



# SERVICE MANUAL

MODEL

**RP.21**

ISSUED: NOVEMBER, 1960

**KOLSTER-BRANDES LIMITED**  
FOOTSCRAY                      SIDCUP                      KENT

SERVICE DEPOTS

41, BENT STREET,  
CHEETHAM, MANCHESTER

FOOTSCRAY,  
SIDCUP, KENT

87, McALPINE STREET,  
GLASGOW

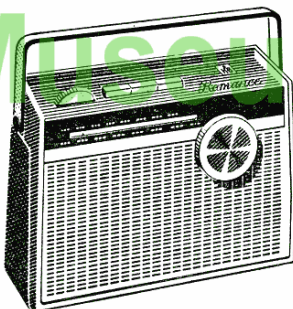
Telephone: BLAckfriars 1751 (3 lines)      FOOTscray 3333 (10 lines)

CENTral 1779



# Service Data RP. 21

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## GENERAL INFORMATION

This is a new, two wave band, transistor "hand-bag" style portable, smaller than the successful "Rhapsody" range of receivers.

The cabinet is moulded in "Forticel" which combines a very high gloss finish with high impact strength.

BATTERIES: 2 x 9v. Nominal life: 300 hours.

<i>Make</i>	<i>Type No.</i>
Ever Ready	PP7
Vidor	T6007

### TRANSISTOR COMPLIMENT:

			FUNCTION
TX1	S.T.C.	TK1000C	Oscillator-Mixer
TX2	S.T.C.	TK1000C	1st I.F. Amplifier
TX3	S.T.C.	TK1000C	2nd I.F. Amplifier
TX4	G.E.C.	GET.114	Audio driver
	or Mullard	OC81	
TX5, TX6	G.E.C.	GET.114	Push-pull Output
		(Matched Pair)	
	or Mullard	OC81	
Diode Detector:			B.T.H. CG64H.

WAVERANGES: Medium Waveband: 540-1,610 Kc/s. (556-185 metres).

Long Waveband: 150-265 Kc/s. (2,000-1,132 metres).

POWER OUTPUT: 700 mW for 10% distortion.

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POWER CONSUMPTION:

Standing current: 7 mA.  
50 mW output: 20 mA.  
700 mW output: 65 mA.  
Average listening level: 12 mA.

CONTROLS:

**Press buttons:**

Long waveband and On.  
Medium waveband and On.  
Off.  
Volume control (Thumb drive).

DIMENSIONS:

<b>Height</b>	<b>Width</b>	<b>Depth</b>
6 $\frac{1}{8}$ inches (15.6 cms.)	8 $\frac{1}{8}$ inches (20.75 cms.)	2 $\frac{7}{8}$ inches (7.3 cms.)

WEIGHT:

With batteries 3 lbs. 6 ozs. (1.530 Kgs.)  
Without batteries 2 lbs. 8 ozs. (1.130 Kgs.)

**REMOVAL OF CHASSIS FROM CABINET**

1. Open hinged back and remove batteries.
2. Unsolder speaker leads and car aerial socket leads.
3. Remove tuning knob (pull-off type).
4. Remove the three chassis fixing screws.
5. Withdraw the chassis from the cabinet, bottom edge first.

## **CIRCUIT DESCRIPTION**

This is a six transistor superhet receiver, in which the first transistor, TX1, operates as a mixer oscillator. Long and Medium wave aerial coils, tapped to obtain correct impedance, feed the signal into the base of TX1. These coils, L2 and L1, are mounted on a ferrite rod, which serves as an internal aerial to the receiver.

A socket for a car aerial is provided, which feeds direct over resistance, R1, to the base of TX1.

Back coupling between the emitter and collector to TX1 is achieved by means of the oscillator coil, L3.

The I.F. is 470 Kc/s, and two stages of amplification are used, each fed from one of the two batteries used in the receiver. The I.F. coils act as impedance transformers, and the 2nd and 3rd I.F. transformers have primaries to which neutralising condensers C7 and C10 are connected.

A germanium diode is used as detector, and is included inside the screened can of the 3rd I.F. transformer, to prevent feedback of harmonics. This diode also provides positive A.G.C. voltage.

The audio circuits comprise a driver transistor, TX4, and a matched pair of output transistors, TX5 and TX6.

