

# Taking apart



# the FT101

## Cross modulation

Prior to the crystal filter most stages in the receiver have to handle all the unwanted signals for a few hundred kilohertz either side of the wanted station. Consider the 40 metre band after dark. Hundreds of powerful stations in some cases running Megawatts, are operating inside and just outside the amateur band, and if a great deal of amplification is used, these signals will completely overload the front end of the receiver and cross modulate with each other producing a steady background mush. Reducing the amount of amplification or switching in an attenuator will reduce the overload but then the weaker amateur signals will tend to become lost in receiver noise. Over the years Yaesu have altered component values and played with stage gain to try and strike the best possible compromise, and from the FT101 Mk2 onwards results — whilst not perfect — have been reasonable.

## Part 3

### Improvements and modifications By Harry Leeming G3LLL

#### Some unofficial mods

The original FT101 Mark 1 was pretty bad for cross modulation, and in desperation many owners fitted the 'VK blob'. This was a double balanced mixer made with miniature components and encapsulated in a blob of resin about the size of a sugar cube. If you purchase a second hand FT101 Mark 1 look for this item squeezed inside the second mixer module PB1080. The blob is no longer made but a similar circuit on a small printed circuit board is available from the FT-Club in America. Fitting these units to the FT101 Mark 1 results in a considerable improvement, with a noticeable but less dramatic enhancement in later models.

A couple of years ago Plessey introduced a high signal level double balanced mixer integrated circuit and I decided to have a go at using this. The results obtained by fitting it in the second mixer, VK blob style, were disappointing; but after some experimenting a small circuit board was made up fitting in place of the first mixer. This noticeably improved the receiver of FT101s from the Mark 2 onwards, and dramatically improved the Mark 1. It was decided to market this unit and it is now available commercially, and takes about ten minutes to wire to an FT101. When this double balanced first mixer is installed, using a double balanced mixer in the second stage does not seem to make much further improvement.

#### AGC system

Fig. 1 shows how the automatic gain control voltage is applied to the gate of Q1 in the RF unit. For maximum gain Q1 has about four volts on its gate when no signal is being