

Modifying The FRG-7



by Peter D. Rouse
Part 1

In this series of articles we will be looking at the FRG-7 short wave receiver manufactured by Yaesu-Musen. We will look at the shortcomings of the set and how to eliminate them as well as how to add extra facilities without major surgery to the front panel.

History

Development of the prototype FRG-7 started in 1975 and the first production sets went on sale in Japan early in 1976. Soon after the set was exported world wide and, between then and late 1981 when production ceased, 50 000 sets were made. Yaesu say the design policy had been to produce a general communications receiver at a reasonable price which would fit the middle of the range market. The numbers sold show that they clearly judged their market well and the set will rightly take its place amongst h.f. receiver history. Many buyers will clearly remember it for the introduction of technology that had hitherto only been seen on far more expensive amateur, commercial and military equipment. Many people, the author included, who had been weaned on traditional t.r.f.s and single conversion superhets with their image problems and vague dial readings, were delighted by the relatively accurate and drift-free tuning together with up-conversion. However, it is not intended here to go into detail about the Barlow-Wadley loop tuning or other aspects of the circuitry as these have been quite adequately detailed in the FRG-7 handbook and previous articles.

Shortcomings

Having praised the set's main features, it must be said that there were a few shortcomings, not least of which was the massive 6kHz bandwidth. This and the lack of any fine tuning control on early production sets (the addition of fine tuning was the only modification in the entire production history) was the only major gripe and other areas looked at in this series of articles are really just improvements.

These areas include the power supply, mains input and earthing arrangements on UK models, the rather high frequency span of the fine tuning and inaccuracies in the kilohertz reading dial.

Bandwidth

Selectivity in the FRG-7 takes place at the final i.f. of 455kHz and the characteristics are determined by a ceramic filter designated LFC6. Whilst 6kHz bandwidth may be alright for general listening to relatively powerful

broadcast stations, it has serious deficiencies for the DX hunter particularly in crowded amateur bands when tuning for s.s.b. stations. The effect on the 3.5MHz band (80m) for instance can be that you hear several stations together and can make little sense of what any of them are saying.

The solution is to fit a narrow band filter. The problem then though is that such a filter will restrict the audio bandwidth of a.m. stations and although a 2kHz filter will not cause too much degradation of speech it can make music unpleasant to listen to. Yet even in making that point it must be said that such a filter can be useful when trying to identify a weak broadcast station that is otherwise masked by more powerful ones when the 6kHz filter is used.

Clearly the answer is to have a switched filter system although users who do not normally listen to s.s.b. may find that merely changing the existing filter for a 4kHz one will improve selectivity enough. Such filters are available as straight replacements from various suppliers. A list of suppliers will be given at the end of this series.

Switched Filtering

In the next part we will be presenting a switched filter system using the existing filter together with a 2.1kHz filter which has an excellent shape factor. For those readers who prefer to buy a ready-made unit though, Cirkit (formerly Ambit) offer one specifically designed for the FRG-7. It uses diode switching to bring a 2kHz or 4kHz filter into circuit. At a cost of more than £30 users must decide whether or not this is a case of overkill on such a modest receiver. Having said that, it must be pointed out that you do get a superb filter for your money. The 2kHz filter is a mechanical one manufactured by Kokusai and is the same as the one used in the highly respected NRD515 professional monitor costing nearly £1000.

Fitting the unit is very easy. It is wired in place of the existing filter and switching can be carried out using spare contacts on the MODE switch so that the narrow position is automatically selected for s.s.b. Incidentally, the next part will also offer several switching options which can be adopted for this unit as well.

Fine Tuning

The lack of fine tuning on early models can be a nuisance particularly when tuning s.s.b. and even more so if a narrow filter is fitted. However, it is not too difficult to fit such a control and South Midlands Communications can offer a kit comprising a variable capacitor, two fixed ones and a control knob that matches the others on the