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Colin Hinson

In the village of Blunham, Bedfordshire, UK.

WIRELESS SET AD. 77 (ZA 13091)

DATA SUMMARY

PURPOSE

A small transmitter with C.W., M.C.W. and R/T facilities.

DESCRIPTION

This transmitter employs a Hartley master oscillator, a modulator and a magnifier stage, the latter using two pentodes in parallel. Keying is by means of a relay, energized by a morse key or pressel switch. The set is housed in a metal case.

PHYSICAL DATA

Weight : 39 lb.
Length : 1 ft. 6 in.
Width : 12 in.
Height : 1 ft. 4 in.

FREQUENCY

Coverage : Range 1 8,570-5,000 kc/s (35-60 m.)
Range 2 5,455-2,857 kc/s (55-105 m.)
Range 3 545-273 kc/s (550-1,100 m.)

Calibration curves with each transmitter give relation between dial reading and transmitter frequency.

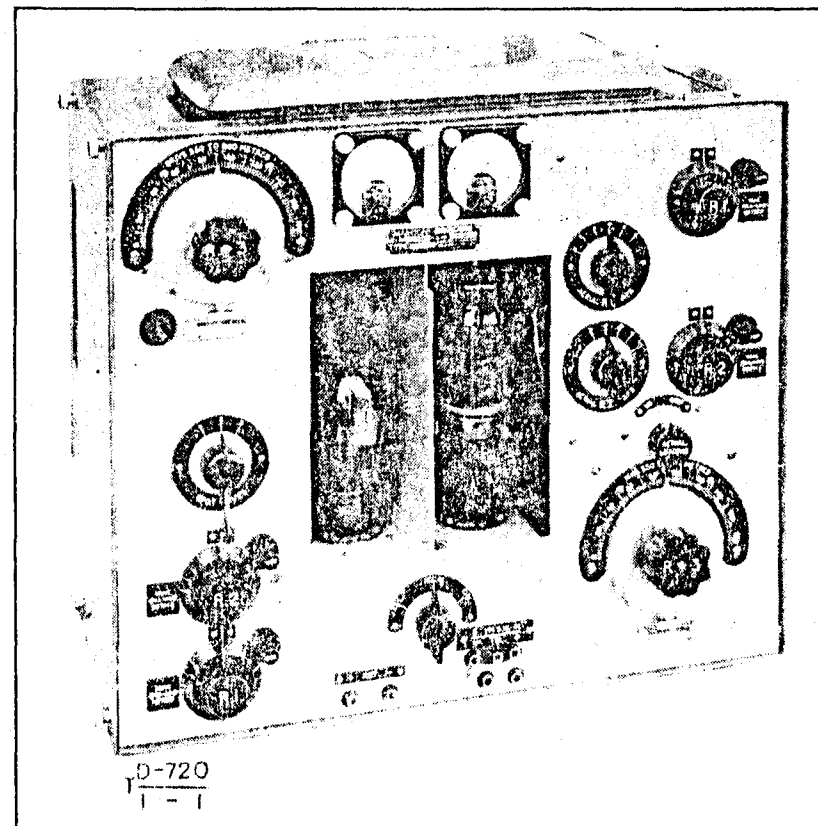


Fig. 1—Front view of set

TELECOMMUNICATIONS
D 720

ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS

PERFORMANCE

Sender output: 40-50W.

POWER REQUIREMENTS AND CONSUMPTION

Power supply: 12V accumulator, feeding P.S.U. No. 3 to give 1,200V, 200 mA.

AERIAL SYSTEM

Suitable for Marconi dipole aerial or aircraft type trailing aerial.

VALVES

<i>Circuit reference</i>	<i>Type</i>	<i>Function</i>
V1A	VT 105	Master oscillator
V2A and V2B	VT 104	Magnifier
V1B	VT 105	Modulator

END

WIRELESS SET AD 67D (ZA10746)

DATA SUMMARY

PURPOSE

For use on special L of C, providing C. W., M.C. W., and R/T facilities ; used with receivers CR 100 or R 107.

DESCRIPTION

The sender is fitted with six separately tuned master oscillator and magnifier circuits, one for each of the six frequency ranges. It employs two valves in parallel as magnifiers, a master oscillator and a modulator. Power supply is normally from the batteries, but a supply unit can be used with 230V A.C. mains.

PHYSICAL DATA

	AD 67 (Sender in case)	Rotary trans- former (in case)	S.U.R. No. 12
Weight :	93 lb.	61 lb.	80 lb.
Length :	30 in.	29 in.	29 in.
Height :	21 "	13 "	13 "
Depth :	15 "	15 "	15 "

FREQUENCY

Coverage :	Range 1.	20	—	13.64	Mc/s
	" 2.	14.29	—	9.38	"
	" 3.	10	—	7.143	"
	" 4.	7.5	—	3.33	"
	" 5.	3.75	—	1.5	"
	" 6.	545	—	273	kc/s

PERFORMANCE

Sender output :	C. W.	—	75 W
	M.C. W.	—	35 W
	R/T	—	35 W

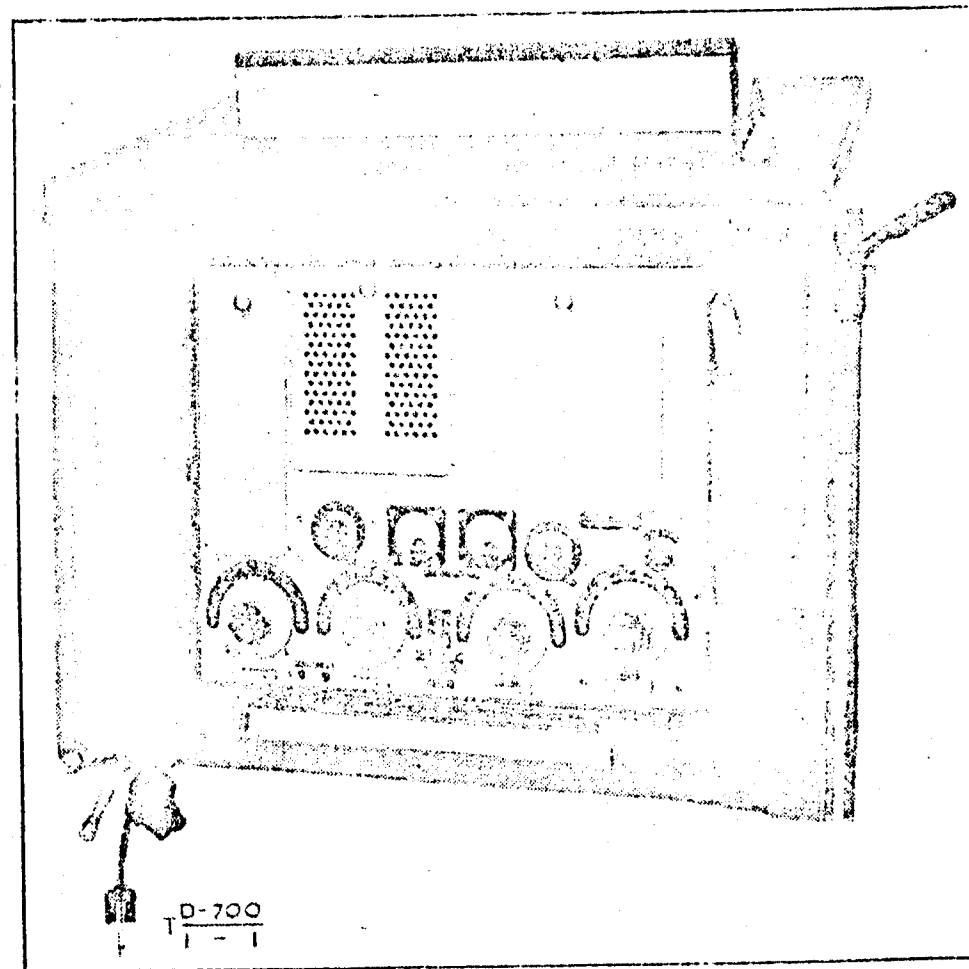


Fig. 1—General view of equipment

POWER REQUIREMENTS AND CONSUMPTION

Power supply : 12V battery feeding a rotary transformer which gives 1,200V, 200mA. or 230V($\pm 10V$), 40-60 c/s, A.C. mains with Supply unit rectifier No. 12 to give 1,200V H.T.
Sender has a power consumption of 420 W

AERIAL SYSTEM

- | | | | | |
|-----------|-------------|--------|----------|-----------|
| (a) No. 1 | 24 ft. wire | for 20 | —10 Mc/s | frequency |
| (b) No. 2 | 49 " " | " 10 | — 5 " | " " |
| (c) No. 3 | 100 " " | " 5 | — 2.5 " | " " |
| (d) No. 4 | 200 " " | " 2.5 | — 1.5 " | " " |

VALVES

<i>Circuit reference</i>	<i>Type</i>	<i>Function</i>
V1	DET12 (VT 62)	Master oscillator
V2A	PT15 (VT104)	} Magnifiers
V2B	PT15 (VT104)	
V3	ML 6 (VT105)	Modulator

END

WIRELESS SET, TYPE CR 100

DATA SUMMARY

PURPOSE

High-grade communication receiver for use in fixed stations.

DESCRIPTION

The receiver embodies two R.F. amplifier stages ; mixer with separate local oscillator ; three I.F. amplifier stages with four selectivity positions, the first being fed from the mixer via a crystal filter circuit ; a double-diode-triode, incorporating the second detector, A.V.C. rectifier and first audio frequency amplifier output stage ; beat oscillator ; power supply. Eleven valves are employed. Provision is made for A.C. mains operation or operation from batteries. Two aerial input sockets, one for low-impedance (100-120 Ω), and one for high-impedance aerial systems, are provided. Three types of outputs are available :—

- (a) Headphones from two panel jacks.
- (b) Loudspeaker terminals (3 Ω).
- (c) Line terminals (600 Ω).

Sidetone facilities are provided for use in conjunction with a sender.

PHYSICAL DATA

Weight : 82 lb.
Width : 15 $\frac{15}{16}$ in.
Depth : 16 $\frac{1}{16}$ in.
Height : 12 $\frac{1}{2}$ in.

FREQUENCY

Coverage : 60 kc/s to 30 Mc/s with a gap between 420 and 500 kc/s.

- Range :
- 1. 60 kc/s to 155 kc/s.
 - 2. 155 kc/s to 420 kc/s.
 - 3. 500 kc/s to 1.4 Mc/s.
 - 4. 1.4 Mc/s to 4 Mc/s.
 - 5. 4 Mc/s to 11 Mc/s.
 - 6. 11 Mc/s to 30 Mc/s.

Internal : 465 \pm 2 kc/s.

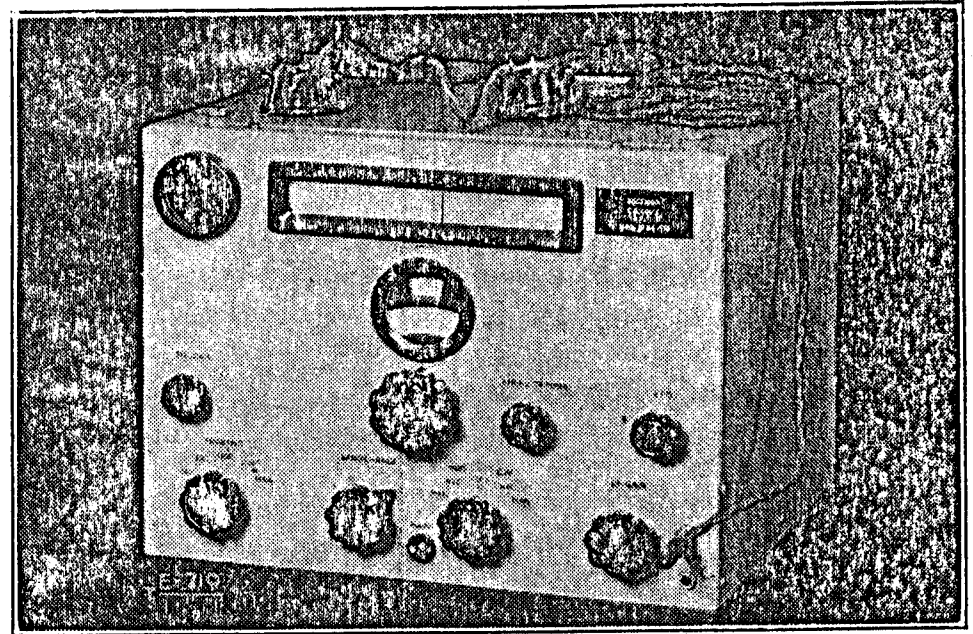


Fig. 1—General view of equipment

PERFORMANCE

Sensitivity :

R.T. : Total input voltage necessary to ensure a 10db. signal noise ratio and operate the A.V.C. system is $2\mu\text{V}$.

C.W. : Total input voltage necessary to ensure a 20db. signal noise ratio and operate the A.V.C. system is $2\mu\text{V}$.

Selectivity : Second channel ratio is greater than 100db. at 60 kc's falling to 25db. at 28 Mc's.

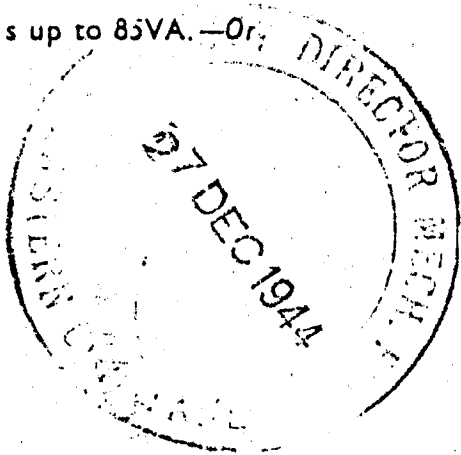
I.F.

Pass band switch position	Total bandwidth at 6db. down
6 kc/s	5 — 8 kc/s
3 kc/s	2 — 3.5 kc/s
1.2 kc/s	1.0 — 1.5 kc/s
0.3 kc/s	0.25 — 0.45 kc/s

Pass band switch at 100 c/s brings in an A.F. filter.

POWER REQUIREMENTS AND CONSUMPTION

A.C. mains 200-250V 50 c/s up to 85VA. — Or —



Batteries, 250V at 100mA, and 6V at 4A.

VALVES

Circuit reference	Type	Function
V1A	KTW.62	R.F. amplifier
V1B	KTW.62	R.F. amplifier
V2A	X.65	Mixer
V1C	KTW.62	Local oscillator
V1D	KTW.62	1st I.F. amplifier
V1E	KTW.6.2	2nd I.F. amplifier
V1F	KTW.62	3rd I.F. amplifier
V3A	DH.63	2nd det. A.V.C. and L.F. amplifier
V4A	KT.63	Output
V1G	KTW.62	Beat oscillator
V5A	V.50	Rectifier

END

WIRELESS SENDER S.W.B.IIE MODIFIED FOR S.S.B. WORKING

DATA SUMMARY

PURPOSE

High-power sender using a 2-channel single-sideband system, transmitting two audio-frequency channels, each 6kc/s wide, over long-distance links.

DESCRIPTION

The sender consists of a modified S.W.B. IIE and three extra units, a monitor unit, a drive unit and a modulator unit.

The two input channels, A and B, are fed to the drive unit which produces a modulated (double-sideband) output at 3.1Mc/s. The upper sideband carries channel A information, and the lower sideband channel B information. Two stages of modulation are employed in the drive unit and unwanted sidebands are removed by crystal filters. The drive unit output is fed to the modulator rack which is interposed between stages 3 and 4 of the modified S.W.B.IIE sender.

The monitor rack permits signals at any point in the system to be monitored, and measurements of level and distortion made.

Issue 1, 10 Jan. 1948

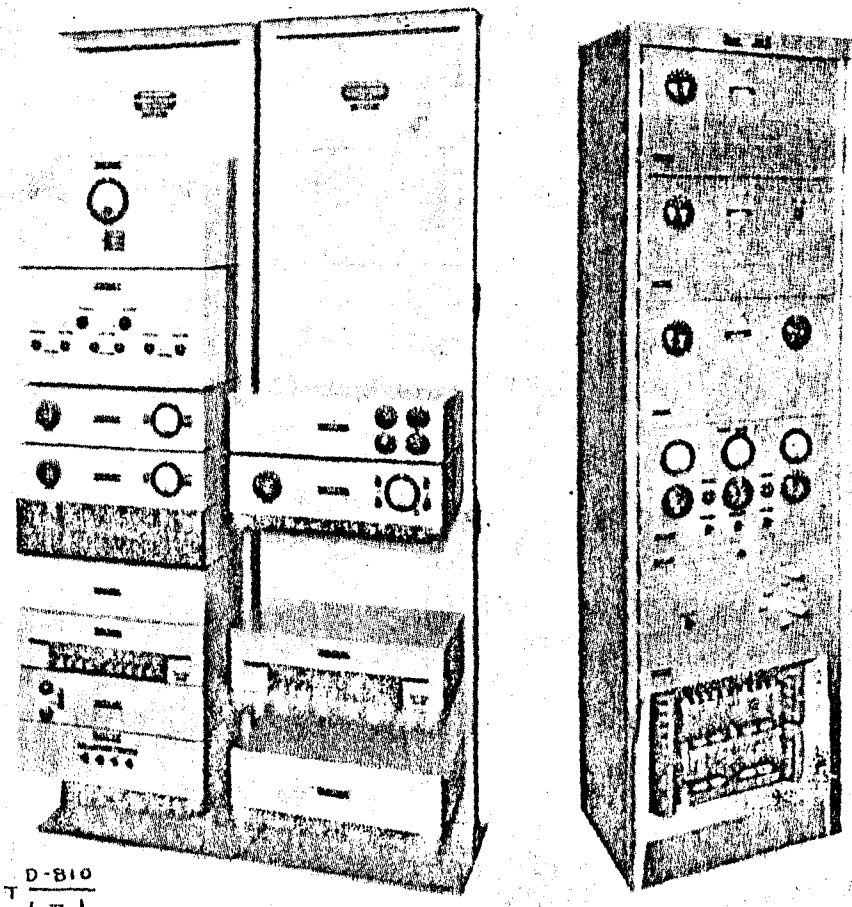


Fig. 1—Front view of drive, monitor, and modulator (M3) racks

PHYSICAL DATA

	M3 rack	Drive rack	Monitor rack
Weight:	280 lb.	566 lb.	270 lb.
Height:	6 ft. 0 in.	6 ft. 9 in.	6 ft. 6 in.
Depth:	1 ft. 6 in.	1 ft. 9 in.	1 ft. 9 in.
Width:	1 ft. 9 in.	1 ft. 9 in.	1 ft. 9 in.

FREQUENCY

Coverage: 4.0—22.2Mc/s
Carrier frequencies in drive unit: 100kc/s and 3.1Mc/s
Power output: 3.5—4.5kW.

POWER REQUIREMENTS AND CONSUMPTION

M3 rack: 60W, 230V, 50c/s, single-phase.
Drive and monitor rack: 250W, 230V, 50c/s, single-phase.
Sender: as for unmodified S.W.B.11E (major).

AERIAL SYSTEM

Rhombic aerial with 600Ω twin-wire feeder.

REMARKS

The monitor rack must be operated at least 30 feet away from the sender. By changing over link and socket connections, the sender can be restored to normal C.W. working.

VALVES

Unit	Panel	Valve No.	CV. No.	Comm. name
Drive unit	IFI	V1—2	1065	SP6I
		V3—4	509	6V6G
		V5	1301	D63
	Mod 1, 2	V1—6	1065	SP6I
	LAV 1	V1	1038	MHL4
		V2	1732	ML4
	AFO	V1—2	509	6V6C
O2	V1	1124	MS—Pen	
	V2	1188	N43	
O1	V1	1065	SP6I	
H.T.	V1—2	1070	GU50	
Monitor unit	MR	V1—5	1065	SP6I
	MRA	V1 V2	1038 1732	MHL4 ML4
M3 rack	IM3	V1	124	807
	Mod 3	V2	124	807
	OM3	V3	124	807
	Rect	V4	1071	U52

(BY COMMAND OF THE ARMY COUNCIL)

WIRELESS SENDER S.W.B.11E

TECHNICAL HANDBOOK - DATA SUMMARY

Note: This issue, Pages 1 to 2 supersedes Pages 1 and 2, of Issue 2, dated 28 Jul. 1950. It has been amended throughout.

PURPOSE

A high-power, high-frequency, C.W. transmitter for use in static L. of C. installations.

DESCRIPTION

The equipment consists of two units, the transmitter and its rectifier and control unit. A Franklin master oscillator is followed by a 4-stage harmonic amplifier driving a 2-stage power amplifier. A valve keying circuit, absorber valves and monitoring unit are incorporated. Air cooling is provided by an external blower motor. The equipment is completely enclosed and a system of mechanical interlocks prevents access to dangerous voltages.

PHYSICAL DATA

Transmitter unit Rectifier and control unit

Weight:	18 cwt.	25 cwt.
Height:	6 ft. 3 in.	6 ft. 3 in.
Depth :	2 ft. 11 in.	4 ft. 0 in.
Width :	5 ft. 3 in.	3 ft. 6 in.

Issue 3, 14 Dec. 1951

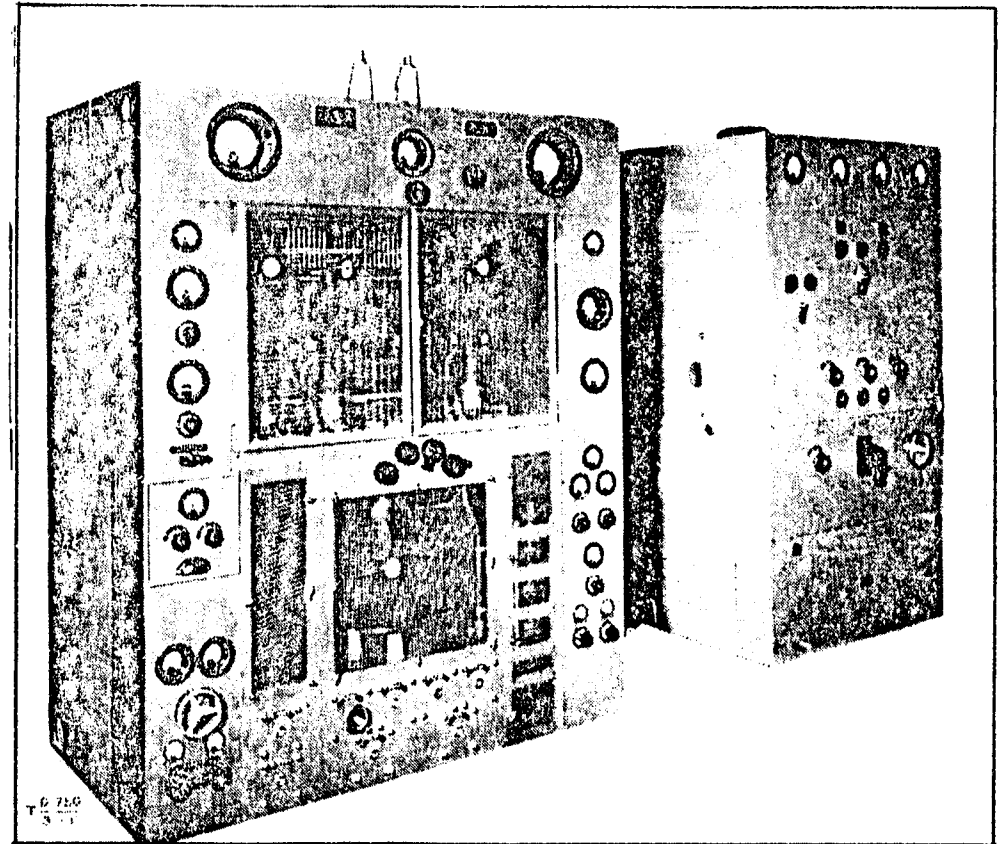


Fig. 1 - General view of equipment

FREQUENCY COVERAGE

3Mc/s - 22.2Mc/s

POWER OUTPUT

8kW at 20Mc/s - 10kW at 5Mc/s

POWER SUPPLY

28kVA at 400V, 50c/s 3-phase (4-wire) A.C.

AERIAL SYSTEM

Rhombic aerial with 600Ω twin-wire feeder.

SPECIAL FACILITIES

The S.W.B. 11E may be operated in the following alter-

Unit	CV5	CV6	CV28	CV124	CV1069	CV1071	CV1105	CV1281	CV1363	CV1443
Transmitter unit		1	5	10	1	1	4	3	2	1
Rectifier and control unit	8					8				

Valve table

57/Maint./3785

END

native roles:-

- As a frequency modulated transmitter employing an internal frequency modulation stage.
- As a carrier frequency shift transmitter in conjunction with Keying units, C.F.S., No. 2 (see Tels. K 330/2)
- As an independent sideband telephony or V.F. transmitter in conjunction with:-

Drive and monitor units, S.S.B., No. 1 (see Tels. K 320/1).

Modulator unit No. 20 (see Tels. K 340).

Oscillator unit, crystal, No. 1.

WIRELESS SENDER, MARCONI, SWB 8E EDITION H (ZA 15513)

DATA SUMMARY

PURPOSE

High-power sender, transmitting C.W. only, over long-distance, high-speed telegraphy links. Forms part of Golden Arrow Mk. II mobile wireless station.

DESCRIPTION

Sender is built in two units — R.F. unit and Power supply unit edition AS. R.F. circuit comprises a Franklin master oscillator, four stages of harmonic amplification, two stages of power amplification, aerial coupling circuits and keying circuits. The power supply unit contains the H.T. and bias power packs.

PHYSICAL DATA

	<i>R.F. unit</i>	<i>Power supply unit</i>
Weight:	12 cwt.	20 cwt.
Height:	6 ft. 3 in.	6 ft. 3 in.
Width:	3 ft.	3 ft. 6 in.
Depth:	2 ft.	4 ft. 4 in.

FREQUENCY COVERAGE

3—22.2 Mc/s. covered by internal switching and plug-in coils.

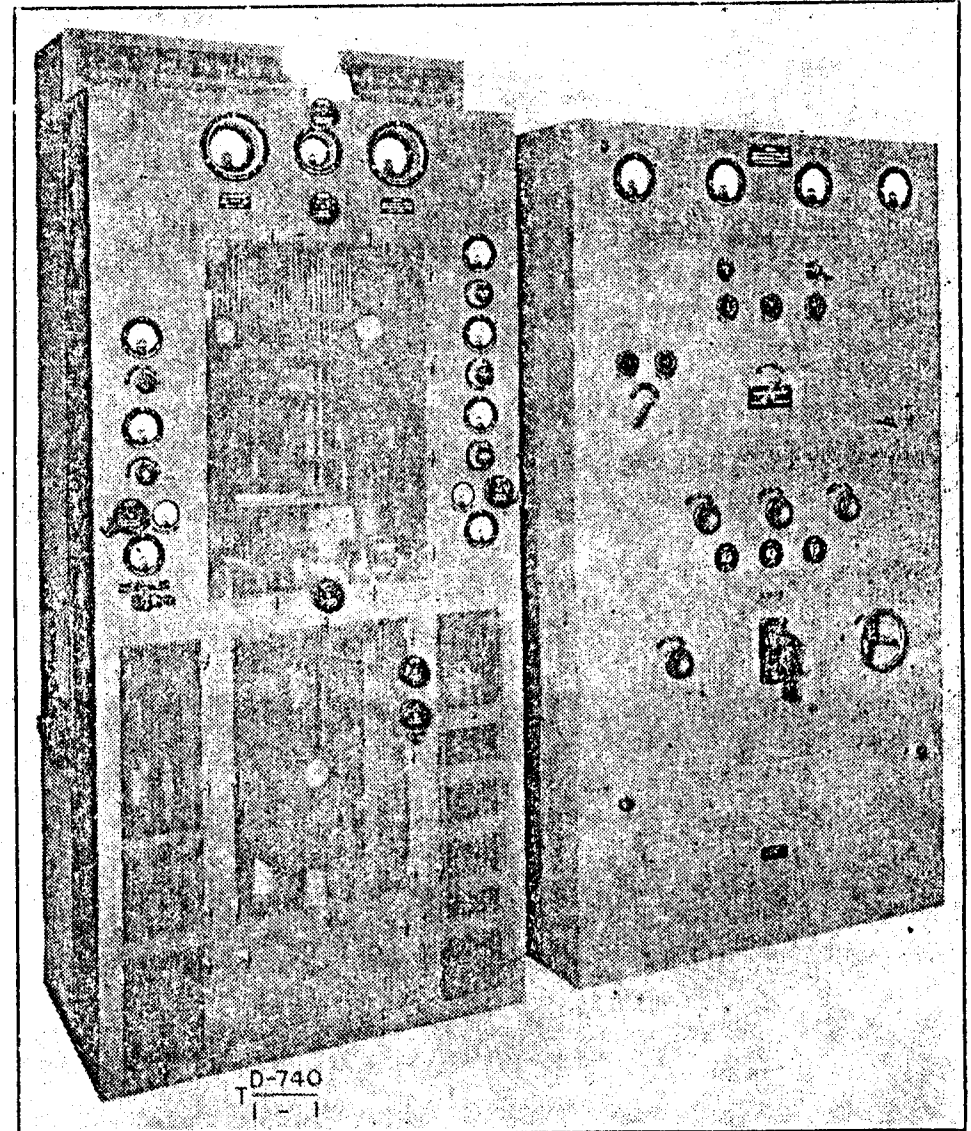


Fig. 1—General view of equipment

PERFORMANCE

Power output: 3.5 kW (max.)

Range: Up to 2,500 miles, depending on frequency, aerial design, etc.

POWER REQUIREMENTS

400 V, 50 c/s, 3-phase A.C. (four-wire), up to 10 kW.

AERIAL SYSTEM

Normally used with dipole aerials and 80 ohm concentric line or 600 ohm balanced (twin wire) feeder, but provision is made for matching into any aerial.

VALVES

Franklin oscillator (two valves) type ML 6.

Harmonic amplifier

1st stage type VT 60A (or RCA 807)

2nd stage type VT 60A

3rd stage type VT 60A

4th stage (two valves) type VT 60A

Power amplifier

1st stage type ACT 9

2nd stage (two valves) type ACT 9

REMARKS

Extra facilities are available, i.e., frequency-modulated C.W. (modulation 400 c/s or 270 c/s), monitor unit fitted internally which rectifies signal and feeds it to two monitor terminals, and remote control for keying. An internal conditioning unit is incorporated in the power supply unit. The dummy aerial consists of a bank of carbon lamps.

END

WIRELESS SET TR 1143 (ZA 10D 52)

DATA SUMMARY

PURPOSE

TR 1143 is a transmitter-receiver designed to provide communication between aircraft and ground. For Army use it is mounted in a vehicle and used for artillery reconnaissance (see Tels. L 150.1). It is primarily a R.A.F. set.

DESCRIPTION

Receiver is an eight-valve crystal-controlled superheterodyne receiver, using one R.F. stage, mixer, crystal oscillator and frequency multiplier, frequency multiplier, three I.F. stages, detector, A.V.C. and muting. The first frequency multiplier is controlled by the crystal oscillator. The transmitter employs seven valves as crystal oscillator, two frequency treblers, frequency doubler, two output stages and one diode for output measurement. The A.F. amplifier unit employs six valves in a two-stage receiver amplifier, a two-stage transmitter modulator and a voice-operated send/receive switch. The set is mounted in a steel case and incorporates an electro-mechanically controlled device which selects any one of four spot frequencies from a remote switch.

PHYSICAL DATA

Complete TR 1143 assembly on baseplate.
Weight : 102 lb. (approx.)
Length : 26½ in.
Width : 16½ in.
Height : 11 in.

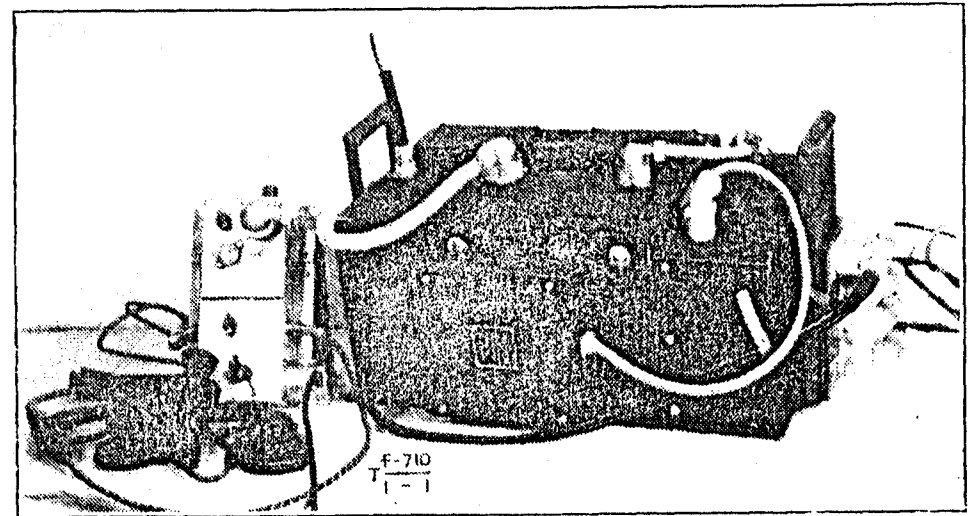


Fig. 1—General view of equipment

WIRELESS SET T 1154 (ZA/10D/196) DATA SUMMARY

PURPOSE

Low-power transmitter used in 15 cwt. truck or as a ground station, usually with a Reception set R 106. Provides R/T, C.W. and M.C.W. facilities. Primarily a R.A.F. set.

DESCRIPTION

The transmitter employs four valves as master oscillator, tone oscillator and modulator, and power amplifiers (two) and is fitted with eight "click stop" preset frequencies. It is housed in a metal case and can be supplied with power from A.C. mains through a Power unit, type 114 or from batteries with a Power unit, type 32A. It is normally used as an airborne sender.

PHYSICAL DATA

	T 1154	P.U. Type 32A	P.U., type 114	
			Main sec.	H.T. sec.
Weight :	50 lb.	28 lb.	111 lb.	104 lb.
Length :	17½ in.	18 in.	19½ in.	19½ in.
Width :	16¾ in.	8 in.	12 in.	9½ in.
Height :	11¼ in.	7 in.	19 in.	19 in.

AERIAL SYSTEM

- (a) Aerials, vertical, 16 ft., twin, No. 1 (on the move).
- (b) Aerials vertical, 34 ft., (used during short halts).
- (c) No. 6A and 6B dipole aerial with 50-150 ft. of feeder cable (stationary working).

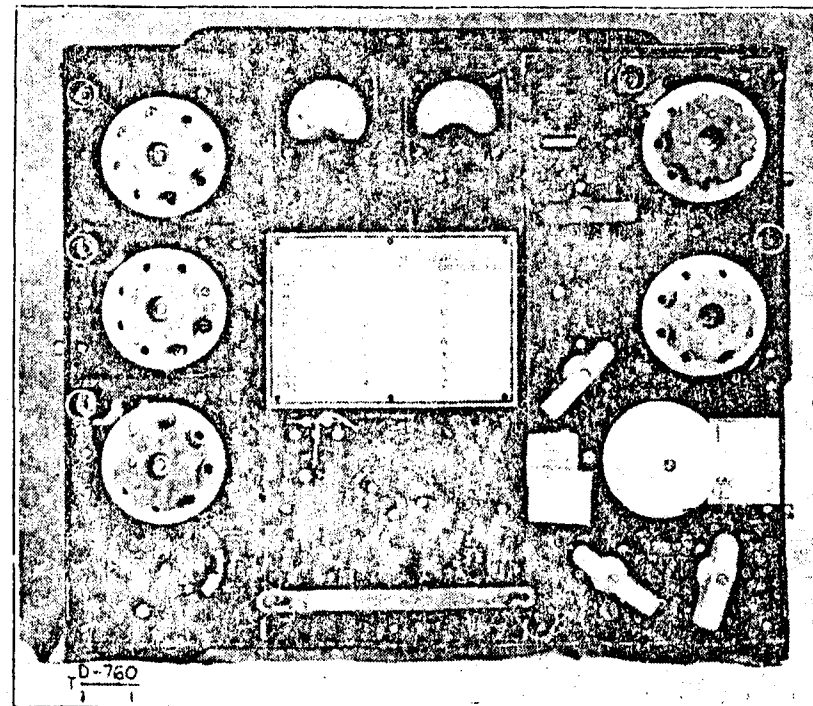


Fig. 1- Front view of set

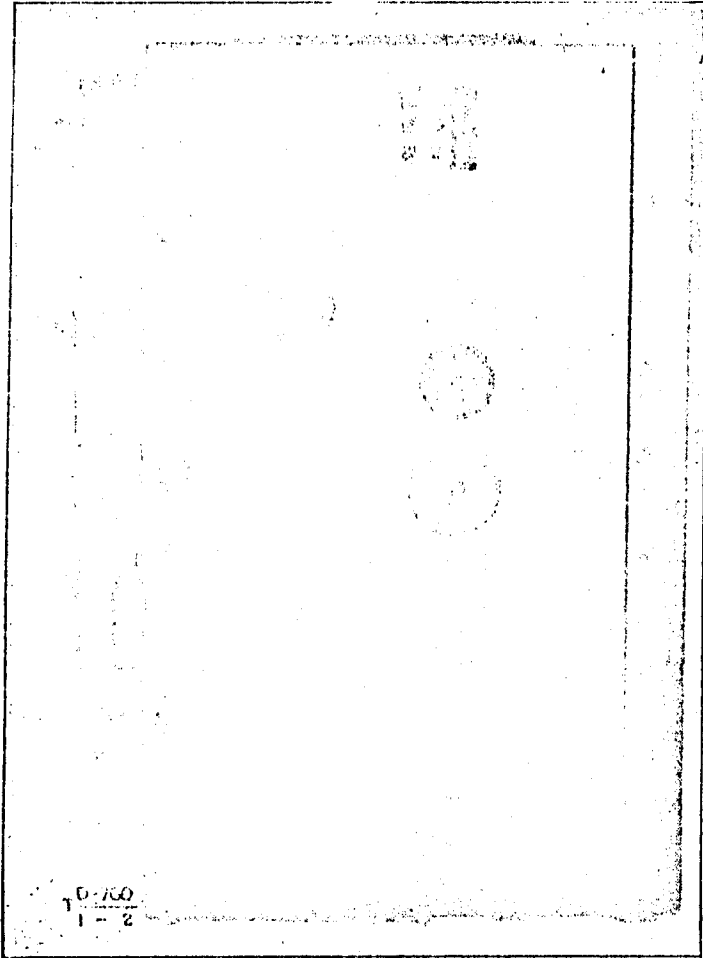


Fig. 2—Side view of set

FREQUENCY

Coverage : 8 Mc s-2.5Mc s and 500kc s-200 kc s in three ranges.

PERFORMANCE

Sender output: 10W approx. (varies with frequency range and service).

POWER REQUIREMENTS AND CONSUMPTION

Power supply : (a) 230-250V, 50c s A.C. mains up to 240W, using Power supply units, type 114 or

(b) 12V battery for H.T. supply up to 240W and 6V battery for heaters up to 91W, using Power unit, type 32A.

VALVES

Circuit reference	Type	Function
V1	VT 105	Master oscillator
V2	VT 105	Tone oscillator and modulator
V3	VT 104	Power amplifier
V4	VT 104	

TRANSMITTER T 1190 (NOT CATALOGUED)

DATA SUMMARY

PURPOSE

Ground station transmitter, providing R/T, C.W. and M.C.W. facilities.

DESCRIPTION

A R.A.F. type sender employing crystal-controlled or master oscillator, frequency-doubler, R.F. power amplifier, H.T. rectifiers and grid-bias rectifier. Rectifier panel incorporated in set.

PHYSICAL DATA

Weight: 4½ cwt.
Length: 2 ft. 6 in.
Width: 1 ft. 10 in.
Height: 5 ft. 10 in.

FREQUENCY

Coverage: 1.5—15Mc/s.

PERFORMANCE

Sender output: 350W on C.W., 80W on R/T.

POWER REQUIREMENTS AND CONSUMPTION

Power supply: A.C. mains, 230V, 50c/s. Filament transformer (rectifier panel), tapped 150V to 230V.

AERIAL SYSTEM

Balanced 600Ω lines or low-impedance coaxial feeder to dipole aerial.

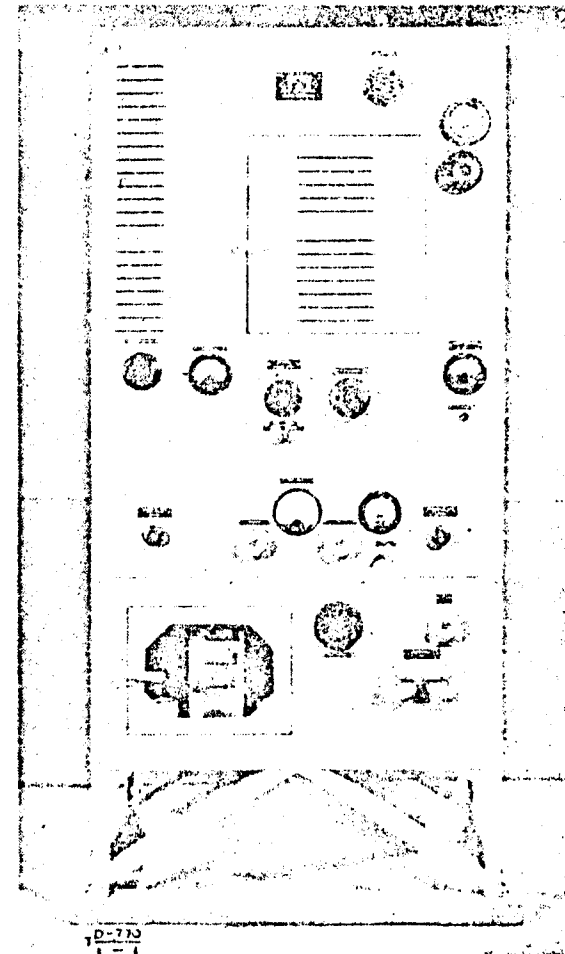


Fig. 1—General view of the equipment

VALVES

<i>Circuit reference</i>	<i>Type</i>	<i>Function</i>
V1	VT96	Master oscillator
V2	VT96	Frequency-doubler
V3 } (parallel)	VT31 (ATS 250)	R.F. power amplifier
V4 }		
V5 }	VU29	H.T. rectifiers
V6 }		
V7	VU39 (AU3A)	Grid-bias full-wave rectifier

END

RECEPTION SET R 1100 (ZA 11205). DATA SUMMARY

PURPOSE

Self-contained portable receiver for C.W., M.C.W. and R/T. Used primarily by R.A.F. Limited application in Army.

DESCRIPTION

It is a three-valve superheterodyne receiver, using a frequency changer, one I.F. stage, and detector. The receiver is suspended in the carrying case by a rubber mounting and is easily removed for the replacement of the H.T. batteries. The case has a waterproof canvas hood for protection when operating in the open, and has two carrying straps.

PHYSICAL DATA

Weight : 36 lb. (with batteries).
Length : 22 $\frac{3}{4}$ in.
Width : 12 $\frac{1}{2}$ in.
Height : 9 $\frac{1}{2}$ in.

FREQUENCY

Coverage : 1.2—1.54 Mc/s, 2.0—3.0 Mc/s.
Internal : 465 kc/s I.F.

PERFORMANCE

Receiver sensitivity : 60 μ V for 1 mW output and signal/noise ratio of 25 db.
Receiver selectivity : 20 db. attenuation at 20 kc/s off-centre frequency.

POWER REQUIREMENTS AND CONSUMPTION

2V, 0.5A L.T. from 16 Ah. accumulator.
120V, 10mA H.T. from two 60V H.T. batteries.

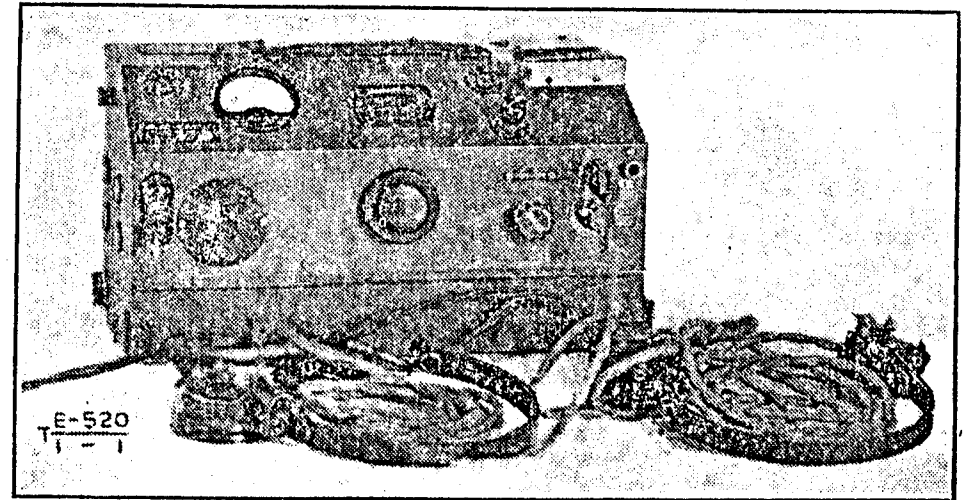


Fig. 1—General view of set

AERIAL SYSTEM

- (a) 16 ft. aerial rod.
- (b) 30 ft. wire aerial.

VALVES

Circuit reference	Type	Function
V1A	VR 43 (R.A.F.)	Heptode—frequency changer
V2A	VR 49 (R.A.F.)	Pentode—I.F. amplifier
V2B	VR 49 (R.A.F.)	Pentode—detector

57/Maintenance/772 (M.E.10)

END

RECEPTION SET R 1359

DATA SUMMARY

Note: This information is provisional and is supplied for guidance pending the issue of more complete instructions. All errors of a technical nature should be notified in accordance with Tels. A 009.

PURPOSE

Primarily a R.A.F. receiver, used by the Army in a ground or vehicles station for communication with the R.A.F.

DESCRIPTION

Superheterodyne receiver with facilities for R/T or C.W. Received signals are fed direct to the mixer, which consists of a circular concentric line and crystal detector. Two I.F. bandwidths are available, 3.5Mc/s or 420kc/s.

PHYSICAL DATA

Weight: 46 lb.
Height: 12 $\frac{1}{2}$ in.
Length: 18 $\frac{1}{2}$ in.
Width: 11 $\frac{1}{2}$ in.

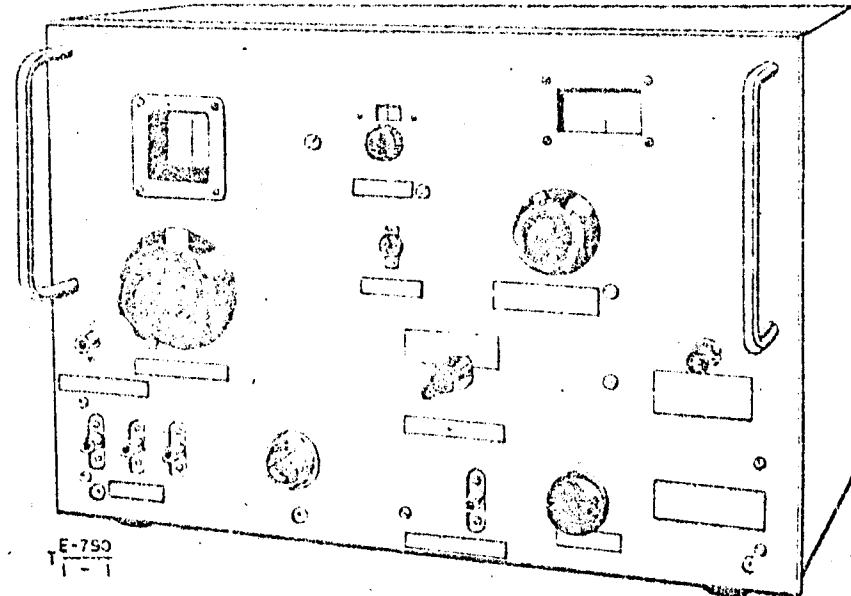


Fig. 1 - Front panel of equipment

TELECOMMUNICATIONS
E 790

ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS

FREQUENCY

Coverage: 130 - 520Mc/s in two ranges:-
(a) 130-260Mc/s
(b) 260-520Mc/s
Internal: 13.5Mc/s

PERFORMANCE

Power and type of output: Cathode follower of output impedance 130 ohms.
Maximum output, 15V R.M.S.
Sensitivity: 80uV (narrow-band), 150uV (wide-band) for 10db. signal/noise ratio.

POWER REQUIREMENTS AND CONSUMPTION

200-250V A.C. mains, 120W (approx.) alternatively a vibrator pack (R.A.F. type VP.554) may be used with a large-capacity 6V battery.

AERIAL SYSTEM

Various types, depending on operational requirements; wide-band omnidirectional, using a conical aerial system; narrow-band, using a Yagi array; wide-band, using a dipole in a paraboloid or V reflector.

Circuit reference	Type	Function
V1	VR91	1st.I.F.
V2	VR91	2nd.I.F.
V3	VR91	3rd.I.F.
V4	VR91	4th.I.F.
V5	VR54	2nd. detector
V6	VR65	Video amplifier
V7	VR65	Cathode follower
V8	VR65	Beat oscillator
V9	CV52	V.H.F. oscillator
V10	5Z4G	Rectifier
V11	5Z4G	Rectifier

SPECIAL FACILITIES

Analysis of received signals can be effected by means of an oscilloscope as well as normal listening with headphones.

END

CONDITIONS OF RELEASE

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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-

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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.

Distribution - Class 1235. Code No 4

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>	<i>-6dB</i>	<i>-66dB</i>
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)	

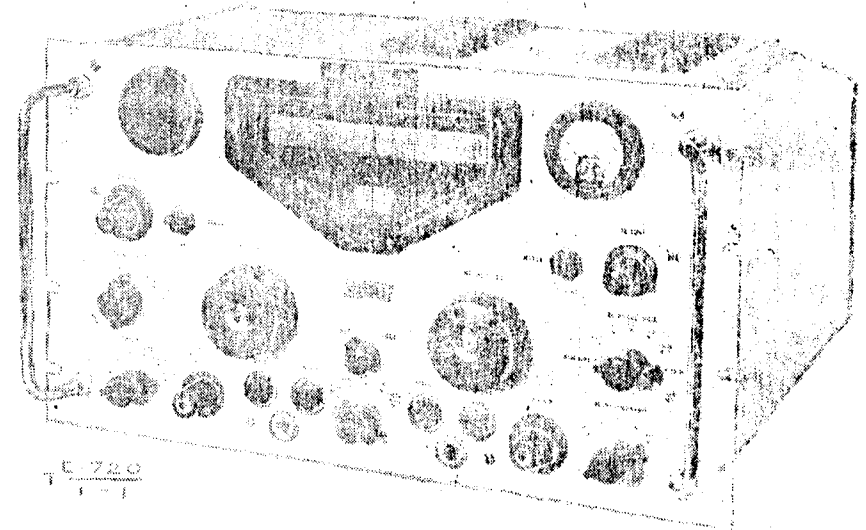


Fig 1 - General view

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.

EMEB/1082

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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

A.F. outputs

2.1/2 in. loudspeaker on front panel.

Three independent outputs 3mW at 60Ω one of which is also connected to a pair of phone jacks.

One output of 10mW at 60Ω with an independent level control.

One output of 1W at 3Ω.

PERFORMANCE

Stability

After a warm-up period of 2 hours the overall drift is less than 50c/s at all frequencies under normal operating conditions.

Sensitivity

C.W. reception at 3kc/s bandwidth: $1\mu V$ for 18dB signal-to-noise ratio.

M.C.W. reception at 3kc/s bandwidth: $3\mu V$ for 18dB signal-to-noise.

Accuracy

The 100kc/s divisions are within ± 1 kc/s and using the built in crystal controlled calibrator an accuracy in the order of 5 parts in 10^6 can be achieved.



Fig 1 - General view

Cross modulation

With wanted signal modulated 30%, and level between $3\mu\text{V}$ and 1mV , an unwanted signal, 10kc/s removed and modulated 30%, must have a level 50dB above wanted signal to produce 3% cross modulation.

Image and spurious responses

External image signals are at least 60dB down and internally generated spurious responses are less than 2dB above noise level in all cases.

Noise factor

Better than 7dB throughout entire range.

A.V.C.

An increase in signal level of 20dB above $1\mu\text{V}$ improves the signal-to-noise ratio by 18dB. An increase in signal level of 100dB increases the a.f. output by less than 7dB.

A.F. response

With 13kc/s bandwidth, response remains within $\pm 4\text{dB}$ from 250 to 6000c/s with distortion less than 5% at 1W.

POWER SUPPLIES

100 - 125V and 200 - 250V, 45 - 60c/s.
Power consumption 100W approximately.

ANTENNA

75Ω unbalanced or
 2000Ω unbalanced.

ASSOCIATED EQUIPMENT (Optional)

L.F. converter RA 237B
S.S.B. adaptor RA 63A
I.S.B. adaptor RA 98B
Panoramic unit RA 66B

HANDBOOKS

I.S.P.L. 14268
C.E.S. No 42976.

RECEPTION SET DST 100

MK. II (ZA 11322), MK. III (ZA 16518), MK. III* (ZA 16519)

DATA SUMMARY

PURPOSE

A highly sensitive receiver to be used in fixed stations for the reception of weak R. T and C.W. signals.

DESCRIPTION

The receiver covers 50kc's to 30Mc's continuously in seven ranges. Six different bandwidths are available. On the six higher-frequency ranges A to F the set operates as a double superhet, rodyne receiver, on the five narrow bandwidths; on the broad bandwidth it is a single superhet rodyne receiver, with an I.F. of 2Mc's. On the lowest frequency range G the set operates as a single superhet rodyne receiver, with an I.F. of 110kc's and the broad bandwidth is not available. Variable regeneration is provided for receiving very weak signals. A beat oscillator is used for C.W. reception. The set is mounted on two chassis, both housed in one steel case. A separate power supply unit is used.

PHYSICAL DATA

Weight : 110 lb.
Length : 24½ in.
Width : 15½ in.
Height : 15½ in.

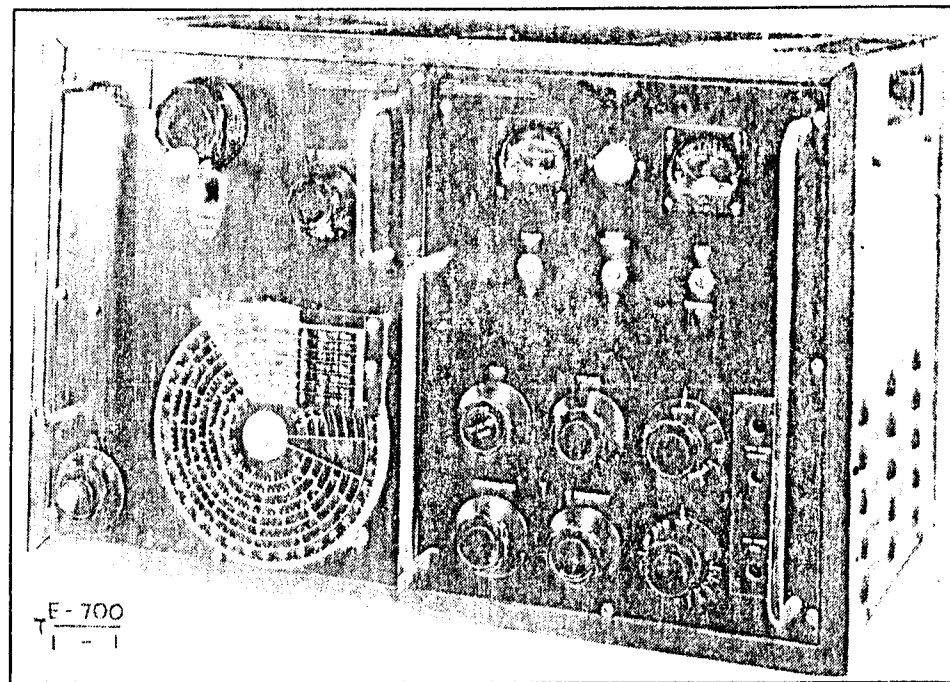


Fig. 1—General view of Reception set, DST 100, Mk. III

RECEPTION SET AR-88

DATA SUMMARY

PURPOSE

General purpose communications receiver designed to withstand severe climatic variations, and severe changes in line voltage.

DESCRIPTION

The receiver consists of two stages of R.F. amplification, first detector, local oscillator; three stages of I.F. amplification, second detector, noise limiter, B.F.O.; one A.F. amplifier stage, output stage, and power supply system.

PHYSICAL DATA

Weight:	97 lbs.
Height:	11 ins.
Width:	19 1/4 ins.
Depth:	19 1/4 ins.

FREQUENCY

Coverage: 535 Kc/s to 32 Mc/s in six bands.
Intermediate Frequency: 455 Kc/s

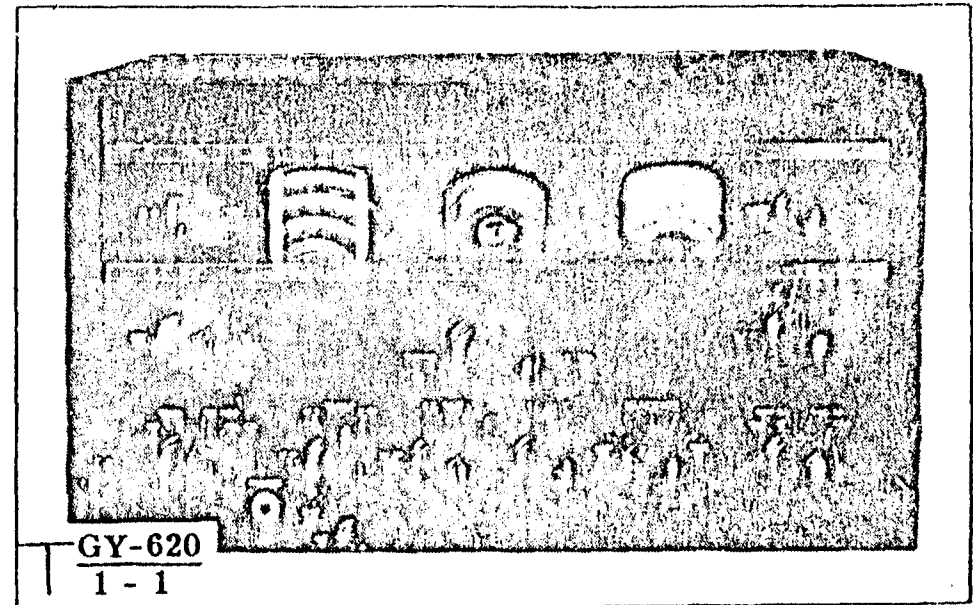


FIGURE 1. RECEPTION SET AR-88

TELECOMMUNICATIONS

GY-620

PERFORMANCE

Maximum undistorted output:

approximately 2.5 W into 2,25 or 600 ohms.
Receivers with serial numbers below 003000 have 20 ohms output instead of 600 ohms.

Sensitivity: less than 1 μ V for .5 W output over most of the band.

Selectivity: bandwidths at 6 dB down:
Position 1 approximately 13 Kc/s
Position 2 approximately 7 Kc/s
Position 3 3 Kc/s
Position 4 1,500 c/s
Position 5 400 c/s

It is possible to adjust the bandwidths in positions 3, 4 and 5 for narrower bands, but the values given are standard settings.

POWER SUPPLY

Any one of the following may be used:

- (a) L.T. 6 V AC/DC 4 A
- H.T. 250-300 V 90 mA

ELECTRICAL AND MECHANICAL ENGINEERING REGULATIONS

- (b) 100-165 V or 190-260 V 50-60 c/s, consuming 70 W to furnish the supplies shown under (a).
- (c) Vibrator supply (e.g. Vibrator Power Supply Unit R.C.A. Type MI-8319, which consumes approximately 75 W to give the supplies shown at (a). See E.M.E.R. Tels. IY-210/3.)

AERIAL

The receiver is designed for coupling to a 200 ohm line (except on the lowest frequency band), but for general use a single wire 25-50 ft. long is recommended.

VALVES

5	RCA-6SG7	R.F. and I.F. Amplifiers
1	RCA-6SA7	Mixer
1	RCA-6J5	Local Oscillator
1	RCA-6H6	2nd Detector
1	RCA-6H6	Noise Limiter
1	RCA-6SJ7	A.F. Amplifier
1	RCA-6K6GT	Power Amplifier
1	RCA-6J5	B.F.O.
1	RCA-5Y3GT	Rectifier
1	RCA-VR-150	Voltage Regulator

END

RECEPTION SETS AR88D AND AR88LF

TECHNICAL HANDBOOK - DATA SUMMARY

PURPOSE

General purpose communications receivers for M.C.W., C.W. and R.T., designed to withstand wide climatic and supply voltage variations.

DESCRIPTION

The receivers consist of two R.F. stages, a mixer, local oscillator, three I.F. stages, a detector, noise limiter, B.F.O., A.F. amplifier, output stage and power supply system. The I.F. amplifiers incorporate variable selectivity, and a crystal filter. The sets are normally housed in steel cases but can be rack mounted.

PHYSICAL DATA (In case)

Weight: 100 lb.
Height: 11 in.
Width: 19½ in.
Depth: 19½ in.

FREQUENCY

AR88D

Coverage: 535kc/s to 32Mc/s in six bands
Intermediate frequency: 455kc/s

AR88LF

Coverage: 73 to 550kc/s and 1.48 to 30.5Mc/s in six bands
Intermediate frequency: 735kc/s

PERFORMANCE

Sensitivity; both sets:
C.W. - less than 3.0μV for 20db. signal-to-noise ratio at 500mw to loudspeaker
M.C.W. - less than 10μV for 20db. signal-to-noise ratio at 500mw to loudspeaker

Maximum undistorted output; both sets:
2.5W to loudspeaker or line

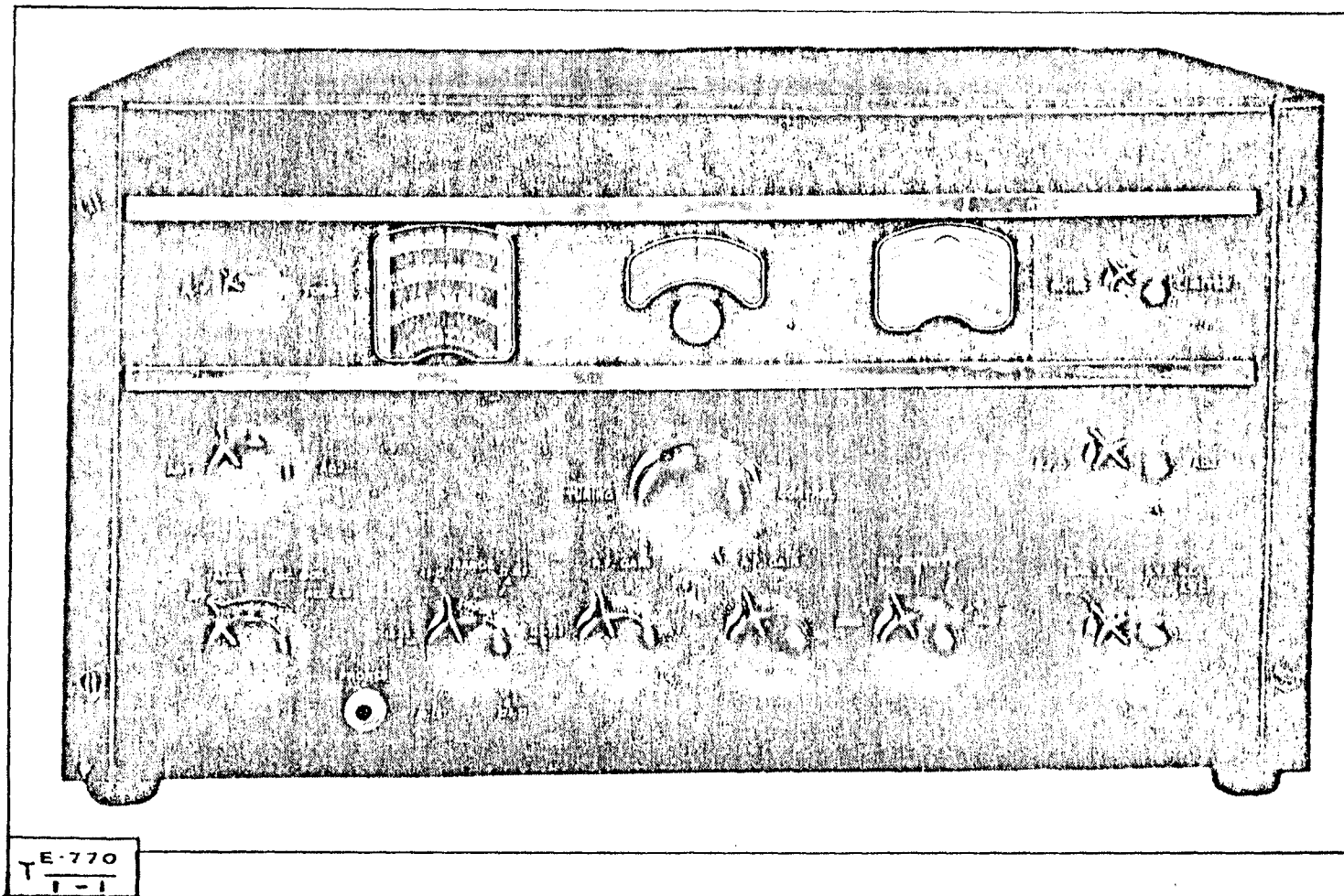


Fig 1 - General view of Reception set AR88D

**ELECTRICAL AND MECHANICAL
ENGINEERING REGULATI**

Output impedances:—

AR88D

- 2.5Ω to speaker
- 600Ω to balanced line
- 20,000Ω to headphones

AR88LF

- 2.5Ω to speaker
- 20Ω to unbalanced line
- 20Ω to headphones

Selectivity

Selectivity control position	Bandwidth at -6db.	
	AR88D	AR88LF
1	13kc/s	16kc/s
2	7kc/s	8kc/s
3	3kc/s	4kc/s
4	1.5kc/s	2kc/s
5	0.4kc/s	0.55kc/s

POWER REQUIREMENTS

AR88D: 100 - 165V or 190 - 260V, 50 - 60c/s, 100VA
 AR88LF: 115 or 230V, 25 - 60c/s, 100VA

Alternatively each receiver may be fed with following D.C. supplies:—

- L.T. 6V at 4A
- H.T. 250 - 300V at 90mA

AERIAL

The receivers are designed for coupling to a 200Ω transmission line, except on the low frequency general broadcast bands. For these and general use a single wire 25 to 50 ft. long can be used.

VALVES

Circuit ref.	Function	Value type	
		AR88D	AR88LF
V1 - V2	R.F. amplifiers	CV 1978	CV 1978
V3	Local oscillator	CV 1933	CV 1933
V4	Mixer	CV 1966	CV 1966
V5 - V7	I.F. amplifiers	CV 1978	CV 1978
V8	Detector and A.V.C.	CV 1930	CV 1930
V9	Noise limiter	CV 1930	CV 1930
V10	A.F. amplifier	CV 591	CV 591
V11	Power amplifier	CV 1940	CV 511
V12	B.F.O.	CV 1933	CV 1933
V13	Voltage stabilizer	CV 216	CV 216
V14	Rectifier	CV 1856	CV 1856
V15	Gas gap protector	—	CV 651

TELECOMMUNICATIONS
E 770

ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS

REMARKS

The Reception set AR880 was originally manufactured as the Reception set AR88. It still bears this name on the front panel. The change in designation occurred between the serial Nos. 003000 and 010000 and coincided with a change in the design of the output transformer to provide a 600Ω balanced line output and a $20,000\Omega$ headphone output. The output impedances of

the original Reception set AR88 are as follows:-

AR88 with serial Nos. below 003000:-

2.5Ω to speaker
 20Ω to headphones

AR88 with serial Nos. above 003000:-

2.5Ω to speaker
 600Ω to headphone and unbalanced line

57/Maint/4017

END

RADIO RECEIVER BC-342

DATA SUMMARY

PURPOSE

Receiver for C.W., I.C.W., M.C.W., and R.T. working, built for vehicular, portable or fixed operation.

DESCRIPTION

The receiver comprises two stages of R.F. amplification, mixer, local oscillator; two I.F. stages, detector and audio amplifier. A B.F.O. is included for C.W. reception. A crystal filter is incorporated between the mixer and first I.F. stages in all models.

PHYSICAL DATA

Weight: 61 1/2 lbs.
Height: 10 3/4 lbs.
Width: 18 ins.
Depth: 9 1/2 ins.

FREQUENCY

R.F. Coverage: 1.5 Mc/s to 18 Mc/s in 6 ranges
Intermediate Frequency: 470 Kc/s.

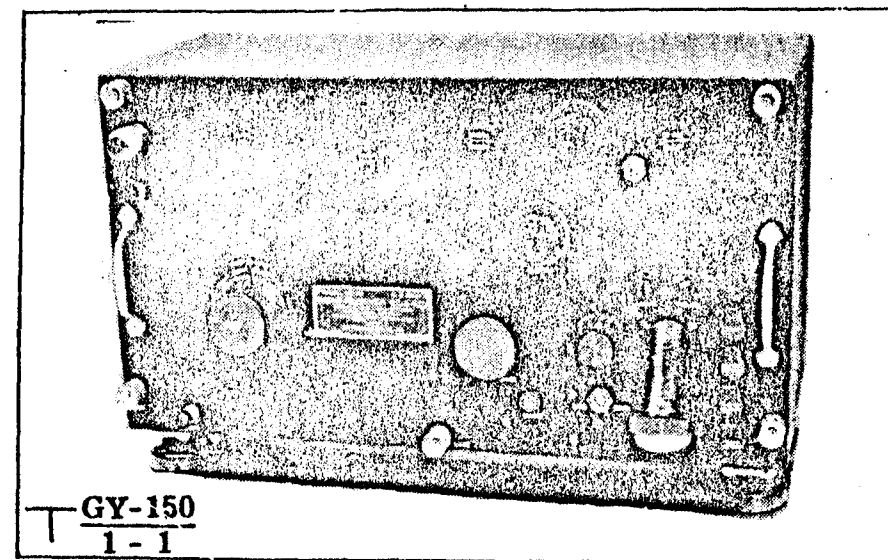


FIGURE 1. RADIO RECEIVER BC-342

RECEPTION SETS, PHILCO, BP 412 and BP 413

DATA SUMMARY

Note.—This replaces and cancels Tels. E 730, Issue 1. It has been amended throughout.

PURPOSE

Portable stations for short-range reception (about 3 miles) of R/T signals.

DESCRIPTION

Four-valve superhet, using frame aerial and dry battery supplies. Mounted in wooden cabinet containing:—

BP 412 set: loudspeaker, battery and set of spare valves, and provided with canvas carrier.

BP 413 set: loudspeaker, battery and frame aerial.

PHYSICAL DATA

	BP 412	BP 413
Weight:	28 lb.	16 lb. (in carrier)
Height:	11 in.	7 $\frac{3}{8}$ in.
Length:	22 in.	10 $\frac{8}{16}$ in.
Width:	10 in.	7 $\frac{1}{8}$ in.

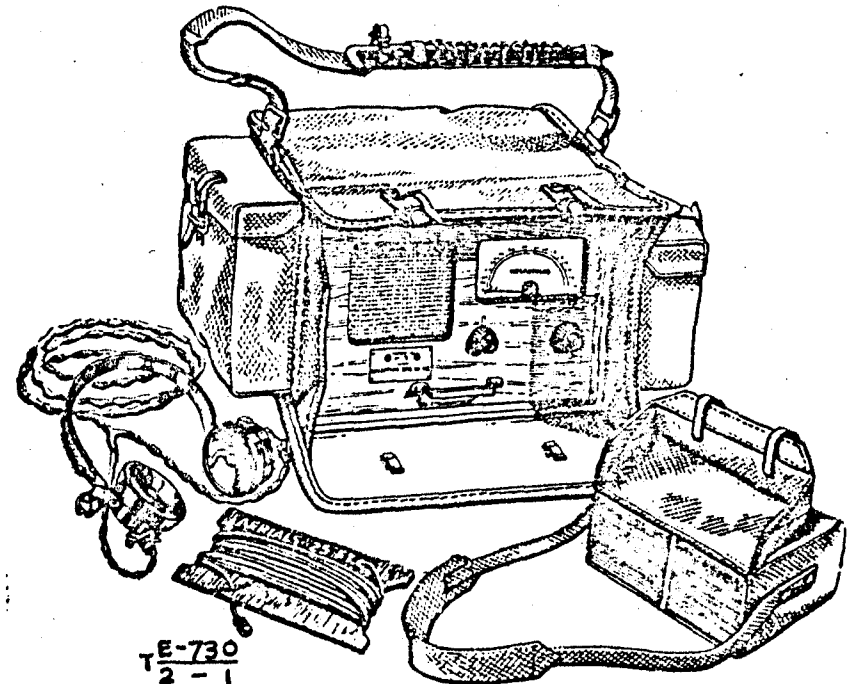
FREQUENCY

Coverage: 1.4–4.2Mc/s.

I.F.: 465kc/s.

PERFORMANCE

Power and type of output: 50mW A.F. into loudspeaker. Also works into L.R. headphones.



T-E-730
2-1

Fig. 1—General view of BP 412

Distribution—Class 870, Code No. 4

Sensitivity : About 100 μ V aerial for full output.

POWER REQUIREMENTS AND CONSUMPTION

H.T. : 150V, 16mA ; L.T. : 3V, 0.55A, both provided by combined H.T./L.T. dry battery.

AERIAL SYSTEM

Frame aerial built into cabinet, with provision for connecting external aerial and earth for increased range.

VALVES

Circuit ref.	Nomenclature	Type	Function
V 1A	ARTP 2	Triode-pentode	Frequency changer
V 2A	ARP 12	R.F. pentode	I.F. amplifier
V 3A	AR 8	Double-diode-triode	Second detector, A.V.C. rectifier, and A.F. amplifier
V 4A	CV 65	Pentode	A.F. output valve

REMARKS

BP 413 is provided with a waterproof cover and canvas carrier, and carries no spare valves.

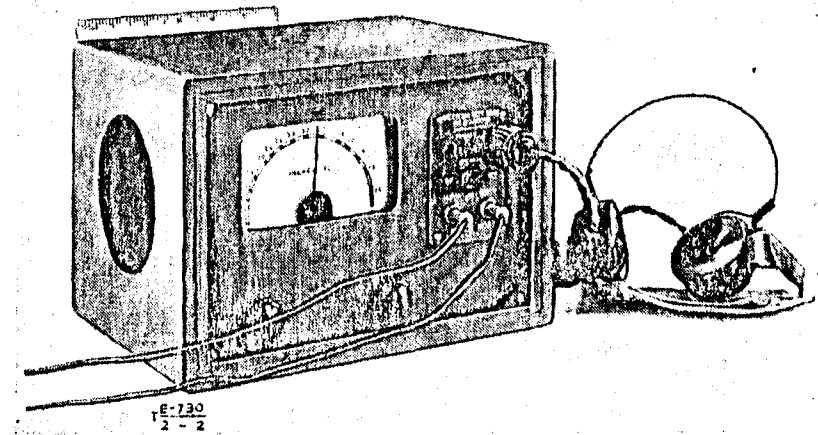


Fig. 2—General view of BP 413

END

FREQUENCY

Coverage : Range A, 30 Mc/s—12 Mc/s
 „ B, 12 Mc/s—4.8 Mc/s
 „ C, 4.8 Mc/s—1.9 Mc/s
 „ D, 1.9 Mc/s—0.78 Mc/s
 „ E, 780 kc/s—310 kc/s
 „ F, 310 kc/s—126 kc/s
 „ G, 126 kc/s—50 kc/s
 Internal : I.F.s., 2 Mc/s and 110 kc/s

PERFORMANCE

Receiver sensitivity : 2.5 μ V input for 50 mW output with signal/noise ratio of 20 db. at zero regeneration.
 Receiver selectivity : Variable bandwidths at 6db. attenuation :—
 1 kc/s, 1.4 kc/s, 1.6 kc/s, 1.8 kc/s, 2 kc/s, 12-25 kc/s.

POWER REQUIREMENTS AND CONSUMPTION

Power supply : 100-240V, A.C. mains, feeding Supply unit, rectifier, No. 8 to provide 110 mA and 250V, H.T. and 4.75A at 6.3V, L.T.
 Power consumption : approx. 70W.

AERIAL SYSTEM

Open or dipole aerials of 75 or 600 Ω impedance.

VALVES

Circuit reference	Type	Function
V1A	CV 21	R.F. amplifier
V2A	ARTH 2	1st mixer
V3A	6J5G (NR 78A)	R.F. regenerator
V3B	6J5G (NR 78A)	1st local oscillator
V4A	ARP 34	1st 2 Mc/s I.F. amplifier
V5A	6B8G (ARP 31)	2nd 2 Mc/s I.F. amplifier 2 Mc/s A.V.C. rectifier and signal detector
V2B	ARTH 2	2nd mixer and local oscillator
V4B	ARP 34	110 kc/s I.F. amplifier
V6A	6R7G	Beat oscillator 110 kc/s A.V.C. rectifier
V3C	6J5G (NR 78A)	110 kc/s signal detector
V7A	6H6G (ARDD 3)	Noise limiter
V8A	6Q7G (NR 68)	1st A.F. amplifier
V9A	6U6G (ARP 32)	Output

REMARKS

Mks. II and III have a semi-tropical finish.
 Mk. III* has a fully-tropical finish.
 Mk. II differs slightly from Mks. III and III* in its R.F. circuits.

END

RECEPTION SET, EDDYSTONE, 730/4 (Z4/ZA 51262)

TECHNICAL HANDBOOK - DATA SUMMARY

PURPOSE

General purpose communications-type single superheterodyne a.m. receiver covering range 480kc/s to 30Mc/s in five bands.

DESCRIPTION

The basic receiver comprises: Two r.f. stages, mixer, local oscillator, two variable bandwidth i.f. stages with gain compensation, detector, two a.f. stages and an output stage. A.G.C., noise limiter, 'S' meter, beat frequency oscillator and crystal calibrator facilities are incorporated. A low impedance i.f. outlet is provided. A crystal filter may be inserted in the i.f. amplifier, and a narrow-band a.f. filter may be switched into the audio stages. A logging scale is fitted. The set is not sealed. Brackets are supplied for 19 in. rack mounting.

PHYSICAL DATA

Weight	Height	Width	Depth overall
59 lb	9.3/8 in.	16.7/8 in. (inside mounting brackets)	13.3/4 in.

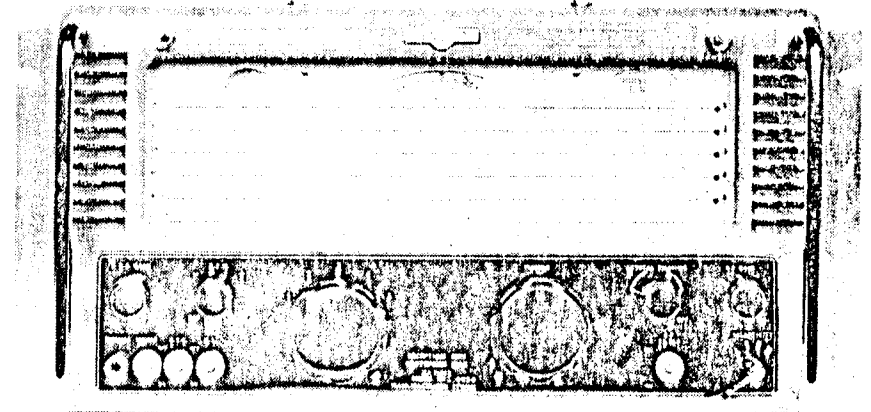


Fig 1 - Front view

FREQUENCY

Tuning range:-

1	12.3Mc/s	30.0Mc/s
2	5.3Mc/s	12.5Mc/s
3	2.5Mc/s	5.7Mc/s
4	1.11Mc/s	2.5Mc/s
5	480kc/s	1120kc/s

Intermediate frequency: 450kc/s

Intermediate frequency bandwidth (-3dB):-

- (a) Variable coupling - 10.0, 3.6, 2.2, 1.5kc/s
- (b) Crystal filter - 0.6kc/s (asymmetrical)

Crystal calibrator: 500kc/s

B. F. O.: I. F. ± 2.0 kc/s

Audio filter: Centre frequency 1,000c/s
Bandwidth (-6dB) 100c/s

PERFORMANCE

Sensitivity (50mW output, 15dB Signal-to-noise ratio):-

- C. W. - Ranges 1, 2, 3, 4 - better than 1μ V
- Range 5 - better than 2μ V
- R. T. - better than 5μ V

R. F. selectivity:-

Image attenuation varies from -90dB at 2Mc/s to -38dB at 25Mc/s.

Noise factor: 5 to 12dB.

Audio output (600 Ω or 2.5 Ω):-

Max 1000mW - 20% distortion
500mW - 7% distortion
100mW - 3% distortion

I. F. output: 0.3V into 70 Ω at 450kc/s.

A. G. C: Output variation less than 14dB for signal change of 100dB.

POWER REQUIREMENTS AND CONSUMPTION

A. C: 80W at 110 to 250V, 50c/s
or

D. C: 6V, 5A and 250V, 120mA.

AERIAL

80 Ω unbalanced.

RECEPTION SET R 100 (ZA 21571)

(OBSOLETE)

DATA SUMMARY

PURPOSE

General purpose receiver with R/T, C.W. and D.F. facilities.

DESCRIPTION

A superterodyne receiver of unit construction, using an Aerial coupling unit (Nos. 1 to 3, according to frequency range), an Aerial tuning unit (Nos. 1 to 4 according to frequency range) or a combined aerial tuning and coupling unit in the case of R 100A, an I.F. unit and a filter output unit. The units are clamped together in an adjustable metal frame. The aerial coupling units are used for D.F. work and are not required for normal reception.

AERIAL SYSTEM

- (a) An open-wire aerial.
- (b) A quarter- or half-wave single wire.
- (c) A half-wave dipole with balanced matched impedance feeders.
- (d) A dipole aerial with tuned feeders.
- (e) A wyndom aerial.
- (f) Bellini-tosi or Adcock D.F. aerial.

FREQUENCY

Coverage : R 100A : 4— 25Mc/s
 R 100B : 1,000—75,000kc/s
 R 100C : 150— 1,500kc/s
 R 100D : 40— 160kc/s
 R 100E : 15— 60kc/s

Internal : 166.6kc/s

PERFORMANCE

Receiver sensitivity: $3\mu\text{V}$ for 1mW output and signal/noise ratio of 20db.
 Receiver selectivity : 6db. attenuation \pm 4kc/s.

POWER REQUIREMENTS AND CONSUMPTION

Power supply : 12V accumulator feeding H.T. unit (12/150V).
 Power consumption : H.T. unit : 12V, 4.5A.

VALVES

Circuit reference	Type	Function
Aerial coupling unit		
1	ARP 5	R.F. amplifiers in push-pull
2		
3	ARP 5	Sense valve
Aerial tuning unit		
4	ARP 5	R.F. amplifiers
5	ARP 5	
6	ARP 2	Mixer
7	ARP 2	Local oscillator
I.F. amplifier unit		
8	ARP 5	1st. I.F. amplifier
9	ARP 5	2nd. I.F. amplifier
10	ARP 5	3rd. I.F. amplifier
11	ARP 2	Detector
12	ARP 2	Beat oscillator
13	ARP 2	A.V.C. amplifier
Filter output unit		
14	ARP 2	1st. L.F. amplifier
15	ARP 2	2nd. L.F. amplifier

The above valve table applies to the R 100A, R 100B, R 100D. R 100C employs a second local oscillator valve in the Aerial tuning unit No. 2 in addition. R 100E does not use an aerial coupling unit, only one R.F. amplifier and no A.V.C. amplifier.

RECEPTION SET R101 (ZA 3253)

OBSELETE

DATA SUMMARY

PURPOSE

General purpose receiver for R.T. and C.W., generally used with Wireless Set No. 5.

DESCRIPTION

The set is an eight-valve superheterodyne receiver employing R.F. stage, mixer, local oscillator, two I.F. stages, A.V.C. and detector, beat oscillator, and L.F. amplifier; seven plug-in coils are supplied to cover frequency range. The set is housed in an aluminium alloy cast case.

PHYSICAL DATA

	<i>R101 receiver</i>	<i>Plug-in coils (each)</i>
Weight :	28½ lb.	1½ lb.
Length :	16½ in.	7 in.
Width :	15 in.	2½ in.
Height :	7½ in.	4½ in.

FREQUENCY

Coverage : 22,000 kc/s—150 kc/s.

Internal : 465 kc/s.

PERFORMANCE

Receiver sensitivity : 10 µV for 50 mW output and signal noise ratio of 16 db.

Receiver selectivity : 40 db. attenuation at 11 kc/s.

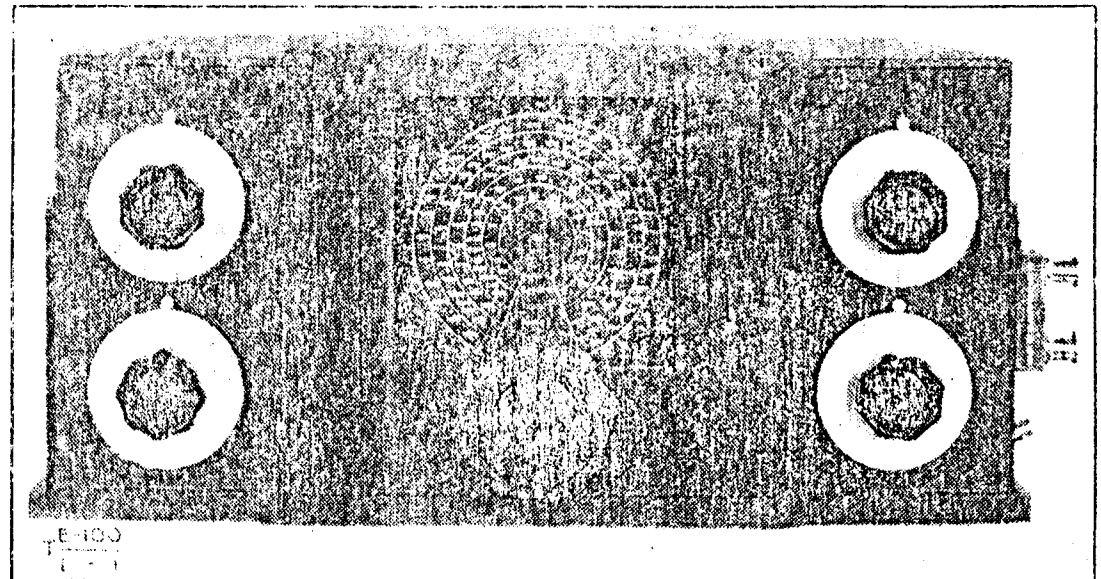


Fig. 1—Front view of set

POWER REQUIREMENTS AND CONSUMPTION

L.T. : 2V battery giving up to 1.8 W.

