QUAD

A.M. II

TUNER

DESIGNED FOR
THE QUAD
AMPLIFIER

QUAD

A.M. II TUNER

ALTHOUGH a VHF-FM service provides the highest possible quality of broadcast reproduction such transmissions are not available to all listeners. In addition the reception range is limited to a maximum of 50–100 miles from the transmitter.

For areas where there is no VHF-FM service, or where reception over greater distances is required, the complementary A.M. service must be used.

Broadcast A.M. tuners may be divided into two groups according to their function; those intended for the high quality reproduction of programmes from a nearby transmitter, and those intended for acceptable reception of more distant transmitters.

The QUAD A.M.II tuner has been designed to perform either of these functions, the choice being that of the listener.

DESCRIPTION

A superheterodyne circuit is used with a tuned Radio Frequency amplifier stage. The Intermediate Frequency amplifier can be switched to provide either a narrow-band response or a wide-band response.

With the selectivity switch in the "Wide" position the I.F. amplifier allows an overall response to over 10kc/s and the R.F. amplifier ensures a very low level of receiver background noise. When reception conditions are suitable the quality of reproduction is comparable with that provided by a VHF-FM service.

In the "Filter" position of the selectivity switch the wide-band I.F. response remains available, but a rejection filter is included to eliminate the high pitched whistle generated by interaction of the received carrier and an adjacent channel carrier. The filter rejection is so narrow that it has little effect upon the quality of reproduction.

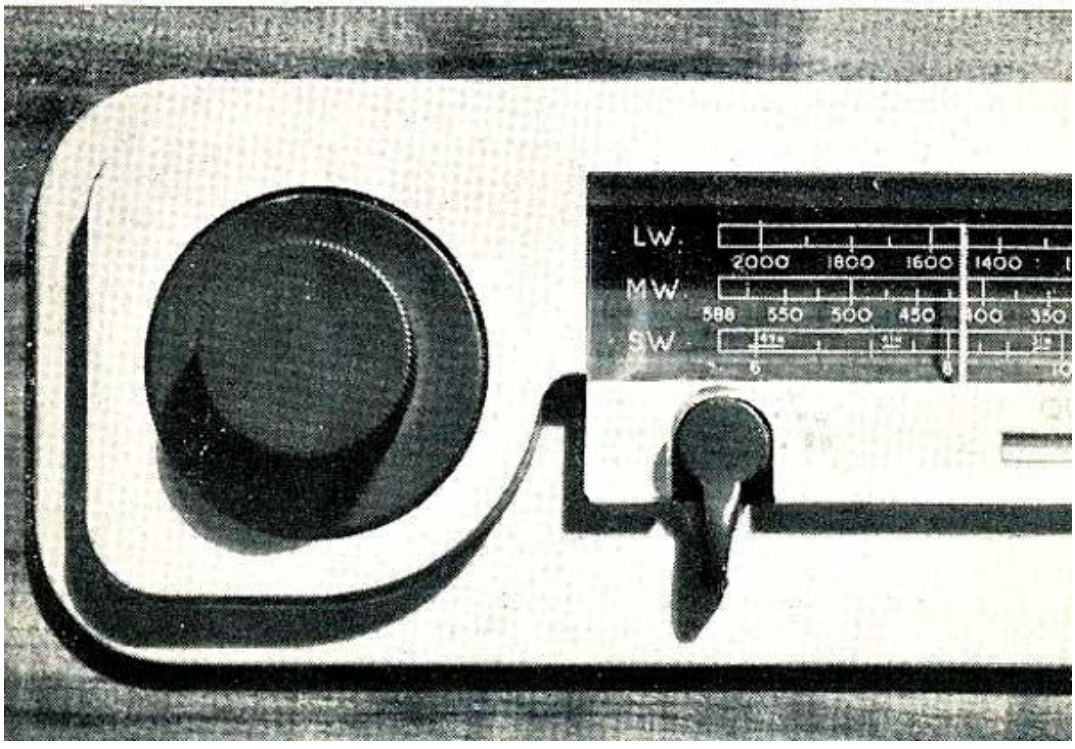
In the "Narrow" position of the selectivity switch

the I.F. passband is reduced to improve separation between transmissions. This, with the R.F. amplifier, gives a tuner of high sensitivity, good selectivity and image rejection, and improved automatic gain control characteristics. The overall response is equalised to 5kc/s and acceptable reproduction is obtained from distant transmitters despite the congested state of the broadcast bands.

