UHF Tropospheric-scatter Amplifier (10 kW)
Type HS 313

TROPOSPHERIC-SCATTER links are now providing reliable high-quality UHF communication services over distances of up to 250 miles (400 km) in a single 'hop'.

The simplest arrangement is for one Type HS 313 Amplifier to be used in conjunction with a single drive unit, such as the Type HD 313 (see page 164). By the use of spaced receiving aerials and a two-path receiver, dual diversity operation may be achieved on such a system.

Where higher reliability is required, or the path conditions dictate a system of greater gain, two Type HS 313 Amplifiers may be associated with two drive units and the outputs fed to separate spaced aerials, either on different frequencies or in different polarizations.

Employing reception from two aerials, and a four-path receiver, a quadruple diversity system results. The advantages of such a system are as follows:—

(i) The transmitters, while normally working together, can operate alone and thus form an active stand-by to each other if either should fail.

(ii) With full operation, a diversity gain equivalent to some 5 or 6 dB improvement over the dual diversity system is achieved.

Features

Four cavity power klystron employed, carriage-mounted for easy withdrawal and ready accessibility.

Miniature circuit breakers employed for overload protection, thus eliminating entirely the need for fuses.

Front access only will suffice for general maintenance, thus achieving maximum space economy.

Air-cooled HT transformers are mounted *inside* the amplifier.

Automatic restarting after a mains failure.

HT re-cycling minimizes stoppage periods due to transient faults.

Comprehensive protection is afforded to both equipment and personnel.

Suitable for operation in tropical climates over an ambient temperature range of −18°C to +55°C with up to 100% humidity.

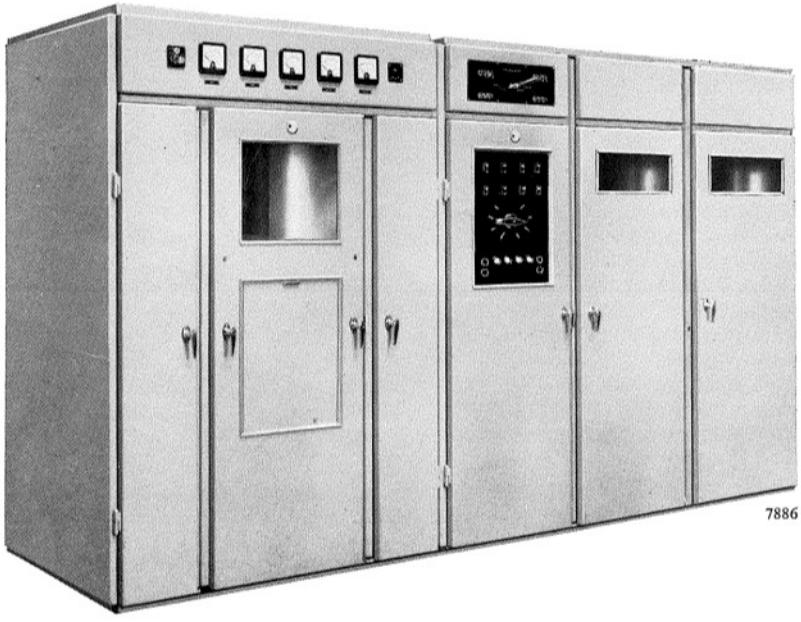
EQUIPMENT

The amplifier consists of a 10 kW water-and-air-cooled klystron which together with its power supplies is housed in four free-standing cubicles 7 ft high. Three of these contain power supplies and control circuits whilst the fourth is a double cubicle and contains the klystron. Each of these units has front and rear access doors with full personnel protection provided by mechanical interlocks. Separate klystrons, each on its own slide-in carriage, are employed for the two frequency ranges.

Where space is limited the amplifier may be placed directly against the wall as adequate access for servicing can be gained through the front doors alone.

Automatic voltage regulators are installed externally to the amplifier cabinet, usually at one end of the transmitter in a cabinet matching the amplifier. The external water/air heat exchanging system is contained in an annexe.

Provision is made for automatic run-up to full power from cold, correct sequential operating being ensured by the use of preset timing units in conjunction with interlocks. Manual control may be reverted to for changing frequency, commissioning of klystron, servicing, etc. Facilities are provided to give a direct indication of power output and reflection coefficient in the output feeder.



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Data Summary

Frequency ranges: 400–525 Mc/s and 680–970 Mc/s.
Service: Multi-channel telephony and telegraphy.
Power output: 10 kW continuous.
Output impedance: 50 Ω unbalanced.
Frequency tolerance: ±10 parts in 10^6 from 0–50°C.
Frequency response: ±0·5 dB from 6–300 kc/s with ref. to level at 100 kc/s.
Input: 10 W into 50 Ω unbalanced at radiation frequency.
Associated drive unit: Type HD 313.
Power supply: 380–440 V (±10%), 45–65 c/s (±2½%), 3-phase AC, using associated voltage regulator.
Power consumption: 40 kW at 0·9 PF.
Dimensions:
Height 7 ft 2¼ in. (219 cm)
Width 12 ft 6 in. (380 cm)
Depth 3 ft 9 in. (114 cm)

Marconi

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