Marconi Receiver Matching and Switching Units

Certain types of aerials terminating in open-wire feeders require matching to screened feeders for leading into the receiver building. Marconi aerial matching units form a convenient and efficient means of achieving this. The Matching Unit Type H 2405 provides matching facilities over a wide band of frequencies, and is adaptable for use with a considerable range of balanced or unbalanced aerial and feeder systems. It consists of a wide band transformer, moulded in a high-quality synthetic resin, mounted on a casting, and covered with a showerproof cover. The unit is provided with fixing lugs for bolting to the aerial mast or suitable neighbouring object. The open-wire feeders are terminated on porcelain lead-in insulators and provision is made to accommodate a cable gland to suit the output cable employed. Satisfactory operation is maintained in ambient temperatures between −40°C and +100°C and in conditions of high humidity (equivalent to R.C.S 214 Clause H1).

There are two windings on the transformer. One is unbalanced and suitable for terminating a line of 50 or 75 Ω impedance. The other winding is balanced and has tappings suitable for terminating a line of 300 or 600 Ω impedance.

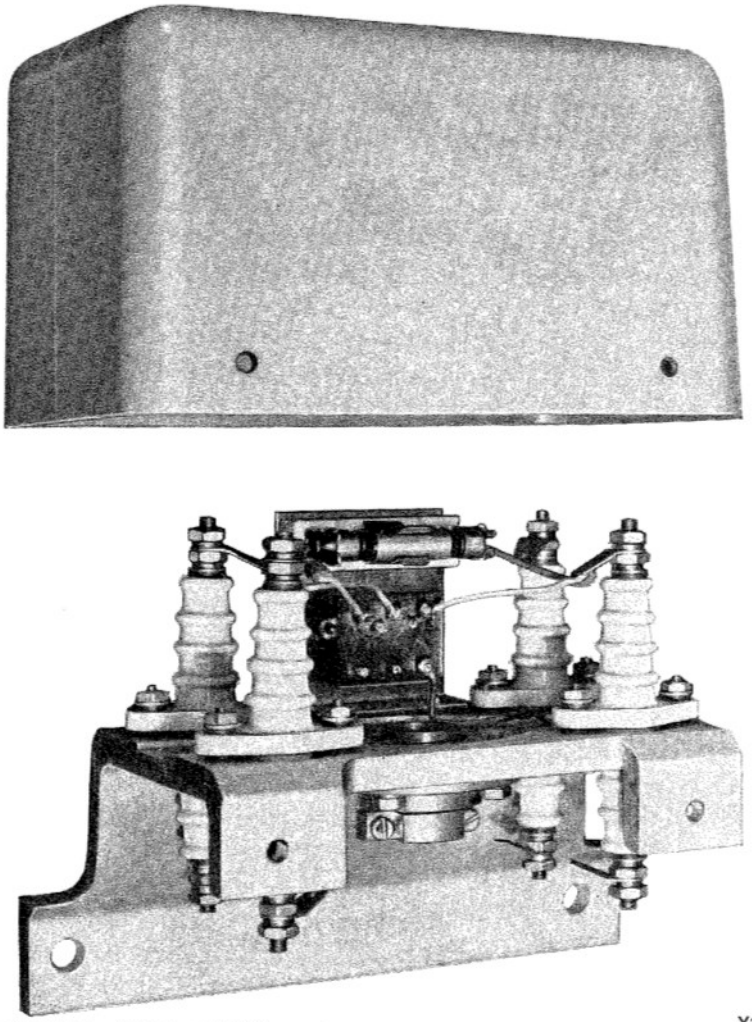
Protection against lightning is provided for both limbs of the aerial.

The Matching Unit Type HA 21 has a similar specification but is mounted in a robust galvanized iron case with a waterproof cover and is not fitted with lightning protection devices.

Similarly-constructed straight-through junction boxes are also available. These are suitable, for example, for open-wire connection to a short screened lead-in and include lightning arrestor gear. The following types are made:

Type 1255: Twin open-wire to twin screened cable.

Type 1583: Single aerial wire to single coaxial cable.



Aerial Matching Unit Type H 2405

Y1041

Data summary

Type H 2405

Frequency range: 1 to 30 MHz with reduced performance between 100 kHz and 1 MHz.

Input impedance: 300 or 600 Ω balanced.

Output impedance: 50 or 75 Ω unbalanced.

Insertion loss: Not greater than 2 dB over the range 1 to 30 MHz. 5 dB at 100 kHz.

Balance Ratio: Greater than 30 dB over the range 1 to 30 MHz.

Dimensions:

Height	6¼ in.	(15·9 cm)
Width	7¼ in.	(18·5 cm)
Depth	4½ in.	(11·5 cm)
Weight	4 lb	(1·8 kg)

Type HA 21

Frequency range: 1 to 27·5 MHz.

Input impedance: 300 to 1000 Ω, balanced or unbalanced.

