



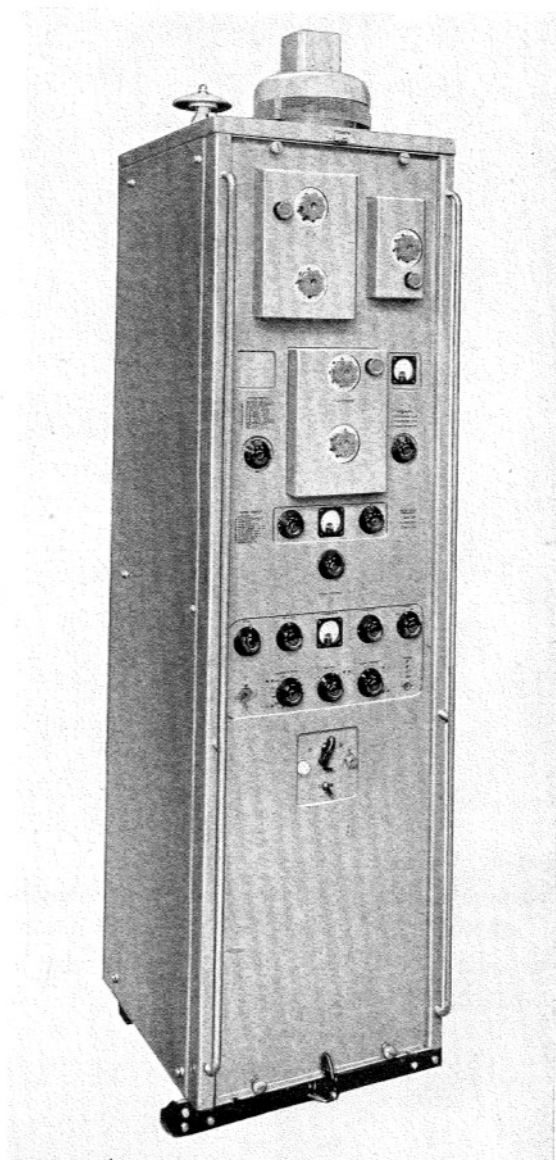
200-Watt HF Telegraph/Telephone Transmitter *Type TGS 541*

PARTICULARLY SUITABLE for fixed stations working point-to-point, this HF transmitter also offers facilities for headquarters stations operating to mobile services.

Two editions of the transmitter are available, Types TGS 541A and TGS 541B. The first of these provides full remote control, including frequency selection, from a distant site (see page 289). The Type TGS 541B, however, is designed for local control and employs hand selection of frequency. If specially required both transmitters can be provided with extended multi-wire control for use from a nearby position.

FEATURES

- Rapid selection of any of six predetermined spot frequencies.
- Facilities for CW, MCW and telephony, and provision for phase modulation of the carrier as an anti-fading device.
- Single or double current keying at speeds up to 160 bauds with full absorption.
- A voice-operated carrier switching unit can be employed in addition.
- Provision for power reduction in three steps down to 5 W output.
- All units are mounted on extension runners thereby providing complete accessibility and facilitating servicing.
- Visual and aural monitoring of all services at both local and remote control points is provided.
- 'Listening through' facilities are incorporated.
- The normal output circuits provide for both 600 Ω balanced and single-wire unbalanced conditions.



CIRCUITS

The crystal oscillator drives into a phase splitter stage, the output of which is applied to the grids of two cathode followers working in push-pull and constituting the phase modulation driver stage. The output of this stage is fed to the grids of two pentode valves *via* an RC network. A phase difference in the grid signals of 90° is thereby introduced and the anode currents, which feed into a common load, vary correspondingly in phase. The combined output is then fed to the aperiodic amplifiers which raise the signal level so that sufficient drive to the harmonic generators is ensured.

Phase modulation of the carrier is effected by superimposing an LF voltage on the steady DC voltage applied to the suppressor grids of the pentode valves in a differential manner (*i.e.*, the voltage of one grid is a maximum when the other is a minimum and *vice versa*). This results in the current in the load varying in phase by $\pm 45^\circ$ with respect to its mean value. The LF voltage is obtained from a local tone oscillator.

Two harmonic generator stages are incorporated and are switched to give the necessary frequency multiplication to cover the range, their output being automatically maintained constant throughout. The output circuits of these two stages are pre-tuned to the six spot frequencies of the transmitter.

The final stage consists of six tetrode valves, working in parallel push-pull. Anode modulation is applied for MCW and telephony working. The transmitter can be operated either at full power or in one of three reduced power conditions with a minimum value of 5 W.

AERIALS

The normal output circuits are designed to provide both a balanced output, working into 600 Ω impedance (assuming the standing-wave ratio is not greater than two), and also an unbalanced output such as is required for use with a harmonic aerial of not less than a quarter-wave in length. The balanced output is not used for frequencies below 3 Mc/s.

DATA SUMMARY

Power rating (to aerial feeder):

CW 200 W.

MCW 180 W (when modulated 95%).

Telephony 125 W carrier (modulation up to 95%).

Frequency range: 1.5–23 Mc/s

Frequency stability: $\pm 0.01\%$ (crystal drive).

Service: CW, Ph.MCW, MCW, telephony.

AF harmonics: AF harmonic content on full-power telephony does not exceed 6% at 80% modulation.

Keying: Up to 160 bauds.

Modulation: Up to 95% for both MCW and telephony.

AF input level: Transmitter is fully modulated by a speech level of 15 db below 1 mW.

AF response: Level within ± 2 db from 200–7000 c/s at the transmitter.

Noise level: At least -45 db with reference to 95% modulation at full power.

Power supply: 200–250 V, 50–60 c/s single-phase AC mains. Voltage regulation $\pm 6\%$, frequency tolerance $\pm 2\frac{1}{2}\%$.

Power consumption: 1.5 kVA at 0.85 PF on full power.

Dimensions:

Height	Width	Depth	Weight	
			TGS 541A	TGS 541B
6 ft 2 in.	1 ft 11 in.	2 ft 1 in.	700 lb	664 lb
(188 cm)	(58 cm)	(61 cm)	(318 kg)	(301 kg)

Ventilator fittings add approximately 8 in. (20 cm) to the above height.



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