

SERVICE MANUAL

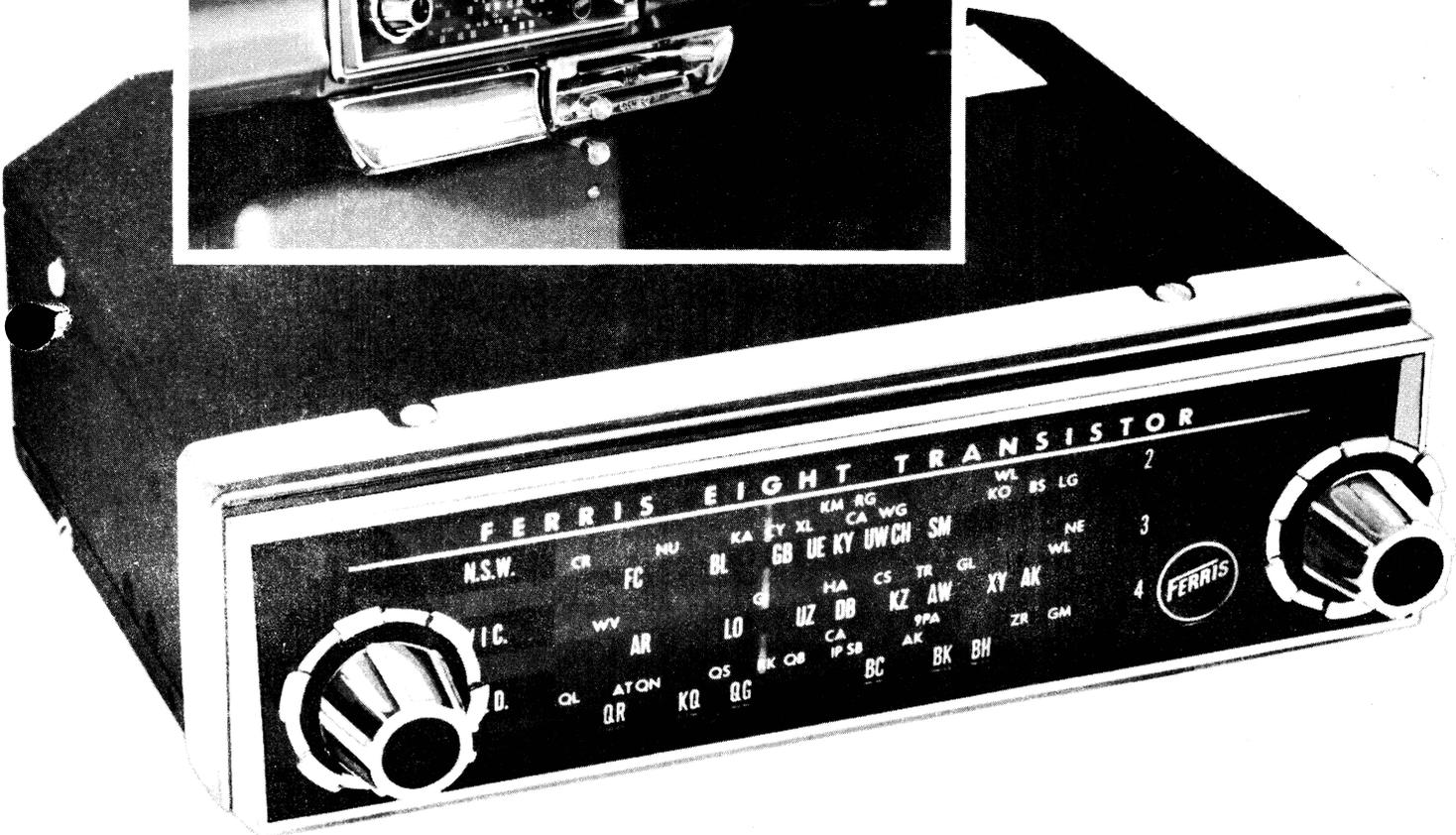


'COMPACT'

MODEL 145 8 TRANSISTOR



CAR RADIO



by **FERRIS BROS. PTY. LIMITED**

(A Division of Ferris Industries Limited)



SYDNEY - MELBOURNE - BRISBANE - NEWCASTLE - WOLLONGONG - CANBERRA - ORANGE - ROCKHAMPTON - TOWNSVILLE

SPECIFICATIONS

TUNING RANGE 525 - 1620KC/S

INTERMEDIATE FREQUENCY 455 KC/S

TRANSISTOR COMPLEMENT

1 x 2N1637 RF amplifier
 1 x 2N1639 Converter
 1 x 2N 1638 1st IF amplifier
 1 x 2N 1638 2nd IF amplifier
 1 x OC71 Audio amplifier
 1 x OC 74 Audio driver
 2 x AC 128 PP power output

DIODES

1 x GD3 overload diode
 1 x GD3 AVC diode
 1 x GD3 detector diode

CONSUMPTION

150 ma including dial lamp for
 12 volts at zero signal.
 200 ma for 6 volts.

