



SHF Multi-channel Radar Link Type SX 101

A NEW FLEXIBILITY is introduced into the design of radar systems by the Type SX 101 Radar Link, which is capable of relaying up to four high-quality radar pictures simultaneously over long distances. Its use removes the necessity of siting the component parts of a radar system within a short distance of each other, and also presents a means of achieving greater speed and accuracy in data handling – an ever increasing necessity in the world of high-speed air transport.

The main applications of the radar link, which incorporates the latest techniques and refinements, may be summarized as follows:

- (1) Where the site of a radar station is too vulnerable or too inaccessible for the operations centre.
- (2) Where two radars of different characteristics, with their heads sited in different

places, are viewed on the same display system.

- (3) Where the associated organization is split into two or more sections, remote from each other, with remote displays at each point.
- (4) For the co-ordination at a central control position of the activities of a number of diverse radar stations.

Features

Vastly increased scope of operation introduced into the fields of both civil and military radar.

No measurable degradation of any channel.

High data handling capacity is an important feature. In a typical arrangement two channels of 2 microsecond pulse widths, or two channels of 2 microseconds and one of 0.5 microsecond may be transmitted. All channels are complete with azimuth turning and auto-align data and in addition telemetering, system switching and indicating; with suitable audio channelling equipment, up to sixteen telephone channels can function simultaneously. Reverse link equipment is used to give a two-way facility.

Freedom from accidental interference and deliberate jamming is afforded by the use of frequency modulation and a very narrow transmitted beam.

Security against unauthorized interception provided by the narrow beamwidth and the complexity of the transmitted signal.

Reliability is ensured, as operation in the 4000 Mc/s band with frequency modulation is subject to no significant degradation by weather or fading effects.

Long distances can be covered by the use of repeater stations, distances in excess of 200 miles being easily achievable subject to proper initial survey.

CONSTRUCTION

Transmitting and receiving terminals both consist of a 3-cabinet assembly, compact and easily accessible.

Horn-fed paraboloid aerials are employed at both transmitting and receiving ends.

Repeater stations are simple in construction as demodulation and re-modulation is avoided. They comprise a single cabinet of equipment and two aerial systems and are

capable of unattended operation over long periods of time.

The equipment can be contained in static installations housed in suitable buildings, or in mobile units contained in vehicle-mounted cabins or trailers.

CIRCUITS

The individual channel components amplitude-modulate sub-carriers and these are then combined into a composite signal used to frequency-modulate the main carrier, operating at 4000 Mc/s.

Travelling-wave tubes are employed and it is their special properties of large-gain bandwidth, broad-band match and low noise figure that enable a large number of signals to be transmitted simultaneously over several 'hops' with negligible degradation of picture quality. After seven 'hops' the noise due to the radar link is at least 40 dB below the peak radar signal in each channel.

Data Summary

Frequency coverage: 3800–4200 Mc/s.

Power output: 4 W.

Frequency baseband: 9.5 Mc/s.

Amplitude/frequency response: Within ± 1 dB from 50 c/s to 9.5 Mc/s.

Gain: Stable to within ± 1 dB.

Receiver noise factor: 11 dB.

Linearity: To within ± 1 %.

Intermodulation: –40 dB.

Angular error: Less than 12 minutes peak-to-peak.

Max. aerial rotation speed for auto-align: 15 r.p.m.

Max. aerial rotation speed: 20 r.p.m.

Power supplies: 230 V (± 3 %), 50 c/s, single-phase AC.

Power consumption:

Terminal: 10 A approx.

Repeater: 4A approx.

Dimensions (3-cabinet terminal assembly):

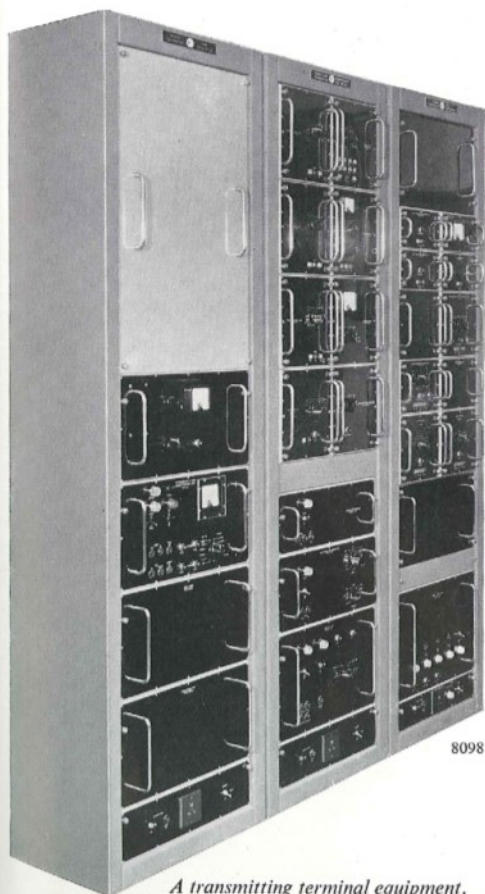
Height 7 ft (214 cm)

