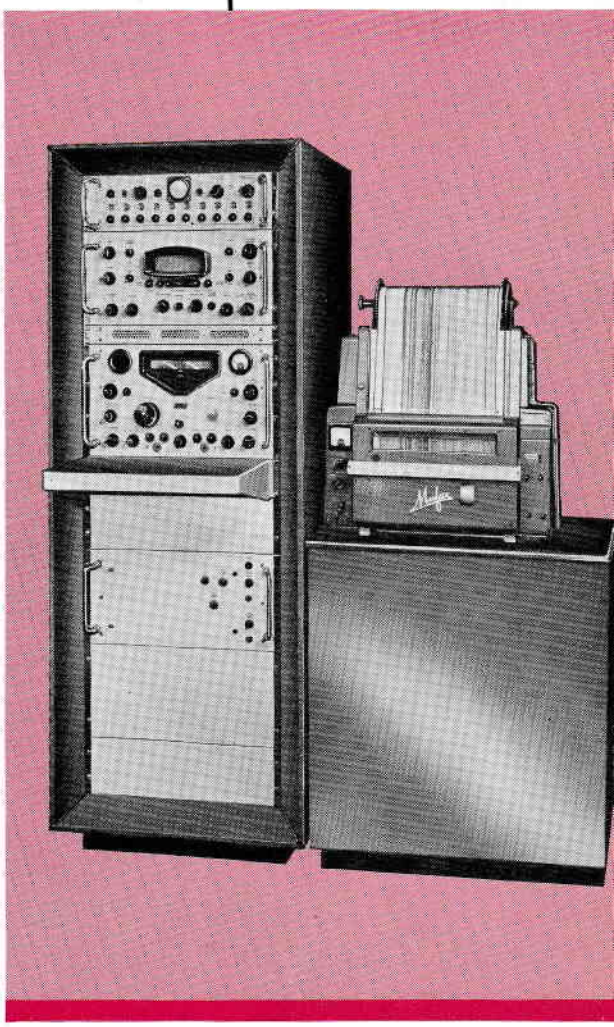
PANORAMIC RECORDING RECEIVER

RA.166



The Panoramic Recording Receiver Type RA.166, (Panfax) has been developed to eliminate problems arising in the operational use of panoramic receivers caused by the short display time of the image presented on the cathode ray tube. The Panfax Recorder, in providing a permanent record of the spectrum under examination, is of great value to telecommunication authorities who require recordings over a given period of activity in a selected frequency band to determine suitable "spot" working frequencies for service allocation. It is also of considerable assistance in monitoring selected frequency bands in the search for frequency position of random sources of radio interference.

Recordings of up to 24 hours duration can be made, without attention to the equipment, by the automatic insertion of time and/or frequency markers as and when required.

Two versions are available: the RA.166A comprises a Racal H.F. Communications Receiver type RA.17, a Panoramic Adaptor Type RA.66B, a Tone Generator and Voltage Control Unit Type MA.256, and a Mufax Chart Recorder Type D-611-X. The RA.166B, by the addition of a Megacycle Stepping Unit Type MA.257, provides all the facilities of the RA.166A plus automatic selection of the megacycle bands to be scanned. This is by preselection of ten 1 Mc/s bands, within the range 1-30 Mc/s, taken in any sequence for unattended recordings of the selected bands over a 24 hour period.

Descriptions and technical specifications for the RA.17 Receiver and RA.66B Panoramic Adaptors are given in leaflets 143C and 146C respectively. A technical specification and description of the Muirhead D-611 Mufax recorder can be supplied on request.

OUTSTANDING FEATURES

- ★ Permanent record of spectrum under examination
- ★ 24-hour unattended operation possible
- ★ Special version for programmed monitoring

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PANORAMIC RECORDING RECEIVER TYPE RA.166

The time-base of the RA.66B is operated by an external trigger pulse, derived from the Muirhead Mufax Chart Recorder. The recorder operates at 120 or 60 sweeps per minute. The sweep control on the RA.66B offers the choice of four periods (0.2, 0.5, 1 and 2 seconds) which can be triggered either internally or from an external trigger pulse supplied by the recorder. The d.c. deflection pulses from the Panoramic Adaptor, which create the vertical "pips" on the cathode-ray tube, are fed to the Tone Oscillator Unit where the deflection voltage is used to modulate the output of an audio frequency oscillator; the modulated AF signal then being passed to the recorder.

