



MF/HF Transmitter/Receivers (47–60 W)

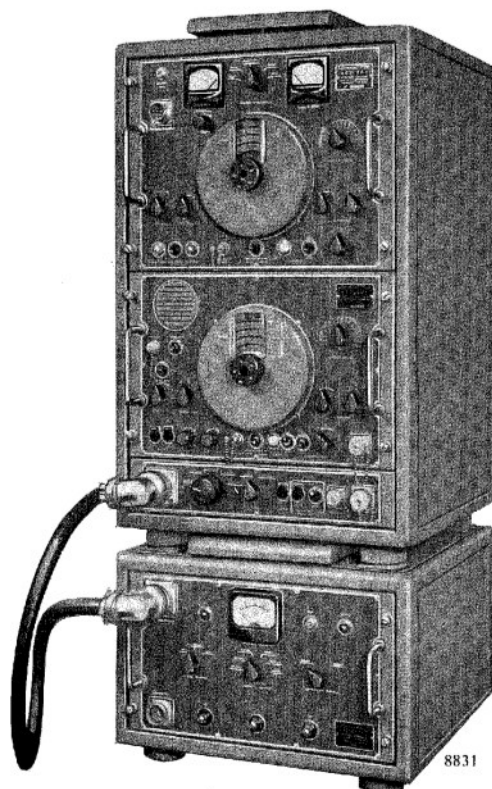
Types TR 50A and TR 50D

Designed and produced by Marconi Italiana, Genoa, Italy

THESE COMPACT transmitter/receivers are suitable for use as fixed or transportable stations and provide rapid changing from one frequency to another. DSB telephony and CW or MCW telegraphy can be operated.

Features

- Rapid selection of any one of up to 10 pre-set frequencies.
- Complete coverage of the frequency range by hand tuning.
- Built-in crystal calibrator eliminates necessity for calibration tables. Very clear, accurate tuning dials.
- Automatic tuning by servo-mechanisms on any frequency.
- Reduced power operation without changing modulation characteristics.
- Advanced aerial matching facilities.
- Volume compression prevents over-modulation.



EQUIPMENT

The equipment comprises:

- (a) Transmitter/receiver unit.
- (b) Power supply unit.
- (c) HF automatic aerial matching unit (with control unit)
- (d) MF aerial matching unit } TR 50D
(with control unit) } only

The transmitter/receiver unit and its power supply unit comprise two compact cabinets, mounted one on top of the other. The upper and larger cabinet is the transmitter/receiver, the transmitter unit and receiver unit being separate drawer-type assemblies mounted on telescopic runners for easy access for servicing. The power supply unit is also withdrawable from its cabinet on runners. Provision is made for operation of these units in the extended position for testing.

Both cabinets are of robust design and are mounted on shock absorbers.

Sub-unit construction has been widely employed throughout the equipment. The circuit is divided into well-defined sections, each forming a sub-unit easily replaceable in case of fault.

The HF automatic aerial matching unit, with its associated control panel is described on page 246.

The MF aerial matching unit, used with the Type TR 50D is similar in construction to the HF aerial matching unit, consisting of the matching unit itself, housed in a cast waterproof box at the aerial site, and a separate control unit mounted either on a bench or wall near the transmitter/receiver.

CIRCUIT

The RF circuit of the transmitter consists of the master oscillator (either a crystal or free-running LC oscillator can be selected) followed by appropriate frequency multipliers and a power amplifier.

The modulator includes a microphone pre-amplifier, for dynamic microphones, and a compressor circuit which ensures 70–100% modulation with a variation of at least 15 dB in the input level. An 850 c/s oscillator is also provided for use when working MCW (A2) telegraphy.

The receiver is a single superheterodyne. Two stages of RF amplification precede the mixer which is followed by two IF stages at 690 kc/s and detector circuits. A noise suppressor circuit precedes the two AF amplification stages, the second of which is a

push-pull power amplifier capable of supplying three 1.5-watt loudspeakers as well as headphones.

Data Summary

GENERAL

Services: CW & MCW telegraphy (A1 and A2), DSB telephony (A3).

Frequency range: TR 50A, 1.5 to 24 Mc/s (in 4 bands). TR 50D, 200 to 550 kc/s and 1.5 to 12.8 Mc/s (in 5 bands).

TRANSMITTER

Tuning: Rapid switching between 10 crystal-controlled frequencies as well as hand tuning over the whole frequency range.

Frequency stability: Within 50 parts in 10^6 with crystal drive. Within 200 parts in 10^6 with free-running oscillator drive. (For a temperature variation of $\pm 15^\circ$ between -20 and $+50^\circ\text{C}$ and a mains variation of $\pm 10\%$ in voltage and $\pm 5\%$ in frequency).

Power output: At least 60W on A1 and 47W on A2 and A3. Reducible to $\frac{1}{2}$ or $\frac{1}{3}$ full power.

Output impedance: 51.5 Ω unbalanced.

Harmonic level: At least 40 dB below fundamental.

AF response: ± 1.5 dB from 300 to 3400 c/s.

Modulation: 80%.

Keying speed: 50 bauds max.

RECEIVER

Input impedance: 51.5 Ω unbalanced.

Sensitivity: Less than $5\mu\text{V}$ input signal required for 3.5W output power and 10 dB signal-to-noise ratio (30% modulated, 1000 c/s).

Selectivity: Crystal filter out – 4 bandwidths, ± 8000 , 6000, 4000 and 2200 at 6 dB attenuation.

Crystal filter in – 3 bandwidths, ± 1100 , 500 and 200 c/s at 6 dB attenuation.

AGC: Output signal changes 10 dB for input variation from $5\mu\text{V}$ to 1V.

Spurious response: At least 40 dB below signal.

AF output: 3.5W (Accommodates up to 3 loudspeakers and 3 dynamic headphones, with load compensation).

Overall distortion: Better than 10% for $20\mu\text{V}$ to 0.5V 90% modulated signals.

BFO variation: ± 1500 c/s.

Marconi

Marconi's Wireless Telegraph Company Limited
Marconi House, Chelmsford, Essex
Telephone: Chelmsford 3221 · Telex: 1953
Telegrams: Expanse Chelmsford Telex