H.T. : 135V battery giving up to 2.2 W.

Or

From 230V A.C. mains with Supply unit rectifier No. 1, providing both L.T. and H.T. (see Tels. K220/4).

AERIAL SYSTEM

- (a) Open-wire aerial.
- (b) Dipole.

VALVES

<i>Circuit reference</i>	<i>Type</i>	<i>Function</i>
V1	ARP 13	R.F. amplifier
V2	ARP 4	Mixer
V3	ARP 4	Oscillator
V4	ARP 13	1st I.F. amplifier
V5	ARP 13	2nd I.F. amplifier
V6	AR 10	Detector and A.V.C.
V7	ARP 1	Output
V8	ARP 4	Beat oscillator

END

RECEPTION SET R. 102 (ZA 3244)

DATA SUMMARY

PURPOSE

General purpose receiver for reception of C.W., M.C.W. and R T signals on the M.F. band, used principally with Wireless set No. 5 H.P.

DESCRIPTION

The set is an eight-valve superhet, using one R.F. stage, mixer, local oscillator, two I.F. amplifier stages, beat oscillator, detector, A.V.C. and 1st A.F. stage, and 2nd A.F. stage. An A.C. mains power supply unit (Supply unit rectifier No. 1), operating from 110, 200-250 V 40-60 c/s, is used with the set, which can be operated up to 200-300 ft. from its aerial through a screened feeder and impedance matching units.

PHYSICAL DATA

Weight : 54 lb.
Length : 21½ in.
Width : 12½ in.
Height : 12 in.

FREQUENCY

Coverage : 180-620 kc/s.
Internal : 110 kc/s I.F.

PERFORMANCE

Receiver sensitivity : 9µV-25µV input for 20mW output with signal' noise ratio 20db.

Receiver selectivity : 50db. attenuation at 7 kc/s from centre frequency.

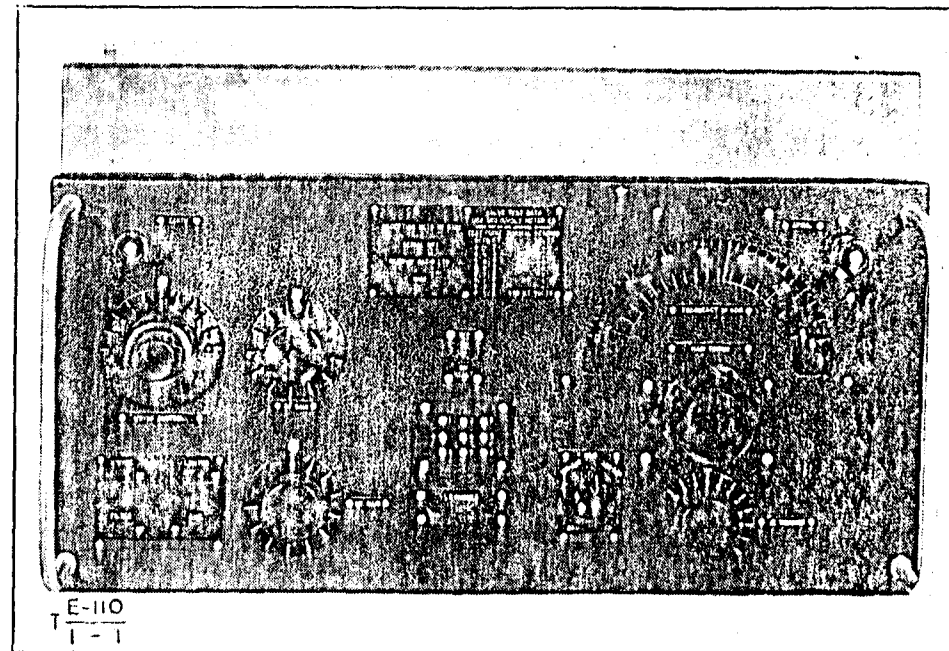


Fig. 1—Front view of set

POWER REQUIREMENTS AND CONSUMPTION

200 V, 20 mA D.C. H.T.
12 V, 0.4 A A.C. or D.C. L.T.
Provided from Supply unit rectifier No. 1 from A.C. mains, or from
6 V battery with Unit H.T. No. 2.

AERIAL SYSTEM

Small aerials up to 20 ft., if necessary from 200-300 ft. from the set
when used with screened feeder and Aerial coupling unit D.

VALVES

<i>Circuit reference</i>	<i>Type</i>	<i>Function</i>
V1A	ARP 12	R.F. amplifier
V1B	ARP 12	Mixer
V2A	AR 8	Local oscillator
V1C	ARP 12	I.F. amplifiers
V1D	ARP 12	
V2D	AR 8	Beat oscillator
V2B	AR 8	Detector, A.V.C. and 1st A.F.
V2C	AR 8	2nd A.F. amplifier

END

RECEPTION SET R 103 (ZA 3080) DATA SUMMARY

PURPOSE

Receiver designed for installation in Army vehicles (mainly staff cars) for short-range listening on C.W. or R/T signals.

DESCRIPTION

A seven-valve superheterodyne receiver, using one R.F. stage, a frequency changer, two I.F. amplifiers, a detector, A.V.C. and first A.F. stage, an output stage, and beat oscillator. The set is housed in a steel case, the power supply unit being in a separate case which also contains the loudspeaker.

PHYSICAL DATA

	Weight	Height	Width	Depth
Reception set R.103	20 lb.	7 in.	12 in.	7 in.
Supply unit (for Mk. I sets)	14½ lb.	6½ in.	11 in.	9½ in.
Supply unit (for Mk. II sets)	14 lb.	6¼ in.	9 in.	8½ in.

FREQUENCY

Coverage : 1.7—7.5 Mc/s
Internal : 465 kc/s I.F.

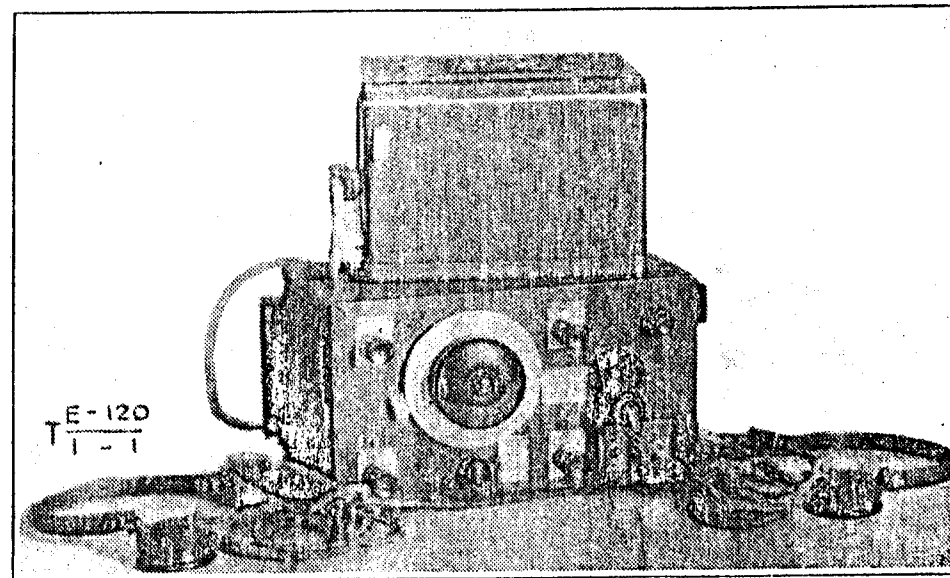


Fig. 1—General view of set

PERFORMANCE

Receiver sensitivity : $1\mu\text{V}$ for 5 mW output or $5\mu\text{V}$ for signal/noise ratio of 20 db.

Receiver selectivity : 45 db. attenuation at 10 kc/s off-centre frequency.

POWER REQUIREMENTS AND CONSUMPTION

12V at 4.5A

AERIAL SYSTEM

- (a) 6 ft. telescopic rod aerial.
- (b) Additional sections (from 1—6) of aerial rods B to above.
- (c) Dipole aerial and $80\ \Omega$ feeder (Mk. II sets only).

57/Maintenance/743 (M.E.10).

VALVES

<i>Circuit reference</i>	<i>Type</i>	<i>Function</i>
V1A	ARP 36	R.F. amplifier
V2A	ARTH 1	Frequency changer
V3A	ARP 31	1st I.F. amplifier
V3B	ARP 31	2nd I.F. amplifier
V3C	ARP 31	Det. A.V.C. and A.F. amplifier
V4A	ARP 32	Output amplifier
V3D	ARP 31	Beat oscillator

END

**RECEPTION SET, R 103A (ZA 11053)
(OBSOLETE)**

DATA SUMMARY

PURPOSE

General purpose reception as stand-by or extra receiver for use with Nos. 9 and 11 sets. Replaced by R 109.

DESCRIPTION

A six-valve self-contained superheterodyne receiver, incorporating a built-in power supply for A.C. mains or 6V D.C. battery. Receiver consists of one R.F. stage, mixer, two I.F. amplifiers, a diode detector, A.V.C. and double-diode-triode output, and beat oscillator. A seventh valve in the power supply pack acts as a cold cathode rectifier. The output is matched to two pairs of low-resistance phones or a No. 5 loudspeaker. It is housed in a steel case.

PHYSICAL DATA

Weight : 29 lb.
Length : 17 in.
Width : 11 in.
Height : 9 in.

FREQUENCY

Coverage : 1.7-7.5Mc s.
Internal : 465kc s.

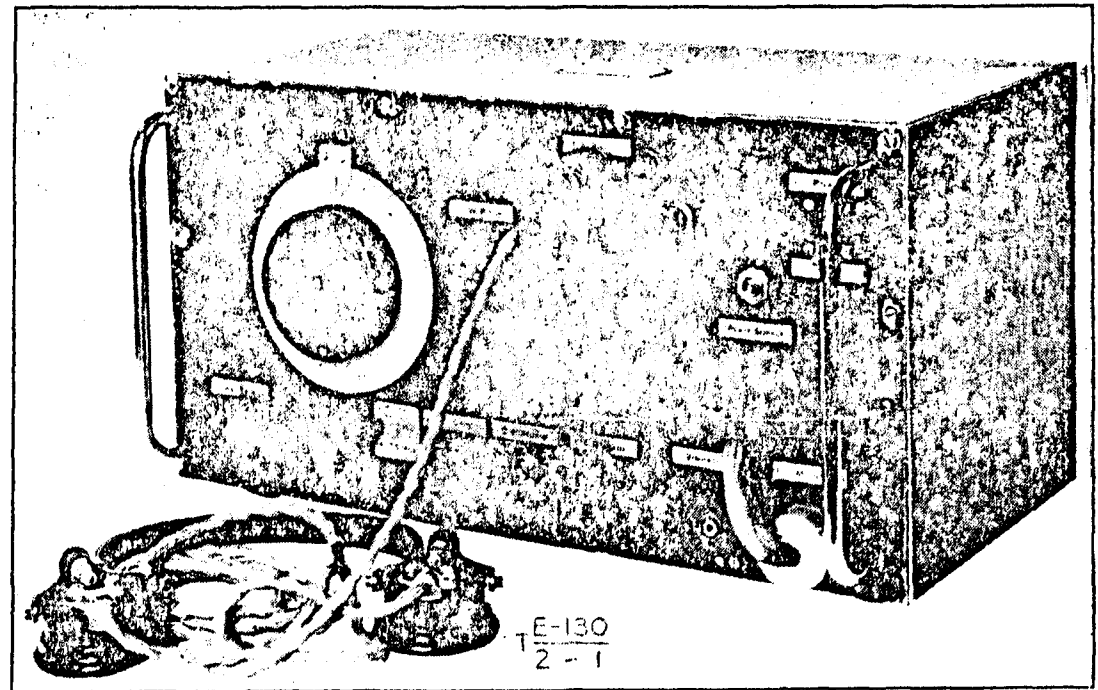


Fig. 1—General view of set

PERFORMANCE

Receiver sensitivity : $1\mu\text{V}$ for 1mW output, signal/noise ratio of 10db. (approx.).

Receiver selectivity : 40db. attenuation at $\pm 12\text{kc/s}$.

POWER REQUIREMENTS AND CONSUMPTION

Power supply :

(a) 100-250V, single-phase, 50c s A.C., giving up to 30W, or

(b) 6V, 4A supply.

AERIAL SYSTEM

(a) 6 to 24 ft. rod aerial.

(b) 80Ω feeder dipole aerial.

(c) Open-wire aerial.

VALVES

Circuit reference	Type	Function
V1A	ARP 36	R.F. amplifier
V2A	6K8G	Frequency changer
V3A	6K7G	1st. I.F. amplifier
V3B	6K7G	2nd. I.F. amplifier
V4A	6Q7G	2nd. detector A.V.C. and output
V5A	6C5G	Beat oscillator
V6A	AU 9	Cold cathode rectifier

END

Note.—This regulation cancels Issue 1, dated 3 Jan. 1944, which has been revised throughout.

RECEPTION SET R 106, MKS. 1 AND 2

TECHNICAL HANDBOOK - DATA SUMMARY

Note: *This issue supersedes Tels. GY 700, Issue 1, dated Dec. 1944. It has been amended and redesignated.*

PURPOSE

A special purpose receiver, for C.W., M.C.W. and R.T. (A.M.) signals, capable of high re-setting accuracy,

DESCRIPTION

A high-grade sensitive, selective, superheterodyne receiver, operating from a separate A.C. or D.C. power pack. The circuit comprises two tuned stages of R.F. amplification, a frequency changer stage employing a separate local oscillator; two I.F. amplification stages, the first incorporating a crystal filter with phasing and selectivity controls; a combined second detector, A.G.C. and first A.F. amplification stage; a second A.F. amplification stage; and a B.F.O. with pitch control coupled to the second detector.

Frequency bands are changed by plug-in coil sets. The receiver may be either rack-mounted or in a box-type cabinet. The Mk. 2 differs from the Mk. 1 in mainly in using metal valves

Issue 1, 27 Oct. 1950

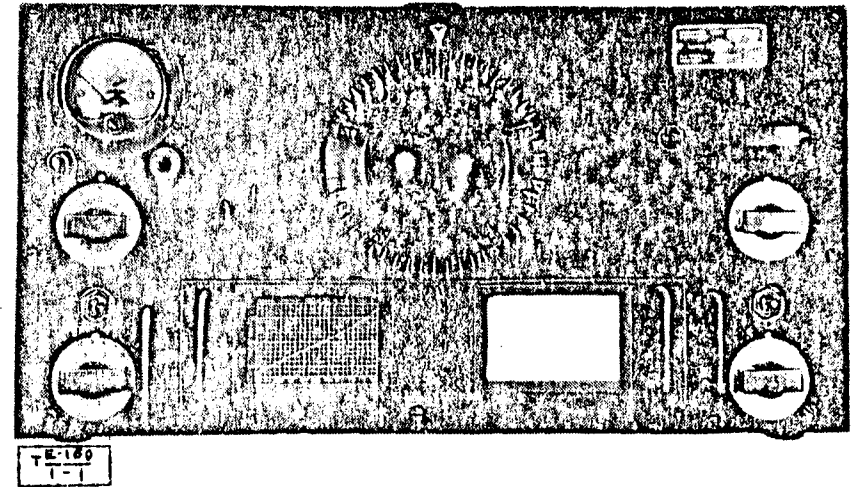


Fig. 1 - General view of equipment

PHYSICAL DATA

	Receiver and one coil set.	Individual coil set.
Weight:	32 lb.	2 lb.
Height:	9 in.	2½ in.
Width:	17½ in.	10½ in.
Depth:	12 in.	5½ in.

The total weight of the receiver with nine coil sets in containers is 53 lb.

FREQUENCY

Nine sets of plug-in coils cover the ranges 50 - 430kc/s and 480kc/s - 30Mc/s.

Frequency	Coil set	Frequency	Coil set
50 - 100kc/s	J	1.7 - 4.0Mc/s	JD
100 - 200kc/s	H	3.5 - 7.3Mc/s	JC
180 - 430kc/s	G	7.0 - 14.4Mc/s	JB
480 - 960kc/s	F	14.0 - 30.0Mc/s	JA
900 - 2,050kc/s	E		

Intermediate frequency: 456kc/s.

PERFORMANCE

Output: 3.0W (maximum) into 7,000
1.5W (undistorted)

Selectivity:

Crystal out - Bandwidth 3kc/s at 6db. down.
Average slope of selectivity curve to -60db. is 6.4db. per kc/s.

Crystal in - Bandwidth adjustable 200 - 2,500c/s at 6db. down.
Average slope of selectivity curve to -60db. is 12db. per kc/s.

Sensitivity: Better than 1µV for 1.5W output.

POWER SUPPLY

Consumption: L.T. 6.3V, 3.5A A.C.
H.T. 240V, 60mA D.C.

Supplied by:

(a) Supply unit, rectifier, No. 5, operated from 100 - 250V A.C., 50c/s supply. Consumption 40W (approx.) (see Tels. K 220/5).

(b) Supply unit, vibratory, No. 2, operated from a 6V D.C. supply. Consumption 50W (approx.).

**ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS**

AERIAL SYSTEM

The aerial input circuit can be arranged for operation with a balanced or unbalanced feeder or a single-wire aerial, and is matched to a load of 500Ω

REMARKS

Used with a separate loudspeaker matched to an impedance of 7,000 or with telephones of 1,000Ω impedance, (Receivers, headgear, C.H.R., double, Mk.3 or Mk. 4).

VALVES

<i>Circuit reference</i>	<i>Mk. 1</i>	<i>Mk. 2</i>	<i>Function</i>
V1	CV 1900	CV 1942	1st. R.F. amplifier
V2	CV 1900	CV 1942	2nd. R.F. amplifier
V3	CV 585	CV 1936	1st. Detector (mixer)
V4	CV 585	CV 1936	Local oscillator
V5	CV 1900	CV 1942	1st. I.F. amplifier
V6	CV 1900	CV 1942	2nd. I.F. amplifier
V7	CV 1891	CV 1990	2nd. Detector, A.V.C., and 1st. A.F. amplifier
V8	CV 585	CV 1936	Beat frequency oscillator
V9	CV 609	CV 511	2nd. A.F. amplifier

A signal strength meter is mounted on the front panel of most models.

The main tuning dial is calibrated from 0 - 500 and not directly against frequency.

Components used are not tropicalized.

57/Maint./4016

RECEPTION SET RI07 (ZA 3050)

DATA SUMMARY

PURPOSE

Receiver for C.W. and R.T. working, principally used in conjunction with Wireless sets Nos. 12 and 33, and other medium-power senders.

DESCRIPTION

Eight-valve superheterodyne receiver with variable beat oscillator and monitoring loudspeaker. Power unit (in same case) has provision for A.C. input and vibrator for D.C. working.

PHYSICAL DATA

Weight : 96 lb.
Height : 13 in.
Width : 24 in.
Depth : 17½ in.

FREQUENCY

Coverage 1.2 Mc s to 17.5 Mc s in 3 ranges.
Range 1 7.0 Mc s—17.5 Mc s.
Range 2 2.9 Mc s—7.25 Mc s.
Range 3 1.2 Mc s—3.0 Mc s.
Intermediate frequency 465 kc s.

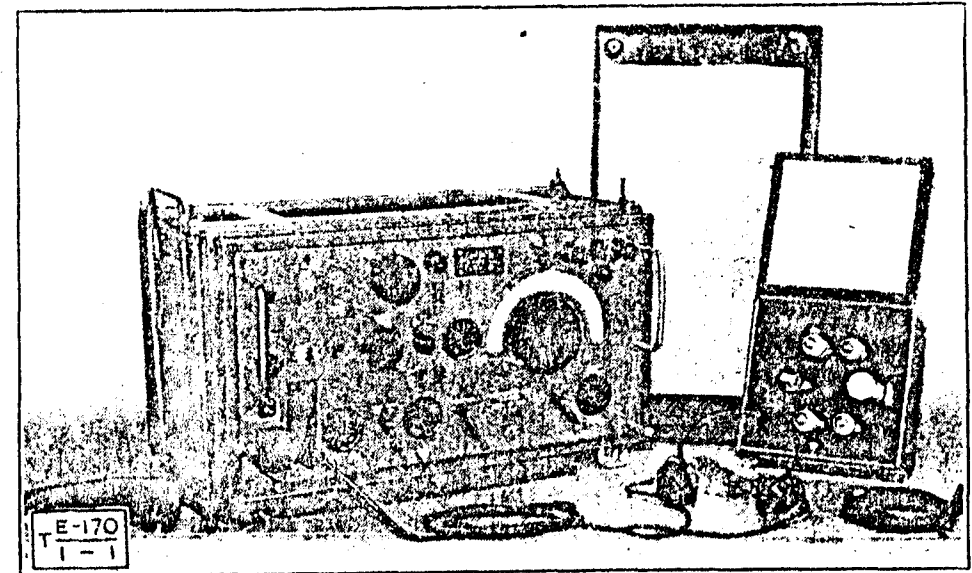


Fig. 1—General view of equipment

PERFORMANCE

Output : 200 mW (max) to telephone or loudspeaker.
Sensitivity : better than $2 \mu\text{V}$ over the whole range for a signal noise ratio of 20 db.

POWER REQUIREMENTS AND CONSUMPTION

Either (a) A.C. 100—250 V, consumption 34 W.
or (b) D.C. 12 V, consumption 3A.
Change over—by switch.

AERIAL SYSTEM

- (a) 20 feet of wire.
- (b) Dipole, with 70Ω balanced feeder.
- (c) For mobile work, a vertical rod.

VALVES

V 1A	R.F. amplifier	type	ARP 34
V 2A	Local oscillator	..	AR 21
V 1B	Mixer	..	ARP 34
V 1C	1st I.F. amplifier	..	ARP 34
V 1D	2nd I.F. amplifier	..	ARP 34
V 2B	Detector, A.V.C. and A.F. amplifier	..	AR 21
V 2B	Output	..	AR 21
V 2A	Beat oscillator	..	AR 21
V 3A	Full-wave rectifier	..	6X5G

REMARKS

Muting and side tune obtained by plug connection to sender. Variable bandwidth controlled by "narrow-wide" panel switch. Audio filter passing 900 c/s may be switched in for C.W. reception:

END

TELECOMMUNICATIONS

E 190

K 101

ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS

PERFORMANCE

Output : to loudspeaker or telephones.
Sensitivity : 2 μ V (approx.) for 1 mW output.

POWER REQUIREMENTS

6 V accumulator.	Consumption :—
	R109 1.3 A
	R109A 2.0 A
	R109B 2.0 A
	R109C 1.3 A

AERIAL

Provision for any type. Normally kept d.c. and aerial

VALVES

- V1B—type ARP 12, R.F. amplifier
 - V1C—type ARF 12, local oscillator
 - V1D—type ARP 12, mixer
 - V1E—type ARP 12, 1st I.F. amplifier
 - V1F—type ARP 12, 2nd I.F. amplifier
 - V2A—type AR 8, detector, A.V.C., and A.F. amplifier
 - V2B—type AR 8, output
 - V2C—type AR 8, B.F.O.
- except that (a) R.F. amplifier in R109A and B is type A coded V3A
(b) there is no A.V.C. in R109 A, B and C

REMARKS

R109 A, B and C incorporate various modifications of the R the purpose of improving C.W. reception.

END

RECEPTION SET R201 DATA SUMMARY

PURPOSE

Long-distance, high-speed telegraphy reception, maintaining a 24-hour service.

DESCRIPTION

Diversity receiver with three R.F./I.F. channels feeding a common L.F. unit providing three outputs :—

- (a) Audio output.
- (b) Push-pull output for operating undulator or telegraph relay.
- (c) Keyed A.F. tone output.

An automatic frequency control system compensates for drift at sending or receiving end. The set consists of five main units built on trays in a common rack.

PHYSICAL DATA

Weight : 10 cwt. 56 lb.
Height : 6 ft. 10 in.
Width : 2 ft. 11 in.
Depth : 2 ft. 6 $\frac{3}{4}$ in.

FREQUENCY

Coverage : 1.48-22.0 Mc/s in four bands :—

- Band 1. 1.5-3.0 Mc/s.
- „ 2. 2.9-5.9 Mc/s.
- „ 3. 5.8-11.4 Mc/s.
- „ 4. 11.2-22.0 Mc/s.

Internal : Intermediate frequency, 465 kc/s.

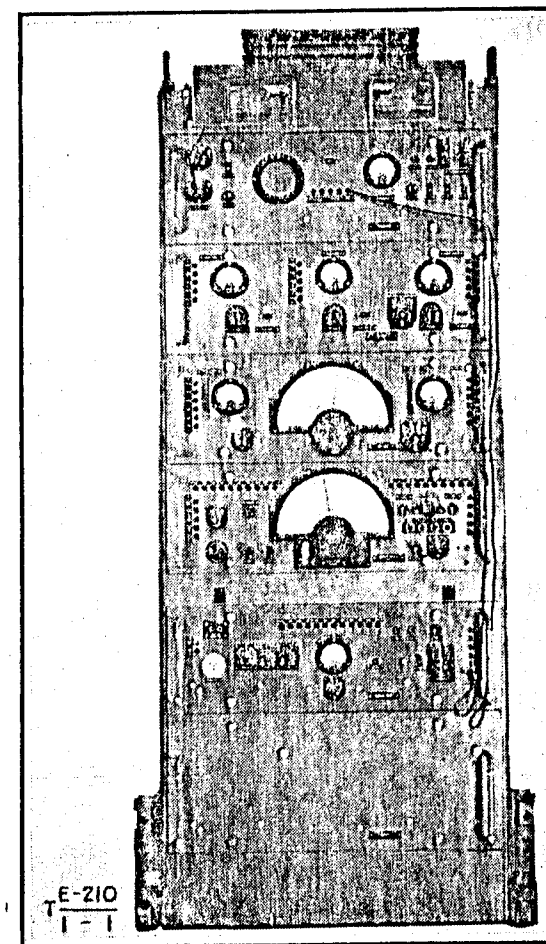


Fig. 1—Front view of equipment

PERFORMANCE

From L.F. unit : 10mW in 600 Ω into speech and C.W. lines.
From V.F. bridge unit : D.C. output to operate undulator UG6A,
10mW in 600 Ω at 900 c/s to tone line.
Sensitivity : Signals down to 2 μ V at the aerial socket may be recorded,
and will operate the A.F.C. system.

POWER REQUIREMENTS AND CONSUMPTION

230 V (± 10 V) 40-50 c/s, single-phase, A.C., giving 600 W.

AERIAL SYSTEM

Three rhombic aerials connected to the receiver by 75 Ω impedance
lines.

VALVES

Type	Complement	Spares
ARDD5	8	8
ARP34	36	36
ARP35	4	4
ARTH2	3	3
CV45	4	4
CV187	2	2
VR56 (R.A.F. type)	17	17
VT75	5	5
5U4G	2	2
6V6G	2	2

REMARKS

This set must be installed in a well-ventilated room having a clear
height of 7 ft. 6 in. ; the floor must be reinforced and dust free.
A fan is incorporated for air-cooling. The aerials and feeders are not
included in the Station List.

END

RECEPTION SET R 206, MK. I AND POWER SUPPLY UNIT NO. 15

DATA SUMMARY

PURPOSE

Sensitive receiver for use with special wireless services.

DESCRIPTION

High-grade 11-valve superheterodyne receiver for reception of C.W., M.C.W. and R/T (AM) signals, capable of high re-setting accuracy, incorporating crystal filters for high selectivity (2.5 and 0.7 kc/s bandwidth).

PHYSICAL DATA

	<i>Reception set R 206, Mk. I</i>	<i>Power supply unit No. 15</i>
Weight:	100 lb.	43 lb.
Height:	13 in.	12½ in.
Length:	25 in.	7 in.
Width:	13½ in.	14½ in.

FREQUENCY

Coverage: 0.55-30 Mc/s
Internal: 465 kc/s.

AERIAL SYSTEM

Provision for use with all types of aerial. Normally used with rhombic aerial.

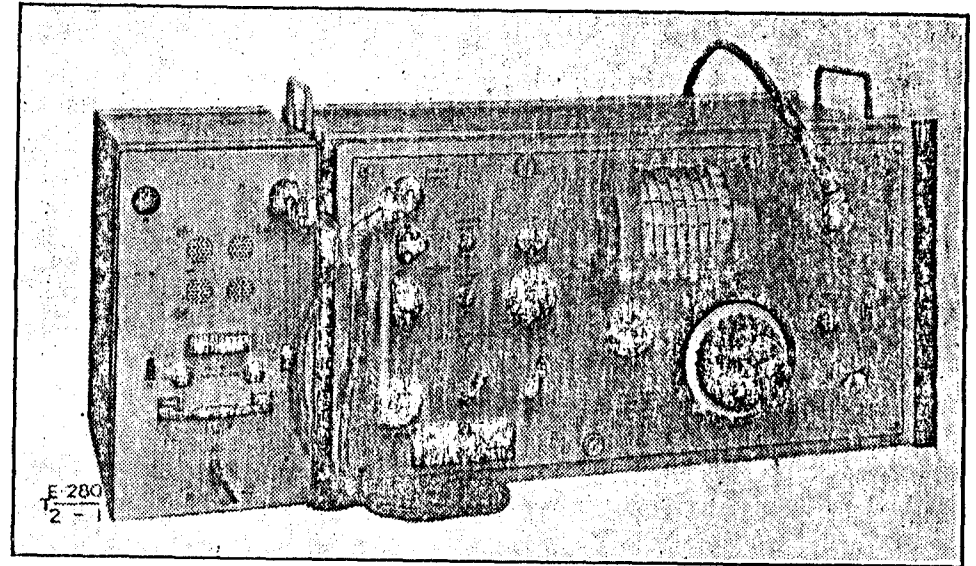


Fig. 1—General view of equipment

PERFORMANCE

Power and type of output: 1W max. A.F. in 10 Ω , 150 Ω and 600 Ω .
Sensitivity: R/T order of $1\frac{1}{2}$ - $2\frac{1}{2}\mu\text{V}$ } for signal-noise ratio of 20db.
C.W.: better than $1\mu\text{V}$ } for a nominal pass-band of 2.5 kc/s.

POWER REQUIREMENTS AND CONSUMPTION

Power supply unit No. 15 operated from: A.C. mains of 110-240V
40-60 c/s up to 60VA; or from D.C. 12V supply up to 50W.

VALVES

Circuit ref.	Type	Function
RECEPTI	ON SET R 206	
V1A	ARP 35 R.F. pentode	1st R.F. amplifier
V2A	ARP 34 R.F. pentode	2nd R.F. amplifier
V3A	ARTH 2 Triode-hexode	Mixer
V1B	ARP 35 R.F. pentode	Local oscillator
V2B	ARP 34 R.F. pentode	1st I.F. amplifier
V2C	ARP 34 R.F. pentode	2nd I.F. amplifier
V4A	AR 21 Double-diode-triode	2nd detector and A.F. amplifier

VALVES—contd.

Circuit ref.	Type	Function
V2E	ARP 34 Pentode	Beat oscillator
V2D	ARP 34 R.F. pentode	A.V.C. amplifier
V5A	ARDD 5 Double-diode	A.V.C. rectifier
V6A	VT 52 Pentode	A.F. output
POWER SUPPLY UNIT No. 15		
V1A-B	6X5G Double-diode	Anodes strapped to work as half-wave rectifier
V2A	AW2 (or CV188)	Voltage stabilizer

REMARKS

The R 206, Mk. II is being developed and will incorporate minor circuit changes, a different type of tuning dial and a different method of range selection. Details will be published at a later date.
The R 206, Mk. I incorporates a drum type tuning dial.
The frequency coverage is 0.05-30 Mc/s when the set is used in conjunction with Adaptors, frequency range, No. 1.

END

This replaces Tels. E 280, Issue 1, dated 16 Aug. 1943. All paras. have been amended and Fig. 1 is additional.

RECEPTION SET R 206, MK. 2 AND POWER SUPPLY UNIT NO. 33

DATA SUMMARY

PURPOSE

Sensitive receiver for use with special wireless services and also with direction-finding stations. Tropicalized version of R 206, Mk. 1 with improved features, chiefly mechanical.

DESCRIPTION

High-grade 11-valve superheterodyne receiver for reception of C.W., M.C.W. and R/T (A.M.) signals, capable of high resetting accuracy, incorporating crystal filters (0.7 kc/s and 2.5 kc/s band-width).

PHYSICAL DATA

	R 206, Mk. 2	P.S.U., No. 33
Weight :	120 lb.	45 lb.
Height :	12 $\frac{13}{16}$ in.	13 $\frac{5}{8}$ in.
Length :	24 $\frac{3}{8}$ in.	7 $\frac{1}{16}$ in.
Width :	17 in.	16 in.

FREQUENCY

Coverage : 0.55—30 Mc/s in 6 bands
Internal : 465 kc/s

PERFORMANCE

Power and type of output : 1W Max. A.F. in 10 Ω , or 600 Ω balanced.
Sensitivity : R/T order of 2-2 $\frac{1}{2}$ μ V } for signal-noise ratio of 20db.
C.W. better than 1 μ V } for a nominal pass band of 2.5 kc/s

POWER REQUIREMENTS AND CONSUMPTION

Power supply unit No. 33 operated from A.C. mains, 100-250V., 40-60 c/s up to 60VA ; or from D.C. 12V supply up to 54W.

AERIAL SYSTEM

80 Ω Input. Normally used with rhombic aerial.

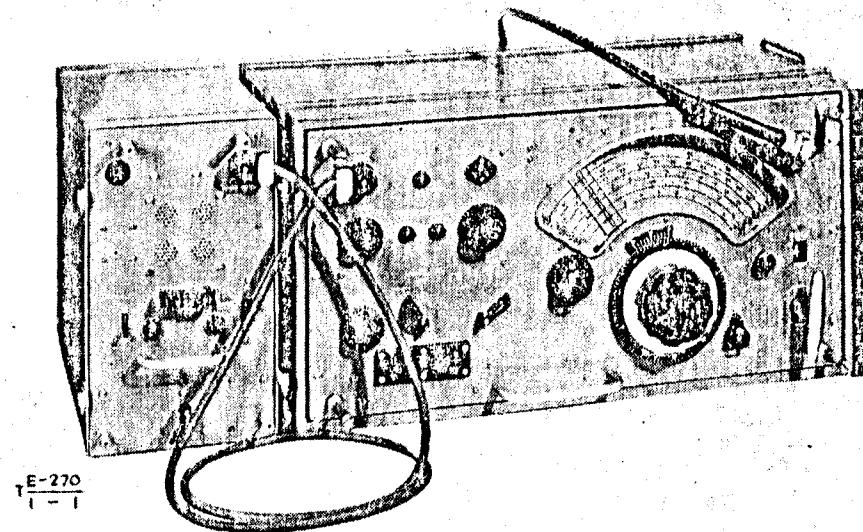


Fig. 1—General view of equipment

VALVES

<i>Circuit reference</i>	<i>Type</i>	<i>Function</i>
(a) R206, Mk. 2		
V1A	ARP35 R.F. pentode	1st. R.F. amplifier
V2A	ARP34 R.F. pentode	2nd. R.F. amplifier
V3A	ARTH2 Triode-hexode	Mixer
V1B	ARP35 R.F. pentode	Local oscillator
V2B	ARP34 R.F. pentode	1st. I.F. amplifier
V2C	ARP34 R.F. pentode	2nd. I.F. amplifier
V4A	AR21 Double-diode-triode	2nd. detector and A.F. amplifier
V5A	VT52 Pentode	A.F. output
V2D	ARP34 R.F. pentode	Beat oscillator
V2E	ARP34 R.F. pentode	A.V.C. amplifier
V6A	ARDD5 Double-diode	A.V.C. rectifier
(b) P.S.U. No. 33 V1 and V2	6X5G Double-diode	Anodes strapped to work as half-wave rectifier
V3	AW2 (or CV188)	Voltage stabilizer
VBI	Vibrator No.4T	Vibrator

REMARKS

Tropical components and finishes employed.
The frequency coverage is 0.05—30 Mc/s in 9 bands, when used with Adaptor, frequency range, No. 1 or No. 1 (T).
P.S.U. No. 33 contains a small moving-coil loudspeaker.

END

RECEPTION SET R 208 (ZA 10083)

DATA SUMMARY

PURPOSE

This reception set is designed for medium-distance reception, local broadcast service and mobile use in forward areas, providing C.W., M.C.W. or R/T facilities.

DESCRIPTION

A six-valve superheterodyne receiver, employing an R.F. stage, mixer, 1st. I.F. stage, 2nd. I.F. and beat oscillator, detector and output stages. The power supply unit and loudspeaker are built in with the receiver on a steel chassis. Receiver can be driven by battery or mains.

PHYSICAL DATA

Weight : 80 lb.
Length : 23 in.
Width : 12 $\frac{3}{4}$ in.
Height : 17 $\frac{1}{2}$ in.

FREQUENCY

Coverage : 10-60 Mc/s in three overlapping bands.
Internal : 2 Mc/s.

PERFORMANCE

Receiver sensitivity : 40 μ V input for 50mW output and signal/noise ratio of approx. 20db.
Receiver selectivity : 6db. attenuation \pm 60 kc/s.

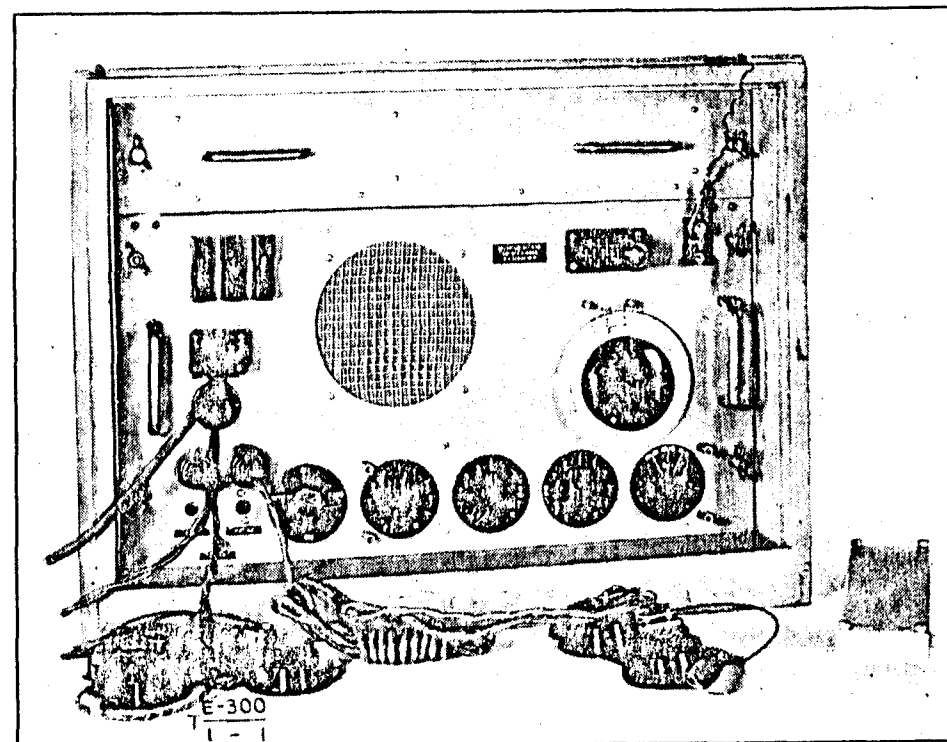


Fig. 1—Front view of set

RECEPTION SET R209, MK.2

DATA SUMMARY

PURPOSE

Replaces Reception sets R107, R109 and R209 Mk.1. It will also replace R106 and R206 when weight is of paramount importance.

DESCRIPTION

Hermetically sealed miniature 10 valve superhet receiver for reception of Voice (A.M.) or C.W. signals, with I.F. output socket for C.F.S. working. Provision is made for an external crash limiter which plugs into the 'phone socket if required. Re-design has rendered the F.M. facility inoperative and no attempt should be made to use this system.

PHYSICAL DATA

Weight - 22 lbs.
Height - 8.1/2 inches
Length - 12.1/8 inches
Width - 9.1/8 inches

T E - 310/2
1-1

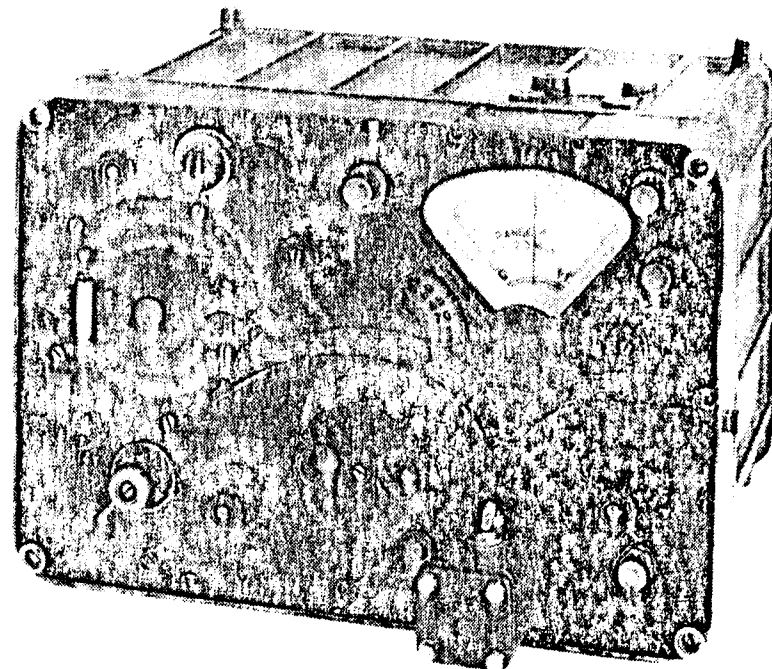


Fig. 1 - Front view of equipment

REMARKS

The receiver with vibrator power unit, built-in loudspeaker and desiccator, is housed in an hermetically sealed and watertight case.

FREQUENCY

R.F. : 1-20Mc/s in four bands
I.F. : 460kc/s

PERFORMANCE

Sensitivity : A.M. 3.5-5 μ V for 20db signal-to-noise ratio with 80 Ω input.

Selectivity : 4-6kc/s at 6db down.
(Slope 9db per kc/s between 6 and 40db)

Audio output : 50mW 1 Ω L.S. or 50 Ω 'phones (2).

AERIAL SYSTEMS

Two inputs to set:
80 Ω input for coaxial line
1,000 Ω input for matching to rod
or single-wire aerial

END

POWER REQUIREMENTS AND CONSUMPTION

12V battery, less than 1.5A
(average 1.4A)

VALVES

R.F. amplifier	CV131
Mixer	1R5
Local oscillator	1T4
Stabiliser	CV284
1st, 2nd, 3rd I.F.	1T4
Beat oscillator	1S5
Discriminator	1S5
Output	1S5, 1T4

REMARKS

Capable of high re-setting accuracy comparable with R106 or R206. High-frequency stability with vibration.

E290

RECEPTION SET R211 TECHNICAL HANDBOOK—DATA SUMMARY

PURPOSE

Long range S.S.B. radio reception.

DESCRIPTION

The equipment consists of two bays.

Bay 1 contains the basic receiver unit and may be used independently for triple-diversity, double-sideband reception. This bay consists of three receivers with a common local oscillator unit and a combining unit. The first I.F. is 1.2Mc/s and the second I.F. 465kc/s. Bay 2, when used in conjunction with Bay 1, provides for the reception of twin-channel single-sideband signals. It comprises a third frequency-changer stage giving an I.F. of 100kc/s, crystal sideband filters, sideband amplifiers and line amplifiers. There are six outputs, one for each channel from each of the three receivers. For telegraphy, all these may be fed to line; and for telephony, the outputs of the three receivers are combined, giving two outputs, one for each channel.

PHYSICAL DATA

Weight: Bay 1: Reception set CRD 150 20A 5 cwt.
Bay 2: S.S.R.2 6 cwt.
Height: 7 ft. 3 in.
Width: 1 ft. 10½ in. per bay total 3 ft. 9 in.
Depth: 1 ft. 7 in.

POWER OUTPUT

Bay 1 only—Three independent or one combined output of 100mW in 600Ω.

Bay 1 and 2— Each sideband available either as three independent outputs, or one combined output of 100mW in 600Ω.

FREQUENCY COVERAGE

1.5 30Mc/s (10 200 metres)
In five overlapping bands:
30.0 16.5Mc/s
16.5 9.0Mc/s
9.0 5.0Mc/s
5.0 2.75Mc/s
2.75 1.5Mc/s

Intermediate frequencies:

1st I.F.: 1.2Mc/s
2nd I.F.: 465kc/s
3rd I.F.: 100kc/s

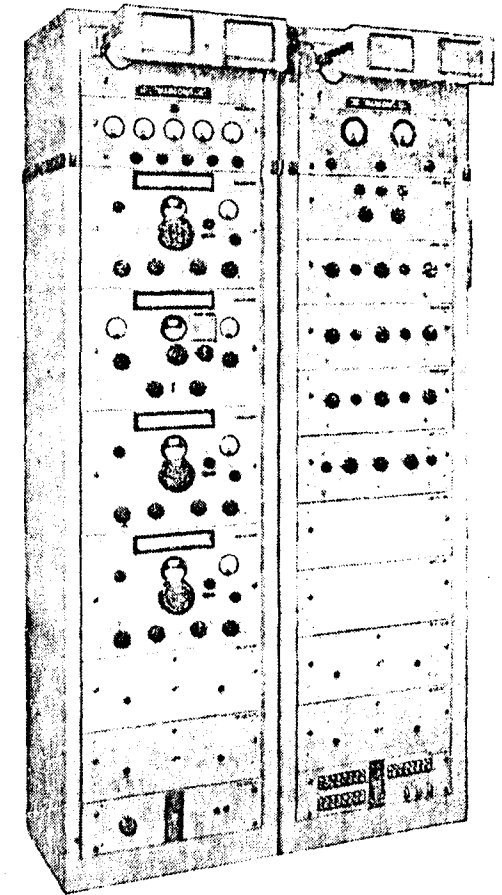


Fig. 1 General view of equipment

TELECOMMUNICATIONS

~~E-610~~ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS

SENSITIVITY

1.5 to 3 μ V input for signal/noise ratio of 10db.

POWER REQUIREMENTS AND CONSUMPTION

110 or 230V, 50c/s A.C. mains.

Consumption: Bay 1 only—450W

Bay 2 only—400W

AERIAL INPUT SYSTEM

Three 75 Ω coaxial feeders.

VALVES

TYPE OF AERIALS

Normally rhombic.

SPECIAL FACILITIES

Automatic frequency-control is applied to the second oscillator in both D.S.B. and S.S.B. reception.

REMARKS

All units are mounted on runners and trunnions for ease of servicing.

Reception set CRD 150/20A

Panels	CV 124	CV 181	CV 358	CV 587	CV 1053	CV 1054	CV 1067	CV 1068	CV 1071	CV 1073	CV 1091	CV 1347
Receiver CRD150/4	—	—	—	6	9	—	3	3	—	—	12	3
Common oscillator No. 2	1	—	3	—	—	—	—	1	—	—	4	—
Combining unit No. 2	—	—	3	—	—	6	1	—	—	1	—	—
Supply unit No. 1	—	—	—	—	—	—	—	—	4	—	—	—

S.S.R.2

Frequency changer and Carrier filter No. 1	—	—	1	—	—	—	—	1	—	—	—	6
Intermediate frequencies 3 No. 1	—	—	—	—	12	12	12	3	—	—	3	—
Selector No. 2	—	6	2	—	—	—	2	—	—	—	—	—
Supply unit No. 1	—	—	—	—	—	—	—	—	4	—	—	—

END

E380

**RECEPTION SET R 216
TECHNICAL HANDBOOK—DATA SUMMARY**

PURPOSE

Intended for use in forward areas for V.H.F. reception and direction-finding of C.W., M.C.W., R.T. (A.M. and F.M.) signals. This equipment replaces Reception Set R 308.

DESCRIPTION

A high performance, miniature, hermetically sealed, pan-climatic, 17 valve superheterodyne receiver. The complete station consists of five packs:—

- (a) Reception Set R 216
- (b) Supply unit, A.C., No....
- (c) Supply unit, D.C., No....
- (d) D.F. aerial equipment
- (e) Aerial feeder and set accessories

PHYSICAL DATA

Reception Set R 216	} have each the dimensions	{	Weight :	20 lb.
Supply unit, A.C., No....			Height :	8½ in.
Supply unit, D.C., No....			Length :	12½ in.
			Width :	9 in.

FREQUENCY

Coverage : 20 to 150Mc/s (in five overlapping bands) :—

- 21 to 32Mc/s
- 30 to 48Mc/s
- 45 to 70Mc/s
- 67 to 110Mc/s
- 105 to 150Mc/s

Internal : I.F. 4.86Mc/s

Calibrator intervals at 1 and 5Mc/s

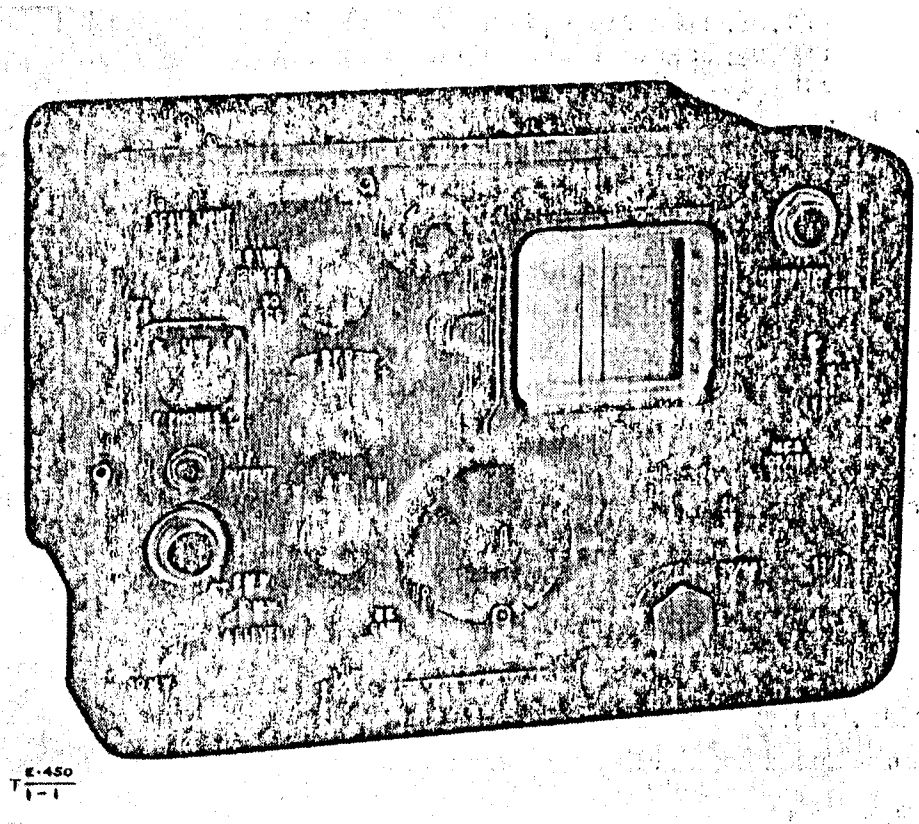


Fig. 1.—General view of equipment

Issue 1, 31 Jan. 1950

Distribution—Class 880. Code No 4

CONFIDENTIAL

U 5

G 380

PERFORMANCE

Power and Type of output

50mW { One 150Ω unbalanced phone output } via a 4-point sealed
 { One 600Ω balanced line output } socket.
 One I.F. output taken from a cathode follower via a coaxial connection.

Sensitivity: A.M., 2 to 3μV for 20db. signal-to-noise ratio with 80Ω input.

Selectivity: Two degrees of selectivity are provided:—

Narrow band-width at -6db., 30kc/s } slope 0.75db.
 Wide band-width at -6db., 120kc/s } per kc/s.

POWER REQUIREMENTS AND CONSUMPTION

Two external power supply units:—

(a) 100 to 120V and 200 to 250V, A.C., at 45 to 65c/s } via Mk. IV
 (b) 24V, D.C., regulated between 21 and 32V } plugs

Consumption: 60W

AERIAL/LINE SYSTEM

80Ω unbalanced coaxial line (no aerial trimmer).

57/Maint./3531

VALVES

Description	CV Nos.
1st. R.F. amplifier	CV 138
2nd. R.F. amplifier	CV 138
Frequency changer	CV 1092
1st. Oscillator	CV 138
1st. I.F. amplifier	CV 785
2nd. I.F. amplifier	CV 785
3rd. I.F. amplifier	CV 785
4th. I.F. amplifier	CV 1758
5th. amplifier or limiter	CV 1758
Discriminator and 2nd. detector	CV 140
1st. A.F. amplifier (on F.M.)	CV 785
Output amplifier	CV 1758
B.F.O.	CV 1758
Cathode follower (I.F. output)	CV 1758
Noise limiter	CV 140
Crystal calibrator	CV 138
Neon stabilizer	CV 287

REMARKS

The station can be conveniently carried either in vehicle or manpack form. Carriers are provided for both methods.

END

CONFIDENTIAL

Issue 1, 31 Jan. 1950

RECEPTION SET R216

TECHNICAL HANDBOOK - DATA SUMMARY

Note: This issue, Pages 1 to 4, supersedes Pages 1 and 2 of E 450, Issue 1, dated 31 Jan. 1950.
It has been amended throughout.

PURPOSE

General use in forward or rear areas for reception of C.W., M.C.W., or voice (A.M. and F.M.) signals. It replaces the Reception set R308.

DESCRIPTION

A high-grade, hermetically sealed, pan-climatic 16 valve superheterodyne receiver contained in the Reception set R209 box. The complete station consists of four packs:-

- (a) Reception set R216.
- (b) Supply unit rectifier No. 24 (A.C. unit).
- (c) Power supply unit No. 45 (D.C. unit).
- (d) Aerial feeder and accessories.

PHYSICAL DATA

	Weight	Height	Length	Width
Reception set R216	25½ lb	} 8½ in	} 12½ in	} 9¼ in
Supply unit rectifier				
No. 24	21 lb			
Power supply unit				
No. 45	23 lb			

FREQUENCY

Coverage: 20-155Mc/s in five overlapping bands:-

- Band 1: 105-155Mc/s
- Band 2: 67-110Mc/s
- Band 3: 45-70Mc/s
- Band 4: 30-48Mc/s
- Band 5: 20-32Mc/s

Internal: I.F.: 4.86Mc/s
Calibration signals at intervals of 5Mc/s and 1Mc/s.

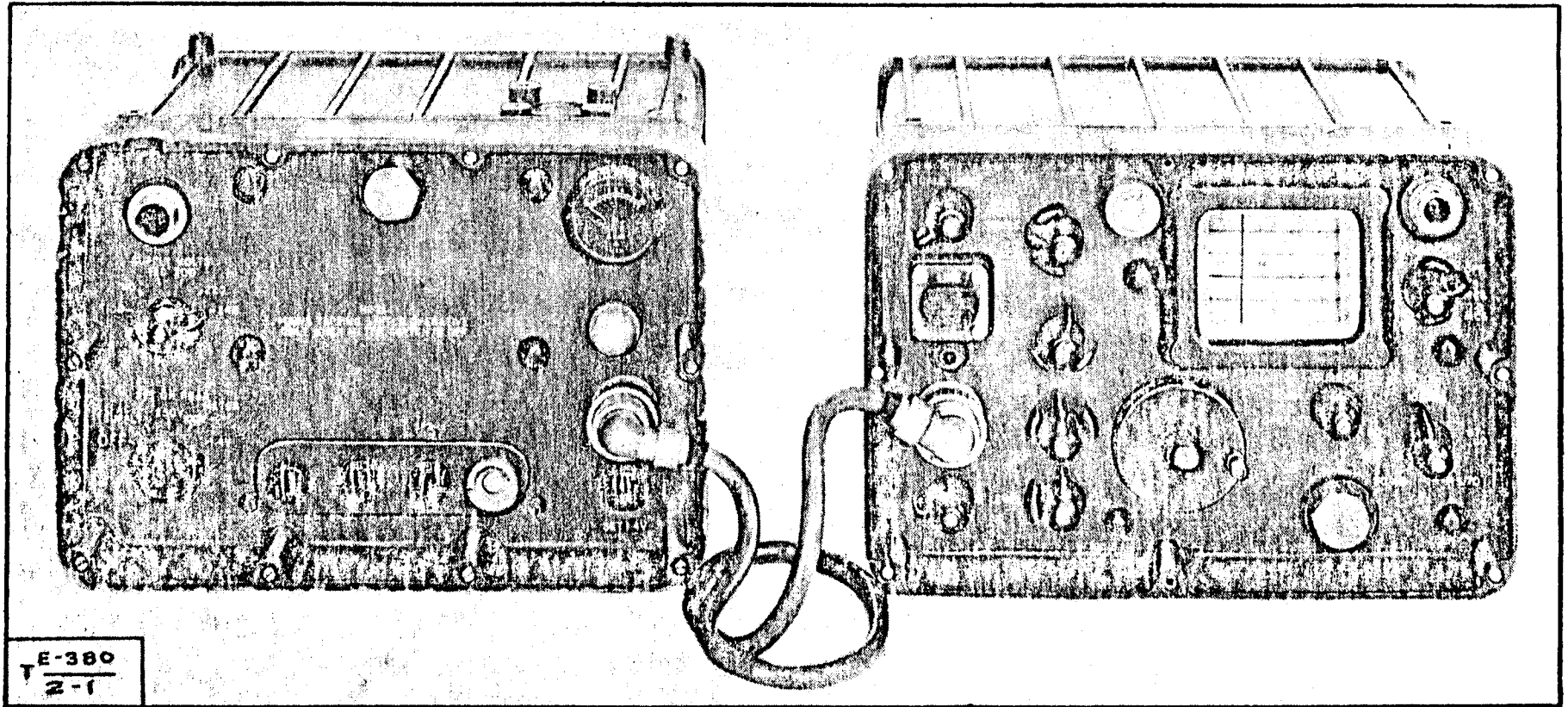


Fig 1 - View of equipment with S.W.R. No. 24

ELECTRICAL AND MECHANIC
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TELECOMMUNICATIONS
E 380

Power and type of output:

50mW { One 150 Ω unbalanced phase output } via a 4-point
{ One 600 Ω balanced line output } sealed socket

An I.F. output at 80 Ω via a coaxial plug.

Sensitivity: A.M. 3-6 μ V for 20db signal-to-noise ratio.)
C.W. 1-2.5 μ V for 20db signal-to noise ratio.) With input at 80 Ω
F.M. 1.5-3 μ V for 10db quieting.)

Selectivity: Two degrees of selectivity are provided:-

Narrow band-width at -3db, 30kc/s;
cut off slope 0.7db per kc/s.

Wide band-width at -6db, 120kc/s;
cut off slope 0.5db per kc/s.

POWER REQUIREMENTS AND CONSUMPTION

Two external P.S.U's:-

- (a) Supply unit rectifier No. 24; input 100-120V and 200-250V A.C. at 45-65c/s.
- (b) Power supply unit No. 45 $\frac{1}{2}$ nominal input 24V D.C. regulated between 22-32V D.C. by carbon pile.

Consumption: With S.U.R. No. 24 - 50W at 230V
With P.S.U. No. 45 - 70W average

AERIAL/LINE SYSTEM

80 Ω unbalanced coaxial line (no aerial trimmer).

RECEPTION SET R218
(UNDER DEVELOPMENT)

TECHNICAL HANDBOOK - DATA SUMMARY

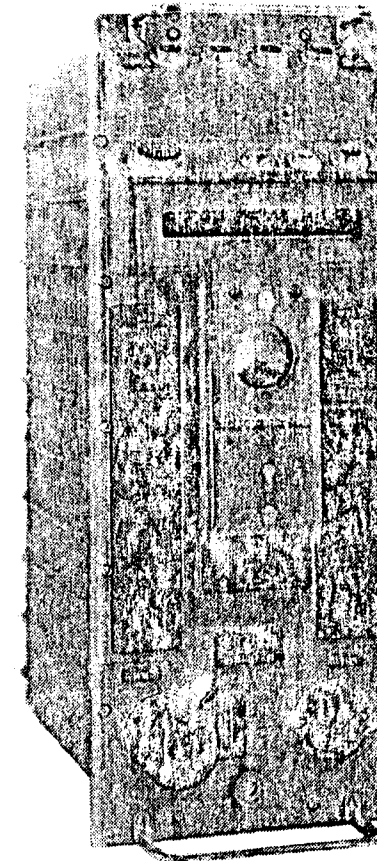
PURPOSE

High-grade communication receiver replacing R206 plus A.F.R. No. 1. The set covers the bands 13kc/s-680kc/s and is complementary to Reception set R219.

DESCRIPTION

Pan-climatic six-band superhet receiver, line-up as follows: 2 R.F., mixer, local oscillator, four stage I.F. amplifier (800kc/s) with optional crystal filters between 1st and 2nd stages. I.F. output fed to A.G.C. network which consists of A.G.C. detector, D.C. amplifier and delay valve. I.F. is also fed via a buffer stage to an A.M. demodulator, resulting A.F. is passed via 1st audio stage, optional noise limiter to 2nd and 3rd audio stages. Outputs provided are:

T E - 400
1 - 1



PERFORMANCE

Sensitivity A.M. : 3-4 μ V for 20db sig/noise
 C.W. : 1-1.3 μ V for 20db sig/noise

Outputs (i) 2 at 600 ohms - 10mW with A.G.C. in operation
 (ii) High or low impedance phones - up to at least 10mW

POWER REQUIREMENTS AND CONSUMPTION

Power is obtained from separate unit - S.U.R. No. 27. See EMER Tels K 220/13 for technical description and servicing data. Operates from A.C. mains 100/125V or 200/250V. Consumption: 90 watts approx.

AERIAL SYSTEM

Provision for 3 systems: (i) Unbalanced 70-100 ohm coaxial for normal dipole.
 (ii) Balanced 400 ohms - overhead feeders, etc.
 (iii) High impedance - rod or wire aerials.

- (i) Two 600 ohm balanced outputs.
- (ii) High or low impedance phone outputs and built-in monitor speaker.

C.W. reception is obtained by beating a B.F.O. into the demodulator.

Four degrees of selectivity are provided:

- | | | | |
|-------|---------|---|-------------------------|
| (i) | 8kc/s | } | crystal lattice filters |
| (ii) | 1.8kc/s | | |
| (iii) | 0.6kc/s | | |
| (iv) | 0.2kc/s | | |

PHYSICAL DATA

Weight
70 lbs.

Height
22 inches

Width
9 inches

Depth
15 inches

FREQUENCY

R.F.:

I.F.: 800kc/s

Range	Frequency in kc/s
1	13 to 27
2	25 to 52
3	47 to 98
4	89 to 186
5	170 to 355
6	324 to 680

RECEPTION SET R 308

DATA SUMMARY

PURPOSE

High-grade communication reception.

DESCRIPTION

Double superhet receiver for vehicle or ground station reception of amplitude-modulated and frequency-modulated signals.

PHYSICAL DATA

Receiver complete with carrier and internal spares.

Weight : 112 lb.

Height : $16\frac{1}{2}$ in.

Length : $24\frac{3}{4}$ in.

Width : $16\frac{1}{2}$ in.

REMARKS

The receiver, complete in one case with carrier, includes an R.F. unit, I.F./audio unit, power unit, compartments for 'phones and spare valves, and an optional internal loud speaker.

Fast- and slow-motion tuning with locking device. Flood-lit open dial with 0—100 logging scale. Lamps, operator. Aerial trimmer.

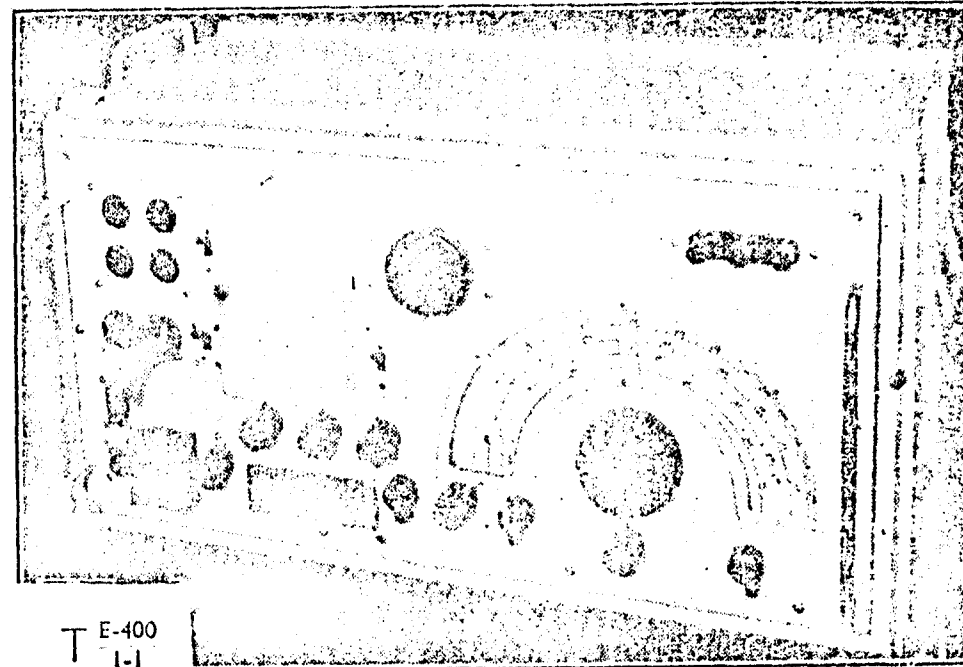


Fig. 1—View of development model

E690

FREQUENCY

Coverage : Five switched R.F. ranges, 20—145 Mc/s inclusive.

Internal : 1st I.F.	9.72 Mc/s
2nd I.F.	2.1 Mc/s
B.F.O.	2.1 Mc/s
Discriminator	2.1 Mc/s

PERFORMANCE

Power and type of output :	Loudspeaker	15 Ω , 160 mW
	Line	600 Ω , 500 mW
	Twin 'phones, D.L.R.,	30 mW

Sensitivity :

F.M.—An input of 2—5 μ V required to give 20 db. quieting over all frequency ranges.

A.M.—of the order of 3 μ V input for 20 db. signal-to-noise ratio over all frequency ranges.

Selectivity : 2nd I.F. amplifier.

Narrow	—	20 kc/s	at 6 db.	down
Medium	—	60 kc/s	"	"
Wide	—	140 kc/s	"	"

POWER REQUIREMENTS AND CONSUMPTION

Alternative supplies,	A.C. 100-250 V approx.	55W.
	or D.C. 12 V	" 50W.

AERIAL/LINE SYSTEM

Type : Ground station :—One or the other of two dipoles slung from a 36-ft. steel mast, adjustable to match the frequency in use.

Vehicle station :—Fishing rod aerial.

VALVES

VIA	—	VR 136	—	H.F. Pentode (R.F. amplifier).
V2A	—	VR 92	—	Diode (Mixer).
VIB	—	VR 136	—	H.F. Pentode (1st oscillator).
VIC	—	VR 136	—	H.F. Pentode (1st I.F. amplifier).
V3A	—	AW 2	—	Voltage stabilizer—(for 1st oscillator).
V3B	—	AW 2	—	Voltage stabilizer—(for 1st oscillator).
V4A	—	ARTH 2	—	Triode hexode—(2nd frequency changer).
VID	—	VR 136	—	H.F. Pentode—(2nd I.F. amplifier).
V5A	—	ARP 34	—	Vari-mu H.F. pentode (2nd I.F. amplifier).
V5B	—	ARP 34	—	Vari-mu H.F. pentode (2nd I.F. amplifier and limiter).
V4B	—	ARTH 2	—	Triode hexode (B.F. oscillator).
V6A	—	ARDD 5	—	Double-diode discriminator and audio detector.
V7A	—	6Q7G	—	Double-diode-triode audio amplifier and A.V.C.
V8A	—	VT 52	—	Pentode (audio output).

END

RECEIVER, RADIO, RACAL, TYPE RA117
TECHNICAL HANDBOOK - DATA SUMMARY

PART NO

Z1/5820-99-949-4826.

ROLE

General purpose h.f. communications receiver which can be used for normal a.m./c.w. reception and for diversity reception.

DESCRIPTION

The RA117 is a high grade receiver covering the range 980kc/s - 30Mc/s and providing a high order of sensitivity, selectivity and stability. Resembling the RA17, the equipment employs four stages of frequency conversion of unconventional design. Band setting is crystal-controlled in 1Mc/s steps and a second v.f.o. provides

fine tuning with a very high resetting accuracy. A crystal calibrator provides check points at 100kc/s intervals. A built-in meter monitors r.f., i.f., or a.f., levels. When used for diversity reception the 2nd v.f.o. can be used to tune two receivers simultaneously. The receiver is designed for rack mounting and is built up of sub-units mounted on a rigid cast aluminium chassis. Comprehensive screening plus filtering of h.t. and l.t. lines minimises pick-up between stages and from external sources.

PHYSICAL DATA

	<i>Rack mounting</i>	<i>Bench mounting</i>
Weight	67 lb	97 lb
Height	10.5 in.	12 in.
Width	19 in.	20.5 in.
Depth	20 in.	21.875 in.

CLIMATIC RANGE

Storage: -26°C to +70°C
Operation: 0°C to +55°C.

ELECTRICAL DATA

Frequency range

980kc/s - 30Mc/s

Intermediate frequencies

First i.f.: 40Mc/s ± 650kc/s

Second i.f.: 2.5Mc/s ± 500kc/s

Third i.f.: 1.6Mc/s with a bandwidth of approximately 14kc/s

Fourth i.f.: 100kc/s with six specific bandwidths:

6dB	66dB	
kc/s	kc/s	} LC filters
13	35	
6.5	22	
3	15	
1.2	8	} Crystal filters
c/s	kc/s	
300	2.0	
100	1.5	

I.F. outputs

Two outputs in parallel. Level 0.2V across 75Ω with a.v.c. operating.

RECEPTION SET RBZ

DATA SUMMARY

PURPOSE

A small portable A.M., R.T., receiver for special duties.

DESCRIPTION

The receiver and batteries are contained in watertight plastic cases and are carried in a canvas case.

The receiver employs one R.F. stage, frequency changer, one I.F. stage, detector and A.V.C., audio and output stages.

PHYSICAL DATA

	Height ins.	Width ins.	Depth ins.	Weight lbs. oz.	
Receiver:	8	2-7/8	1-7/8	1	14
Power Supply:	8	2-7/8	1-7/8	1	14

Complete equipment including case,
headset and aerial lead:

5 5-1/2

FREQUENCY

R.F. Coverage: 2 to 5.8 Mc/s
I.F. 455 Kc/s

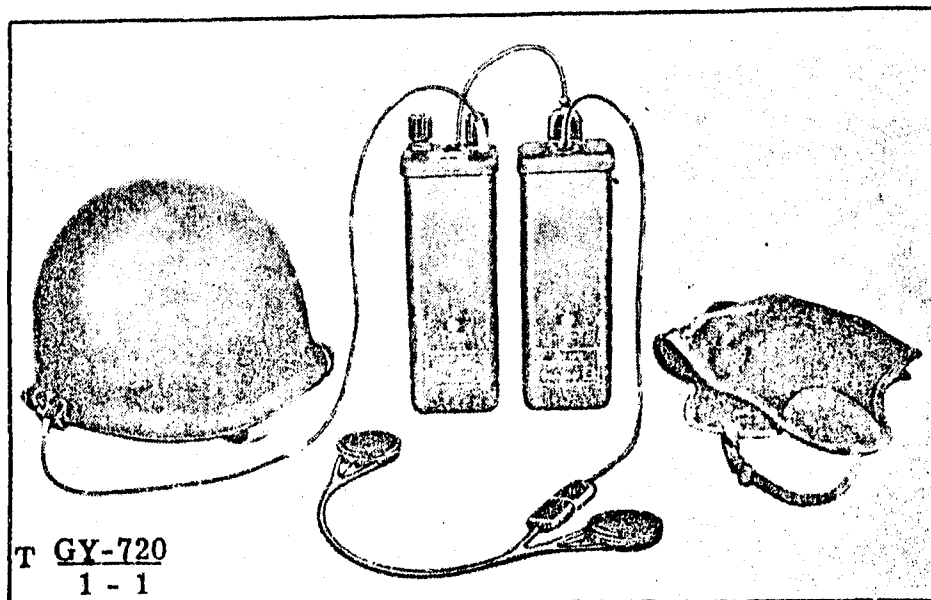


FIG. 1. VIEW OF EQUIPMENT

PERFORMANCE

Sensitivity: 1 to 4 uV input for 1 mW output.

RECEPTION SET RC 67 (ZA 10904)

DATA SUMMARY

PURPOSE

Short-wave telegraph-telephone receiver for diversity reception, reception and re-diffusion of broadcast programmes, and for use with high-speed recording apparatus.

DESCRIPTION

The complete set is mounted in a single-bay cabinet, comprising eight steel sections: (1) Rectifier panel, mounting one hard rectifier (type U52) and smoothing circuits; (2) Receiver panel, comprising two R.F. stages and frequency changer stage, four I.F. stages, diode detector, audio A.F. and output stages, beat oscillator and mixer stage, square law detector and telephony auto-gain control stage; (3) V.F. recording bridge, including rectifying and D.C. amplifying (see Tels. T 282/8 and T 283/8); (4) Sliding desk; (5) Main switch and fuse panel; (6) Blank panel; (7) Rectifier panel; (8) Blank panel. Circuits will deal with the following functions: (a) Passing to line broadcast or commercial telephone signals; (b) High-speed telegraph working via V.F.-operated D.C. circuits; (c) Passing to line a limited V.F. beat note output; (d) Spaced aerial diversity reception by use of two or more receivers.

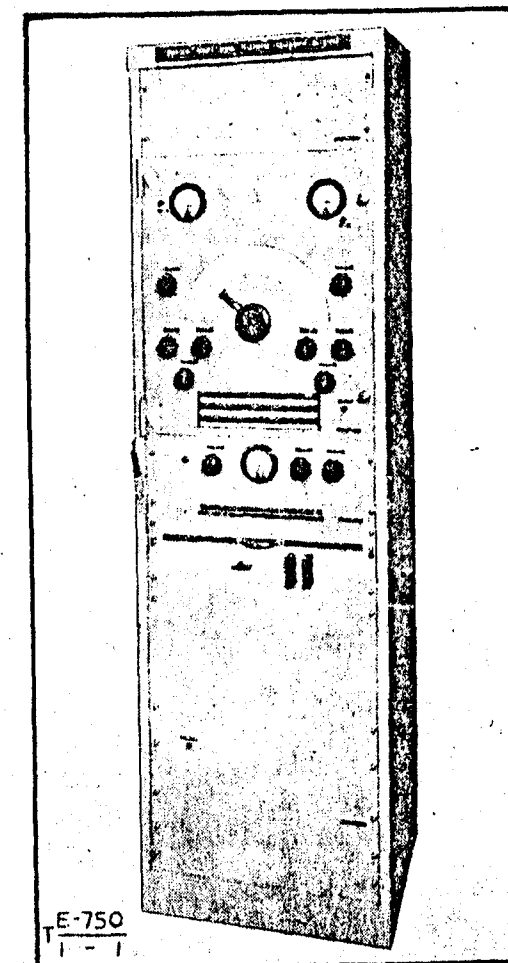


Fig. 1 - Front view of set

PHYSICAL DATA

Weight: 2½ cwt. (approx.)
Height 6 ft.
Length: 1 ft. 9 in.
Width: 1 ft. 3 in.

FREQUENCY

Coverage: 3 - 24 Mc/s
Internal: 600 kc/s

PERFORMANCE

Receiver sensitivity: 1.7 µV for 25 mW output
and signal/noise ratio of 20 db. at 6 Mc/s
Receiver selectivity: 60 db. attenuation ± 15
kc/s

POWER REQUIREMENTS AND CONSUMPTION

Power supply: Mains, 220 - 250V, A.C., 50 c/s up
to 170 VA, or Batteries, 200V up to 26W for anode
circuits, 8V up to 84W for heater circuits, 24V
up to 0.4W for grid bias circuits (receiver), 120V
up to 300W for grid bias circuits (bridge).

AERIAL SYSTEM

- (a) Concentric feeder of 75 Ω
- (b) Balanced two-wire feeders of 300 Ω matching into
rhombic aeriials.

VALVES

Circuit reference	Type	Function
Receiver V1) V2)	KTW 62 (VR 100)	R.F. stages
V3	X 65 (NR 82)	Frequency changer
V4) V5) V6) V7)	KTW 63 (ARP 15)	I.F. stages
V8	DH 63 (NR 68)	Detector
V9	X 65 (NR 82)	Beat oscillator
V10	KT 63 (ARP 17)	A.F. output stage
V11	H 63 (VT 73)	A.G.C. rectifier
V13) V14)	KTZ 63 (ARP 16)	D.C. amplifier

Bridge panel employs 10 valves (listed in Tels. T 280

END

Issue 1, 30 Oct.

Am

RECEPTION SET RG 35 (ZAI0774) DATA SUMMARY

NOTE.—This replaces and cancels Tels. E 810, Issue 1. Items marked thus ● have been amended.

PURPOSE

General purpose services receiver, giving facilities for secondary rebroadcast. Used by special wireless units.

DESCRIPTION

The set is a seven-valve superheterodyne receiver employing a R.F. stage, mixer, two I.F. stages, detector and oscillator stage, auto-gain and output stages. The set is housed in a metal case.

● PHYSICAL DATA

	Set	P.S.U., R.E.4
Weight :	112 lb.	15 lb.
Length :	24½ in.	10 in.
Width :	16½ in.	8½ in.
Height :	15¼ in.	7 in.

FREQUENCY

Coverage : 3,000 - 100kc/s.
Internal : 85kc/s.

PERFORMANCE

Receiver sensitivity : 9.5μV for 10mW output and signal/noise ratio of 10db.
Receiver selectivity : 45db. attenuation, ± 3.5kc/s.

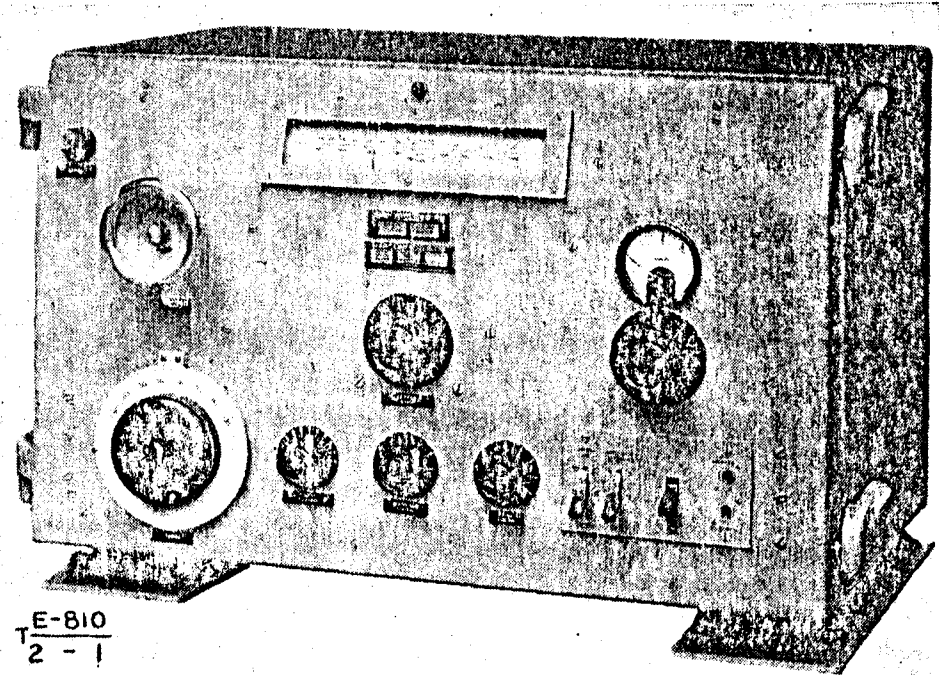


Fig. 1—Reception set RG 35

POWER REQUIREMENTS AND CONSUMPTION

Power supply :

(a) 6V L.T. accumulator, giving up to 13.2W.
160V H.T. battery, giving up to 7.2W, or

(b) Power supply unit R.E.4

Input : 110 or 210-250V A.C., 55W.

Output : 6.3V A.C., 2.2A.
160V D.C., 50mA.

AERIAL SYSTEM

10 ft. wire.

VALVES

<i>Circuit reference</i>	<i>Type</i>	<i>Function</i>
V1	KTW63 (ARP15)	R.F. amplifier
V2	X65 (NR82)	Mixer
V3	KTW63 (ARP15)	1st. I.F. amplifier
V4	KTW63 (ARP15)	2nd. I.F. amplifier
V5	X65 (NR 82)	Detector and oscillator
V6	KTW63 (ARP15)	Auto-gain
V7	KT63 (ARP17)	Output

END

RECEPTION SET HALLICRAFTERS SX-24

DATA SUMMARY

PURPOSE

A general purpose communication receiver for reception of R.T., C.W., and M.C.W. signals.

DESCRIPTION

The receiver employs two stages of R.F. amplification, frequency changer, two I.F. amplifiers with variable selectivity and crystal filter, second detector and A.V.C., noise limiter, audio and output stages and B.F.O. Band spread tuning and an "S" meter are provided and the set incorporates a mains power pack.

Model SX-24-U is identical with SX-24 except that it includes a universal mains transformer.

PHYSICAL DATA

Weight: 40 lbs.
Height: 9-1/2 ins.
Width: 19-1/2 ins.
Depth: 10-1/8 ins.

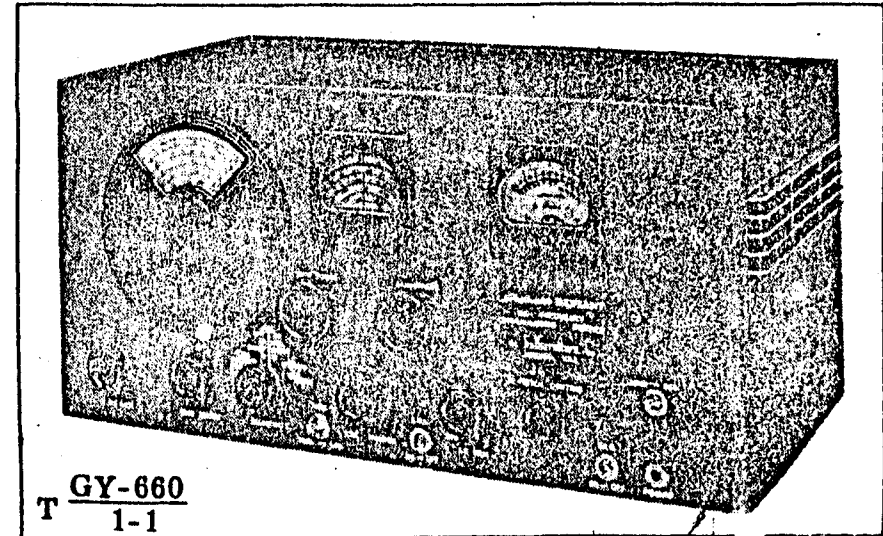


FIG. 1. VIEW OF EQUIPMENT

FREQUENCY

Coverage: 540 Kc/s to 43.5 Mc/s in four switched bands
Intermediate: 455 Kc/s.

RECEPTION SET HALLICRAFTERS S-36

DATA SUMMARY

PURPOSE

A general purpose communication receiver for reception of A.M. or F.M. signals.

DESCRIPTION

The receiver is a conventional superheterodyne incorporating both A.M. detector and F.M. discriminator, which are selected by switching, and feed to the same output stage. The set uses one R.F. amplifier, mixer, local oscillator, three I.F. amplifiers, A.M. detector with A.V.C., F.M. limiter and discriminator, audio amplifier, power audio amplifier, and B.F.O. A mains power pack is incorporated.

An 'S' meter for indicating signal strengths, variable selectivity, noise limiter and tone control are provided.

The receiver is known as BC-787-A used in Radio Set SCR-607-A and was also known as S-27-D. A later model with improved construction is S-36A (BC-787-B used in SCR-607-B).

S-36U has a universal mains transformer.

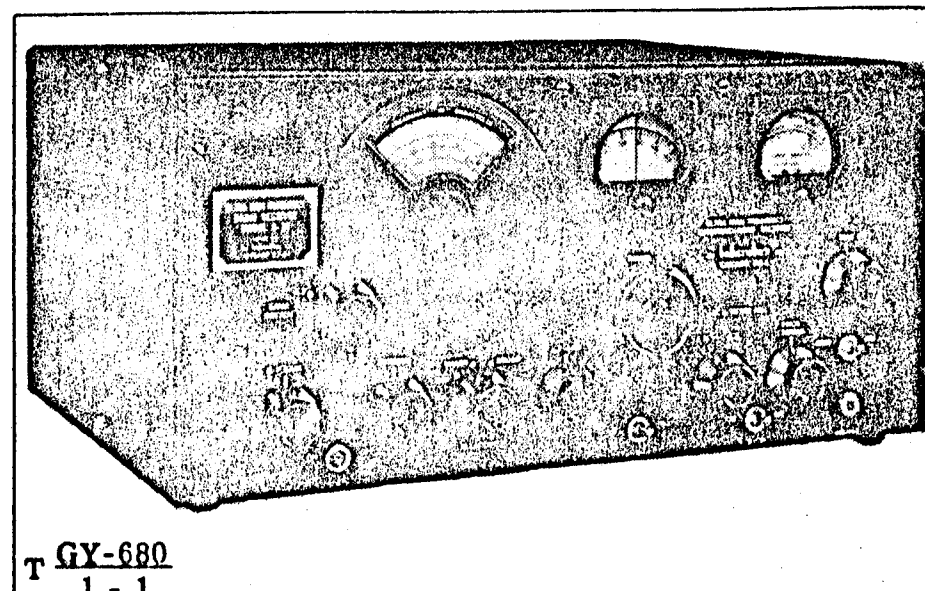


FIG. 1. VIEW OF EQUIPMENT

RECEPTION SET, U.H.F., SPECIAL (ZA 11324)

(OBSOLESCENT)

DATA SUMMARY

PURPOSE

Special wireless duties.

DESCRIPTION

A ten-valve superheterodyne receiver, employing an R.F. stage, mixer, local oscillator, two I.F. stages, detector, beat oscillator and A.V.C. stage, L.F. stage and output stage. The tenth valve is a full-wave rectifier. The frequency band is in five overlapping stages selected by switching. A Muirhead precision type dial, marked 0-100°, with a vernier cursor, is the main frequency control. A chart is provided to convert dial reading to Mc/s. Alternative mains or battery power supply is controlled by a switch at the back of the set.

PHYSICAL DATA

Weight : 58 lb.
Length : 22½ in.
Width : 12 in.
Height : 10 in.

