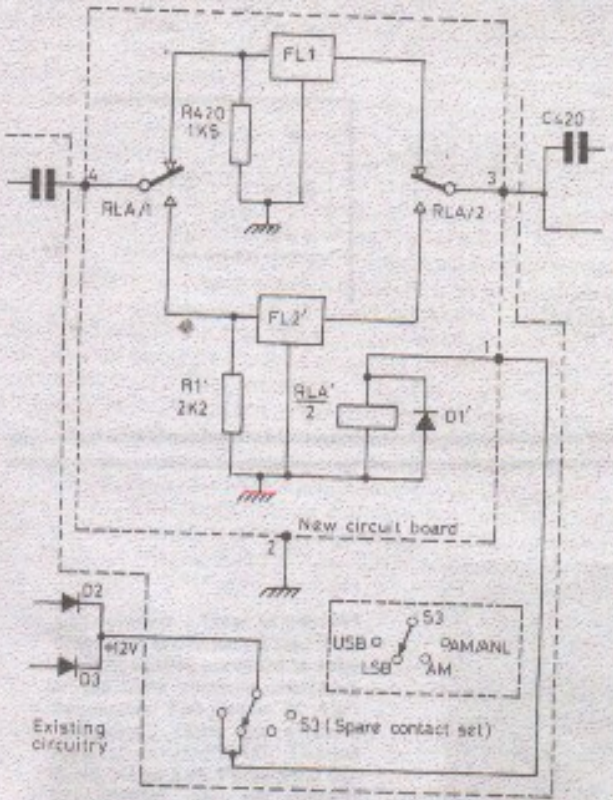

Fig.2 DUAL FILTER CIRCUIT

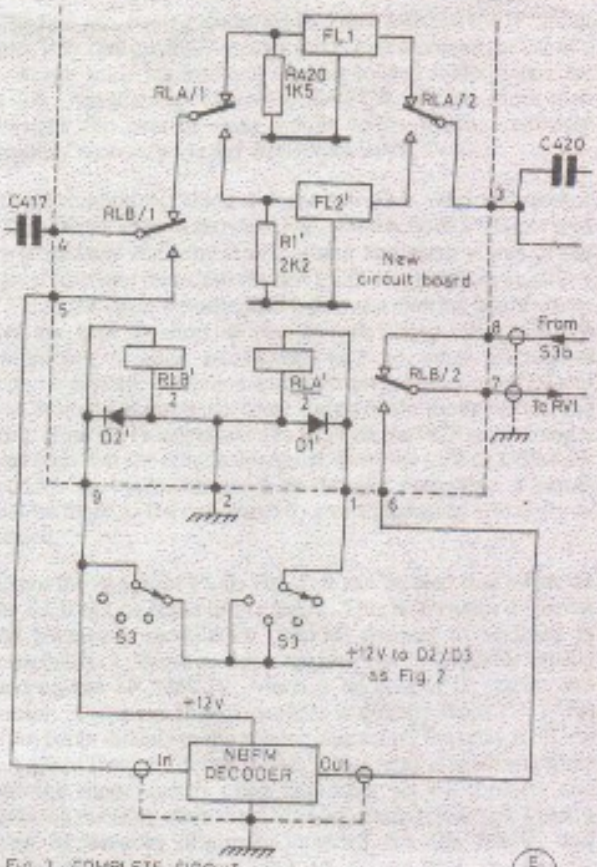

Fig. 3 COMPLETE CIRCUIT

Table of Values
Fig. 3

FL2' = CFM455J1 (Murata)
RLA', RLB' = DPDT sub-min. OU8 type with 12v. coil
R1' = 2K2, ¼-watt
D1', D2' = 1N4004
NBFM decoder = e.g. FM80

Also: solid PVC-covered copper wire, and PCB or Veroboard; all components available from *Ambit International*, 200 North Service Road, Brentwood, Essex CM14 4SG.

A suitable SSB filter is readily available, having a bandwidth of 2.6 kHz and of the same physical size as the one fitted at the factory. It is electrically similar, with a slightly higher input impedance at 2K, as opposed to 1.5K of the one fitted. If the receiver is only required for amateur use it is a simple matter to remove the existing and replace it with the new. Ideally the input resistor, R420, should be changed from 1.5K to 2K, but in reality it makes little difference to the performance of the receiver, *see* Fig. 1. I considered doing this, but decided the receiver would be rather limited and consequently I came up with the following modifications.

Investigation of the construction of the receiver showed two spare switch wafers on the mode switch. Whilst this is adequate for switching the two filters, I considered the wiring would be too long and preferred instead to use a relay, as can be seen from the circuit in Fig. 2. A small printed circuit was made, although I see no reason why *Veroboard* should not be used, as long as the leads are kept short. Details of the layout are shown in the associated diagram, Fig. 5.