An interstage transformer, L7, provides correctly phased voltages for the power output transistors which have the speaker voice coil as a load impedance. This impedance is 40Ω.

### **ALIGNMENT INSTRUCTIONS FOR RP.21**

The following equipment will be required:

1. A.M. signal generator covering the range 140–1700 Kc/s.
2. Output power meter.
3. Shielded test coil (85 turns of enamel covered wire on 2" diameter former).

#### **PROCEDURE.**

1. All measurements made with signal modulated 30% at 400 c.p.s.
2. Progressively reduce signal input as the sensitivity increases with alignment maintaining approximately 50 mW. output.

#### **I.F. ALIGNMENT**

1. Set generator to 470 Kc/s. and connect via a 0.1 μF. condenser to base of mixer transistor.
2. Set gang to minimum capacity.
3. Trim for maximum gain by adjusting cores in the following order:– 3rd., 2nd., 1st. and then readjust if required.

#### **R.F. ALIGNMENT.**

1. Connect signal generator to test coil.
2. The following operations should be carried out in the order indicated being repeated as necessary until scale accuracy, with maximum sensitivity, is attained.

Operation	Input Frequency	Wave Band	Gang Position	Adjustments
1.	540 Kc/s.	M.W.	180°(max. C)	Osc. core L5.
2.	1610 Kc/s.	M.W.	0°(min. C)	Osc. trimmer.
3.	Check operation 1.			
4.	600 Kc/s.	M.W.	—	Move M.W. aerial coil for maximum gain.
5.	1350 Kc/s.	M.W.	—	Adjust aerial trimmer for maximum gain.
6.	225 Kc/s.	L.W.	—	Move L.W. aerial coil for maximum gain.