LOUD SPEAKER

Size and type - to suit vehicle
 Voice coil impedance 3 ohms.

TUNING DRIVE RATIO 6:1

3 turns of knob

POWER OUTPUT

Undistorted 1.5 watts.
 Maximum 2.0 watts.

DIMENSIONS 7" x 5¼" x 2"

Weight: 3lbs. 11 oz. Nett.
 4lbs. 5 oz. Packed.

DESCRIPTION

The Ferris Model 145 is a compact and rugged eight transistor car radio designed to mount either in dash or under dash in a motor vehicle. Both the 12 volt and 6 volt models have polarity reversal adjustment thus giving correct matching for the appropriate installation.

CONTROLS

A die cast metal knob operates tuning capacitor via anti-back lash gear system
 Dial pointer is cord driven from spindle winding drum.

VOLUME & ON-OFF SWITCH

A die cast concentric knob controls receiver volume and on-off switch.

TONE CONTROL

A continuously variable tone control is concentric with volume control.

EXTERNAL CONNECTION

Aerial and speaker connecting sockets are mounted at rear corners of set.
 Aerial compensating trimmer is adjacent to aerial socket and battery lead is adjacent to speaker socket.

POLARITY SELECT

To adjust polarity, remove top lid and follow instructions on indicator plate.

LID REMOVAL

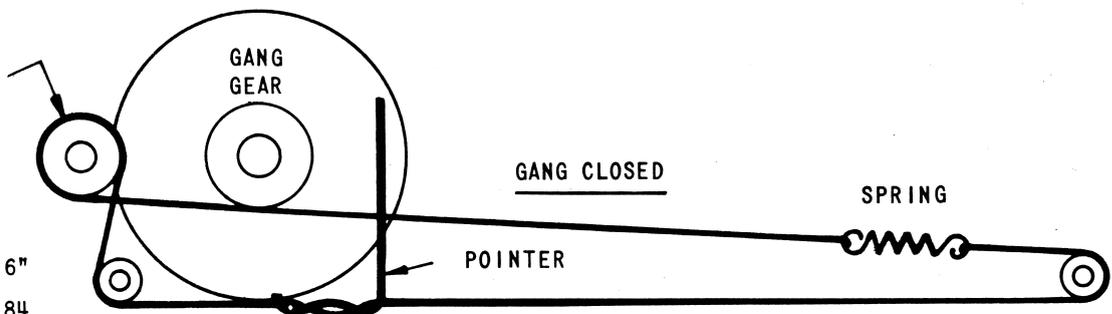
To remove either lid, remove one self tapping screw from rear of set and one from each side. Slacken the two lid screws at front of set. Lid can now be slid off towards rear of set.

DIAL CORD REPLACEMENT

Remove top and bottom lids as previously described and re-string in accordance with diagram.

DIAL CORD DETAIL

2 TURNS AROUND
 TUNING SPINDLE



TOTAL CORD LENGTH - 16"
 CORD TYPE NYLON - B.184

To adjust pointer, slide along cord as required.

DIAL LAMP REPLACEMENT

Remove knobs (knobs pull off) then remove spigot nuts and dial scale. Remove screw which holds dial lamp bracket. Lamp assembly can now be brought out through aperture for ease of replacement.

For all alignment operations, connect the low side of the signal generator to the frame or case and keep the generator output as low as possible to avoid AVC action. Set volume control at maximum.

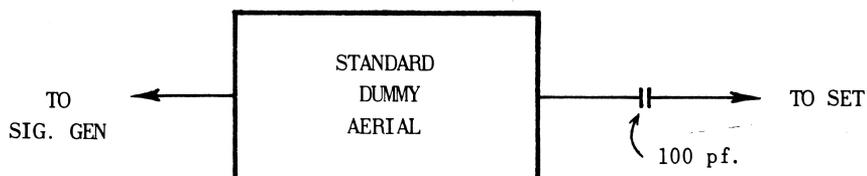
NB - Use proper alignment tool for making adjustments. Cores are easily broken by improper handling, making replacement of entire coil or transformer necessary.

STEP	Connect sig. gen. to	Tune sig. gen. to	Tune receiver to	Adj. for Max. output
1	Base of 2N1639 via .1 uf capacitor	455KC/S	Gang fully open " " "	1F3 (one slug)
2				1F2 (all slugs on
3				1F1 outer peaks.)
4	Repeat above adjustments until no further increase can be obtained.			
5	Aerial socket via dummy aerial & 100 pf capacitor (see diagram)	525 KC/S	Gang fully closed	OSC coil slug (L6)
6		1620KC/S	Gang fully open	OSC. Trimmer TR4
7	Repeat steps 5 and 6 until band limits are 525 - 1620 KC/S			
8	Aerial socket via dummy aerial & 100 pf capacitor (see diagram)	550 KC/ft	550 KC/S	* RF coil slug (L5) * Aer. coil slug (L2)
9		1400 KC/ft	1400 KC/S	TR2 and TR3

Rock gang back and forth through signal.