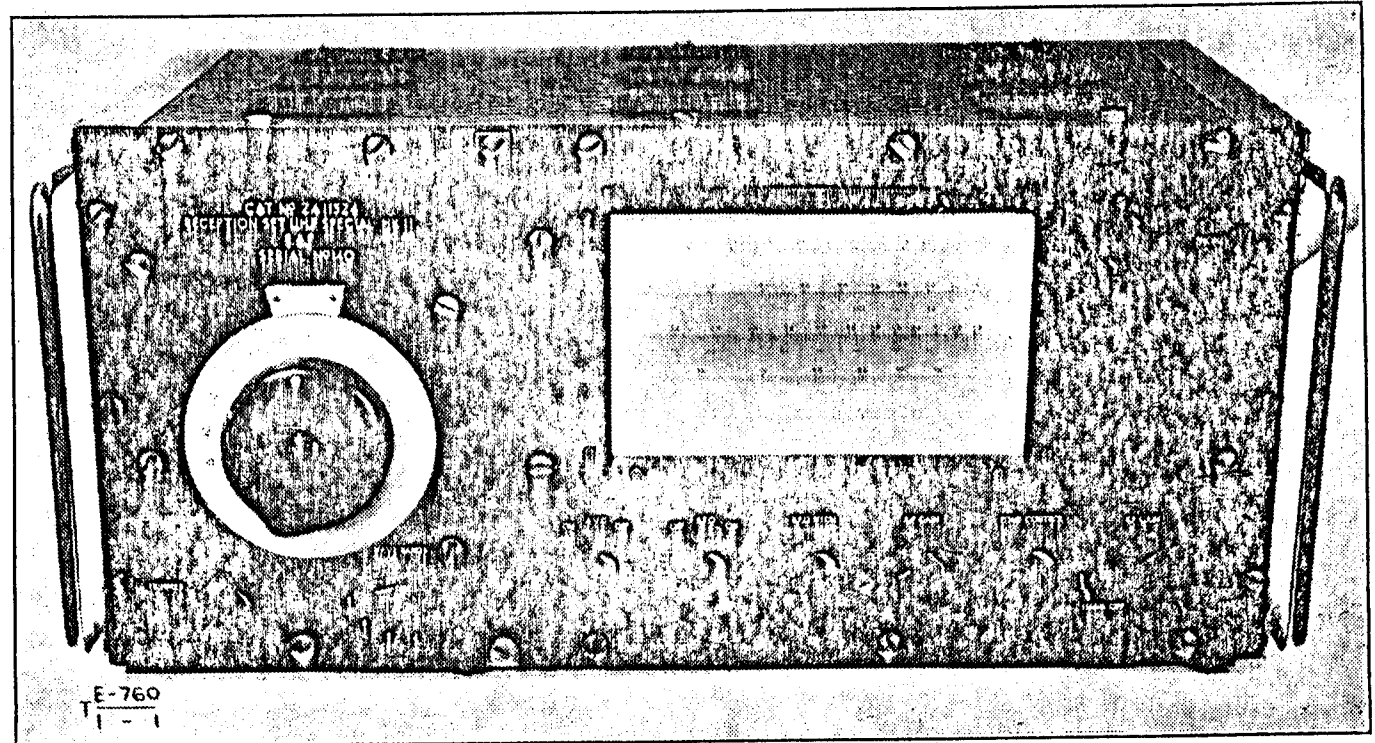


Fig. 1—General view of equipment

FREQUENCY

Coverage : 27-130 Mc/s in five switched bands.
Internal : 5,000 kc/s.

PERFORMANCE

Receiver sensitivity : $5\mu\text{V}$ for 50mW output, and signal/noise ratio of 20db.

Receiver selectivity : 6db. attenuation, ± 20 kc/s.

POWER REQUIREMENTS AND CONSUMPTION

(a) Built-in A.C. power pack, 200-250V, 40-50 c/s A.C., up to 50VA.—Or
(b) 6V accumulators up to 15W and 250V H.T. battery up to 20W.

AERIAL SYSTEM

(a) Open-wire aerial—or
(b) Aerial, dipole No. 7 or 7A.

VALVES

Circuit reference	Type	Function
V1A	956	R.F. stage
V1B	956	Mixer
V2A	955 (VR59)	Local oscillator
V3A	6K7G (ARP15)	1st I.F.
V3B	6K7G (ARP15)	2nd I.F.
V4A	6C5G (NR 78)	Detector
V5A	6Q7G (NR 68)	Beat oscillator and A.V.C.
V6A	6J7G (NR 83)	L.F. stage
V7A	6V6G (ARP32)	Output
V8A	5Z4G	Full-wave rectifier

END

WIRELESS STATION B43/R220, MKS. 1/1 AND 3/1

TECHNICAL HANDBOOK - DATA SUMMARY

PURPOSE

The wireless station B43/R220, Mks. 1/1 and 3/1 consist of a Sender B43 and Receiver R220. The stations are intended for use by A. A. Command in a permanent or semi-permanent static role. The stations are constructed to withstand vehicle transportation over rough country.

DESCRIPTION

The wireless station B43/R220, Mks. 1/1 and 3/1 are self-contained, V.H.F. amplitude modulated senders and receivers. There are two versions of the station:--

- (a) B43/R220, Mk. 1/1 comprises; Sender B43, Mk. 1/1, Receiver R220, Mk. 2 and power supply unit No. 40, Mk. 1/1. This station can be controlled remotely via land lines or can be used as a repeater station.
- (b) B43/R220, Mk. 3/1 comprises; Sender B43, Mk. 2/1, Receiver R220, Mk. 2 and power supply unit No. 40, Mk. 2/1. This is a general purpose station which is operated from a desk telephone set which is plugged into the front panel of the sender.

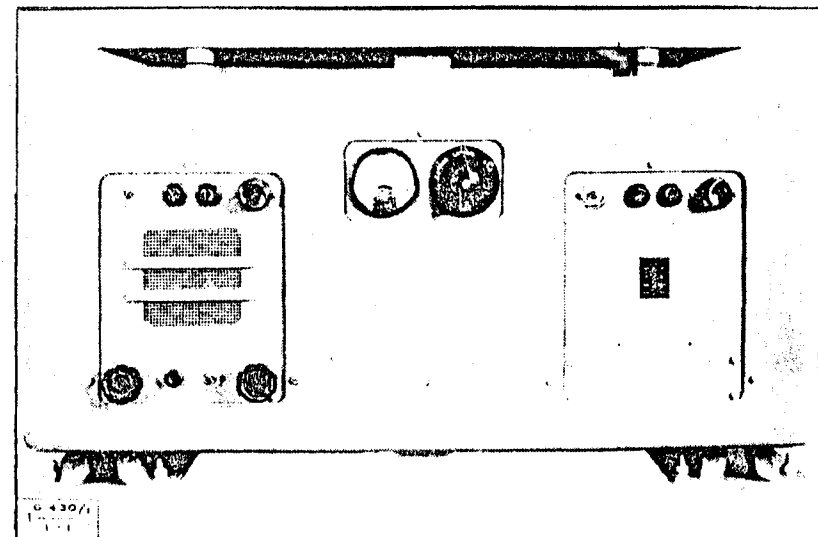


Fig. 1 - general view of complete station

B44
mk III

POWER REQUIREMENTS

12V supplied by two 6V 40Ah secondary batteries.

Battery consumption:-

Stand by	On (no send)	On (send)
3.0 amp	3.8 amp	6.0 amp

AERIAL SYSTEM

Two types of aerial are provided:-

- (a) An end-fed rod which fits into the aerial socket of the set.
- (b) A half-wave vertical dipole with fittings for mounting on a pole or tree, together with 50 feet of connecting feeder.

Aerials and sets are coded according to the frequency bands.

Valves:-

Valve ref	type
V1-5	CV 138
V6	CV 140
V7	CV 137
V8-9	CV 136
V10-11	CV 416
V12	CV 2129

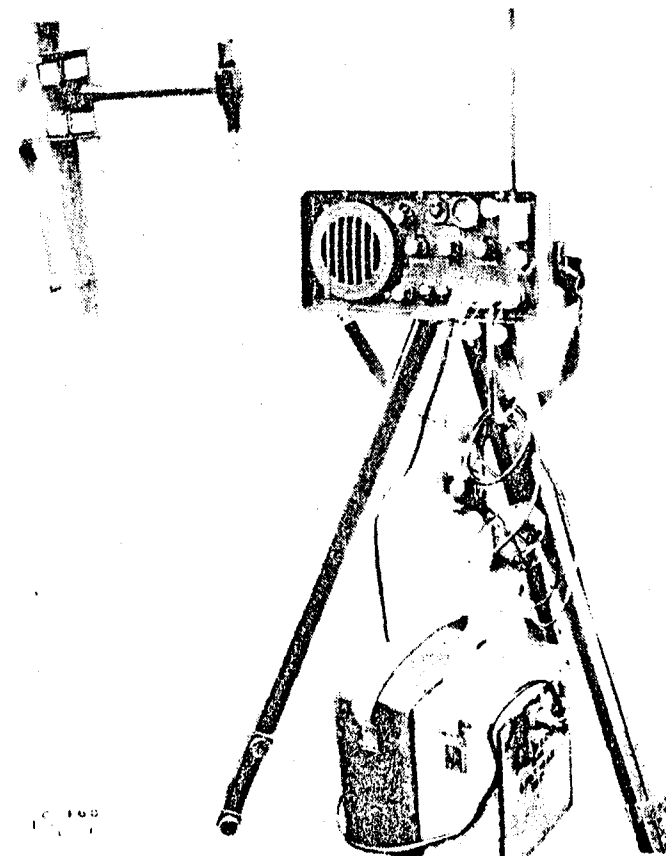


Fig 1 - Wireless station, B44, Mk 3

END

WIRELESS SET C12

TECHNICAL HANDBOOK - DATA SUMMARY

PURPOSE

The set is intended for use as a replacement for the Wireless set, No 19. It provides medium range communication on AM voice and CW.

DESCRIPTION

An HF, tropicalized transceiver employing the sender - mixer principle. It is housed in a metal case similar to the WS 19. The power supply unit and the aerial tuning unit are separately housed in metal cases. The receiver is a conventional superheterodyne comprising one RF stage, frequency changer, 2 IF's, detector, AGC, AF and audio output stages. The sender uses the receiver LO plus a beat oscillator and mixer stage feeding a buffer amplifier and power amplifier. The modulator comprises a push-pull pre-amplifier feeding a push-pull power amplifier stage which modulates the anode and screen grid circuits of the RF power amplifier. Send receive switching is effected by pressel switch on the handset. Netting and intercommunication facilities are provided. Facilities for crystal control were provided but the relevant control (MO/xtal) is normally rendered inoperative.

PHYSICAL DATA

	Set	PSU	ATU
Width:	17.1/2 in.	6.1/4 in.	8.1/4 in.
Height:	8.1/4 in.	8.1/2 in.	5 in.
Depth:	12.1/2 in.	12 in.	12 in.
Weight:	37 lb	2 lb	9 lb

FREQUENCY

Coverage: 1.6 - 40Mc/s
4.0 - 10.0Mc/s
IF: 460Kc/s

PERFORMANCE

Receiver sensitivity

3.5 - 5-0 μ V for 50mW output at 20dB signal/noise ratio over frequency range 1.6-10Mc/s.

Sender output

8 watts unmodulated) This varies over the frequency band dropping to 3.5-4.0W at 10
5 watts voice) Mc/s

Range

15 - 40 miles on voice depending on terrain

POWER CONSUMPTION AND REQUIREMENTS

Two PSU's are available for either 12 or 24V. d.c.

Consumption

	12V	24V
Receiver only	4.6A	2.8A
Receiver, I/C and sender heaters	6.9A	5.0A
Sender voice	18.0A	9.0A
Sender CW	11.5A	7.3A

VALVES						REMARKS
Qty	CV131 4	CV136 2	CV138 2	CV287 1	CV428 3	The set embodies an electrical flick system such that on the turn of a switch either of two pre-selected frequencies for sender, receiver and ATU is obtained. Power supply for both operator lamp and a calibrator crystal No 10 is provided. The set may be used with wireless harness type A or type B and a special adaptor connector for use with WS No 19 harness is being provided.
Qty	C452 1	CV492 1	CV493 2	CV2128 2	CV2293 1	

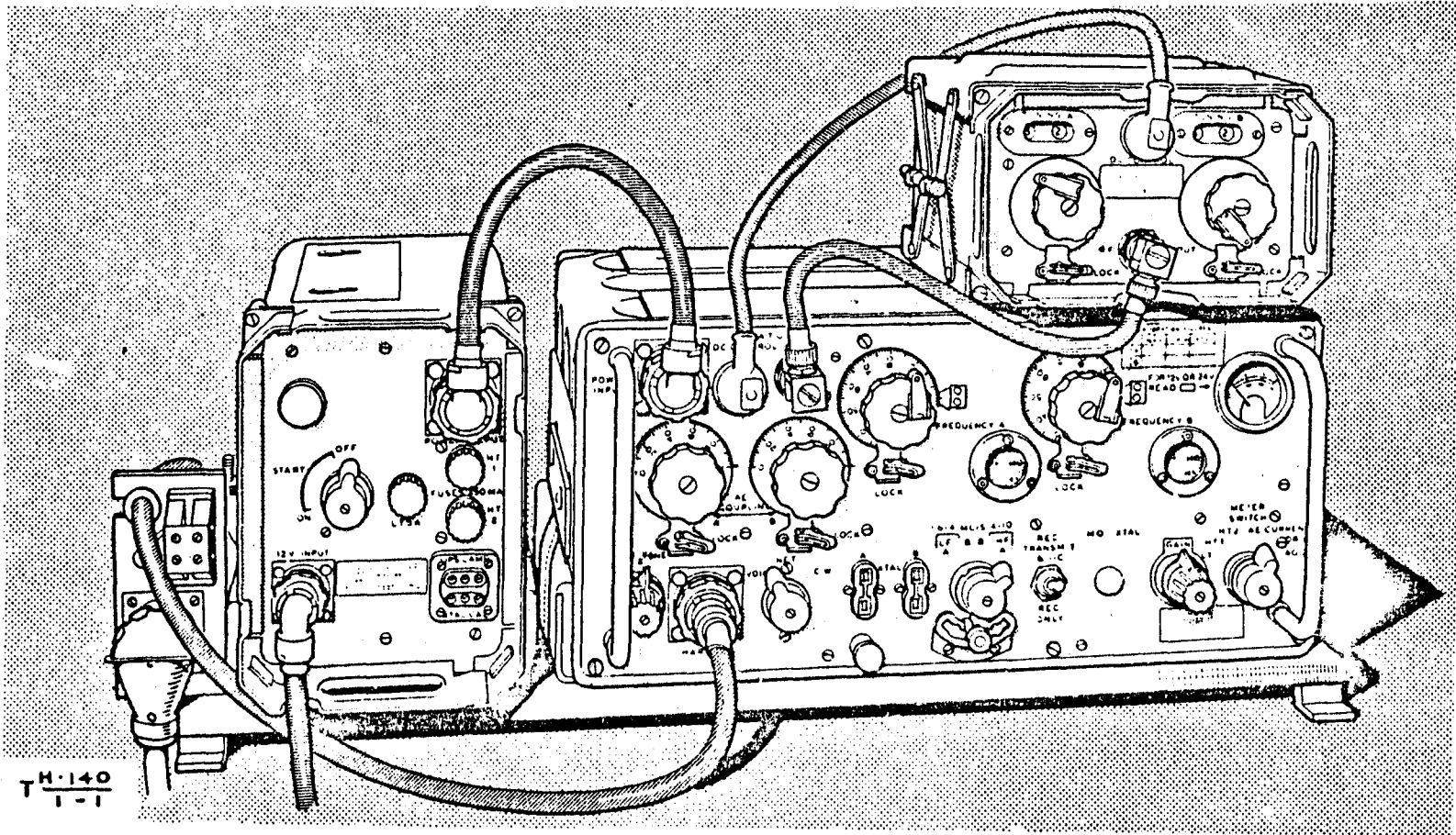


Fig 1 - General view of equipment

END

STATION, RADIO, C14
(REDIFON TYPE GR 410 R/A)
TECHNICAL HANDBOOK - DATA SUMMARY

TERMINOLOGY

The station consists of the following main items:-

Transmitter/Receiver Z1/5820-99-949-2815

P.S.U. Transistorized, No 48,
24V d.c. input Z1/5820-99-949-2755

Tuner, r.f., antenna

Z1/5820-99-949-2756

PURPOSE

Replacement for SRC11/R210 for ASSU role only.

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Page 1

DESCRIPTION

The station includes a mainly transistorized crystal controlled transmitter-receiver providing s.s.b. suppressed carrier and a.m. telephony as well as c.w. and m.c.w. telegraphy on any four channels in the range 2-16Mc/s. A special (Third method) suppressed carrier s.s.b. generation and demodulation system is employed in which some of the circuits are used for both transmit and receive functions. Send/receive switching is performed by relays controlled either automatically by a voice operated relay (VOR) circuit, or manually by the press-to-talk switch. Automatic switching (break-in) may also be employed on telegraphy, VOR circuit then being controlled by the telegraph side-tone oscillator. The equipment operates from a 24V d.c. transistorized power supply unit.

PHYSICAL DATA

	<i>Transmitter/ receiver</i>	<i>Power supply unit</i>	<i>Antenna tuner</i>
Weight	37.1/2 lb	18 lb.	17 lb.
Height	9 in.	9 in.	8.3/4 in.
Width	13.1/4 in.	13.1/4 in.	11.1/4 in.
Depth	19 in.	7.1/2 in.	15.1/4 in.

CLIMATIC RANGE

The equipment follows standard commercial construction practice and is not sealed. It has been designed for mobile operation in ambient temperatures from -10°C to +55°C and in a relative humidity up to 90%.

OPERATIONAL DATA

Modes of operation:

- A1 C.W. telegraphy
- A2 M.C.W. keyed carrier and tone (a.m.)
- A2a M.C.W. keyed tone (s.s.b.) fully suppressed carrier
- A3 Telephony (a.m. compatible) s.s.b. with carrier
- A3a Telephony (s.s.b.), fully suppressed carrier.

In s.s.b. modes the upper or lower side band may be selected by front panel control.

Antennae:

- Mobile role: 8 or 12 ft rod with antenna tuner
- Static role: End fed wire with antenna tuner
Half wave dipole without antenna tuner.

ELECTRICAL DATA

Frequency range: 2 to 16Mc/s crystal controlled. Drift does not exceed ±120c/s within working temperature range. Four switched channels may be selected and tuned to any frequency in this range.

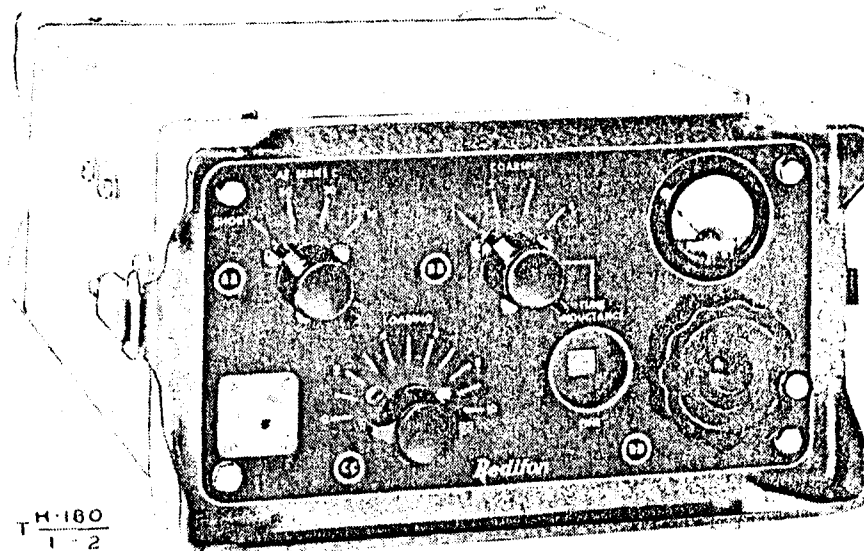
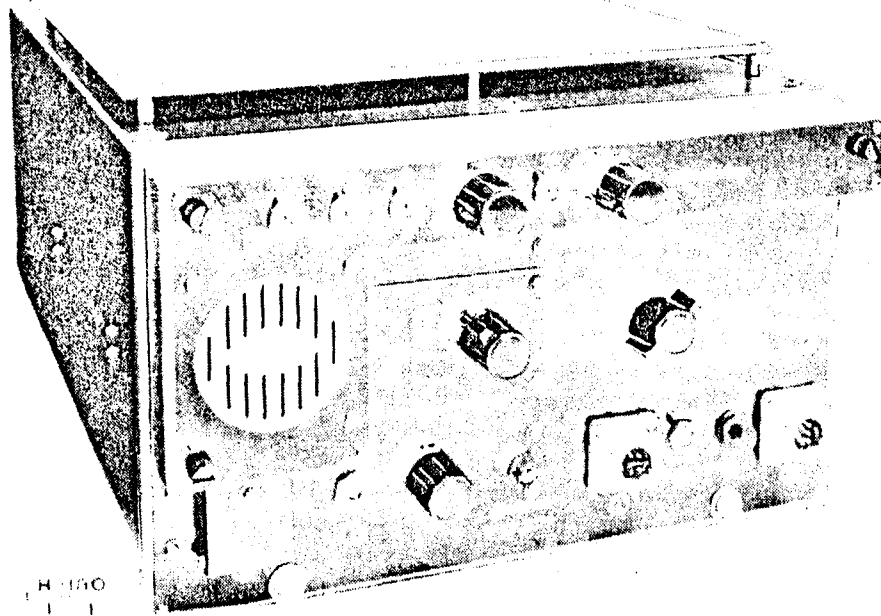


Fig 1 - Transmitter-receiver unit

Fig 2 - Antenna tuner unit

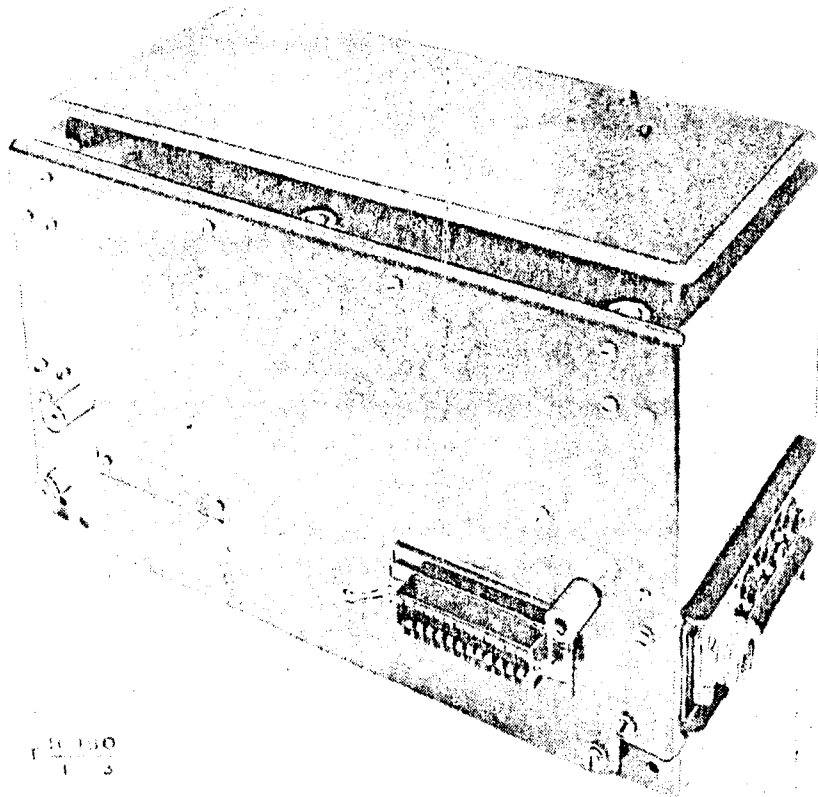


Fig 3 - Power unit

Intermediate frequencies: 250kc/s and 1.2Mc/s

Transmitter:

Power output into
75 Ω unbalanced line: A1 - 50W
A2, A3 - 25W carrier plus one
25W side band at 100% modulation
A2a, A3a - 100W p.e.p.

Carrier and unwanted
sideband suppression: At least 50dB below p.e.p.

Intermodulation
distortion: Third order intermodulation at
least 28dB below either tone of
standard two tone test.

A.F. input level: 2mV at 1000c/s for peak s.s.b.
or 100% a.m.

Input impedance: 600 Ω resistive

Keying speed: 200 bands maximum

Receiver:

Sensitivity: S.S.B: Less than 1 μ V input for 10dB S/N
ratio

A.M: Less than 5 μ V input for 10dB S/N
ratio

Selectivity: S.S.B: 2.7kc/s at 3dB down
5.0kc/s at 50dB down

A.M. 6.0kc/s at 6dB down
20kc/s at 30dB down
40kc/s at 60dB down

Image rejection: Better than 45dB from 2-10Mc/s
and 35dB from 10-16Mc/s

I.F. rejection: Better than 60dB at 2Mc/s

A.F. output: 0.5W into 10 Ω internal speaker
1.5W into 2 Ω external speaker
1.0mW into low impedance phones

POWER REQUIREMENTS

24 Volts d.c.:

Receive: 11W

Transmit: 125W (s.s.b. unmod-
ulated) 210W (50W
c.w.)

EME/8c/2771

In addition each cry-
stal oven consumes
approximately 6W when
working.

MAINTENANCE

Modular plug in construction is used for the audio, i.
f., and s.s.b. generator/demodulator units to give easy
access for servicing. Metering of circuits in the var-
ious units and monitoring of r.f. output can be carried
out with the aid of the plug in meter unit supplied with
the equipment. The equipment uses 4 valves, 63 tran-
sistors and 43 diodes of various types.

ASSOCIATED PUBLICATIONS

C.E.S. 42866 Service Edition
Handbook for SRC14
Maintenance Manual for SRC14
(Redifon type G.R. 410R/A).

END

STATION, RADIO, C15 (VC 102)
TECHNICAL HANDBOOK - DATA SUMMARY

NOMENCLATURE

<i>Part No</i>	<i>Designation</i>	<i>Description</i>
Z1/5820-99-900-9997	Station, kit, radio, No. 1 Transmitter-receiver, radio, C15 (VC 102) type 718F-1 (Transceiver-converter)	Fibreglass case enclosing:- F.S.K. convertor unit, type 700B-2 Power supply 24-27.5V d.c., type 426T-1 Transmitter-receiver, radio, type 618T-3

Part No	Designation	Description
Z1/5820-99-900-9998	Station, kit, radio, No. 2 Transmitter-receiver, radio, C15 (VC 102)	Includes:- Control unit, type 313V-1 Coupling unit, antenna, type 490B-1 Loudspeaker unit, type 76F-1 Microphone, earphones, handset, morse key, antennae and base, cables, connectors, etc.
Z1/5820-99-900-9999	Station, kit, radio, No. 3 Transmitter-receiver, radio, C15 (VC 102)	Includes:- Antenna guard and mounting brackets for complete equipment.

ROLE

Normally vehicle-mounted, the C15 is a medium power, h. f. transmitter-receiver used by Royal Signals strategic and theatre reserve units for medium distance communication.

DESCRIPTION

The station consists of three principle items:-

- Item 1 - Control unit, type 313V-1
- Item 2 - Automatic antenna coupler, type 490B-1
- Item 3 - Transceiver-converter, type 718F-1, incorporating:-

- (a) Transmitter-receiver, type 618T-3
- (b) Power supply, type 426T-1

(c) F.S.K. converter, type 700B-2.

Item 3(a) covers the range 2-30Mc/s and is servo-tuned and controlled from Item 1 which may be either secured to the main case or located up to 100 ft. away. Item 2 may also be up to 100 ft distant and is automatically tuned to match antenna to transmitter at all frequencies. Transmitter tuning is carried out in 1kc/s steps each derived from a 3Mc/s crystal oscillator. A choice of 28000 accurately defined channels is thus afforded, with provision for s.s.b., a.m., c.w. or f.s.k. operation including phone patching facilities. Item 3(b) provides a regulated 115V 400c/s supply from 27.5V d.c. while 3(c) provides for teleprinter operation. The equipment is splashproof; mainly transistorized and is built up of plug-in modules.

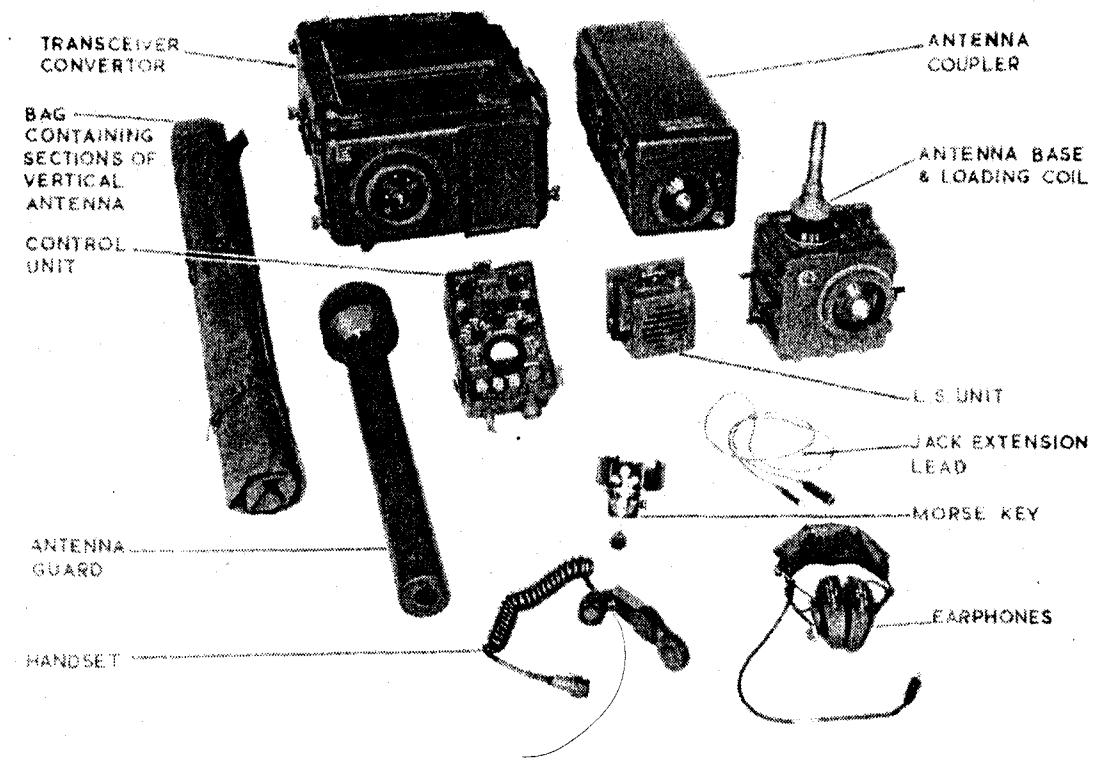


Fig 1 - General view of equipment

PHYSICAL DATA

<i>Unit</i>	<i>Width</i>	<i>Depth</i>	<i>Height</i>	<i>Weight</i>
Control unit	6.1/2 in.	4.1/2 in.	9.3/4 in.	7.1/2 lb
Antenna coupler	29 in.	10 in.	9.3/4 in.	50 lb
Transceiver-converter	20 in.	31.1/2 in.	13 in.	140 lb.
Loudspeaker unit	6.1/4 in.	6.1/4 in.	5 in.	3.1/2 lb
Antenna base and mounting assy (incl. loading coil)	8.1/4 in.	9.1/4 in.	17.1/2 in.	22 lb

CLIMATIC RANGE

Temperature: -40 to +50°C
 Pressure: Will operate at altitudes of up to 15,000 ft.
 Humidity: 0 to 90% relative humidity.

TRANSPORTATION DATA

Air transportable
 Splashproof

OPERATIONAL DATA

Choice of upper or lower s.s.b., a.m., c.w., or f.s.k. operation with facility for patching-in to 600Ω line, and with built-in f.s.k./binary teleprinter converter.

Auto-tuned from Control unit up to 100 ft distant.

Facilities for remote antenna up to 100 ft distant.

PERFORMANCE

Range: Up to 60 miles with 15 to 32 ft rod antenna.
 Up to 500 miles with wire antenna.

ELECTRICAL DATA

Frequency range: 2 to 29.99Mc/s
 28000 channels at 1kc/s intervals

Stability: 1 part per million per month

I.F.: 500kc/s

Transmitter output: S.S.B. : 40W P.E.P. ±1dB
 A.M. & C.W. : 10W

Receiver sensitivity: S.S.B.: $1\mu\text{V}$ for 10dB sig/noise ratio
POWER REQUIREMENTS

A.M.: $3\mu\text{V}$ (30% mod at 1kc/s) for 6dB sig/noise ratio
27.5V d.c. at the following currents:-

Audio output: 100mW into 300Ω

Tune: 53A

Transmit: 50A

Receive: 18A

ASSOCIATED EQUIPMENT

Mast, lightweight, SP48 and erection kit (for static stations).

Antenna, 100 ft No 5 (Wire)

Antenna, vertical, 32 ft. (8 sections in canvas storage bag).

Antenna base and mounting assembly, including Loading coil assembly, type 690D-1.

Loudspeaker unit, type 76F-1 with built-in transistor amplifier.

Microphone, Headset Earphones, Handset, Telegraph key, Cables, Connectors.

Earthing rod, Batteries, Charging set, (last two items eventually to be replaced by Power supply unit, rectifier, No 31).

MAINTENANCE

Field repairs are limited to replacement of faulty modules which will be back-loaded to a specified U.K. workshop.

ASSOCIATED PUBLICATIONS

C.E.S. No P/42975/2

User Handbook - Station Radio, C15 in Truck, 1/4 ton (Landrover) Mk 8 FFR

Instruction Book - Transportable H.F. Communication System (Collins Radio Co)
VC 102

EME8c/2561

END

TRANSMITTER, RADIO, D11

TECHNICAL HANDBOOK - DATA SUMMARY

PART NUMBERS

Transmitter: ZA 54910
Power supply unit: ZA 55704

ROLE

Medium power h.f. transmitter to replace Transmitter, radio, No 53 providing d.s.b./s.s.b./i.s.b. telephony and f.s.k./c.w. telegraphy communication principally in a mobile role as part of Station radio D11/R230 or D11/R234. May also be used in a static role to provide a short distance subsidiary link.

DESCRIPTION

The transmitter consists of seven self-contained withdrawable units mounted in an aluminium cabinet. Telephony and telegraphy signals at intermediate frequency are derived from two separate units either of which can be switched to modulate the output of the phase-locked oscillator. This crystal controlled oscillator with one of two intermediate frequencies provides very high stability r.f. signals at 1kc/s intervals, over the output frequency range. The signal is fed to amplifiers which give an output power of up to 350

STATION, RADIO, F75AM (STATIC)

TECHNICAL HANDBOOK - DATA SUMMARY

NOMENCLATURE

Transmitter/receiver group, F75AM (Z1/5820-99-105-8790)
Controller radiotelephone (Z1/5820-99-105-8783)

ROLE

Static control station providing a speech communication

link with mobile equipments. Used for internal security and by the RMP, the Army Department constabulary and the Fire Service etc.

DESCRIPTION

The equipment is a mains energized, v.h.f. amplitude-modulated transmitter-receiver for single or two frequency simplex working. A re-broadcast facility is

TELECOMMUNICATIONS
H 390

ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS

also provided. The equipment is unsealed and the receiver with its own power supply together with the transmitter, the transmitter power supply unit, and a control unit are on separate panels within a common cabinet. The control unit is used with the separate controller for remote operation eg via telephone lines. The transmitter and its power supply unit use valves throughout, whilst the remainder of the equipment is transistorized. The receiver is a double superhet with squelch quieting and, as in the transmitter, crystal-controlled operating frequencies are selected by a switch.

PHYSICAL DATA

Item	Height (in.)	Width (in.)	Depth (in.)	Weight (lb)
Cabinet	39.1/2	21	12	62 (empty)
Transmitter	10.1/2	19	10.1/2	34
Power supply unit	8.1/8	19	10	61
Receiver	5.1/4	19	11.1/8	16
Remote control unit	3.1/2	19	9.1/2	7.1/4
Controller	6.5/8	16.1/4	7.3/8	16.3/4

CLIMATIC RANGE

Temperature: -10°C to +50°C
Altitude: Up to 30,000 ft.

FREQUENCY RANGE

Carrier frequency

Different versions of both receiver and transmitter are available, each covering one of the following bands; at present the Army use frequencies of 81.15Mc/s (transmit) and 97.15Mc/s (receive).

Receiver Mc/s

25-32.5
32.5-42
42-54
54-68
68-88
88-108
112-136
132-156
148-174
79-101

Transmitter Mc/s

33-39
38/48
48-60
60-80
80-100
100-125
125-156
158-184
115-140

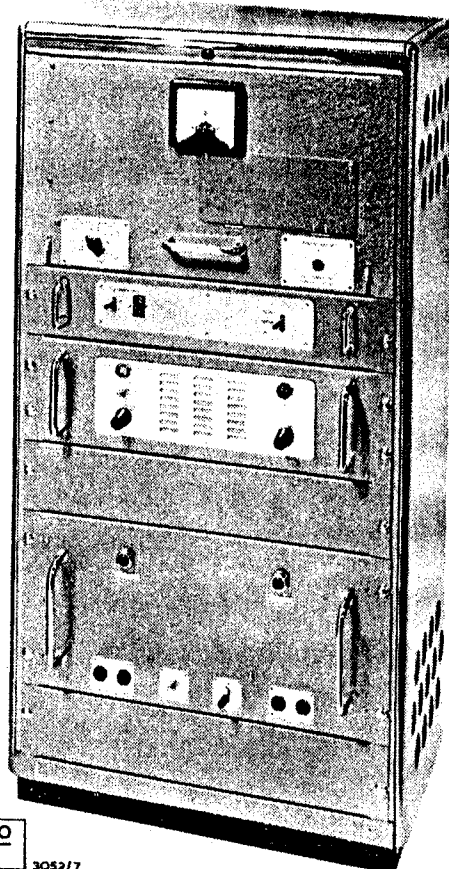
Channel spacing

Each set offers six switched channels spaced at 50kc/s, or, more usually, at 25kc/s intervals; none must differ by more than 0.2% from the centre frequency (to which the r.f. section is tuned) if quoted performance figures are to be obtained.

PERFORMANCE

Transmitter:

Power: 45-60W depending on frequency
Modulation: High level a.m.



T H390
1-1
3052/7

Fig 1 - Transmitter/receiver group, F75AM

Receiver:

Sensitivity: $1\mu V$ input for 0.5W output
Signal/noise: $1\mu V$ input for 12dB (25-108Mc/s)
 $1\mu V$ input for 10dB (198-174Mc/s)
Audio output: 1W into loudspeaker
40mW into 600Ω line
I. F. 1st i.f. 10.7Mc/s (6Mc/s when carrier
is below 68Mc/s)
2nd i.f. 455kc/s
Squelch: Can be adjusted to operate with sig-
nal inputs between $0.25\mu V$ and $5\mu V$.

Antennae:

Two single horizontal dipoles, 50Ω impedance, are provided. Separate antennae for transmitter and receiver is normal but common working is permissible.

Controller:

Receive gain: 1W output for -20dBm input at line terminals
Transmit level: 0dBm output at line terminals
Line impedance: 600Ω
Line loop resistance: 2-wire line - not greater than 2000Ω
3-wire, L1 or L2 with ground return
- not greater than 2000Ω



Fig 2 - Controller, radiotelephone

ASSOCIATED EQUIPMENT

Station, radio, AM10B (Mobile) - (Tels G380)

POWER REQUIREMENTS

Supply: 100-150V pr 190-240V a.c., 50-60c/s.

Consumption: Receiver - 13W

Transmitter - 142W Standby

520W Transmit (unmodulated)

585W Transmit (modulated)

Controller - 16W Receive

20W Transmit

MAINTENANCE

Repairs by REME Workshops are limited to the replacement of loose CES items, faulty printed circuit boards, and components other than those mounted on printed circuit boards. In addition to general purpose test equipment already in service, a set of special connectors is required for bench use. Until these connectors are available, the equipment will be repaired by outside contractors.

ASSOCIATED PUBLICATIONS

Manufacturers (Pye) handbooks

CES 43298

EME/8/3052/TELS

END

WIRELESS SET HS1 (ZA 13856)

DATA SUMMARY

PURPOSE

A mobile transmitter used in wireless stations R/T link No. 3. Provides C.W. M.C.W. and R/T facilities.

DESCRIPTION

The sender is made up of three units mounted in a metal case :—

- (1) A single-stage modulator at the top, driven by a three-stage speech amplifier mounted at the rear of the R.F. unit.
- (2) The R.F. unit, which consists of master oscillator, buffer stage and power amplifier and is mounted in the middle of the case.
- (3) The power supply unit at the bottom.

Facilities for crystal and auto control are provided and remote control over short distances can be used

PHYSICAL DATA

Weight : 850 lb

Depth : 1 ft 10½ in.

Width : 2 ft. 8½ in.

Height : 4 ft. 8½ in.

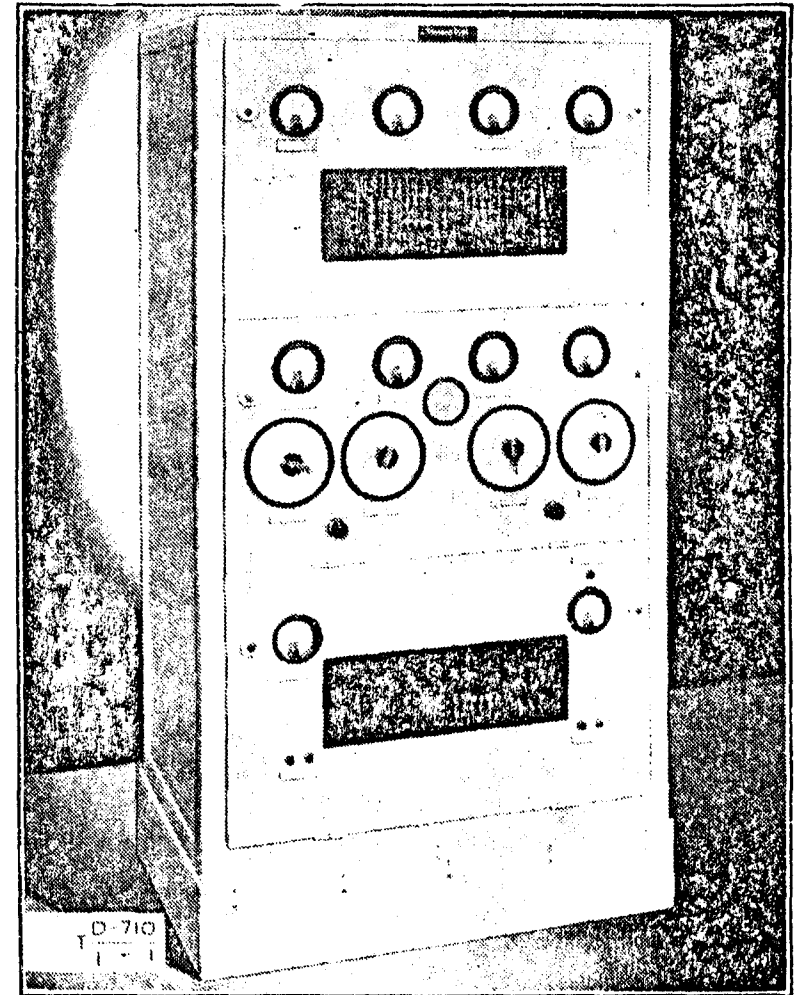


Fig. 1—Front view of set

AERIAL SYSTEM

- (a) Vertical rod for use on the move.
- (b) Single-wire inverted L.
- (c) Dipole aerial.

FREQUENCY

Coverage : 2-14 Mc/s.

PERFORMANCE

Sender output : 200-250W.

POWER REQUIREMENTS AND CONSUMPTION

Power supply : Mains, 220/240V, 50/60 c/s., A.C.

or 2.5kW Stuart Turner petrol-electric generator, feeding
power supply unit supplying 1,600V and 500V H.T.

Power consumption of sender : 1.75kW.

VALVES

Circuit reference		Type	Function
R.F. unit	V1	(4074A) VT 61	Master oscillator
	V2	5B250A	Buffer
	V3	(4069A) ATP100	Power amplifier
	V4		
Speech amp.	V1	(6L7G) ARHI	1st stage amplifier
	V2	(4074A) VT 61	2nd stage amplifier
	V3	(P 61) NT 37	3rd stage amplifier
	V4		
Modulation	V1	(4212 D) NT 92	Amplifier
	V2		

END

WIRELESS SET NO. 2 (ZA 7729)

DATA SUMMARY

PURPOSE

A transmitter and receiver for use as Div. and Corps sets, supplying C.W., M.C.W. and R/T facilities as a mobile ground station. The receiver is also used with the Wireless set No. 3.

DESCRIPTION

The sender employs five valves, master oscillator (with or without crystal control), frequency doubler, modulator and amplification stages. The receiver is a nine-valve superhet, employing R.F. stage, mixer, local oscillator, two I.F. stages, detector, output stage, A.V.C. and beat oscillator stage. The sender and receiver are mounted in separate metal cases and are provided with detachable covers. Remote control facilities are possible.

PHYSICAL DATA

	Sender	Rotary transformer	Receiver	H.T Unit (12V/150V)
Weight :	78 lb.	17 lb.	76 lb.	18 lb.
Length :	13 in.	12 $\frac{3}{4}$ in.	10 $\frac{3}{4}$ in.	11 $\frac{1}{2}$ in.
Width :	17 $\frac{3}{8}$ in.	6 in.	17 $\frac{3}{8}$ in.	4 $\frac{1}{2}$ in.
Height :	14 $\frac{7}{8}$ in.	5 in.	17 in.	7 $\frac{1}{4}$ in.

AERIAL SYSTEM

- (a) 6 ft.-18 ft. rod aerial.
- (b) Roof type aerial (when mounted in wireless van).
- (c) Wyndom aerial.
- (d) Tuned dipole aerials.

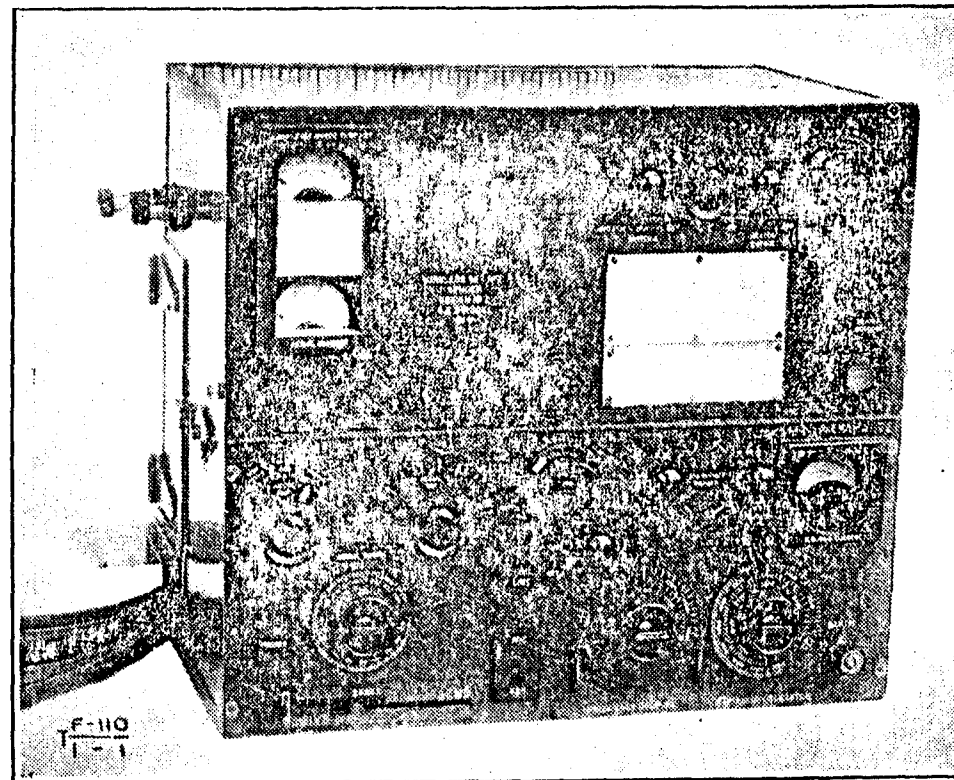


Fig. 1—The sender

FREQUENCY

Coverage : 5,000 kc s-1.875 kc s
Internal : 166.6 kc s

PERFORMANCE

Sender output : 10 W
Receiver sensitivity : An input of 2 μ V produces a readable R T signal
Receiver selectivity : 30 db. attenuation at \pm 6 kc's

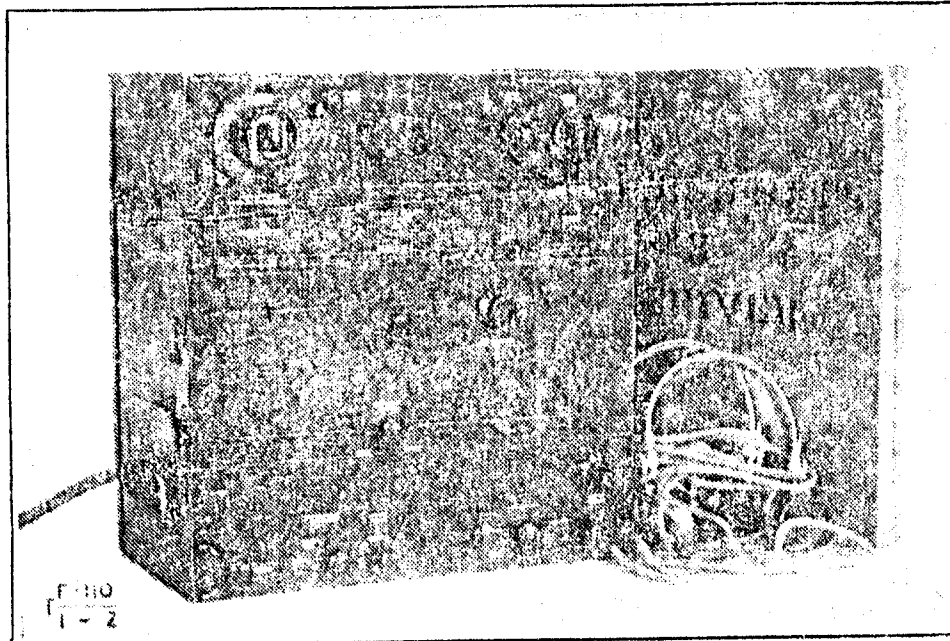


Fig. 2—The receiver

POWER REQUIREMENTS AND CONSUMPTION

Power supply : 12V accumulator supplying :—

- (a) 80W rotary transformer : output 1,100V, 72mA for the sender.
- (b) H.T. unit ; output 160V, 30mA for the receiver and sender grid bias.

Power consumption : sender 12V, 21A ; receiver 12V, 2.5A.

VALVES

<i>Circuit reference</i>	<i>Type</i>	<i>Function</i>
Sender		
V1	AT15	Master oscillator
V2	AT16	Frequency doubler
V3	AT16	Modulator
V4 } V5 }	AT26	Amplifiers
Receiver		
V1	ARS8	R.F. amplifier
V2	AR4	Mixer
V3	AR4	Local oscillator
V4	ARS8	1st I.F. amplifier
V5	ARS8	2nd I.F. amplifier
V6	AR4	Detector
V7	ARP1	Output
V8	ARS8	A.V.C.
V9	AR4	Beat oscillator

END

WIRELESS SET NO. 5, H.P. (ZA 9530)

DATA SUMMARY

PURPOSE

Primarily used as a long-range fixed station sender on L. of C., transmitting C.W. and M.C.W. and, as an auxiliary facility, R/T. Reception sets R101 and R.102 are normally used with this sender.

DESCRIPTION

The sender employs fifty-two valves in three units, the high-frequency unit, the medium-frequency unit and the power supply unit, the latter being used in conjunction with one of the other two to form a complete sender according to the frequency required. The high-frequency unit consists of master oscillator, buffer amplifier, two doubler amplifier stages, third amplifier and power amplifier and aerial circuits. The medium-frequency unit consists of a master oscillator, two amplifiers, and power amplifier and aerial circuits. The power supply unit includes keying amplifier, absorber, M.C.W. oscillator and modulation amplifier. Provision is made for crystal control on four spot frequencies on the high-frequency unit. The sender units are built up of rigid frameworks of angle aluminium and each consists of a number of assemblies which are removable for the replacement of valves, etc. The power supply unit can be divided into two sections for transport.

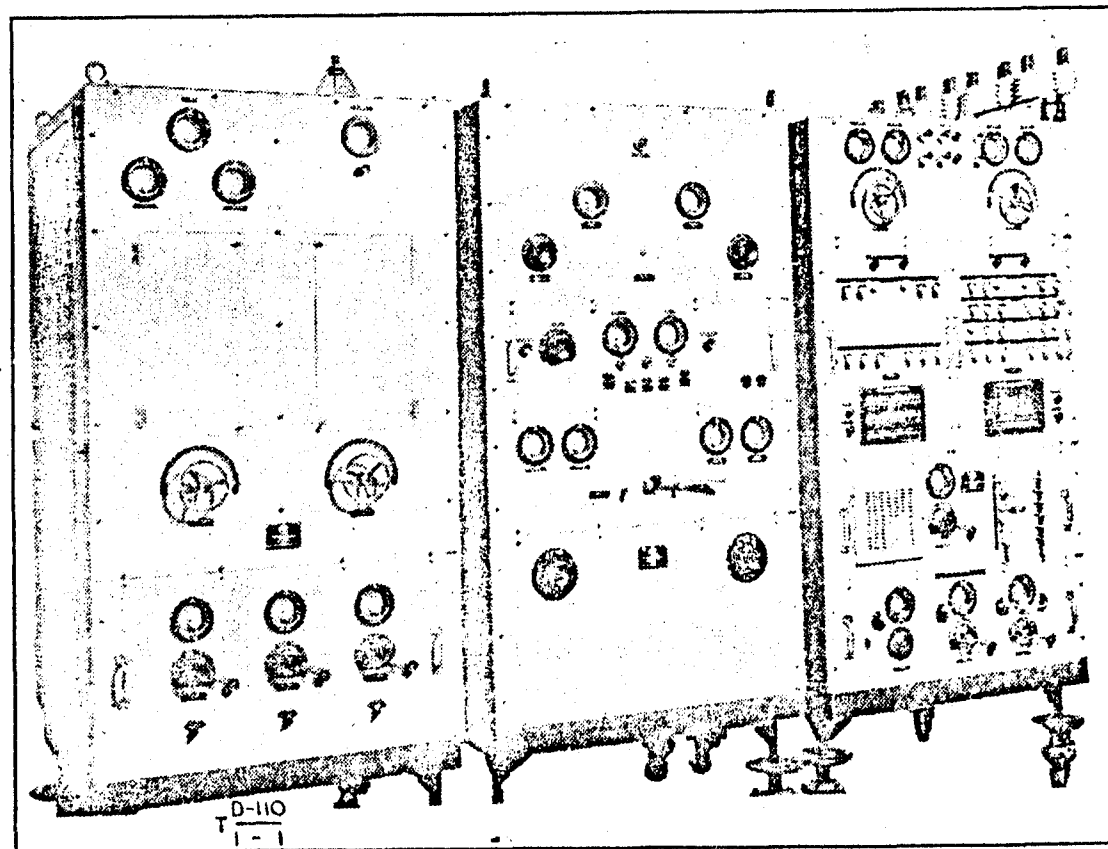


Fig. 1—General view of equipment

PHYSICAL DATA

Equipment	Weight	Height	Width	Depth
H.F. unit	10 cwt.	6 ft. 9 in.	3 ft. 3 in.	3 ft. 3 in.
M.F. unit	6 $\frac{3}{4}$ cwt.	7 ft.	3 ft. 3 in.	3 ft. 3 in.
Power supply unit	(Top, 9 cwt.) (bottom, 7 cwt.)	6 ft. 6 in.	3 ft. 3 in.	3 ft. 3 in.

FREQUENCY

Coverage : M.F. unit, 200—600 kc/s
H.F. unit, 3—20 Mc/s

PERFORMANCE

Sender output : 2kW.
Range : up to 2,000 miles or over, depending on frequency.

POWER REQUIREMENT AND CONSUMPTION

200—250V, 40—60 c/s, single-phase, A.C., up to 7.5kVA, from 9kVA generator supplied with station.

AERIAL SYSTEM

H.F. unit : dipole, fed from 600 Ω twin feeder.
M.F. unit : 300 ft. twin top T aerial slung from 70 ft. masts.

VALVES

Equipment	Type	Quantity
H.F. unit	ARP 7	2
	ARP 8	1
	ATP 35	4
	ATP 75	2
	ATP 600	2
	AW 4	1
	AU 1	2
	AU 6	2
M.F. unit	AD 1	1
	ARP 7	2
	ATP 75	1
	ATP 600	2
	AU 1	2
Power supply unit	AU 6	2
	ARP 6	5
	ARP 8	4
	ATP 75	1
	ATP 600	2
	AW 3	1
	AU 1	3
	AU 6	6
AU 7	2	
	AD 1	2

END

WIRELESS SET No. 7 (ZA 7990)

OBSOLETE

DATA SUMMARY

PURPOSE

For use in A.F.V.'s. on medium range, employing M.C.W. and R/T.

DESCRIPTION

The receiver is a seven-valve superhet with a beat oscillator stage, H.F. amplifier stage, mixer, three I.F. stages and an output stage. The sender employs six valves, for use in a crystal-controlled master oscillator unit and a modulator unit. The sender and receiver are mounted in a metal case which also contains the rotary transformer and H.T. unit. The set is obsolete.

PHYSICAL DATA

Weight : (sender and receiver, rotary transformer and H.T. unit),
133 lb.

Length : 29½ in. (base) 19½ in. (top)

Width : 13 in. (base) 7 in. (top)

Height : 16½ in.

AERIAL SYSTEM

(a) 6 ft. vertical rod

(b) 10 ft. vertical rod

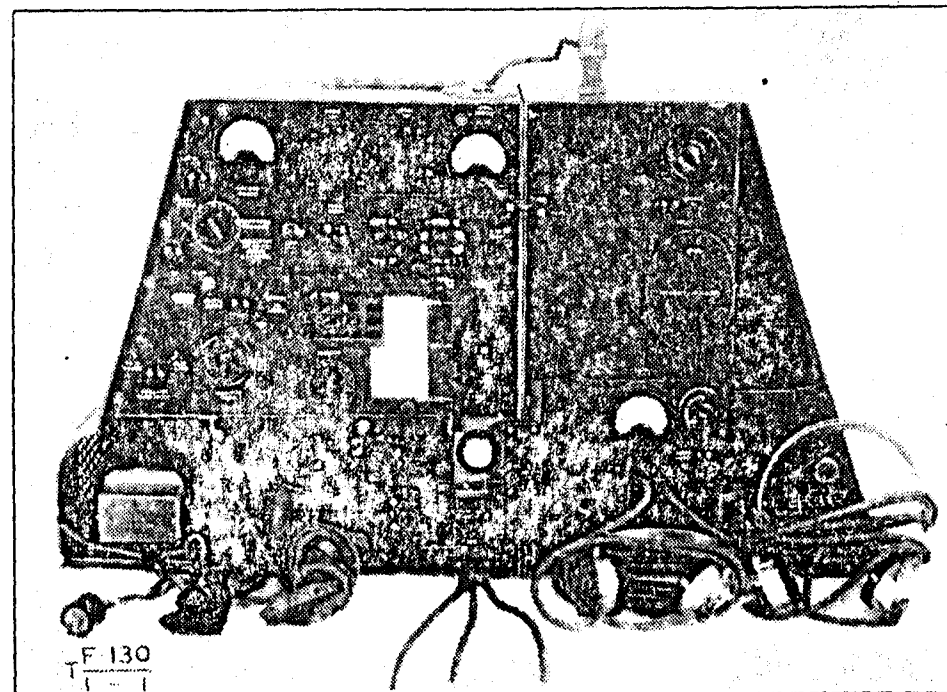


Fig. 1—General view of set

WIRELESS SET No. 8 (ZA 9819) DATA SUMMARY

PURPOSE

Short-range infantry pack set, providing R/T communication in forward areas between Company and Battalion H.Q.

DESCRIPTION

The receiver is a six-valve superhet, comprising one R.F. stage, a separate local oscillator, mixer, two I.F. stages, second detector—A.V.C.—A.F. output stage. The sender employs a power amplifier and master oscillator. The set is housed in a pressed steel case fitted with a Bergen type rucksack frame and derives power from a dry H.T. L.T. battery housed in the transmitter frame. There is provision for an external battery. This set is now obsolete and has been superseded by the Wireless set No. 18.

PHYSICAL DATA

Weight : 45 lb. (complete with batteries).
Length : 14 in.
Width : 13 in.
Height : 14 in.

FREQUENCY

Coverage : 6—9 Mc/s.
Internal : 465 kc/s.

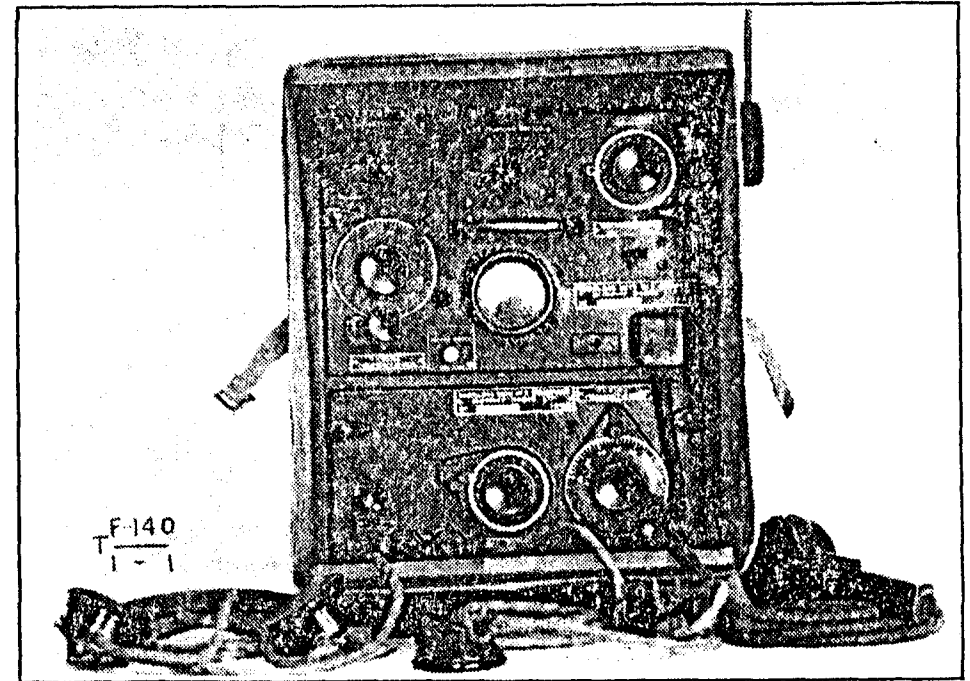


Fig. 1—General view of set

WIRELESS SET NO. 10, MK. 2

PROVISIONAL DATA SUMMARY

PURPOSE

To provide eight telephone channels, or alternatively a single 1 | 4 carrier telephone system, over a wireless link.

DESCRIPTION

A self-contained, semi-mobile trailer station.

Main equipment :

- Wireless sender No. 10, Mk. 2
- Kit, cooling, wireless station No. 10, Mk. 2
- Signalling equipment No. 10
- Amplifier, monitoring, No. 10
- Modulator unit No. 21
- Reception set R10, Mk. 1/1
- Generating set, 10kVA (PE 95)
- Generating set, Onan, 3kVA

All these items, except the generating sets, are carried in a Trailer, 2-ton, 4-wheeled, beam wireless, which also carries the send and receive aerial systems mounted on the roof. The generating set 10kVA (PE 95) is mounted in a 2-wheeled trailer and the Generating set, Onan, 3kVA is carried in the Lorry, 3-ton, G.S. used to tow the beam wireless trailer.

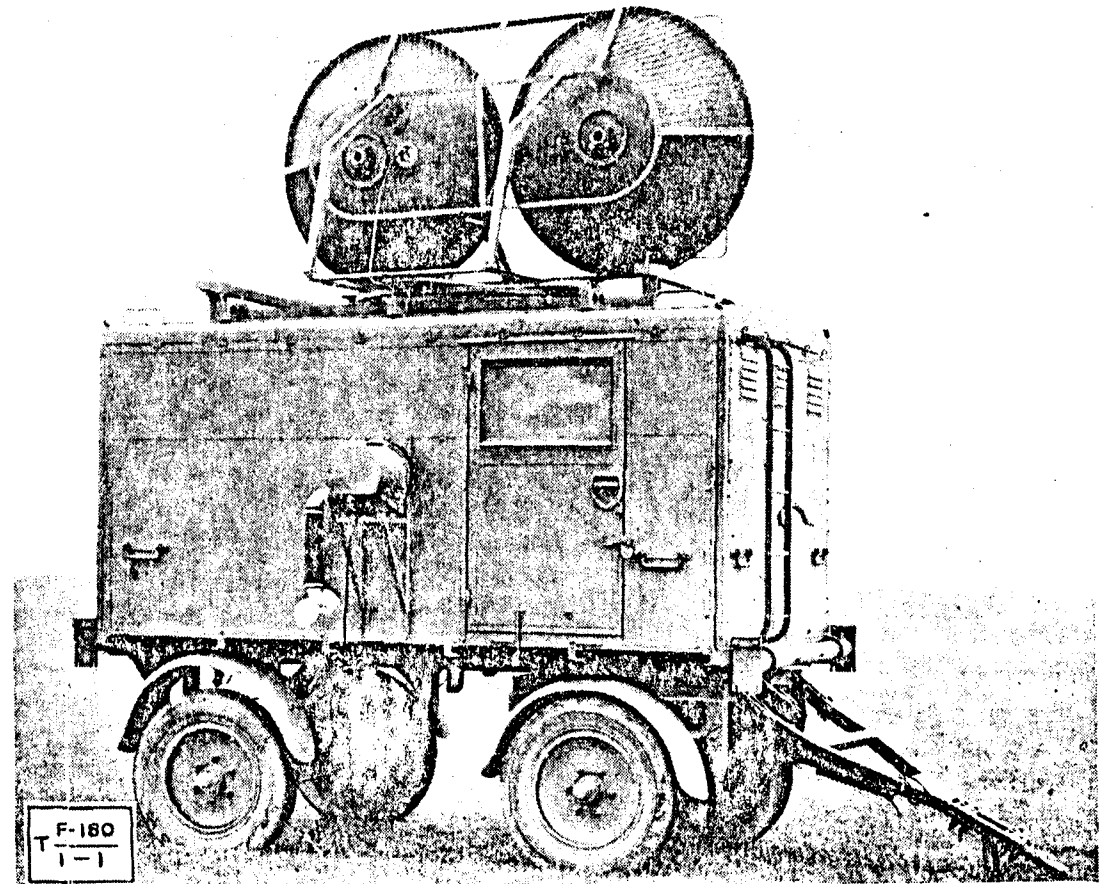


Fig. 1—General view of equipment

**WIRELESS SET No. II (ZA 8157)
(OBSOLESCE)
DATA SUMMARY**

PURPOSE

General purpose low-power transceiver, with R.T and C.W. facilities. Used for both vehicle and ground stations.

DESCRIPTION

Receiver is a six-valve superheterodyne, using one R.F. stage, triode-pentode frequency changer, three I.F. stages, metal rectifier detector and A.V.C., and triode-pentode output, the triode being used as beat oscillator for C.W. reception. Five-valve sender uses local oscillator and beat oscillator to act as master oscillator, pentode mixer, buffer, and output pentode. Three valves are common to sender and receiver, making a total of eight. Set is housed in steel case, with separate power unit and additional unit for higher power. Alternatively H.T. battery and 6V L.T. can be used.

PHYSICAL DATA

	<i>Transceiver (in carrier)</i>	<i>L.P. unit</i>	<i>H.P. unit</i>
Weight :	58 lb.	14 lb.	11 lb.
Length :	22½ in.	4½ in.	4½ in.
Width :	12½ in.	11 in.	11 in.
Height :	13 in.	8½ in.	8½ in.

FREQUENCY

Coverage : 4.2 Mc's to 7.5 Mc's in one range. Tuning is common to both sender and receiver.

Internal : Intermediate frequency 475 kc s.

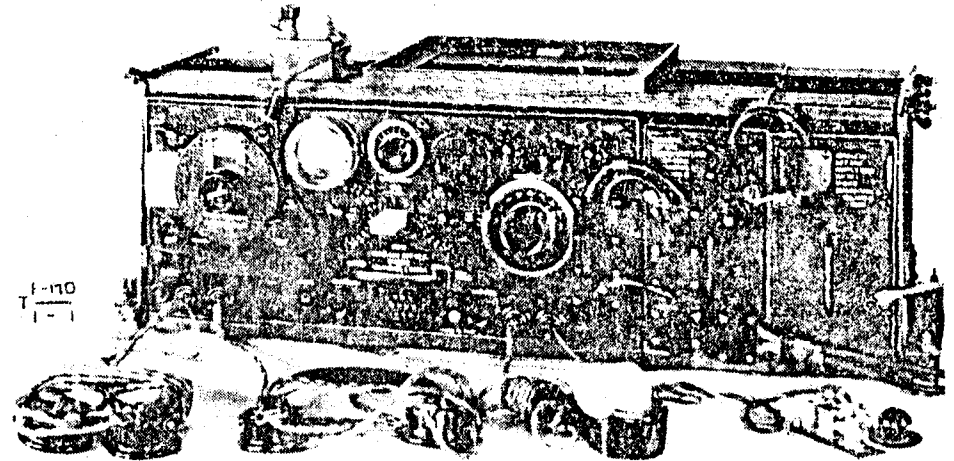


Fig. I—General view of equipment

WIRELESS SENDER NO. 12 (ZA 3244)

DATA SUMMARY

PURPOSE

General purpose low-power sender for C.W., M.C.W. and R T, designed as a ground station but now adapted for vehicle stations (15 cwt. truck).

DESCRIPTION

Circuit comprises master oscillator (crystal-controlled or self-excited) followed by frequency-multiplying amplifier feeding into P.A. stage.

Modulation is effected by two-stage amplifier feeding into suppressor grid of power amplifier.

First valve of modulator is used for 900 c/s oscillator on M.C.W.

PHYSICAL DATA

Weight : Sender in case 134 lb.
Height : 12½ in.
Length : 24 in.
Depth : 17½ in.

FREQUENCY

Coverage : 1.2 Mc/s—17.5 Mc/s in four overlapping ranges :

- Range 1 10—17.5 Mc/s
- 2 5.2—10.5 Mc/s
- 3 2.5—5.3 Mc/s
- 4 1.2—2.55 Mc/s

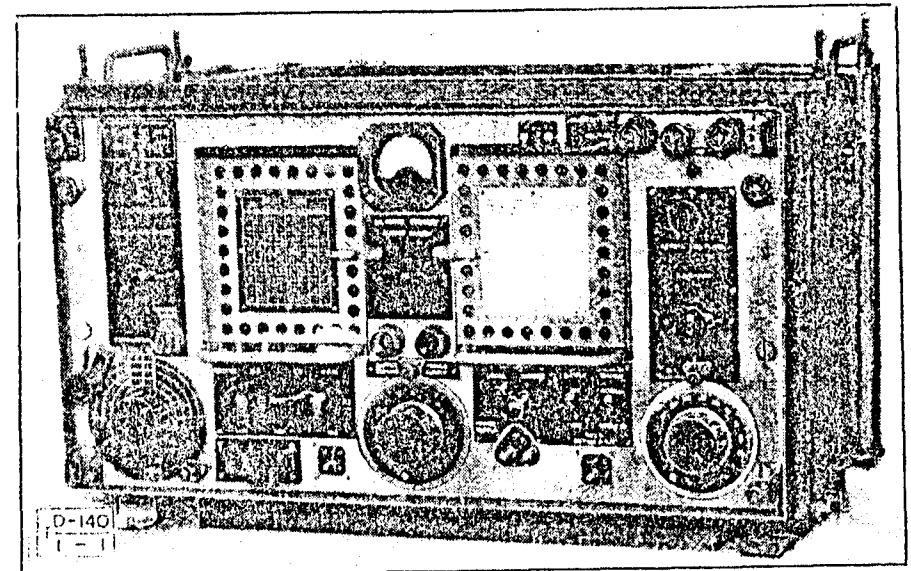


Fig. 1—Front panel view

WIRELESS SET NO. 12 H.P.

DATA SUMMARY

PURPOSE

A mobile sender primarily designed for R-T communication over 100 miles range; C.W. and M.C.W. facilities also provided. It is normally used with a Reception set R 107.

DESCRIPTION

The four units of the high-power sender (the Power supply unit No. 1, the Modulator unit No. 1, the Amplifier, R.F., No. 1 and the Aerial coupling unit No. 2) are usually mounted in a rack, while the Wireless set No. 12 (low power), see Tels. D 110, used for driving Amplifier, R.F., No. 1, is usually mounted in another rack close by. The complete sender H.P. employs the master oscillator stage, buffer doubler and amplifier of the No. 12 L.P. set, working in conjunction with the power amplifier of the Amplifier, R.F., No. 1, and the three modulator stages, modulator output and automatic modulation control of the modulator unit.

PHYSICAL DATA

Equipment	Weight	Height	Width	Depth
Wireless set No. 12	131 lb.	12½ in.	21 in.	1 ft. 9 in.
Power supply unit No. 1.	550 lb.	4 ft. 7 in.	2 ft. 3 in.	1 ft. 9 in.
Modulator unit No. 1.				
Amplifier, R.F., No. 1.				
Aerial coupling unit No. 2.				
Rack, mounting, No. 3.				

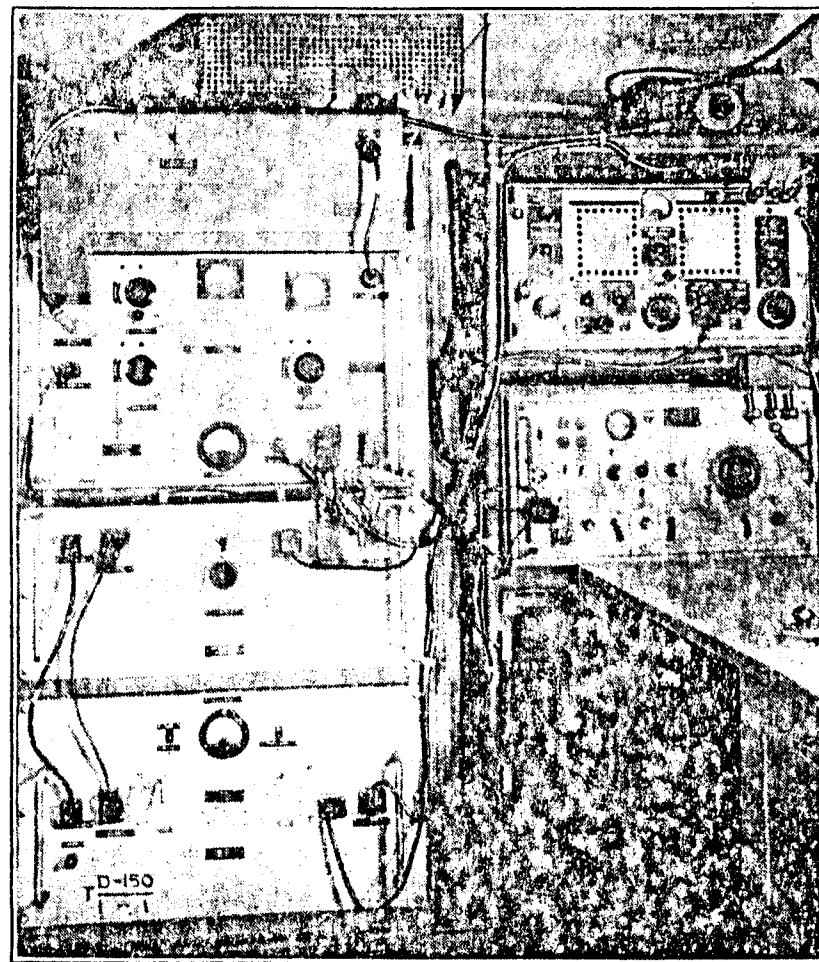


Fig. 1—General arrangement

FREQUENCY

Coverage : 1.2Mc/s-17.5Mc/s in five ranges :—
 1.2-1.8 Mc/s.
 1.8-2.5 Mc/s.
 2.5-4.5 Mc/s.
 4.5-10.0Mc/s.
 10.0-17.5Mc/s.

PERFORMANCE

Sender output : 250W on R/T.
 Range : approx. 100 miles on R/T on rod or V aerial, depending on frequency.

POWER REQUIREMENTS AND CONSUMPTION

230V, 50c/s, single-phase, A.C. up to 1.8kW.
 12V, D.C. supply at 2A.

AERIAL SYSTEM

- (a) 16 ft. twin rod (V).
- (b) 24 ft. or 34 ft. vertical rod.
- (c) A dipole aerial.
- (d) External end-fed wire.

REMARKS

Remote control, using units G or H.

VALVES

<i>Circuit reference</i>	<i>Type</i>	<i>Function</i>
MODULATOR UNIT, No. 1		
V1A	ARP 34	Microphone amplifier Sub-modulator
V2A	6C5G	
V3A } V3B }	ATS 25	Sub-modulators
V4A	6X5G	Automatic modulation control
V5A } V5B }	ATP 100	Modulators
AMPLIFIER, R.F., No. 1		
V5C } V5D }	ATP 100	Power amplifiers
POWER SUPPLY UNIT No. 1, MK. I*		
V6A } V6B }	CV 128	1,500V H.T. rectifiers
V7A } V7B }	5U4G	400V H.T. rectifiers

Note : In Power supply units, Mks. I and II, valves V6A-B and V7A-B are replaced by selenium rectifiers.

END

WIRELESS SET NO. 14 (Sender ZA 9812) (Receiver ZA 9809)

(OBSOLETE)

DATA SUMMARY

PURPOSE

Sender and receiver for short-range R T intercommunication between members of a group of H.Q. tanks or armoured Command vehicles within 800 yd. of each other. The sender and receiver units can be used independently.

DESCRIPTION

The receiver is a five-valve superhet, using one R.F. stage, local oscillator, mixer, one I.F. stage and one output stage. The various stages are built in separate units to facilitate the rapid replacement of a faulty unit by a spare. The sender employs three valves—master oscillator, and a power amplifier of two valves in parallel. Modulation is applied by means of a selenium rectifier connected across the line winding of the microphone transformer. Separate H.T. units are used for the receiver and sender. Receiver and sender units are each housed in their own cases and are secured in a special frame when used together.

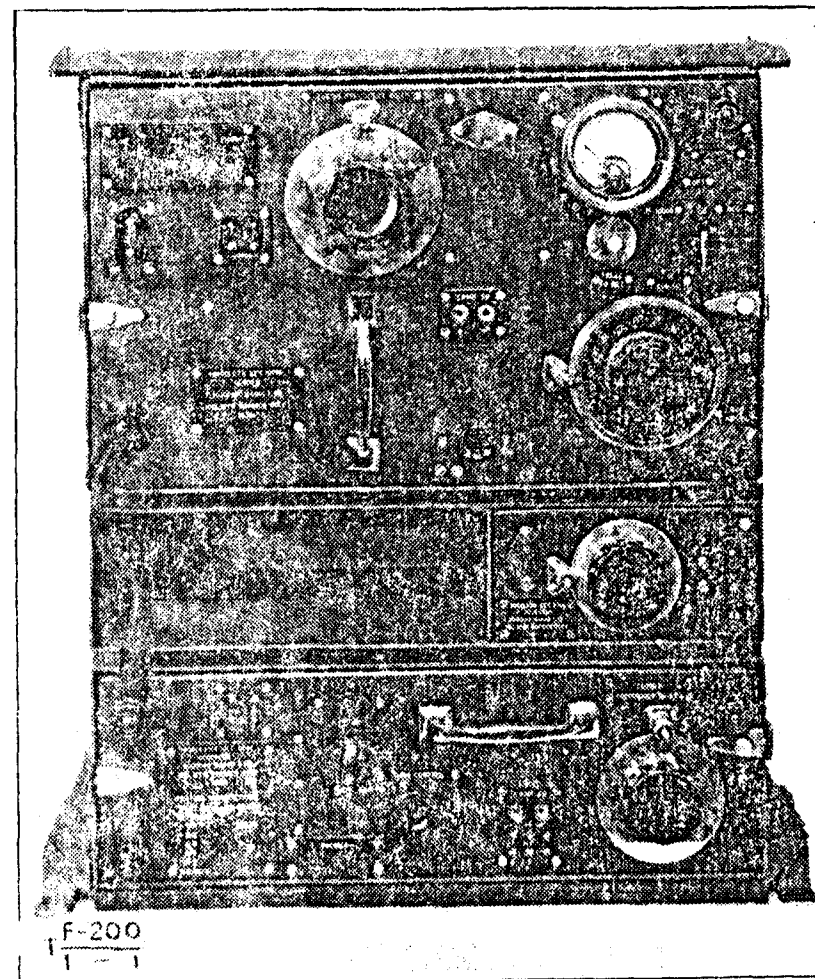


Fig. 1—Front view of set

WIRELESS SET NO. 16, MKS. I AND I*

(Mk. I, A 2901, Mk. I*, ZA 10772)

DATA SUMMARY

PURPOSE

To jam the enemy's wireless communications in the field.

DESCRIPTION

The receiver (RG42c) employs ten valves: two R.F. stages, mixer, three I.F. stages, A.V.C., detector A.F. amplifier and beat oscillator. A crystal resonator circuit provides the coupling between the mixer and 1st. I.F. amplifier. The sender employs nine valves: master oscillator, main and sub-modulators (employing series modulation) four oscillators and two amplifiers. The station to be jammed is first picked up on the receiver and then the sender is netted to the receiver. The station, in four main units (sender, main power supply, modulator and receiver) is carried in a Lorry, 3 ton, 6 x 4, wireless and a Lorry, 3 ton, 4 x 4, G.S. transporting the Diesel alternator for power supply. The Mk. I model is non-tropical, the Mk. I* is tropical. Any type of noise or speech may be applied to the modulator, while keying may be automatic or by hand. Each of the four oscillators can give 16 tones to be applied to the modulator and four oscillators also produce a bag-pipe jamming noise by giving 16 audio frequencies which are selected in rapid succession by a motor-driven commutator. The reception set is fitted with desensitising gear. Cooling fans are fitted in the sender and power units.

PHYSICAL DATA

	Sender	Power supply unit	Modulator	Receiver
Weight:	16 cwt. 3 qr.	9 cwt. 3 qr.	2 cwt. 1 qr.	3 cwt.
Length:	2 ft. 8 in.	6 ft. 2½ in.	1 ft. 7¾ in.	1 ft. 7⅓ in.
Width:	6 ft. 0 in.	2 ft. 4⅛ in.	1 ft. 5½ in.	2 ft. 0 in.
Height:	5 ft. 4 in.	4 ft. 2 in.	4 ft. 2¼ in.	4 ft. 2⅝ in.

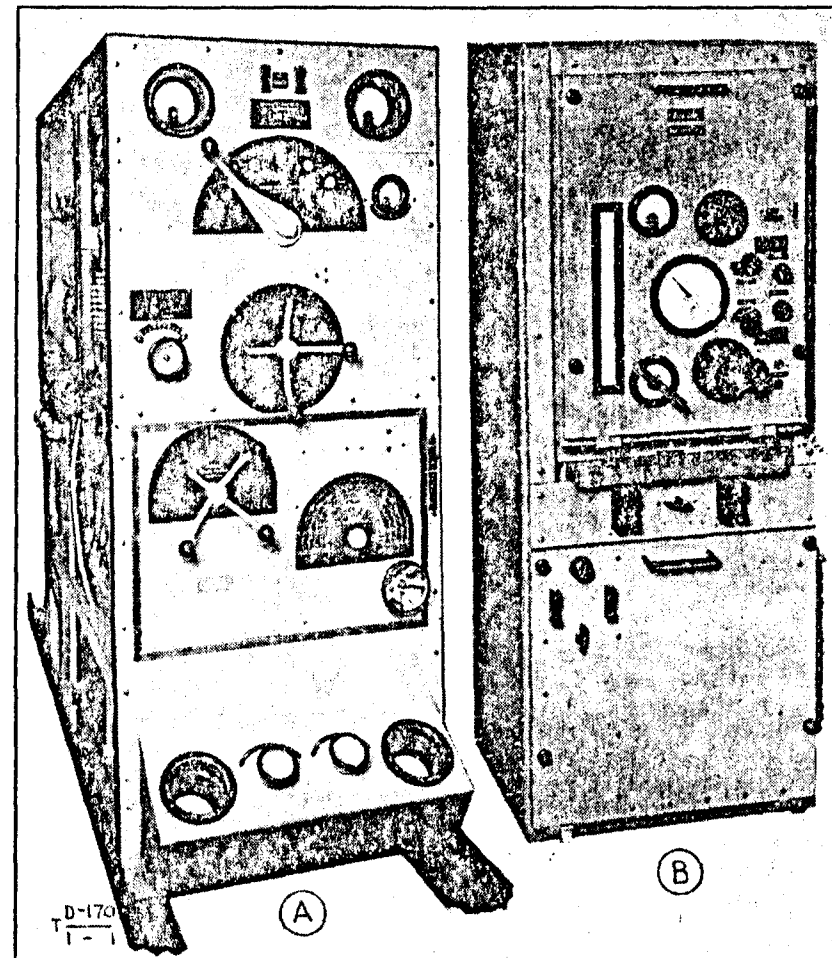


Fig. 1—A. View of sender
B. View of receiver with its power supply

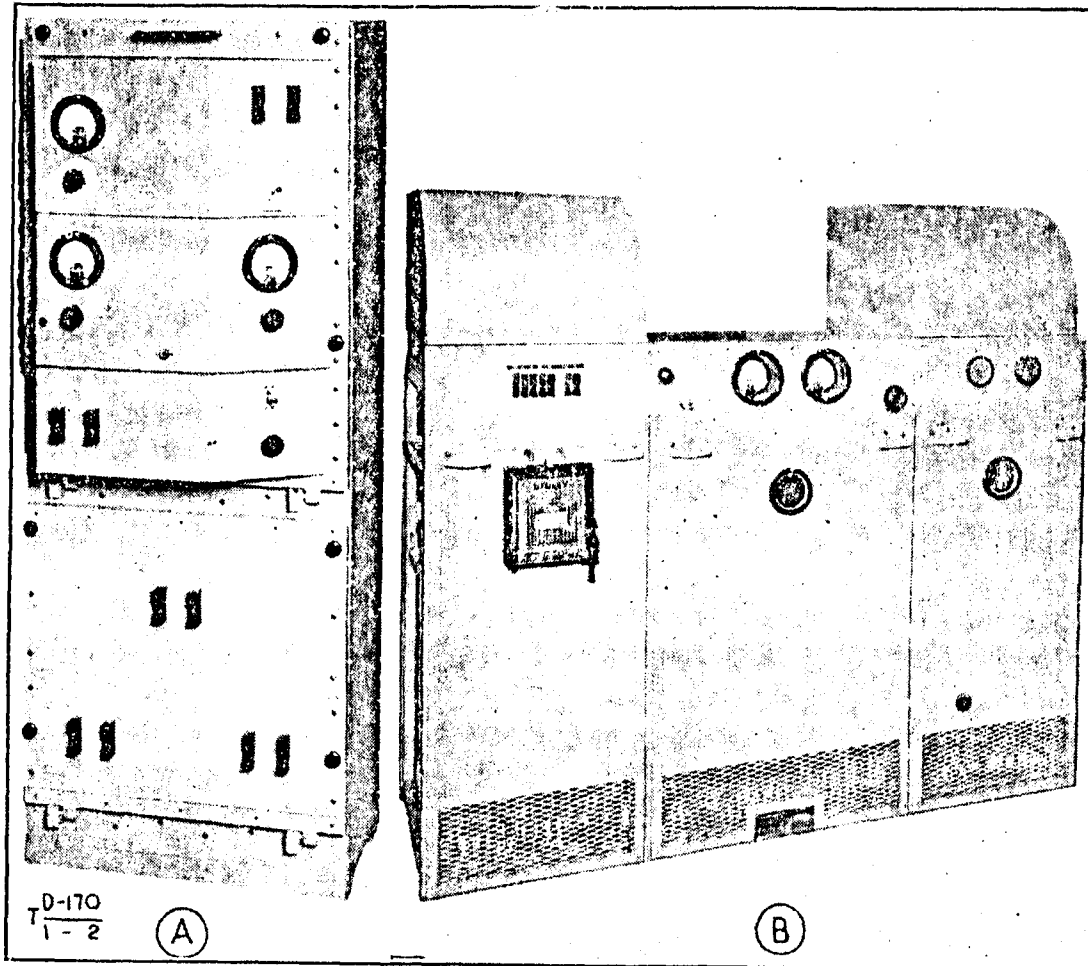


Fig. 2—A. View of modulator unit
B. View of main power supply unit

AERIAL SYST 1

A 48 ft. telescopic vertical rod aerial, with a counterpoise earth, is used for sending and receiving.

