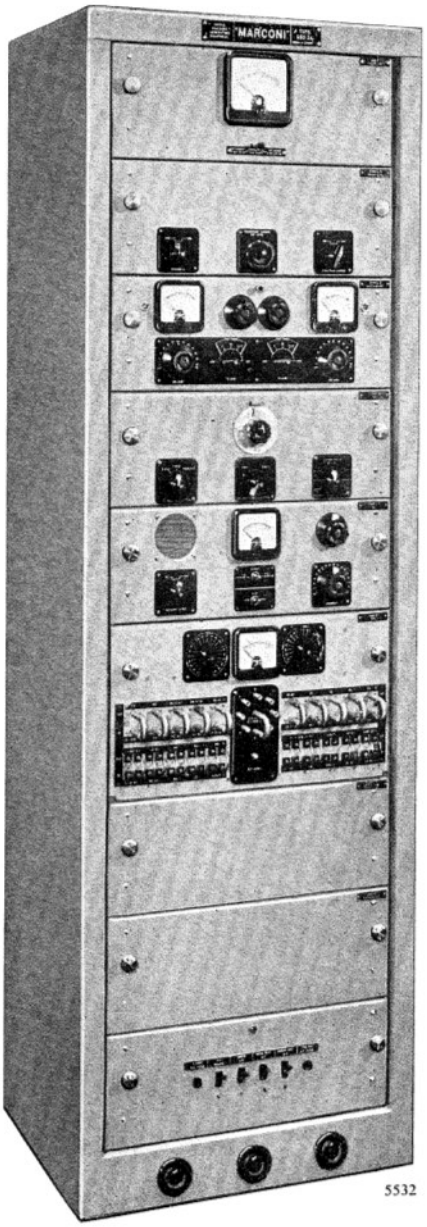
SSB Generating and Monitoring Equipment *Type SSD 2*



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THE TYPE SSD2 EQUIPMENT supplies low-power excitation at 3·1 Mc/s, which, *via* an intermediate modulator, drives an HF transmitter giving the desired frequency and power output for radiating SSB telephony transmission on two independent sidebands.

The units of the equipment are all mounted in a sturdy cabinet of attractive design. The more important units are built in chassis with front panels on which are mounted meters and controls. These units slide on runners which permit complete withdrawal from the cabinet, and, in addition, the units may be tilted to give complete access to the under-chassis.

CIRCUITS

Single-sideband generating circuits. Each of the two audio inputs passes through a line amplifier (fitted with a volume indicator for level measurement), to a balanced first modulator, where it is combined with the output of a 100 kc/s oscillator to produce the usual upper and lower sidebands. Special crystal band-pass filters select the upper sideband of channel A and the lower sideband of channel B, and pass them, through a combining hybrid, carrier-stop filter and hybrid input circuit, to the second modulator. The carrier-stop filter eliminates any small residue of the 100 kc/s carrier that may have been passed from the channel filters. The pilot carrier is fed from the first oscillator (100 kc/s) *via* a level control to the hybrid input circuit of a balanced second modulator.

A second oscillator generates a 3 Mc/s signal which is combined with the two 100 kc/s sidebands and the 100 kc/s pilot carrier in the second modulator to produce sidebands in the 3·1 Mc/s

region and a pilot carrier of 3·1 Mc/s. An IF amplifier provides the necessary discrimination against unwanted products and its output consists of the 3·1 Mc/s pilot carrier and the wanted upper and lower sidebands carrying channels A and B respectively. The IF amplifier is fitted with a peak voltmeter for measuring the sideband and pilot-carrier levels.

Two AF oscillators (1605 c/s and 1015 c/s) are provided for setting-up purposes, and special care has been taken to obtain high stability in these oscillators. The setting up of the individual tones, or both tones together, at their correct levels, is done simply by the operation of a switch.

Monitoring circuits. The monitoring circuits provide means for demodulating down to audio frequencies the outputs from selected monitor points in either the transmitter, the 3·1 Mc/s IF amplifier, or the 100 kc/s stage; aural monitoring either by headphones or by small loudspeaker being provided.

The main part of the monitoring equipment is the monitor receiver, which comprises two frequency-changers, a demodulator, and an AF stage. The control for monitoring either at RF, 3·1 Mc/s, or 100 kc/s, consists simply of a switch. Channel filters are provided so as to enable either channel to be selected for monitoring purposes. A 425 c/s bandpass filter is provided to select the $(2f_1–f_2)$ inter-modulation component when measuring distortion. Special care has been taken to obtain a very high degree of discrimination against unwanted products, and this, combined with the good frequency stability of the AF test oscillators, ensures a high degree of accuracy in making distortion measurements. Provision is made for enabling the carrier level to be checked, even when signals are being transmitted. The AF output from the monitor receiver is amplified by the monitor receiver amplifier, which is provided with a volume indicator for the purpose of measuring levels.

Double-sideband operation. It might happen that the need would arise to work with a receiver suitable only for normal DSB operation, and to cater for this need it has been arranged that the simple operation of one switch converts the equipment from SSB to DSB in an instant. In DSB operation only channel A is used. The DSB output level is $\frac{1}{4}$ W PEP and the carrier level is −6 db relative to $\frac{1}{4}$ W. The same monitoring equipment is used in the DSB condition of working.

DATA SUMMARY

AF input:

Impedance: 600 Ω (two inputs).

Level: −22 dbm to +24 dbm, *i.e.*, −30 db to +16 db relative to reference telephonic power. Frequency range: 100–6000 c/s.

Output:

Impedance: 75 Ω (coaxial feeder).

Level: Each AF input produces maximum output of −6 db relative to $\frac{1}{4}$ W, *i.e.*, the total peak sideband power is $\frac{1}{4}$ W.

Pilot carrier: Level is set to:

(*a*) −16 db reference to $\frac{1}{4}$ W for single-channel operation.

(*b*) −26 db reference to $\frac{1}{4}$ W for two-channel operation.

Frequency range: 3·094–3·106 Mc/s.

Non-linear distortion: The third-order inter-modulation product $(2f_1–f_2)$ is at least 40 db down relative to the level of one of the two equal level testing tones f_1 and f_2.

Carrier compression:

Less than 1 db at $\frac{1}{4}$ W output.

Pilot-carrier stability:

1 part in 10^5 from 0° to 45°C.

Power supply: From 110 V or 210–250 V 50–60 c/s (±2 c/s) AC mains.

Power consumption: 200 W approx.

Dimensions:

Height	Width	Depth	Weight
72 in.	22 in.	18⅞ in.	576 lb
(183 cm)	(57 cm)	(50 cm)	(261 kg)

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