

Other side of 70 cm module — showing the PLL unit.

main receiver IF is at 10.8MHz approximately, the three modules acting as transverters, 70cm having an extra higher IF.

We looked at the static distortion of the product detector on SSB and the discriminator on FM for an audio output level of 125mW. On both modes the distortion was a little high, but whilst FM was acceptable, the SSB measurement did not correlate with the audible transient distortion on speech, whereas ordinary carriers sounded moderately clean, this showing that the AGC attack time was not quite right, and/or there was possibly insufficient overload margin in the entire IF chain to accommodate transients before the AGC could take hold. Fast AGC as very fast indeed, whilst slow AGC is just about how I like it, full recovery taking many seconds. The maximum available output from the rig into 8 ohms was about average and I really would like to see more available.

Output Powers

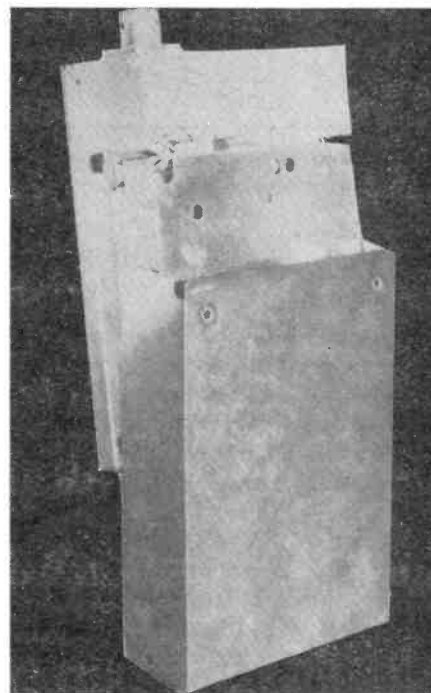
We checked FM, SSB and CW output powers on all three modules,

and whilst I was happy with 6m and 70cm, the 2m module seemed to have been set up for too much available output power, which was confirmed in subjective trials with golden eared listeners! We had a look at the 2nd and 3rd harmonic outputs on all the bands and the only one that worries me is the 2nd harmonic of 52MHz at -59dB, which of course is well within Band II. When the band is opened up to 104MHz in the next few years, we shall have to pay very close attention to 2nd harmonic distortion if we get 50MHz; this should not be a major problem but just a nuisance, because we will all need good output filters.

We carried out two tone IM tests at two power levels on each of three bands. The 6m results were good for a black box, the higher orders falling down well below the lower orders quite rapidly. At lower power levels the IM performance was excellent. On 2m at high power levels, higher order harmonics were worse than they should have been, and these did not fall rapidly enough at lower power levels. 70cm IM performance was far better, although it is

odd that the third order product at low levels was higher than I might have expected it, although not of any concern. Note that the two tone PEP levels are somewhat lower than those for speech, as the former was continuous, whilst the latter represented transients.

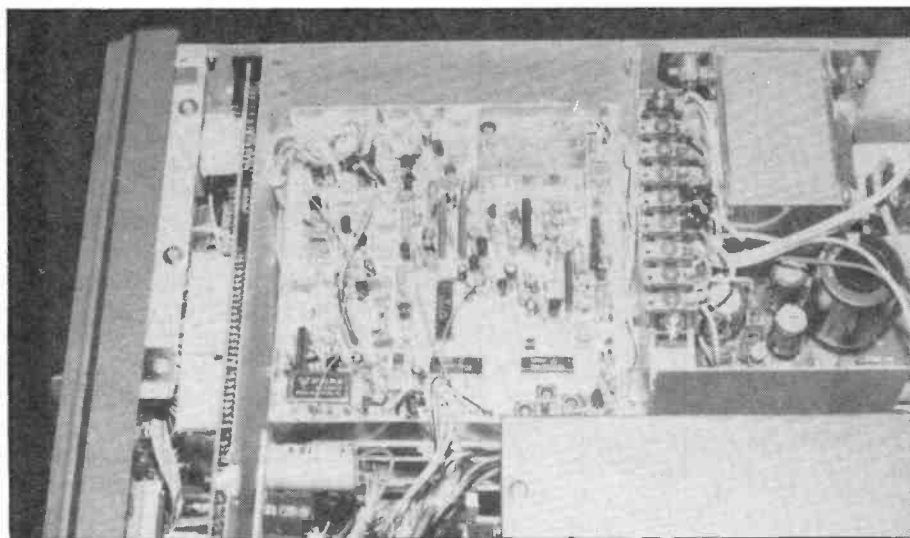
The deviation level of the tone burst of all frequencies was slightly high, but absolute peaks of modulation very high when measured with wide bandwidth on a Marconi 2305 peak reading deviation meter. In practice, the maximum deviation seemed full but not excessive within a communication bandwidth, but high total devia-



Each VHF/UHF module is triple screened.

tions seemed to be rather common on almost all FM amateur radio equipment, perhaps because very steep audio filters above 2kHz would be extremely costly to instal. Frequency accuracy coincided pretty well throughout with received frequencies.

We checked the carrier rejection referred to full single tone output on SSB with the power control on the onset of ALC. Carrier rejection was excellent at -60dB, which degraded to -51dB when the power control was fully advanced, so well into ALC, which is not recommended. SSB side-band rejection was better than -49dB, which is excellent. With mic gain at minimum, the noise within the filter pass-band was around -70dB per 50Hz bandwidth, which thus



Optional satellite unit (PCB in centre of picture).