FREQUENCY

Sender: range 1, 0.86—1.35Mc/s.

„ 2, 1.35—2.0 „

„ 3, 2.0 —2.7 „

„ 4, 2.7 —4.5 „

„ 5, 4.5 —7.6 „

Receiver: 0.75—13.5Mc/s. Internal, 600kc/s.

PERFORMANCE

Sender output: 1.5kW.

Receiver sensitivity: $6\mu\text{V}$ for 20mW output and signal/noise ratio of 20db.

Receiver selectivity: 40db. attenuation | 10kc/s.

POWER REQUIREMENTS AND CONSUMPTION

Power supply: Three-phase, 50c/s, 400V, 4-wire, A.C. mains, for sender, or a Diesel alternator giving the above power. Receiver, 6V battery for filaments and 6V battery to drive H.T. rotary transformers.

Power consumption:—

Sender, 12.5kVA.

Receiver, filaments, 6V, 4.4A and rotary transformer 6V, 4.1A.

VALVES

<i>Unit</i>	<i>Circuit reference</i>	<i>Type</i>	<i>Function</i>
<i>Sender</i>	V1A	NT32B	Master oscillator
	V1B	NT32B	Main modulator
	V2A	PX25 (NR47)	Sub-modulator
	V3A	KT61 (ARP25) }	A.F. oscillators
	V3B		
	V3C		
	V3D		
	V3E		
	V3F		
<i>Receiver</i>	V1A	KTW61	Amplifiers
	V1B	KTW61	R.F. amplifier
	V3A	X65	R.F. amplifier
	V2A	KTW63	Mixer
	V2B	KTW63	1st. I.F.
	V2C	KTW63	2nd. I.F.
	V2D	KTW63	3rd. I.F.
	V4A	DH63	A.V.C.
	V5A	KT63	Detector
	V2E	KTW63	A.F. amplifier
<i>Main power supply unit</i>	V1A, B, C	MR10	Beat oscillator
			Rectifiers

END

WIRELESS SET NO. 18, MKS. I, II AND III

DATA SUMMARY

PURPOSE

To provide short-range R/T (Mk. I), or R/T and C.W. (Mks. II and III) communication in forward areas, primarily between Battalion H.Q. and Company H.Q.

DESCRIPTION

The set, consisting of sender, receiver and batteries, is self-contained in one unit, and can be used as a man-pack, ground, or airborne station. Change-over from send to receive is controlled by the pressel switch of the microphone. Netting facilities are provided.

PHYSICAL DATA

	Wireless set No. 18	Static battery
Weight:	31½ lb. including harness, battle battery, microphone, etc.	22½ lb.
Width:	11 in.	13½ in.
Depth:	10 in.	11½ in.
Height:	17 in.	3½ in.

FREQUENCY

Coverage: 6—9 Mc/s in a single range.
Internal: 465 kc/s.

PERFORMANCE

Power: ¼ watt approx.
Sensitivity: C.W. Better than $2\mu\text{V}$ at 8 Mc/s for 20 db. sig./noise.
R.T. $4.5\mu\text{V}$ at 8 Mc/s 30% modulated by 400 c/s for 20 db. sig./noise.

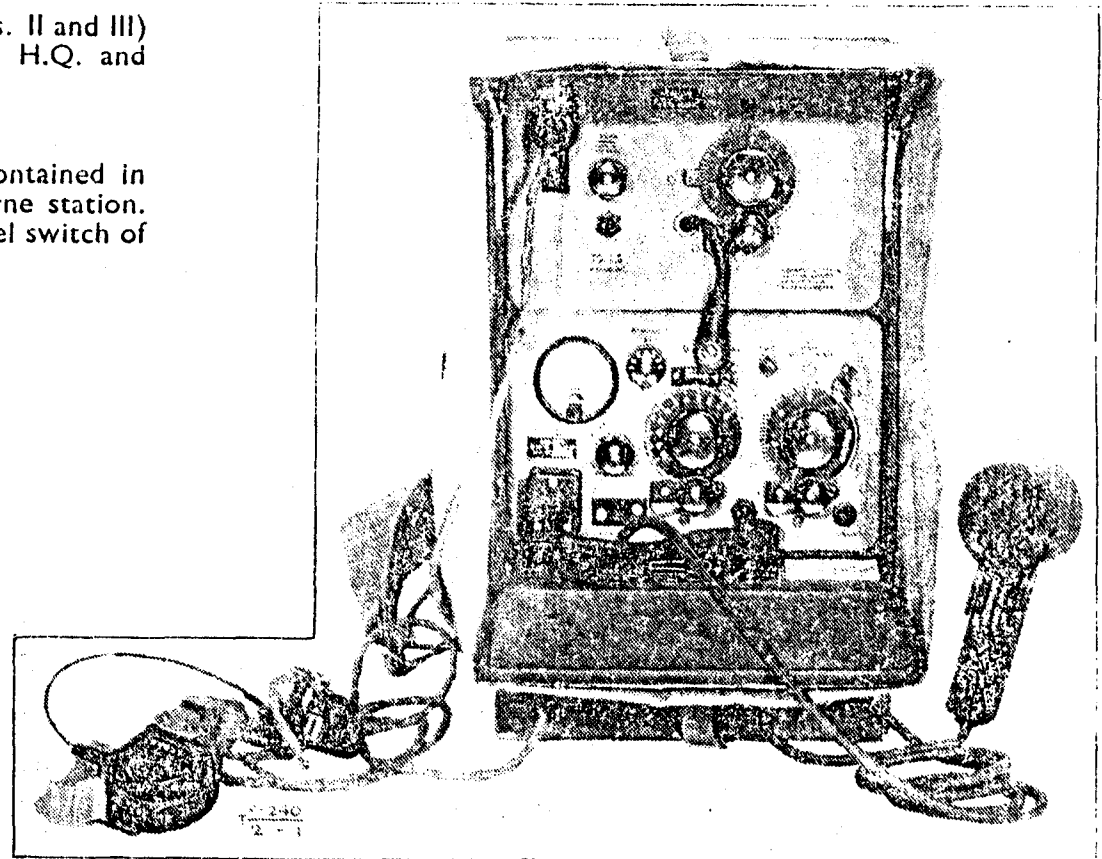


Fig. 1—General view of equipment

WIRELESS SET No. 21 (ZA 1829)

(OBSOLESCE)

DATA SUMMARY

PURPOSE

General purpose low-power transmitter-receiver, with R/T, C.W. and M.C.W. facilities. Intended for ground or vehicle use.

* DESCRIPTION

Receiver is normal eight-valve superhet. on 4.2—7.5 Mc/s range, using one R.F. stage, separate local oscillator, mixer, two I.F. stages, diode detector and A.V.C., triode A.F. amplifier and triode output. Beat oscillator for C.W. reception. On 19—31 Mc/s range receiver is double superhet. with an extra valve as first frequency changer. Sender has combined master oscillator frequency doubler driving the power amplifier. Modulation and keying applied direct to power amplifier. Set, including sender, receiver, vibrator power unit, control unit and accessories, is housed in one steel case.

PHYSICAL DATA

Weight : 48½ lb. Width : 12½ in.
Length : 19¾ in. Height : 11 in.

FREQUENCY

	Low band	High band
Coverage :	4.2—7.5 Mc/s	19—31 Mc/s
Internal :	I.F. 465 kc/s	1st I.F. 4.4—7.4 Mc/s 2nd I.F. 465 kc/s

Issue 2, 10 Nov. 1944

* PERFORMANCE

	Low band	High band
Range :	5 miles (approx.)	1 mile (approx.)
Sender output :	1.5 W	0.8 W
Receiver sensitivity :	9µV (low band) or 24µV (high band) for 1mW output and signal-noise ratio of 20db.	
Receiver selectivity :	20db. attenuation at ± 10kc/s (low band) or ± 20kc/s (high band)	

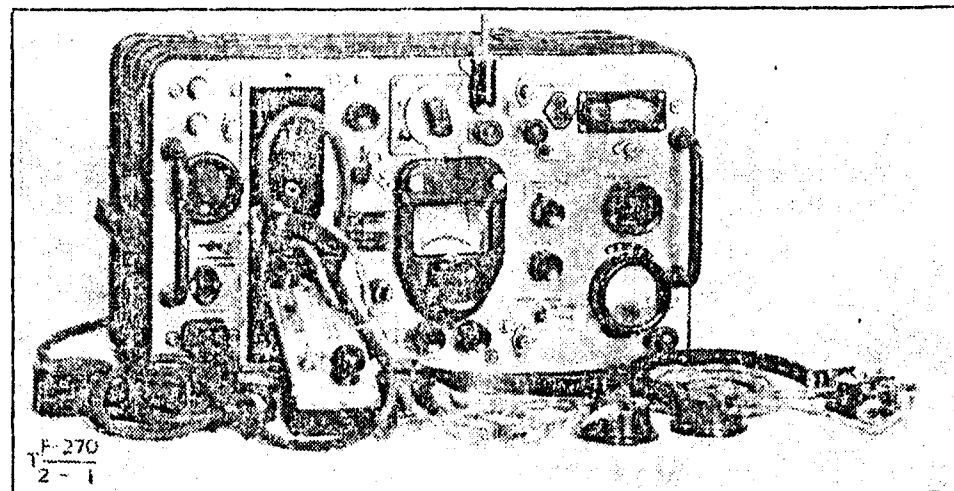


Fig. 1.—General view of equipment.

WIRELESS SET NO. 23 (ZA 3750)
(OBSOLETE)

DATA SUMMARY

PURPOSE

To replace W.S. No. 3 for communication between Corps and Division and for general long-range communication. It provides facilities for R/T, C.W. and M.C.W. and is not intended for transmission on the move.

DESCRIPTION

The complete station consists of the No. 23 sender and two receivers, originally both R101, now one R101 (see Tels. E 100) and one R107 (see Tels. E 170). The sender employs master oscillator, modulator and output stages. To cover the frequency band used there are two amplifier tuned circuits, each coupled to its own tuned aerial circuit. A nine-position switch covers the frequency band. The sender is housed in a brass angle framework with detachable covers. The complete station is carried in two 15 cwt. trucks, one containing the sender, power supply and stand-by receiver, the other the main receiver and its power units, remote control unit, etc. This set is now superseded by the W.S. 33.

PHYSICAL DATA

	<i>Sender</i>	<i>Engine generator</i>
Weight:	3½ cwt. (approx.)	2½ cwt.
Length:	2 ft. 11 in.	
Width:	1 ft. 11 in.	
Height:	4 ft. 4½ in.	

FREQUENCY

Coverage: 1.2—13.55Mc/s.

Issue 1, 5 Feb. 1945

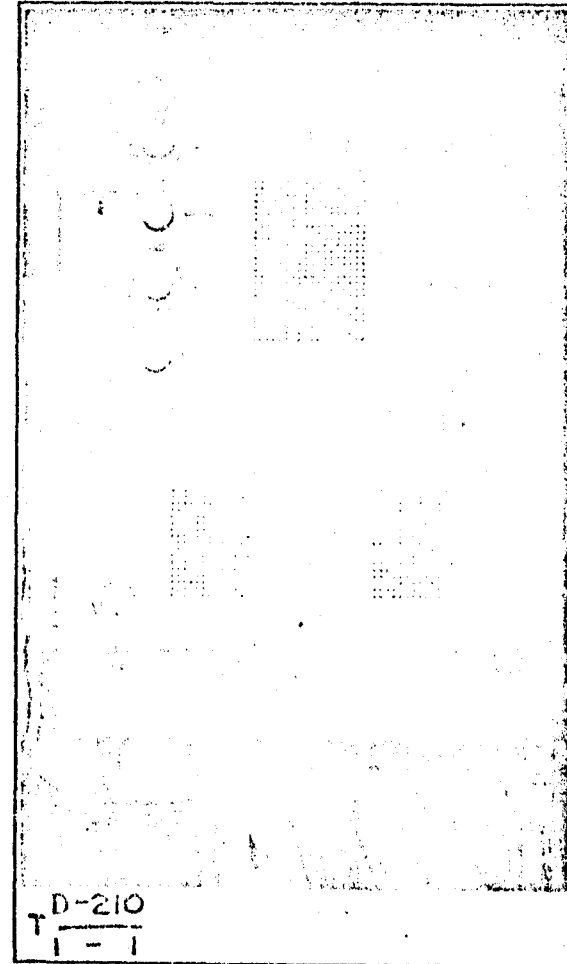


Fig. 1—Front view of set

WIRELESS STATION NO. 26

DATA SUMMARY

- NOTES.* 1. This information is provisional and is supplied for guidance pending the issue of more complete instructions. All errors of a technical nature should be notified, through the usual channels, to the War Office (M.E.10).
2. This regulation covers the Mk. II model only.

PURPOSE

To provide six telephone circuits over an U.S.W. wireless link.

DESCRIPTION

Consists essentially of a six-channel carrier telephone system which works over a wireless link. To permit connection to the field telephone system to be made, certain audio equipment is necessarily provided. Audio equipment of each channel consists of a signalling unit, a termination unit and a channel receive amplifier. The carrier telephone equipment consists of six carrier oscillators and six modems, each embodying modulator, demodulator, transmit and receive band-pass crystal filters. The wireless equipment consists of a modulator with an output valve dissipating 150W, and an H.F. unit consisting of crystal-controlled M.O., frequency multiplier stages, and P.A.

PHYSICAL DATA

	<i>Sender vehicle</i>	<i>Receive vehicle</i>	<i>Each trailer</i>
Weight	7 tons 5 cwt.	7 tons 12 cwt.	2 tons 5 cwt.
Height	11 ft. 0 in.	11 ft. 0 in.	8 ft. 6 in.
Length	21 ft. 0 in.	21 ft. 0 in.	15 ft. (including tow-bar)
Width	7 ft. 6 in.	7 ft. 6 in.	8 ft. 0 in.

One vehicle contains the sender. The other vehicle contains the receiver and carrier telephone equipment. The trailers carry the aerial cases and the petrol engine alternators.

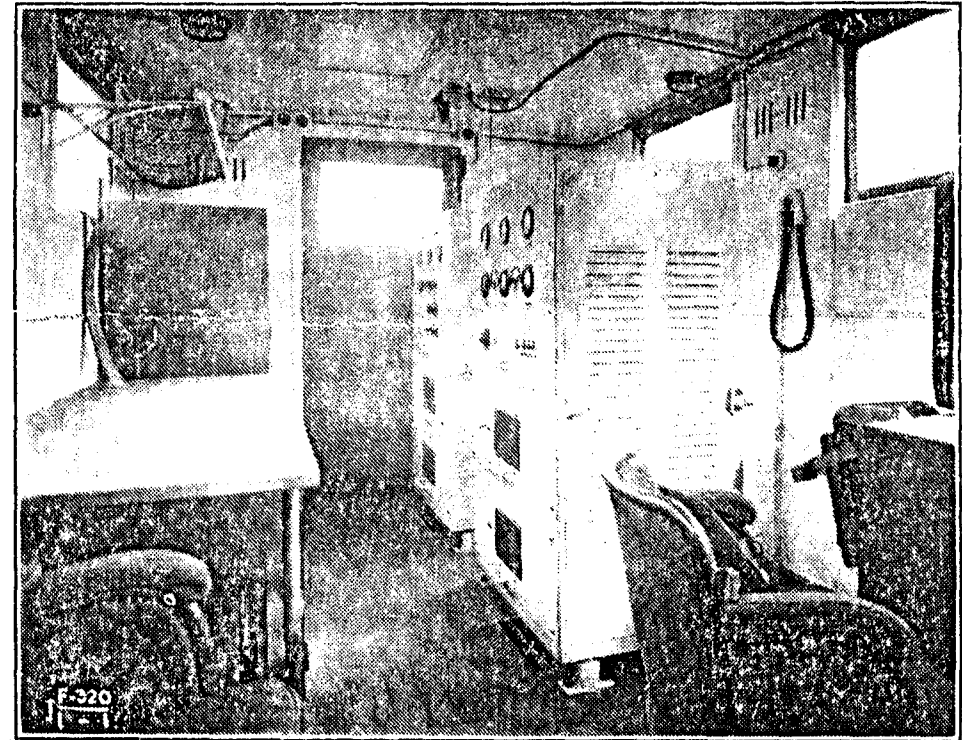


Fig. 1—Interior view of transmitter vehicle

PERFORMANCE

Sender range: R/T up to 200 miles, C.W. up to 1,000 miles.
Sender output: 250W.

POWER REQUIREMENTS AND CONSUMPTION

Power supply: 1½kW, double-voltage, D.C. generator, driven by a 4 h.p. petrol engine, supplies the sender with 2,000/2,800V, 350mA H.T. and 16/22V, 23A L.T. (receiver is supplied by 12V accumulator driving an H.T. unit No. 1 in each vehicle).

AERIAL SYSTEM

- (a) Inverted L, horizontal span 160 ft., in two 45 ft. masts.
- (b) 19 ft. wire from 25 ft. mast at rear of vehicle to lead in.

- (c) Small roof aerial for reception on the move.
- (d) Receiver dipole aerial 110 ft. horizontal span.
- (e) Open-wire, 19 ft., as (b), for reception.

VALVES

<i>Circuit reference</i>	<i>Type</i>	<i>Function</i>
V1	AT 75	Master oscillator
V2	DET 1	Modulator
V3	AT 200B	Output

END

WIRELESS SET NO. 27 (ZA 9950)

OBSOLETE

DATA SUMMARY

PURPOSE

A portable Infantry patrol set, for R T working only.

DESCRIPTION

A two-valve sender and separate two-valve receiver in one unit, carried in a haversack. The sender employs a master oscillator and a modulator. The receiver is a super-regenerative set, employing a triode valve oscillating detector followed by a separate triode connected quench valve. The microphone and telephone are incorporated in a handset. Only very limited quantities were produced.

PHYSICAL DATA

Weight : 14½ lb.
Length : 12½ in.
Width : 4½ in.
Height : 12 in.

AERIAL SYSTEM

A 10 ft. wire aerial is used, normally in a vertical position, but if used on the move, the set can be worked with the aerial trailing along the ground.

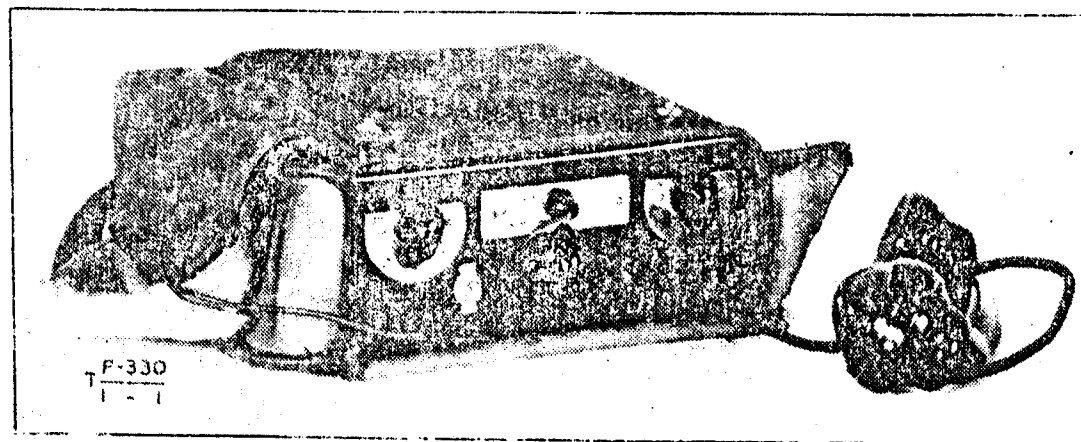


Fig. 1—General view of equipment

WIRELESS SET No. 28 (ZA 2937) DATA SUMMARY

PURPOSE

General short-range communication, with R/T and C.W. facilities. Primarily intended for use as ground station, but can be carried as a man-pack, and operated on the march.

DESCRIPTION

Receiver is a six-valve superhet, using one R.F. stage, a mixer, local oscillator, two I.F. stages, and a second detector—A.V.C.—A.F. stage. The sender employs a master oscillator and buffer stage and a power amplifier. Modulation is applied direct to the power amplifier. The set is housed in a Birmabright case fitted with a detachable canvas cover and webbing shoulder straps. The L.T. and H.T. dry batteries are carried in a separate satchel. This set is now obsolete and has been superseded by the Wireless set No. 38.

PHYSICAL DATA

Weight : 15 lb. approx.
Length : 12½ in.
Width : 11 in.
Height : 7 in.

FREQUENCY

Coverage : 6—9 mc/s
Internal : 465 kc/s

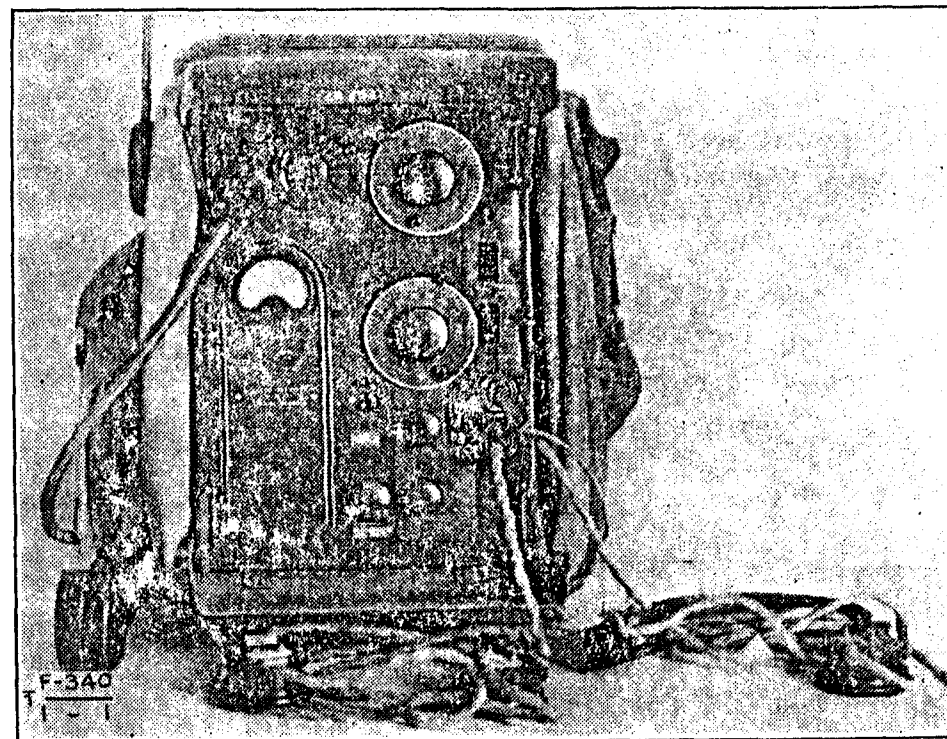


Fig. 1—General view of equipment

WIRELESS SET NO. 31

DATA SUMMARY

PURPOSE

Short-range R/T communication between infantry units.

DESCRIPTION

A frequency-modulated man-pack transceiver with internal dry battery.

The set is splash-proof and treated to withstand tropical conditions.

The receiver section employs a double superhet. with no-signal noise suppression and automatic frequency-control.

A crystal calibrator is incorporated for frequency reference.

PHYSICAL DATA

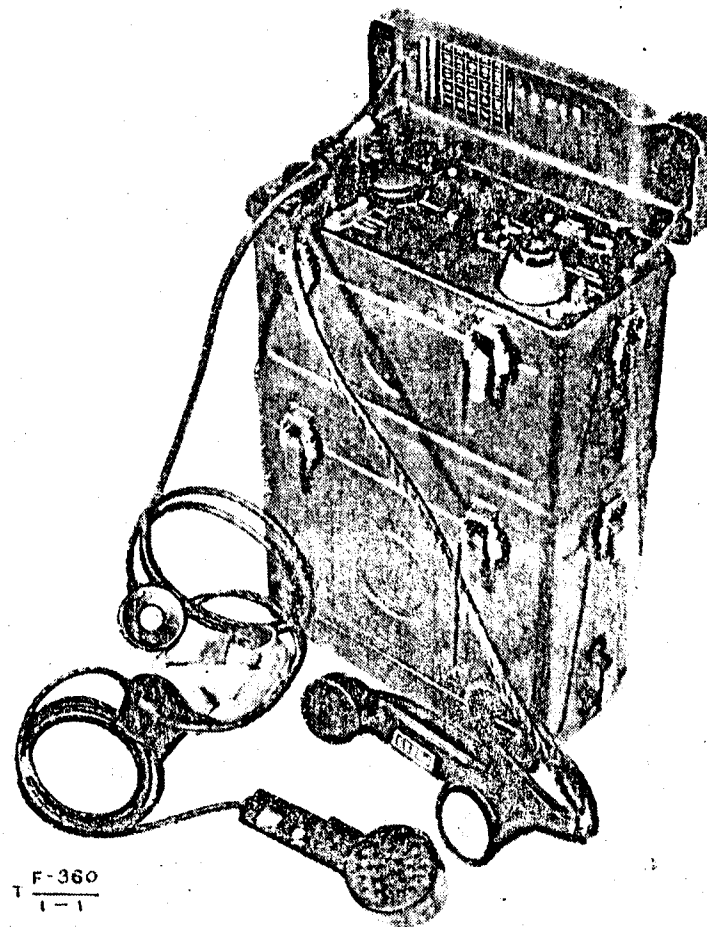
Weight: 23.5 lb.

Height: 17 in.

Length: 11 in.

Width: 5½ in. (7½ in. with belt carrier bracket).

Issue 1, 31 Dec. 1947



F-360
1-1

Fig. 1—General view of equipment

FREQUENCY

Coverage: 40—48Mc/s in 41 channels 200kc/s apart.
Mean deviation: ± 35 kc/s.

PERFORMANCE

I.F.: 4.3 and 2.515Mc/s.
Power output:—Sender: 0.5W
Receiver: 2mW
Receiver sensitivity: 3μ V for 20db. noise quieting
Range: 3—5 miles

POWER REQUIREMENTS AND CONSUMPTION

Send:— 45mA at 150V
25mA at 90V
0.5A at 4.5V
Receive:—25mA at 90V
[0.3A at 4.5V

AERIAL SYSTEM

Two vertical whip aeriels:—
• One in two sections, giving a 2 ft. 9 in. rod.
• One in eight sections, giving a 10 ft. 8 in. rod.

VALVES

Circuit reference	Type	Function	Used on
V1	CV807 (3A4)	Power amplifier	Send
V2	CV807 (3A4)	Mixer and crystal osc.	Send
V3	CV785 (1T4)	Doubler	Send and receive
V4	CV785 (1T4)	Master oscillator	Send and receive
V5	CV1758 (1L4)	First local oscillator	Receive
V6	CV785 (1T4)	Reactance valve	Send and receive
V7	CV1758 (1L4)	A.F.C. valve	Receive
V8, 9	CV785 (1T4)	R.F. amplifier	Receive
V10	CV1758 (1L4)	First mixer	Receive
V11	CV785 (1T4)	I.F. amplifiers	Receive
V12, 13	CV782 (1R5)	Second mixer and crystal osc.	Receive
V14	CV785 (1T4)	I.F. amplifier	Receive
V15	CV1758 (1L4)	Limiters	Receive
V16	CV753 (1A3)	Discriminator	Receive
V17	CV784 (1S5)	Discriminator and A.F. amp.	Receive
V18	CV784 (1S5)	Noise amplifier	Receive
	CV1758 (1L4)	D.C. amplifier	Receive
	CV784 (1S4)	Squelch oscillator	Receive

REMARKS

The battery eventually to be issued for use with this set is the Battery, dry, H.T./L.T., 91+65/5.2 volt, No. 1 (R.M.); this battery, still under development, is expected to have a working life of at least 25 hours. Pending the availability of this battery, an interim layer type will be issued for the Wireless set No. 31. This battery, designated Battery, dry, H.T./L.T. 90+60/4.5 volt, No. 1, will have a working life of 8—10 hours.

WIRELESS STATION NO. 31 A.F.V. TECHNICAL HANDBOOK - DATA SUMMARY

Note: This issue, Pages 1 and 2, supersedes Pages 1 and 2 of Issue 1, dated 27 Oct. 1952. It has been amended

PURPOSE

Communication between Command or Control A.F.Vs and infantry.

DESCRIPTION

The Wireless station No. 31 A.F.V. is basically a Wireless set No. 31 (see Tels F 360) with minor modifications. Its power supply is obtained from the Power supply and L.F. amplifier unit No. 3, which also provides:-

- (a) Operation from 12 or 24V supply (by interchangeable sub-chassis).
- (b) Control by Wireless set No. 19 harness, using Control units Nos. 16 and 17, or No. 33.
- (c) Additional A.F. amplification, which is required when working under A.F.V. conditions.

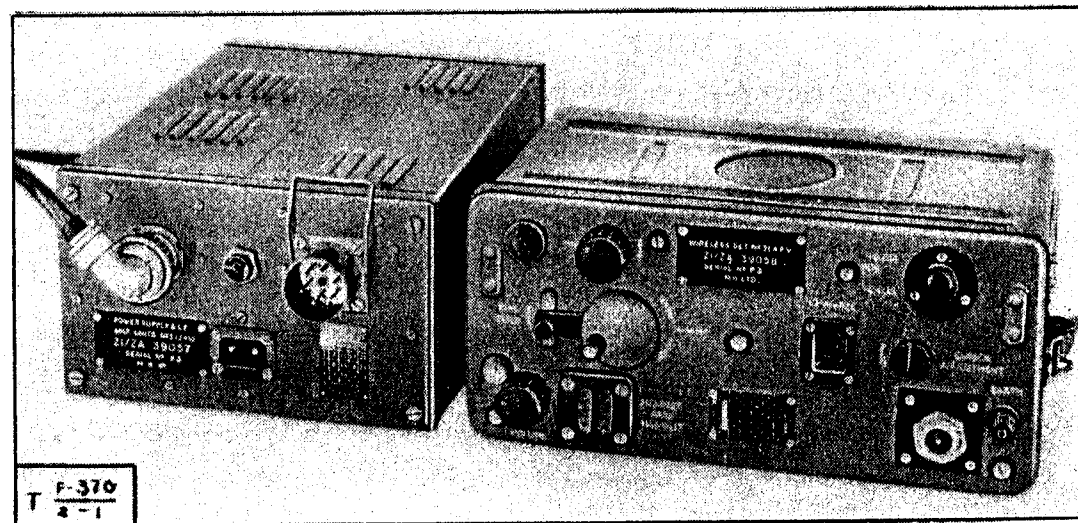


Fig 1 - General view of equipment

PHYSICAL DATA

	Weight	Length	Height	Depth
W.S. 31 A.F.V.:	8 lb	12 in	5 $\frac{3}{8}$ in	6 $\frac{1}{2}$ in
Power supply and L.F. amplifier unit No. 3:	17 $\frac{1}{2}$ lb	8 in	5 in	10 $\frac{1}{2}$ in
Control unit No. 16:	3 lb	6 $\frac{1}{2}$ in	6 in	3 $\frac{1}{4}$ in
Control unit No. 17:	2 $\frac{5}{8}$ lb	6 $\frac{1}{2}$ in	6 in	3 $\frac{1}{4}$ in
Control unit No. 33:	2 $\frac{3}{4}$ lb	6 $\frac{1}{2}$ in	6 in	3 $\frac{1}{4}$ in

FREQUENCY

Frequency coverage : 40-48Mc/s in 41 channels,
200kc/s separation
Intermediate frequencies : 4.3 and 2.51Mc/s

PERFORMANCE

Receiver: Sensitivity: 7 μ V for 20db quieting
Output : 150mW nominally, from
Power supply and L.F. amplifier unit No. 3
Sender : Output : 0.2W into 45 Ω

57/Maint/5366

RANGE

3-4 miles, depending on local terrain

POWER REQUIREMENTS AND CONSUMPTION

Power : 12 or 24V battery
Consumption: On send: 12V 2.5A
24V 1.3A

The filament supply is regulated by a carbon-pile so that input voltage variations of 11-15 and 22-30 to the 12V and 24V units, respectively, may be tolerated.

AERIAL SYSTEM

5 ft 6 in vertical rod

SPECIAL FACILITIES

Re-broadcast facilities are available on both Wireless sets No. 19 and No. 31 A.F.V., using Control unit No. 16.

WIRELESS SET NO. 32D

DATA SUMMARY

PURPOSE

This set has been produced for experimental purposes, to obtain comparisons between A.M. and F.M. communication. It is not available for issue for operational purposes.

DESCRIPTION

The normal receiver stages used are: R.F., mixer, I.F., detector, A.F. and beat oscillator, and output. For F.M. reception the detector becomes a limiter for the I.F. signals feeding a Forster-Seeley type discriminator. The sender employs a master oscillator, power amplifier, two microphone amplifier stages and modulator. For F.M. a control valve is added. The set is housed in a steel case and employs a Wireless Set No. 19 Power supply unit No. 1, Mk. III. There is no send/receive switch, the change-over being made by the microphone pressel switch or morse key.

PHYSICAL DATA

Weight: 76 lb. (sender/receiver, P.S.U. mounted on chassis)
Length: 27 in.
Width: 12 in.
Height: 9½ in.

AERIAL SYSTEM

- (a) 12 ft. rod aerial for mobile use.
- (b) Up to 31 ft. rod aerial for ground use.
- (c) 140 ft. wire aerial for ground use.

FREQUENCY

Coverage: 8-2Mc/s in two bands: -8-1Mc/s, 1-2Mc/s.
Internal: 460Mc/s.

PERFORMANCE

Sender output: 10W (approx.) on C.W. or F.M. R.T.
Receiver sensitivity: (A.M.) 6-7 μ V for 10mW output and signal noise ratio 20db.
(F.M.) 2-3 μ V for 20db. quieting.
Receiver selectivity: 60db. attenuation \pm 16kc/s.

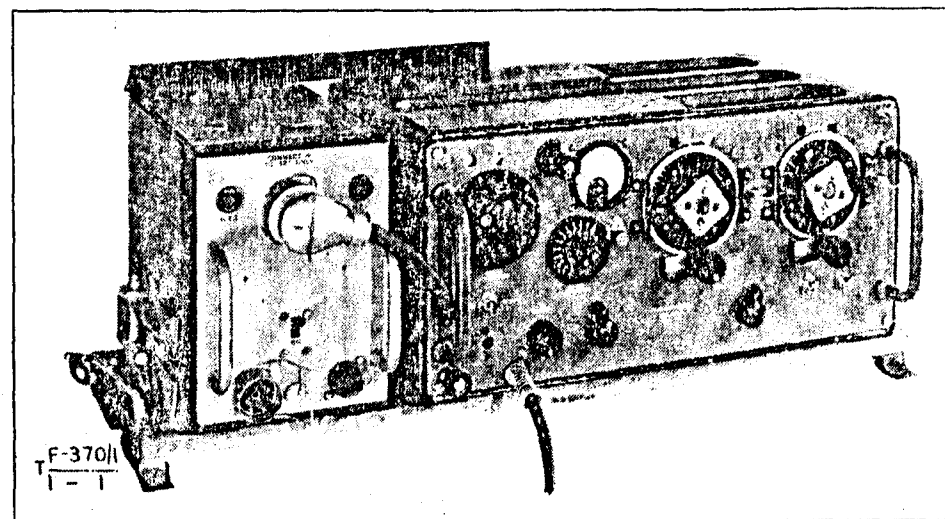


Fig. 1 - General view of equipment

WIRELESS SET NO. 33 (ZA 10750) DATA SUMMARY

PURPOSE

Wireless set No. 33 is a general-purpose medium-power sender, providing C.W., M.C.W. and R/T facilities. It is used as a mobile or ground station.

DESCRIPTION

This set uses a two-stage modulator, master oscillator (crystal or self-excited), buffer and frequency multiplier, driver, and power amplifier stages, and is housed in a metal frame with readily removable steel covers. The Power supply unit, which is separate from the sender, is similarly housed. Using the Remote control unit C, the sender may be switched on or off, keyed on C.W. and M.C.W. and modulated by any V.F. system, including a teleprinter, from a remote point. It is normally used with a Reception set R 107.

PHYSICAL DATA

	<i>Sender</i>	<i>P.S.U.</i>
Weight :	175 lb.	170 lb.
Length :	25 in.	25 in.
Width :	16 in.	16 in.
Height :	23 in.	15 in.

FREQUENCY

17.5 Mc/s—1.2 Mc/s in four ranges :—
Range 1, 17.5—10 Mc/s ; Range 2, 10.5—5.2 Mc/s ;
Range 3, 5.3—2.5 Mc/s ; Range 4, 2.55—1.2 Mc/s.

PERFORMANCE

Sender output :—250W on C.W. 65W on R/T and M.C.W.

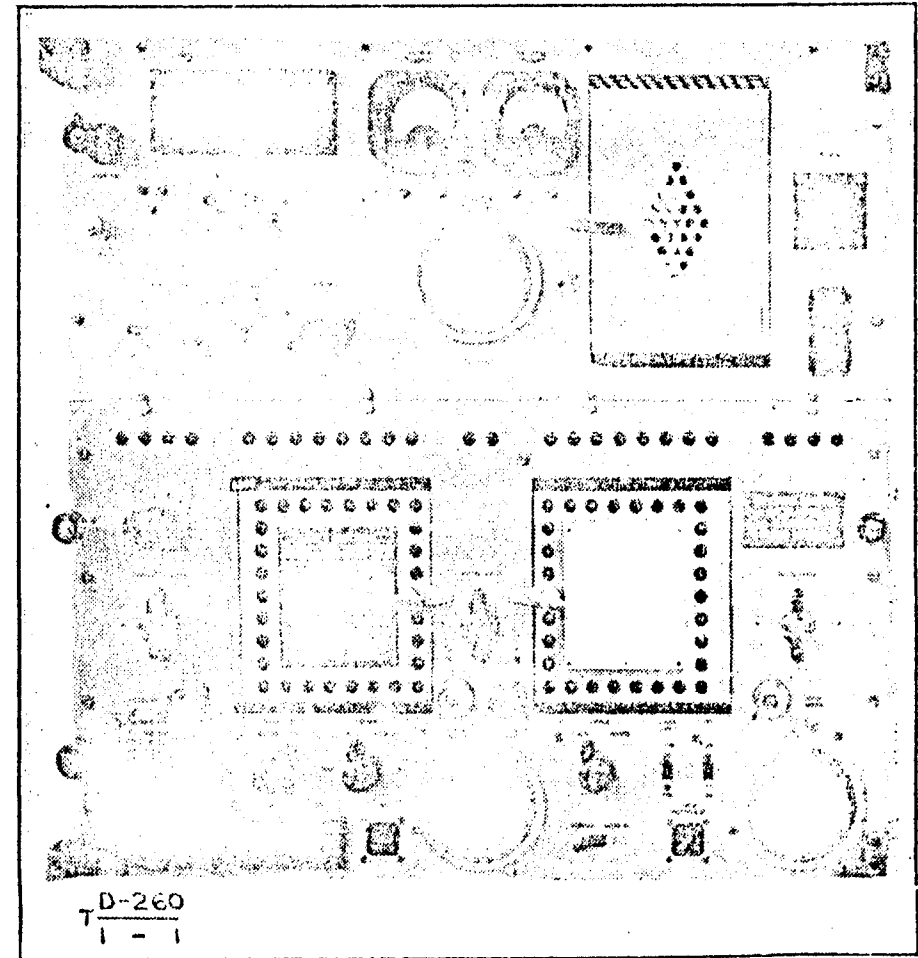


Fig. 1—Wireless set No. 33

POWER REQUIREMENTS AND CONSUMPTION

A.C. mains of 100-250V, 45-60 c/s up to 1,200VA approx. Alternately an Onan 2 kVA petrol-electric generator.

AERIAL SYSTEM

- (a) Wyndom aerial.
- (b) Single-wire aerial of any length up to 100 ft.
- (c) 16 ft. twin-rod aerial (mobile use).

VALVES

<i>Circuit reference</i>	<i>Type</i>	<i>Function</i>
V1A	AW3	Neon stabilizer
V1B	AW3	Neon stabilizer
V2A	ATS25	Master oscillator
V2B	ATS25	Buffer
V3A	ATP35	Driver
V4A	ATP100	Power amplifier
V4B	ATP100	Power amplifier
V5A	AU1	500V rectifier
V5B	AU1	500V rectifier
V2C	ATS25	Mod. amplifier 2
V6A	ARP34	Mod. amplifier 1
V6B	ARP34	Sidetone rectifier

REMARKS

The Power supply unit contains a full-wave selenium rectifier W1 providing 2,000V D.C. for the P.A. valve anodes. This rectified from a power transformer, with variable primary tapings, also supplies 230V for the rectifier valves in the sender unit.

END

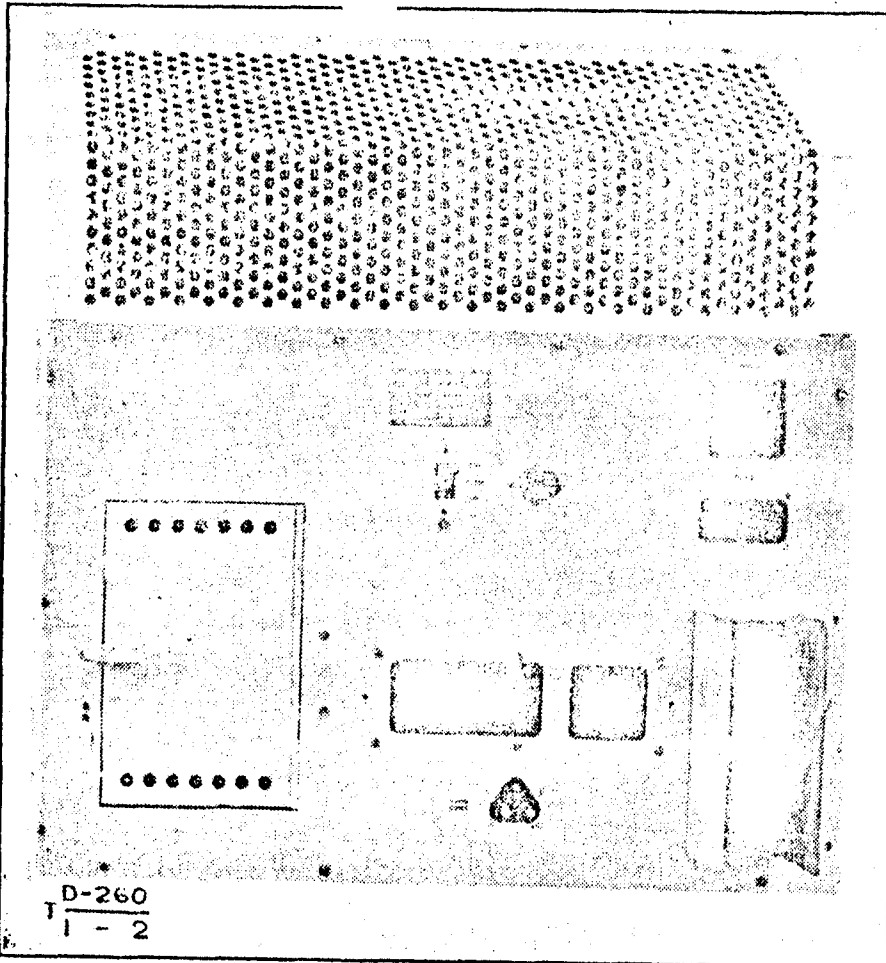


Fig. 2—Power supply unit

WIRELESS SET NO. 36

DATA SUMMARY

PURPOSE

A sender for use as an R/T link in an A.A. defence system. C.W., M.C.W. and R/T facilities are provided.

DESCRIPTION

The sender consists of two units: the R.F. unit (ZA 11689), comprising a master oscillator with or without crystal control, frequency doubler, and power amplifier, and the Power supply and modulator unit (ZA 11688), comprising an A.F. oscillator (which also serves to amplify speech from the microphone on R/T) and a rectifier with smoothing system for H.T. supply. Each unit is built on a steel chassis and housed in a wooden case.

PHYSICAL DATA

	<i>R.F. unit</i>	<i>P.S. and modulator unit</i>
Weight :	90 lb.	130 lb.
Length :	24 $\frac{1}{8}$ in.	24 $\frac{1}{8}$ in.
Width :	16 $\frac{1}{4}$ in.	16 $\frac{1}{4}$ in.
Height :	16 $\frac{1}{2}$ in.	14 $\frac{7}{8}$ in.

FREQUENCY

Coverage : 10-60 Mc/s in three ranges covered by coils.

PERFORMANCE

Sender output : 25 W.

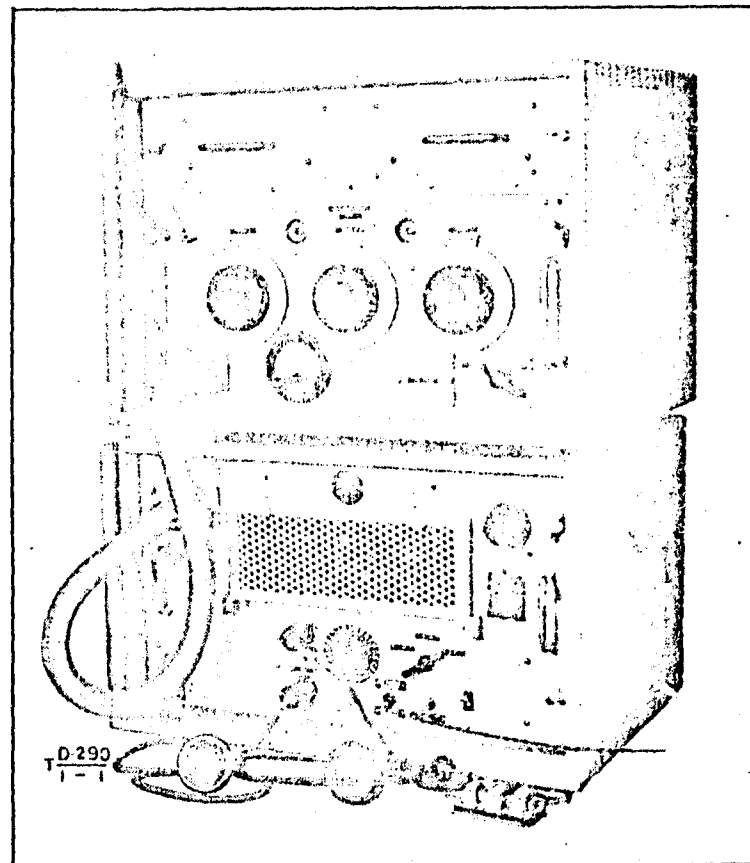


Fig. 1—General view of set

AERIAL SYSTEM

A coaxial 80-100 Ω feeder with a dipole centre-fed aerial.

VALVES

<i>Circuit reference</i>	<i>Type</i>	<i>Function</i>
R.F. unit		
V1A	ATS 25 (807)	Master oscillator
V1B	ATS 25 (807)	Frequency doubler
V1C and V1D	ATS 25 (807)	Power amplifier
V2A and V2B	AW 3 (S 130)	Stabilizers for M.O. H.T.
Power supply and modulator unit		
V4A	6C5G (NR 78)	Modulation amplifier or M.C.W. oscillator
V4B and V4C	6C5G (NR 78)	Push-pull mod. amplifier
V1E and V1F	ATS 25 (807)	Push-pull modulators
V5A, V5B and V5C	AU 1 (FW4/500)	Rectifiers
V3A and V3B	AW 6 (EM 1)	Tuning indicators

POWER REQUIREMENTS AND CONSUMPTION

Power supply :

A.C. mains, 100/110V or 200/250V, 40-60 c/s
or Power unit, 2 kVA, No. 2, generating set, giving up to 350W approx.

REMARKS

Associated equipment :

- (a) Harmonic filter units, Nos. 1, 2 and 3 to restrict radiation of harmonics of the fundamental frequency, one for each frequency band.
- (b) Line coupling unit with six switch positions, giving :—
 - (i) Simple broadcast
 - (ii) Local four-wire
 - (iii) Remote four-wire
 - (iv) Remote and local four-wire
 - (v) Re-broadcast
 - (vi) Hybrid two-wire
- (c) The Sender No. 36 is normally used with Reception set R 208.

END

WIRELESS SET NO 37 (ZA 3232) (OBSOLETE)

DATA SUMMARY

PURPOSE

Short-range transceiver for parachute troops, with R/T and M.C.W. facilities.

DESCRIPTION

Receiver consists of an acorn triode super-regenerative detector, with acorn triode A.F. stage. Sender uses same valves as oscillator, anode modulated by microphone amplifier. M.C.W. provided by buzzer and key. R.F. stage and microphone are in small case, which mounts tuning and switching controls and dipole, and has a pistol grip handle. A.F. stage and batteries are carried in a bandolier round the waist. R.F. unit and phones stored in satchel when not in use.

PHYSICAL DATA

Length: $4\frac{3}{4}$ in. } R.F. unit case
Diam.: $2\frac{5}{8}$ in. }
Weight of complete station: approximately 14 lb.
Aerial length: 16 in.

FREQUENCY

Coverage: 340—385Mc/s.

Issue 1, 14 Dec. 1944.

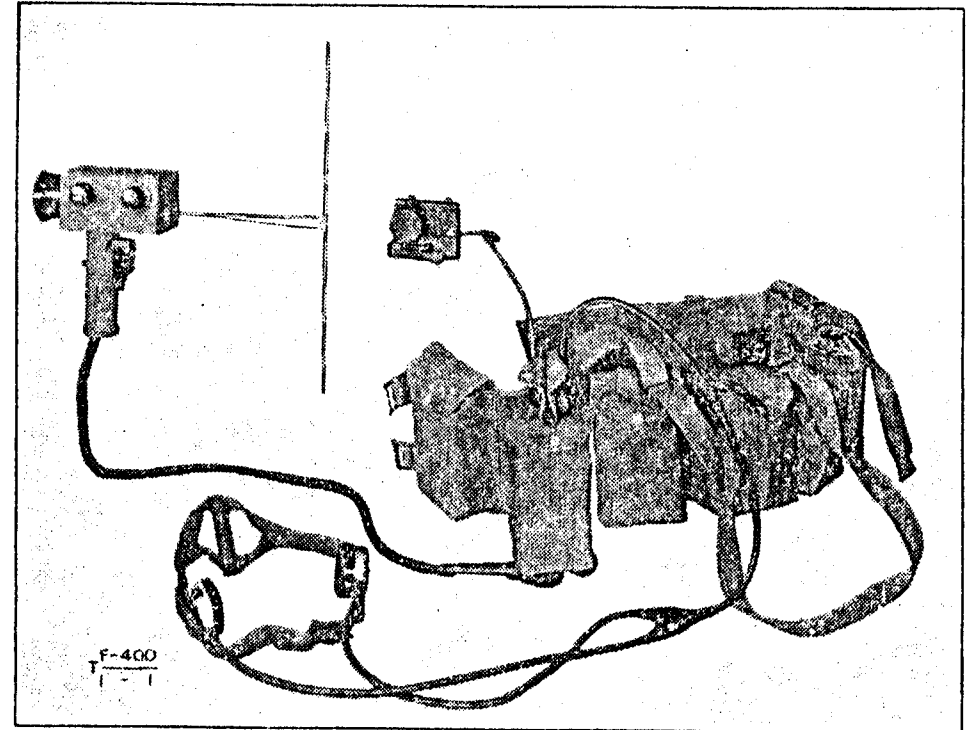


Fig. 1—General view of equipment

WIRELESS SET No. 38, Mk. I (ZA. 11305), Mk. II (ZA. 13280) and Mk. II* (ZA. 13280)

DATA SUMMARY

PURPOSE

Light weight infantry pack set, for short-range R/T communication.

DESCRIPTION

Four-valve superhet receiver, comprising one R.F. stage, separate local oscillator, mixer and I.F./A.F. reflex amplifier, with one metal rectifier for detection and A.V.C. Sender master oscillator is local oscillator switched over and acting as frequency doubler, followed by power amplifier. Throat microphones drive reflex amplifier switched to modulate power amplifier. Set is housed in steel case; Mk. I carries dry battery in case; Mk. II and Mk. II* carry it in separate haversack. The Wireless Set No. 38, Mk. I is now obsolete.

PHYSICAL DATA

Mk. I	Mks. II and II*	Battery
Weight : 7 lb.	6½ lb.	6 lb.
Length : 13 in.	9 in.	6½ in.
Width : 7 in.	6½ in.	6½ in.
Height : 7 in.	4 in.	3 in.

FREQUENCY

Coverage : 7.3 Mc/s to 8.9 Mc/s.
Internal : I.F. 285 kc/s

PERFORMANCE

Range : 4 ft. rod, ¾ mile ; 12 ft. rod, 2 miles.
Sender output : 0.2 W.
Receiver sensitivity : 35 µ V for 0.5 mW output.
Receiver selectivity : 30 db. attenuation at ± 19 kc/s

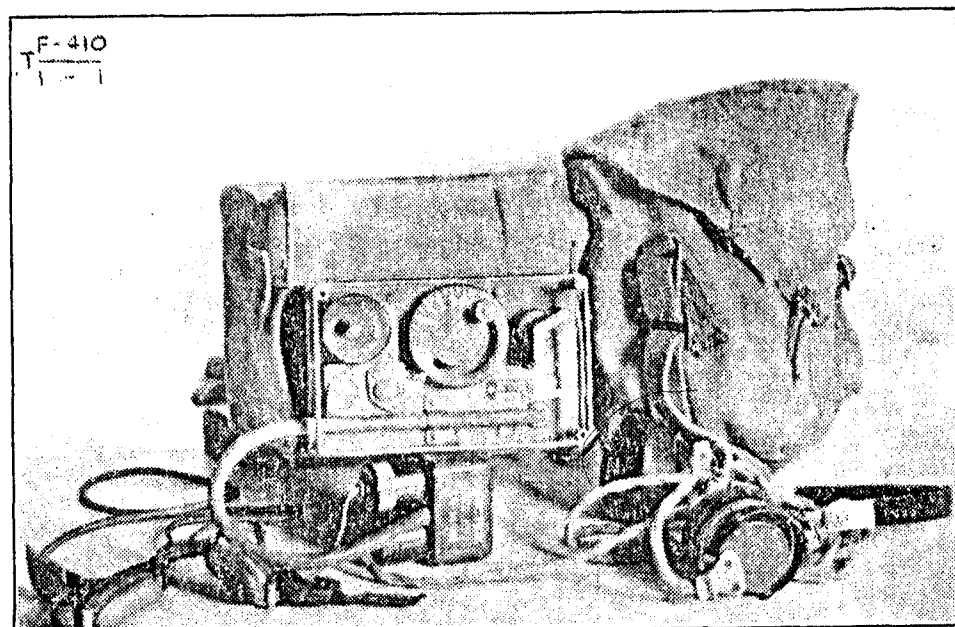


Fig. 1—General view of complete equipment

WIRELESS SET NO. 38, MK. III DATA SUMMARY

NOTE.—This replaces and cancels Issue 1. Items marked thus ● have been amended.

PURPOSE

Short-range Infantry pack set, as Wireless set No. 38, Mk II (see Tels. F. 410/1), for use in tropical climates.

DESCRIPTION

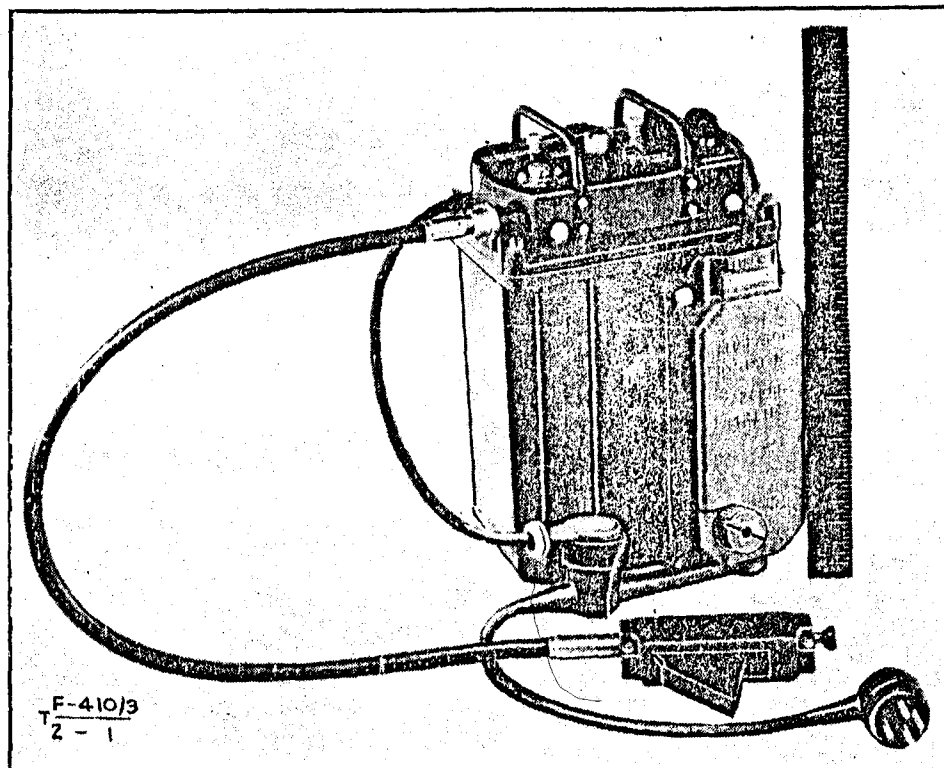
Circuit is essentially as for Wireless set No. 38, Mk. II (5-valve transceiver) with addition of crystal calibrator unit for checking and correcting dial calibration. Built-in die-cast light metal case, hermetically sealed, with calibrator unit in small sealed case screwed on side. Off-receive-send switching performed by hand control box and Bowden cable link to set.

PHYSICAL DATA

	Weight	Length	Width	Height
Set with calibrator :	11 $\frac{1}{4}$ lb.	7 in.	6 $\frac{1}{4}$ in.	10 $\frac{3}{4}$ in.
Complete station in signal satchel :	21 lb.			

FREQUENCY

Coverage : 7.4 – 9.0Mc/s
Internal : 285kc/s I.F.
Harmonics of 285kc/s from crystal calibrator.



● Fig. 1—General view of set

WIRELESS SET NO. 42

DATA SUMMARY

PURPOSE

General purpose set for C.W. and R T (F.M. or A.M.) communication, hermetically sealed for use in extreme climatic conditions and using miniature technique to keep weight to a minimum. Designed for simplicity of operation and elimination of usual netting drill on an external signal. Used in man-pack and vehicle animal stations.

DESCRIPTION

Sender-receiver, employing internal crystal calibrator circuit for setting up on channels at 10kc/s intervals without use of an external netting signal. Uses 21 valves, nine in sender, nine in receiver, and three in calibrator. Sender consists of M.O., frequency tripler, and P.A., two voltage stabilizers, and 3-stage microphone amplifier modulating M.O. for F.M. and P.A. for A.M. Receiver is a conventional superhet, using R.F. amplifier, local oscillator, mixer, three I.F. amplifiers, discriminator/detector and output amplifier, and beat oscillator. Set is used in:—

- (a) Man-pack station with:—
 - (i) Case, accessory, No. 3 (containing 2.4V nickel-cadmium battery and vibrator power pack).
 - (ii) P.S.U., pedal-driven, H.T./L.T., 45W, No. 1 (supplying L.T. for float-charging battery and high-voltage H.T. for sender).
- (b) Vehicle/animal station with P.S.U. No. 34 for operation from 12V supply.

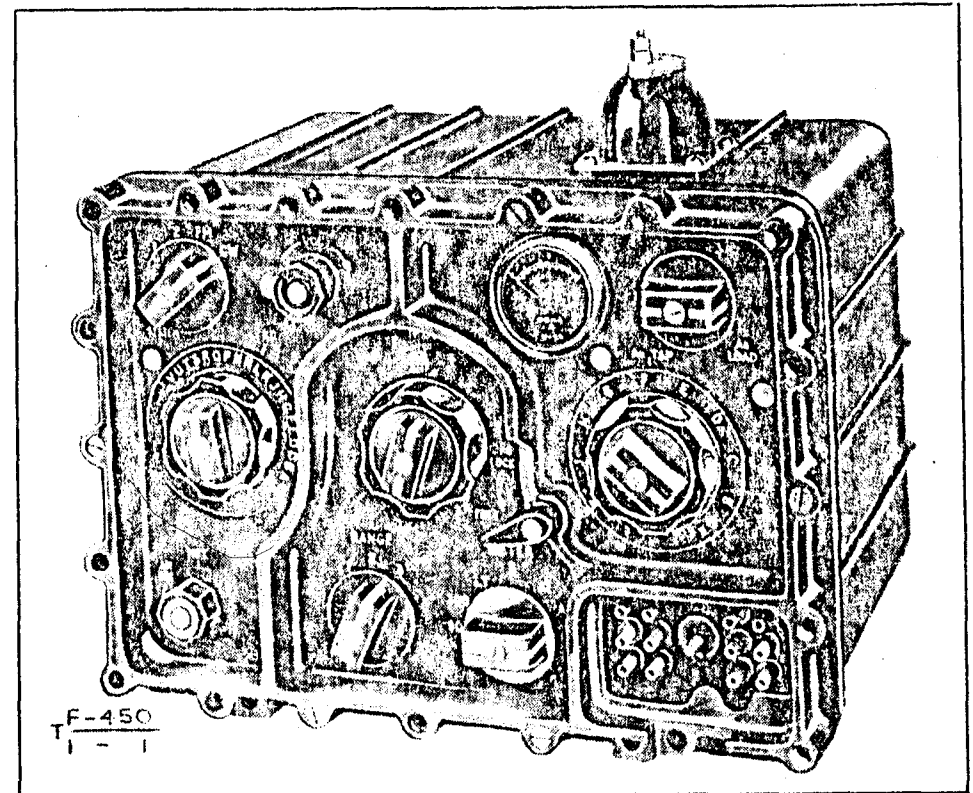


Fig. 1—General view of set

**WIRELESS STATION NO. 57
DATA SUMMARY 57**

PURPOSE

To provide a point-to-point, single-channel, duplex, R/T link, easily operated by unskilled users from a telephone set. Used in Wireless station No. 26 to provide a service link.

DESCRIPTION

The Wireless station No. 57 embodies a crystal-controlled sender and receiver at each station, using different sending and receiving frequencies to provide duplex communication between two telephones without interference with W.S. 26. The receiver runs continuously, and calls through a loudspeaker when the telephone handset is on its rest. Lifting the handset automatically transfers receiver output from loudspeaker to telephone and starts sender. Separate sender and receiver power units are used for mains operation, with additional rotary generator units for battery operation if desired. Units are mounted on a wooden panel in W.S. 26 receiver vehicle, which also carries W.S. 57 receiver aerial. Sender aerial is mounted on sender vehicle. In emergency, W.S. 26 aeriels may be used by W.S. 57.

PHYSICAL DATA

Sender	Sender power units		Receiver	Receiver power units		Loud-speaker
	Mains	Battery		Mains	Battery	
Length: 15½ in.	16½ in.	15½ in.	13½ in.	13½ in.	13½ in.	10 in.
Width: 7½ in.	7½ in.	7½ in.	5 in.	5 in.	5 in.	5 in.
Height: 7¼ in.	7 in.	7 in.	5 in.	5 in.	5 in.	9¼ in.
Weight: 20 lb.	32½ lb.	31½ lb.	11½ lb.	15 lb.	14½ lb.	8 lb.

The whole equipment mounts on a board 4 ft. x 2 ft. 8 ft. with total approximate weight of 150 lb.

FREQUENCY

Group	1	2	3	4	5	6	7	8	9	10	11	12
A sender	85.4	85.5	85.7	85.8	86.3	86.4	86.6	86.7	88.1	88.2	88.4	88.5
B sender	89.0	89.1	89.3	89.4	93.5	93.6	93.8	93.9	94.4	94.5	94.7	94.8

Table I—Frequencies of W.S. No. 57 in Mc/s
Internal I.F.: 2.9Mc/s

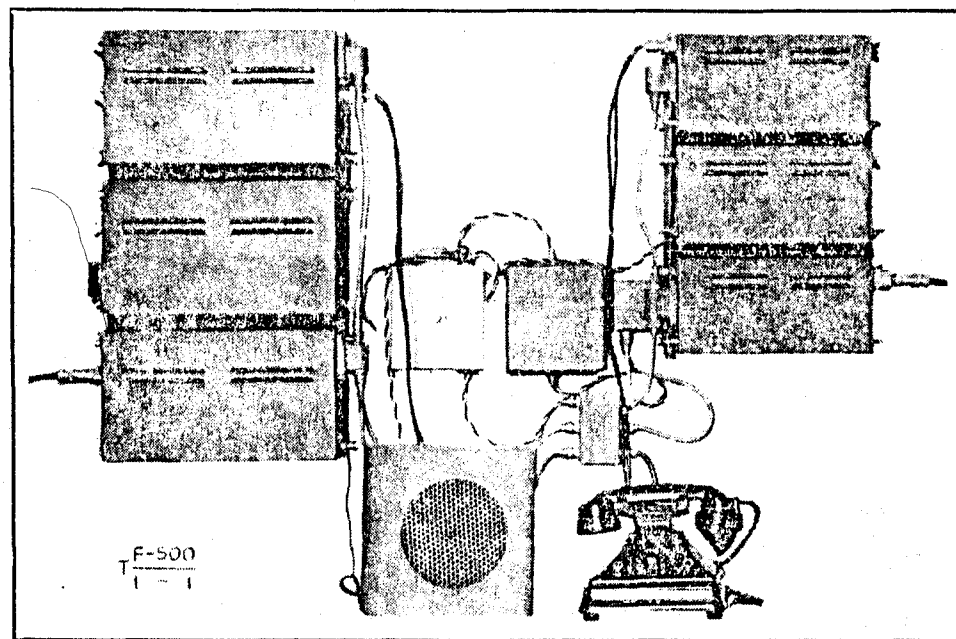


Fig. I—General view of equipment.

WIRELESS SET No. 62

DATA SUMMARY

PURPOSE

General purpose, low-power, tropicalized, transceiver, providing R.F. and C.W. facilities. Primarily intended for vehicle station but also man- or animal-pack.

DESCRIPTION

Set housed in steel case, with internal 12V rotary transformer. Receiver: normal 8-valve superhet, one R.F. mixer and separate local oscillator, two I.F.s., detector A.V.C., pentode output and beat oscillator for C.W.

Sender: Uses local oscillator plus beat oscillator plus mixer, buffer and P.A.

Modulation, two-stage microphone amplifier. Send-receive switching by pressel key.

PHYSICAL DATA

Weight: 29 lb.

Height: 8½ in.

Length: 17½ in.

Width: 13½ in.

FREQUENCY

Coverage: 1.6—10 Mc/s in two ranges, 1.6—4 Mc/s and 4—10 Mc/s. (8-10 Mc/s to be used only in emergency.)

Internal: I.F., 460 kc/s.

PERFORMANCE

Sensitivity: 3µV for 10mW and signal/noise of 20db.

Range: 14 miles on R/T, 20 miles on C.W. (14 ft. rod.)

Issue 1, 21 Jul. 1945

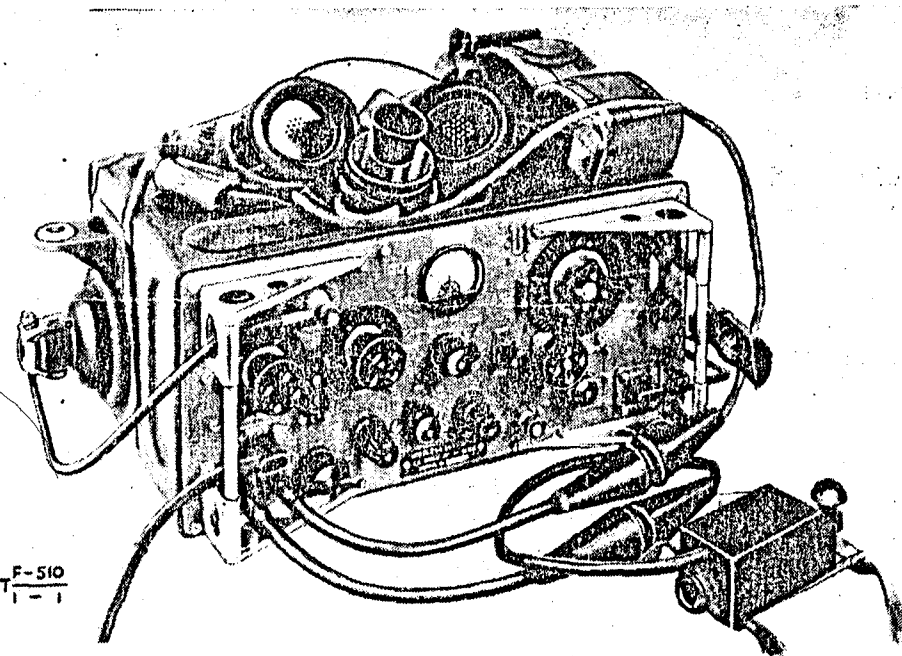


Fig. 1—General view of equipment

POWER REQUIREMENTS AND CONSUMPTION

Battery, secy. port, 12V.

Consumption : Listening watch, 3.0A.

Receive, 3.7A.

Send R/T, 4.6A

Send C.W., 5.0A.

VALVES

<i>Circuit ref.</i>	<i>Type</i>	<i>Function</i>
V1A	ARP 12	R.F. amplifier, sidetone rectifier
V1B	ARP 12	Mixer
V1C	ARP 12	Local oscillator
V1D	ARP 12	1st. I.F.
V1E	ARP 12	2nd. I.F.
V2A	AR 8	Det. A.V.C., 1st. microphone amplifier
V3A	CV 65	Receiver output sidetone
V3B	CV 65	2nd. microphone amplifier
V4A	ARTH 2	Sender mixer, beat oscillator
V5A	ARP 35	Buffer
V6A	VT 510	Power amplifier

REMARKS

Set is immersion-proof for 5 minutes ; will float.

SPECIAL FACILITIES

Remote aerial up to 50 ft., using Aerial coupling unit J. Remote control by units L up to $\frac{1}{2}$ mile, using D.3, and $\frac{1}{4}$ mile, using assault cable. Junctions, remote control, No. 1 and No. 2 can be used in lieu of Remote control units L. Station includes crystal calibrator.

**ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS**

**WIRELESS SETS NOS. 68P, R AND T
DATA SUMMARY**

PURPOSE

Short-range R/T and C.W. facilities, primarily for communication between Company and Battalion H.Q.

DESCRIPTION

Man-pack comprising sender/receiver, embodying crystal control of sender frequency, if required.

PHYSICAL DATA

	Wireless set	Static battery
Weight:	31 lb. with battle battery	22½ lb.
Height:	17½ in.	3½ in.
Length:	10½ in.	13½ in.
Width:	10½ in. (with cover open, Width= 17½ in.)	11½ in.

FREQUENCY

Coverage: Wireless sets 68T & R, 3—5.2 Mc/s
 " " 68P, 1.75—2.9 Mc/s
 Internal: I.F. for all three types, 465 kc/s.

PERFORMANCE

Approx. average range with 11 ft. aerial rod, 5 miles
 " " " " 6 ft. " " 2.5 miles
 " " " " ground (25 ft.) aerial, 1—3 miles

POWER REQUIREMENTS AND CONSUMPTION

Supply

- (a) Battery, dry, H.T./L.T. 162/3 V, for pack use.
- (b) Boxes primary battery, H.T./L.T. 162/3 V— for ground station use.

Consumption

- (a) L.T. battery: 0.35 A on send (R/T), 0.2 A on receive.
- (b) H.T. battery: 17.5—21 mA on send (R/T) 17 mA on receive.

AERIAL/LINE SYSTEM

Type: Rod, ground, or elevated aerial.

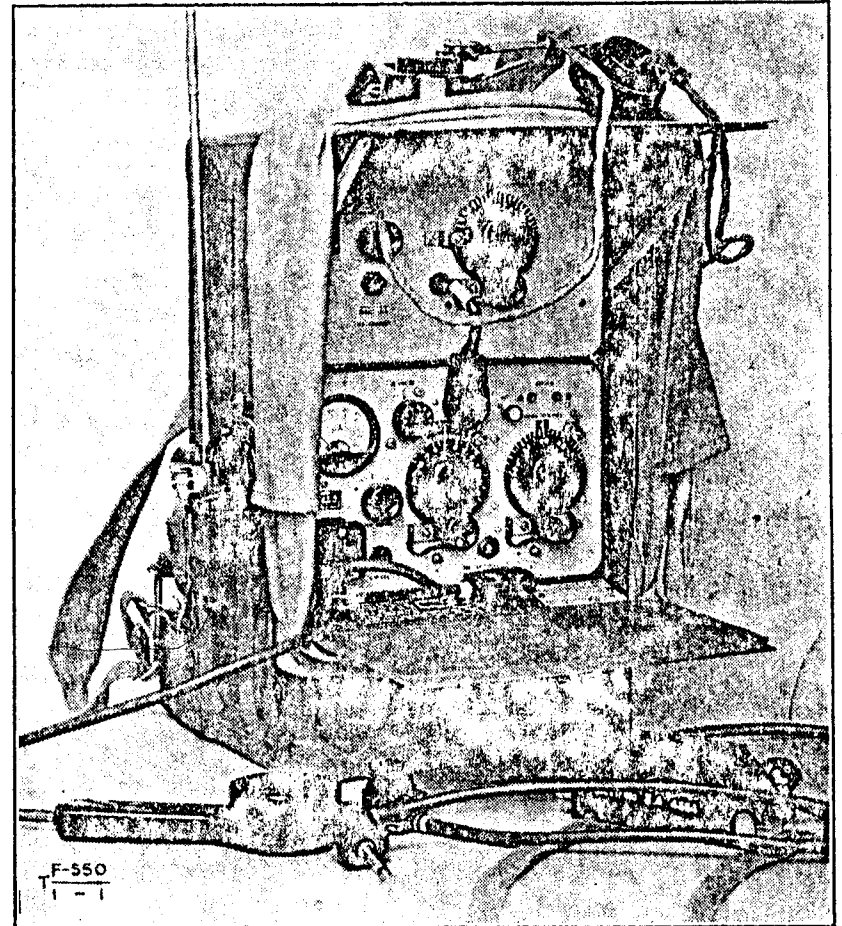


Fig. 1—General view of equipment

WIRELESS SET NO. 88, TYPE 'A', A.F.V. TECHNICAL HANDBOOK—DATA SUMMARY

PURPOSE

Communication between A.F.Vs. and infantry.

DESCRIPTION

The installation in an A.F.V., when associated with a Wireless set No. 19, consists of four main parts:—

- (a) Wireless set No. 88, type 'A', A.F.V.
- (b) Power supply and L.F. amplifier unit No. 2.
- (c) Control unit No. 16.
- (d) Control unit No. 17.

The Wireless set No. 88, A.F.V. is basically a Wireless set No. 88 (see Tels. F 650) with minor modifications. The Power supply and L.F. amplifier unit No. 2 provides:—

- (a) Operation from a 12V battery supply.
- (b) Control by harness of Wireless set No. 19, using Control units No. 16 and No. 17.
- (c) Additional A.F. amplification, for reception and transmission under noisy conditions.

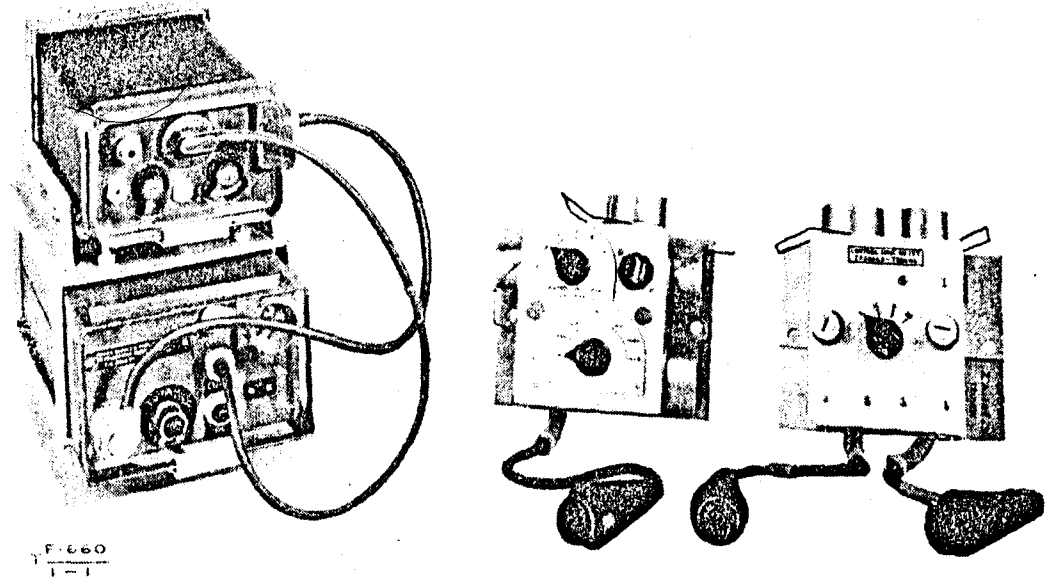


Fig. 1—General view of equipment

WIRELESS SET NO. 88
(Types A and B)

TECHNICAL HANDBOOK - DATA SUMMARY

Note: This issue, Pages 1 to 3, supersedes Pages 1 and 2, of Issue 2, dated 5 Nov. 1948. It has been amended throughout.

PURPOSE

A short-range infantry pack set for R/T communication; F.M. only. Hermetically sealed for use in tropical climates. Suitable for dropping by parachute.

DESCRIPTION

A 14-valve V.H.F. sender-receiver. The sender employs four valves; reactor, master oscillator, frequency doubler, and power amplifier. A frequency stabilizing circuit is included. The ten valves of the receiver are, R.F. amplifier, mixer, oscillator and frequency trebler, three I.F. amplifiers, limiter, two discriminators, and an A.F. amplifier. Four spot frequencies, crystal-controlled, are selected by a channel selector switch. The complete station is carried in two pouches similar to, though larger than, Bren ammunition pouches. There are two types of set: Type A (for Inf. Pl. - Coy. use) and Type B (for Inf. Mortar Pl. use). The two types are distinguishable by their colours.

PHYSICAL DATA

	Wireless set	Battery	Complete station
Weight:	5 lb.	5 lb.	11½ lb.
Height:	9¾ in.	8 in.	
Length:	5¾ in.	4 in.	
Width:	3¾ in.	3 in.	

Issue 3, 12 Jan. 1951

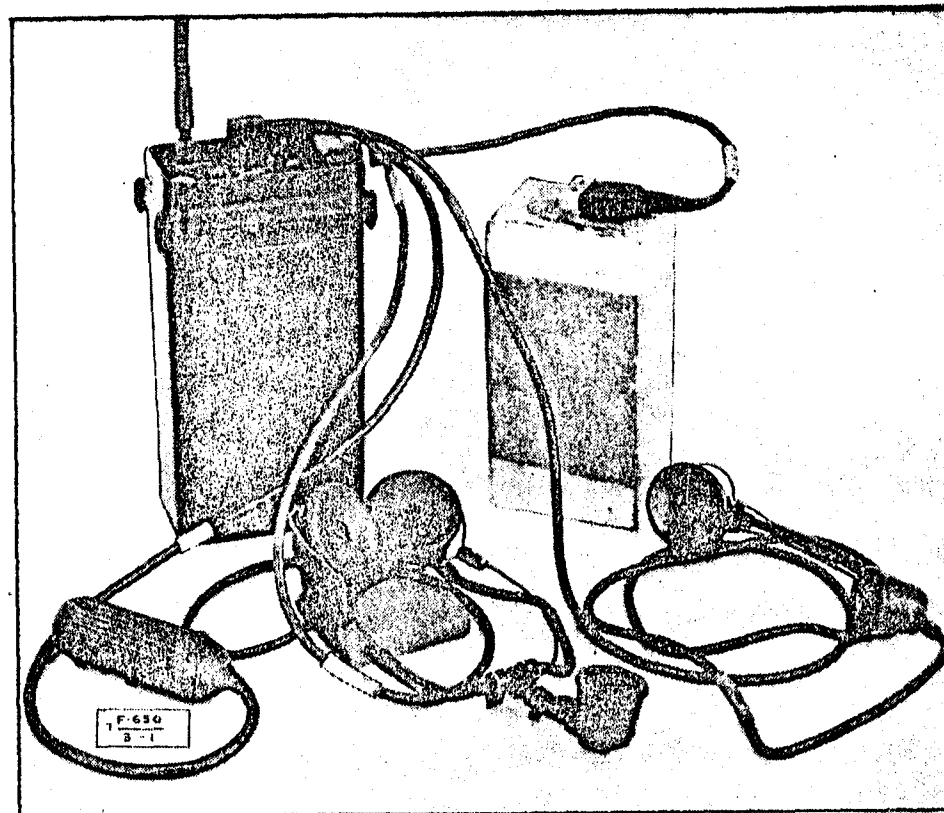


Fig. 1 - General view of equipment

TEST SET, DEVIATION, NO. 2

TECHNICAL HANDBOOK— DATA SUMMARY

PURPOSE

To measure the carrier deviation of frequency-modulated (F.M.) senders in the ranges 2.5 to 10Mc/s and 25 to 100Mc/s.

DESCRIPTION

The equipment consists of a low-sensitivity F.M. receiver working on the superheterodyne principle. It has a tuning indicator, carrier deviation meter, and facilities for monitoring, aurally and visually, the modulation waveform by external means.

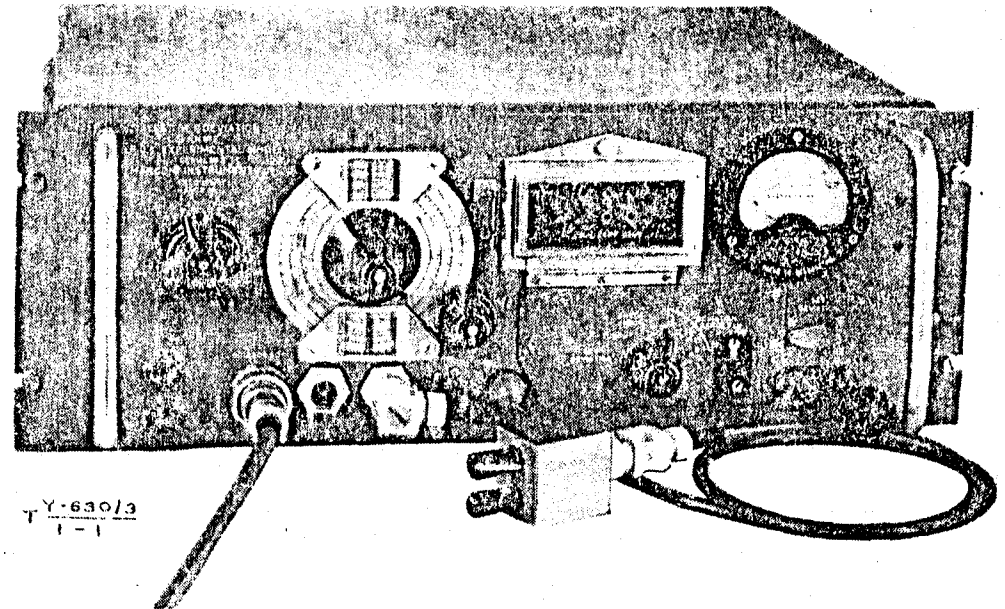


Fig. 1 General view of equipment

Y 830/3 2830

PHYSICAL DATA

Weight: 51 lb.
 Height: 7 in.
 Length: 18½ in.
 Depth: 15 in.

FREQUENCY RANGES

Carrier-frequency ranges: A 2.5 - 4 Mc/s
 B 4 - 6.5 Mc/s
 C 6.5 - 10 Mc/s
 D 25 - 33 Mc/s
 E 33 - 44 Mc/s
 F 44 - 58 Mc/s
 G 58 - 77 Mc/s
 H 77 - 100 Mc/s

Deviation-frequency ranges: 0 - 75kc/s
 0 - 25kc/s
 0 - 5kc/s

PERFORMANCE

The minimum input required to operate the instrument is about 20mV.

POWER REQUIREMENTS AND CONSUMPTION

100 to 150V, 45 - 100c/s A.C., in steps of 10V: 70VA
 200 to 250V, 45 - 100c/s A.C., in steps of 10V: 70VA.

