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RECEIVERS, RADIO, RACAL, TYPE RA17

TECHNICAL HANDBOOK - DATA SUMMARY

PURPOSE

General purpose communications receiver.

DESCRIPTION

This is a high grade general purpose communications receiver which provides a high order of sensitivity, selectivity and stability. The circuit employs triple frequency conversion of unconventional design. Band switching is electronic, in 1Mc/s steps, a variable second i.f. providing a very stable interpolation re-

ceiver. A crystal calibrator is incorporated which provides check points at 100kc/s intervals. A number of audio and i.f. outputs are provided for flexibility of operation. The receiver can be provided for rack mounting or as a table model. The main chassis is of rigid cast construction on which sub-units are mounted. Comprehensive screening is employed between sub-units and stages.

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PHYSICAL DATA

	<i>Rack mounting</i>	<i>Table mounting</i>
Weight:	67 lb	97 lb
Height:	10.1/2 in.	12 in.
Width:	19 in.	20.1/2 in.
Depth:	20.1/8 in.	21.7/8 in.

FREQUENCY

Tuning range

1 - 30Mc/s
(with slightly degraded performance down to 500kc/s)

Intermediate frequency

First i.f.: 40Mc/s \pm 650kc/s (Comprehensive band-pass filter)
 Second i.f.: tuneable over 2-3Mc/s
 Third i.f.: 100kc/s; two stages including a crystal filter employing six crystals.

<i>Bandwidth</i>	$-6dB$	$-66dB$
1	8kc/s	20kc/s
2	3kc/s	15kc/s
3	1.2kc/s	8kc/s
4	750c/s)	less than 3.5kc/s: obtained with crystal lattice filters
5	300c/s)	
6	100c/s)	

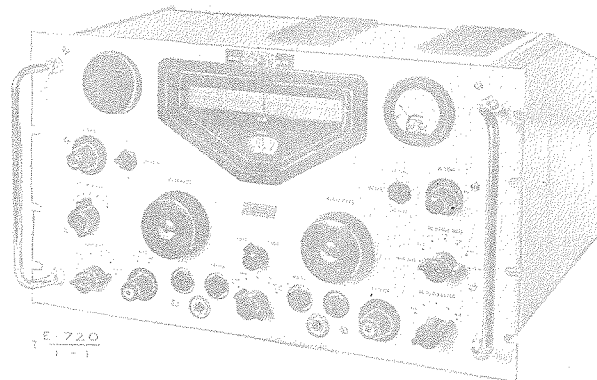


Fig 1 - General view

PERFORMANCE

Stability

Up to three hours warm-up drift is less than 1500c/s under conditions of constant supply voltage and ambient temperature. After this period, drift is less than 150c/s.

Sensitivity

C.W. reception at 3kc/s bandwidth, 1 μ V for 20dB signal-to-noise ratio.

M.C.W. reception at 3kc/s bandwidth, with 30% modulation, 3 μ V for 20dB signal-to-noise ratio.

Calibration

A 100kc/s signal derived from a 1Mc/s crystal oscillator having stability accuracy of 5c/s in 1Mc/s provides check points at 100kc/s on the dial.

Cross modulation

Using the aerial attenuator with the r.f. amplifier tuned to a wanted signal of 1mV and the i.f. bandwidth set to 3kc/s, an unwanted signal differing by 10kc/s with 30% modulation requires a level at least 30dB greater than the wanted signal in order to cause cross modulation output equivalent to 1% modulation of the wanted signal.

Image and spurious responses

With a tuned input, external image signals are at least 60dB down. Internally generated spurious responses are below noise level in all cases.

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Noise factor

1.5Mc/s: less than 8dB
3Mc/s:)
6Mc/s:) less than 6dB
12Mc/s:)
24Mc/s:)

A.V.C.

In increase in signal level of 20dB above 1 μ V improves the signal-to-noise ratio by 20dB and an increase in signal level of 60dB above 1mV increases the audio output by less than 6dB.

Audio response

With 8kc/s i.f. bandwidth, response remains within \pm 3dB from 250c/s to 3500c/s.

Distortion

Not greater than 5% at 50mW output.

POWER REQUIREMENTS AND CONSUMPTION

100-125 and 200-250V, 45-65c/s
Consumption: 85W approximately

AERIAL

75 Ω input impedance, unbalanced.

END