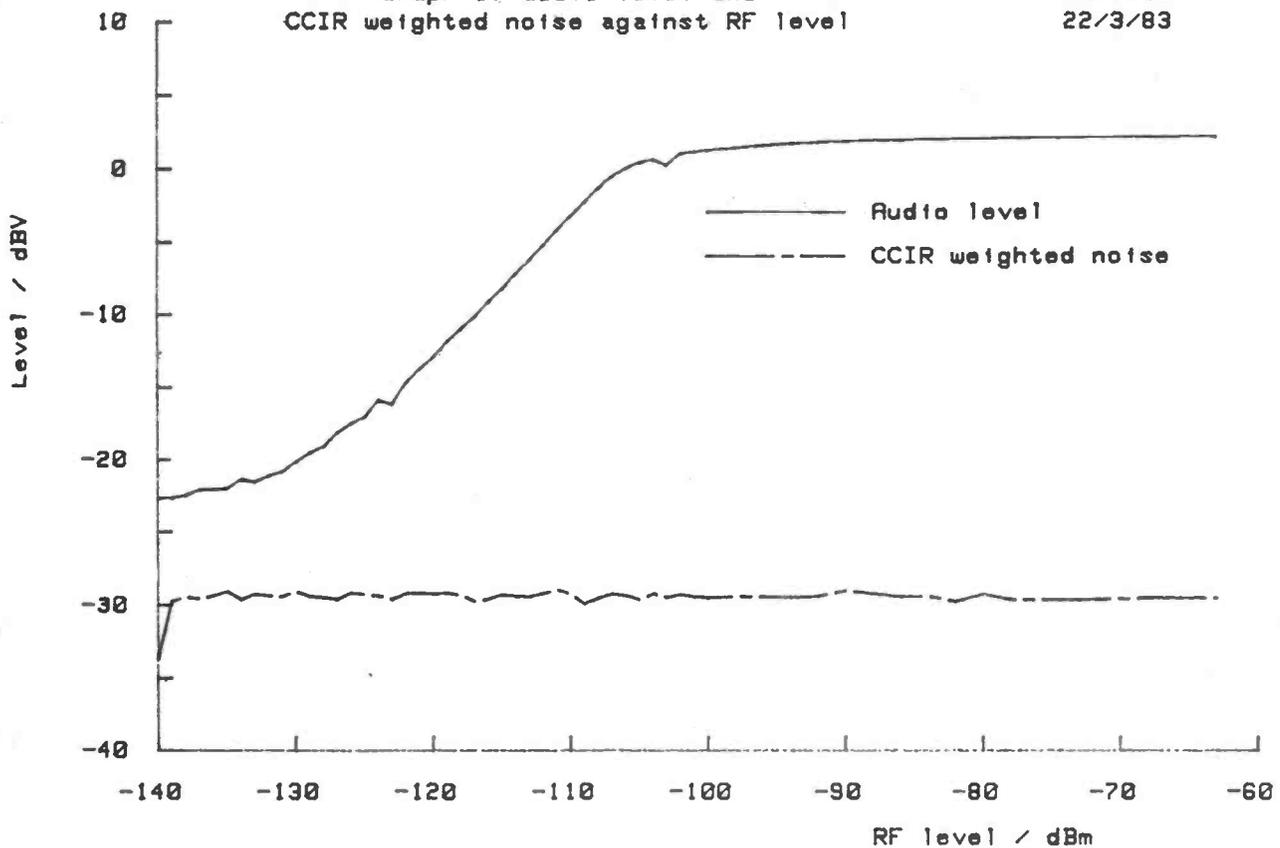


Graph of audio level and  
CCIR weighted noise against RF level

TRIO430  
22/3/83



around  $70\mu\text{V}$  right across all the amateur bands, is perhaps a little insensitive, and I would have preferred it to have been at the more usual  $50\mu\text{V}$ . The T-notch filter gave a remarkable maximum notch with hardly any reduction of signal level 400Hz away, which is splendid. The AGC characteristics can be seen very clearly in the pen chart recording in which we knock down the RF level in 10dB steps from a very high to a very low level. Note the recovery time at the various levels, together with the fact that normal level is not restored on lower level signals. My colleague, Simon G8UQX, thought of a rather nice computer test to apply, in which computerised test equipment monitored the audio output level whilst stepping up the RF input level automatically from a Marconi 2019 signal generator, finally plotting the result.

Additionally, the CCIR/ARM weighted noise was plotted with unity gain held at 2kHz, this being the audio output noise at the test gain control setting for no RF input. It can be seen that full audio output is reached at around  $2\mu\text{V}$  input, above which the level is fairly constant, with just a gradual slope. At very low levels indeed there was slight computer noise breakthrough, but even so I would ideally have preferred full level to have been reached at a much lower RF

level, particularly for 10m where band noise can be so extremely low relatively.

I have already commented favourably on the good audio quality, and so it was not quite so surprising to see the very low distortion measurement at 125mW output from a carrier giving a 1kHz beat in the product detector. The loudspeaker was fairly sensitive, which is fortunate for the maximum available output into 8 ohms was slightly limited. The only other receiver measurement which seems very relevant is the high current drawn, which is easily sufficient to flatten a car battery if the rig is left on inadvertently for more than a day. I would have thought that with modern circuit design the standing current could have been a mere fraction of what it was.

The transmitter took around 16A peak which is very reasonable indeed, showing a high efficiency PA. The current drawn by the entire transmitter on transmit, but with mic gain at minimum, was considered quite low, only double that of the receiver, and so the average consumption from a car battery will be surprisingly low, unless speech compression is selected, which will, of course, greatly increase the DC duty cycle. Frequency accuracy on transmit was checked on CW, such that the output frequency measured 160Hz below that indicated, and this is perhaps just a little

bit further out than I might have expected, although the receiver was exceptionally accurate. Maximum power output on CW was either at, or only very marginally below, the legal limit, so you certainly can't grumble, and SSB peaks were well in excess of the CW output, which is very useful. No drift problems were noted, either on TX or RX, after a warm up period. We checked harmonic and spurious outputs on a spectrum analyser on all bands from top band to 10 meters, and must particularly praise the harmonic suppression on the latter. The worst band was 40 meters with 3rd harmonic just a little high, but fortunately the harmonic was in another amateur band! SSB carrier suppression was fantastically low, showing a very well designed balanced modulator. The microphone circuits seemed to have a good overload margin, and no problems were noted with the transmitter, which is praiseworthy.

Equipment used by Angus McKenzie Laboratories Ltd. for this review.

Two programmable Marconi 2019 signal generators, Marconi 995 generator, coaxial attenuators by Greenpar, Marconi, Rhode and Schwartz and Narda; hybrid transformer by Elcom; power meters by Racal and Bird; analysis equipment, including Hewlett Packard 8903 audio analyser, and 3580 spectrum analyser, an RF spectrum analyser; Hewlett Packard 8558B, a Takeda Riken eight digit frequency counter (four parts in  $10^9$  accuracy), a Bruel and Kjaer and HP pen charting/plotting equipment, and computer control were appropriate was with a Hewlett Packard 9816 computer with 82901 dual disc drive.