VALVES

Circuit reference	CV No.	Function
V1	CV 138	Local oscillator
V2	CV 140	Diode mixer
V3	CV 138	Untuned buffer amplifier
V4	CV 138	Untuned I.F. amplifier
V5	CV 138	Untuned I.F. amplifier
V6	CV 138	Untuned I.F. amplifier
V7	CV 138	Untuned I.F. amplifier
V8	CV 140	Limiter
V9	CV 286	Stabilizer
V10	CV 140	Counter diode
V11	CV 138	A.F. amplifier
V12	CV 138	A.F. amplifier
V13	CV 286	Voltage stabilizer
V14	CV 133	Valve voltmeter
V15	CV 133	Cathode follower
V16	CV 140	Valve voltmeter
V17	CV 572	Rectifier

SPECIAL FACILITIES

Alternative high and low input sockets on the test set provide for various R.F. inputs. Additional equipment is necessary for monitoring the modulation waveform.

END

REJECTOR UNIT, B47 AND B48

TECHNICAL HANDBOOK : DATA SUMMARY

PART NUMBER

ZA 53557 - Rejector unit, TRB47
ZA 53558 - Rejector unit, TRB48

PURPOSE

Fitted in most vehicle installations, using SRC42/B47 or SRC45/B48, to limit interference in the B47 receiver from the C42 transmitter, or in the B48 receiver from the C45 transmitter.

DESCRIPTION

Both units are identical in size and appearance, and differ only in respect of their nameplates and frequency coverage (ie internal component values). Each is a small sealed unit containing fixed and variable reactances to form a tunable filter network, and is normally inserted between the antenna tuning unit and the associated receiver input.

TELECOMMUNICATIONS
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ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS

PHYSICAL DATA

Weight: 5.1/2 lb
Width: 7.1/8 in.
Depth: 6 in.
Height: 5 in.

CLIMATIC RANGE

Temperature: -40 to +55°C
Pressure: Altitude of 25,000 ft.

TRANSPORTATION DATA

Air transportable
Immersion-proof

PERFORMANCE

Attenuation: Wanted signal - not greater than 4dB)
Unwanted signal - not less than 30dB)
Provided the signals differ by not less than 2Mc/s

ELECTRICAL DATA

Characteristic impedance

70Ω

Frequency range

Rejector unit, TRB47: 36-60Mc/s

Rejector unit, TRB48: 23-38Mc/s

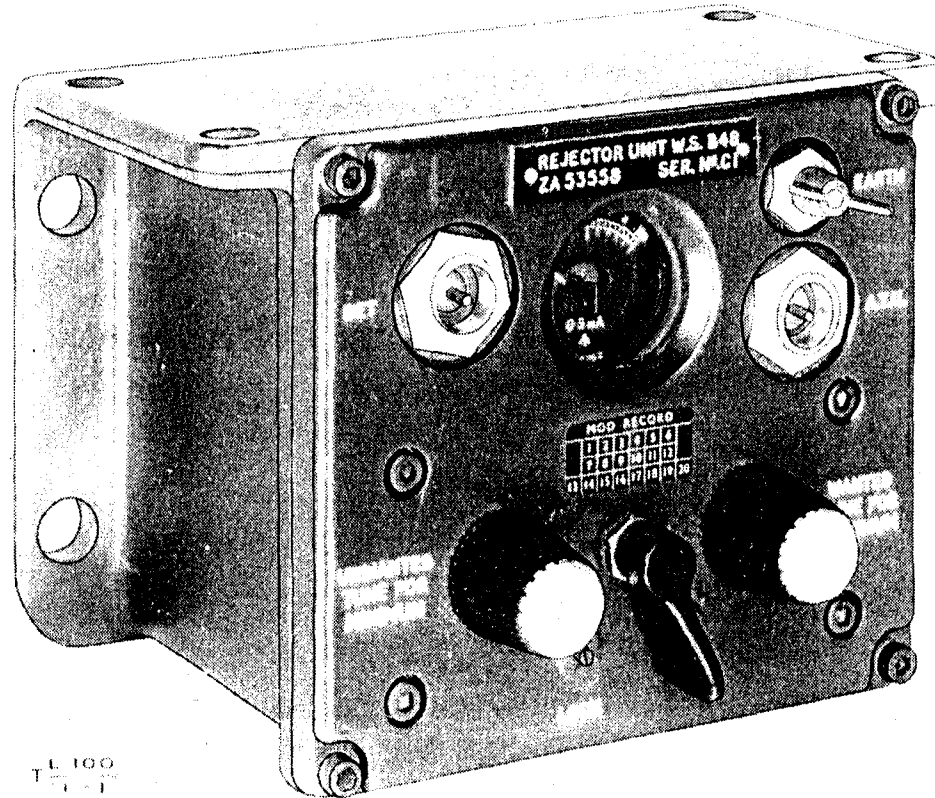
POWER REQUIREMENTS

Nil.

ASSOCIATED PUBLICATIONS

Station, radio, B47 - Tels G 530

Station, radio, B48 - Tels G 550



L 100
T 1-1

Fig 1 - General view of the B48 unit
END

AERIAL TUNING UNIT NO. 6 AND NO. 8
TECHNICAL HANDBOOK - DATA SUMMARY

PURPOSE

Aerial tuning unit No6 matches Wireless set C42 to an 8ft rod aerial.

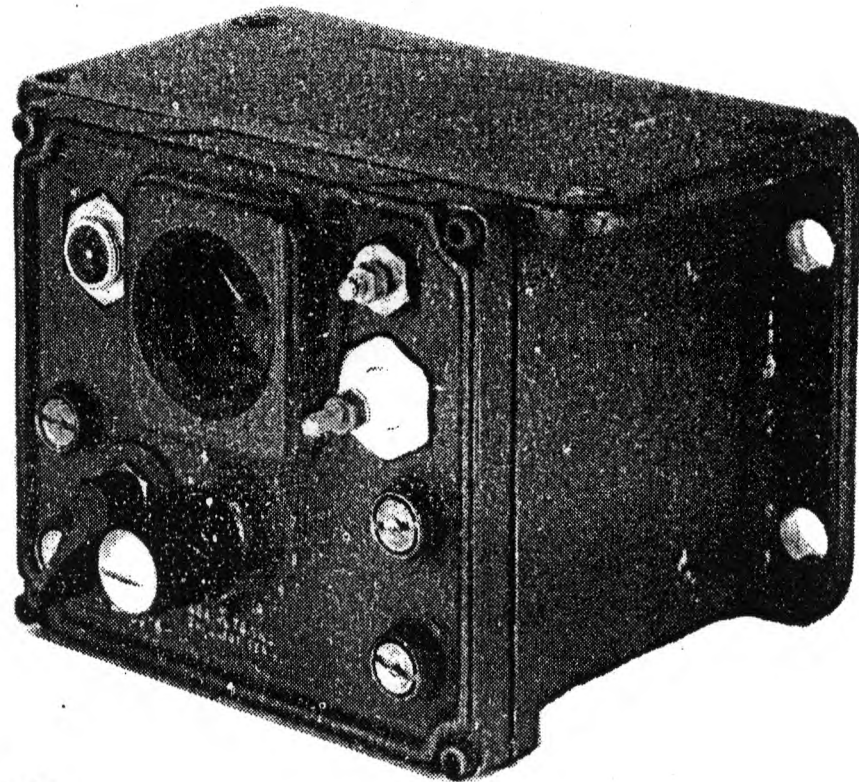
Aerial tuning unit No8 matches Wireless set B47 to an 8ft rod aerial.

DESCRIPTION

A tuning unit, housed in a sealed waterproof case, employing a Collins type coupler adapted to use one tuning control. A built-in metering circuit gives indication of output and tuning. ATU No6 and No8 are identical except for one metering resistor value.

PHYSICAL DATA

Weight 6 lb
Height 6 in
Length 6½ in (including tuning knob)
Width 7½ in



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TELECOMMUNICATIONS
L 300/1

ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS

FREQUENCY

36 - 60Mc/s.

SPECIAL FACILITIES

Provision made for use with remote tuning control.

REMARKS

Details of associated EMERS:-

Wireless set C42 - Tels H440 - 449

Wireless set B47 - Tels G530 - 539

END

4730 X-710/2

DUMMY LOAD FOR WIRELESS SET NO. 31

TECHNICAL HANDBOOK—DATA SUMMARY

PURPOSE

Designed as a load for the Wireless set No. 31, and to facilitate the measurement of sender output and receiver sensitivity.

DESCRIPTION

The dummy load screws directly into the aerial socket of the Wireless set No. 31 and is fitted with a spade terminal on a short lead for earthing purposes.

Sender output power can be measured by connecting a valve voltmeter to the two spade terminals situated on the end of the dummy load. A signal generator can be connected to the coaxial socket for making receiver sensitivity measurements.

PHYSICAL DATA

Diameter: 2 in.

Height: 3½ in.

Weight: 7 oz.

FREQUENCY

40—48Mc/s

Issue 1, 14 Jul. 1949

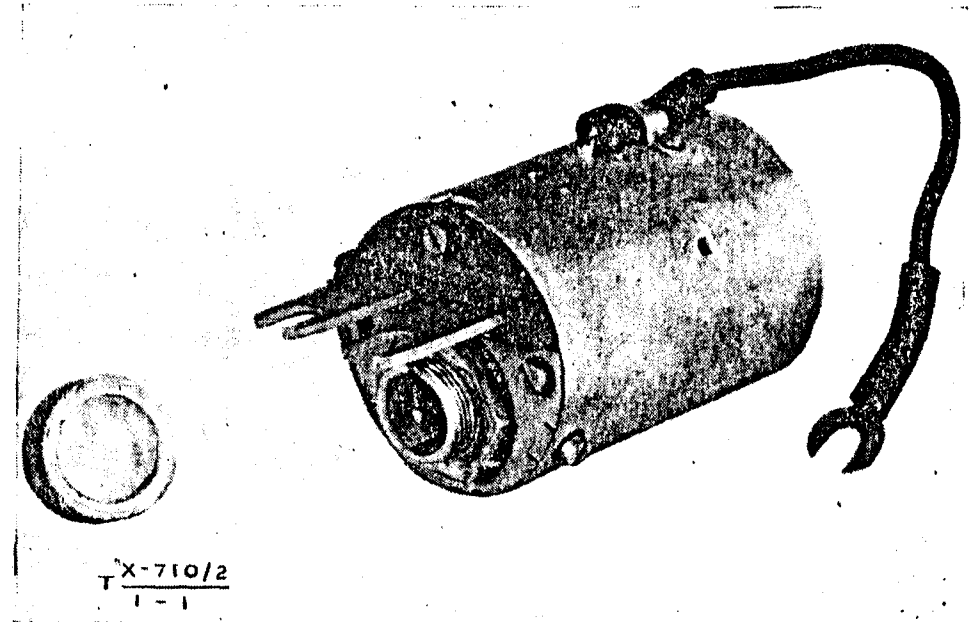


Fig. 1—General view of equipment

Note: Only the Data Summary is being issued for this equipment.

END

Distribution—Class 930. Code No. 6

Page 1

4740
?

DUMMY LOAD FOR WIRELESS SET NO. 88

TECHNICAL HANDBOOK—DATA SUMMARY

PURPOSE

Designed as a load for the Wireless set No. 88, and to facilitate the measurement of sender output and receiver sensitivity.

DESCRIPTION

The dummy aerial plugs directly into the aerial and earth sockets of the Wireless set No. 88. The value of the components are such as to simulate the impedance of an 8 ft. aerial.

Sender output power can be measured by connecting a valve voltmeter to the two spade terminals situated on the side of the dummy aerial. A signal generator can be connected to the coaxial socket for making receiver sensitivity measurements.

PHYSICAL DATA

Weight: 3 oz.
Height: $1\frac{1}{2}$ in.
Length: $2\frac{1}{2}$ in.
Width: $3\frac{1}{4}$ in.

FREQUENCY

38.01Mc/s—42.15Mc/s

Note: Only the Data Summary will be published on this equipment.

Issue 1, 14 Jul. 1949

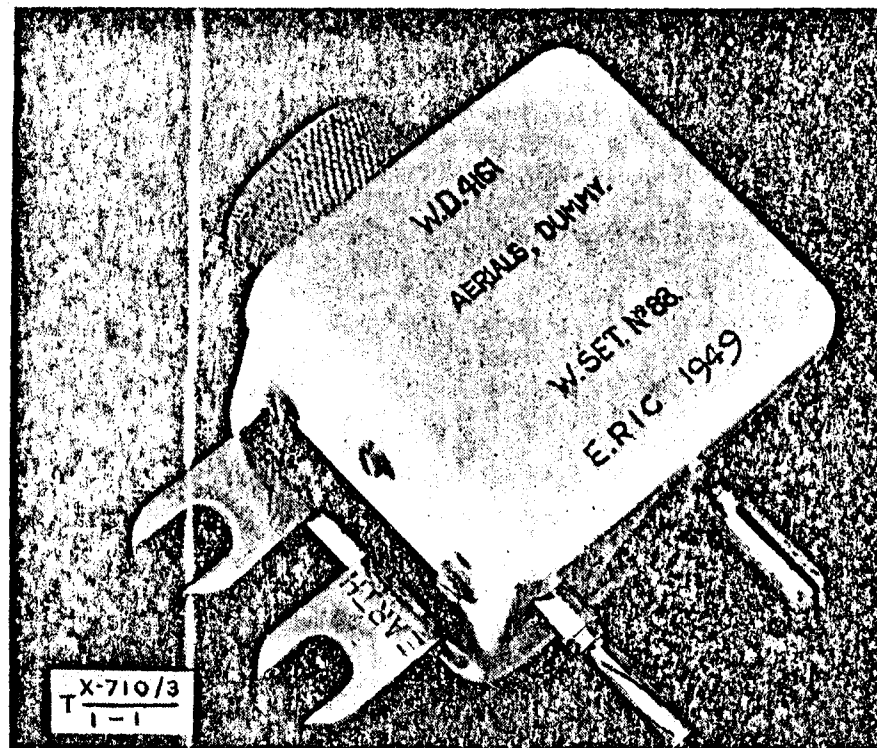


Fig. 1—General view of equipment

SARBE BEACON MK III
TECHNICAL HANDBOOK - DATA SUMMARY

NOMENCLATURE

Designation: Transmitter-receiver, radio Mk3 3B etc
Part Numbers: Z1/5825-99-952-6842 Mk 3 243 Mc/s
(Yellow body)
Z1/5825-99-104-9000 Mk 3B 240.3 Mc/s
(Black spot on olive-drab body)
Z1/5825-99-104-9001 Mk 3C 241.8 Mc/s
(Red spot on olive-drab body)

Z1/5825-99-104-9002 Mk 3D 244.3 Mc/s
(Blue spot on olive-drab body)
Z1/5825-99-104-9003 Mk 3E 246.8 Mc/s
(Yellow spot on olive-drab body)

Other Marks operating on slightly
different frequencies may also be
introduced.

WARNING

When the antenna release toggle is pulled, the speech unit must be held with the microphone facing the user and the antenna cover on the right otherwise the antenna, when uncoiling may injure the user. The toggle should not be operated unnecessarily, since excessive use will damage the antenna. When possible the antenna should be allowed to uncoil gradually.

RCLE

Designed primarily as a portable homing beacon, the equipment can also transmit or receive speech. The Mk 3 operating on the distress frequency of 243Mc/s, is used by the Army Air Corps. The other marks are used by army patrols.

DESCRIPTION

The SARBE (Search and Rescue Beacon Equipment) is a miniature transistorized equipment consisting of a transmitter-receiver, a speech unit and a battery. All three are sealed with epoxy resin and are interconnected by a tough rubber cable; a waterproof plug and socket allows disconnection for testing and battery replacement. A short flexible antenna attached to the speech unit is normally coiled inside a removable cover. Withdrawal of a pin jettisons the cover allowing the antenna to erect itself and also operating a microswitch which brings the pulsed m.c.w. homing beacon into operation. Additional switches on the transmitter-receiver allow transmission or reception of a.m. speech.

PHYSICAL DATA

	<i>Dimensions</i>	<i>Weight</i>
Transmitter - receiver unit	4.7/8 in. x 3.1/2 in. x 1.1/4 in.	} 27.1/2 oz. (including cable)
Speech unit	5.7/8 in. x 2.7/8 in. x 1.7/32 in.	
Battery	5 in. x 2.7/16 in. x 1.3/16 in.	23 oz.
Cable (battery)	38 in.	

CLIMATIC RANGE

DEF 133 Table A2

MIL-E-5272 (ASG)

TRANSPORTATION DATA

Air transport-ability:

May be ejected from aircraft at altitudes up to 70,000 ft.

Waterproofing:

May be immersed to a depth of 30 ft.

PERFORMANCE

Range over sea: Beacon - more than 60 nautical miles
to aircraft at 10,000 ft.
R/T - more than 10 nautical miles
ground-to-air, or line-of-
sight ground-to-ground.

ELECTRICAL DATA

Modulation:

Beacon:	Pulsed m.c.w. at 1020c/s \pm 250c/s:-	
	<i>Pulse duration</i>	<i>Interval</i>
A coding:	0.5 to 0.8 sec	2.0 to 3.5 sec
D coding:	0.7 to 1.0 sec	1.0 to 1.7 sec

R/T A.M.

Carrier frequency:

The four crystal-controlled frequencies for Army use are:-

240.3Mc/s - Mark 3B	241.8Mc/s - Mark 3C
244.3Mc/s - Mark 3D	246.8Mc/s - Mark 3E

Transmitter output:

Beacon:	400mW peak
R/T:	50mW carrier (100% mod capability)

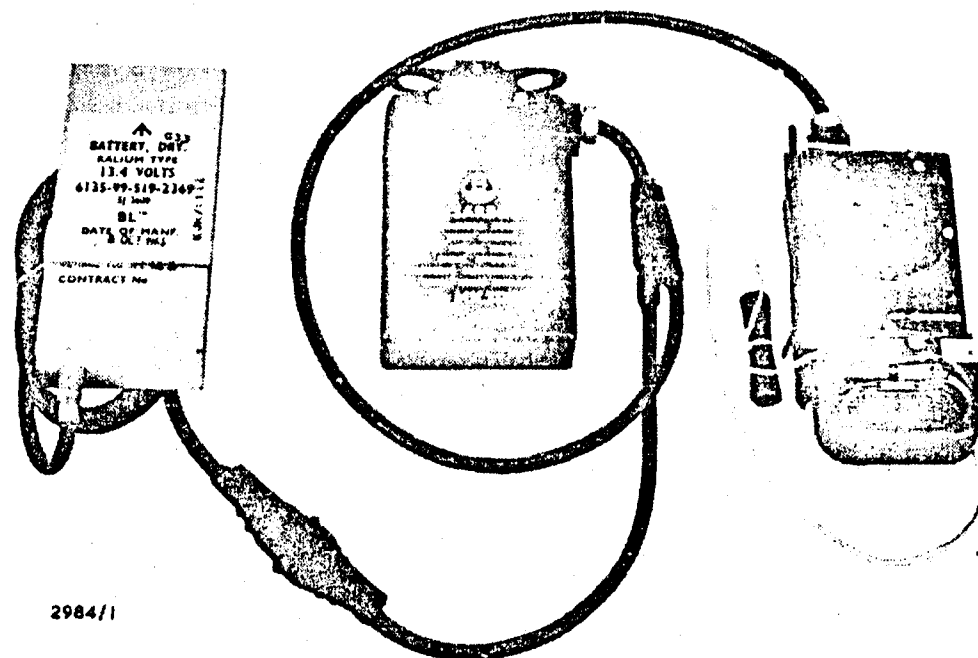


Fig 1 - Complete equipment

Receiver-Sensitivity:

Better than $20\mu V$ for 25mW output, with 80% modulation at 1kc/s.

POWER SUPPLY

Battery dry, Kalium type, 13.4V (Y3/6135-99-519-2369)

Stored life: 6 months (tropical) or 12 months (temperate)

Operating life: more than 48 hr at temperatures above $4^{\circ}C$ when used as a beacon; proportionately less time at lower temperatures or when used for R/T.

ASSOCIATED TEST EQUIPMENT (special to type)

- (a) Test, box, SARBE
- (b) Dummy load, electrical
- (c) Attenuator fixed
- (d) Coaxial T adaptor

- (e) Connector, coaxial, Cannon type (female) to BNC (male) (for use with Signal Generator No 15 Mk 1) OR
- (f) Connector coaxial N type (female) to BNC (male) (for use with Signal Generator CT394A)
- (g) Adaptor, leak testing.

MAINTENANCE

Unit repair limited to battery check and a performance check using identical SARBE sets with item (a) above.

Field repair limited to replacement of antenna, seal testing, and a more thorough performance test involving items (b) to (f) above and on standard test equipment.

ASSOCIATED PUBLICATIONS

Repair and Test information in EMER Tels B 044. Technical description, diagrams etc in manufacturers handbook - Burndept Electronics Ltd., SARBE, Transmitter-Receiver BE310.

EME 8c/3022/Tels

END

CARRIER, FREQUENCY SHIFT, RADIO LINK (INITIAL TYPE)

DATA SUMMARY

PURPOSE

A static wireless equipment used in L. of C. areas as one terminal of a medium-range wireless telegraph (teleprinter) link. Provides one duplex channel over a radio link, working on the frequency-shift principle which may be extended by land line to the telegraph equipment situated in the signal office.

DESCRIPTION

The equipment consists essentially of:—

- (a) Wireless sender equipment.
- (b) Dual space-diversity wireless receiving equipment.
- (c) Telegraph equipment.

These groups of equipment will, in general, be situated some miles apart from each other and interconnected by lines.

At the sender station, incoming telegraph signals from line are used to key the wireless sender, operating on the frequency-shift principle so

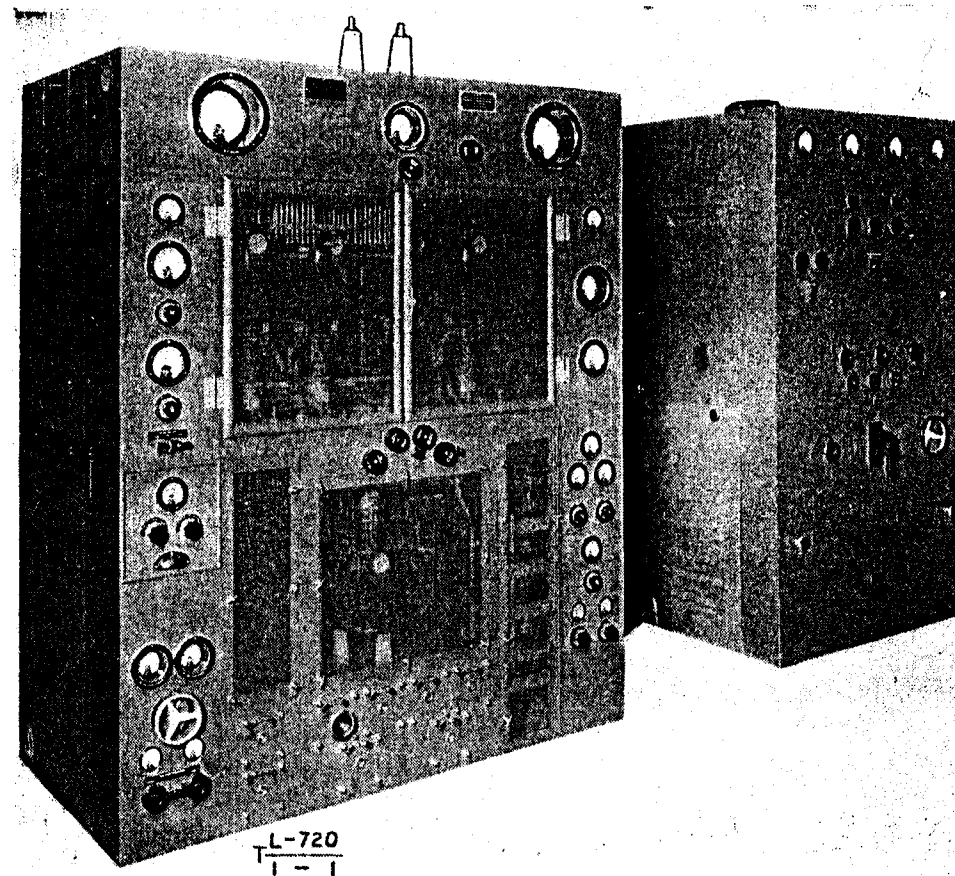
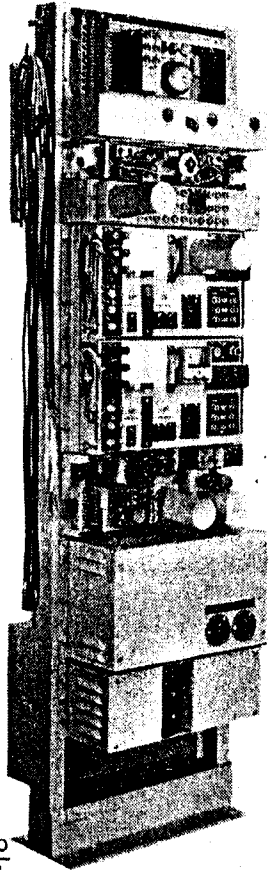


Fig. 1. Sender SWBII



that it radiates a certain frequency when mark signals are received from line and a frequency slightly lower (by approximately 950c/s) when space is received from line. The allotted frequency for the radio link is the arithmetic mean of these two radiated frequencies. At the receiving end of the link, the signals are picked up by two receivers working in space diversity, each of which converts the two transmitted radio frequencies into two audio tones differing by the frequency shift, as defined by the sender. The audio tones from each receiver are passed into two tone telegraph detectors which are connected in diversity to provide double-current telegraph signals to operate the receiving telegraph equipment.

EQUIPMENT

The station consists of:—

- 1 Wireless sender SWB8 or 11
(Tels. D 740 or D 750)
- 1 Keying unit, carrier frequency shift,
No. 1 or No. 2
(for keying the sender)

- 4 Reception sets AR88D (Tels. GY 620)
- 1 Equipment, signalling, carrier shift, No. 1 (Tels U 230/4)
- 1 Teleprinter 7B (Tels. T 240/1)
- 1 Equipment table DTN200 (Tels. T 250/7)
(For monitoring the received signals)

FREQUENCY

Sender: }
Receiver: } 3 to 22Mc/s
Shift: 950c/s

RANGE

Using SWB8 sender: Up to 1,500 miles } dependent on aerial
Using SWB11E sender: Up to 4,000 miles } design, frequency, etc.

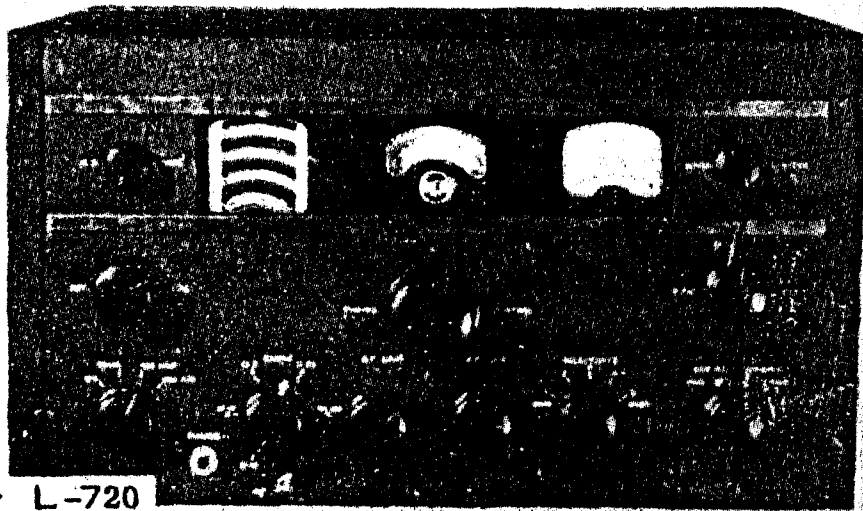
POWER SUPPLIES

The power supplies required depend upon the equipment in use:—

- 1 Sender SWB8 (including keying unit): 440V, 50c/s, 3-phase A.C. mains, 10kW

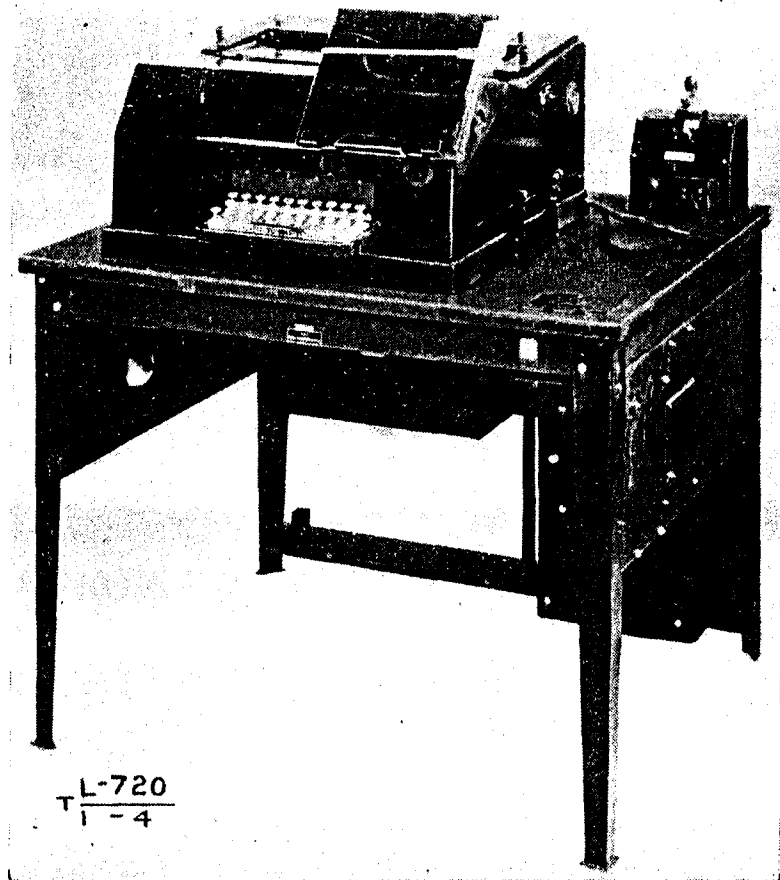
Fig. 2—Equipment, signalling, carrier shift, No. 1

- I Sender SWB11 (including keying unit): 440V, 50c/s, 3-phase A.C. mains, 26kW
- I Equipment, signalling, carrier shift: 100-250V, 50c/s, single-phase A.C. mains, 150W
- I Receiver AR88: 100-250V, 50c/s, single-phase A.C. mains, 70W
- I Monitor teleprinter set
(including Teleprinter 7B and DTN 2000 table): 200-250V, 50c/s, single-phase A.C. mains, 350W



T $\frac{L-720}{1-3}$

Fig. 3—Reception set AR88



T $\frac{L-720}{1-4}$

Fig. 4—Equipment table DTN2000

AERIAL SYSTEM

The normal transmitting array consists of one 600Ω rhombic aerial. The normal receiving array consists of two rhombic aerials working in space diversity.

LINE SYSTEM

Two-wire with earth return, 80-0-80V, telegraph circuits between the send telegraph equipment and the wireless sender and between the wireless receiver equipment and the receive telegraph equipment.

END

CALIBRATOR, CRYSTAL, NO. 7

DATA SUMMARY

Note: This information is provisional and is supplied for guidance pending the issue of more complete instructions. All errors of a technical nature should be notified in accordance with Tels. A 009.

PURPOSE

To provide signals at 1Mc/s, 100kc/s or 10 kc/s intervals for the calibration of receivers, oscillators, etc.

DESCRIPTION

Consists of a crystal oscillator, 100kc/s and 10kc/s multi-vibrators (these latter are switched according to output frequencies required) and a mixer-modulator valve. It is mounted in a composition box, battery leads being led out from the back.

PHYSICAL DATA

Weight: 9 lb.
Height: 7½ in.
Length: 12 in.
Depth: 9 in.

OUTPUTS

- (a) R. F. signals at calibrator terminals (one side earthed) at 1mc/s, 100kc/s or 10kc/s intervals, unmodulated or with 400c/s modulation.
- (b) Headphones to give audio beat notes between crystal calibrator signals and R. F. signals applied to calibrator terminals.

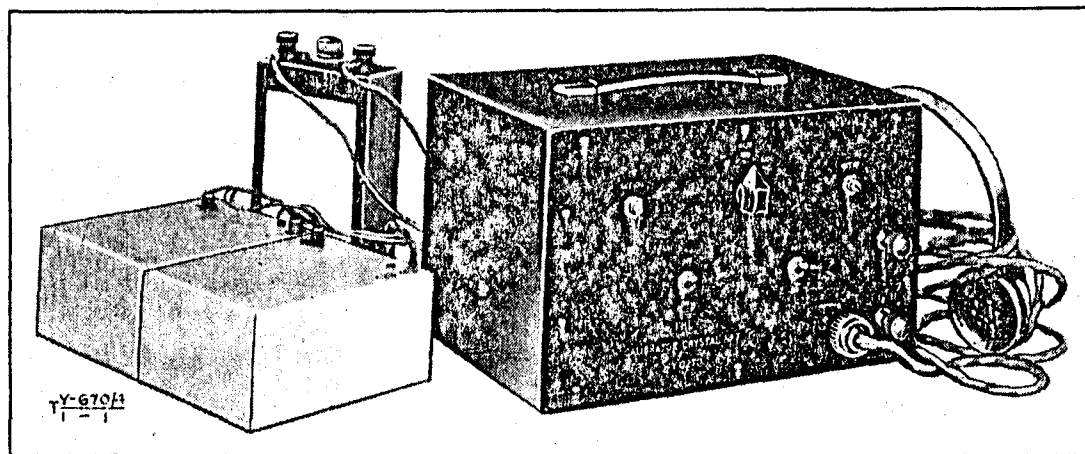


Fig. 1—General view of equipment

~~4-670,4~~ 2630

POWER REQUIREMENTS AND CONSUMPTION

L. T.: 2V, 0.7A max.

H. T.: 120V, 15mA max.

VALVES

VIA-E: HL2 or LD210 or VR21 (CV 1021)

V2A: P2 (CV 1246)

END

SIGNAL GENERATOR NO. 1, Mks. 1 (WY 0063), 2 (WY 0062) and 2* (WY 0268)

DATA SUMMARY

PURPOSE

To provide an R.F. signal of constant amplitude to an internal accurately calibrated variable attenuator. The output from the attenuator is used in measuring the performance of telecommunications equipment.

DESCRIPTION

A R.F. oscillator provides a C.W. signal, variable in frequency over a wide range. The output is adjusted during operation to IV R.M.S., by means of a thermocouple monitor, and fed to the variable attenuator, from which any output from $1\mu\text{V}$ to IV may be taken. A modulator stage allows of internal amplitude modulation at an audio frequency to a known variable depth, if required. Provision is also made for the application of external modulation, either direct or amplified.

PHYSICAL DATA

Weight : 78 lb.
Height : 12½ in.
Length : 29½ in.
Width : 10 in. } over projections.

FREQUENCY

R.F. : 85kc/s in eight ranges.
Internal modulation : 400 c/s.

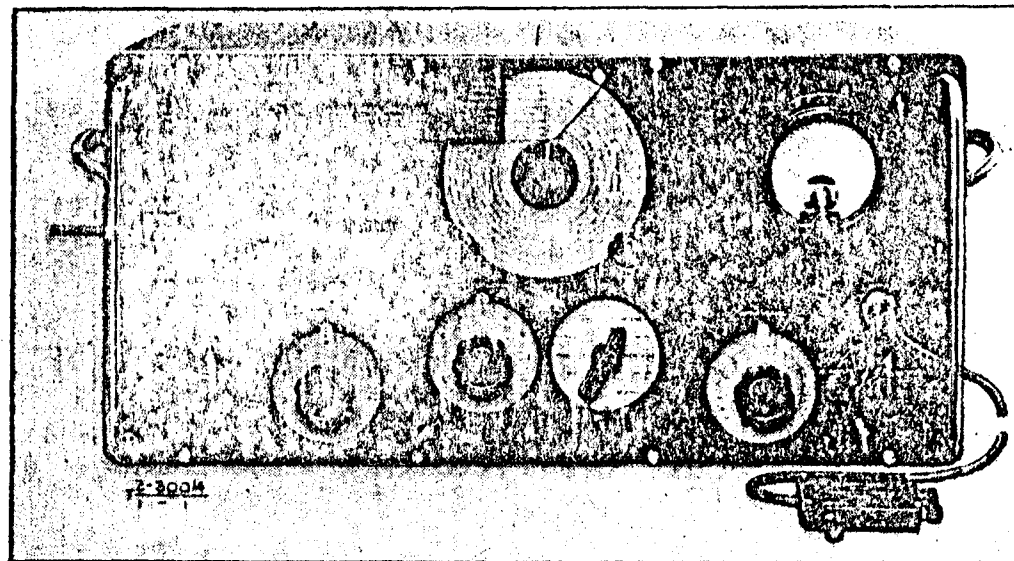


Fig. 1—General view

~~Z-300/4~~ Z 380**PERFORMANCE**Output is continuously variable from $1\mu\text{V}$ to 1V .R.F. accuracy : Below 4.5 Mc/s $\pm 5\%$ $\pm 0.2\mu\text{V}$ 4.5 to 15 Mc/s $\pm 10\%$ $\pm 0.3\mu\text{V}$ 15 to 25 Mc/s $\pm 20\%$ $\pm 0.5\mu\text{V}$ Modulation : depth 0 to 75%. Accuracy $\pm 5\%$.Output impedance (Mk. 1) : 1 to $10\mu\text{V}$: 10Ω 10 to $100\mu\text{V}$: 15Ω $100\mu\text{V}$ to 1V : 52.5Ω Output impedance (Mks. 2 and 2*) : 1 to $100\mu\text{V}$: 10Ω $100\mu\text{V}$ to 1V : 52.5Ω **POWER REQUIREMENTS AND CONSUMPTION**

Mains or battery supply may be used.

Mains : 200 to 250V, 40 to 100 c/s, A.C. Consumption : 40W.

Battery : H.T., 200V at 30mA.

L.T., 4V at 3.5A.

OUTPUT TERMINATION

The output is taken via a screened coaxial cable terminating in a dummy aerial, which may be put in or out of circuit. The minimum external impedance should be not less than 200Ω for outputs of $1\mu\text{V}$ to 100mV , and not less than $1\text{k}\Omega$ for outputs of 100mV to 1V .

VALVES

	Mks. 1 and 2	Mk. 2*
R.F. oscillator	AC/P	ML4
A.F. oscillator	AC/P	ML4
A.F. amplifier	AC/P	ML4
F.W. rectifier	AU3A (UU5 or MUI2 14)	

END

OSCILLOSCOPE, TYPE 13A

TECHNICAL HANDBOOK - DATA SUMMARY

PURPOSE

A general purpose twin-beam cathode-ray oscilloscope and monitor. It is fully tropicalized.

DESCRIPTION

The cathode-ray tube employed is electrostatically focused and deflected. Its screen is of the green trace short afterglow type and has an effective diameter of $4\frac{1}{2}$ inches. Either beam will display on a time axis, a graphical representation of a variation of a voltage, or of any other physical quantity which can be reproduced as a voltage. The twin-beam facility enables two independent voltages to be displayed simultaneously on the same time scale. The time-base is linear and can be synchronized to the input waveforms. When free-running it can operate at recurrence frequencies from 2c/s to 750kc/s. The velocity is high enough at the top of the range for waveforms having recurrence frequencies up to 10Mc/s to be investigated. In addition, calibration markers at intervals of $1\mu\text{S}$ or of $10\mu\text{S}$ may be applied to both traces independently of the work voltages; the vertical deflection may be calibrated in terms of voltage so that with the aid of

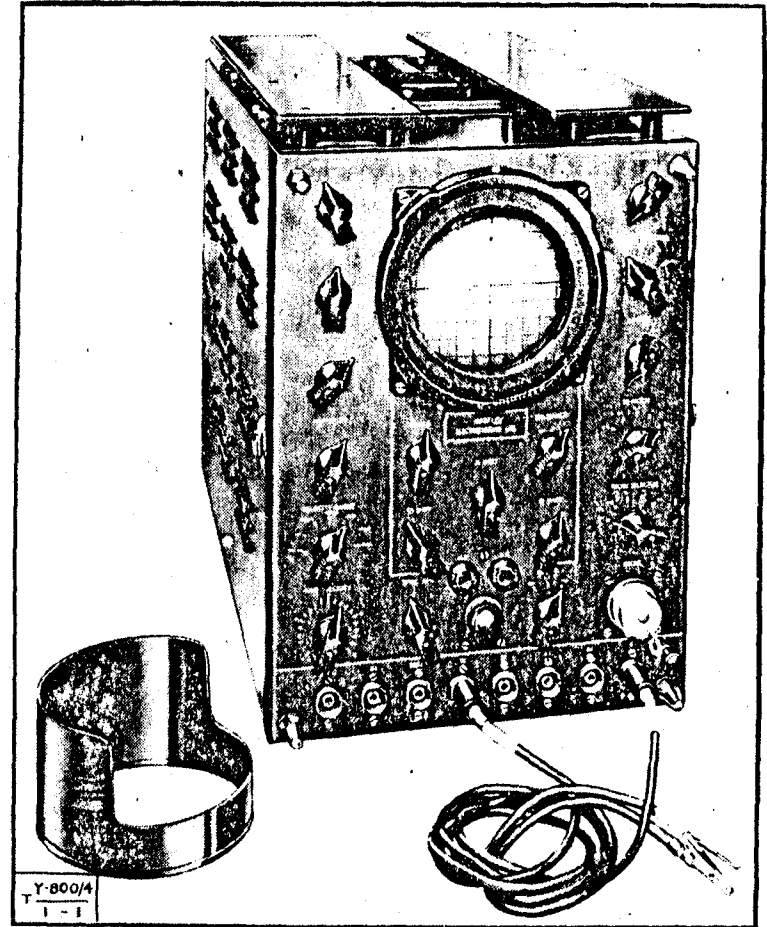


Fig 1: - Oscilloscope, Type 13A

TELECOMMUNICATIONS

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ELECTRICAL AND MECHANICAL ENGINEERING REGULATIONS

the millimeter graticule provided with the instrument, accurate quantitative measurements can be made. Alternatively the time-base may be triggered from either a positive or a negative waveform; it is then suitable for monitoring pulse waveforms from $1\mu\text{s}$ to several milliseconds in duration. This arrangement is also suitable for single-stroke operation for observation of transient or non-repetitive waveforms.

PHYSICAL DATA

Weight: 75 lb
 Height: 15 inches
 Length: 24 inches
 Width: 11 inches

These figures include a detachable front cover, carrying the accessories.

INPUT IMPEDANCE

Terminal	Capacitance	Resistance
Y1/Y2	80pF	$3.3\text{M}\Omega$
Cathode-follower probe	5pF	$5\text{M}\Omega$

AMPLIFIER GAIN AND FREQUENCY RESPONSE

Switch position	Gain	Bandwidth
A 1	27	80c/s to 2Mc/s
A 2	27	80c/s to 550kc/s
2 A 1	750	80c/s to 550kc/s
2 A 1 HF	60	9c/s to 5.5Mc/s
"	30	80c/s to 400kc/s

ATTENUATOR

The A.C. input to the T2 deflector plates can be attenuated by reduction ratios as follows: 1-to 1, 1 to 2, 1 to 4, 1 to 8, 1 to 16.

Maximum frequency response of attenuator - 100kc/s.

CALIBRATOR

This comprises a 100kc/s and a 1Mc/s Oscillator giving $10\mu\text{/sec}$ and $1\mu\text{/sec}$ markers.

VALVES

Cathode-ray tube: CV 1596

Valve reference	Function	Type
V 1	Trigger synch switching)	CV 1092
V 2	Trigger synch switching)	
V 3	Time-base driver	CV 1091
V 4	Time-base driver	CV 173
V 5	Time-base valve (Also X1 video amplifier in switch position X x 30)	CV 1091
V 6(a/b)	Calibration)	CV 1988
V 7(a/b)	Calibration)	
V 9	A 1 amplifier	CV 9
V 10	A 2 amplifier	CV 9
V 8	H.T. rectifier	CV 378
V 11	E.H.T. rectifier	CV 1120
V 12	Cathode-follower probe	CV 136

POWER REQUIREMENTS AND CONSUMPTION

115 or 230 volts, 50c/s A.C. supply.
 Consumption: 160 watts

TESTER, RELAY AND DISTORTION MEASUREMENT, PORTABLE, NO. 1

TECHNICAL HANDBOOK - DATA SUMMARY

PURPOSE

To carry out functional tests on double-current telegraph systems operating at 50 bauds.

DESCRIPTION

The tester provides a means of measuring percentage distortion of telegraph signals from line or from any normal telegraph transmitter. A facility also exists for transmitting telegraph reversals, or re-transmitting undistorted received signals, with any distortion from 0 to 100%. Carpenter type 3 or 5 relays may be tested for contact bias and adjusted.

PHYSICAL DATA

Weight: 40 lb
Height: 12½ in
Width: 9 in
Depth: 13½ in

SPEED OF WORKING

50 bauds, 7- or 7½- unit code

POWER REQUIREMENTS

100-130V or 200-260V A.C. 50c/s
Consumption approx 25 watts

VALVES

<i>Circuit reference</i>	<i>Type</i>	<i>Function</i>
V1	CV 511	Signal distorter
V2	CV 284	Stabiliser
V3	CV 284	Stabiliser

426

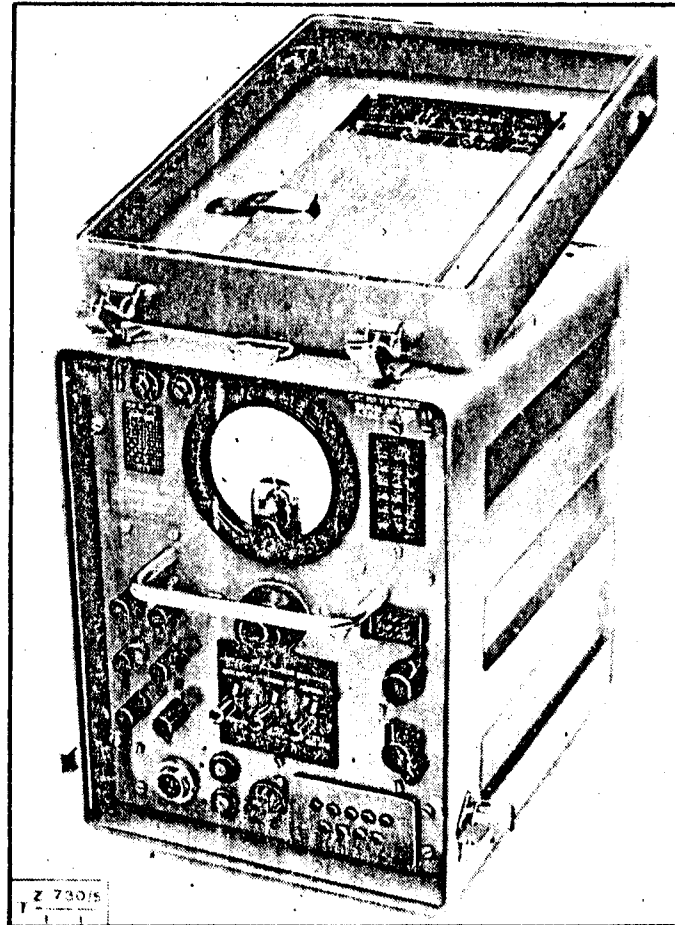


Fig 1 - General view
END

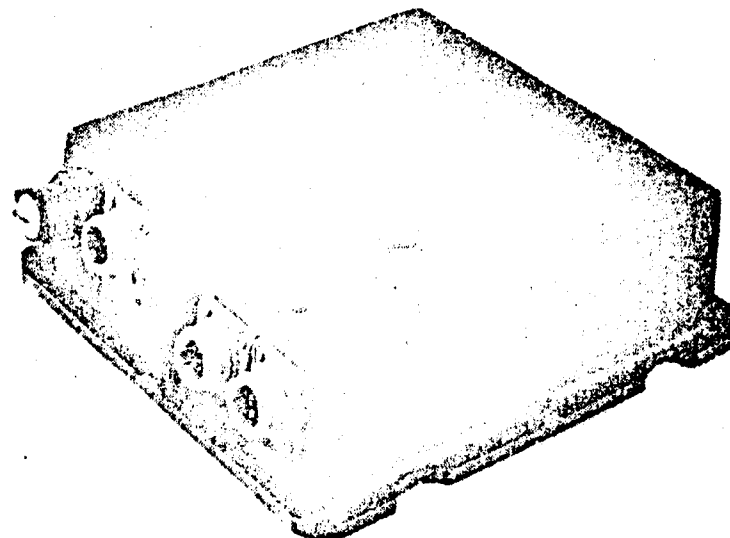
AMPLIFIER A.F. 2 WATT SEALED No. 1 12 VOLTS
AMPLIFIER A.F. 2 WATT SEALED No. 1 24 VOLTS
TECHNICAL HANDBOOK DATA SUMMARY

PURPOSE

To amplify the output of a wireless set or intercom to a sufficient level to drive a loudspeaker system. It is normally associated with the loader/operator's position in an A.F.V.

DESCRIPTION

A push-pull amplifier, supplied by either a 12 or 24 volt internal vibrator power unit, containing circuits compensating for the wide range of battery voltage from fully charged to discharged, under control of an external master relay. It is hermetically sealed and suitable for pan climatic use.



TC 200
1-1

TELECOMMUNICATIONS

C 400

ELECTRICAL AND MECHANICAL ENGINEERING REGULATIONS

PHYSICAL DATA (Both 12 and 24 volt types)

Weight 5 lb.
Height 9 in.
Width 9 in.
Depth 3.1/4 in.

PERFORMANCE

Power Output 2W for 7%
distortion with an input of
0.3V at 1000 c/s.

Frequency response 400c/s to 10kc/s
+1db

POWER REQUIREMENTS AND CONSUMPTION

12V nominal. Consumption 17W

24V nominal. Consumption 22W

Battery input voltage working
range 10.5-14.5 volts or 21-29 volts.

VALVES

CV136 Quantity two

ASSOCIATED EQUIPMENTS

Control unit No. 31.

Loudspeakers, P.M., 3.1/4 in.,
9 ohms, rubber housed. (A maximum
of 3 may be used connected in
parallel).

Receivers, headgear, S.I.,
double, No. 1A.

Microphones, hand, S.I.,
No. 1A.

Associated connectors.

RECORDING BRIDGE R.B .50

(ZA 15981)

DATA SUMMARY

PURPOSE

Used in L. of C. high-speed morse systems for operating undulator or reperforator from line or a receiver.

DESCRIPTION

Audio frequency morse signals are amplified, filtered and detected. D.C. pulses from detector are limited and smoothed by five D.C. amplifiers, and fed to mark and space valves. A.G.C. is provided. Bridge can be used with any receiver provided with a beat oscillator. Provision is also made for diversity reception with several receivers. Housed on metal chassis in a metal case. H.T. and L.T. terminals provided for supplying external apparatus.

PHYSICAL DATA

Weight : 50 lb.
Length : 15½ in.
Width : 9½ in.
Height : 12¾ in.

LINE SYSTEM

Input impedance : 600 or 5,000Ω.
Output impedance : 1,000 + 1,000Ω or 20 + 20Ω.

FREQUENCY

Coverage : Filter passes band, 500-2,000c/s.
Usual : 1,200c/s.

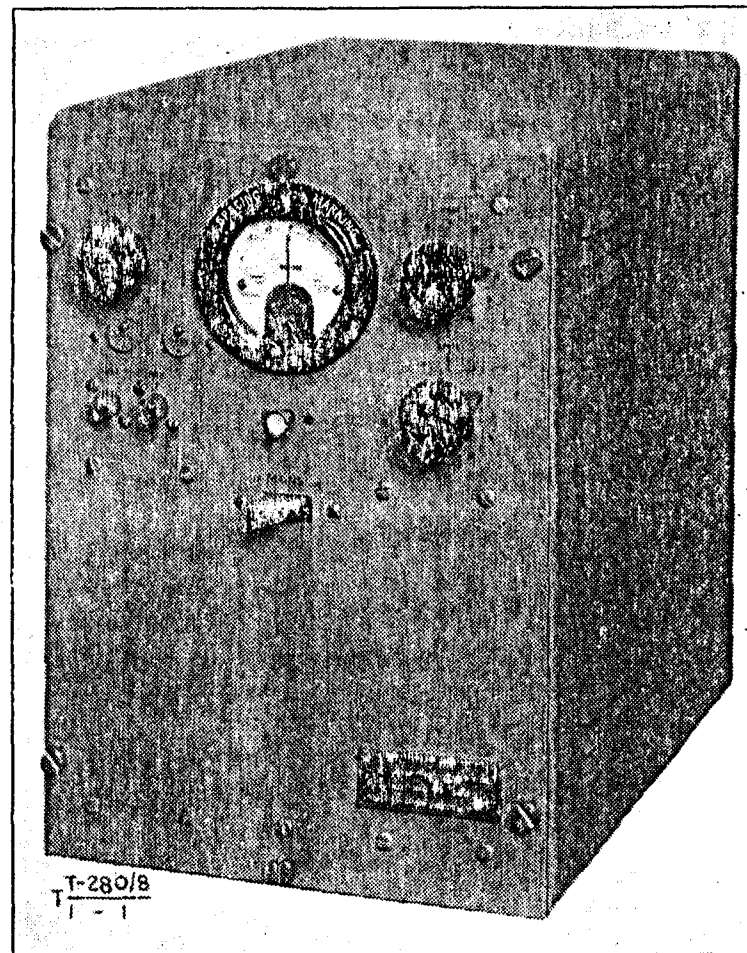


Fig. 1—General view of the equipment

PERFORMANCE

Sender output : 30mA.

Receiver sensitivity : Operates with signals down to 15db. referred to 1mW.

POWER REQUIREMENTS AND CONSUMPTION

Power supply : 200-250V A.C. mains.

External power supplies : 6.3V A.C. up to 4A.

120V. D.C. up to 10mA. 210V D.C. up to 50mA.

Power consumption : Normal, 95W ; diversity (using external power connections), 155W.

REMARKS

Used in the Golden Arrow, Mk. II, with Reception set CR 100/2 and Undulator UG.6A.

VALVES

<i>Circuit reference</i>	<i>Type</i>	<i>Function</i>
V1A	6J7G (ARP16)	A.F. amplifier
V3A	6H6G (ARDD3 or D63)	Detector and A.G.C.
V4A	ML6 (R.A.F.VT105)	Limiter
V4B	ML6 (R.A.F.VT105)	D.C. amplifier
V6A	6Q7G (DH63)	D.C. amplifier
V4C	ML6 (R.A.F.VT105)	Signal shaper
V4D	ML6 (R.A.F.VT105)	Signal shaper
V4E	ML6 (R.A.F.VT105)	Phase inverter
V4F	ML6 (R.A.F.VT105)	Mark valve
V4G	ML6 (R.A.F.VT105)	Space valve
V5A	5U4G (R.A.F.VU71A or U52)	Power rectifier
V5B	" " "	Power rectifier

END

TELESONIC EQUIPMENT

DATA SUMMARY

PURPOSE

Used for the control of bridging operations.

DESCRIPTION

A transmitter, consisting of two amplifiers and a push-pull output stage, feeds A.F. into a line loop. Signals are picked up by A.F. induction in pick-up coils, which feed receivers consisting of four-valve amplifiers. Pick-up coils may be up to 200 yd. from loop periphery. A set comprises one transmitter, six receivers, accessories and carrying case. The transmitter incorporates A.V.C. and emits a continuous calling note on pressing CALL button.

PHYSICAL DATA

	<i>Transmitter</i>	<i>Receiver</i>	<i>Case, carrying, filled</i>
Weight :	48 lb.	4 lb. 4 oz.	98 lb. 2 oz.
Length :	18 in.	6½ in.	34 in.
Width :	9 in.	2½ in.	17½ in.
Height :	12 in.	7½ in.	11 in.
Weight of cable drum :	48 lb.		

LINE SYSTEM

Loop line.

FREQUENCY

Coverage : Voice frequencies.

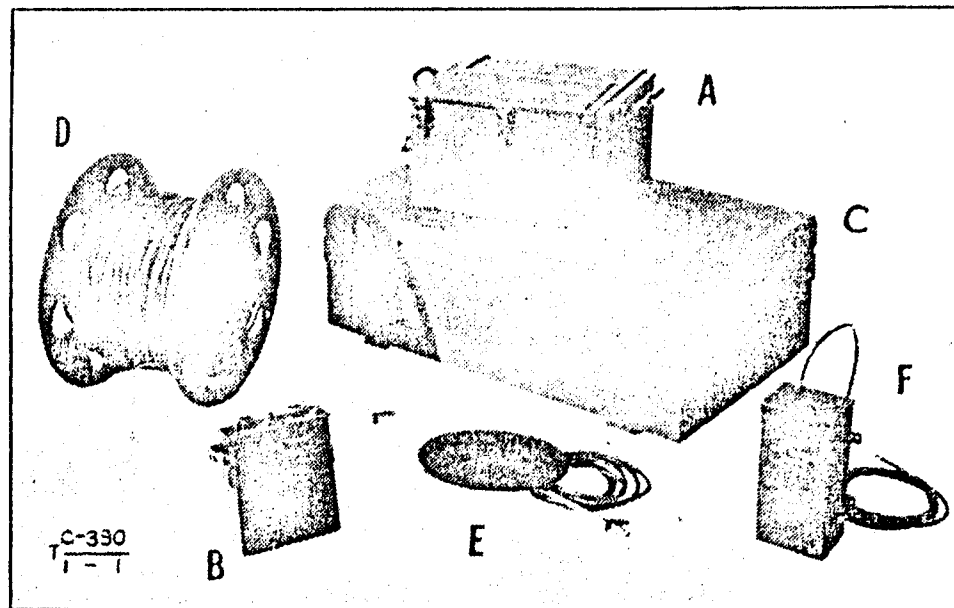


Fig. 1—A : Transmitter ; B : Receiver ; C : Case, carrying ; D : Cable ; E : Pick-up loops ; F : unit, suppressor

PERFORMANCE

Sender output: approx. $\frac{1}{4}$ W, requiring minimum input of 6mV from microphone.

Receiver sensitivity: 30μ V input from coil gives approx. 3mW output.

POWER REQUIREMENTS AND CONSUMPTION

Power supply: Transmitter: H.T., 180V dry battery with 120V and 60V tapplings. L.T., 3V dry battery.

Receiver: H.T., 45V dry battery. L.T., 3V dry battery.

Power consumption:—

Transmitter: H.T., 180V 22mA approx. L.T., 3V 0.6A.

Receiver: H.T., 45V 2 mA. L.T., 3V 0.18A.

VALVES

<i>Circuit reference</i>	<i>Type</i>	<i>Function</i>
Transmitter		
V1A	ARP 12	A.F. amplifier
V1B	ARP 12	A.F. amplifier
V2A and B	ATP 4	Push-pull output
Receiver		
V1A, B and C	X.H.15	A.F. amplifiers
V2A	X.P.15	Output

100% spares provided.

END

AMPLIFIER, I.T., NO. 1 (ZA 0327)

DATA SUMMARY

PURPOSE

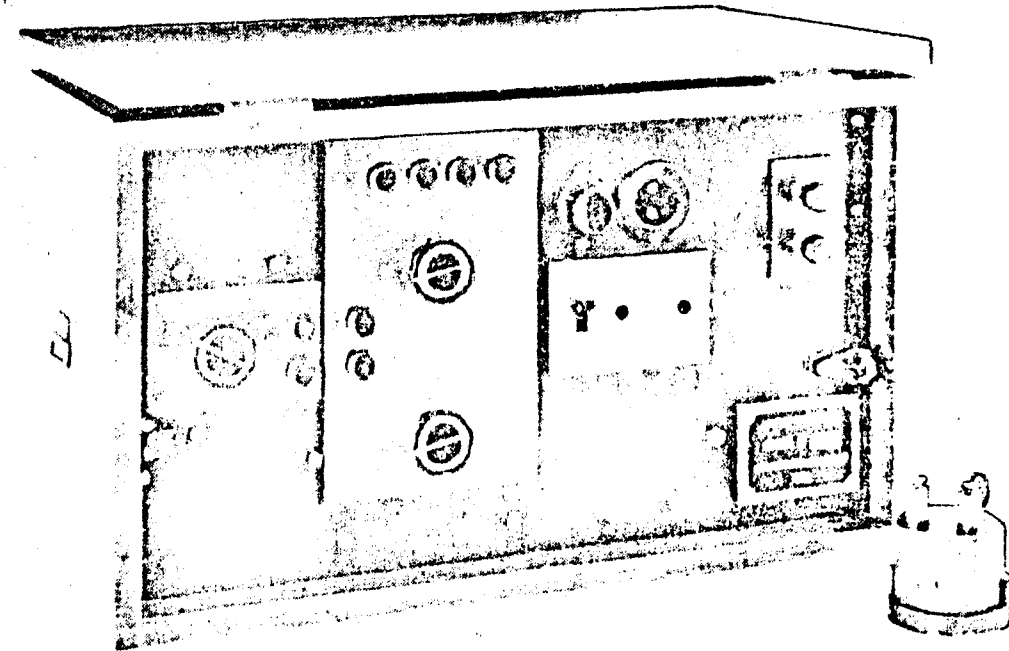
An audio-frequency amplifier, used primarily for intercepting telephone circuits without requiring electrical contact with them.

DESCRIPTION

The apparatus consists of a 2-valve high-gain amplifier, with variable input impedance, volume-control, and output to two headphone jacks. Four types of pick-up for interception are provided:—

- (a) In series, with a single wire earthed at each end.
- (b) In series, with a square loop of $\frac{1}{8}$ — $\frac{1}{4}$ mile sides.
- (c) Cross-shaped wires, with input via directional potentiometer (for direction-finding and avoiding interference).
- (d) Using Transformer, I.T., dipped over a telephone wire.

It can also be used as a microphone amplifier. The L.T. supply is obtained from dry batteries housed in the amplifier case, and the H.T. supply is external. An external L.T. supply may be used if more convenient.



T $\frac{C-350}{1-1}$

Fig. 1—General view of equipment

PHYSICAL DATA (Complete in case without batteries)

Weight: 21 lb. approx.

Height: 9 in.

Length: 15½ in.

Width: 9⅝ in.

LINE SYSTEM

Consists of an input transformer in series with pick-up wires, giving seven input impedances, from 38 to 2,400 ohms.

Output impedance is suitable for one or two pairs of C.L.R. headphones.

VALVES

Two valves are used, each CV1333 (ARPI4).

FREQUENCY

Coverage: 400c/s to 3,000c/s for maximum gain.

PERFORMANCE

Output: 1mW

Gain: about 90db.

Range: Depends on earth conditions, telephone circuits, amount and direction of interference, and whether buzzer, morse or telephony is used.

POWER REQUIREMENTS AND CONSUMPTION

Separate batteries are used for H.T. and L.T. power supplies.

H.T. consumption: 5mA (approx.).

L.T. consumption: 0.2A (approx.).

Batteries will give about 80 hours continuous working.

REMARKS—Associated equipment

The Transformer, I.T., is arranged with a split iron core which can be placed round a single telephone wire. The wire then becomes the primary of the transformer, and the secondary feeds induced signals to the Amplifier, I.T.

END

DECIBEL METER, PORTABLE, NO. 3
TECHNICAL HANDBOOK - DATA SUMMARY

PURPOSE

For making 'transmission' (terminated) or 'level' measurements on balanced and unbalanced telephone and telegraph circuits.

DESCRIPTION

A portable, waterproof, self-contained instrument of suitable size and shape for carrying in the battle-dress pocket. It incorporates resistance networks which may be switched to provide 4 ranges of power ratio measurement about a reference of 1mW into 600Ω . A second switch allows for the instrument being used on circuits of characteristic impedance 75Ω and 150Ω in addition to 600Ω .

PHYSICAL DETAILS

Length : $7\frac{1}{2}$ in.
Breadth: $4\frac{1}{2}$ in.
Depth : 2 in.
Weight:: 3 lb.

RANGES

1. - 15 to 0db.
2. - 5 to + 10db.
3. + 5 to + 20db.
4. + 15 to + 30db.

Issue 1, 21 Jul. 1951

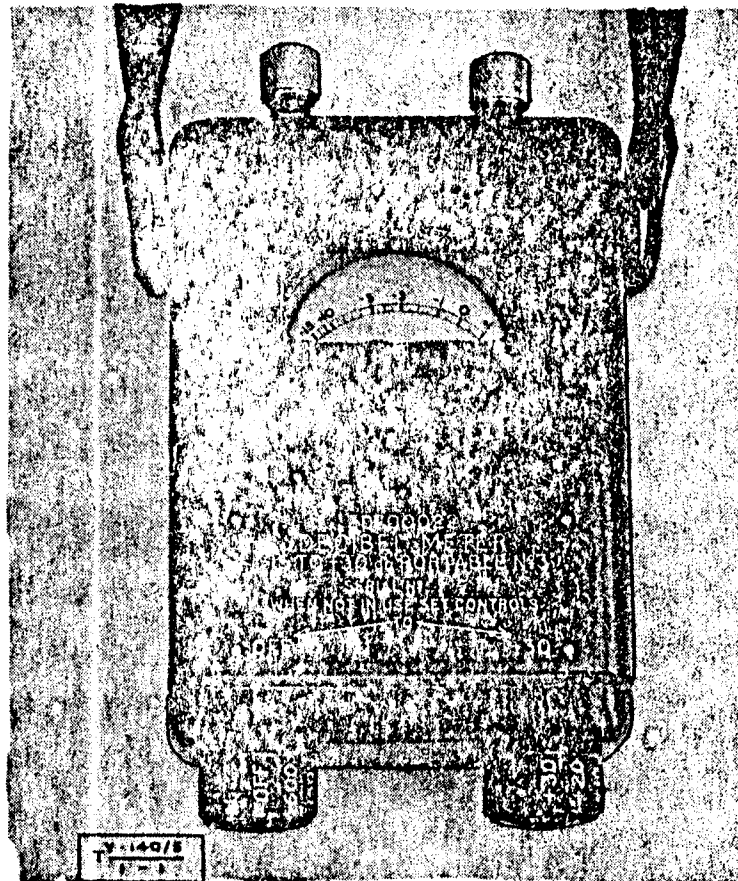


Fig. 1 - General view of equipment

TELECOMMUNICATIONS

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1070

INPUT IMPEDANCE

Balanced or unbalanced 75, 150 and 600Ω selected by a switch.

FREQUENCY CHARACTERISTIC

Level within $\pm \frac{1}{2}$ db. from 200c/s to 120kc/s.

ACCURACY

Within $\pm \frac{1}{2}$ db. at 20°C.

57/Maint./4606

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Within \pm 2db. between - 25°C. and + 45°C. at a level corresponding to 1mW into 600Ω.

PROTECTION

A cut-out is incorporated to protect the instrument from electrical overload.

ADDITIONAL FACILITIES

A webbing strap permits the instrument being carried slung round the neck when in use.

END

WATTMETER, ABSORPTION, A.F., NO.1

TECHNICAL HANDBOOK - DATA SUMMARY

Note: This issue, Pages 1 and 2 supersedes Pages 1 and 2, Issue 2, dated 4 Jan 52. It has been amended throughout.

PURPOSE

For the measurement of audio frequency power.

DESCRIPTION

A sealed, tropicalized instrument to measure power from a minimum of $10\mu W$ to a maximum of 6W in 10 ranges. A matching transformer providing eleven switched ranges permits the impedance of the source under test to be matched to the meter circuit.

PHYSICAL DATA

Height: 12 in.
Length: 8.1/4 in.
Depth: 7 in.
Weight: 11.1/4 lb (approx)

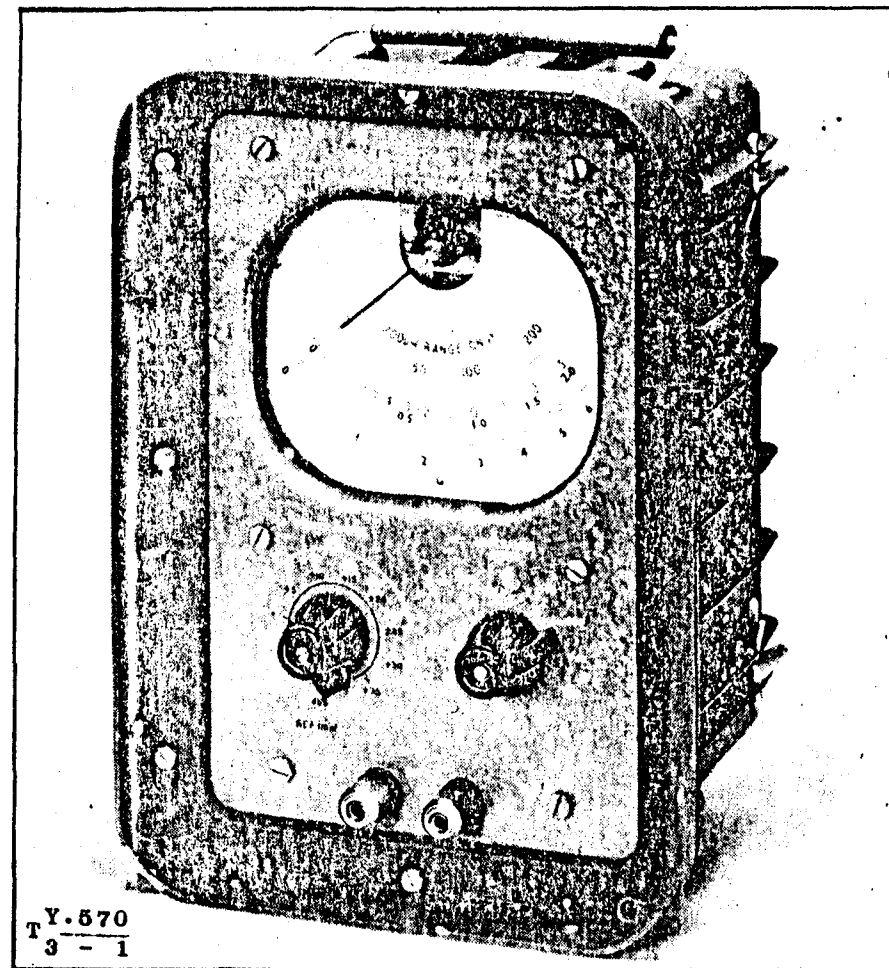


Fig 1 - General view

RANGES

Power measurement

Ten ranges as follows:-

0-200, 600 μ W
0-2, 6, 20, 60, 200, 600mW
0-2, 6W

Power ratio

-10db to +38db with respect to 1mW

Input impedance

2.5, 5, 10, 50, 100, 150, 300, 600
4000, 8000 and 20,000 Ω .

PERFORMANCE

Accuracy (At 1kc/s and 20 $^{\circ}$ C)

\pm 5% of reading from full-scale to half-scale and
 \pm 2.1/2% of f.s.d from half-scale to 10% of f.s.d on
all impedance ranges and power levels above 200 μ W.
On the 200 μ W range, \pm 10 μ W.

Frequency characteristic

\pm 1db from 100c/s to 10kc/s }
 \pm 2db from 50c/s to 20kc/s } With reference to 1kc/s

57/Maint/3685

Temperature characteristic

\pm 5% of f.s.d in the range +15 $^{\circ}$ C to +40 $^{\circ}$ C rising to
 \pm 30% of f.s.d in the range -10 $^{\circ}$ C to +55 $^{\circ}$ C

INPUT IMPEDANCE

On all impedances of 50 Ω and above \pm 3% of nominal.
On the 2.5 to 10 Ω ranges within \pm 5% of nominal.

PART NUMBER

Instrument: ZD 00661

REMARKS

The instrument may be stored at -40 $^{\circ}$ C but not operated
until it has recovered to -10 $^{\circ}$ C.

END

FREQUENCY METER SCR-211

DATA SUMMARY

PURPOSE

A portable heterodyne frequency meter for calibrating senders and receivers in the field.

DESCRIPTION

There are ten important basically different models of this frequency meter, but each of them comprises:—

- (a) A crystal oscillator and detector.
- (b) A variable-frequency oscillator.
- (c) An audio-frequency amplifier.

They differ in the mechanical arrangement of the cabinets and controls, as well as in the valves and their associated circuits. The sets are normally battery-operated but can be modified for mains operation by using Power supply unit No. 29.

PHYSICAL DATA

Weight: 40 lb. approx.
Length: 9½ in.
Height: 14 in.
Width: 10½ in.

FREQUENCY

Coverage: 125—20,000kc/s
Internal: 1,000kc/s crystal
125—250kc/s or 2,000—4,000kc/s V.F.O.

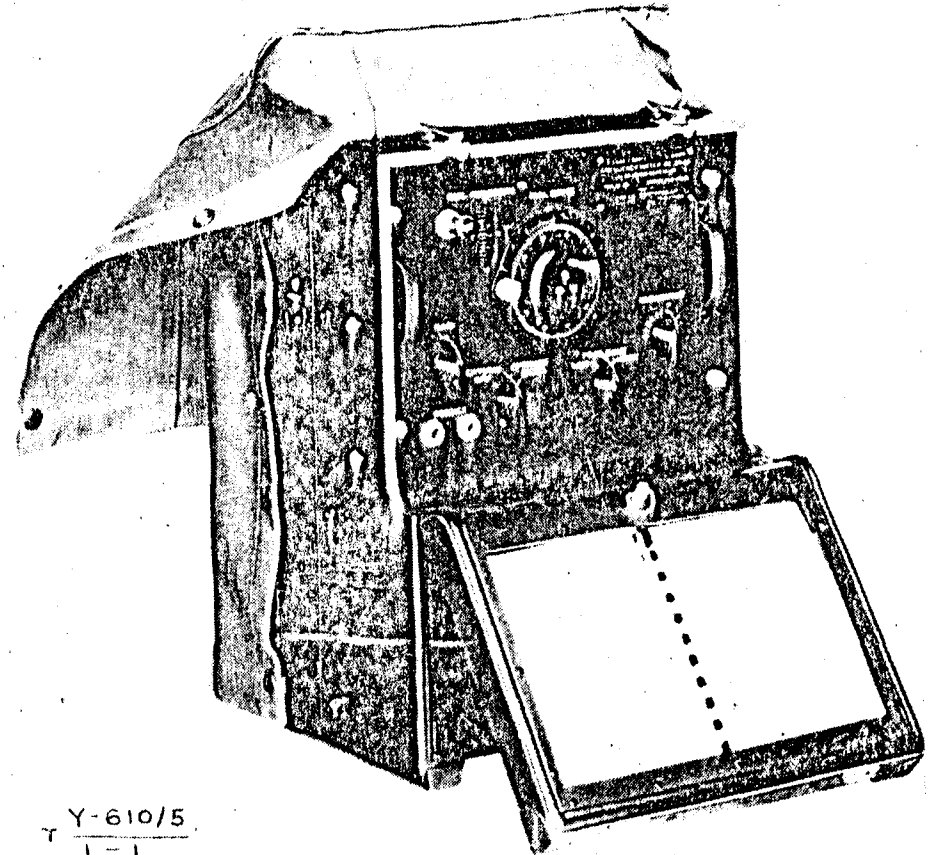


Fig. 1—General view of equipment

VALVES

Models	Crystal oscillator and detector			Variable-frequency oscillator			A.F. amplifier		
	C.V. No.	U.S. No.	Comm. No.	C.V. No.	U.S. No.	Comm. No.	C.V. No.	U.S. No.	Comm. No.
A, C, D	1870	—	6A7	616	VT-77	77	615	VT-76	76
B, N, Q, AA, AE, AG, AK	1945	VT-167	6K8	591	VT-116	6SJ7	591	VT-116	6SJ7
E	883	VT-208	7B8	1777	VT-193	7C7	1770	VT-192	7A4
F, J, K, L	1870	—	6A7	866	VT-116B	6SJ7Y	615	VT-76	76
M, O, P, R, T, AC, AF, AH, AJ, AL } }	1945	VT-167	6K8	866	VT-116B	6SJ7Y	591	VT-116	6SJ7

ACCURACY

125—250kc/s: 180c/s

2,000kc/s: 985c/s

4,000kc/s: 1,355c/s

In actual practice, the average errors are no greater than 50 per cent. of the above figures.

POWER REQUIREMENTS AND CONSUMPTION

Six Batteries BA-2 (22.5V each);
maximum consumption is 18mA at 135V.

Four Batteries BA-23 (1.5V each);
maximum consumption is 0.92A at 6V.

Using P.S.U. No. 29;
maximum consumption is 35mA at 230V.

END

CALIBRATOR, CRYSTAL, NO. 10

DATA SUMMARY

PURPOSE

Setting up a W.S.62 accurately on a particular frequency.

DESCRIPTION

Contains a 500kc/s crystal-controlled oscillator giving harmonics at 500kc/s intervals, and a variable 250-500kc/s interpolating oscillator.

PHYSICAL DATA

Housed in a metal case and fully tropicalized.

Weight: 5lb.
Height: 7½in.
Depth: 4in.
Width: 7in.

REMARKS

Part of the W.S.62 station.

Issue 1, 26 May 1947

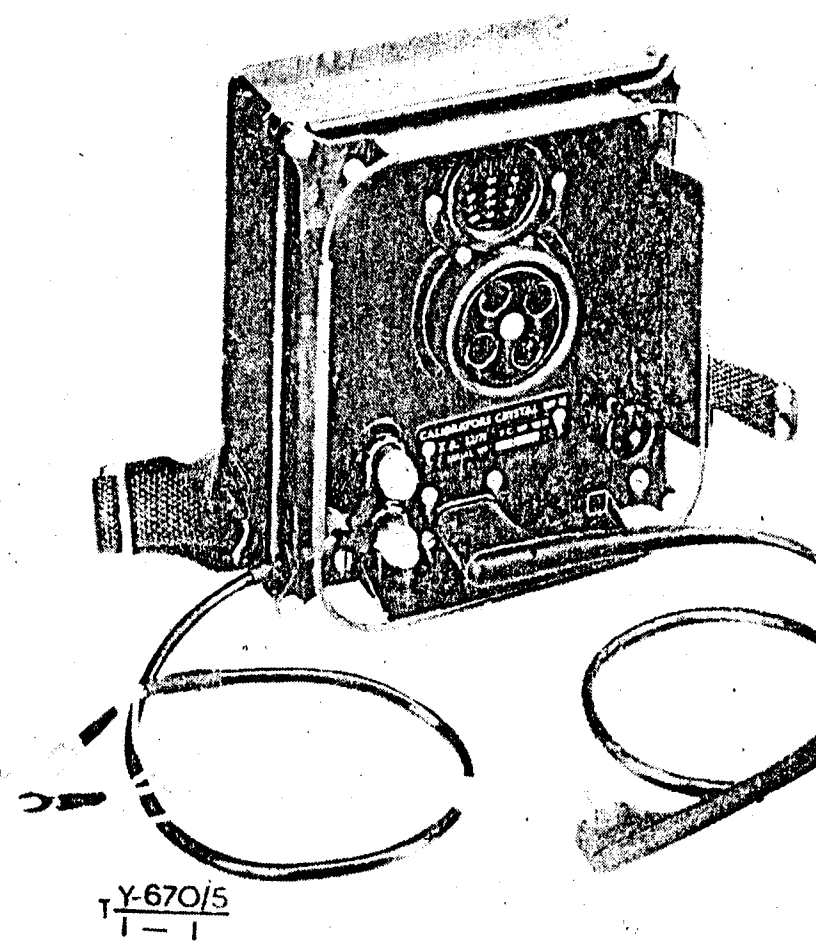


Fig. 1 - General view of equipment

TELECOMMUNICATIONS

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ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS

FREQUENCY

Continuous coverage; 1.5 to 30Mc/s.

Accuracy better than 0.05%.

OUTPUT

To aerial terminal of W.S.62: 1 to 2 μ V.

POWER REQUIREMENTS

12V and 300V from a special socket on the W.S.62.

Consumption: L.T. : 0.3A

H.T. : (Switched to 500kc/s) - 10mA
(Switched to DIAL) - 15mA

VALVES

V1	CV 286	
V2	CV 785	(1T4)
V3	CV 782	(1R5)
V4	CV 785	(1T4)

END

WAVEMETER, CLASS D, NO. 2

TECHNICAL HANDBOOK - DATA SUMMARY

Note: This issue, supersedes Page 1 of Issue 1, dated 14 Jul. 1945. It has been amended.

PURPOSE

For checking calibration of receivers and senders, and for measuring the frequency of a received signal.

DESCRIPTION

- (a) Absorption wavemeter, with magic eye indication.
- (b) Heterodyne wavemeter, with calibration referred to internal crystal oscillator.

PHYSICAL DATA

Weight : 55 lb.
Height : 12½ in.
Length : 12¼ in.
Breadth: 19½ in.

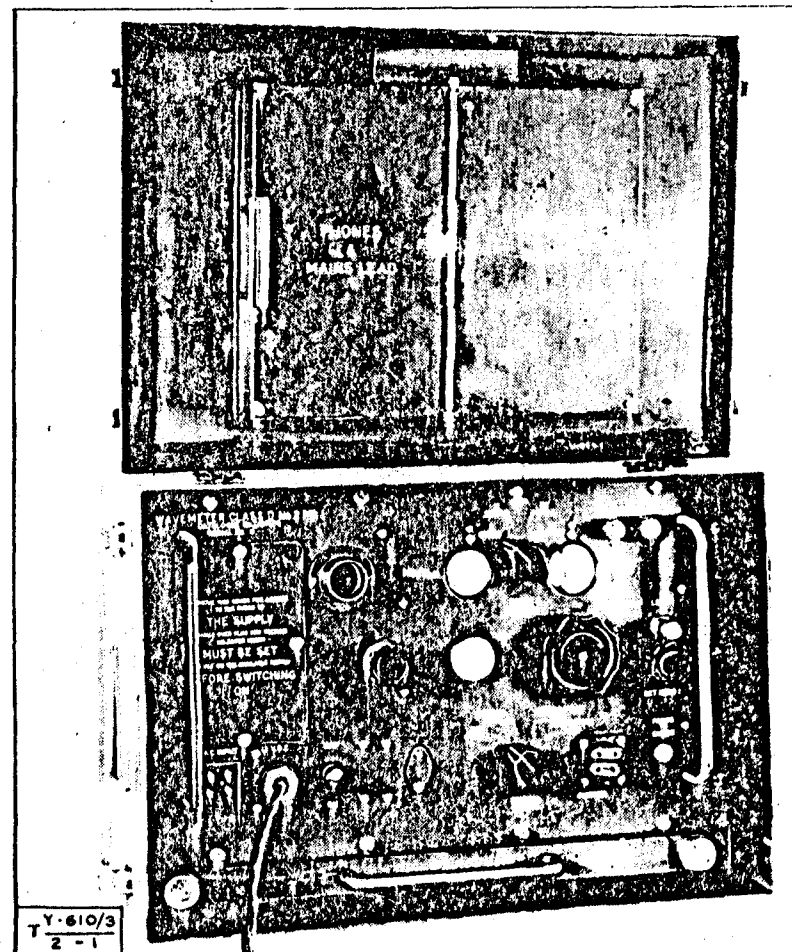


Fig. 1 - General view of equipment

~~Y 510/8~~ 2180

FREQUENCY

Coverage: 1.2 to 19.2Mc/s in four bands

Internal: 100kc/s crystal)
1.8 - 1.9Mc/s) Oscillators overmodulated
1.2 - 2.4Mc/s) to give harmonics

ACCURACY

(a) As heterodyne wavemeter

Range 1 ± 200c/s
Range 2 ± 400c/s
Range 3 ± 800c/s
Range 4 ± 1,600c/s

(b) As absorption wavemeter ± 4%

M.E. 8/114

POWER REQUIREMENTS AND CONSUMPTION

12V D.C. or 100-250V A.C., 40-60c/s

Consumption at 230V: 75VA
at 12V: 2.8A

VALVES

ARTH2	...	...	...	...	3
CV 51	...	...	...	...	1
6X5G	...	...	...	...	1
Vibrator 850	...	...	...	...	1

END

PRINTING REPERFORATORS NOS. 1 AND 2 DATA SUMMARY

§ 230

PURPOSE

The Printing reperforator No. 1 can be used either as:—

- (a) A keyboard reperforator producing a message in 5-unit code on chadless (semi-perforated) tape, at the same time printing a message on the same tape. The maximum speed of typing is 66 words per minute.
- (b) A keyboard transmitter performing a similar function to the sending half of the teleprinter, or
- (c) A receiving reperforator recording the signals received in 5-unit code on chadless tape and at the same time printing a message on the same tape.

DESCRIPTION

Basically the model 1 is the Teleprinter No. 7B but the paper carriage is replaced by a perforator unit and deep wheel, whilst other minor alterations have also been made. An orientation device is fitted allowing the time between the start signal and the instance of selection to be varied.

The model No. 2 can be used only as a receiving reperforator as in (c) above. It is similar to the No. 1 except that the keyboard and transmitting apparatus is omitted.

PHYSICAL DATA

	<i>Model No. 1</i>	<i>Model No. 2</i>
Length:	22 in.	22 in.
Depth:	20 in.	13 in.
Height:	10 in.	10 in.
Weight:	61 lb. approx.	51 lb. approx.

The machine is fitted with a metal dust cover and may be mounted on any suitable table without fastening down.

TRAFFIC CAPACITY

The maximum traffic capacity is 66 words per minute, corresponding to telegraph speeds of 50 bauds. A 7½-unit code is employed but the equipment is capable of reception of 7-unit code signals.

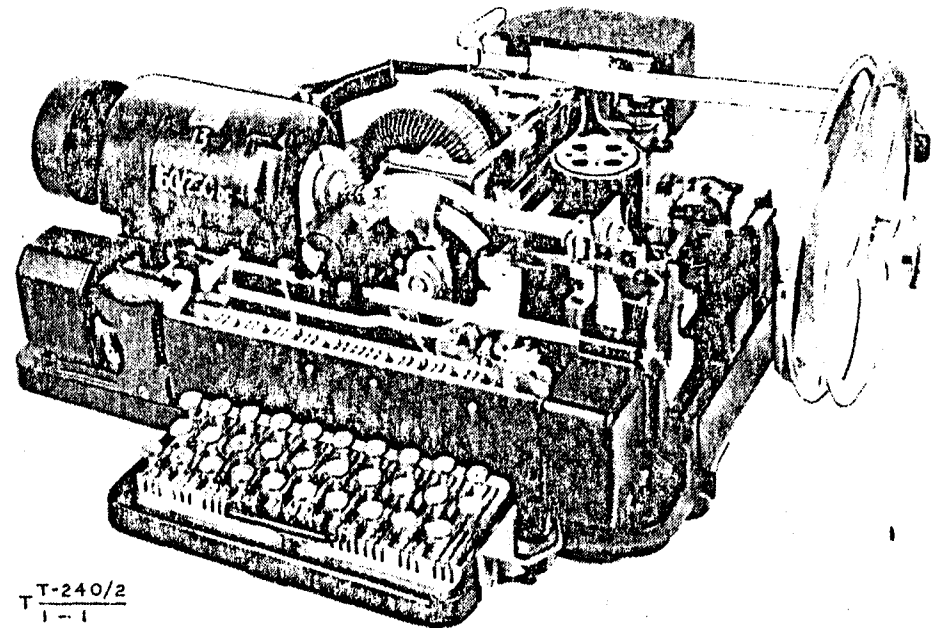


Fig. 1—View of Reperforator No. 1 with cover removed

POWER REQUIREMENTS AND CONSUMPTION

In general, 24V D.C. motors will be fitted but a limited number of machines fitted with 110V D.C. motors will also be in use. These will be used in conjunction with the Equipment table D.T.N. 2000 (see Tels. T250 7) to operate from a 200 to 250V, single-phase, 50c/s, A.C. supply. Using D.C., the power consumption is 72W.