In the recorder an electro-sensitive paper is drawn at constant speed between a stainless steel writing edge and a rotating helix. Current is passed through the paper at the point of contact, causing a chemical action which marks the paper. The density of the trace depends upon the magnitude of the current, which is controlled by the received signal. The rotation of the helix and the movement of the paper together cause the point of intersection to traverse the paper in a series of horizontal lines.

At the commencement of each traverse of the recording trace, the time-base of the RA.66B is triggered and the frequency of the sweep oscillator moves through the RF band under investigation. At the same time the recording trace passes horizontally across the sensitised paper, making a mark when a signal is present. At the end of the sweep the RA.66B time-base returns to zero and awaits the next trigger pulse.

In addition to this basic recording facility, it is possible to inject 100 kc/s marker pulses from the RA.66B for chart calibration purposes. These marker pulses may be manually switched to the recorder, by means of a push button or, when an external timing clock is employed, may be switched automatically at pre-determined intervals. In the latter case, timing markers can also be inserted on the record.

The RA.166B incorporates, in addition, a 1 Mc/s Stepping Unit which provides automatic stepping of the "Megacycles" control of the RA.17 receiver. This also involves the fitting of a new 1st VFO unit to the RA.17 where the megacycle switching is accomplished electrically by means of an incremental inductor in the VFO circuit. The 1 Mc/s Stepping Unit allows the pre-selection of ten 1 Mc/s bands which are programmed by means of ten pre-set potentiometers mounted on the front panel of the unit. The design is such that the programme can be carried out in any sequence, i.e. it need not necessarily follow numerical order. The number of lines scanned per megacycle can be selected by a four position switch which gives the choice of 5, 10, 15 or 20 lines. Other arrangements can be made to special order.

TECHNICAL SPECIFICATION

Frequency Range:
1-30 Mc/s.

Frequency Sweep:
Continuously variable spectrum width from 100 kc/s to 1.04 Mc/s. Spectrum centre control permits selected sweep to be centred anywhere in the explored band.

Sweep Times:
Panoramic Adaptor: 0.2, 0.5, 1 and 2 second.
Recorder: 0.5 and 1 second (120 and 60 sweeps/min. respectively).

Chart Width:
11 in. (28 cm.).

Scanning Pitch:
75 lines/inch.

Paper Speed:
0.8 and 1.6 in./minute (60 and 120 r.p.m.), giving duration of 25 hours and 12½ hours, respectively, for a 100 ft. roll of paper. By use of a suitable external clock, time markers may be inserted on the chart.

Frequency Markers:
100 kc/s marker pulses are available from the RA.66B for chart calibration purposes. On the RA.166 installation, these marker pulses may be printed at any time by manual switching, or they may be printed automatically at pre-determined intervals by means of an external timing clock.
On the RA.166B installation, they can be printed automatically in addition, between each sequence of Megacycle Band recordings.

Automatic Megacycle Band Switching (RA.166B only):
Ten one megacycle bands, programmed in any sequence by present potentiometers. Selection of number of lines scanned per megacycle by four position switch, giving choice of 5, 10, 15 or 20 lines.

Power Supply:
198-258 v, 47-65 c/s, Single phase, a.c.
Other voltages to order.
Consumption: RA.166A: 550VA
RA.166B: 600VA

Dimensions and Weights:
RA.166A Receiver:
(a) for rack mounting:
33¼" high × 19" wide × 19" deep
84.5 cm × 48.3 cm. × 48.3 cm.
weight: approx 190 lb. (86.3 kg.)
(b) Housed in cabinet:
65¾" high × 24½" wide × 27" deep
167 cm. × 62.3 cm. × 68.5 cm.
weight: approx 340 lb. (155 kg.)
Recorder (for bench mounting):
23" high × 21" wide × 18" deep
58.5 cm. × 51 cm. × 45 cm
weight: 70 lb. (32 kg.)
RA.166B Receiver:
(a) for rack mounting:
38½" high × 19 "wide × 19" deep
97.8 cm. × 48.3 cm. × 48.3 cm.
weight: approx 220 lb. (100 kg.)
(b) Housed in cabinet:
65¾" high × 24½" wide × 27" deep
167 cm. × 62.3 cm. × 68.5 cm.
weight: approx 370 lb. (168 kg.)
Recorder (for bench mounting): as for RA.166A above.

Details of the standard RA.17 Receiver and RA.66 Panoramic Adaptor are given in Racal Technical Publication Nos. 143C and 146C respectively.

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