



vanced above about setting 6/7, and introduce lots of distortion products. Until this was realised, one station was about to get told he was occupying 50kHz bandwidth on 80 metres — switching off the blanker solved the problem!

A further row of pushbutton switches control T-F SET (allows momentary listening on the transmit frequency when both VFOs are in use), the IF notch filter (claimed at better than 40dB and effective, it is very critical to tune indicating a narrow notch), AF TUNE (selects the AF audio filter for CW), and a DIAL LOCK facility which disables the tuning knob.

RIT is controlled by two of these pushbuttons. One selects/deselects the function by repeated pushing, and the other is a CLEAR control. A rotary control beneath varies the RIT offset up to  $\pm 9.9\text{kHz}$  maximum, a useful range for DX-pedition split frequency working without involving the dual VFOs. If an RIT offset has been set, the original frequency can be returned by pressing RIT again, but the offset is held and displayed — it can be reactivated by pressing the control again. Pressing CLEAR either deletes the offset from memory, or, if RIT is active, resets to the nominal frequency and also clears the offset.

Further rotary controls set NOTCH FILTER frequency, and AF and RF gain (concentric).

### Passband tuning

The remaining controls are concerned with the various forms of passband tuning and CW reception facilities.

CW VBT (CW Variable Bandwidth Tuning) allows reduction of the bandwidth in the CW mode, but does not affect the centre frequency. The actual bandwidths obtainable depend on the filter in use. The review rig came without any CW filter as such so the SSB filter (2.4kHz) is used. This gives control over 2.4kHz-600Hz bandwidth. If you have a CW filter fitted, then the control allows 500Hz-150Hz bandwidth. This control is

also effective in the AM position with the same bandwidth control!

As it stands the CW received beat note is around 800Hz, which suits most people. If you want to use a different pitch then there is a PITCH control, which allows you to alter the pitch to suit and varies the filters centre frequency to match. It also adjusts the sidetone frequency to be the same as that of the received signal.

Effective only in the SSB mode are the SSB SLOPE TUNE controls (HIGH/LOW) arranged as two independent concentric controls. One sets the upper edge frequency of the filter, and the other the lower, so that the bandwidth can be set to suit the conditions. These controls are easier to use than the Yaesu FT-102 equivalents which are friction locked together and very stiff to operate. Being able to set the bandwidth with the upper and lower cutoff frequencies defined is a very useful operating aid, especially when as effective as this version.

### The back panel

Having disposed of the front, we move to the back, via a small slider panel on top which covers the memory back-up battery compartment, and the VOX controls, plus a calibrator on/off switch.

The first thing that is very noticeable is the presence of two cooling fans. One is for the power supply (and this one comes on a lot even on receive) and the other for the PA. The latter has two speeds — the fan first comes on at a heatsink temperature of 45°C. If you manage to get the PA heatsink above 75 — 80°C, probably because you have insufficient convection cooling, the fan speeds up, the TX circuits are disabled, and will only be re-enabled when the temperature has dropped below 65-70°C.

Both fans are quiet and unobtrusive, except when the PA one is running at fast speed, although still acceptable and both are guarded against prying fingers.

Along the lower rear apron, left to

right, are the SO-239 aerial connector, an earth terminal, RX aerial switch (for using an external receiver rather than the TS-930S itself), and the external RX socket (phono). Output for a transverter is provided (no output level quoted) via an 8-pin DIN socket, and for external accessories such as linear amplifier via another 8-pin DIN.

If you have a monitor scope, you can view the received signal waveform via the IF OUT jack, taken just before the product detector, and if you are going to the USA, you have the usual phone-patch facilities. Of course, these IN/OUT jacks also enable you to transmit tape recordings (of the right kind!), and take AF output from the rig for recording, SSTV, AFSK etc (at 600 ohms impedance).

The remaining connectors are for RTTY keying (low level only — not current loop), AC power, external speaker (3.5mm) and CW key jack (0.25"). Plus of course a fuse (AC, 4 amps).

### Construction

Externally the TS-930S is a very impressive unit to look at, finished in two-tone grey (light case, dark panel) with a faultless finish. The controls are all smooth and easy to use, with no excessive pressure needed for the switches.

Internally, the standard of workmanship is high, with most of the circuit boards arranged on the underside. The PA, output filters and PSU are on the top. Some screening of individual sections is provided, which must help towards eliminating sprogies, as there are very few to be found. Some adjustment points are marked in the manual, for sidetone, monitor and buzzer levels, Mic impedance (high or low) and notch filter adjust).

As noted earlier, there is little service info provided if you do want to tackle this yourselves, but there may possibly be another manual available. This is akin to buying Lotus or Ferrari and not being able to get hold of a service manual!