A telegraph signalling supply between 12—0—12V to 80—0—80V, depending on the line condition, is also required. The current required to operate the electromagnet is approximately 25mA.

When transmission to line takes place at the same time as preparing a tape, the transmitted line current is additional to that in the electromagnet of the sending machine.

57; Maint./2240

SYSTEMS OF OPERATION

The reperforator may be used over any link or in conjunction with any instrument with a 7½-unit start/stop code as 50 bauds is employed. In addition, it is capable of reception of all 50-baud 7-unit start/stop signals. The machine is employed chiefly as a keyboard perforator or as a reperforator in tape relay systems or in place of a non-printing reperforator for signal storage at switching centres when there is a delay in providing a through connection.

SUPPLY FACILITIES

The reperforator produces 5-unit code perforations and superimposed printing, this lagging the perforations by eight characters. Every perforated signal combination has its equivalent printed on the tape, including code signs for functional signals. An alarm device is provided to indicate when the end of the roll of tape is approached.

END

TAPE WINDER NO. 3

TECHNICAL HANDBOOK - DATA SUMMARY

PURPOSE

To wind up tape used on inter-service 5-unit code equipment. This machine is capable of:-

- (a) Winding up 5-unit code tape for storage purpose.
- (b) Rewinding 5-unit code tape from one reel to another to recover a portion of the tape for making a re-run.

DESCRIPTION

The tape reel is driven at 15 r.p.m. through a friction clutch by means of fractional horse-power electric motor. To ensure a steady flow of tape, a series of guides is interposed in the feed to the tape reel. The tape reel is removable from the winder and the outer flange of the reel can also be detached. To suppress radio interference a filter is fitted to the motor.

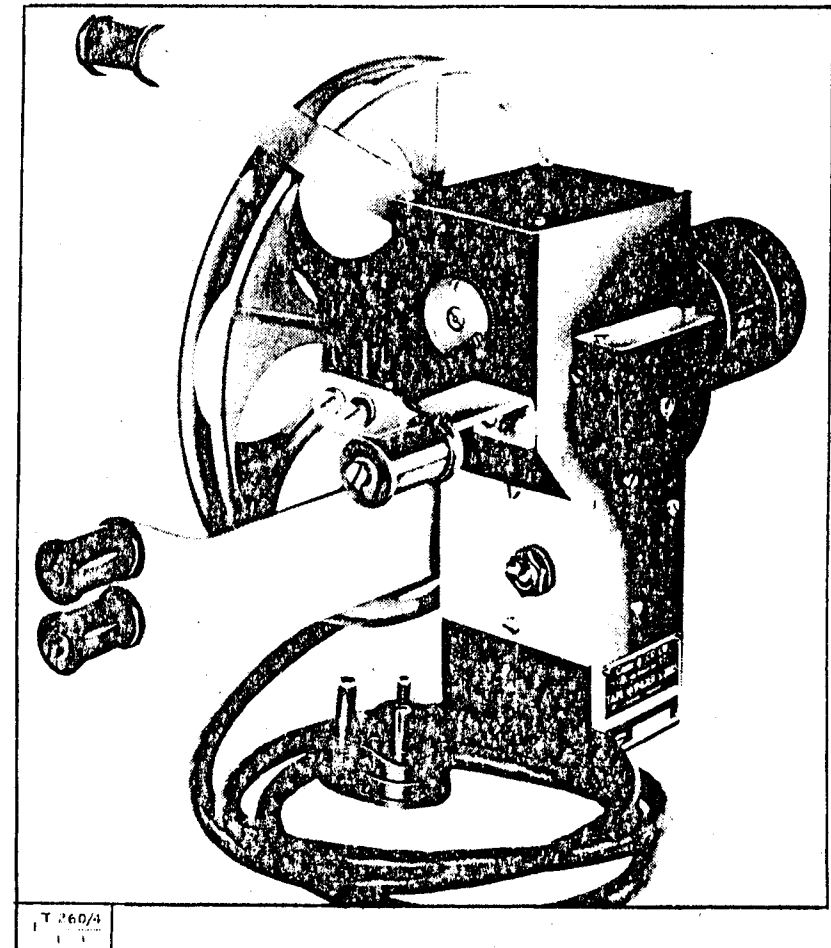


Fig. 1 - Tape winder No. 3

TELECOMMUNICATIONS

~~T 260/4~~

550

PHYSICAL DATA

Weight: 8 lb. 1½ oz.

Length: 11 5/8 in.

Width : 6½ in.

Height: 11 in.

57/Maint./4436

ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS

POWER REQUIREMENTS AND CONSUMPTION

Power supply : 220-250V, 50-60c/s A.C.

Power consumption: 15VA

END

REPERFORATOR, GNT., MODEL 451

DATA SUMMARY

NOTE : This information is provisional and is supplied for guidance pending the issue of more complete instructions. All errors of a technical nature should be notified in accordance with Tels. A 009.

PURPOSE

Receiving telegraph apparatus used on high-speed morse circuits. Located at the receiving wireless station or central telegraph office, to reconvert the received current signals into a perforated tape.

DESCRIPTION

A reperforator producing punched tape from received morse telegraph signals—the tape produced corresponding to the one used at the sending station for transmission. The machine comprises a motor, a self-synchronizing governor and a punching mechanism, all mounted on a common baseplate. There are also two relays mounted on this plate and these are connected in series, one controlling the punching mechanism, and the other controlling the governor mechanism which automatically synchronizes the machine to the speed of the incoming signals. The instrument will tolerate very large signal distortion (about 75 per cent of the signal element), without misperforation.

PHYSICAL DATA

Weight : 95 lb.
Height : 11½ in.
Length : 25½ in.
Width : 11 in.

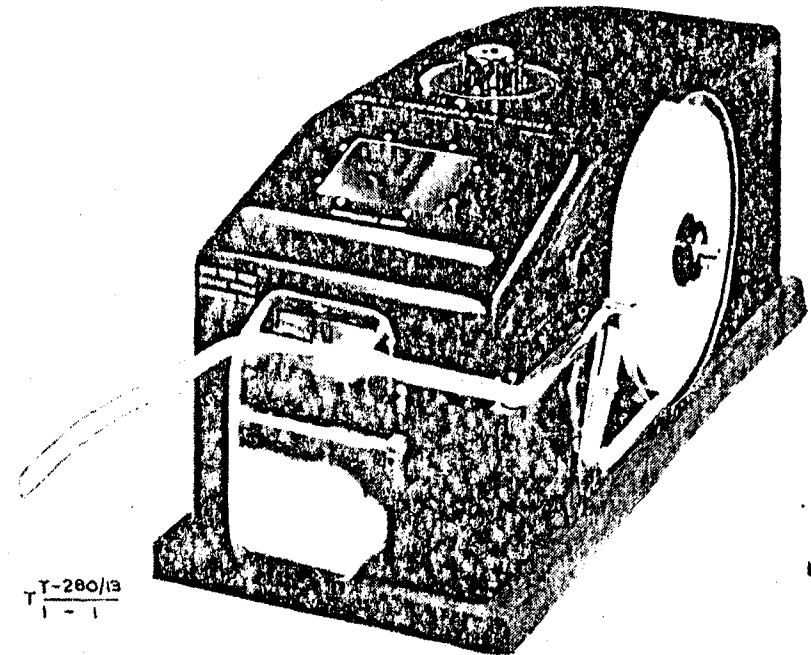


Fig. 1—General view of equipment

TELECOMMUNICATIONS

T-280/13 S 450

ELECTRICAL AND MECHANICAL ENGINEERING REGULATIONS

PERFORMANCE

Traffic capacity : 40-200 w.p.m.
Speed : 36.6-183 bauds.

POWER REQUIREMENTS AND CONSUMPTION

The motor runs on 230V A.C., 50c/s, single-phase, and requires a starting current of 7A and a running current of 1A.

LINE SYSTEM

The reperforator operates from double-current (80-0-80V or 110-0-110V) telegraph signals of a peak value of 100mA, and these are usually

derived from a local telegraph relay, e.g., Creed relay 27C, which is itself operated by the actual line current.

REMARKS

The instrument may be used in place of the Creed morse reperforator (Reperforator No. 7W/B) described in Tels. T 280/5-T 284/5.

Associated equipment :

High-speed morse equipment (Tels. T 282)

Creed relay No. 27C (Tels. T 280/11-T 284/11)

END

MORSE TRANSMITTER (CREED)

(Transmitter, Auto, No. 11B, YB 04306)

DATA SUMMARY

PURPOSE

High-speed morse transmitter. Rare in the Army, but likely to be met in occupied territories.

DESCRIPTION

Morse perforated tape is fed by a star wheel across the ends of two peckers. Perforations in the tape allow the peckers to rise under spring action. Movements of the peckers operate contacts which control a transmit relay. Relay thus sends out positive or negative signals to line according to the perforations. Driven by electric motor with variable speed friction drive. Motor and transmitting head mounted on baseplate, with relay and associated control unit separate.

PHYSICAL DATA

<i>Transmitter and control unit</i>		<i>Creed relay 27 C</i>
Weight :	28 lb.	4 lb.
Length :	11½ in.	Diam. 5 in.
Width :	10 in.	Height : 7 in.
Height :	7½ in.	

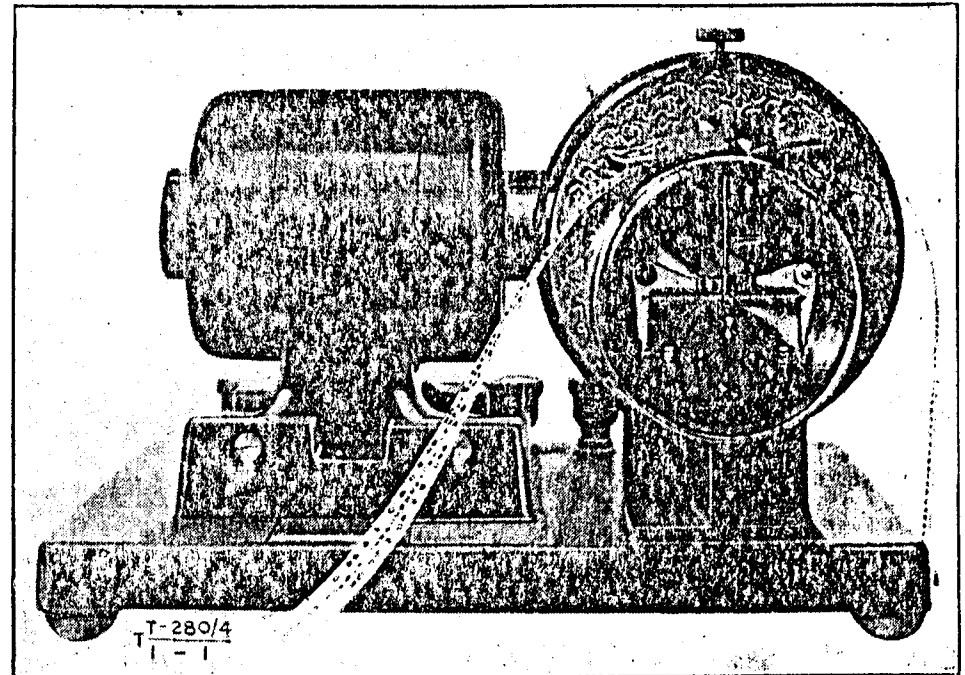


Fig. 1—General view of equipment

LINE SYSTEM

Double-current D.C. telegraphy.

FREQUENCY

Speed : From 10 to 140 words per minute, using three different friction discs and four-pole A.C. motor (Army model).

From 20 to 200, as above, but with two-pole A.C. motor.

From 12 to 200, as above, but with D.C. motor.

100 w.p.m. morse --- 80 bauds.

PERFORMANCE

Sender output : Reversals.

POWER REQUIREMENTS AND CONSUMPTION

Power supply : 110 or 220V, D.C. or A.C. (Army uses 220V A.C.) for motor. Telegraph battery, centre-tapped.

Power consumption : 55W D.C. or 80W A.C. for motor.

END

WHEATSTONE TRANSMITTER (ELLIOTT)

(Transmitters, Wheatstone, M.D., 110/220V, motor-driven No. 1 - YB 02782 ;
motor-driven No. 2 - YB 01806)

DATA SUMMARY

PURPOSE

A high-speed morse transmitter used on L. of C.

DESCRIPTION

Morse-perforated tape is fed by a star wheel across the ends of two peckers. Perforations in the tape allow the peckers to rise under spring action. Movement of the peckers operates a beam, which sends out positive or negative signals to line, according to perforations. Driven by electric motor. Variable mechanical speed governor on all models, also rheostat speed control on later motor-driven models. Weight-driven model is mounted on a trestle.

PHYSICAL DATA

	No. 1	No. 2
Weight :	approx. 23 lb.	approx. 31 lb.
Length :	11½ in.	16 in.
Width :	10½ in.	12 in.
Height :	9½ in.	10½ in.

FREQUENCY

Speed : Up to 300 words per minute is usual. (100 w.p.m. morse = 80 bauds).

PERFORMANCE

Sender outputs : Reversals.

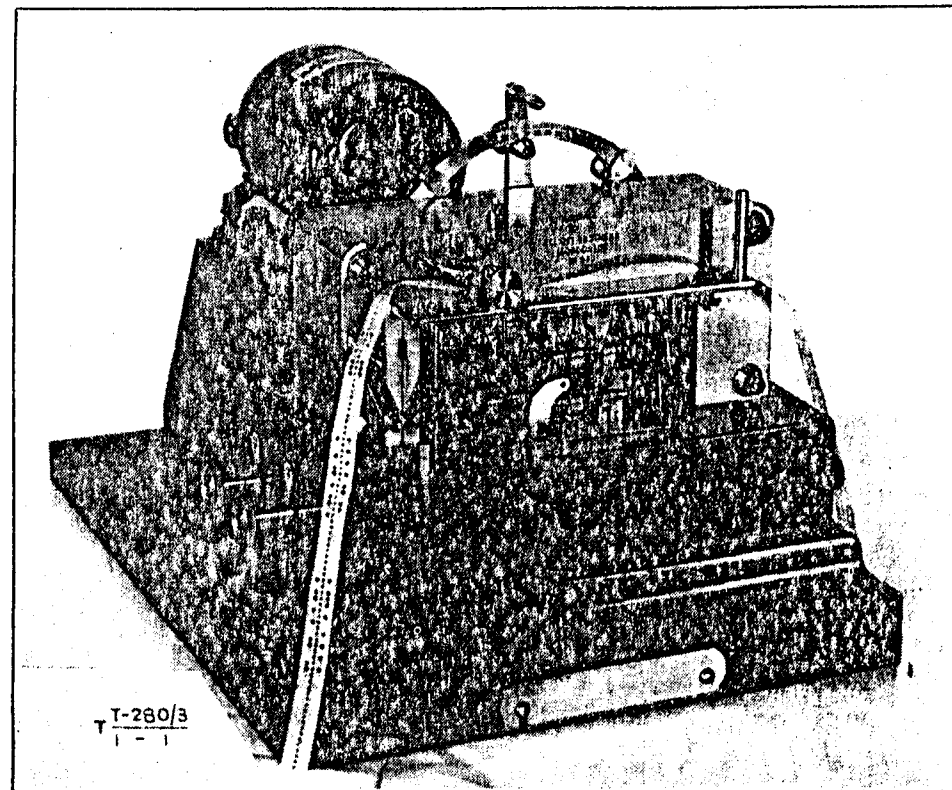


Fig. 1—General view of equipment.

TELECOMMUNICATIONS

T.280/3 S. 20

ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS

POWER REQUIREMENTS AND CONSUMPTION

Power supply: 110 or 220V D.C. for motor (for 220V working, a dropping resistor is used). Telegraph battery, centre-tapped.
Power consumption: Electric motor 10-15W.

LINE SYSTEM

Double-current D.C. telegraphy.

SPECIAL FACILITIES

Can be used for manual morse with double-current key, and MANUAL-AUTO switch to MANUAL.

REMARKS

Used in the Golden Arrow to modulate S.W.B. 8 transmitter.

END

TELEPRINTER T.100R

TECHNICAL HANDBOOK - DATA SUMMARY

ROLE

The equipment provides for the transmission and reception of information over line or radio links by means of 5 unit start/stop Murray code signals. A printed copy of the received information is provided.

DESCRIPTION

The equipment is set to operate at 50 bauds (66 w.p.m.) but may be converted to 75 bauds (100 w.p.m.) using components mounted in the equipment. The signals into and from the machine are single current telegraph
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signals, current for mark and no current for space. The equipment consists of a number of sub-units mounted on a main base containing the keyboard. Extra facilities may be provided by means of additional units to provide for the transmission of signals from perforated paper tape and/or the production of such tape from receiver signals. The equipment is supplied with a metal cover which is left in position during normal operation. Such functions as paper and ribbon changes may be performed without removing the cover. The cover carries the paper roll for printing and the reel of tape for the reperforator, when fitted.

Page 1

Distribution - Class 1280. Code No 4

PHYSICAL DATA

Basic machine plus roll of paper:-

Weight: 65 lb
Height: 1 ft 2.1/2 in.
Width: 1 ft 4 in.
Depth: 2 ft 1 in.

With reperforator and tape transmitter:-

Weight: 72 lb
Height: 1 ft 2.1/2 in.
Width: 1 ft 9 in.
Depth: 2 ft 1 in.

Packed:-

Weight: 93 lb
Height: 1 ft 7.1/2 in.
Width: 2 ft 2.1/2 in.
Depth: 2 ft 5 in.

Packed with reperforator and tape transmitter:-

Weight: 100 lb
Height: 1 ft 7.1/2 in.
Width: 2 ft 2.1/2 in.
Depth: 2 ft 5 in.

ASSOCIATED EQUIPMENT

Converter adapter, single current/double current,
Lorenz type TUS.01

Terminal box, 8 pole Y2/5940-12-134-0140

POWER REQUIREMENTS

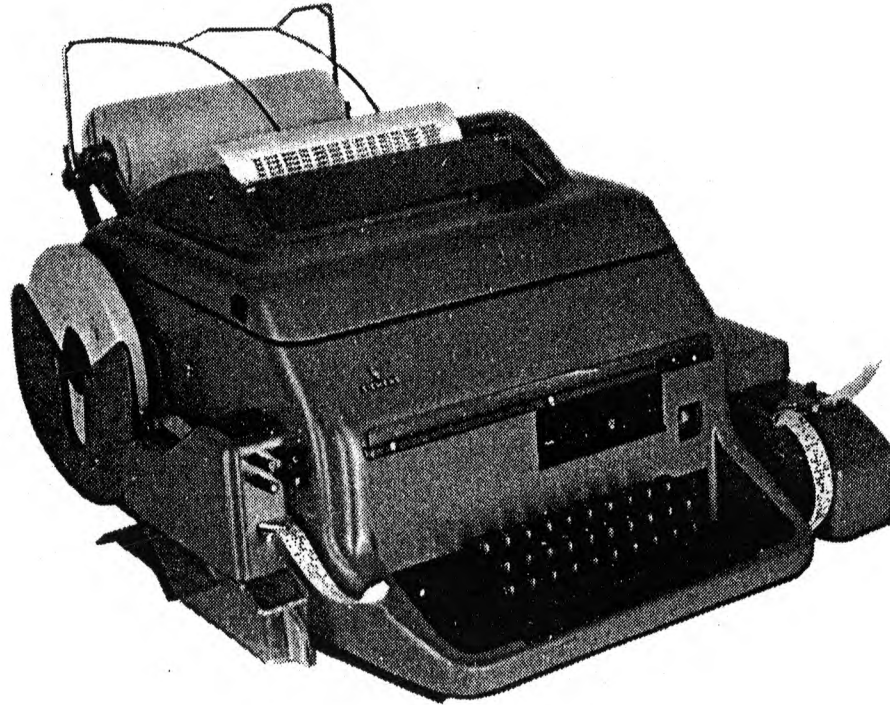
Motor supplies: 220V, 50c/s nominal
190-240V, 40-60c/s

Consumption: 80W nominal
100W maximum

Line supply: Single current 60-120V d.c.
40-60mA

CLIMATIC RANGE

+5°C to +40°C



END

~~S 17072~~
S 230

PRINTING REPERFORATORS NOS. 1 AND 2 DATA SUMMARY

PURPOSE

The Printing reperforator No. 1 can be used either as:—

- (a) A keyboard reperforator producing a message in 5-unit code on chadless (semi-perforated) tape, at the same time printing a message on the same tape. The maximum speed of typing is 66 words per minute.
- (b) A keyboard transmitter performing a similar function to the sending half of the teleprinter, or
- (c) A receiving reperforator recording the signals received in 5-unit code on chadless tape and at the same time printing a message on the same tape.

DESCRIPTION

Basically the model 1 is the Teleprinter No. 7B but the paper carriage is replaced by a perforator unit and deep wheel, whilst other minor alterations have also been made. An orientation device is fitted allowing the time between the start signal and the instance of selection to be varied.

The model No. 2 can be used only as a receiving reperforator as in (c) above. It is similar to the No. 1 except that the keyboard and transmitting apparatus is omitted.

PHYSICAL DATA

	<i>Model No. 1</i>	<i>Model No. 2</i>
Length:	22 in.	22 in.
Depth:	20 in.	13 in.
Height:	10 in.	10 in.
Weight:	61 lb. approx.	51 lb. approx.

The machine is fitted with a metal dust cover and may be mounted on any suitable table without fastening down.

TRAFFIC CAPACITY

The maximum traffic capacity is 66 words per minute, corresponding to telegraph speeds of 50 bauds. A 7½-unit code is employed but the equipment is capable of reception of 7-unit code signals.

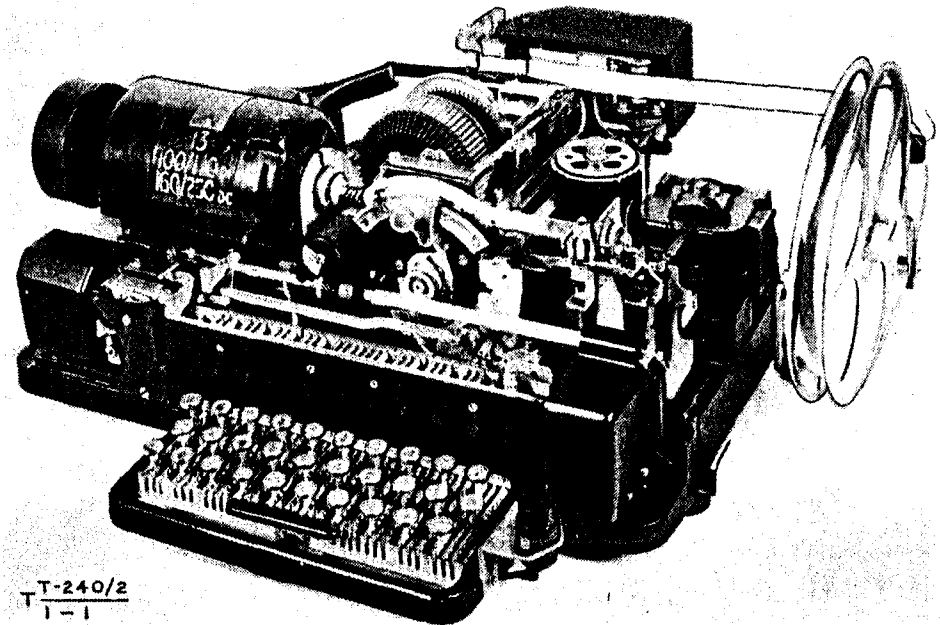


Fig. 1—View of Reperforator No. 1 with cover removed

POWER REQUIREMENTS AND CONSUMPTION

In general, 24V D.C. motors will be fitted but a limited number of machines fitted with 110V D.C. motors will also be in use. These will be used in conjunction with the Equipment table D.T.N. 2000 (see Tels. ~~S160~~ to operate from a 200 to 250V, single-phase, 50c/s, A.C. supply. Using D.C., the power consumption is 72W.

A telegraph signalling supply between 12—0—12V to 80—0—80V, depending on the line condition, is also required. The current required to operate the electromagnet is approximately 25mA.

When transmission to line takes place at the same time as preparing a tape, the transmitted line current is additional to that in the electromagnet of the sending machine.

57/Maint./2240

SYSTEMS OF OPERATION

The reperforator may be used over any link or in conjunction with any instrument with a $7\frac{1}{2}$ -unit start/stop code as 50 bauds is employed. In addition, it is capable of reception of all 50-baud 7-unit start/stop signals. The machine is employed chiefly as a keyboard perforator or as a reperforator in tape relay systems or in place of a non-printing reperforator for signal storage at switching centres when there is a delay in providing a through connection.

SUPPLY FACILITIES

The reperforator produces 5-unit code perforations and superimposed printing, this lagging the perforations by eight characters. Every perforated signal combination has its equivalent printed on the tape, including code signs for functional signals.

An alarm device is provided to indicate when the end of the roll of tape is approached.

END

● FULLERPHONES, MK. IV (YA 0618), MK. IV* (YA 4318),
MK. V (YA 6916) AND MK. VI (YA 7717)

DATA SUMMARY

NOTE: This replaces and cancels Tels. T 200/2, Issue 1. Items marked thus ● have been amended; Fig. 2 is additional.

PURPOSE

A portable telegraph instrument of high sensitivity for use in forward areas. It is practically immune from interception.

DESCRIPTION

● The apparatus is housed in an aluminium case which is secured by guides in a wooden carrying case. It consists of a buzzer-chopper (Buzzer F., Mk. II), a potentiometer, a morse key and headphones. The buzzer-chopper operates on one dry cell and uses one pair of contacts for "driving" and the second pair for "chopping" the D.C. signal pulses of the Fullerphone at approximately 550 times per second. The potentiometer, operating on the second dry cell through a reversing switch, permits stray earth currents or other interferences to be balanced out. A filter circuit of chokes and condensers prevents any sudden rise and fall of current and keeps any A.C. interference of a frequency above 90c/s off the receive side and prevents the leakage of local tone on the line on send. This filter also permits the instrument to be superposed on a line or phantom circuit. The Mk. IV* is fitted with radio suppression to reduce the possibility of radio interception. The Mk. V has a tropical finish and is fitted with a crash limiter which reduces acoustic shock from ringing currents when the Fullerphone is worked in series with a telephone. The Mk. VI is an immersion proof tropical edition with a metal case. The circuit is similar to that of the Mk. IV*.

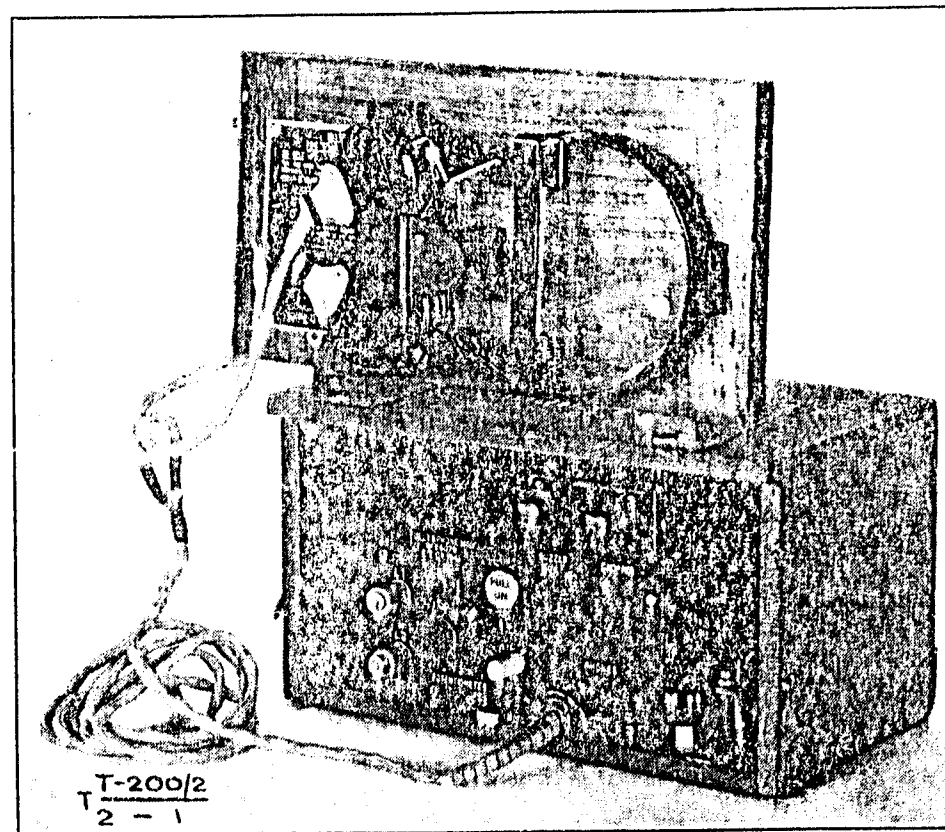


Fig. 1—Fullerphone, Mk. IV

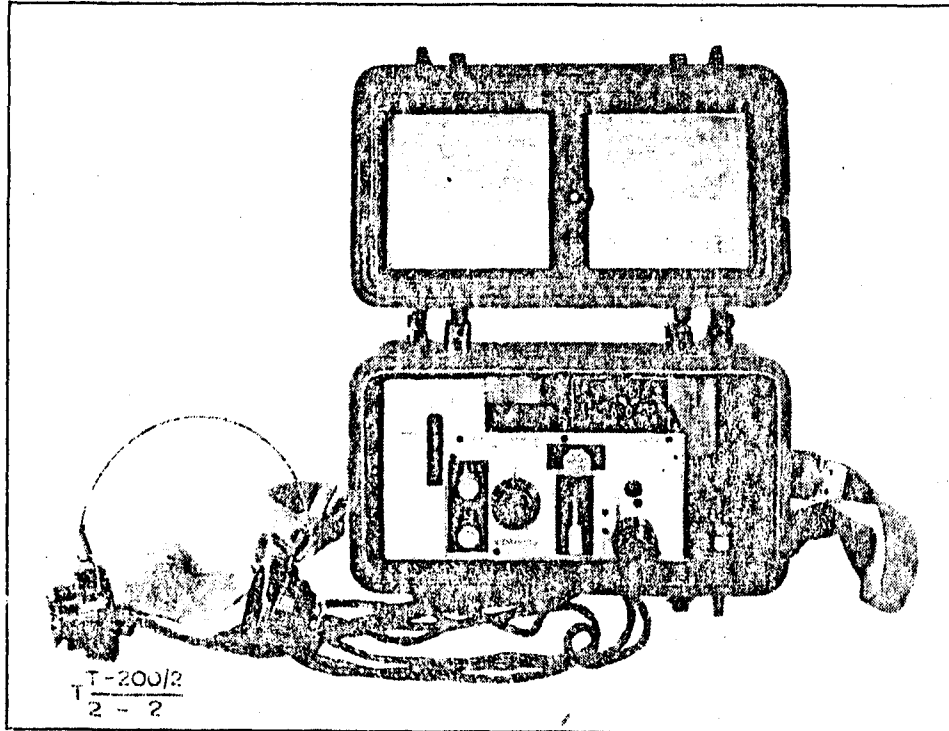


Fig. 2—Fullerphone, Mk. VI

PHYSICAL DATA

	<i>Mk. IV</i>	<i>Mks. IV* and V</i>	● <i>Mk. VI</i>
Weight:	14 lb.	13 lb.	14 $\frac{3}{4}$ lb.
Length:	12 in.	12 in.	12 in.
Width:	6 $\frac{7}{8}$ in.	6 in.	7 $\frac{1}{2}$ in.
Height:	7 in.	7 in.	7 in.

LINE SYSTEM

The Fullerphone can be used over:—

- (a) Twin line or a single line and earth return.
- (b) Simple series superposed circuit.
- (c) Superposed series or a superposed phantom circuit.

RANGE

Under field service conditions range would not normally exceed 15-20 miles.

Under normal conditions a current of $2.5\mu\text{A}$ is considered necessary for reliable communication, but a readable signal is produced by only $0.5\mu\text{A}$.

POWER SUPPLY

One cell X for the buzzer chopper operation.

One cell X for the potentiometer.

END

TELEPHONE SET, FLASH SPOTTING

MK. I (VB 0499) OBSOLESCE, MK. II (VB 0665)

DATA SUMMARY

PURPOSE

The Telephone set, flash spotting, is used by Observation (flash spotting) troops of Survey Regiments, R.A. It provides communication between observation posts and a plotting centre.

DESCRIPTION

Mk. I gives normal speech communication, buzzer calling, and D.C. flash signalling over two wires. It was designed to work to a Switchboard, flash and buzzer, now obsolete. A Microphone hand, No. 3A, C.L.R. headphones and a Telephone, hand are used for speech. They are carried in an accessories box. A Key, W.T., 8A, No. 2 is used for D.C. signalling. A buzzer T, Mk. I is operated by a push-button for calling. Mk. II has no facilities for D.C. signalling, but incorporates a centre-tapped bridging coil across the line terminals. This centre tap permits an additional phantom-earth speech circuit to be provided, using a field telephone. The accessories for Mk. II are carried in a Satchel, Signals. Both models are housed in a metal case with carrying strap.

PHYSICAL DATA

	<i>Lid open</i>	<i>Lid closed</i>
Weight :	9 $\frac{3}{4}$ lb.	9 $\frac{3}{4}$ lb.
Length :	9 $\frac{1}{2}$ in.	9 $\frac{1}{2}$ in.
Width :	5 $\frac{5}{8}$ in.	5 $\frac{5}{8}$ in.
Height :	10 $\frac{7}{8}$ in.	5 $\frac{1}{2}$ in.

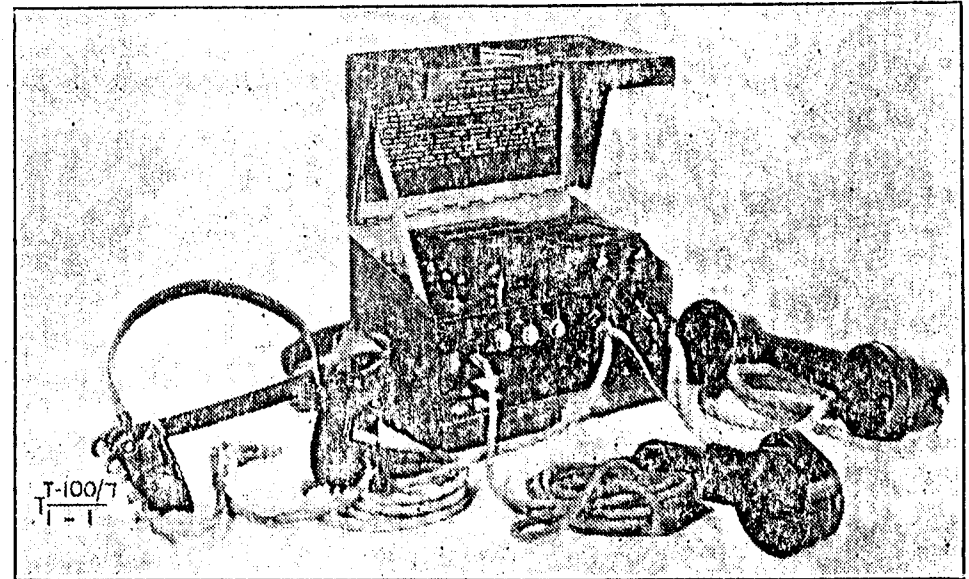


Fig. 1—View of complete equipment

TELECOMMUNICATIONS

~~7100/7~~ U750

ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS

NE SYSTEM

Mk. I : Two-wire

Mk. II : Two-wire, and phantom earth.

PERFORMANCE

Range : The normal working range is 3-4 miles. The maximum range is 8-10 miles.

Microphone transmission to line : Approx. -8db. referred to 1mW.

POWER REQUIREMENTS AND CONSUMPTION

Power supplies : Microphones, 3V from Cells, dry, X or S.
D.C. signalling, 12V or 24V from Batteries, dry, refill, 8-cell, No. 1, Mk. I.

Power consumption : Microphone, hand, No. 3A : 30mA (usually a steady drain).
Microphone of Telephone, hand : 30mA (when used).
D.C. signalling, depends on line conditions.

END

TELEPHONE SET D, MK. V (YA 1853)

DATA SUMMARY

PURPOSE

The Telephone set D, Mk. V is designed as a portable instrument for field use forward of Div. H.Q.

DESCRIPTION

The instrument, contained in an aluminium alloy case, consists of a buzzer, key, magneto bell, handset and single headphones, the two latter being housed in the lower part of the case. The buzzer unit performs three functions :—

- (a) Operates as A.C. generator in the form of step-up transformer with interrupted primary winding for calling or for working morse telegraphy.
- (b) Secondary winding operates as two arms of an A.C. bridge network for the suppression of sidetone on speech.
- (c) The primary and secondary windings form a microphone transformer for speech working.

The telephone can call only by means of its buzzer and it can, therefore, work only to the U.C. type switchboard. The telephone's bell will respond to incoming magneto call ; a buzzer call is heard in the receivers.

PHYSICAL DATA

Weight : 11 lb.
Length : 10½ in.
Width : 5½ in.
Height : 6¼ in.

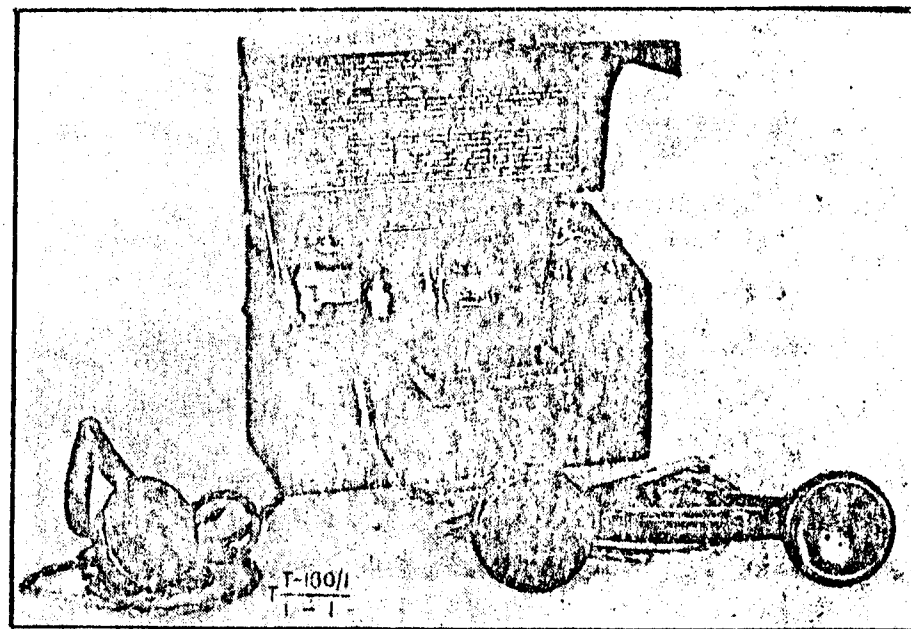


Fig. 1—General view of equipment

FREQUENCY

Buzzer, 350 c/s.

RANGE

Reliable speech up to 14-16 miles on D.8 twisted cable.
Morse telegraphy up to 25 miles on D.8 twisted cable.

POWER REQUIREMENTS AND CONSUMPTION

Power supply : Two cells, dry, X, Mk. II.

Power consumption :

Buzzer, 3V, 160mA.

Buzzer output, 270-300mW.

Voltage output, 16.5V across 1,000 Ω .

Microphone, 3V, 15-30mA approx.

END

TELEPHONE SET F

U 690

Mk. I (YA 2256), Mk. I* (YA 1893), Mk. II (YA 2886)

DATA SUMMARY

PURPOSE

A portable telephone set for Army communications. Not normally used forward of Div. H.Q.

DESCRIPTION

The Mk. I and Mk. I* instrument is contained in a metal case which slides into a wooden carrying case. It consists of a buzzer unit, magneto generator, magneto bell and handset. The buzzer performs three functions:—(1) Operates as an A.C. generator in the form of a step-up transformer with interrupted primary winding for calling. (2) The secondary winding operates as two arms of A.C. bridge network for the suppression of sidetone. (3) The primary and secondary windings form a microphone transformer. The telephone can call by, or respond to calling from, buzzer or magneto generator. It includes a cradle switch, which, when the handset is removed from the cradle, connects battery to the microphone and puts a loop across the line via a retuned coil. The instrument is, therefore, suitable for working to U.C., magneto or C.B.S. switchboards. The Telephone F, Mk. II is similar to the Mk I except that the buzzer unit is replaced by an induction coil.

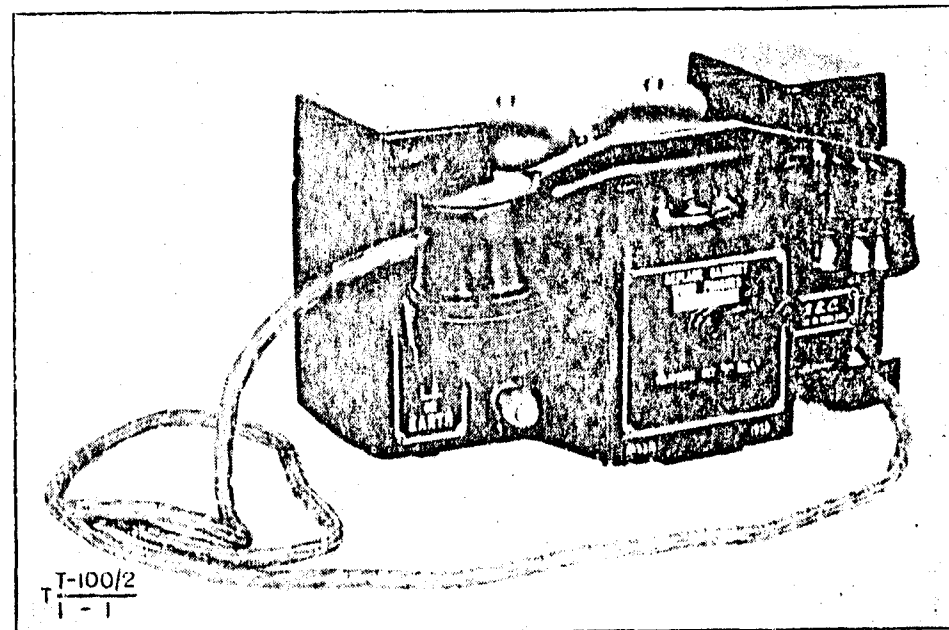


Fig. 1—General view of equipment

PHYSICAL DATA

Weight : 17 lb. 4 oz.
Length : 12 in.
Width : 7 in.
Height : 8 in.

FREQUENCY

Buzzer, 350c/s.

RANGE

Reliable speech up to 14-16 miles on D.8 twisted cable, or 8-10 miles on D.3 twisted cable.

POWER REQUIREMENTS AND CONSUMPTION

Two Cells, dry, X, Mk. II or S. Hand-operated generator.
Buzzer, 3V, 160mA.
Buzzer power output, 270-300mW.
Buzzer voltage output, 16.5V across 1,000 Ω .
Microphone, 3V, 30mA approx.

END

TELEPHONE SET F, H. P. (No. I. Mk.I (YA 5741) (Obsolescent)
(No. I. Mk.II (YA 6244)

DATA SUMMARY

PURPOSE

To provide amplification in both send and receive directions and thus increase the working length of field telephone lines. The sending signal-to-noise ratio may also be improved in areas where the external background noise level is high.

DESCRIPTION

The set consists of two units: the telephone unit and the amplifier unit. The telephone unit is a Telephone set F (Tels. T 100/1), modified as follows:—

- (a) The magneto bell and generator have been removed from the Telephone set F circuit and incorporated in the primary circuit of the amplifier line transformer.
- (b) The functions of the cradle switch have been changed.
- (c) The hold coil has been removed.
- (d) The telephone handset incorporates a pressel switch.

The amplifier is a single-stage A.F. transformer-coupled unit with a fixed sending gain of 20db. and a receive gain variable up to a maximum of 40db. A key is provided to switch the amplifier into or out of circuit, and when in circuit, it is switched from the receive to the send direction of transmission by the pressel switch. The complete station is carried in two wooden boxes, one of which contains the telephone and amplifier units, the other the

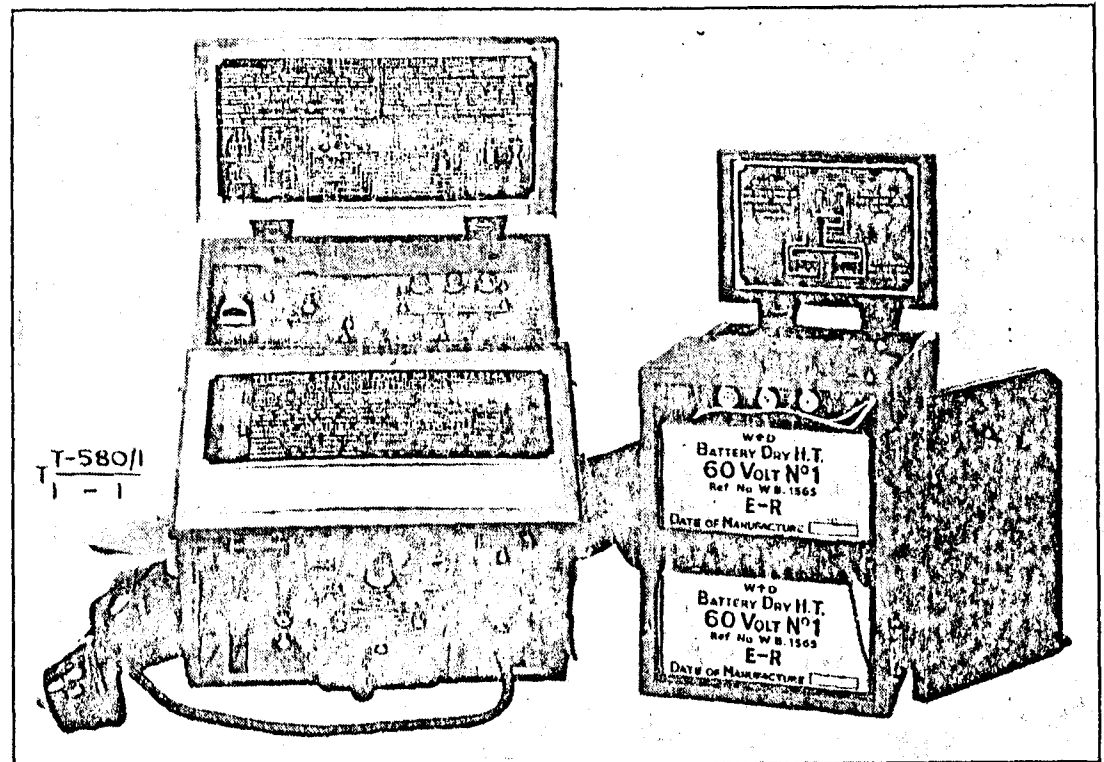


Fig. 1—General view of equipment

Batteries. The batteries are connected to the amplifier set by three single-core connectors when in use. Working instructions and battery connection details are given on plates fitted in the lids of the telephone set and battery boxes respectively. Both boxes are fitted with carrying straps. Magneto or buzzer signalling may be employed and the set may be used on all lines, other than those using central battery signalling.

PHYSICAL DATA

	<i>Telephone F, H.P.</i>	<i>Battery box (with battery)</i>
Weight:	26 lb.	14 lb.
Length:	12½ in.	11½ in.
Width:	11 in.	9½ in.
Depth:	6½ in.	7½ in.

FREQUENCY

Speech: Normal audio range.

Ringing: Magneto 17c/s.

POWER REQUIREMENTS

Amplifier H.T.: 120V, 6mA (two Batteries, dry, H.T., 60V, No. 1)

L.T.: 6V, 0.21A sending } Three Cells, secondary,
0.15A receiving } portable, 16Ah, Mk. II.

Telephone set F: 3V (two Cells, dry, X, Mk. II or inert, S, Mk. I).

LINE SYSTEM

Any pair or single-wire earth-return telephone circuit.

VALVE

V1: CV65

REMARKS

When the set is used in conjunction with repeatered circuits, great care must be taken to avoid overloading.

END

TELEPHONE SET H, MK. II (YA 2782)

DATA SUMMARY

PURPOSE

A sound-powered telephone used by field units.

DESCRIPTION

The equipment comprises a hand telephone fitted with sound-powered microphone and receiver elements and employs magneto signalling for normal purposes. When connected to a C.B.S. exchange, calling is achieved by raising the hand telephone off the cradle and thus completing a D.C. loop across the line terminals. The set is housed in a bakelite moulded case similar to that used for the telephone set F.

PHYSICAL DATA

Weight: 8½ lb.
Length: 10 in.
Width: 6½ in.
Height: 5¼ in.

LINE SYSTEM

Two-wire.

PERFORMANCE

Output: approx. -30db. referred to 1mW.
Range: Speech is possible over a 20db. circuit.

POWER REQUIREMENTS

Nil.

REMARKS

Due to the difference in relative transmission and reception levels, the Telephone set H will often not give satisfactory communication when working with Telephone set D Mk. V, F or L, or a switchboard.

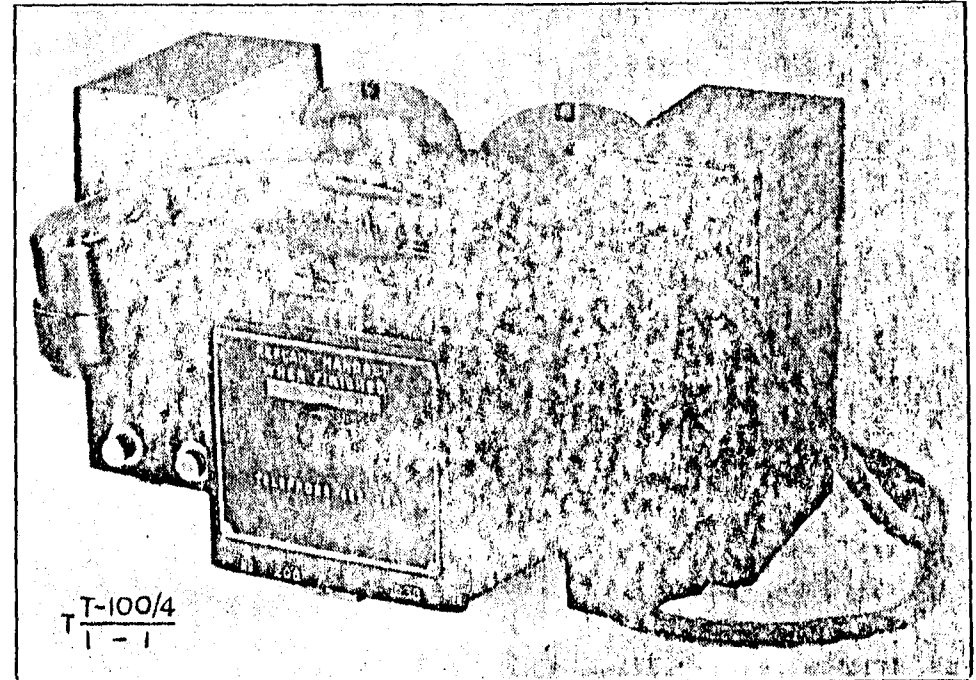


Fig. 1—General view

END

TELEPHONE SET H, MK. III (YA 4841)

U 710

DATA SUMMARY

PURPOSE

A sound-powered telephone used by field units, down to battalions.

DESCRIPTION

The equipment comprises a hand telephone fitted with sound-powered microphone and receiver elements and employs magneto signalling for normal purposes. When connected to a C.B.S. exchange, calling is achieved by raising the C.B. button, thus completing a D.C. loop across the line terminals. The set is housed in a pressed metal case similar to that used for the Telephone set L.

PHYSICAL DATA

Weight : 9 lb.
Length : 11 in.
Width : 5 in.
Height : 6 in.

LINE SYSTEM

Two-wire.

PERFORMANCE

Output : -40db. (approx.) referred to 1mW.
Range : Speech is possible over a 20db. circuit.

POWER REQUIREMENTS

Nil.

REMARKS

Due to the difference in relative transmission and reception levels the Telephone set H will often not give satisfactory communication when working with Telephone set D Mk. V, F or L, or with a switchboard.

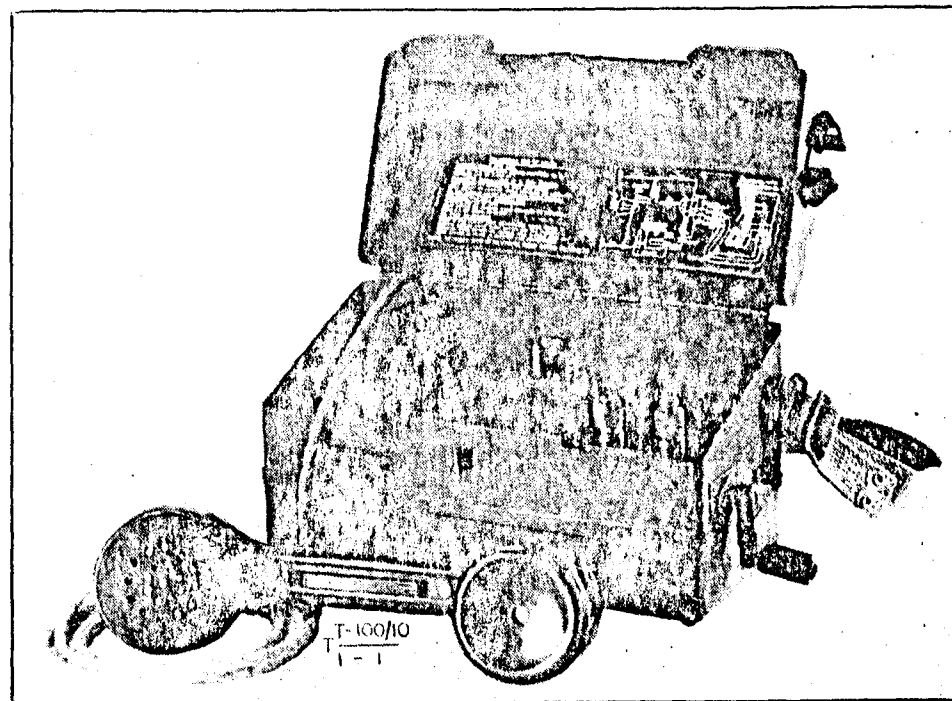


Fig. 1—General view of equipment

END

TELEPHONE SET J DATA SUMMARY

PURPOSE

A tropicalized field telephone set for use with C.B. or magneto exchanges or over point-to-point circuits.

DESCRIPTION

A lightweight telephone set housed in a sheet-steel case, designed to be immersion-proof. Terminals are provided for connecting an additional receiver.

PHYSICAL DATA

Weight : 9 lb. approx.
Height : 5 $\frac{3}{8}$ in.
Length : 10 $\frac{1}{4}$ in.
Width : 5 in.

FREQUENCY

A magneto generator gives ringing currents at approx. 17c/s at normal turning speed (120 r.p.m. approx.)

PERFORMANCE

Satisfactory speech is possible over 18-20 miles of D.8 cable or 13-15 miles of D.3 cable. If cable is in poor condition and laid on the ground, these distances may be reduced by 50 per cent. The distance quoted corresponds to a line loss of approx. 40db. at 1,600c/s.

POWER REQUIREMENTS AND CONSUMPTION

Two Cells, dry, X, Mk. II or two Cells, inert, S, Mk. I.

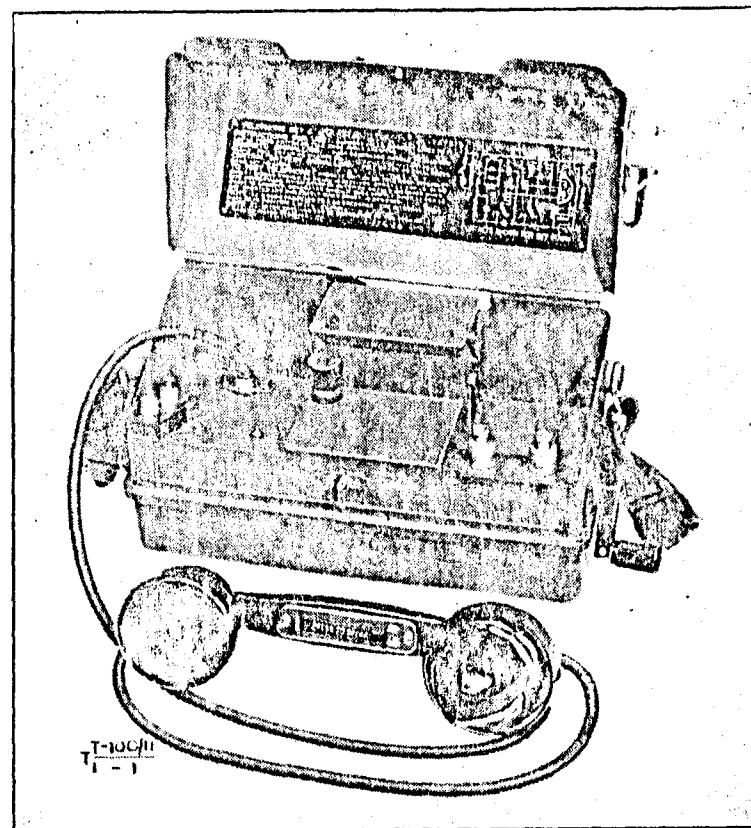


Fig. 1—Telephone set J, general view

T-100/11
0720

REMARKS

An additional receiver is carried in a web pouch which may be attached to the telephone set carrying strap. Links for changing over from C.B. working to magneto are housed in the sealed portion of the case. A key is included for calling C.B. exchange.

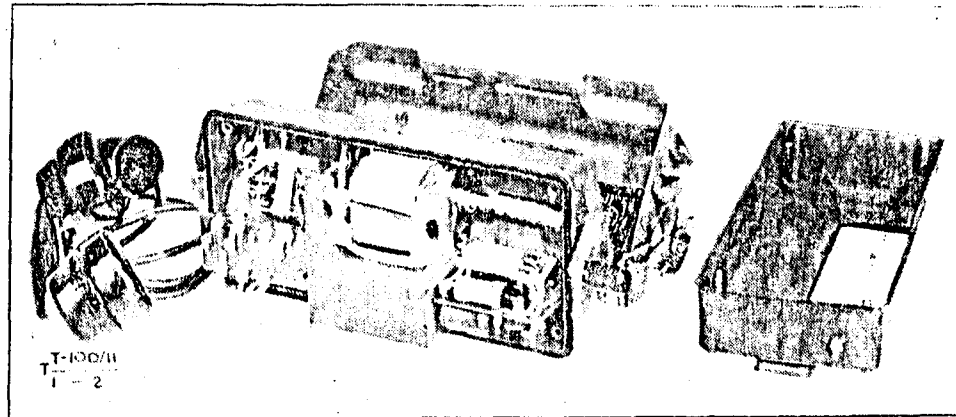


Fig. 2--Telephone set J, interior view

END

TELEPHONE SET L (YA 3717)

DATA SUMMARY

PURPOSE

A portable instrument for Army communications, used mainly in forward areas and by linesmen.

DESCRIPTION

The instrument is contained in a pressed metal case and consists of an induction coil, magneto bell, hand generator, C.B. switch and hand telephone. It is used over magneto or central battery signalling systems. On magneto systems, the telephone calls by means of its generator and its bell responds to incoming rings. On C.B.S. systems, the C.B. switch is pulled up to call, remains in this position during conversation, and is depressed to clear. The receiver is, in effect, permanently connected across the line and an incoming buzzer call will, therefore, be heard.

PHYSICAL DATA

Weight: 10 lb. 14 oz.
Length: 10 $\frac{3}{4}$ in.
Width: 5 in.
Height: 5 $\frac{3}{8}$ in.

LINE SYSTEM

- (a) Two-wire.
- (b) One-wire, with earth return.

RANGE

35db. circuit at 1,600c/s.

POWER SUPPLY

Two Cells, dry, X, Mk. II or two Cells, inert S, Mk. I.

POWER CONSUMPTION

Microphone, 3V, 30mA (approx.).

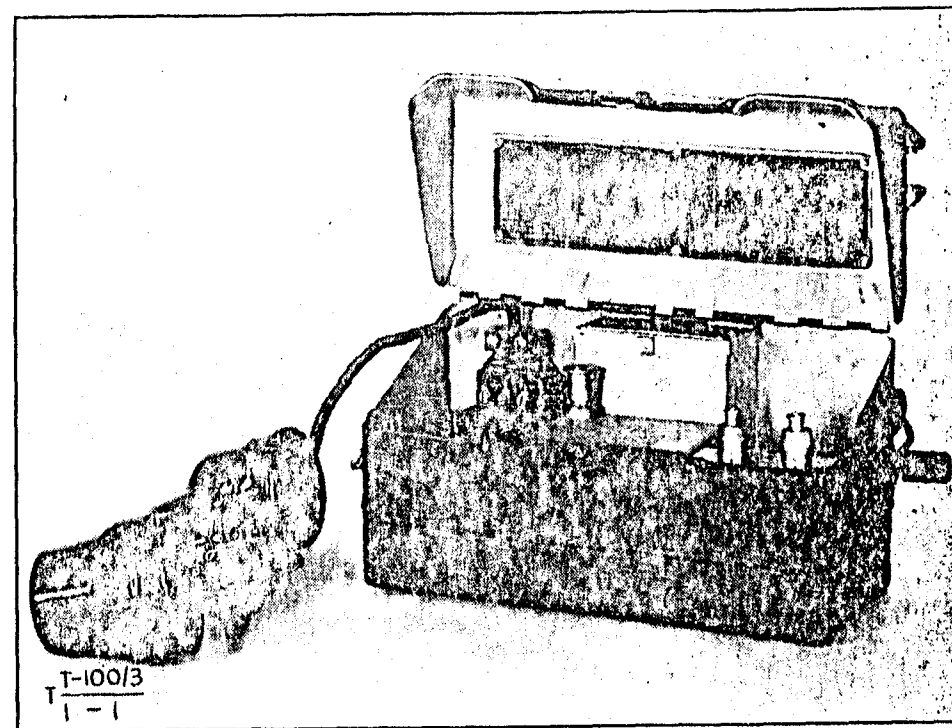


Fig. 1—General view of set

END

TELEPHONE SET T (YA 6816)

DATA SUMMARY

PURPOSE

A portable field telephone set for use with magneto or C.B.S. exchanges, or over circuits in forward areas.

DESCRIPTION

The instrument, contained in a pressed metal case, consists of an induction coil, a magneto bell and generator, two keys and a handset.

The induction coil serves two purposes:—

- (a) The primary and secondary act as a microphone transformer, and
- (b) The secondary, which is asymmetrical, acts as two arms of an A.C. bridge network to give a measure of sidetone suppression.

The telephone can call by, or respond to calling from, a magneto generator. One key serves to isolate the microphone battery, i.e., in place of the normal cradle switch, and thus prevents battery leakage, while the other, which has three positions, functions as follows:—

- (a) On MAG. It places the bell coils in series with a condenser for magneto working.
- (b) On C.B. It provides a low-resistance D.C. loop with the bell coils in parallel. The microphone current is still supplied by the local battery in this condition.

- (c) On NO BELL. It cuts the bell off and the occurrence of incoming calls is indicated only by the receiver.

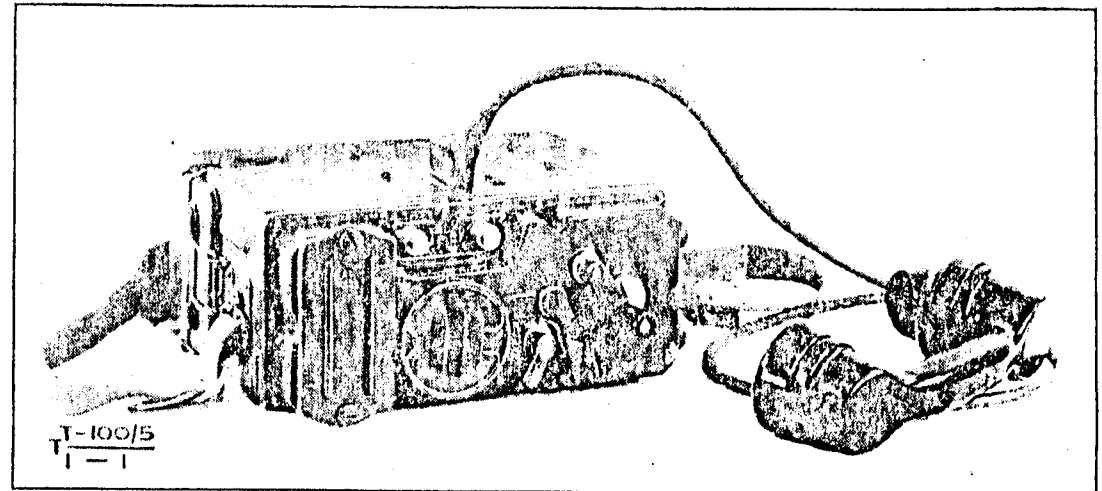


Fig. 1—General view of set

TELECOMMUNICATIONS

T-100/5

4670

ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS

PHYSICAL DATA

Weight: 15 lb.
Height: 10 $\frac{1}{2}$ in.
Depth: 9 $\frac{1}{2}$ in.
Width: 4 $\frac{1}{2}$ in.

FREQUENCY

Speech: Normal audio range.
Ringing: Magneto 17c/s.

POWER REQUIREMENTS

3V, two Cells, dry, X, Mk. II, or inert, S, Mk. I.
Current drawn, approximately 90mA when speaking.

LINE SYSTEM

Any pair of single-wire earth-return telephone circuit.

SPECIAL FACILITIES

Bell may be cut off, e.g., by troops operating in the proximity of enemy positions.

REMARKS

Transmitting and receiving efficiencies, 6 and 11db. higher respectively than the Telephone set F or L. The instrument is suitable for use in tropical climates and, when closed for transit, is protected from damage due to immersion.

END

**ELECTRICAL AND MECHANICAL
ENGINEERING REGULATION**
(By Command of the Army Council)

Comma No 15
~~TELECOMMUNICATIONS~~
~~L-800/3~~
R120

D.F. STATION, TRANSPORTABLE, ADCOCK NO. 3

TECHNICAL HANDBOOK - DATA SUMMARY

PURPOSE

To obtain the bearing of a distant, medium- or high-frequency wireless transmitter.

DESCRIPTION

The station operates on the Adcock system of spaced fixed vertical aeri-als. Indication is aural, sense being obtained by internal tapping of the goniometer. The equipment is tropicalized, housed in a Trailer, 1-ton, 2-wheeled D.F. and contains:-

Reception set R 206, Mk. 5 (D.F. receiver)

Power supply unit No. 33

Adaptor, frequency range No. 1, Mk. 2

Goniometer unit No. 4

Reception set R 209 (D.F. control)

Adaptor, telephone No. 3

Aerial system, medium (or high) frequencies

The trailer is towed by a Truck, 3-ton, 4 x 4, G.S. which also carries the aerial equipment.

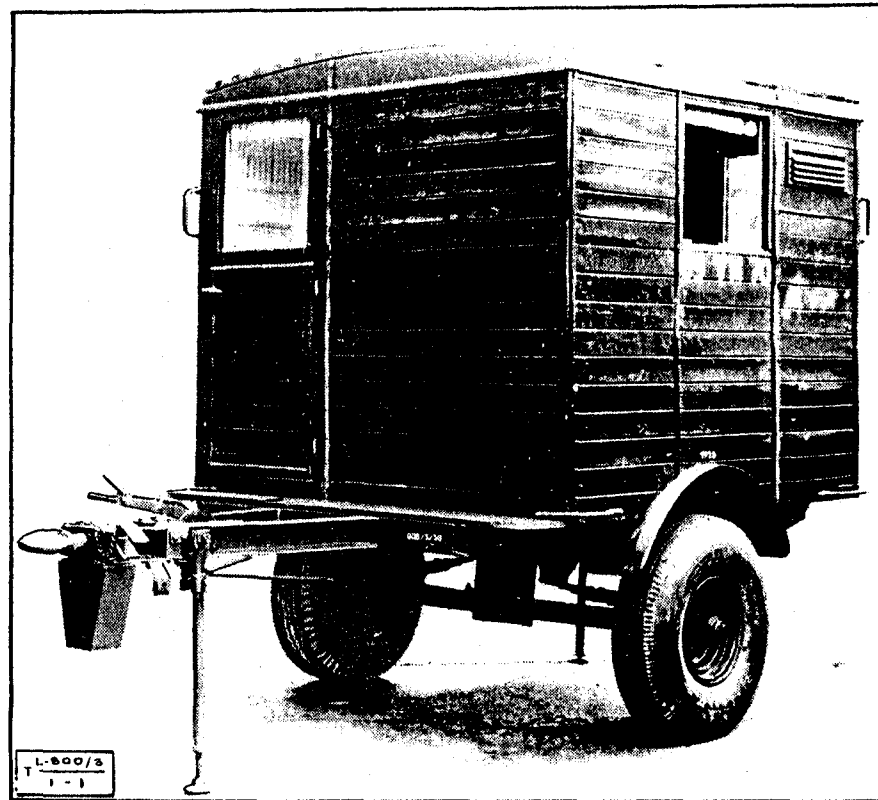


Fig. 1 - General view of equipment

PHYSICAL DATA**Trailer**

Length: 10 ft. 9 in. (including tow bar)
 Width: 6 ft. 5 in.
 Height: 9 ft. 0 in.
 Weight: 25 cwt. (loaded)

FREQUENCY**Coverage**

Medium-frequency aerial - 300kc/s to 4.8Mc/s
 High-frequency aerial - 2.2Mc/s to 15.0Mc/s

PERFORMANCE**Sensitivity**

The station will operate on a field strength of less than $1\mu\text{V/m}$ at frequencies above 600kc/s and less than $10\mu\text{V/m}$ below 600kc/s, for a bearing arc of $\pm 5^\circ$.

D.F. accuracy

Better than $\pm 3^\circ$ on direct ground waves or on sky waves from over 200 miles.

Encl. 2 to 57/Maint./3682

POWER REQUIREMENTS

D.F. receiver : 100-250V, 40-60c/s, 70VA
 or
 12V D.C. 5A
 Interior lighting : 12V D.C. 3A and 230V A.C.
 D.F. control receiver : 6V D.C. 1.7A

AERIAL SYSTEM**Medium frequencies**

Four vertical sectional steel masts, 70 ft. high, erected at the corners of a square, 75 ft. diagonal.

High frequencies

Four vertical sectional steel masts, 24 ft. high, erected at the corners of a square, 30 ft. diagonal.

GENERAL

Calibration unit is included to correct for D.F. errors arising from local site conditions. The station can be set up by a crew of nine men in less than five hours. Only one operator is required.

END

D.F. STATION, MARCONI, DFG 24/4

(ZA 28082)

DATA SUMMARY

PURPOSE

Short-wave direction-finding station.

DESCRIPTION

Works on the Adcock principle of spaced vertical aerials. Continuous visual indication of bearing given on a C.R.O. by means of a spinning goniometer. Radio equipment is housed in a wooden hut in the centre of the aerials.

PHYSICAL DATA

	Complete station	Main assembly
Weight:	-	280 lb.
Height:	8 ft. 9 in.	4 ft. 10½ in.
Length:	11 ft.	4 ft.
Width:	11 ft.	2 ft. 10 in.

FREQUENCY

Coverage, 1.5Mc/s to 20Mc/s in four bands.
Internal, 600kc/s.

12 Oct 1946

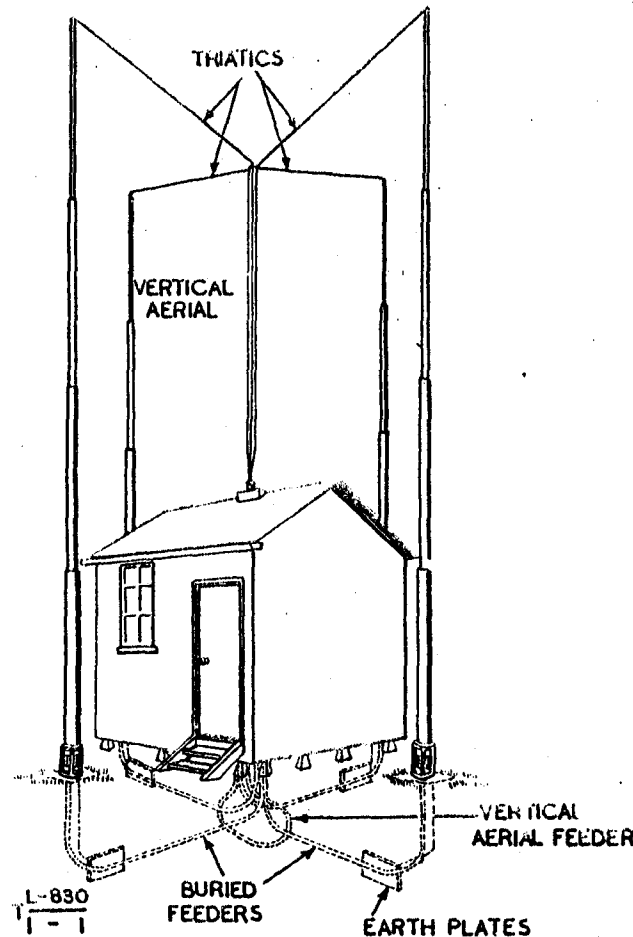


Fig. 1 - External layout of station

R150

PERFORMANCE

Power and type of output: 2mW in 600 Ω headphones.
Display on C.R.O. 200mW
in 125 Ω external loudspeaker
also available.

Sensitivity: Field strength required for 20db.
signal-to-noise ratio on 3kc/s band-width.
1.5 to 8.0 μ v/metre, depending on frequency.
Bearing accuracy, $\pm 2\frac{1}{2}\%$ for direct rays.

POWER REQUIREMENTS AND CONSUMPTION

100-250V, 50c/s 130W. Mains operation.
60V, 94mA H.T. and 8V 9A L.T. Battery operation.

SERIAL SYSTEM

Four vertical mast aerials, 30 ft. high, at the
corners of a square, 20 ft. diagonal. Vertical
sense aerial in the centre.

VALVES

RECEPTION SET MARCONI DFG 24/4

Circuit reference	Type	Serial Type	Function
V1	KTW 61	CV 1281	R.F. amplifier
V2	KTW 61	CV 1281	R.F. amplifier
V3	X 65	CV 1193	L.O. and mixer
V4	KTW 63	CV 1195	I.F. amplifier
V5	KTW 63	CV 1195	I.F. amplifier
V6	KTW 63	CV 1195	I.F. amplifier
V7	KTW 61	CV 1281	A.V.C. amplifier
V8	DH 63	CV 587	Detector and amplifier
V9	KT 63	CV 1186	Output valve
V1	KTW 63	CV 1195	B.F.O.
V1	U 50	CV 3754	Full-wave rectifier

OSCILLOGRAPH, MARCONI TYPE, O.R. 2/3 No. 1

Circuit reference	Type	Serial Type	Function
V1	EF 36	CV 1056	Pulse amplifier
V2	EF 36	CV 1056	Trigger valve

**D.F. STATIONS, MOBILE, B.C.,
NOS. 2A AND 3(T)**

DATA SUMMARY

PURPOSE

These equipments are mobile stations to obtain directional bearing of any transmitter whose groundwave can be received.

DESCRIPTION

Both are rotating loop D.F. stations with vertical sense aerials. B.C. No. 2A is mounted in Trailer, 10 cwt., 2-wheeled : B.C. No. 3(T) is mounted in Trailer, Lt. cargo, amphibian, 2-wheeled, $\frac{1}{4}$ ton. Each station contains the following items of equipment :—

Reception set R. 106 D.F. No. 3	...	...	1	
Intercommunication receiver	...	...	1	
Control gear assembly D.F. No. 3	...	...	1	
Aerial, loop, D.F.B. No. 5	...	...	1	
Aerial, loop, D.F.C. No. 5	...	...	1	
Supply units, rectifier, No. 5	...	...	2	} One only if intercommuni- cation receiver has own power supply unit
Supply units, vibratory, No. 2	...	...	2	
Adaptor, telephone, No. 2	...	...	1	
Batteries, secondary, portable 6V, 100, 125Ah, Mk. 4	...	...	4	

PHYSICAL DATA

Weight :	Trailer, D.F.	Trailer, Lt. cargo
Height (with aerials stowed) :	18 $\frac{1}{2}$ cwt. 7 ft. 6 in.	11 cwt. 4 ft. 1 in.

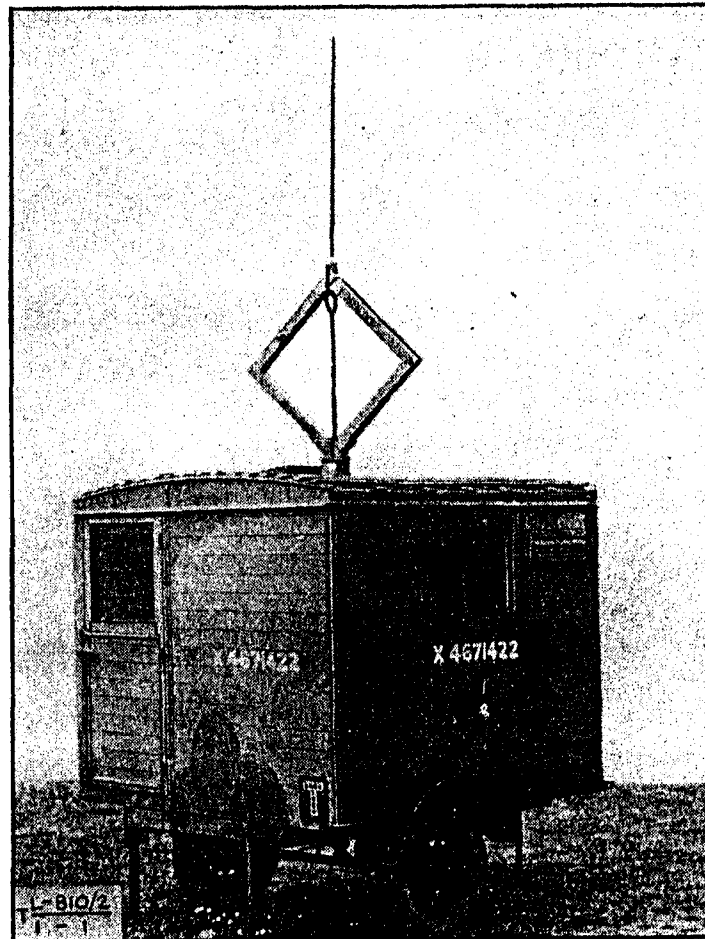


Fig. 1—D.F. Station, mobile, B.C., No. 2A

L810/2 KR40

	<i>Trailer, D.F.</i>	<i>Trailer, Lt. cargo</i>
Height (with loop aerial and 16 ft. rod aerial erected) :	27 ft. 1 in.	25 ft. 7 in.
Length (including towbar) :	9 ft. 8 in.	9 ft.
Width :	6 ft. 5 in.	4 ft. 8 in.

FREQUENCY

0.48Mc/s to 10 Mc/s, using two loops.
0.48Mc/s to 4Mc/s, using loop D.F.C. No. 5.
1.7 Mc/s to 10Mc/s, using loop D.F.B. No. 5.

PERFORMANCE

Equipment is workable with a field strength of not less than $5\mu\text{V}$ — $15\mu\text{V}$ per metre, dependant upon frequency.

POWER REQUIREMENTS AND CONSUMPTION

110V—230V A.C. mains, using Supply unit, rectifier, No. 5 or 6V battery, using Supply unit, vibratory, No. 2.

Consumption : 80—100VA A.C. or
16A at 6V D.C.
with 5A for lighting.

AERIAL SYSTEM

Aerials, loop, D.F.B., No. 5 and C, No. 5.
16 ft. antenna rod F for sense determination.

VALVES

In addition to valves used in Reception set R. 106 D.F. No. 3 and those in the intercommunication receiver.
Type ARP35 — 2

REMARKS

Improved version of D.F. Station, mobile, B.C., No. 2 (see Tels. L 810/1).
Reception set R. 106 D.F. No. 3 is a modified Reception set R. 106.

END

~~1540~~
R160

D.F. STATION, MARCONI, D.F.P.5

DATA SUMMARY

PURPOSE

Transportable direction-finding equipment
covering the range 30-300Mc/s.

DESCRIPTION

The receiver is a normal 8-valve superheterodyne,
and the aerial in use plugs into a socket on top.
It is mounted on a tripod and carries an internal
accumulator.

PHYSICAL DATA

Weight: 80lb.
Height: 5ft. 7in. with loop aerial and tripod
Length: 16in.
Width: 14in.

REMARKS

During transportation the tripod stand forms a
protective cover for the receiver.

Issue 1, 1 Apr. 1947

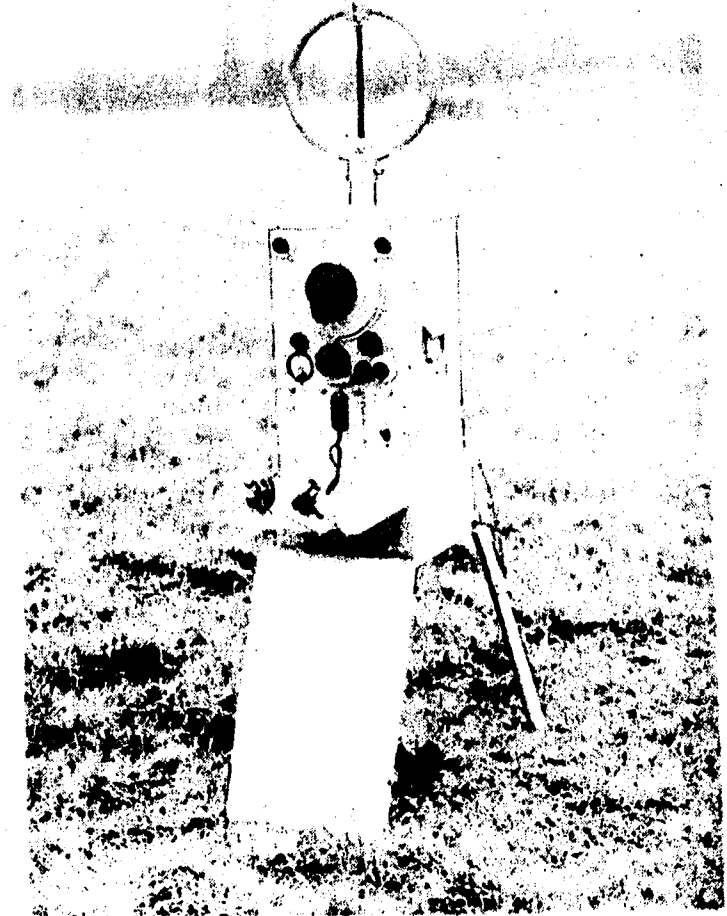


Fig. 1 - General view of
equipment

840

R160

FREQUENCY

Coverage: 30 - 30Mc/s in five ranges
Intermediate: 5.9Mc/s

PERFORMANCE

Bearing accuracy under best conditions to $\pm \frac{1}{2}^\circ$
Power and type of output: 10mW in high-resistance
telephones and meter display
Sensitivity: $8\mu\text{V/m}$ at 30Mc/s.) for $\pm 5^\circ$ arc of
 $400\mu\text{V/m}$ at 30Mc/s.) silence

POWER REQUIREMENTS AND CONSUMPTION

6V accumulator
Consumption, 2A

AERIAL SYSTEM

Three types of aeriels, depending on frequency
9in. dia. loop
Elevated H
Horizontal dipole

VALVES

V1	CV1095 (954) (Acorn)	Mixer
V2	CV1059 (955) (Acorn)	Local oscillator
V3	CV1343 (ARP38)	I.F. amplifier
V4	CV1343 (ARP38)	I.F. amplifier
V5	CV1343 (ARP38)	I.F. amplifier and A.F. modulator
V6	CV1343 (ARP38)	I.F. amplifier
V7	CV587 (6Q7G)	Detector and A.F. amplifier
V8	CV1343 (ARP38)	B.F.O.
V9	CV692 (OZ4)	Full-wave rectifier
X1	Vibrator No.2 (6V)	Vibrator

SPECIAL FACILITIES

Modulation of the I.F. at 1kc/s performed by internal oscillator.

REMARKS

No sense indication given.

END

L-81071
R130

D.F. STATIONS, MOBILE, B.C. NO. 1 AND NO. 2

DATA SUMMARY

PURPOSE

Mobile station to obtain directional bearing of any transmitter whose ground-wave can be picked up.

DESCRIPTION

Rotating loop D.F. station with vertical sense aerial consisting of:—

<i>Equipment</i>	<i>No. off</i>
Reception set R 106 (D.F. receiver)	1 (see Tels. GY 700)*
Reception set R 107 (inter-com.)	1 (D.F. station, Mobile, B.C. No. 2 only).
Aerial coupling unit, D.F., No. 2	1
Control gear assembly No. 2	1
Aerial, loop, type B, No. 3	1
Aerial, loop, type C, No. 3	1
Supply unit, rectifier, No. 5	1
Supply unit, vibratory, No. 2	1
Adaptor, telephone, No. 2	1
Batteries, secondary, portable, 6V, 100/125Ah, Mk. IV	2

NOTE. *Regulation in course of preparation.