Output impedance: 50 to 200 Ω, balanced.

Insertion loss: Not greater than 2 dB over the full frequency range.

Note: *The loss in the transformer is the ratio in dB of the maximum power available from the source to the power actually delivered to the output load. This includes both mismatch losses and the power losses in the transformer.*

Dimensions:

Height	7⅜ in.	(18·7 cm)
Width	*5⅜ in.	(13·7 cm)
Depth	†3½ in.	(8·9 cm)
Weight	5 lb	(2·3 kg)

* *Without cable gland*

† *Case only: 8½ in. (21·6 cm) over insulators.*

Receiving Aerial Distribution Assembly Type H 2400

For h.f receiving stations, one or more of these assemblies can be equipped with aerial splitters (or multicouplers), to enable one aerial to be used by a number of receivers, and with aerial switching devices and patching facilities. The units which can be accommodated in this assembly are described below. The selection and arrangement of units can be made to meet particular station requirements.

Dimensions:

Height	7 ft 6 in.	(229 cm)
Width	1 ft 11½ in.	(60 cm)
Depth	1 ft	(30·5 cm)

Aerial Switching Matrix Type H 2407

This is a 5 × 1 matrix module which can be combined with others in the x and y planes to assemble a matrix of the size required for any particular installation (e.g 5 × 5, 10 × 10, etc.).

It can be used to provide mutually exclusive switching facilities between aerials and receivers, or, more beneficially, between aerials and multicouplers.

The H 2407, which uses reed relays as the switching elements, can be controlled from another position in the receiving station or, by using suitable remote control equipment and landlines or a radio relay link, from a remote site. The switching elements are fitted with change-over contacts to enable every operation to be verified by revertive checks at the extended control or remote terminal point.

The matrix unit occupies a 1¾ in. high panel in the H 2400 assembly. The Power Supply unit for operating the reed relays can also be mounted in the H 2400 cabinet.

Features

Miniature relay switching elements for simplicity and reliability.

Revertive check facilities.

Data summary

Impedance: 75 Ω.

Insertion loss with switch closed: <1 dB.

Cross-talk with switch open: >45 dB protection.

D.C operating power required: 15·5 V, 3 W maximum.

A matrix termination unit is required for each set of five aerials used.

This is a 1¾ in. high panel and will fit into the H 2400 assembly.

Passive Splitter Type H 2403

Passive Splitters (or multicouplers), consisting of ferrite-cored wideband hybrid transformers, are wideband devices which cover the whole h.f band. They have the advantage of introducing negligible intermodulation distortion although there is a slight loss in signal level. Since the noise picked up by the aerial is usually greater than the receiver first circuit noise and is reduced by the same amount as the signal, this is usually acceptable. Two versions of the H 2403 are available, one for feeding two receivers and one for four receivers.

Features

Negligible intermodulation distortion.

Extreme simplicity and reliability.

No mains power required.

Data summary

Frequency range: 2–30 MHz.

Insertion loss: 2-output version <4 dB.

4-output version: <7·5 dB.

Input and output impedance: 75 Ω.

Return loss: >15 dB with 75 Ω terminations.

Isolation: >30 dB with 75 Ω terminations.

3 and 5-way Aerial Switch Type H 2401

The H 2401 was specially developed for use with the H 2002 series MST receiver which incorporates extended control facilities in the display and control panel. Like the H 2407 switching matrix it uses reed relays and provides a revertive check for extended indication of the position of the switch. Up to five 3 or 5-day switches can be accommodated on one 5¼ in. high panel mounted in the H 2400 assembly.

Data summary

Impedance: 75 Ω.

Insertion loss with switch closed: <0·5 dB.

Cross-talk with switch open: >40dB protection.

D.C operating power required: 15·5 V, 0·3 W maximum.

Aerial feeder patching panel

Patching facilities in the H 2400 assembly can be provided by a number of panels, each carrying eight pairs of 75 Ω coaxial sockets. The pairs of sockets are so spaced that they may be bridged by using coaxial U-links so that for normal conditions no patching cords are necessary.

Mains distribution unit

This unit usually fits into the lower part of the H 2400 assembly and provides an anchor point for the incoming supplies (mains or battery). Indicator lamps, fuses and a switch are provided. The incoming mains lead ends in a socket thus enabling the mains supply to be completely isolated from the cabinet assembly when required.

Supply Unit

Two editions are available and both of these will fit into the H 2400 assembly. One edition caters for an a.c mains supply of 200 to 250 V (or 100 to 125 V) as well as a battery supply of −24 V. The other edition caters for −24 V battery supply only. The output of each edition is −15·5 V at 1·2 A and is suitable for operating the relays in the matrix unit and the 3 and 5-way aerial switches.

Rejector Unit Type H 2404

Seven editions are available covering 500 kHz and the range 2 to 30 MHz. Rejection of at least 40 dB is provided over a narrow pre-selected band within the frequency limits defined above.

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