A tuning indicator is provided of the luminous ribbon type which gives a clear indication of the correct tuning point in the "Narrow" switch position. The receiver tuning does not alter when the selectivity switch is changed so that the tuning indicator is made inoperative in the "Wide" and "Filter" positions.

The QUAD A.M.11 tuner is of the same style and size as the other QUAD control units and tuners. It is enclosed in a removable cover which permits mounting through a cabinet cut-out. Each unit is provided with leads for direct connection to the QUAD 22 or Q.C.11 control units from which the tuner power supply is taken. The leads, aerial, and earth connections are passed through the rear of the cover.

An aerial external to the tuner must be provided. Although the high sensitivity of the tuner allows the use of a short aerial, the best results will be obtained with a good aerial preferably of the vertical type.



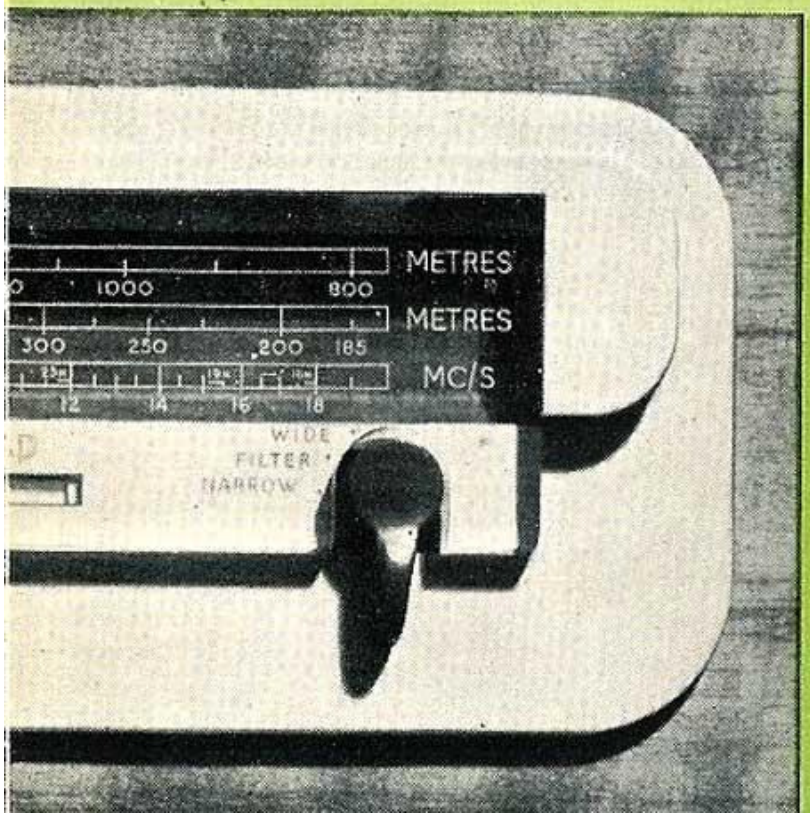
CIRCUIT DETAIL

The aerial is transformer coupled to a variable-μ R.F. amplifier pentode (EF 89) the anode circuit of which is transformer coupled to the mixer grid. Both grid circuits are tuned on all wave-bands, and the Q of the medium wave circuits is reduced when switched to select a wide-band response.

A triode heptode (ECH 81) is used as the local oscillator and mixer. The oscillator anode circuit is tuned, and it is tracked by high-stability close-tolerance capacitors.

The 470kc/s output from the mixer anode is transformer coupled to the I.F. amplifier. The coupling is critical (Qk=1) in the narrow band condition. In the wide band condition the coupling is increased (Qk=4) by including a tertiary winding; this method ensures that the response remains symmetrical about the centre frequency.

The I.F. amplifier is the pentode section of a double diode pentode (EBF 89). This valve has a high slope combined with a low anode-grid capacitance. A simple fixed neutralising circuit is used further to reduce the effective anode-grid capacitance. This allows a high stage gain without tilting the response within the I.F. pass band.