PHYSICAL DATA (of trailer)

Weight :	17½ cwt.
Length :	10 ft. 0 in.
Width :	6 ft. 6 in.
Height :	7 ft. 6 in. (without loop)
	11 ft. 0 in. (with C loop)
	10 ft. 6 in. (with B loop)

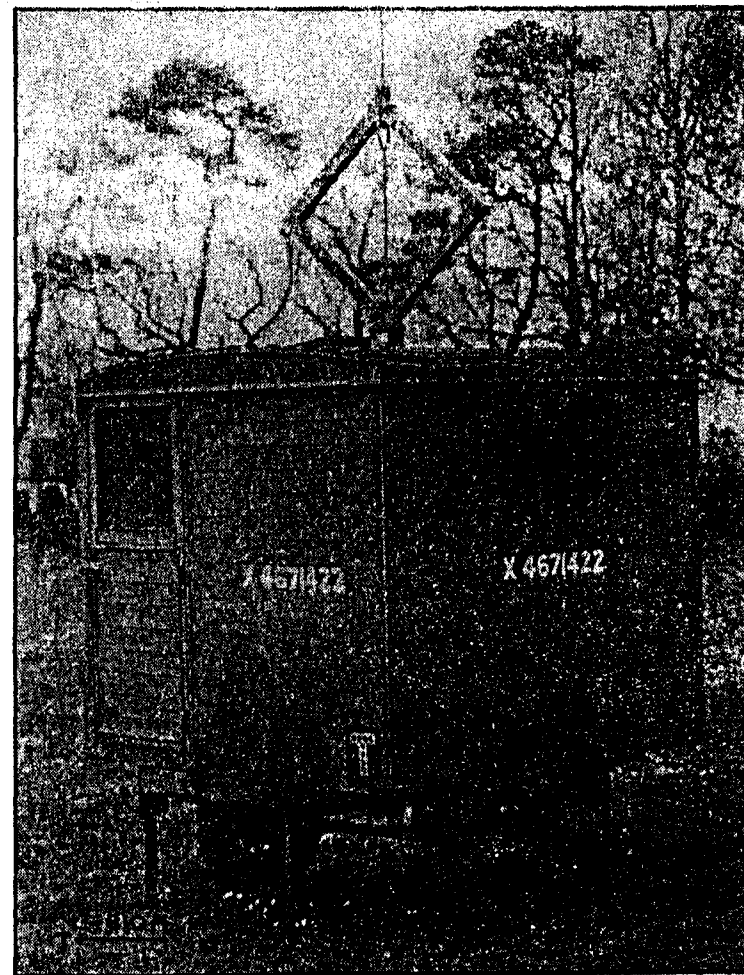


Fig. 1—General view of equipment

810/1 - R130.

FREQUENCY

Coverage : 160kc/s - 9.4Mc/s, using two loops as follows :—
D.F. loop B : 9.4 Mc/s - 1.4 Mc/s
D.F. loop C : 3.2 Mc/s - 160 kc/s

PERFORMANCE

Equipment is workable with field strengths of not less than 5 - 15 μ V per meter, depending upon the frequency.

POWER REQUIREMENTS AND CONSUMPTION

Power supply :—
Either 230V A.C. mains, using Supply unit, rectifier, No. 5
or 6V, using Supply unit, vibratory, No. 2.

Power consumption :—
230V A.C., 40-50W at 110 — 230V per set.
6V D.C., 8A + 5A for lighting.

AERIAL SYSTEM

Aerials, loop, D.F., B, No. 3.
Aerials, loop, D.F., C, No. 3.
9 ft. vertical antenna for sense determination.

REMARKS

The D.F. B.C. No. 2 consists of a D.F. B.C. No. 1 station fitted into a Trailer, 10 cwt., 2-wheeled, D.F. and provided with a separate intercommunication receiver, usually an R 107.

END.

RECEPTION SET D.F.P. 4 (ZA 15505)

(OBSOLESCE)

DATA SUMMARY

PURPOSE

A transportable direction finder for use in the field.

DESCRIPTION

The set is a six-valve superhete rodyne receiver, using R.F. amplifier, mixer, I.F. amplifier, detector and beat oscillator and output stages. The receiver is housed in a metal-faced plywood box with a watertight lid. The L.T. and H.T. batteries are also contained in this box. Two other similar boxes carry the aerial and fittings, spares, valves, etc. and the tripod legs upon which the receiver is set up for operation. The position of the minimum may be determined either aurally or visually, the latter being shown on a meter. For correct sense determination the signal from a vertical aerial is combined with those from the loops at the "heart" valve.

PHYSICAL DATA

	<i>Receiver and batteries in box</i>	<i>Accessory unit</i>	<i>Tripod and aerial</i>
Weight :	88 lb.	88 lb.	35 lb.
Length :	15½ in.	15½ in.	10 in. dia. 47 in. long
Width :	12 in.	12 in.	
Height :	23 in.	19½ in.	

FREQUENCY

Coverage : 75kc's--3,400kc/s in five ranges.

Internal : 60kc's on ranges 1, 2 and 3, 450kc's on ranges 4 and 5.

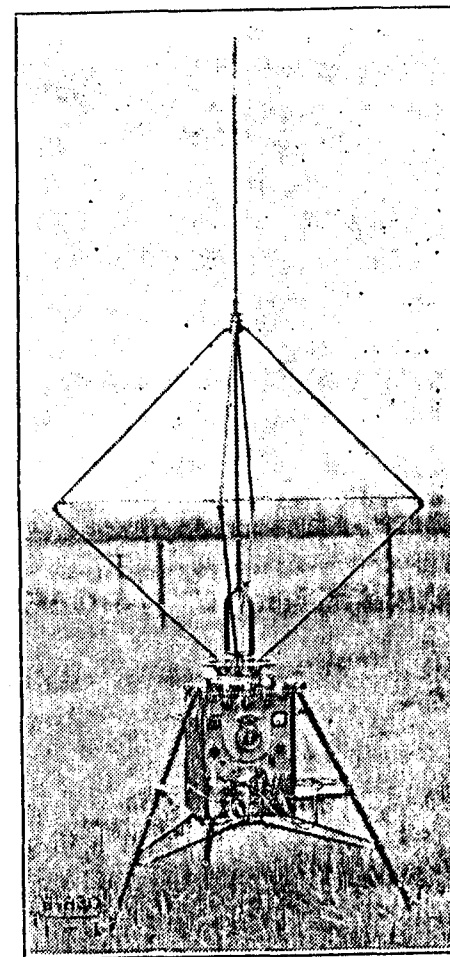


Fig. 1—General view of equipment

PERFORMANCE

Receiver D.F. efficiency: Under suitable radio-noise conditions and with a steady C.W. telegraph signal in which the direct ray predominates, a minimum of $\pm 3^\circ$ is obtained with an input field strength of 3-60 μ V per meter, the figure varying with the frequency used. With these field strengths the signal/noise ratio at the maximum of the figure of eight polar diagram will be 15-20db. excluding radio noise.

Selectivity: The bandwidth at -6db. is about 4kc/s on both values of the intermediate frequency.

POWER REQUIREMENTS AND CONSUMPTION

Power supply: 2V, 24Ah battery up to 1.4W.
120V dry battery up to 1.68W.

AERIAL SYSTEM

Two rectangular loops set at right-angles, surmounted by a vertical rod. The system is capable of being rotated.

VALVES

<i>Circuit reference</i>	<i>Type</i>	<i>Function</i>
V1	ARP4	"Heart" valve
V2	ARP4	R.F. amplifier
V3	X21	Mixer
V4	ARP4	I.F. amplifier
V5	X21	Detector and beat oscillator
V6	ARP4	Output

END

SWITCHBOARD, U.C., 6- AND 10-LINE

U 030

(6-Line, YA 2668, 10-Line YA 2669)

DATA SUMMARY

PURPOSE

The switchboards, U.C., 6-line and 10-line are portable telephone switchboards for field use.

DESCRIPTION

They are built on the unit principle, each comprising line units, common apparatus unit and operator's units. One line unit is used for each line (six in the 6-line and ten in the 10-line) and each unit may be removed for adjustment or repair without disturbing other line units or circuits. Lamps are provided in the line units as calling and clearing indicators. The common apparatus unit includes a magneto and buzzer for calling purposes. The calling signal operates a relay via a rectifier bridge. The operator's unit incorporates an auto sidetone circuit, which suppresses sidetone to a low level, and a crash limiter protects the operator from acoustic shock. The units are housed in a pressed steel case, to which is secured a second smaller case, containing the telephone, hand and cords and weights when the instrument is packed for transport, etc. A night alarm bell is supplied.

PHYSICAL DATA

	6-line	10-line
Weight :	35 lb. 6 oz.	47½ lb.
Length :	1 ft. 5½ in.	1 ft. 10½ in.
Width :	1 ft. 4½ in.	1 ft. 4½ in.
Height :	1 ft. 4¼ in.	1 ft. 4⅛ in.

LINE SYSTEM

Any line using magneto or buzzer calling.

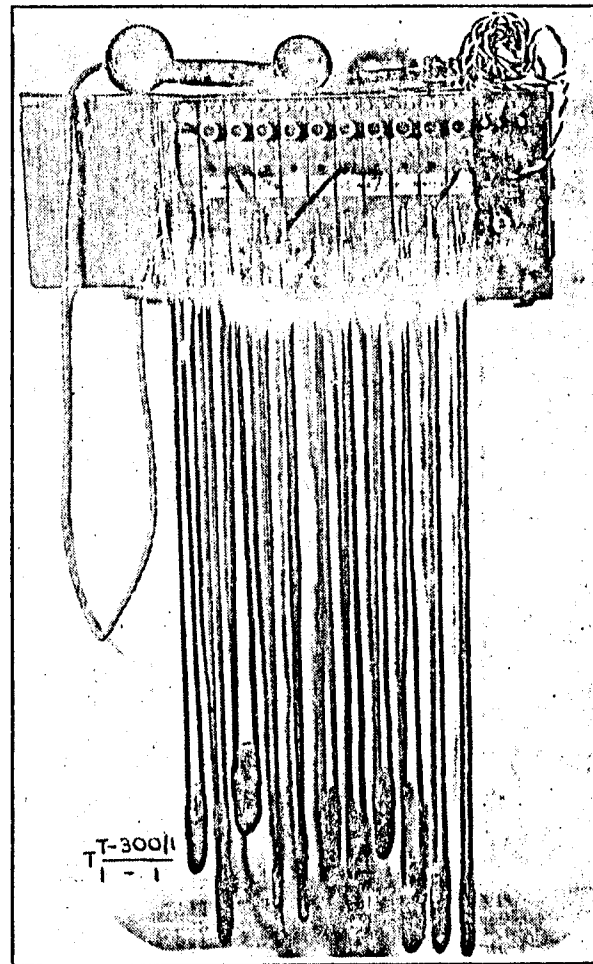


Fig. 1.—General view of Switchboard, U.C., 10-line.

SWITCHBOARD, MAGNETO, 10-LINE (W.D.)
DATA SUMMARY

U 040

PURPOSE

Portable switchboard for use in field telephone systems. May be used in any climate.

DESCRIPTION

10-line switchboard, designed for magneto calling only. Telephone set T (or equivalent) used as the operator's telephone. Alarm facilities (including buzzer) are provided.

PHYSICAL DATA

Weight (including earth pin) : 23 lb.

Height : 5 $\frac{3}{4}$ in.

Length : 14 $\frac{1}{2}$ in.

Width : 9 $\frac{1}{4}$ in.

RANGE

Switchboard does not appreciably affect the range of the telephones in use.

POWER REQUIREMENTS AND CONSUMPTION

3V battery (not supplied) for night alarm buzzer where required.

REMARKS

Enclosed in immersion-proof metal case fitted with carrying strap. Earth pin attached to carrying strap.

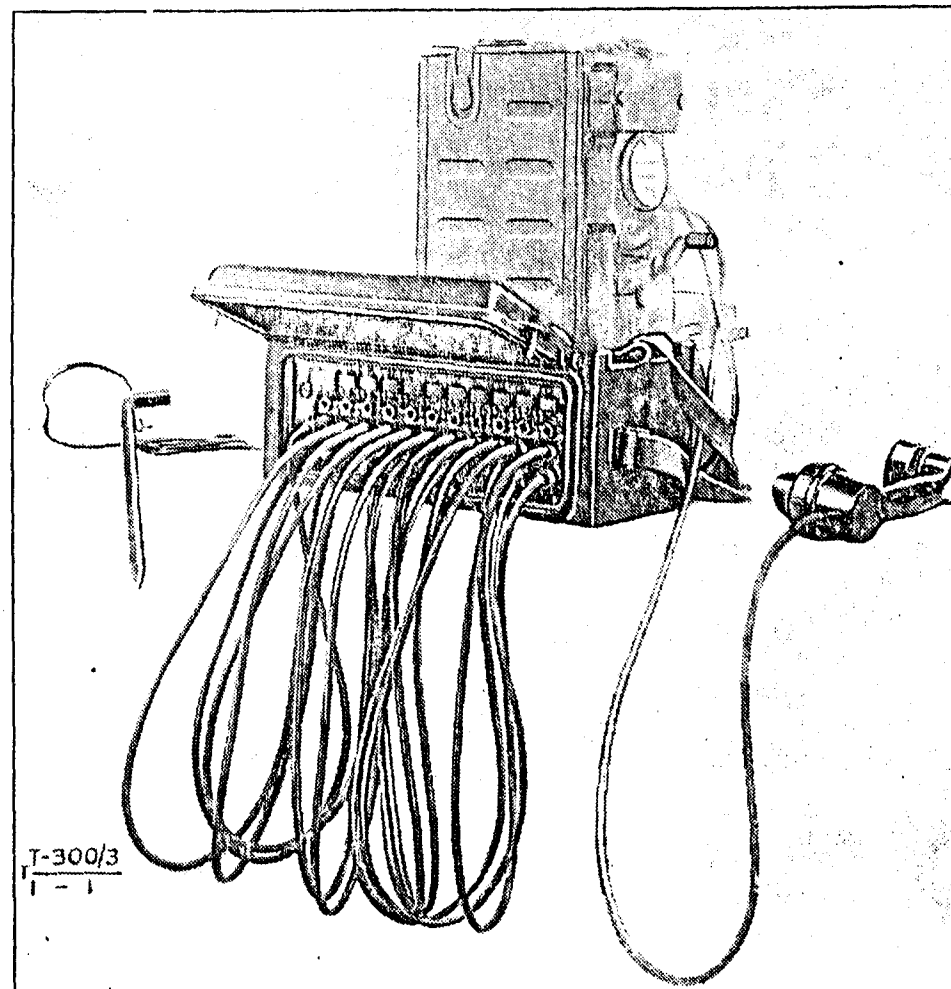


Fig. 1—View of Switchboard, magneto, 10-line (W.D.) and Telephone set T

END

Distribution—Code No. 4

Page 1

EXCHANGE, C.B., MULTIPLE (W.D.), UNIT TYPE, N POSITIONS

POWER SUPPLY EQUIPMENT

DATA SUMMARY

NOTE: This information is provisional and is supplied for guidance pending the issue of more complete instructions. All errors of a technical nature should be notified in accordance with Tels. A 009.

PURPOSE

The power supply equipment provides all the power to operate the exchange (exclusive of accommodation requirements) from either A.C. mains or petrol-engined generators. The equipment is installed near to the apparatus and switch rooms, but in a separate room if possible (see Tels. T 423). The earth system provides an efficient earth for the whole exchange for use with earth return signalling systems and for protection of the exchange equipment.

DESCRIPTION

For a 6-position exchange, the power equipment comprises the following component units:—

- (a) 16 Batteries, secondary, portable, 6V, 170AH (ZB 0588).
- (b) One power distribution panel (YA 6860).
- (c) Three A.C. mains-operated Battery charges, 24V, 10A, No. 1 (ZB 10234).
- (d) One petrol-engined Charging set 1,260W, No. 1 and associated switchboard (ZB 1120).

For an 8-12-position exchange, two entirely separate power supply systems are provided.

For 14-18-position exchange, three entirely separate power supply systems are provided, and so on. In the power supply system, the 16 batteries are cabled to the distribution panel. Eight batteries can be connected in series to give a 48V supply to the exchange, while the remaining eight are connected in series-parallel for charging from a 24V source.

The earth system consists of four buried earth plates cabled to the earth distribution panel on the exchange M.D.F. From this panel the earth is distributed throughout the exchange.

PHYSICAL DATA

Item	Length	Width	Height	Weight	
				Unpacked	Packed
Power panel	2 ft. 6½ in.	1 ft. 0 in.	6 ft. 6 in.	161 lb.	968 lb.
Single battery	1 ft. 5 in.	7½ in.	1 ft. 6 in.	110 lb.	155 lb.
A.C. chargers	2 ft. 0 in.	1 ft. 3½ in.	2 ft. 8 in.	141 lb.	242 lb.
1,260W generator				228 lb.	336 lb.
Engine and generator	2 ft. 5 in.	1 ft. 6 in.	1 ft. 8¼ in.		
Switchboard	9¼ in.	1 ft. 6 in.	1 ft. 8 in.		

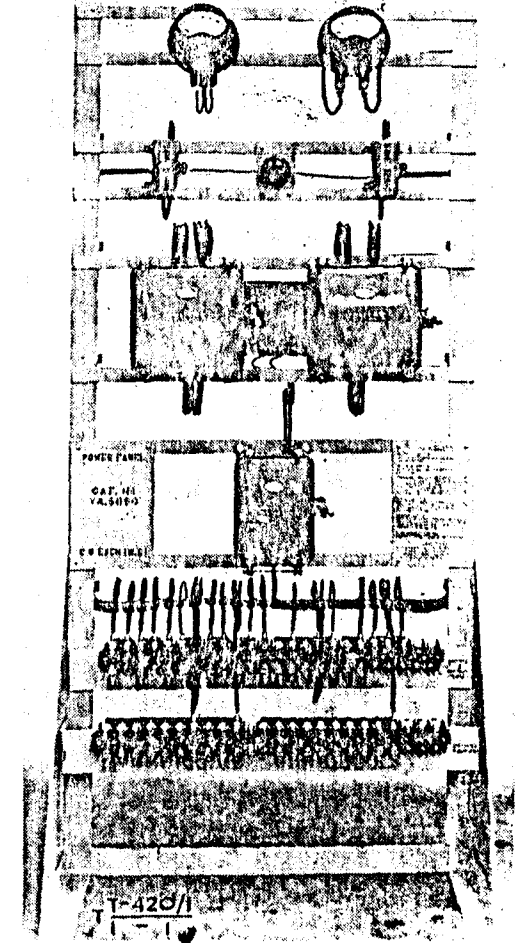


Fig. 1—Power distribution panel

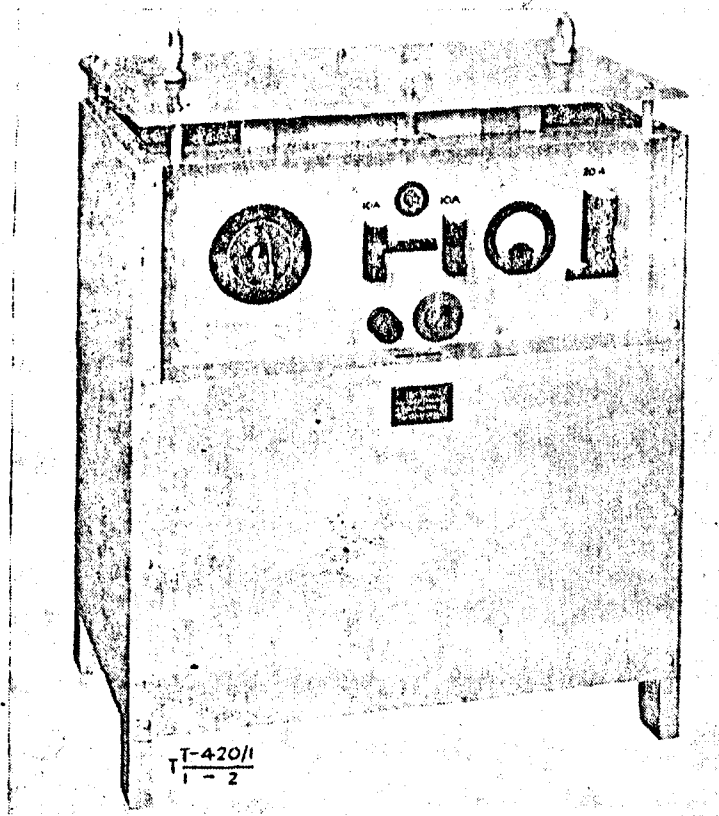


Fig. 2—Battery charger, 24V, 10A, No. 1

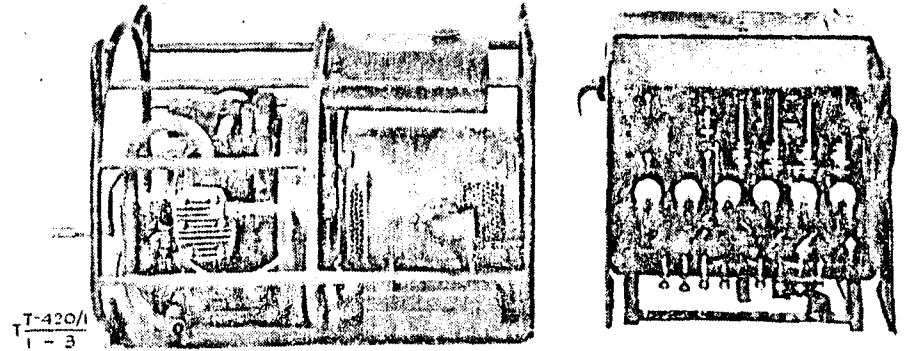


Fig. 3—Charging set 1,260W, No. 1 and switchboard

Cables: 110 yd., 0.06J low : 104 lb.
440 yd., 0.01J low : 100 lb.

POWER REQUIREMENTS

(Available rating required per six positions)
A.C. mains, 110-120V, 20-25A, 50c/s, single-phase, or
220-250V, 10-15A, 50c/s, single-phase.

REMARKS

The connection between the power equipment and earth system and the rest of the exchange is described in Tels. T 423, which covers the exchange installation.

END

SWITCHBOARDS, C.B. 935, $\frac{3+7}{12}$ AND $\frac{3+9}{12}$ (YA 6147)

DATA SUMMARY

PURPOSE

For use in static H.Q.'s etc.

DESCRIPTION

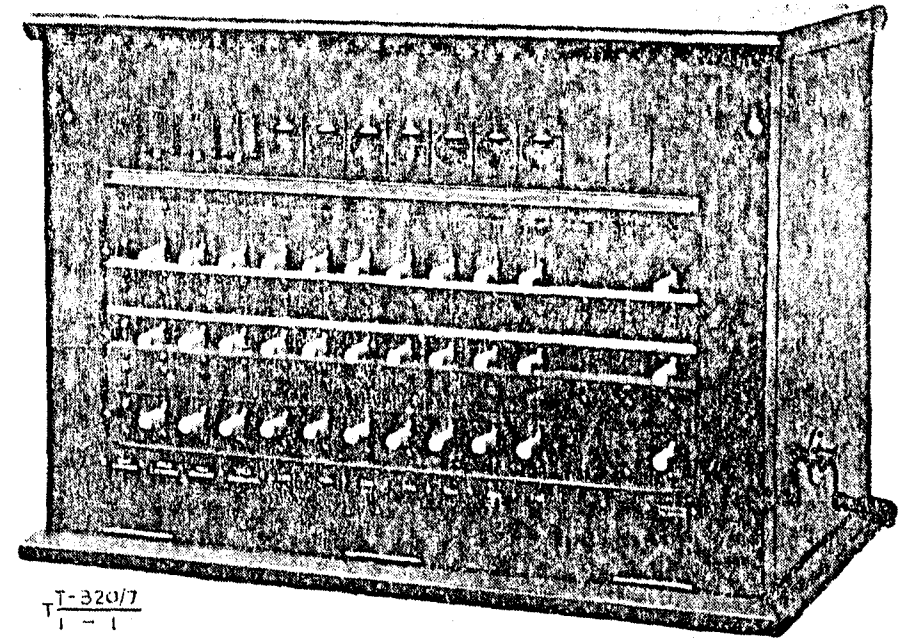
The $\frac{3+7}{12}$ and $\frac{3+9}{12}$ G.P.O. type switchboards both provide for three exchange lines terminating on hand-restored drop shutters, and seven and nine extensions respectively terminating on "doll's eye" indicators. The boards are equipped with RING and interconnecting keys, HOLD EXCHANGE keys and a NIGHT ALARM. A hand generator is supplied for ringing and a standard telephone, less bell set, is supplied for the operator. The switchboard can be connected to C.B. manual or automatic exchanges.

PHYSICAL DATA

Weight : 65 lb.
Length : 1 ft. 10 $\frac{1}{2}$ in.
Width : 1 ft. 0 $\frac{1}{8}$ in.
Height : 1 ft. 2 $\frac{1}{2}$ in.

POWER SUPPLY

Any smoothed D.C. supply which will maintain a minimum P.D. of 12V at switchboard bus-bars on full load, but not to exceed 24V on the lightest load. Alternatively, one set of ten primary cells (1.5V) connected in series.



T-320/7
T-1

Fig. 1—Front view of Switchboard, C.B. 935, $\frac{3+7}{12}$

POWER CONSUMPTION

Variable according to load.

Maximum (with all connecting sets in use on local connections) with 12V bus-bars : 0.32A.

Hypothetical average consumption over busy period (not peak) : 0.054A.

LINE SYSTEM

C.B. signalling limits :—

- (a) The resistance of the exchange line, plus series resistance of

switchboard connecting cct, plus extension line, must not exceed 500Ω. This may be reduced by limiting the resistance for C.B. telephone.

- (b) The resistance of the exchange line, plus series resistance of switchboard connecting cct, plus extension, must not exceed the figure laid down for the civil exchanges concerned.

OVERALL RANGE

Range of lines connected reduced by connecting circuit loss of approximately 2db.

END

EXCHANGE, C.B., MULTIPLE (W.D.), UNIT TYPE, N POSITIONS

DATA SUMMARY

NOTE: *This information is provisional and is supplied for guidance pending the issue of more complete instructions. All errors of a technical nature should be notified in accordance with Tels. A 009.*

PURPOSE

Central battery (C.B.) telephone exchange for large headquarters. Suitable for local network and for switching centre.

FACILITIES

The exchange consists of a number of units which may be assembled and cabled to provide a C.B. telephone exchange, i.e., an exchange with a central battery for signalling and transmission purposes. The maximum size is one of 1,200 multiple jacks, which may be used as either extensions or junctions, according to the cabling scheme. Normally two jacks are required per junction, one jack for the designation peg, so that the maximum number of lines is, say, 900 extensions plus 150 junctions, or equivalent. The capacity may be slightly increased by using one common designation multiple jack per group of junctions.

CONSTRUCTION

The exchange consists of the following component units:—

Main distribution frame (M.D.F.) YA 6725

The M.D.F. provides facilities for connecting any external line to any one of the exchange terminal equipments, or to another external line. As a subsidiary function, it carries line fuses and lightning arrestors. Test facilities are also provided. The frame has seven verticals and is designed for floor mounting, against a wall. One frame is equipped for 400 lines with 540 external cable pairs, and carries three protector and four fuse mountings on each vertical.

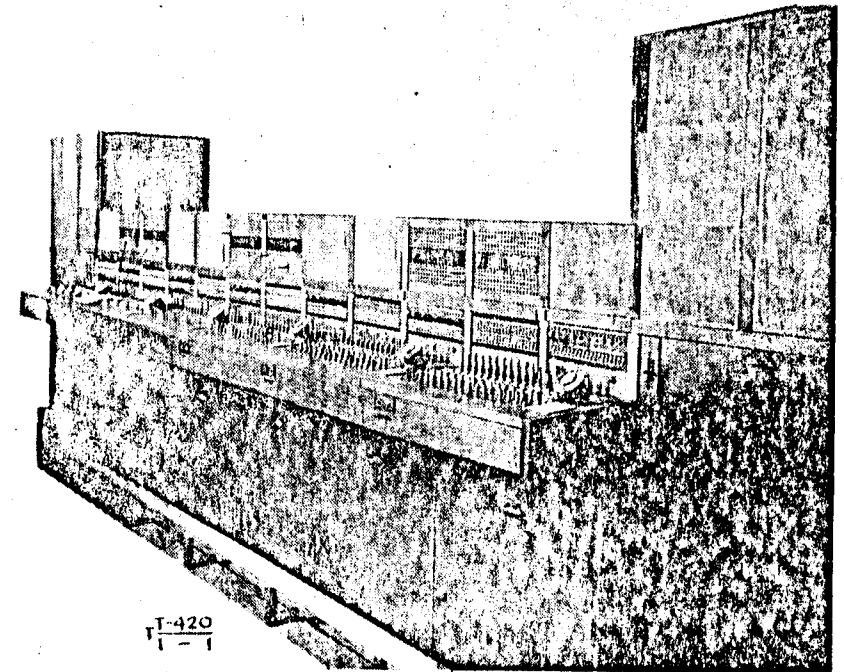


Fig. 1—6-position switchboard suite

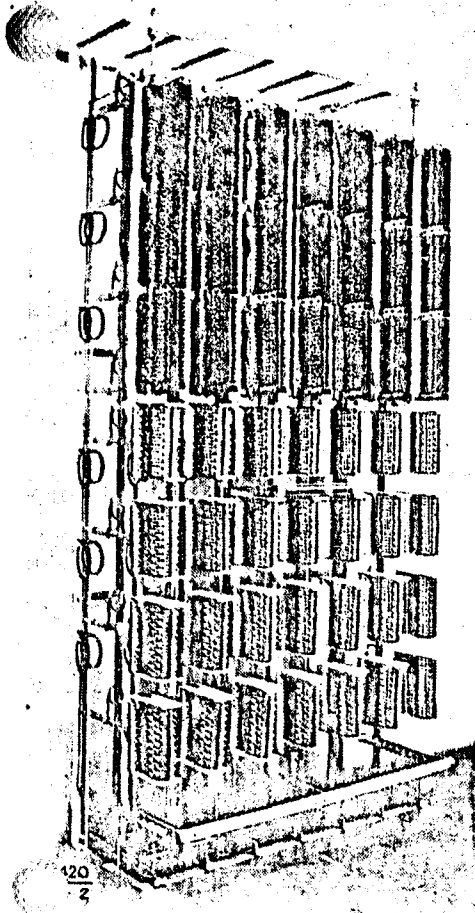


Fig. 2—M.D.F.
unit equipped

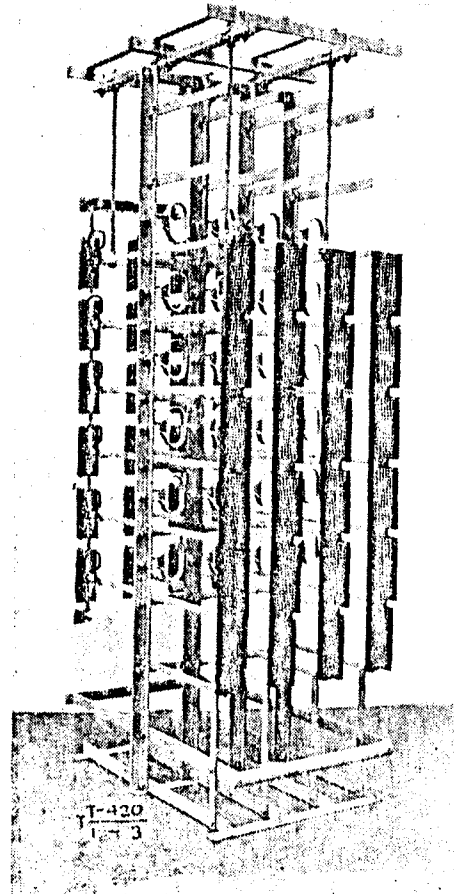


Fig. 3—I.D.F.
unit equipped

Physical data

Floor space occupied: 3 ft. 4½ in. x 1 ft. 11 in.
Height of frame: 8 ft. 0 in.
Weight (fully loaded): 1,232 lb. unpacked
1,310 lb. packed

Intermediate distribution frame (I.D.F.) YA 6726

The I.D.F. provides facilities for the internal distribution of circuits within the exchange. The frame is double-sided, having multiple and local sides, and consists of four verticals. One frame is equipped for 400 lines. Each vertical carries 12 terminal strips, six local and six multiple sides respectively.

Physical data

Floor space occupied: 3 ft. 2¼ in. x 1 ft. 8¼ in.
Height of frame: 7 ft. 0 in.
Weight (fully loaded): 373 lb. unpacked
712 lb. packed.

Line and cut-off relay rack (L and CO rack) YA 6728; Junction relay set rack (J.R.S. rack) YA 6729, including Junction relay sets (YA 6730)

These racks are convenient points of concentration for the terminal relay equipment of incoming and outgoing lines. The L and CO rack is supplied fully equipped with 300 sets and cut-off relays, all wired to tag blocks at the top of the rack. The relays are mounted ten per mounting plate, each plate having its individual dust cover, and the whole rack is enclosed by front and rear panels to reduce troubles from dust and dirt. The J.R.S. rack is supplied with relay set shelves and wiring, but the relay sets are provided separately. The rack is equipped with six shelves, each nominally capable of carrying seven relay sets on jack-in mountings. The shelves are equipped for 40 relay sets, thus leaving space to accommodate two spare relay sets.

U176 ~~P-420~~

Physical data

<i>L and CO rack</i>	<i>J.R.S. rack (without relay set)</i>	<i>Relay set</i>
Floor space 3 ft. 9½ in. x 1 ft. 6 in.	3 ft. 9½ in. x 1 ft. 6 in.	
Height: 7 ft. 0 in.	7 ft. 0 in.	
Weight: 779 lb. unpacked 1,716 lb. packed	591 lb. unpacked 1,232 lb. packed	13½ lb., or in cases of five sets, 150 lbs.

Switchboard 10 + 50 (YA 6723)

60

Each switchboard section is a complete operator's position. These are always installed in pairs as the multiple units exactly fit on top of two positions. The position and associated equipment provide the operator with calling, answering and connecting facilities for all lines available to the position. The switchboard positions include the following equipment:—

- (a) Operator's telephone circuit.
- (b) 16 connecting cord circuits with ringing and dialling facilities.
- (c) 60 answering lamps and jacks.
- (d) Cord test facilities, etc.

Physical data

(One switchboard position)

Floor space occupied: 2 ft. 5 in. x 1 ft. 11¼ in.
 Keyshelf overhang: 1 ft. 0 in.
 Height: 4 ft. 3 in.
 Weight: 340 lb. unpacked
 1,185 lb. packed.

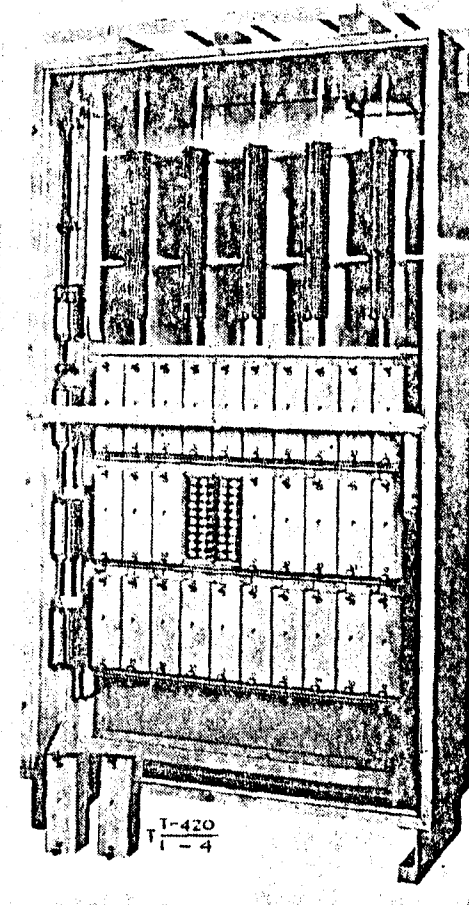


Fig. 4—Equipped L and CO relay racks

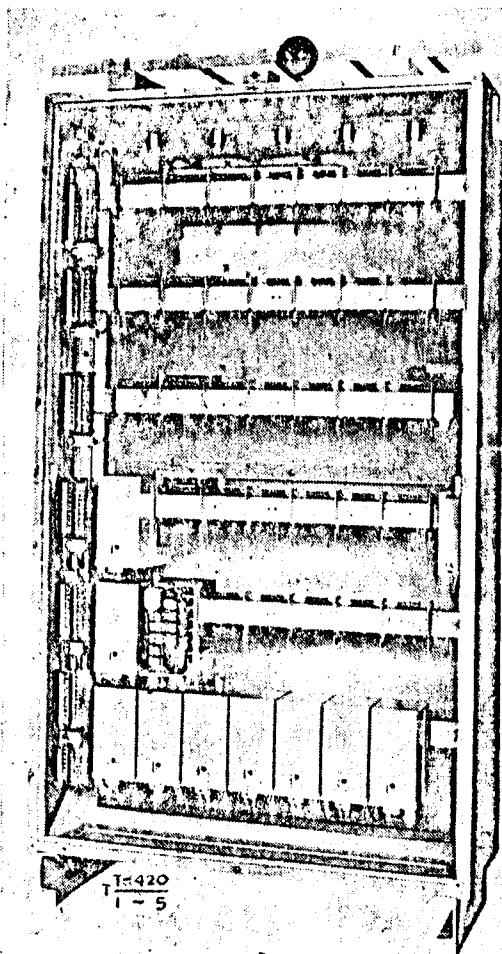


Fig. 5—Junction relay set rack

Multiple units (YA 6724)

The multiple units are designed for mounting on top of the switch-board positions to give an initial multiple of 400 outgoing jacks. Additional multiples may be banked on top of the first to increase the multiple to 800 or 1,200 jacks. All the jacks are not available for service as each junction line (or group) requires a second jack for designation purposes. The multiple units are supplied wired to pinch-strip terminal strips for ease in intercommunication of multiples.

Physical data

Floor space occupied: Nil, as it is mounted on switchboard
 Height: 9 in.
 Weight: 124 lb. unpacked
 448 lb. packed.

Cable terminating sections (YA 6727)

This section consists of an enclosed rack for mounting tag blocks and pinch-strips permanently wired for intercommunication with the end multiple turret. This ensures that multiple cabling on site is limited to cabling between tag blocks on I.D.F. and C.T.S. One C.T.S. is required at each end of a suite of positions.

Physical data

Floor space occupied: 2 ft. 5 in. x 2 ft. 3 in.
 Height: 6 ft. 6 in.
 Weight: 416 lb. unpacked
 1,176 lb. packed.

Intermediate distribution frame and cable terminating section combined (YA 7730)

This unit is intended for use in exchanges having a maximum of only one multiple unit, i.e., normally a maximum of six switch-board positions. It combines in one unit the functions of the

I.D.F. and C.T.S., and can be fitted at either end of the switchboard suite. An end panel is provided for closing the suite at the end opposite to the combined I.D.F. and C.T.S. The I.D.F. section is double-sided (local and multiple) and consists of five verticals. The C.T.S. is equipped with tag blocks and pinch-strips for interconnection with the adjacent multiple unit and with lengths of 81-wire cable for connection to answering equipment.

Physical data

<i>C.T.S. and I.D.F.</i>		<i>End panel</i>
Floor space occupied:	4 ft. 3 in. x 2 ft. 2 in.	2 ft. 2 in. x 1 ft. 3 in.
Height:	4 ft. 6 in.	4 ft. 6 in.

Cable runways (YA 6861)

The cable racks and runways provide simple, neat and convenient means of carrying cables from point to point.

Physical data

Length per section of running: 6 ft. 0 in.
 Width: 1 ft. 3 in.
 Weight per section: 29 lb.
 392 lb. per case of 10 sections packed.

Cables

The cable used for internal cabling in the exchange is standard switchboard cable core, impregnated and having a polyvinyl-chloride (P.V.C.) sheath overall. The standard switchboard cable colour code and conductor make-up apply.

Physical data

81-wire P.V.C. sheathed cable 440 yd.: 525 lb. including drum
 61-wire P.V.C. sheathed cable 440 yd.: 446 lb. including drum
 41-wire P.V.C. sheathed cable 660 yd.: 509 lb. including drum
 21-wire P.V.C. sheathed cable 110 yd.: 58 lb. including drum.

Jumper wiring on frames

This is carried out with 1/028 P.V.C.-covered wire which is used as 1, 2, 3 and 4 wires twisted together as required.

Physical data

Single jumper wire 220 yd.: 3 lb. including drum
 Twin jumper wire 1,760 yd.: 56 lb. including drum
 Triple jumper wire 880 yd.: 30½ lb. including drum
 Quad jumper wire 440 yd.: 24½ lb. including drum.

Test rack (YA 7208)

A separate test rack is supplied as one unit of the exchange; it consists of the following items:—

- (a) Line test case.
- (b) Generator answering unit.
- (c) Access jack unit.

Access jack units are also supplied with the junction relay set racks at the rate of one per J.R.S. rack. Complete testing facilities are provided, both for line testing and testing of the exchange itself.

Power supply unit (YA 6860)

The power supply unit permits two sets, each consisting of two 24V battery units, to be connected in series to give an exchange voltage of 48V on discharge, and to be connected in parallel for charging. The charging plant can be operated from A.C. mains, 100-250V, 60-60c/s and/or from petrol engine charging equipment (see Tels. T 420/1).

EXCHANGE, FIELD, 40/160 LINE

TECHNICAL HANDBOOK - DATA SUMMARY

ROLE

The exchange is intended primarily for use at Brigade, Division and Corps Headquarters.

DESCRIPTION

The exchange comprises from one to four switchboard positions, each of which provide terminations for 40 lines

with (as required) 40 or 80 multiple jacks. The lines may be switched to operate as magneto or central battery extensions, as magneto or C.B.S. (Magneto call/C.B. clear) junctions to any current British Army exchange, and may also be worked as exchange lines to the majority of civil manual exchanges. When working to most types of civil automatic (and a few manual) exchanges,

an auxiliary unit is necessary. With all systems of working an engaged test is available at the multiple, and electromagnetic indicators give calling and supervisory signals; there is no through-clearing facility. Each switchboard position is built up from three basic units: the Line Unit (upper case), the Keyboard Unit and the Base Unit containing cabling and installation kits. The power distribution unit on top of the line unit folds back into it for stowage. The auxiliary unit (when required) is mounted in the line unit. All major

assemblies and components are plug-in and all cabling between units and positions terminate in multi-point plugs and sockets. Additional items, not mounted on the switchboard, include:-

- Chairs, folding, tubular.
- Panels, patching and communication, 30 line.
- Terminal boxes, 10 pair, cylindrical.
- Cable, telephone, 10 pair with couplers.
- Batteries, secondary, acid, 12V 75Ah.

PHYSICAL DATA

Description	Height	Width	Depth	Weight	Remarks
Line unit	17 in.	24 in.	15.1/4 in.	115 lb	} Basic switchboard
Keyboard unit	20.1/4 in.	24 in.	15.1/4 in.	186 lb	
Installation kits No 1	14 in.	24 in.	15.1/4 in.	80 lb	
Installation kits No 2	14 in.	24 in.	15.1/4 in.	104 lb	Contain accessories necessary to increase size of exchange to 2, 3 and 4 positions respectively.
Installation kits No 3	14 in.	24 in.	15.1/4 in.	104 lb	
Installation kits No 4	14 in.	24 in.	15.1/4 in.	122 lb	

CLIMATIC RANGE

Temperature: Operation: -28°C to +55°C
Storage: -40°C to +70°C

Humidity: Operation: 100% up to 30°C
Storage: 95% up to 40°C
Altitude: Operation up to 5,000 ft.

**ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS**

**TELECOMMUNICATIONS
U 190**

TRANSPORTATION DATA

The equipment is dust, damp and drip proof and may be transported in vehicles over rough ground in the operating condition. In the transit condition it may be carried in unpressurized aircraft up to 25,000 ft.

OPERATIONAL DATA

Line signalling limits are as follows:

Magneto: 1500 Ω loop with 5000 Ω leak
CB Extn: 800 Ω loop with 10,000 Ω leak
CBS Junction: 1200 Ω loop with 10,000 Ω leak
Loop resistance includes the telephone instruments.

Reliable operation may be obtained on sloping ground and under conditions of earth vibration due to heavy traffic or bombardment.

ASSOCIATED EQUIPMENT

Exchange, telephone, central battery, CB20.

Automatic exchange 100 Line (H.Q.)
48 Line (TRUNK)
64 Line (TRUNK).

POWER REQUIREMENTS

Two 12V 75Ah secondary batteries permit all systems of working to be employed. The internal 8V battery permits magneto working and connection to a civil automatic or manual exchange only. Ringing current is obtained from a hand generator; alternatively, with a 24V supply, a transistor ringer may be used.

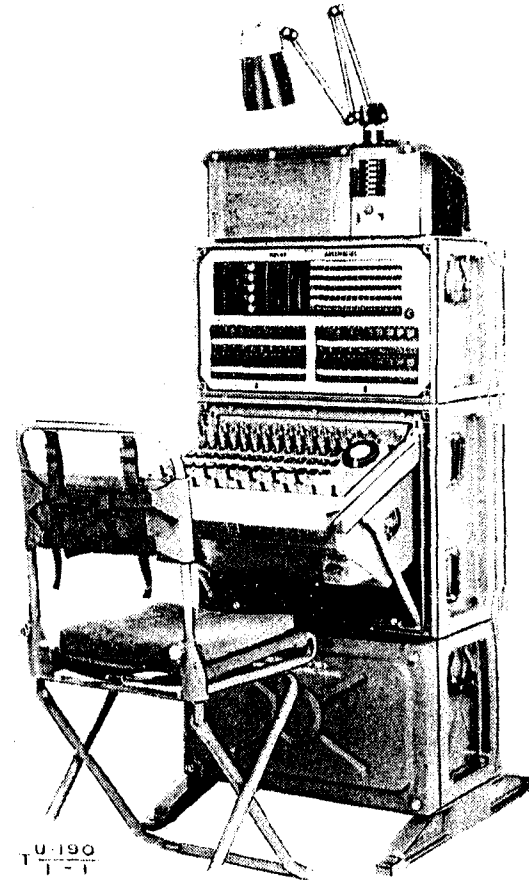


Fig 1 - General view

PRIVACY EQUIPMENT NO. I, MKS. I, I* AND II

STATION A, MK. I YB. 02996 ; MK. I* YB. 02997 ; MK. II YB. 03243

STATION B, YB. 02998

DATA SUMMARY

PURPOSE

This equipment provides telephonic communication which is proof against casual or intentional eavesdropping. It is normally located with an extension telephone.

DESCRIPTION

It consists essentially of a frequency changer which inverts speech from the telephone before transmission to line. Inverted speech received from the line is again inverted to form normal speech and passed to the telephone. The use of the frequency changer can be shared among three telephones by means of the auxiliary apparatus unit. The make-up of the Mk. I, I* and II equipments is shown in Table I.

FREQUENCY

Oscillator frequency is $2,500 \text{ c/s} \pm 5 \text{ c/s}$.

Effective range of frequency changer is 200–2,300 c/s.

PERFORMANCE

The equipment has zero overall equivalent and consequently will work over any link which permits normal telephonic communication. If Apparatus, V.F. telegraph (S + Dx) is working on such a link, however, quality of speech will be degraded as the band 540–900 (approx.) will be removed from the speech spectrum.

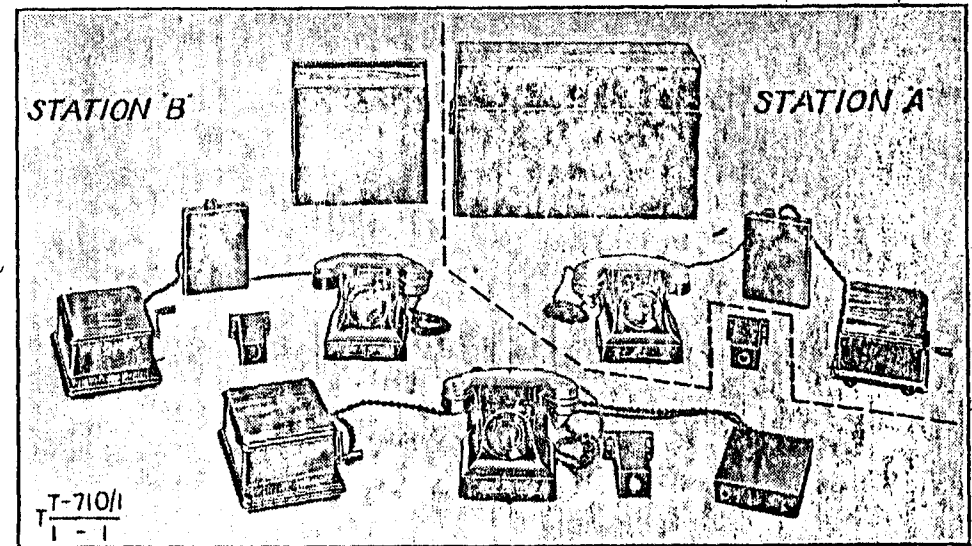


Fig. 1—Main components of stations A and B

PHYSICAL DATA

	Station B			
	Station A (Case, transit No. 12, filled)	Case, transit No. 13, filled	7 pr/10 cable and drum	Batteries, 6 V, 16 Ah in four cases each :—
Weight :	168 lb.	112 lb.	212 lb.	56 lb.
Length :	2 ft. 4 in.	2 ft. 4 in.	2 ft. 2 in.	1 ft. 8 in.
Width :	1 ft. 8 in.	1 ft. 9 in.	2 ft. 2 in.	1 ft. 4 in.
Depth :	1 ft. 6 in.	1 ft. 6 in.	1 ft. 6 in.	1 ft. 6 in.

POWER REQUIREMENTS

Power consumption is about 30-35W with both mains and battery power supply, and the type of supply is given in Table I. Auxiliary apparatus unit, SA 5050 requires 24V battery supply (normally provided by four 6V, 16Ah, Mk. III batteries). Each telephone requires 4.5V battery supply (normally provided by three Cells, dry, 0, Mk. II.)

LINE SYSTEM

Normal telephone line employing Magneto, C.B.S. Nos. 2 and 3, C.B., and auto exchange systems.

VALVES (Frequency changer)

Oscillator : EL 32 ; R.A.F., VT52 ; or G.P.O., VT181

Send amplifier : " " " " "

Receive amplifier : " " " " "

Frequency changer 6 AA has also rectifier valve 5Z4G or G.P.O. type VT, 195.

Spare valves 2 off, EL 32 plus (for Mks. I* and I only) 1 off 5Z4G.

SPECIAL FACILITIES

Sharing equipment includes indicator for each subscriber, showing when frequency changer is engaged.

Main item	Special facilities	Used in				
		Stations A i.e., frequency changer for use with one line			Stations B i.e., equipment for two or three lines to share one frequency changer of station A	
		Mk I	Mk. I*	Mk. II		
Frequency chan- ger 6AA, Mk. I	Uses preferred type valves on 200/250V, 45- 66 c/s	I	—	—	—	
6 AA, Mk. I*	For 100/110V, 200/250V, 45- 66 c/s	—	I	—	—	
6 AC	For 12V, D.C. and 100/110, 200/250V, 45- 66 c/s	—	—	I	—	
Telephones(each type includes hand generator)						
SA 5063 or SA 5063.1	{ Restricted to one tele. per line { Teles. can be paralleled	I	I	I	3 (Includes one essential spare or parallel tele.)	
Auxiliary appar- atus unit SA 5050	Switching re- lays of sharing eqpt.	—	—	—	I	
Batteries, secon- dary, portable, 6v. 16 Ah.		—	—	—	8	

Table I—Composition of the privacy equipments

END

Issue 1, 10 Feb. 1945

ADAPTOR, TELETYPE (U.S.), TELEPRINTER (BRITISH)

DATA SUMMARY

PURPOSE

The adaptor permits the U.S. Telegraph printer set EE-97(-) and EE-98(-) to be worked to the British Teleprinter 7B or other British telegraph apparatus. It will normally be located within 5 ft. of the rectifier unit supplying the teletype machine.

DESCRIPTION

The adaptor consists of two Relays 299 AN and other components fitted in a teak box. The single-current (closed circuit) neutral telegraph signals of the teletype are converted to double-current (two-path polar) signals as used on the British equipment and vice-versa. One relay is used for each direction of transmission.

PHYSICAL DATA

Weight :	23½ lb.	Width :	10½ in.
Height :	10½ in.	Depth :	10½ in.

SPEED OF WORKING

The adaptor is for use at normal teleprinter speeds, i.e., 50 bauds (66 words per minute).

POWER REQUIREMENTS

65mA single current at 115V (obtained from the teletype rectifier).
30mA maximum double current at 80+80V (or 12V+12V) (from a Supply unit, rectifier, No. 7 or alternative source).

LINE SYSTEM

The adaptor may be used on any 2-wire simplex telegraph circuit suitable for teleprinter working.

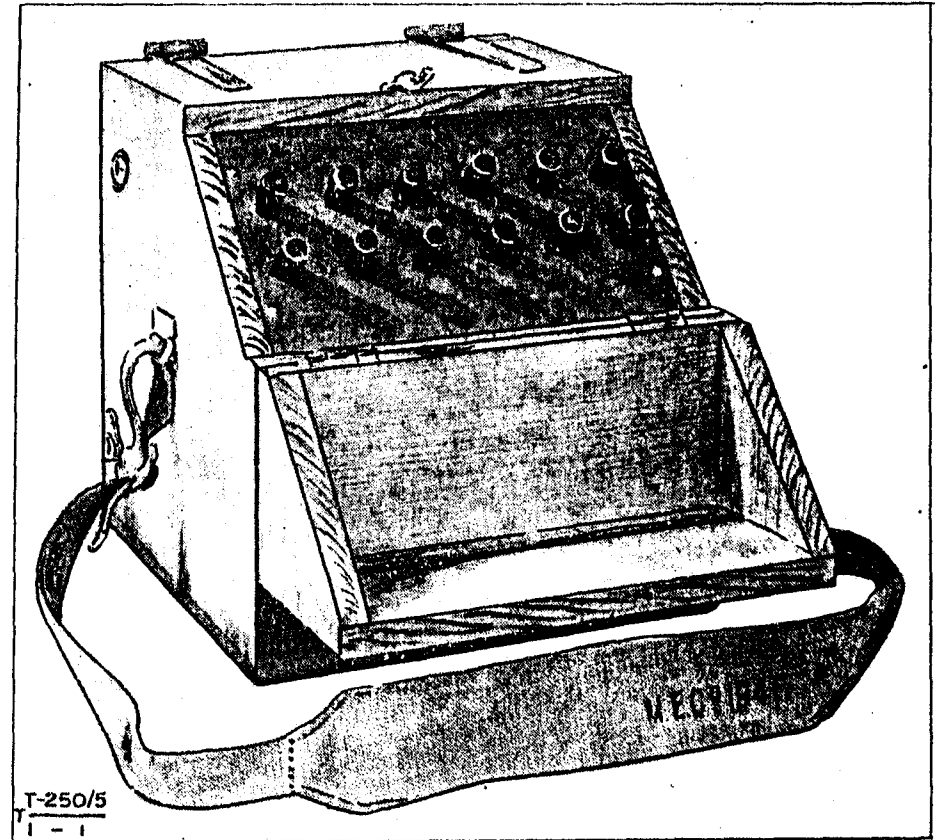


Fig. 1—General view of equipment

END

TELEWRITER (YB02251)

DATA SUMMARY

PURPOSE

To provide telegraphic communication in forward areas.

DESCRIPTION

A printing telegraph instrument for point-to-point or omnibus working. Transmission is by keyboard operation and reception is by facsimile principle on chemically impregnated tape.

PHYSICAL DATA

Instrument in case and closed for transit.

Weight : $24\frac{1}{2}$ lb. Length : $10\frac{3}{4}$ in.
Height : $6\frac{1}{2}$ in. Width : $13\frac{1}{2}$ in.

FREQUENCY

Traffic capacity : 23.3 w.p.m. (max.)
Speed of working : 130 bauds.

PERFORMANCE

Sensitivity : D.C. 6mA min.

Power requirements and consumption

12V, 0.8A, for motor current and signalling up to 20 miles of line of D8 (twisted). Additional cells can be added on longer lines, or on lines with high leakage, to maintain receive current at 6mA.

LINE SYSTEM

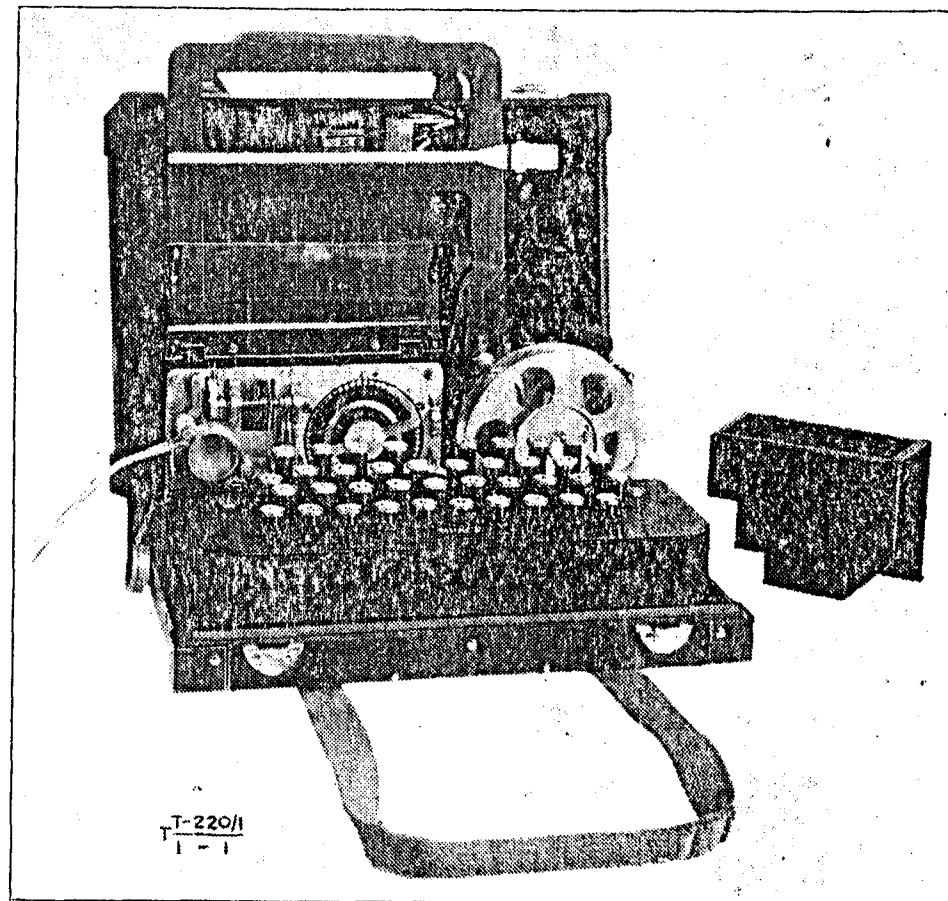
Any single-wire earth-return or two-wire line.

SPECIAL FACILITIES

Buzzer calling and local record are provided.

REMARKS

Cannot be interchanged with Teleprinter No. 7B. Can be connected only for single-current simplex working.



END

Fig. 1—General view of equipment

UNDULATOR, U.G. 6A, NO. 3 (YD 02446)

DATA SUMMARY

PURPOSE

Used on L. of C. for recording high-speed morse signals.

DESCRIPTION

Consists of relay unit and motor-driven tape-pulling mechanism. Relay unit includes ink reservoir feeding syphon. Syphon is moved to and fro across moving tape by electromagnet in response to signals from recording bridge. Tape speed is variable. New tape can be brought into use without stopping machine. Mounted on heavy metal base.

PHYSICAL DATA

Weight 49 lb.
Length 1ft. 6½in.
Width: 1ft. 1½in.
Height: 11¼in.

PERFORMANCE

Speed:—Up to 320 words per minute (= 256 bauds).
Receiver sensitivity: 25 to 30mA operates.

POWER REQUIREMENTS AND CONSUMPTION

Power supply: 220/240V A.C. mains for motor. Metal rectifier supplies D.C. to polarizing winding of magnet.
Power consumption: 70.5VA.

END

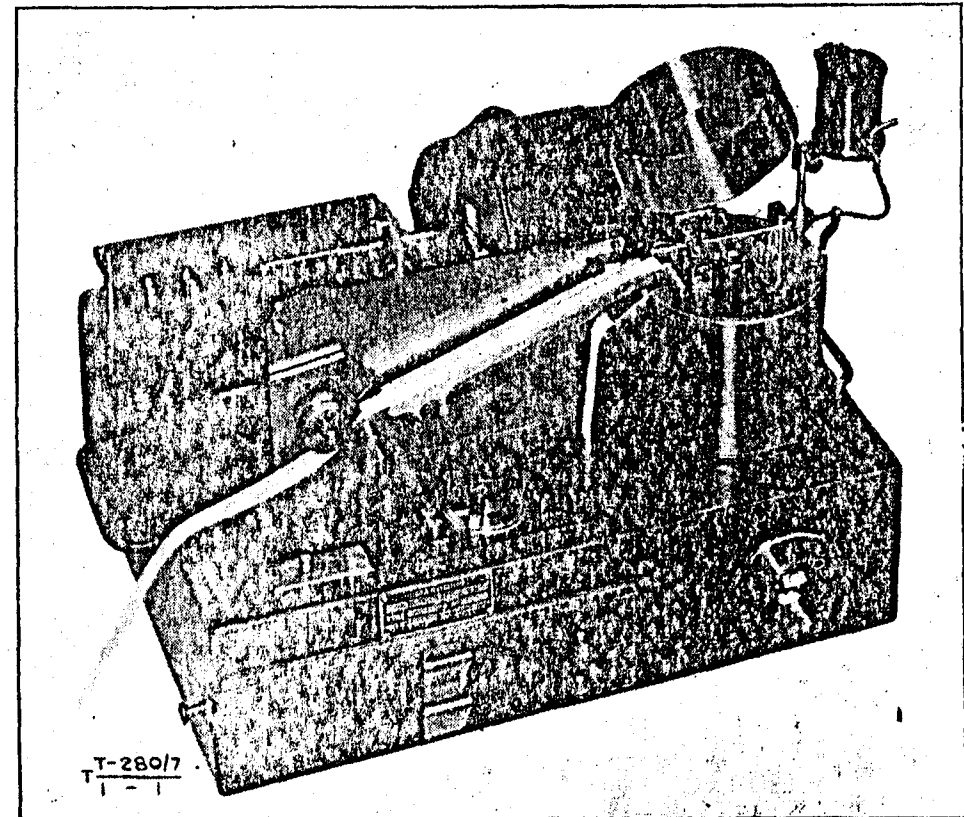


Fig. 1—General view of equipment

WHEATSTONE TRANSMITTER

Transmitter, Wheatstone, M.D., G.N.T., 112, YB 02243

DATA SUMMARY

PURPOSE

A high-speed morse transmitter used on L. of C.

DESCRIPTION

Morse perforated type is fed by a star wheel across the ends of two peckers. Perforations in the tape allow the peckers to rise under spring action. Movement of the peckers operates a contact spring, which sends out positive or negative signals to line, according to the perforations.

PHYSICAL DATA

Weight : 24 lb.
Length : 17 in.
Width : 6 $\frac{3}{4}$ in.
Height : 7 $\frac{3}{4}$ in.

LINE SYSTEM

Double-current D.C. telegraphy.

FREQUENCY

Speed : 13-250 words per minute. (100 w.p.m. morse = 80 bauds.)

PERFORMANCE

Sender output : Reversals.

POWER REQUIREMENTS AND CONSUMPTION

Power supply : 230V A.C. for motor. Telegraph battery, centre-tapped.
Power consumption : 25W.

SPECIAL FACILITIES

Can be used for manual morse with double-current key.

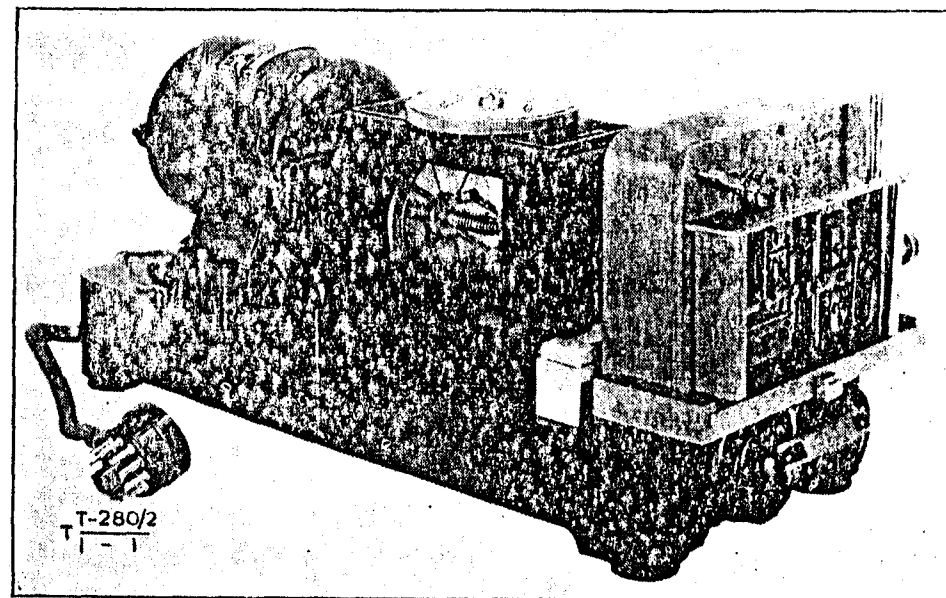


Fig. 1—General view of equipment.

MORSE REPERFORATOR

(Reperforator, No. 7W. A, YB 03839, B, YB 03138, C, YB 03140.)

DATA SUMMARY

PURPOSE

Used in L. of C. to record by perforating received morse signals on tape, for feeding to morse printer.

DESCRIPTION

Signals from a recording bridge actuate an operating magnet via a line relay. Magnet armature releases motor-driven camshaft, which causes hole to be punched in tape. At the moment of punching, the moving tape is halted and its position is corrected. This position correction makes operation possible with reperforator 30% faster or 5% slower than the Wheatstone transmitter. Mounted on metal baseplate, with speed control for motor. Models A and C are used for tuition only. Speed indicator, when fitted, shows any difference between reperforator and transmitter speeds.

PHYSICAL DATA

Weight : 70 lb.
Length : 24 in.
Width : 12 in.
Height : 9½ in.

PERFORMANCE

Speed : 90-120 words per minute.
Line relay : Creed relay 27C operates on 2-3mA.

POWER REQUIREMENTS AND CONSUMPTION

Power supply : 220V D.C.
Power consumption : 135W.

ASSOCIATED EQUIPMENT

Creed polar relay 27C ; Morse printer ; Recording bridge.

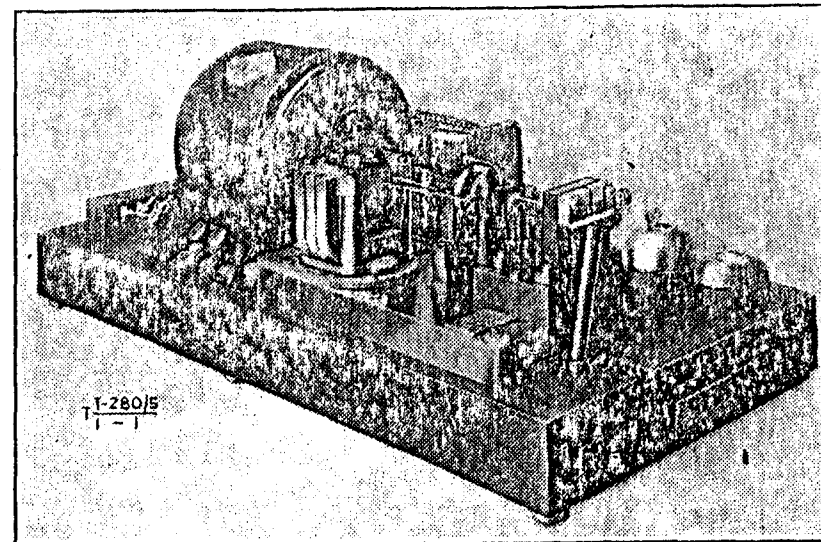


Fig. 1—General view of equipment

END

5430

MORSE KEYBOARD PERFORATOR

Perforator, keyboard, No. 9 W/A, YB 03134
B, YB 03841
C, YB 03842

DATA SUMMARY

PURPOSE

Used in L. of C. to perforate tape for operating Wheatstone transmitter.

DESCRIPTION

Machine is operated like a typewriter. Depression of any key releases a number of combination bars which cause a combination of holes to be punched in the tape. After punching, the tape is fed along according to the length of the character, thus providing blank tape for the next character. Motor-driven and mounted in a metal chassis. Letter counter is provided. Models B and C are used only for tuition.

PHYSICAL DATA

Weight : 38 lb.
Length : 19 in.
Width : 11 in.
Height : 11½ in.

PERFORMANCE

Speed : 125 words per minute maximum.

POWER REQUIREMENTS

Power supply : 230V A.C.
Power consumption : approx. 80W.

ASSOCIATED EQUIPMENT

Wheatstone transmitter.

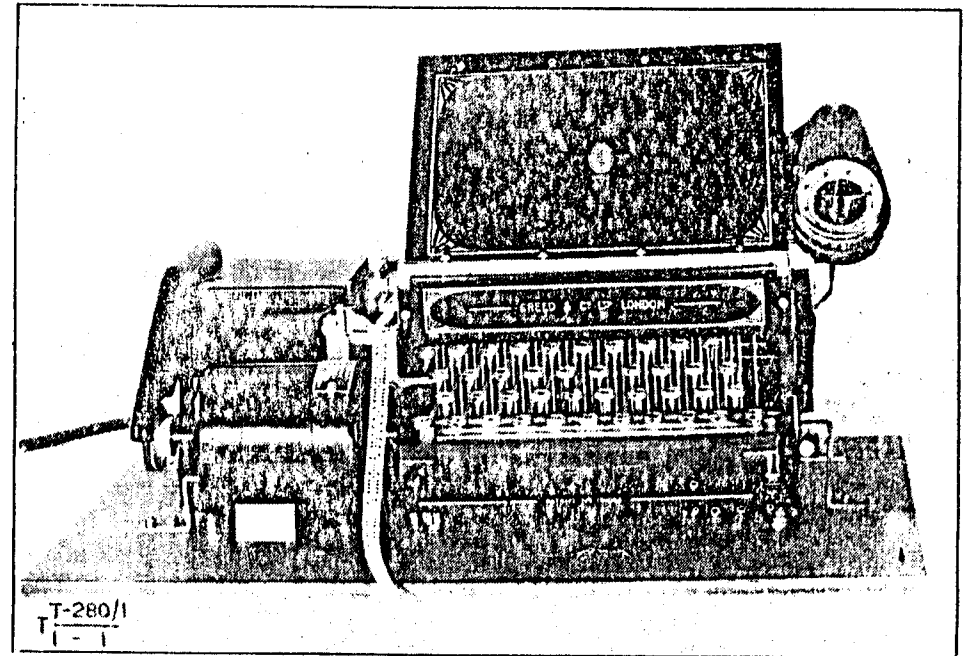


Fig. 1—General view of equipment.

END

S 460 ~~5-280/6~~

MORSE PAGE PRINTER

(Printers, Morse, Nos. 1T (YB 03135) and 1P (YB 02648))

DATA SUMMARY

PURPOSE

Used on L. of C. to convert morse signals in perforated tape into printed characters.

DESCRIPTION

Consists of tape feeding, selecting and printing mechanisms. Tape is fed forward letter by letter, according to length of the preceding letter code. Selector needles dropping into perforations operate combinations combs, so causing typehead to stop and print appropriate character. Tape printing model No. 1T is mounted on metal baseplate; page printing model No. 1P is on table or metal stand with motor mounted underneath the printer. Speed control is provided.

PHYSICAL DATA

	No. 1T	No. 1P (on metal stand)
Weight :	80 lb.	121 lb.
Length :	24in.	24in.
Width :	12in.	16½in.
Height :	9½in.	49½in.

Speed 60-100 words per minute, variable by speed control. (100 w.p.m. in morse = 80 bauds.)

POWER REQUIREMENTS AND CONSUMPTION

Power supply : 220V D.C.
Power consumption : 135W.

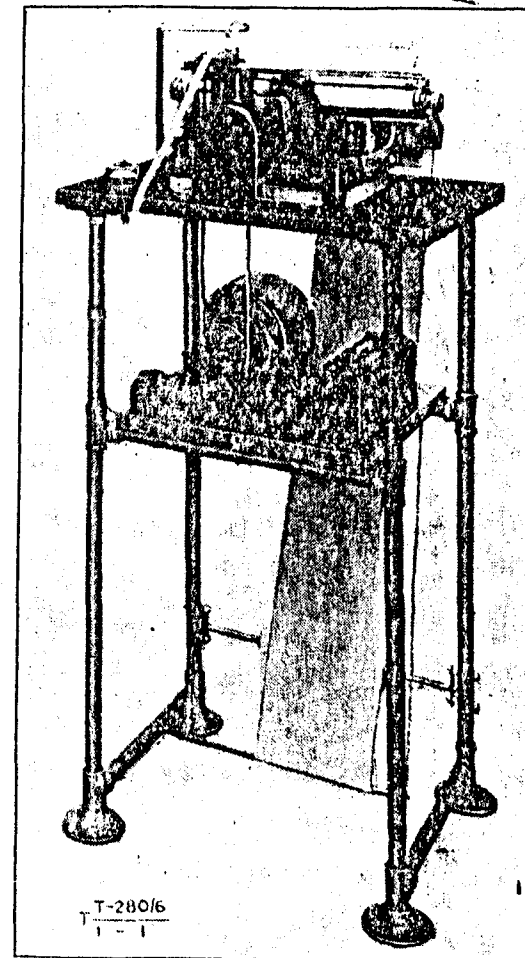


Fig. 1—General view of No. 1P equipment

END

**ELECTRICAL AND MECHANIC
ENGINEERING REGULATIONS**

- (d) Bell, calling attention to the machine when the bell key at the distant station is pressed.
- (e) Duplication. By use of manifolding paper packs, up to six copies of a message may be made simultaneously.

REMARKS

Associated equipment

Teleprinter terminal unit, Mk. II	(Tels. T250/1 S110)
" " " Mk. III	(Tels. T250/2 S120)
" " " Mk. IV	(Tels. T250/3 S130)

TELECOMMUNICATIONS

~~T240/1~~
3020

Teleprinter terminal unit, 80+80	(Tels. T250/4 S140)
Adaptor, teletype (U.S.) teleprinter (British)	(Tels. T250/5 S150)
Supply unit, rectifier, No. 13	(Tels. K220/1).
Supply unit, rectifier, No. 7	(Tels. K290/1).
Apparatus, V.F. Telegraph, S+Sx, No. 3	(Tels. U240/1).
" " " S+Dx, No. 1	(Tels. U260/1).
" " " S+Dx, No. 2	(Tels. U260/2).
" " " 3-ch. Dx No. 1	(Tels. U220/1).
" " " " No. 2	(Tels. U220/2).

END

TELEPRINTER 7B, (W.D.), MKS. I, I* AND I**

DATA SUMMARY

PURPOSE

The teleprinter provides a means for the rapid and accurate transmission of intelligence over land lines and/or wireless links up to any required distance. It may be regarded as a remotely controlled typewriter, operated by telegraph signals from a distant station.

DESCRIPTION

An automatic telegraph machine, using the start-stop principle, the teleprinter may be divided into three major sections—

- (a) The keyboard unit. (comprising keyboard and transmitting head).
- (b) The sub-assembly. (comprising receiving mechanism and motor drive).
- (c) The printing attachment.

Any one of the fifty available keyboard characters is selected for transmission by depressing the appropriate key, which sets in motion the transmitting head by means of the keyboard mechanism. A double-current switch is thus caused to send to line a 5-unit code symbol corresponding to the selected character, the symbol being automatically preceded and followed by a 'Start' and a 'Stop' signal, of one unit and one and one-half units duration respectively.

Received signals energize a high-quality polarized electromagnet, the armature of which controls the operation of a system of levers, which in turn control the setting of a combination head for each character received. The combination head dictates the position that a type-head

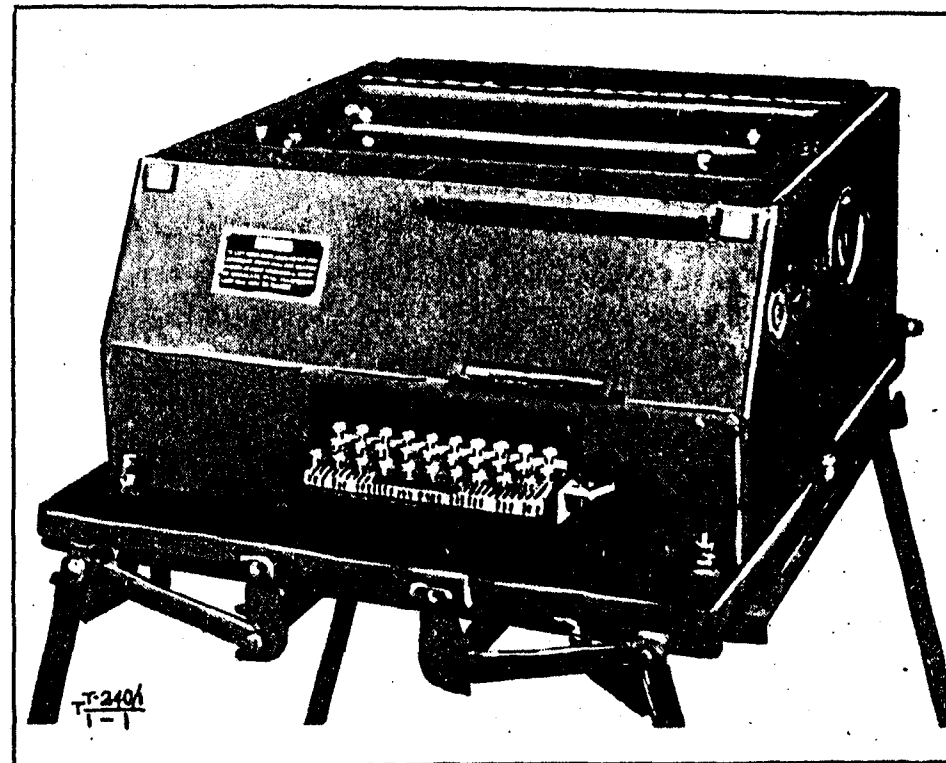


Fig. 1—General view of equipment.

EQUIPMENT TABLE D.T.N. 2000

DATA SUMMARY

PURPOSE

To provide a suitable termination for a Teleprinter 7B, page, G.P.O. mains type.

DESCRIPTION

The equipment consists of a metal table on which a Teleprinter is placed. The necessary power supply units (Rectifiers No. 26B and No. 43A) and auxiliary units (Unit, auxiliary apparatus, T.G. 988, etc.) are mounted underneath the table so that all items of equipment are available and wired to provide a complete teleprinter installation, except the actual teleprinter which is supplied as a separate item. The table may be used only with a G.P.O. type teleprinter and this must be fitted with a 110V D.C. motor.

PHYSICAL DATA

Weight	: 175 lb.	687 lb.*
Height	: 2 ft. 3 in.	2 ft. 10 in.*
Length	: 3 ft. 0 in.	3 ft. 10 in.*
Width	: 2 ft. 6 in.	3 ft. 7 in.*

* When crated together with a teleprinter.

POWER REQUIREMENTS AND CONSUMPTION

200—250V, single-phase, 50c/s, A.C. supply. Consumption, 300W approximately.

Issue 1, 10 Aug. 1945

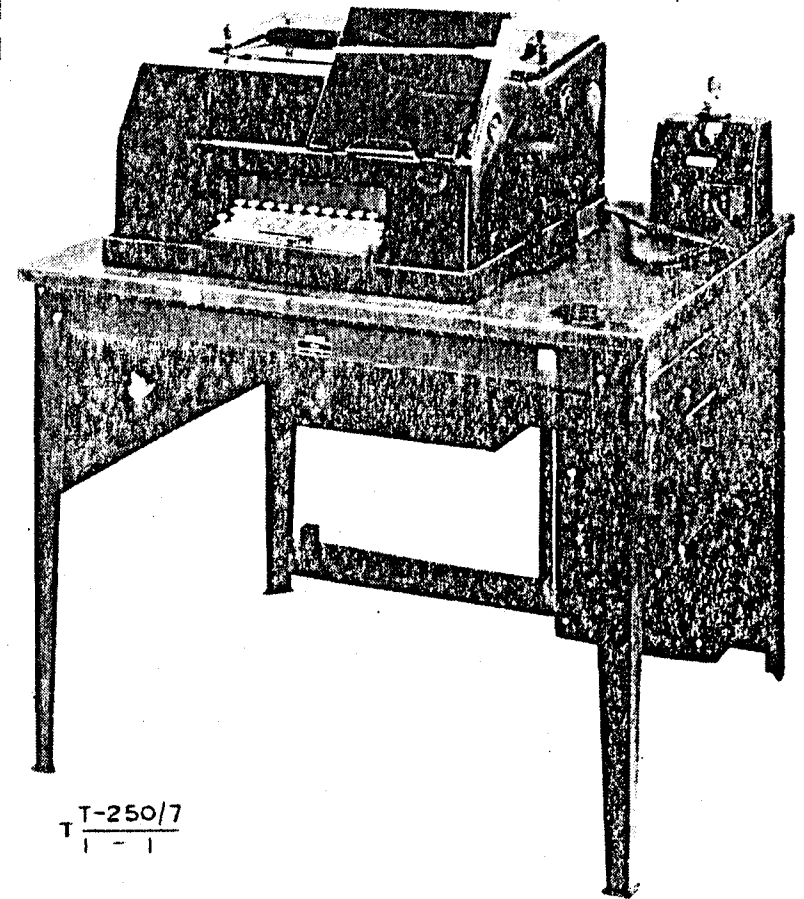


Fig. 1—General view of equipment

TELECOMMUNICATIONS

~~T-250/7~~ S 160

ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS

LINE SYSTEM

Double-current, 80—0—80V, 2-wire simplex, earth return with local record and normal line current 20mA, minimum line current, 16mA.

REMARKS

Associated equipments:—
Teleprinter 7B, page (Tels T 240/1—244/1).
G.P.O. Mains.

END

TELEPRINTER AUTO-TRANSMITTERS

DATA SUMMARY

Note: This Issue 2, Pages 1-3, supersedes Issue 1, Pages 1 and 2 dated 10 Aug 45. The regulation has been revised throughout.

PART NUMBERS

Y2/YB03139	Transmitter, auto, No 6S(WD)	24V d.c.	Y2/YB07849	Transmitter, auto, No 2D	24V d.c.
Y2/YB05162	Transmitter, auto, No 6S(WD)			24V d.c.	24V d.c.
	Mk 2	24V d.c.	Y2/YB07850	Transmitter, auto, No 2D	100/110V d.c.
Y2/YB06490	Transmitter, auto, No 6S(WD)	24V d.c.		100/110V d.c.	
	Mk 2/1	24V d.c.	Y2/YB05163	Transmitter, auto, No 6S	100/110V d.c.
Y2/YB07398	Transmitter, auto, No 2A	24V d.c.		(GPO), No 1B	100/110V d.c.
	24V d.c.	24V d.c.	Y2/YB05164	Transmitter, auto, No 6S	200/220V d.c.
Y2/YB08161	Transmitter, auto, No 2A,	24V d.c.		(GPO), No 1B	
	24V d.c. Mk 1/1	24V d.c.			

Issue 2, 8 Oct 62

Page 1

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**TELECOMMUNICATIONS
S 320**

**ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS**

Y2/YB08157	Transmitter, auto, No 6S(WD) Mk 2/2	24V d.c.
Y2/YB08158	Transmitter, auto, No 6S (GPO), Mk 1/1	100/110V d.c.
Y2/YB08159	Transmitter, auto, No 6S (GPO), Mk 1/1	200/220V d.c.
Y2/YB08160	Transmitter, auto, No 6S (GPO), Mk 1/1	230/250V d.c.
Y2/YB08845	Transmitter, auto, No 6S5M	100/125V d.c.
Y2/YB08823	Transmitter, auto, No 6S6	100/125V d.c.
	Transmitter, auto, No 6S6M	100/125V d.c.

PHYSICAL DATA

The following data refer to the basic machine, No 6S (WD), other types are similar.

	Unpacked	Packed
Weight:	32 lbs	56 lbs
Height:	8 in.	12 in.
Length:	15 in.	20 in.
Width:	8 in.	15 in.

ROLE

The Teleprinter auto-transmitter is a machine telegraph equipment for transmitting 5-unit code signals which have been pre-perforated in paper tape. Its main uses are:-

- (a) On circuits in which it is necessary to make the utmost use of available circuit time.
- (b) For "tape relay," ie re-transmission, facilities in conjunction with reperforators.
- (c) In conjunction with automatic cipher equipment.

DESCRIPTION

The equipment consists of a main base on which are mounted:-

- (a) The driving motor and governor
- (b) The transmitting head.
- (c) The tape control unit.

PERFORMANCE

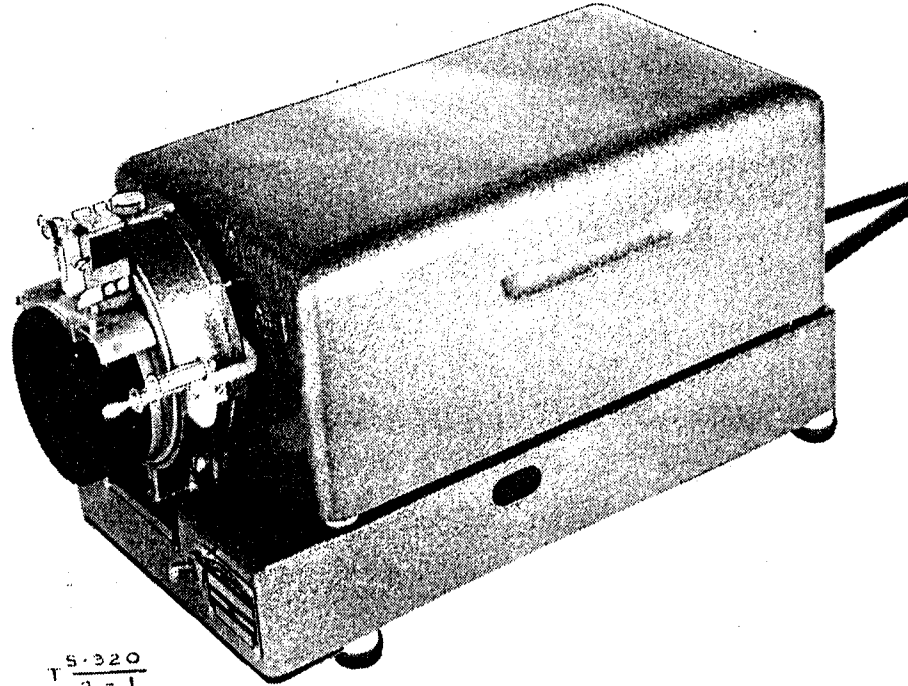
Type of Machine	Traffic Capacity (w.p.m.)	Telegraph speed (bauds)
All except 6S6	66	50
6S6	100	75

POWER REQUIREMENTS

Motor supply voltage as required
Telegraph signalling supplies

SPECIAL FACILITIES

The machine is fitted with a tape control unit to prevent damage to the tape if the feed is delayed or if transmission ceases. Chadless or fully chadded tape may be used.