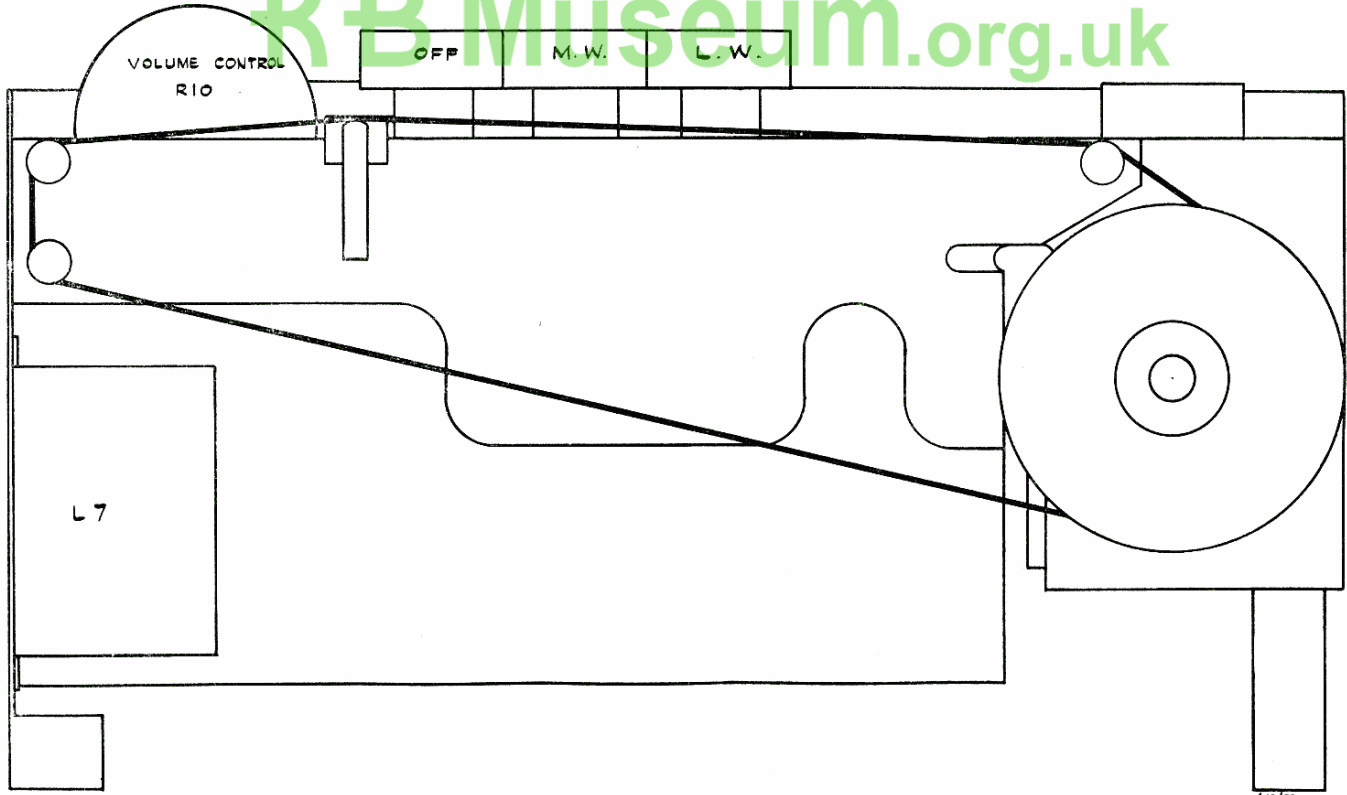
### SPARES LIST

Prices are subject to alteration without notice

Component	Colour Code	Circuit Ref.	Part No.	Price 'R'
Cabinet Assy.			610/4	40/6
<b>COILS</b>				
Oscillator Coil Assy.	Brown Green Brown	L3	610/48	7/3
1st. I.F. Coil Assy.	Brown Green Red	L4	610/50	8/6
2nd. I.F. Coil Assy.	Brown Green Orange	L5	610/51	8/9
3rd. I.F. Coil Assy.	Brown Green Yellow	L6	610/52	14/9
Rod Aerial Assy.		L1, L2	610/30	12/6
Interstage Transformer		L7	610/83	10/6
<b>CONDENSERS</b>				
44pF. ± 2% 125V.		C1	KST 289	1/6
244pF. ± 1% 125V.		C4	KST 292	1/6
Elec. 8µF. 3V.		C15	KEM 146	1/6
Elec. 100µF. 12V.		C11, C12	KEM 147	1/6
Elec. 500µF. 3V.		C18	KEM 155	2/-
Gang Condenser			610/210	15/6
Knob Assy.			610/136	2/6
Pointer			610/187	1/-
Push Button Unit Assy.			610/123	6/-
Printed Scale			610/200	8/-
Loudspeaker			610/251	21/- + P. Tax
Cabinet Handle			610/194	1/9
Battery Lead Assy.			610/125	1/6
Battery Lead Assy.			610/126	1/6
Drive Drum			214/214	3/-
Thermistor		R18, R19	12/57	2/3
Potentiometer		R10	9/25/2	3/-
<b>TRANSISTORS</b>				
" (Matched Pairs)			7/19	15/-
"			7/8/P	36/- pair
"			7/6	18/6
"			7/7	17/6
WHEN S.T.C. TRANSISTORS ARE USED PART No. IS 7/18 IN LIEU OF 7/6 AND 7/7.				
Wavechange Switch : Contact Plate Assembly.			457/139/4	2/-
Wavechange Switch : Contact Slide Assembly.			457/141/4	6d
Drive Cord Assembly.			610/143	1/-
Spring Catch (Cabinet Locking).			610/191	3d