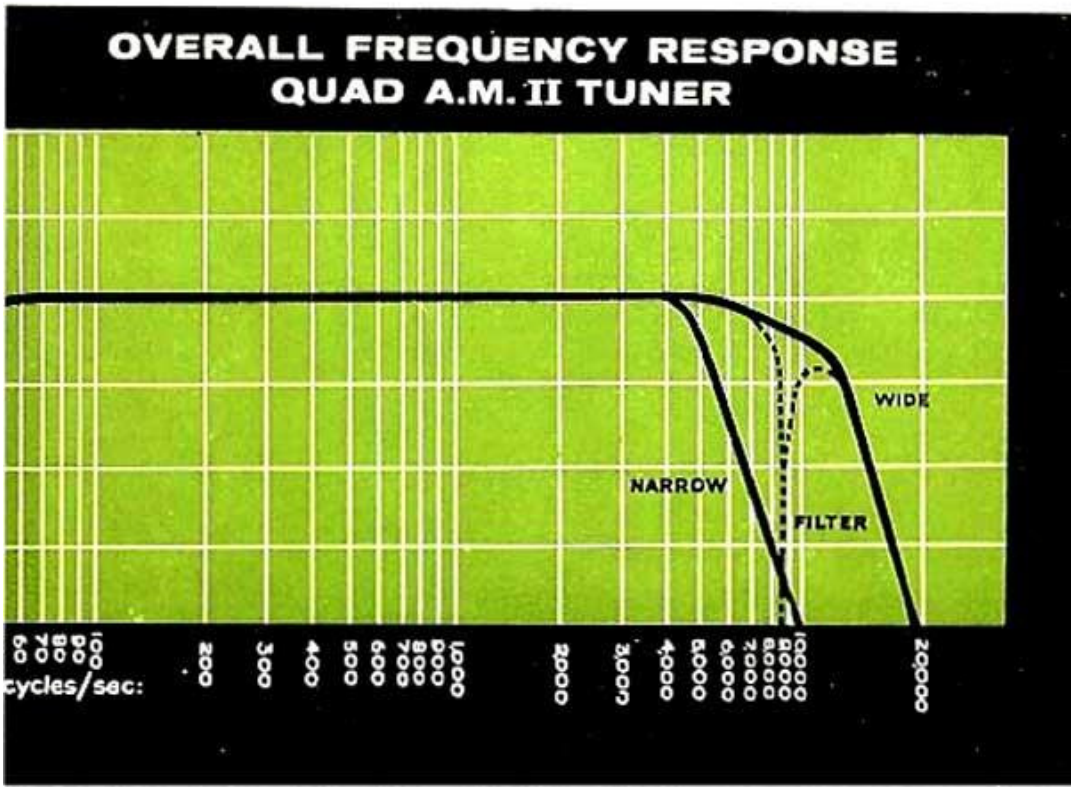
FRONT PANEL OF THE QUAD A.M. II TUNER

One diode of the EBF 89, with a small delay voltage applied, is used to provide the AGC voltage. This voltage is applied fully to the R.F. and mixer stages, and partially to the I.F. stage. The AGC circuit provides good control and large input signals are accepted without overload.

The I.F. amplifier anode is transformer coupled to the diode signal rectifier. The loaded Q of this transformer is half that of the first I.F. transformer and the coupling is critical. In the wide-band condition the combined I.F. response is within ±1dB to 12kc/s and in the narrow-band condition it is —3dB at 3·5kc/s. The narrow-band response is equalised to 5kc/s by an audio frequency circuit. In the "Filter" position of the selectivity switch a bridged-T rejection circuit tuned to the adjacent channel heterodyne whistle is combined with the wide-band response.

The audio output is taken from a small fraction of the diode load in order to minimise distortion with heavily modulated input signals.

The tuning indicator (EM 84) has a variable-μ characteristic and will give a clear indication of the correct tuning point over a wide range of input signal levels. The greatest accuracy of indication is given when the I.F. amplifier has a narrow pass band. The indicator is therefore made inoperative in the wide-band switch positions.



SPECIFICATION

Tuning range:	A.M.11/European Long wave: 2070-800 metres Medium wave: 588-185 metres Short wave: 5·8-18·5 mc/s A.M.11/Overseas Medium wave: 510-1620 kc/s Short wave 1: 2·2-6·6 mc/s Short wave 2: 5·8-18·5 mc/s
Output level:	100mV (Nominal for 30% modulation)
Output resistance:	15,000 ohms
Audio Response:	See curve
Filter rejection frequency:	A.M.11/European: 9kc/s A.M.11/Overseas: 10kc/s
Power requirement:	HT 35 mA at 330V LT 1·2 A at 6·3v
Power and Signal cable lengths:	40" (1m)
Valve complement:	EF 89, ECH 81, EBF 89, EM 84.
Front panel:	Silvered Fawn
Knobs:	Matt Brown
Dimensions:	10½" × 3½" × 6" (267 × 89 × 153 mm)
Weight:	6 lbs. (2·7 Kg.)
Price:	£24 plus £9 P. Tax

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1882/461/3M