EME8c/1148

END

TELEPRINTER 7B, - ALL TYPES

TECHNICAL HANDBOOK - DATA SUMMARY

Note: This Issue 2, Pages 1-4, supersedes Issue 1, Pages 1-3, dated 14 Nov 45. The regulation has been revised throughout.

Part No

Battery working

Y2/YB 02402	Teleprinter, 7B (WD) Mk 1
Y2/YB 02403	Teleprinter, 7B (WD) Mk 1/1
Y2/YB 03117	Teleprinter, 7B (WD) Mk 1/2
Y2/YB 07639	Teleprinter, 7B (WD) Mk 1/3 (for use with RS 53)

Mains working

Y2/YB 08153	Teleprinter, 7B (WD) Mk 1/4
Y2/YB 08151	Teleprinter, 7B (WD) Mk 1/5
Y2/YB 08152	Teleprinter, 7B (WD) Mk 1/6
Y2/YB 01805	Teleprinter, 7B Page, GPO Mains
Y2/YB 08412	Teleprinter, 7B/N3 230V AC/DC (with perforating attachment)

Issue 2, 16 Sep 63

Page 1

Distribution - Class 348. Code No 4

Role

To provide a means for the rapid and accurate transmission of intelligence over land lines and/or radio links up to any required distance. The teleprinter may work through a teleprinter switchboard or a V.F. telegraphy system.

Description

Any one of the fifty available keyboard characters is selected for transmission by depressing the appropriate key or keys, which sets in motion the transmitting head by means of the keyboard mechanism. A switch is thus caused to send to line a 5 unit code symbol corresponding to the selected character, the symbol being automatically preceded and followed by a start and stop signal, of one unit and one and one half units respectively. Received signals energise a polarised electromagnet, the armature of which controls the operation of a system of levers, which in turn control the setting of a combination head for each character received. The combination head dictates the position that a type head takes up relative to the platen on the printing attachment. An inked imprint of the received character is then made on a paper sheet resting on the platen. When a perforating attachment is fitted a punched 5-unit tape is prepared for subsequent use in the transmission of signals by means of an auto-transmitter. The mechanism is operated by a fractional horse power electric motor.

Physical data

The battery working teleprinter is housed in a fabricated steel case, designed to form a convenient table for the machine when open, and a case suitable for transport when closed.

	<i>Height</i>	<i>Width</i>	<i>Length</i>
Dimensions:- Open	15 in	30 in	30 in
Closed	27 in	37 in	30 in

Weight:- Without case 57 lb approx
With case (Case No 2) 190 lb approx

The mains working teleprinter is used in conjunction with equipment table DTN 2000.

	<i>Height</i>	<i>Length</i>	<i>Width</i>	<i>Weight</i>
Dimensions:- 7B	13 in	23.1/2 in	23.1/2 in	65 lb approx
7B/N3	14 in	25 in	27 in	87 lb approx

Packaging details

YB 01977 Boxes, packing A

Operational data

Associated with each battery working teleprinter is a teleprinter terminal unit or VF telegraphy equipment, allowing the following systems to be worked:-

- (a) switched simplex
- (b) two line simplex without local record
- (c) two line simplex with local record
- (d) duplex.

Associated with each mains working teleprinter is an equipment table DTN 2000 allowing 2-wire simplex earth return with local record. Special facilities provided are:-

- (a) Answer back unit, by means of which the identify of a station may be automatically verified when connected via an exchange.
- (b) Symbol counting device for the machines that can work without local record and/or performing attachment.
- (c) Automatic motor start-stop switch, operating on the start of a signal, and off after 90 sec. of no signal.
- (d) Bell, calling attention to the receiving machine prior to the commencement of a message.
- (e) Duplication, up to six copies by use of manifold paper pack.

Performance

Maximum traffic capacity is 66 w.p.m., corresponding to a telegraph speed of 50 bauds.

Associated equipment

Supply unit, rectifier, No 13	Tels K 220
Supply unit, rectifier, No 19	Tels K 240
Supply unit, rectifier, No 7	Tels K 470
Apparatus, v.f. telegraph, 3-ch, duplex, No 1	Tels R 260
Apparatus, v.f. telegraph, 3-ch, duplex, No 2	Tels R 270
Apparatus, v.f. telegraph, S + Dx, No 1	Tels R 300
Apparatus, v.f. telegraph, S + Dx, No 2	Tels R 310
Teleprinter terminal unit, Mk 4	Tels S 130
Teleprinter terminal unit, 80 +80V	Tels S 140
Equipment table DTN 2000	Tels S 160

Power requirements

The battery working teleprinters require a 24V d.c. supply to operate the motor, warning lamps etc., the consumption being from 2.5 to 3.0A. The mains working teleprinters require a 100/110V d.c., 150/250V

d.c. or 230/240V a.c. supply to operate the motor. A telegraph battery supply is also required, which may be 24V or greater, depending on the condition of working of the system. The drain on this supply also varies with the system in use and the line characteristics, but the minimum currents required at the

receiver are:-

Battery working	Single current working 30mA
	Double current working 25mA
Mains working	Single current working 20mA

EME8c/613

END

TYPEWRITER, TELEGRAPH, NO 9B
TECHNICAL HANDBOOK - DATA SUMMARY

PURPOSE

To provide an off-line machine suitable for training telegraph personnel in the operation of teleprinters, perforators etc.

DESCRIPTION

A standard commercial typewriter except for the keyboard lay-out. The keyboard is similar to that of a teleprinter with the omission of the W.R.U., BELL, CAR. RET., and LINE FEED keys, and the addition of MARGIN

RELEASE and BACK SPACE facilities. Case change is effected by the depression of the LTRS or FIGS keys, instead of the normal SHIFT and shift LOCK.

PACKING

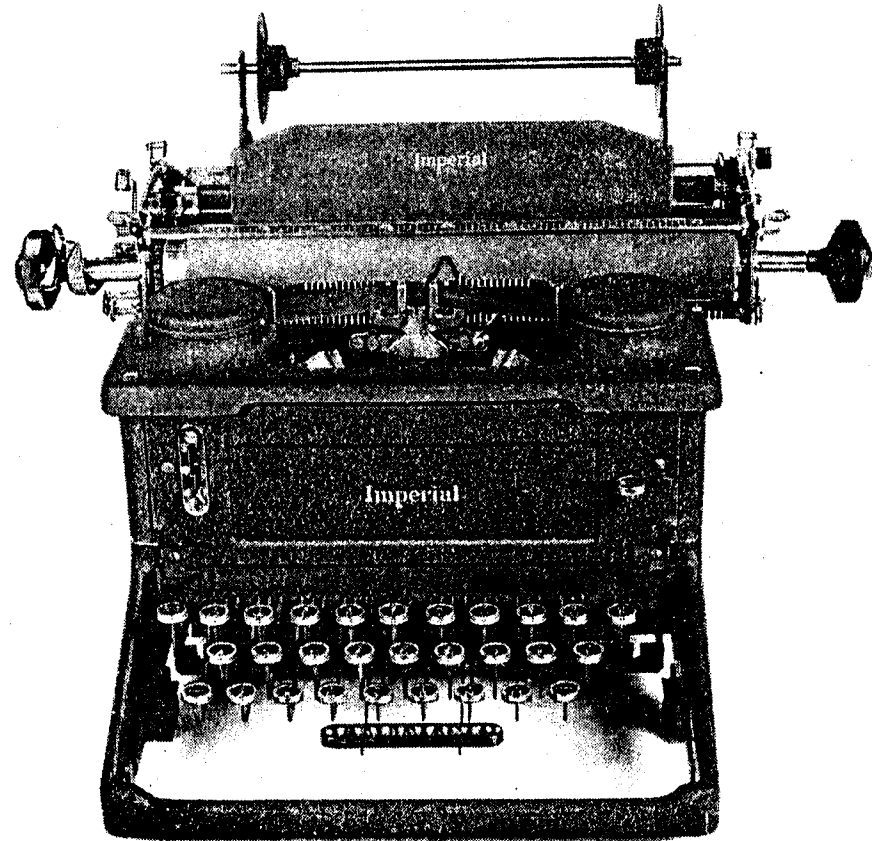
Packed in Boxes, special No 301.

PERFORMANCE

Speed: Subject to the maximum speed of the operator.

PHYSICAL DATA

	<i>Unpacked</i>	<i>Packed</i>
Weight	40 lb	105 lb
Height	12 in.	21 in.
Width	15 in.	24 in.
Length	16 in.	24 in.



T 5-200
1-1

EQUIPMENT TABLE D.T.N. 2000

DATA SUMMARY

PURPOSE

To provide a suitable termination for a Teleprinter 7B, page, G.P.O. mains type.

DESCRIPTION

The equipment consists of a metal table on which a Teleprinter is placed. The necessary power supply units (Rectifiers No. 26B and No. 43A) and auxiliary units (Unit, auxiliary apparatus, T.G. 988, etc.) are mounted underneath the table so that all items of equipment are available and wired to provide a complete teleprinter installation, except the actual teleprinter which is supplied as a separate item. The table may be used only with a G.P.O. type teleprinter and this must be fitted with a 110V D.C. motor.

PHYSICAL DATA

Weight	: 175 lb.	687 lb.*
Height	: 2 ft. 3 in.	2 ft. 10 in.*
Length	: 3 ft. 0 in.	3 ft. 10 in.*
Width	: 2 ft. 6 in.	3 ft. 7 in.*

* When crated together with a teleprinter.

POWER REQUIREMENTS AND CONSUMPTION

200—250V, single-phase, 50c/s, A.C. supply. Consumption, 300W approximately.

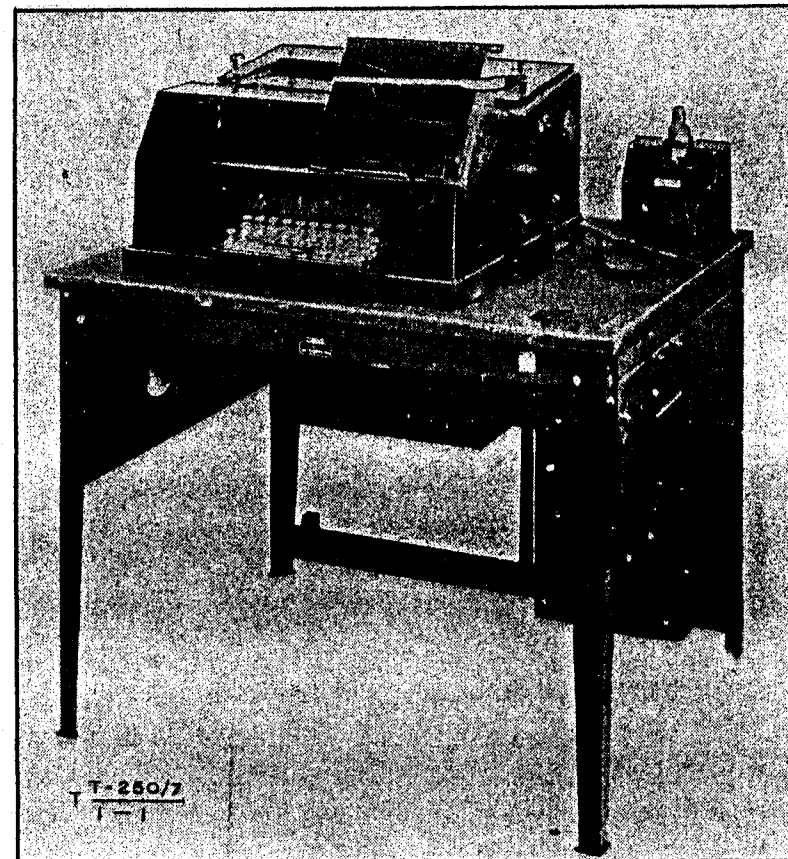


Fig. 1—General view of equipment

TELECOMMUNICATIONS

~~F 250/7~~ S 160'

ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS

LINE SYSTEM

Double-current, 80—0—80V, 2-wire simplex, earth return with local
ground and normal line current 20mA, minimum line current, 16mA.

REMARKS

Associated equipments :—
Teleprinter 7B, page (Tels ~~F 240/1—244/1~~. S020 - 024)
G.P.O. Mains.

END

KEYBOARD PERFORATOR (P.O. PERFORATOR NO. 44)

DATA SUMMARY

PURPOSE

Used in L. of C. teleprinter network to perforate on a tape 5-unit code signals corresponding to the characters in a message. The message is then sent from this tape by a teleprinter automatic transmitter to operate a distant teleprinter. This method of working permits the telegraph circuit to be worked at maximum speed irrespective of the speed of the keyboard operator. Also messages may be re-sent as many times as necessary without retyping.

DESCRIPTION

The machine is operated like a typewriter. Depression of any key operates a number of combination bars which determine the punching to be made. When the key is fully depressed a circuit is completed, energizing the electromagnet whose armature operates the punches. When the key restores, the circuit is broken; the armature restores and in so doing causes the tape to feed forward ready for the next character. A letter counter is provided so that the machine can be used with page printing receiving equipment. The counter restores to zero every time the CARRIAGE RETURN key is depressed. There is no motor on the machine and all necessary power is derived from the electromagnet. There are two general types of the instrument. Mark 1 models were individually produced and vary slightly one with another. These have a dial-type letter counter as well as an end of line alarm lamp. Mark 2 models are mass-produced and have an end of line alarm lamp only.

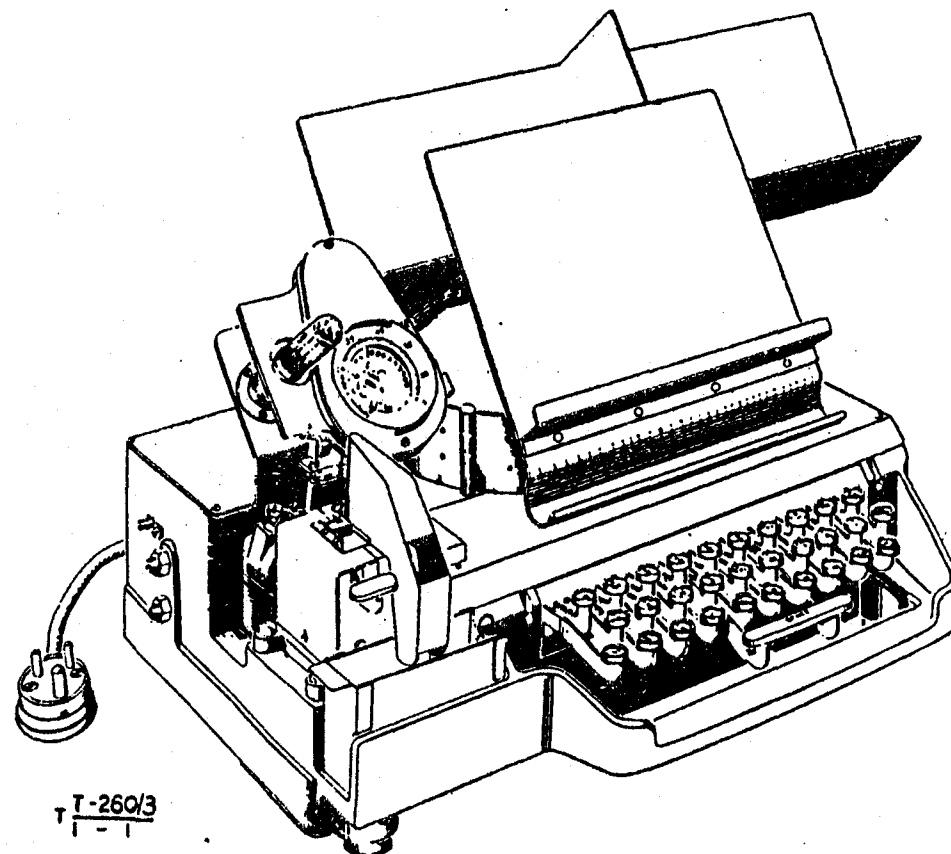


Fig. 1—General view of equipment

TELECOMMUNICATIONS

~~T260/3~~ S 220.

**ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS****PHYSICAL DATA**

	<i>Instrument alone</i>	<i>Crated</i>
Weight :	50 lb.	87 lb.
Height :	11½ in.	12 in.
Length :	17 in.	21 in.
Width :	13 in.	21 in.

REMARKS

Packed in a G.P.O. Box, packing, No. 3.

PERFORMANCE

Speed : 100 words per minute, maximum
Subject to this maximum the speed is that of the keyboard operator
and is usually of the order of 40 w.p.m., average.

POWER REQUIREMENTS AND CONSUMPTION

Power supply : 110—250V D.C.
Power consumption : 0.5A.
For A.C. mains working 110V D.C. is normally derived from a rectifier,
No. 43A (see Tels. T252/7).

<i>Associated equipments</i>	<i>Tels.</i>
Equipment table, DTN 2,000 (Includes rectifier, No. 43A)	T250/7—T254/7 S 250-254
Teleprinter automatic transmitter	T260/1—T264/1 S 320-324
Teleprinter receiving reperforator	T260/2—T264/2 S 240-244
Teleprinter No. 7B	T240/1—T244/1 S 020-024

Table I—E.M.E.Rs. on associated equipments

END

TELEPRINTER, TERMINAL UNIT, MR. III

DATA SUMMARY

PURPOSE

A line terminal unit for teleprinter 7B (WD) and relay unit for D.C. telegraphy.

DESCRIPTION

The unit provides the following facilities which are selected by operation of the appropriate keys :—

- (a) Methods of teleprinter working :—
 - (i) Simplex with local record, 2-wire or 1-wire with earth return.
 - (ii) Simplex without local record, 2-wire or 1-wire with earth return.
 - (iii) Simplex without local record, 2-wire with earth return.
 - (iv) Duplex, or half duplex, 2-wire.
- (b) Connection between teleprinter and Apparatus, V.F. telegraph, 6-channel duplex, with or without local record.
- (c) Relay unit between Apparatus, V.F. telegraph, 6-channel duplex and any duplex or 2-wire simplex system.
- (d) Relay unit between any two systems, duplex or 2-wire simplex (i.e., as a D.C. telegraph repeater).

The unit is constructed of sheet steel and is housed in a wooden carrying case. An external balance unit is required for duplex working on long lines.



Fig. 1—General view of equipment

TELECOMMUNICATIONS

~~T25072~~

S 120'

PHYSICAL DATA

Weight : 44 lb.
Length : 15 in.
Width : 13½ in.
Height : 12 in.

LINE SYSTEM

- (a) 1 wire with earth return.
- (b) 2 wires.
- (c) 2 wires with earth return.

The lines may be part of a D.C. telegraph system or may be D.C. extensions (send or receive legs) of a V.F. telegraph terminal.

PERFORMANCE

The range depends upon line conditions, particularly insulation. Mini-

ELECTRICAL AND MECHANICAL ENGINEERING REGULATIONS

imum receive current is 2mA. Sending current may be increased by the addition of extra cells.

POWER REQUIREMENTS AND CONSUMPTION

Power supply is obtained from a 24V centre-tapped teleprinter battery (12—0—12), and the consumption is approximately 2.5A for the teleprinter motor and approximately 50mA (but depending upon line conditions) for the telegraph supply.

REMARKS

Associated equipment :—

Teleprinter 7B (WD), all marks, (Tels. T240/1).

Apparatus, V.F. telegraph, 3-channel duplex, No. 1 (Tels. U220/1).

Apparatus, V.F. telegraph, 3-channel Duplex, No. 2 (Tels. U220/2).

END

~~T-2503~~
S130

TELEPRINTER TERMINAL UNIT, MK. IV

DATA SUMMARY

Note : This information is provisional and is supplied for guidance pending the issue of more complete instructions. All errors of a technical nature should be notified in accordance with Tels. A 009.

PURPOSE

A line terminal unit for teleprinter 7B (W.D.).

DESCRIPTION

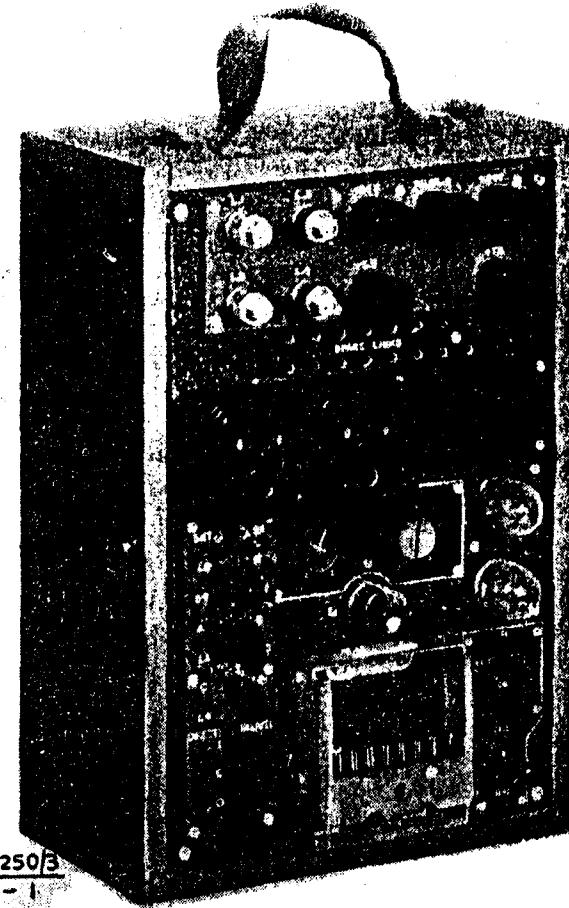
The unit comprises a relay 299 AN, low-pass filter, and associated circuit and controls. The components are mounted on a metal plate, housed in a wooden case with detachable lid. A carrying compartment is provided for the relay, spare lamps, resistor and test leads. The facilities provided are selected by U-links, and allow the following methods of double-current working :—

- (a) Simplex, with or without local record, 2-wire with earth return.
- (b) Switched simplex with local record, 2-wire or 1-wire with earth return.
- (c) Half duplex with or without local record, 2-wire or 1-wire with earth return.

In each case the teleprinter transmitter keys direct to line but reception can be direct to the teleprinter local magnet or via a 299 AN relay which increases the sensitivity and consequently the range of working. The normal signal voltage is 12—0—12, obtained from the teleprinter battery, but this voltage can be increased by connection of dry cells to the unit.

PHYSICAL DATA

Weight : 18 lb.
Length : 9 in.
Width : 7½ in.
Height : 12½ in.



T-2503
1-1

Fig. 1—General view of equipment

TELECOMMUNICATIONS

~~E 250/4~~ S 140.

ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS

PERFORMANCE

Receiving sensitivity : with 299 AN relay the minimum line current is 2mA.

Cadence speed : 50 bauds.

POWER REQUIREMENTS AND CONSUMPTION

Power supplies required are 80-0-80V. Power supply obtainable from a Supply unit, rectifier, No. 7, 24V D.C. for the teleprinter. The battery drain for the teleprinter motor is approximately 2.5A, and

that of the telegraph supply depends upon line conditions, and will be of the order of 30mA.

REMARKS

Associated equipment :

Supply unit, rectifier, No. 7 (Tels. K 290/1).

Relay 299 AN (Tels., A 420.2).

Teleprinter 7B (W.D.) all marks (Tels. ~~E 240/1~~). S 020

END

TELEPRINTER AUTO-TRANSMITTER

(Transmitter, auto No. 6S [W.D.] = Transmitter, auto, No. IB [G.P.O.]

DATA SUMMARY

PURPOSE

The Teleprinter auto-transmitter is a machine telegraph instrument for transmitting 5-unit code signals which have been pre-perforated in paper tape. Its main uses are :—

- (a) On circuits in which it is necessary to make the utmost use of available circuit time.
- (b) For "tape relay," i.e., re-transmission, facilities in conjunction with reperforators.
- (c) In conjunction with automatic cipher equipment.

DESCRIPTION

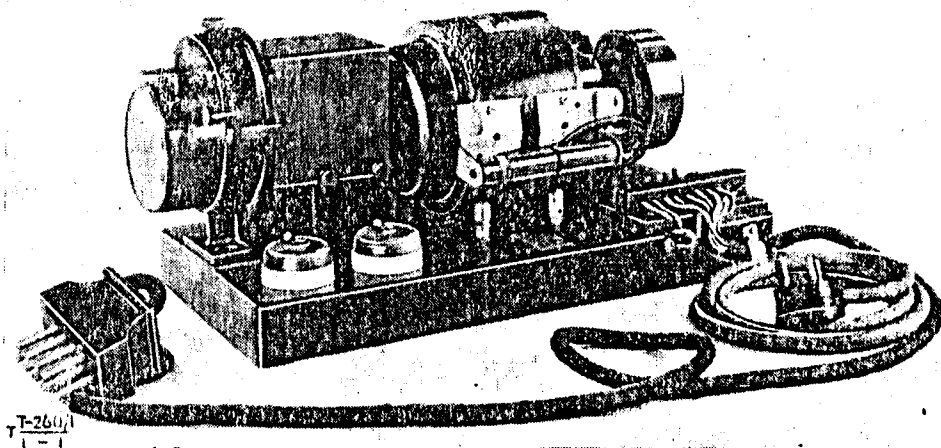
The instrument consists of a main base casting on which are mounted

- (a) The driving motor and governor.
- (b) The transmitting head.
- (c) The tape control unit.

This instrument will work only with teleprinter type apparatus. It will not work with high-speed morse equipment (Tels. T 282) as its uses a different type of paper tape and a different telegraph code.

PHYSICAL DATA

	<i>Unpacked</i>	<i>Packed for transit</i>
Weight :	31 lb. 13 oz.	56 lb.
Height :	8 in.	12 in.
Length :	15 in.	20 in.
Width :	8 in.	15 in.



[Fig. 1—General view of equipment

PERFORMANCE

Traffic capacity : 66 w.p.m. max.
Telegraph speed : 50 bauds.

POWER REQUIREMENTS AND CONSUMPTION

Motor, 24V D.C., consumption, 90W.
Ex-G.P.O. machines with 110V or 220V D.C. motors may also be in use.
Telegraph signalling battery, 80—0—80V, 20mA (or similar arrangement).

LINE SYSTEM

The instrument transmits double-current telegraph signals but does not receive them. Consequently, only a single-wire line (or send leg of a V.F. channel) is required.

SPECIAL FACILITIES

The instrument is fitted with a tape control unit so that if the feed of tape into it is delayed for any reason, sending automatically ceases and the tape is not torn. A send-receive switch is also incorporated. The instrument is fitted with radio suppression.

REMARKS

- (a) Associated equipments :—
Teleprinter terminal unit Mk. 4 (Tels. T 250/3).
Teleprinter terminal unit, 80 + 80V (Tels. T 250/4).
Supply unit rectifier, No. 13 (Tels. K 220/1).
- (b) Related equipments :—
Teleprinter 7B(W.D.) or Page, G.P.O., Mains (Tels. T 240/1).
Teleprinter keyboard perforator (Tels. 260/3).
Teleprinter receiving reperforator (Tels. T 260/2).

END

S 240

TELEPRINTER RECEIVING REPERFORATOR
(Reperforator No. 7 TR [W.D.]—Reperforator G.P.O. No. 2)

DATA SUMMARY

PURPOSE

This instrument receives teleprinter 5-unit code signals and records them as perforations in a paper tape. The tape can then be used for the retransmission of the signals by means of a teleprinter auto-transmitter (Tels. T 260/1).

DESCRIPTION

The instrument consists of a main base casting on which are mounted the driving motor, the automatic start-stop switch, the electromagnet unit, the selecting mechanism, the perforating head and the tape roll.

This instrument will work only with teleprinter type apparatus. It will not work with high-speed morse equipment (Tels. T 282) as it uses a different telegraph code.

PHYSICAL DATA

	<i>Unpacked</i>	<i>Packed for transit</i>
Weight :	35 lb.	150 lb.
Height :	10½ in.	24 in.
Length :	17 in.	35 in.
Width :	15½ in.	25 in.

PERFORMANCE

Traffic capacity : 66 w.p.m. maximum.
Telegraph cadence speed : 50 bauds.

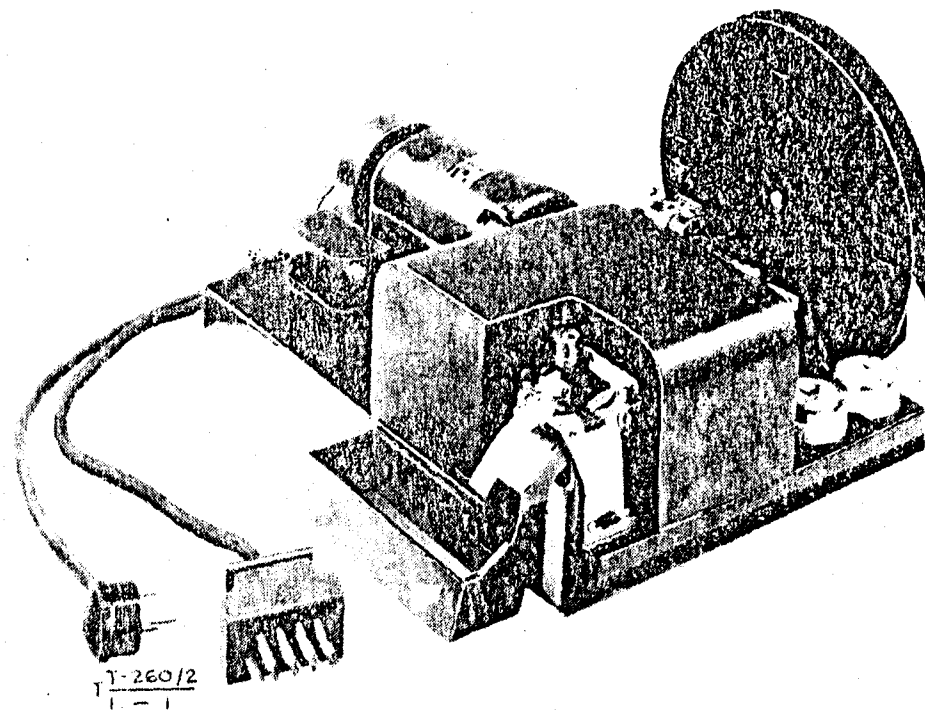


Fig. 1—General view of equipment

POWER REQUIREMENTS AND CONSUMPTION

The motor requires a 24V D.C. supply and is rated at 90W. Some ex-G.P.O. machines may be in use with 110V or 220V D.C. motors.

TELECOMMUNICATIONS

T.260/3 S 240

ELECTRICAL AND MECHANICAL ENGINEERING REGULATIONS

LINE SYSTEM

The instrument operates direct from double-current 5-unit code line signals of 20m.A. Only a single-wire line (or the receive leg of a voice frequency channel) is required.

SPECIAL FACILITIES

The instrument is fitted with radio suppression.

REMARKS

Associated equipments :—

- (a) Teleprinter terminal unit, Mk. 4 (Tels. T 250/3).
Teleprinter terminal unit, 80 + 80V (Tels. T 250/4).
Supply unit rectifier, No. 13 (Tels. K 220/1).
- (b) Teleprinter 7B (W.D.) or Page G.P.O. Mains (Tels T 240/1).
Teleprinter keyboard perforator (Tels. T 260/3).
Teleprinter auto-transmitter (Tels. T 260/1).

END

TELEPRINTER TERMINAL UNIT, MK. IV

DATA SUMMARY

Note : This information is provisional and is supplied for guidance pending the issue of more complete instructions. All errors of a technical nature should be notified in accordance with Tels. A 009.

PURPOSE

A line terminal unit for teleprinter 7B (W.D.).

DESCRIPTION

The unit comprises a relay 299 AN, low-pass filter, and associated circuit and controls. The components are mounted on a metal plate, housed in a wooden case with detachable lid. A carrying compartment is provided for the relay, spare lamps, resistor and test leads. The facilities provided are selected by U-links, and allow the following methods of double-current working :—

- (a) Simplex, with or without local record, 2-wire with earth return.
- (b) Switched simplex with local record, 2-wire or 1-wire with earth return.
- (c) Half duplex with or without local record, 2-wire or 1-wire with earth return.

In each case the teleprinter transmitter keys direct to line but reception can be direct to the teleprinter local magnet or via a 299 AN relay which increases the sensitivity and consequently the range of working. The normal signal voltage is 12—0—12, obtained from the teleprinter battery, but this voltage can be increased by connection of dry cells to the unit.

PHYSICAL DATA

Weight : 18 lb.
Length : 9 in.
Width : 7½ in.
Height : 12½ in.

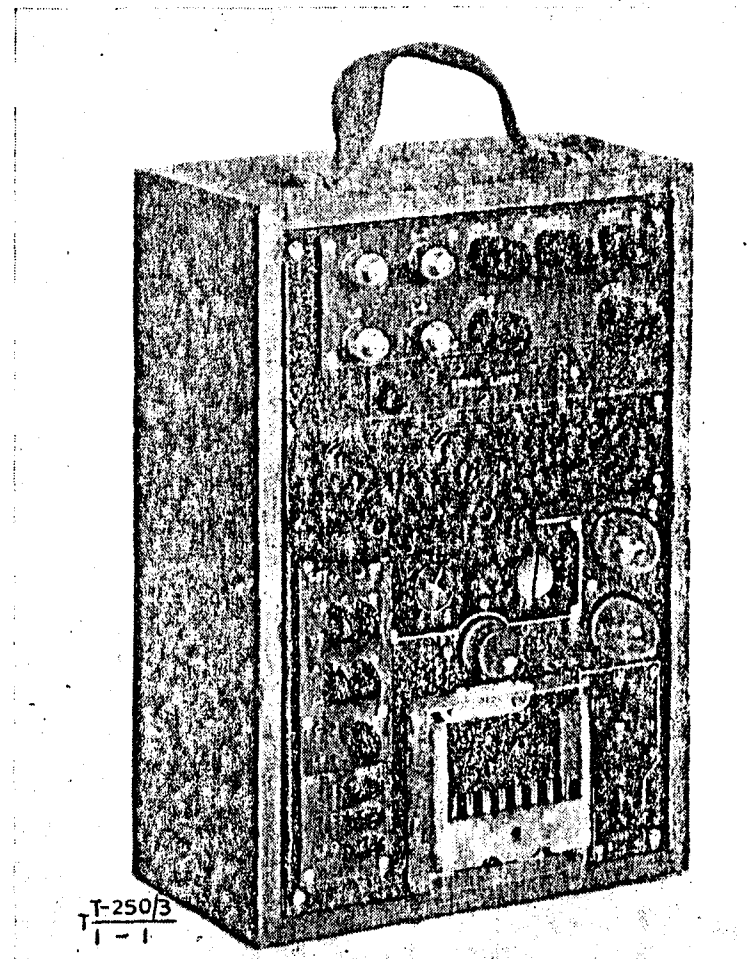


Fig. 1—General view of equipment

TELECOMMUNICATIONS

T-250.3

5.30

WIRE SYSTEM

- (a) One wire with earth return.
- (b) Two wires.
- (c) Two wires with earth return.

The lines may be part of a D.C. system, or may be D.C. extensions (send or receive legs) on a V.F. telegraph terminal.

PERFORMANCE

The range varies with line conditions and signal voltage employed. The 299 AN relay will operate on a minimum receive current of 2mA.

POWER REQUIREMENTS AND CONSUMPTION

Power supply is obtained from a 24V centre-tapped battery (12—0—12V).

ELECTRICAL AND MECHANICAL ENGINEERING REGULATIONS

Teleprinter motor battery drain is approximately 2.5A at 24V and the signalling drain depends upon line conditions and will be about 30mA maximum.

SPECIAL FACILITIES

Using a separate balancing unit, e.g. Networks, balancing and testing, No. 1, the half duplex system may be used for duplex working.

REMARKS

Associated equipments :—

Relay 299 AN (Tels. A420/2).

Teleprinter 7B (W.D.) all marks (Tels. T240/1).

END

320

~~2404~~

TELEPRINTER 7B, (W.D.), MKS. I, I* AND I**

DATA SUMMARY

PURPOSE

The teleprinter provides a means for the rapid and accurate transmission of intelligence over land lines and/or wireless links up to any required distance. It may be regarded as a remotely controlled typewriter, operated by telegraph signals from a distant station.

DESCRIPTION

An automatic telegraph machine, using the start-stop principle, the teleprinter may be divided into three major sections—

- (a) The keyboard unit. (comprising keyboard and transmitting head).
- (b) The sub-assembly. (comprising receiving mechanism and motor drive).
- (c) The printing attachment.

Any one of the fifty available keyboard characters is selected for transmission by depressing the appropriate key, which sets in motion the transmitting head by means of the keyboard mechanism. A double-current switch is thus caused to send to line a 5-unit code symbol corresponding to the selected character, the symbol being automatically preceded and followed by a 'Start' and a 'Stop' signal, of one unit and one and one-half units duration respectively.

Received signals energize a high-quality polarized electromagnet, the armature of which controls the operation of a system of levers, which in turn control the setting of a combination head for each character received. The combination head dictates the position that a type-head

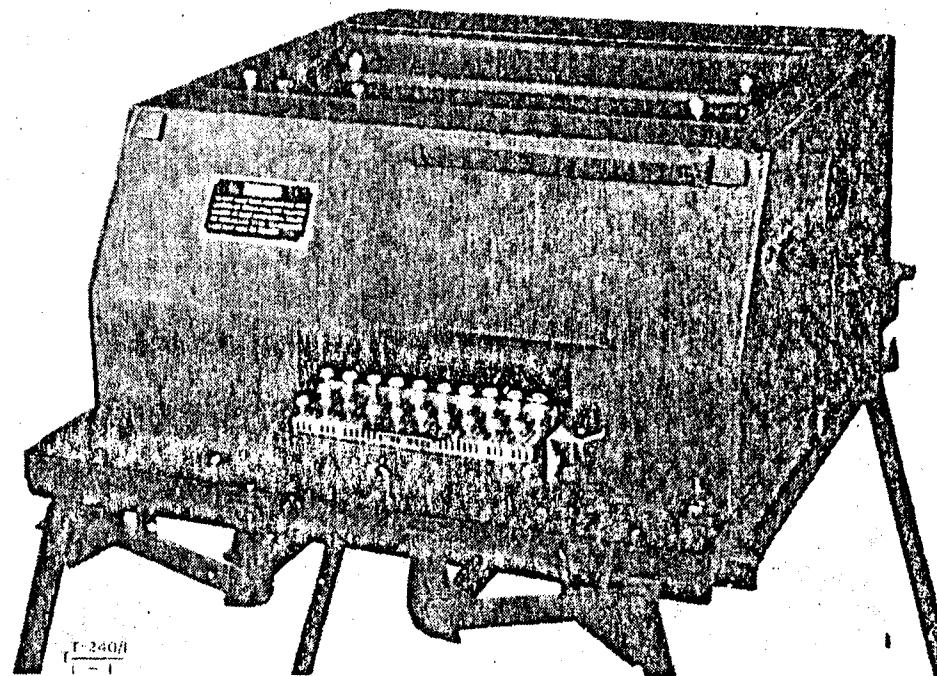


Fig. 1—General view of equipment

~~T-240/1~~ S 220

takes up relative to the platen on the printing attachment. An inked imprint of the received character is made on a paper sheet resting on the platen.

The mechanism is operated by a fractional horse power electric motor and the complete machine is built on a unit principle, and assembled on a single baseplate.

PHYSICAL DATA

The teleprinter is housed in a fabricated steel case, designed to form a convenient table for the machine when opened out, and a case suitable for transport when folded up.

Dimensions :		Height	Length	Width
(1) Folded up	...	15 in.	30 in.	30 in.
(2) Unfolded	...	37 in.	30 in.	37 in.

Weight, without case : 67 lb. approx.

Weight, with case (Case, No. 2) : 190 lb. approx.

TRAFFIC CAPACITY

Maximum traffic capacity is 66 w.p.m., corresponding to a telegraph speed of 50 bauds.

PERFORMANCE

Being entirely automatic in action, the teleprinter is capable of the continued reception of messages over long periods without attention, all its actions being under the control of the transmitting station. The keyboard is of a normal three-bank type, allowing the machine to be operated by a typist with little special training.

POWER REQUIREMENTS AND CONSUMPTION

A 24 volt D.C. supply is required to operate the motor, warning lamps, counting mechanism, etc., the consumption being from 2.5 to 3.0A.

A telegraph battery supply is also required, which may be 24 V or greater, depending on the conditions of working of the system. The drain on this supply also varies with the system in use and the line characteristics, but the minimum line currents required at the receiver are :—

- (a) Single-current working : 30mA.
- (b) Double-current working : 25mA.

AERIAL/LINE SYSTEM

According to the system of working, 1-wire and earth, 2-wire, or 2-wire and earth, lines are used. The teleprinter may work through a teleprinter switchboard, V.F. telegraphy system, or radio link, or a combination of all three.

SPECIAL FACILITIES

Associated with each teleprinter is a teleprinter terminal unit, allowing the following systems to be worked :—

- (a) Switched simplex.
- (b) Two-line simplex without local record.
- (c) Two line simplex with local record.
- (d) Duplex.

Other facilities provided are :—

- (a) Answer-back unit, by means of which the identity of a called station may be automatically verified when connected via an exchange.
- (b) Symbol counting device, essential when working without local record, in the form of a separate attachment on Mk. I and I*, and built-in on Mk. I**.
- (c) Automatic motor start-stop switch, switching on as soon as the receive electromagnet operates, and off, in the absence of any signal after approx. 90 sec.

**ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS**

TELECOMMUNICATIONS

~~T-240/1~~
S220

- d) Bell, calling attention to the machine when the bell key at the distant station is pressed.
- e) Duplication. By use of manifolding paper packs, up to six copies of a message may be made simultaneously.

REMARKS

Associated equipment

Teleprinter terminal unit, Mk. II	(Tels. T250/1).
" " " Mk. III	(Tels. T250/2).
" " " Mk. IV	(Tels. T250/3).

Teleprinter terminal unit, 80+80	(Tels. T250/4).
Adaptor, teletype (U.S.) teleprinter (British)	(Tels. T250/5).
Supply unit, rectifier, No. 13	" (Tels. K220/1).
Supply unit, rectifier, No. 7	" (Tels. K290/1).
Apparatus, V.F. Telegraph, S+Sx, No. 3	" (Tels. U240/1).
" " " S+Dx, No. 1	" (Tels. U260/1).
" " " S+Dx, No. 2	" (Tels. U260/2).
" " " 3-ch. Dx No. 1	" (Tels. U220/1).
" " " " No. 2	" (Tels. U220/2).

END

KEYBOARD PERFORATOR (P.O. PERFORATOR NO. 44)

DATA SUMMARY

PURPOSE

Used in L. of C. teleprinter network to perforate on a tape 5-unit code signals corresponding to the characters in a message. The message is then sent from this tape by a teleprinter automatic transmitter to operate a distant teleprinter. This method of working permits the telegraph circuit to be worked at maximum speed irrespective of the speed of the keyboard operator. Also messages may be re-sent as many times as necessary without retyping.

DESCRIPTION

The machine is operated like a typewriter. Depression of any key operates a number of combination bars which determine the punching to be made. When the key is fully depressed a circuit is completed, energizing the electromagnet whose armature operates the punches. When the key restores, the circuit is broken; the armature restores and in so doing causes the tape to feed forward ready for the next character. A letter counter is provided so that the machine can be used with page printing receiving equipment. The counter restores to zero every time the CARRIAGE RETURN key is depressed. There is no motor on the machine and all necessary power is derived from the electromagnet. There are two general types of the instrument. Mark 1 models were individually produced and vary slightly one with another. These have a dial-type letter counter as well as an end of line alarm lamp. Mark 2 models are mass-produced and have an end of line alarm lamp only.

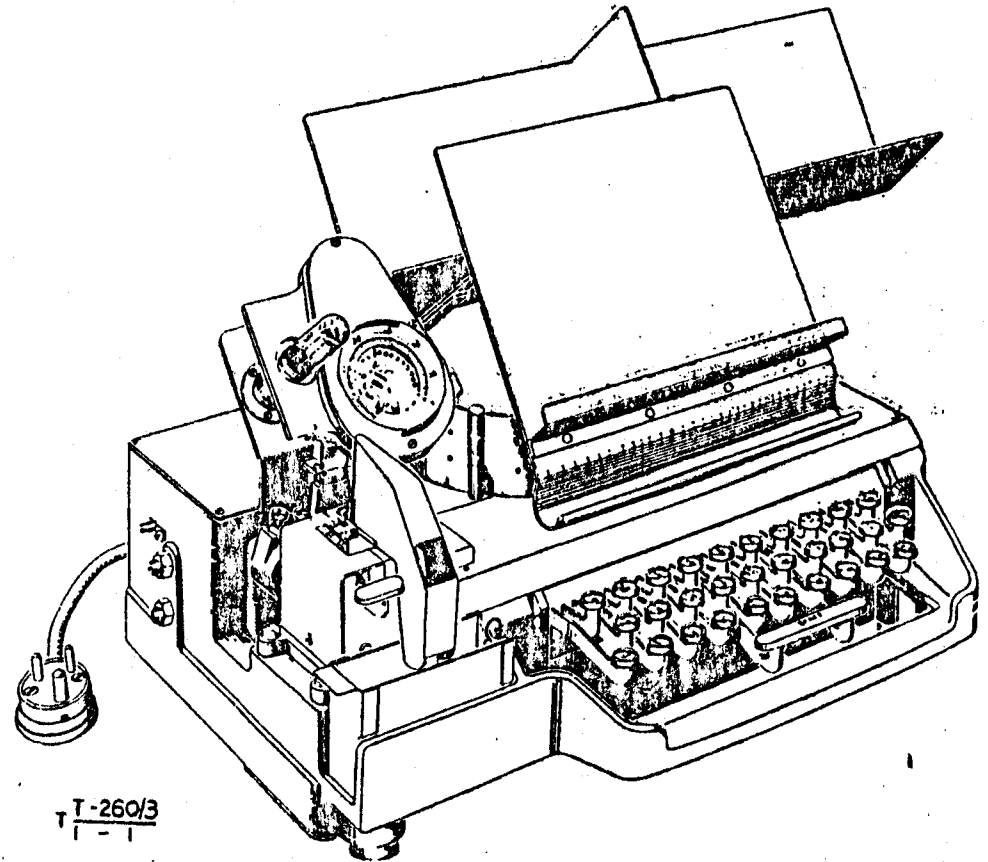


Fig. 1—General view of equipment

TELECOMMUNICATIONS

T-260/3 *S 200*ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS

PHYSICAL DATA

	<i>Instrument alone</i>	<i>Crated</i>
Weight :	50 lb.	87 lb.
Height :	11½ in.	12 in.
Length :	17 in.	21 in.
Width :	13 in.	21 in.

REMARKS

Packed in a G.P.O. Box, packing, No. 3.

PERFORMANCE

Speed : 100 words per minute, maximum
Subject to this maximum the speed is that of the keyboard operator
and is usually of the order of 40 w.p.m., average.

POWER REQUIREMENTS AND CONSUMPTION

Power supply : 110—250V D.C.
Power consumption : 0.5A.
For A.C. mains working 110V D.C. is normally derived from a rectifier,
No. 43A (see Tels. T252/7).

<i>Associated equipments</i>	<i>Tels.</i>
Equipment table, DTN 2,000 (Includes rectifier, No. 43A)	T250/7—T254/7
Teleprinter automatic transmitter	T260/1—T264/1
Teleprinter receiving reperforator	T260/2—T264/2
Teleprinter No. 7B	T240/1—T244/1

Table I—E.M.E.Rs. on associated equipments

END

T-260/2
\$240

TELEPRINTER RECEIVING REPERFORATOR

(Reperforator No. 7 TR [W.D.] = Reperforator G.P.O. No. 2)

DATA SUMMARY

PURPOSE

This instrument receives teleprinter 5-unit code signals and records them as perforations in a paper tape. The tape can then be used for the retransmission of the signals by means of a teleprinter auto-transmitter (Tels. ~~\$ 320~~).

DESCRIPTION

The instrument consists of a main base casting on which are mounted the driving motor, the automatic start-stop switch, the electromagnet unit, the selecting mechanism, the perforating head and the tape roll. *This instrument will work only with teleprinter type apparatus. It will not work with high-speed morse equipment (Tels. ~~T-282~~) as it uses a different telegraph code.*

PHYSICAL DATA

	<i>Unpacked</i>	<i>Packed for transit</i>
Weight :	35 lb.	150 lb.
Height :	10½ in.	24 in.
Length :	17 in.	35 in.
Width :	15½ in.	25 in.

PERFORMANCE

Traffic capacity : 66 w.p.m. maximum.
Telegraph cadence speed : 50 bauds.

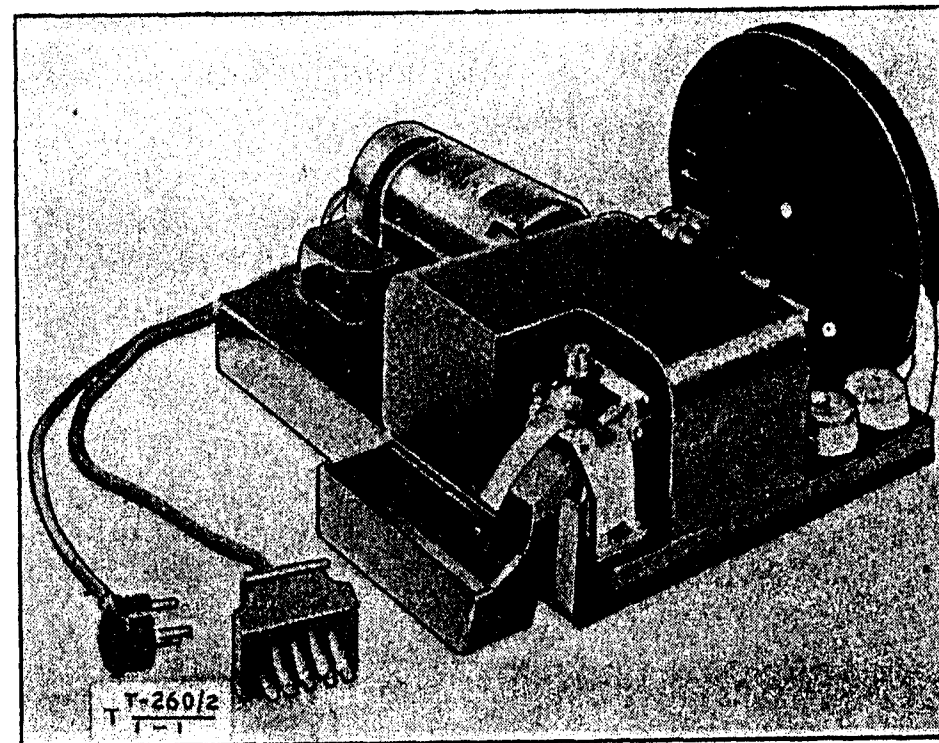


Fig. 1—General view of equipment

POWER REQUIREMENTS AND CONSUMPTION

The motor requires a 24V D.C. supply and is rated at 90W. Some ex-G.P.O. machines may be in use with 110V or 220V D.C. motors.

TELECOMMUNICATIONS

~~T260/2~~ S 240,

LINE SYSTEM

The instrument operates direct from double-current 5-unit code line signals of 20mA. Only a single-wire line (or the receive leg of a voice frequency channel) is required.

SPECIAL FACILITIES

The instrument is fitted with radio suppression.

ELECTRICAL AND MECHANICAL ENGINEERING REGULATIONS

REMARKS

Associated equipments:—

- (a) Teleprinter terminal unit, Mk. 4 (Tels. ~~\$130~~).
- Teleprinter terminal unit, 80 + 80V (Tels. ~~\$140~~).
- Supply unit rectifier, No. 13 (Tels. K 220/1).
- (b) Teleprinter 7B (W.D.) or Page G.P.O. Mains (Tels. ~~\$000~~).
- Teleprinter keyboard perforator (Tels. ~~\$200~~).
- Teleprinter auto-transmitter (Tels. ~~\$300~~).

END

GOLDEN ARROW, MK. 1

DATA SUMMARY

PURPOSE

High-power, long-range, mobile wireless installation for use as a G.H.Q. in the field.

DESCRIPTION

Station consists of three 3 ton wireless lorries, one containing the receiver equipment, one the sender equipment, and one the power supply equipment.

Receiver lorry

Reception set R 106 (Tels. CY 700)
Amplifier recorder (Tels. T 280/12)

Undulator UG6A (Tel. T 280/7)

Typewriters

Apparatus, telegraph, two-tone (Tels. U 230/1)

Teleprinter 7B (Tels. T 240/1)

Keyboard perforator (Tels. T 280/1)

Wheatstone transmitter (Tels. T 280/2 or /3 or /4)

Control unit

Power supply equipment

Aerial gear

Sender lorry

Special sender type 3
High-power amplifier and modulator

Reception set R 106 (for emergency use)

Power supply equipment

550 yd. quad cable

Aerial gear

The station is controlled from the receiver lorry (through the quad cable) and provides C.W., M.C.W. and two-tone M.C.W. facilities up to 100 w.p.m. (80 bauds), hand or automatic, over frequency band of 2.5—17.5Mc/s.

The station can easily be adapted for R/T, but cannot be operated on the move. One officer i.c. and shifts, each consisting of nine operators, are required for full operation.

PHYSICAL DATA

Each lorry

Weight : 8½ ton approx.
Length : 21 ft. 4 in.
Width : 7 ft. 5 in.
Height : 10 ft. 8 in.
Wheelbase : 12 ft. 6 in.

POWER REQUIREMENTS AND CONSUMPTION

A 4kW petrol-electric generator housed in power lorry. Two 2kVA generators as spares. Output is 250V, A.C. Alternatively 100-250V, A.C., mains may be used.

12V battery in sender vehicle.

24V battery in receiver vehicle.

AERIAL SYSTEM

Dipole aerials on masts (70 ft. masts for sender, 48 ft. for receiver).

Makeshift aerials can be used, giving much less power.

Using normal aerials, station can be brought into action in about one hour.

SENDER POWER

Using normal aerial and petrol-electric generator
Using normal aerial and A.C. mains

	C.W.	M.C.W.
Using normal aerial and petrol-electric generator	750W	200W
Using normal aerial and A.C. mains	1000W	260W

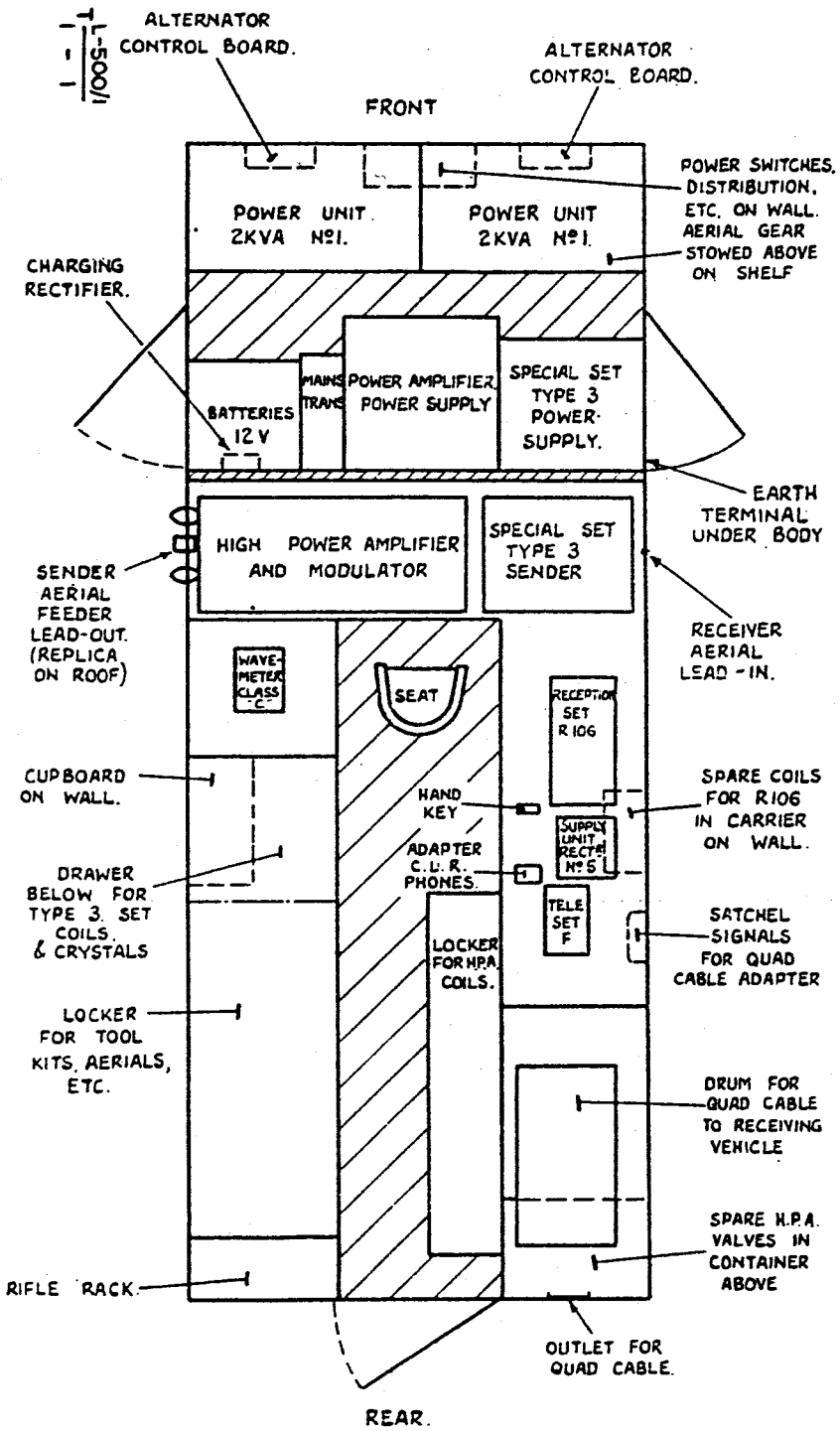


Fig. 1—Layout of sender vehicle

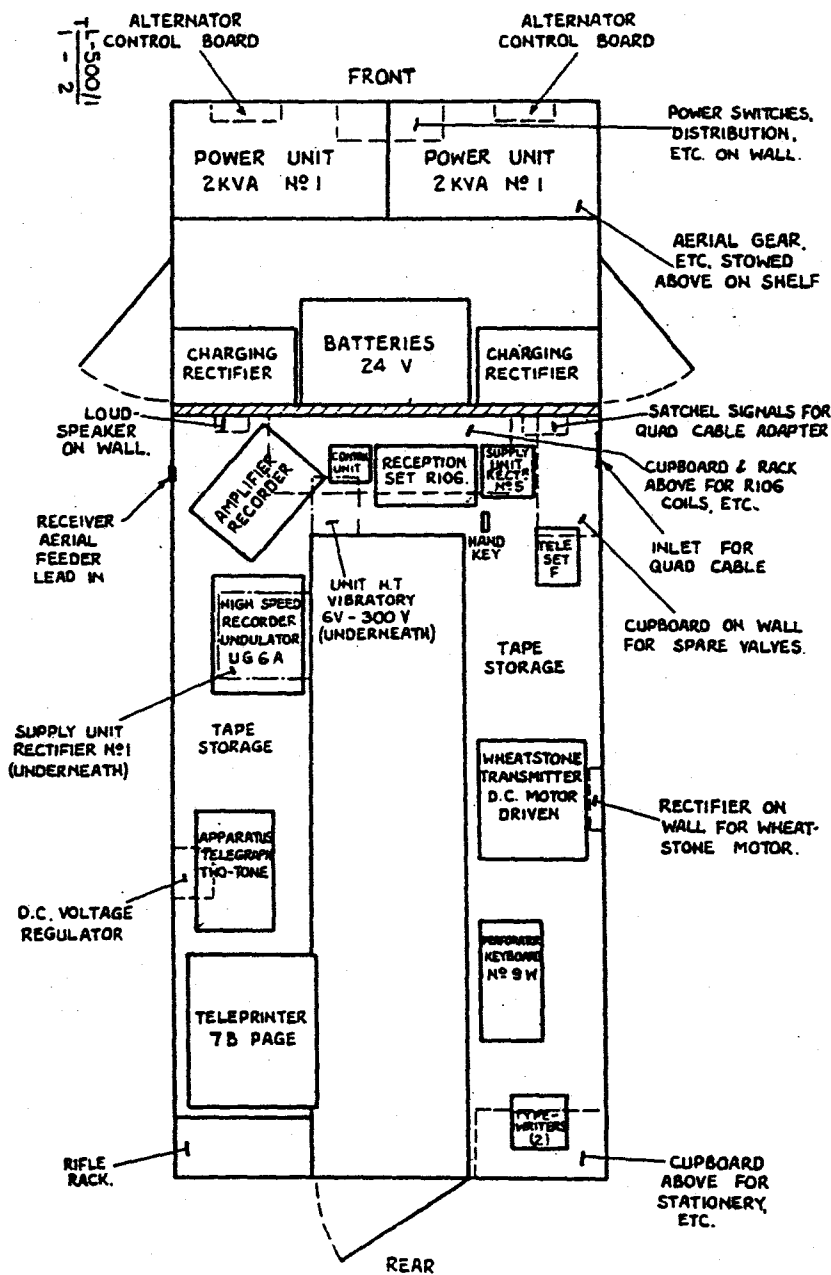


Fig. 2—Layout of receiving (control) vehicle

END

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WIRELESS STATION GOLDEN ARROW, MK. II DATA SUMMARY

PURPOSE

A high-power, long-range, mobile wireless station for direct communication between G.H.Qs. in U.K. and Army H.Qs. It provides facilities for high-speed C.W. morse, and duplex communication.

DESCRIPTION

The station consists of :—

- 2 Lorries, 4 × 2—2 (receiver and sender respectively)
- 2 Lorries, 3 ton, 4×4, G.S., each towing a 2-wheeled generator trailer
- 1 Car, utility, 4×2, or Car, 5 cwt., 4×4, (Jeep)

The main items of equipment in the vehicles are :—

Sender vehicle

- 1 W.S. SWB8E (See Tels. D 740)
- 3 Masts, 70 ft, steel, Mk. II
- 2 Aerials, dipole, No. 10
- 1 Drum of 1 mile cable, D8, twisted
- 1 W.S. 33 (standby) (See Tels. D 260)
- 1 Relay 27C (for W.S. 33) (see Tels. T 280/11)
- 1 Telephone set F., Mk. II (see Tels. T 100/2)

Receiver vehicle

- 2 Perforators, keyboard, No. 9 W/A (Tels. T 280/1)
- 1 Transmitter, Wheatstone, G.N.T. or 110/220V, No. 2 (see Tels. T 280/2 or T 280/3)
- 2 Reception sets, CR 100/2 (see Tels. E 710)
- 2 Recording bridges, RB 150 (see Tels. T 280/8)
- 2 Undulators, UG 6A, No. 3 (see Tels. T 280/7)
- 3 Typewriters, Imperial, standard
- 3 Rulers, tape, No. 3
- 1 Supply unit, rectifier, No. 4 (see Tels. T 280/10)
- 3 Masts, 70 ft., steel, Mk. II

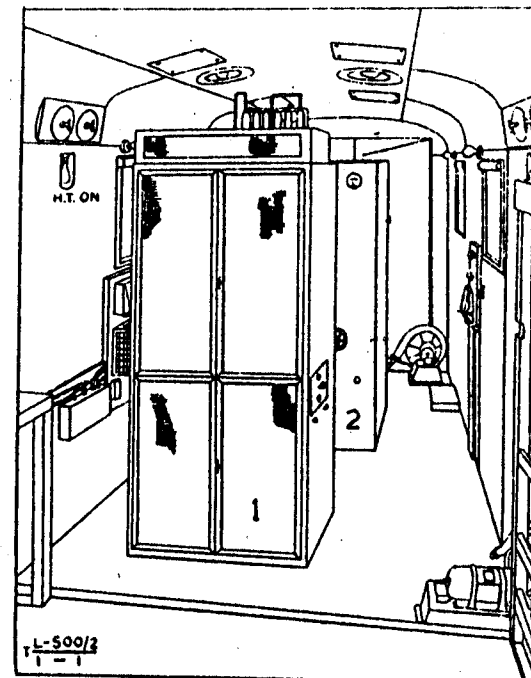


Fig. 1—Transmitter vehicle

Key 1 SWB8E, R.F. unit 2 SWB8E, power unit

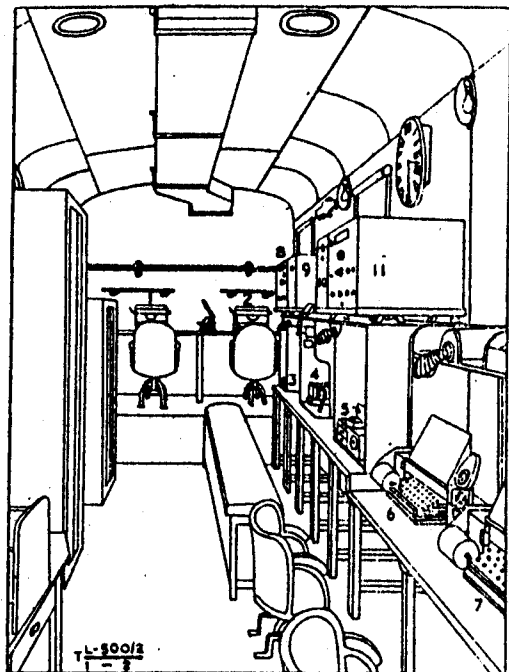


Fig. 2—Receiver vehicle

Key

- | | |
|---------------------------------|---------------------------|
| 1 Typewriter | 7 Keyboard perforator |
| 2 Typewriter | 8 Reception set CR 100/2 |
| 3 Undulator | 9 Recording bridge |
| 4 G.N.T. transmitter, automatic | 10 Recording bridge |
| 5 Undulator | 11 Reception set CR 100/2 |
| 6 Keyboard perforator | |

- 2 Aerials, dipole, No. 12
- 2 Aerials, dipole, No. 13
- 3 Aerial feeders, 120 ft., No. 2
- 1 Clock, spring dial
- 1 Telephone set F, Mk. II (see Tels. T 100/2)
- 1 Air conditioning plant

Each generator trailer

Generator : Diesel-electric, 27.5 kVA, 400V, 3-phase, and 230V single-phase.

The station is controlled from the receiver vehicle.

The Wheatstone transmitter keys the sender via a phantom-earth circuit, using the cable of the telephone circuit between receiver and sender vehicles. Hand keying is possible. The detachment consists of 1 officer and 21 O.R's, including operators, drivers and cook. The maximum traffic capacity is 30,000 words per day.

PHYSICAL DATA

	Sender vehicle with tractor	Receiver vehicle with tractor
Length overall :	31 ft. 4 in.	31 ft. 4 in.
Width :	8 ft. 3 in.	8 ft. 3 in.
Height :	11 ft. 5 in.	11 ft. 5 in.
Wheelbase of tractor :	9 ft. 3 in.	9 ft. 3 in.
Weight laden :	8 tons 3 cwt.	6 tons

AERIAL SYSTEM

Separate horizontal half-wave wire dipoles, for sender and receiver, are slung between 70 ft. masts.

POWER REQUIREMENTS AND CONSUMPTION

Power supply : 400/230V A.C., 3-phase, from diesel-electric generator
 Power consumption : Transmitter, 15kW
 Receiving apparatus, 2kW
 Air conditioning plant, 4kW

END

RECEIVER, BROADCAST, TYPE AC 71 (BUSH) (ZA 30428)

DATA SUMMARY

PURPOSE

Civilian 3-band, long-, medium- and short-wave broadcast receiver used for welfare and educational purposes.

DESCRIPTION

A 5-valve superheterodyne receiver, consisting of frequency changer, I.F. amplifier, detector, output stage and full-wave valve rectifier. The set is housed in a wooden cabinet with a built-in loudspeaker.

PHYSICAL DATA

Weight : 26 lb.
Height : 15 $\frac{3}{8}$ in.
Length : 19 $\frac{1}{2}$ in.
Width : 12 in.

FREQUENCY

I.F. : 465 kc/s
Coverage : (a) 150-352.9 kc/s
(b) 537.7-1515.3 kc/s.
(c) 5.18-18.18 Mc/s.

PERFORMANCE

Sensitivity : approx 50 μ V for 50mW output into a load of 2.5 Ω
Power output : 3.5W, Max.

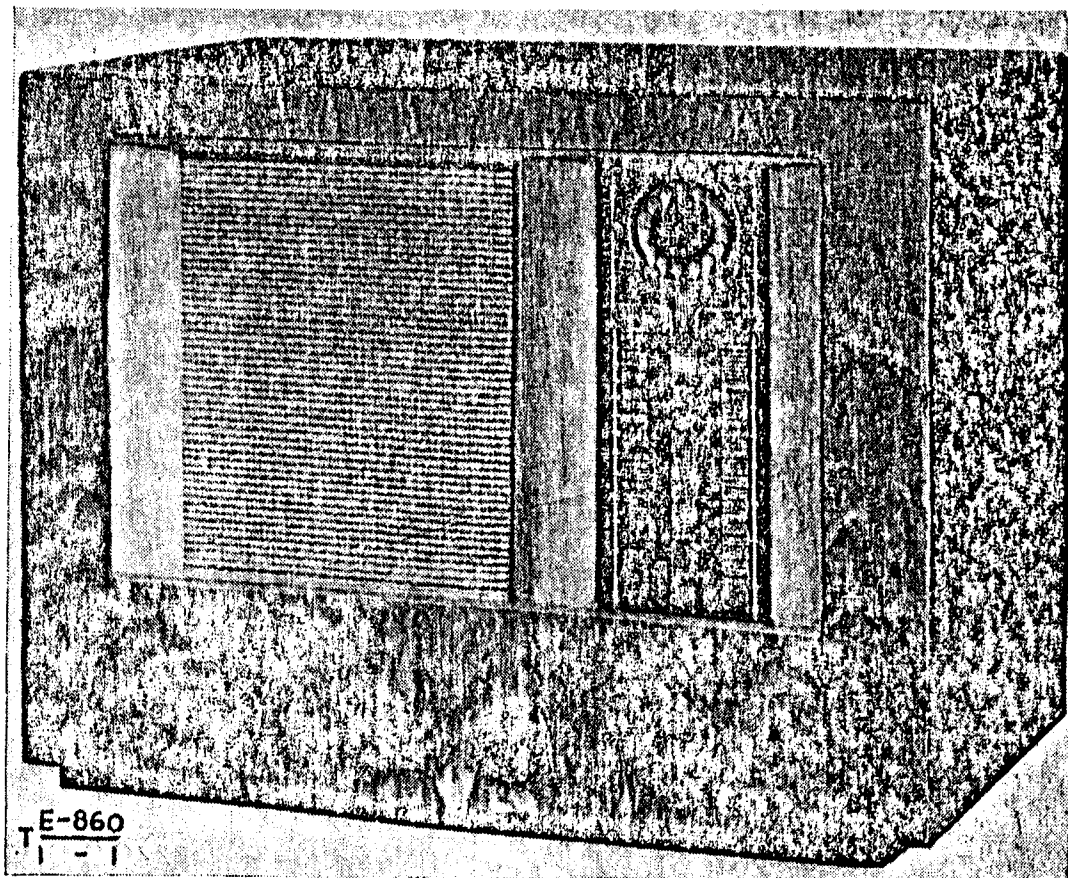


Fig. 1—General view of set

RECEIVER, BROADCAST, TYPE BC 4166

DATA SUMMARY

PURPOSE

Army welfare broadcast receiver for overseas use.

DESCRIPTION

A six-valve medium and short-wave superheterodyne receiver, using a frequency-changer, two I.F. amplifiers, detector A.V.C. and L.F. amplifier, and push-pull output stages. The receiver is housed in a wooden cabinet which also contains the built-in loudspeaker and vibrator unit.

PHYSICAL DATA

Weight : 41 lb.
Length : 19½ in.
Width : 12 in.
Height : 15½ in.

FREQUENCY

Coverage : (a) 200—550 metres (1,500—545kc/s)
(b) 75—200 metres (4—1.5Mc/s)
(c) 31—75 metres (9.5—4Mc/s)
(d) 13.5—31 metres (22—9.5Mc/s)
Internal : 445kc/s

PERFORMANCE

Output : 1.25W
Receiver sensitivity : Better than 13µV for an output at the primary of the L.S. transformer of 0.05W (35V).

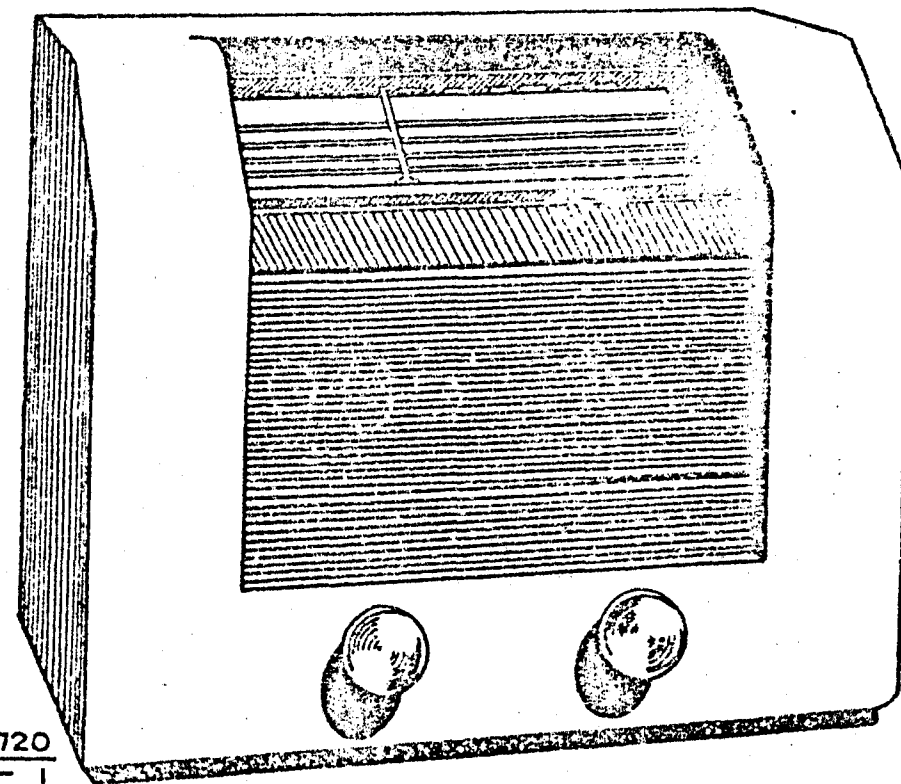


Fig. 1—General view of equipment

POWER SUPPLY REQUIREMENTS

200-250V A.C., 40-100 c/s single-phase mains supply.
Consumption, 50W.

AERIAL SYSTEM

- (a) Short open-wire aerial with earth connection.
- (b) Internal frame for local stations only.

OUTPUT SYSTEM

An internal mains-energized loudspeaker is used, with provision for connections to an external low-impedance speaker (3Ω).

VALVES

Valve	C.V. No.	Commercial type	Function
V2	1053	EF.39	I.F. amplifier
V3	1055	EBC 33	Detector
V4	2938	EL 33	Output
V5	1064	DWA/350	Rectifier

REMARKS

Provision is made for connection to a gramophone pick-up.

END

TELECOMMUNICATIONS

E 720

ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS

POWER REQUIREMENTS AND CONSUMPTION

Power supply : Accumulator, 6V, 2.15A

AERIAL SYSTEM

Open-wire, 30 ft. to 100 ft. long.

VALVES

<i>Circuit reference</i>	<i>Type</i>	<i>Function</i>
V1	X24	Frequency-changer
V2	W21	I.F. amplifier
V3	W21	I.F. amplifier
V4	HD24 (AR10)	Detector, A.V.C. and L.F. amplifier
V5	KT2 (ARP1)	Push-pull output
V6	KT2 (ARP1)	

END

RECEIVER, BROADCAST, BV 613

DATA SUMMARY

PURPOSE

Medium-wave welfare broadcast receiver.

DESCRIPTION

A six-valve superheterodyne receiver, using R.F., frequency changer, I.F., detector and output stages. A full-wave rectifier is also employed. The set is housed in a metal case which also contains the loudspeaker and vibrator pack.

PHYSICAL DATA

Weight : 17½ lb.
Length : 8½ in.
Width : 7¼ in.
Height : 10½ in.

FREQUENCY

Coverage : 1,500kc/s.—500kc/s.
Internal : 125kc/s.

PERFORMANCE

At 1,400kc/s : 20µV input for 50mW output.
At 600kc/s : 50µV input for 50mW output.

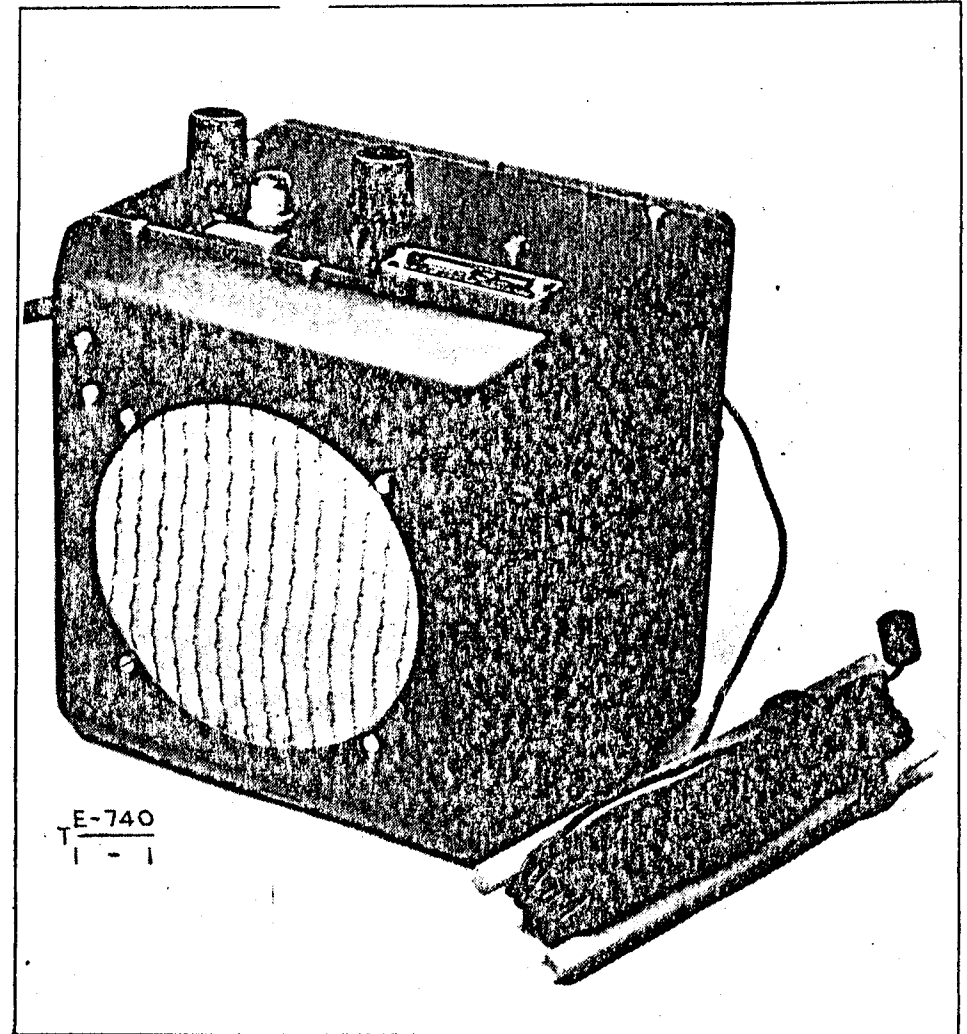


Fig. 1—General view of equipment

TELECOMMUNICATIONS

E 740

POWER REQUIREMENTS

6V, 72Ah, battery supplying vibrator to give 270V, 4.8A.

AERIAL SYSTEM

Short wire aerial attached to sea.

ELECTRICAL AND MECHANICAL ENGINEERING REGULATIONS

VALVES

<i>Circuit reference</i>	<i>Type</i>	<i>Function</i>
V1A	ARP34	R.F.
V2A	ARTH2	Frequency changer
V1B	ARP34	I.F.
V3A	AR21	Detector
V4A	VT52	Output
V5A	6X5G	Full-wave rectifier

END

RECEIVER, BROADCAST, TYPE C, NO. 2 (ZA 13722)

DATA SUMMARY

PURPOSE

Army welfare broadcast receiver.

DESCRIPTION

A four-valve receiver, using frequency-changer, I.F., detector and A.V.C. and output stages. It is housed in a wooden case, which also provides accommodation for the loudspeaker, L.T. and H.T. batteries and frame aerial. The receiver operates on the medium- and short-wave bands.

PHYSICAL DATA

Weight : 14½ lb. (without batteries)
Length : 16¾ in.
Width : 9½ in.
Height : 12¾ in.

FREQUENCY

Coverage : 16—55 metres (18.75—5.5Mc/s), 200—500 metres (1,500—600kc/s).
Internal : I.F. is 375kc/s.

PERFORMANCE

Receiver sensitivity : Better than 100µV at 10Mc/s for 50mW output
Better than 140µV at 1,000kc/s for 50mW output
Receiver selectivity : 20db. attenuation ± 19kc/s.

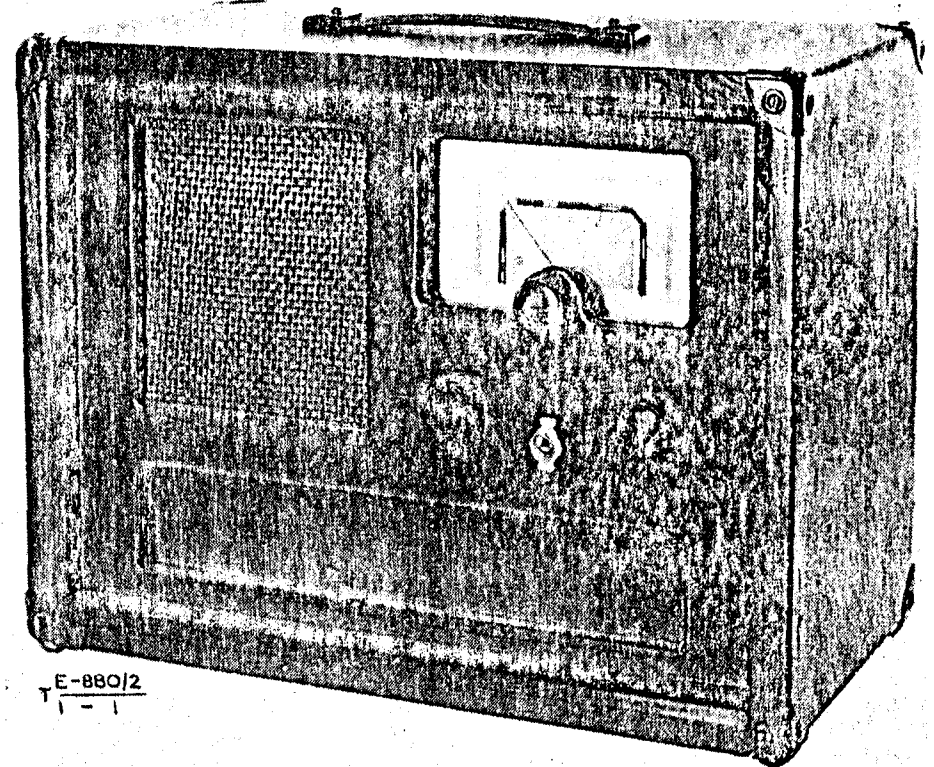


Fig. 3—General view of equipment

POWER REQUIREMENTS AND CONSUMPTION

Power supply : 20V accumulator, giving 0.45A.
120V H.T. dry battery, giving up to 1.2W.

AERIAL SYSTEM

- (a) Internal frame aerial.
- (b) Open-wire aerial up to 100 ft. in length.

VALVES

<i>Circuit reference</i>	<i>Type</i>	<i>Function</i>
V1	TP 25 (ARTP2)	Frequency-chan.
V2	VP 23 (ARP12)	I.F.
V3	HL. 23DD (AR8)	Detector and A.
V4	PEN 25	Output

END

RECEIVER, BROADCAST, TYPE C, NO. 3 (ZA 17599) DATA SUMMARY

PURPOSE

Army welfare broadcast receiver.

DESCRIPTION

A four-valve medium-wave superheterodyne receiver, using a frequency-changer, I.F. amplifier, detector A.V.C. and A.F. amplifier, and output stages. The receiver is housed in a wooden case with a built-in loudspeaker.

PHYSICAL DATA

Weight : 23 lb. (complete)
Length : 19½ in.
Width : 10½ in.
Height : 11 in.

FREQUENCY

Coverage : 185–550 metres (1,621–545.5kc/s).
Internal : 465kc/s

PERFORMANCE

Output : 350mW.
Receiver sensitivity : Better than 50µV and 50mW output.

POWER REQUIREMENTS AND CONSUMPTION

Power supply : Accumulator 2V, 0.3A.; 120V H.T. dry battery, giving 1.2W.

AERIAL SYSTEM

Open-wire aerial.

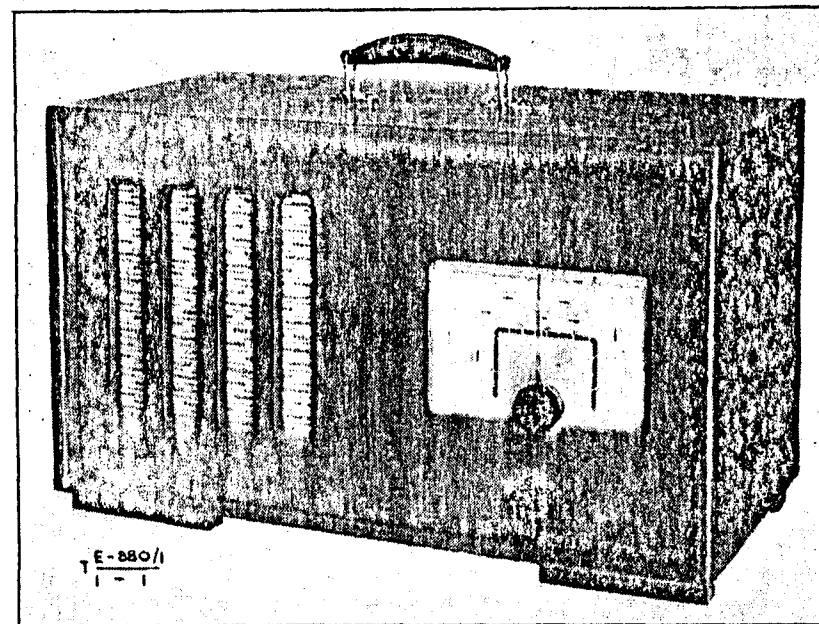


Fig. 1—General view of equipment

VALVES

Circuit reference	Type	Function
V1	TP25 (ARTP2)	Frequency-changer
V2	VP23 (ARPI2)	I.F. amplifier
V3	HL23DD (AR8)	Detector, A.V.C. and A.F. amplifier
V4	PEN25	Output