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L10/591  
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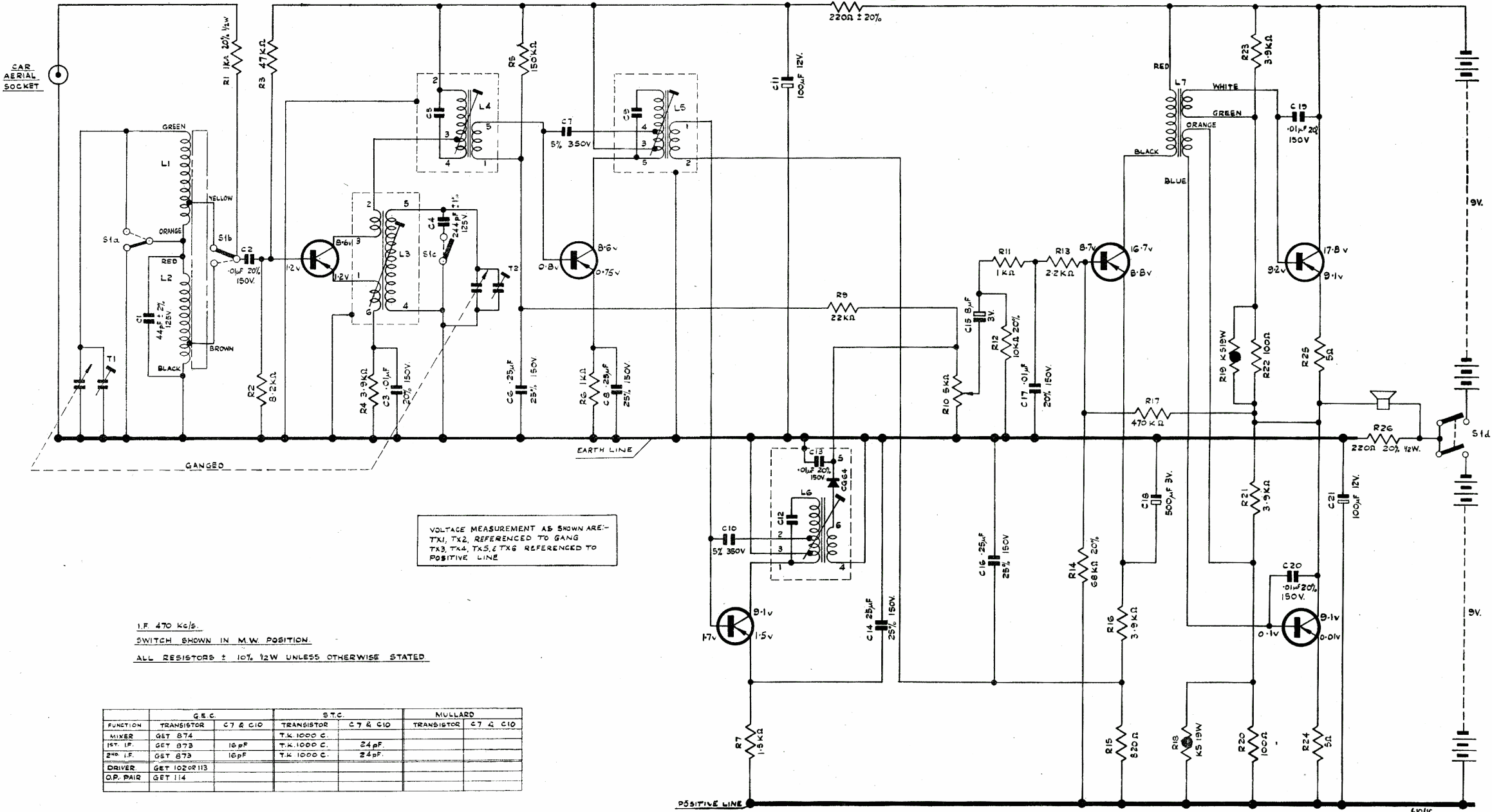
**BOTTOM CHASSIS VIEW**

TX1  
MIXER

TX2  
1<sup>ST</sup> I.F.

TX4  
DRIVER

TX5  
OUTPUT



VOLTAGE MEASUREMENT AS SHOWN ARE:-  
TX1, TX2, REFERENCED TO GANG  
TX3, TX4, TX5, & TX6 REFERENCED TO  
POSITIVE LINE

I.F. 470 Kc/s.  
SWITCH SHOWN IN M.W. POSITION.  
ALL RESISTORS ± 10%, 1/2W UNLESS OTHERWISE STATED

FUNCTION	G.E.C.		S.T.C.		MULLARD	
	TRANSISTOR	C7 & C10	TRANSISTOR	C7 & C10	TRANSISTOR	C7 & C10
MIXER	GET 874		T.K.1000 C.			
1 <sup>ST</sup> I.F.	GET 873	16 pF	T.K.1000 C.	24 pF		
2 <sup>ND</sup> I.F.	GET 873	16 pF	T.K.1000 C.	24 pF		
DRIVER	GET 1020R113					
O.P. PAIR	GET 114					

CIRCUIT DIAGRAM for RP. 21

TX3  
2<sup>ND</sup> I.F.

TX6  
OUTPUT