Width 6 ft (180 cm)

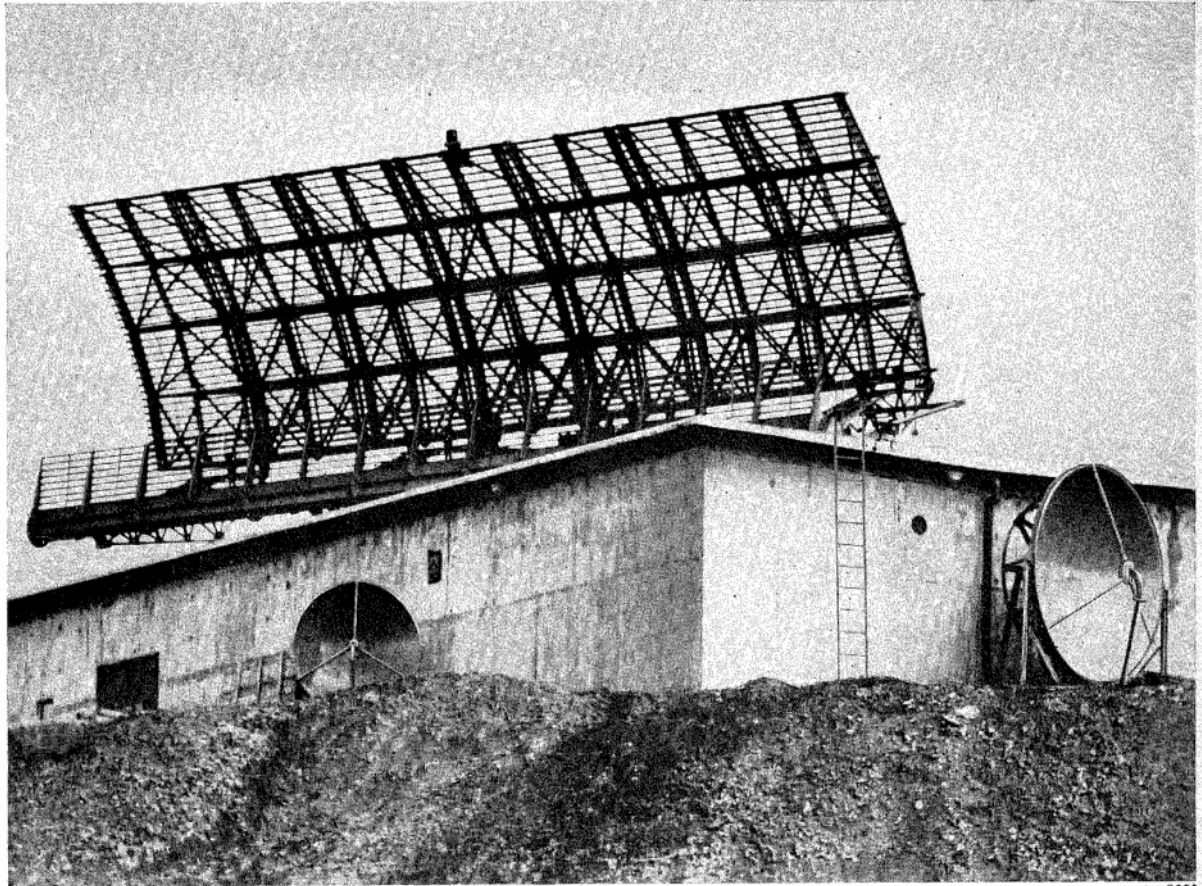
Depth 2 ft (60 cm)

Marconi

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



A transmitting terminal equipment.



Type SX 101 Radar Link Equipment in use in connection with a 50 cm Type S264 radar system at Hawkins Hill, Wellington, New Zealand.

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