Repeat steps 8 and 9 till no further increase can be obtained.

Check sensitivity at 1400, 900 and 550 KC .



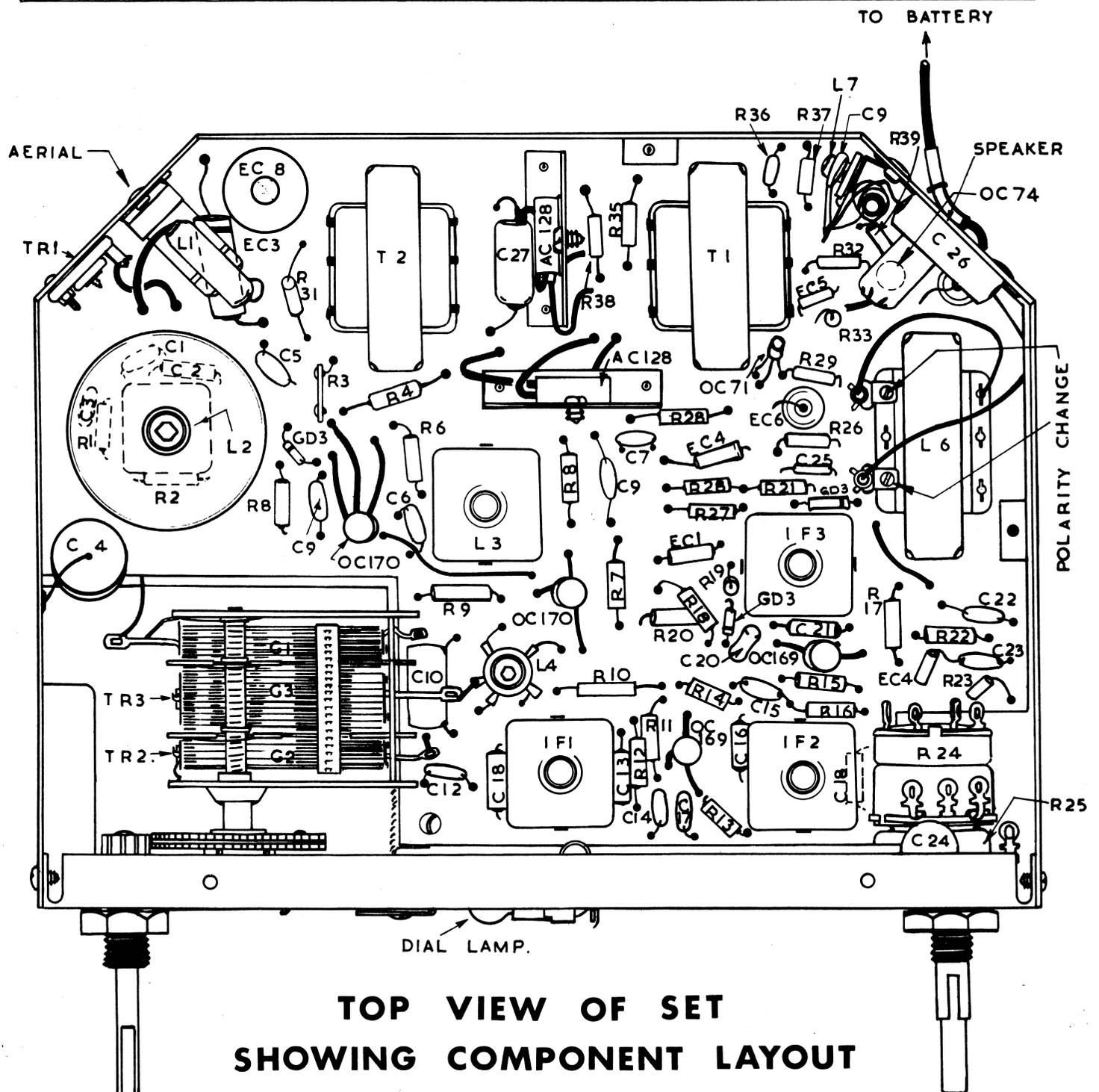
DUMMY AERIAL ARRANGEMENT FOR ALIGNMENT M145

D. C. RESISTANCE OF WINDINGS:

WINDING	DC RESISTANCE in OHMS.
Aerial filter choke (L1)	2.5
Aerial coil primary) (L2)	16
Aerial coil secondary total)	2.2
Ferrite bead choke (L7)	Less than 1 ohm.
HF choke (L5)	Less than 1 ohm.
RF coil primary total) (L3)	2.5
RF coil secondary)	Less than 1 ohm.
Oscillator coil primary) (L4)	Less than 1 ohm.
Oscillator coil secondary total)	7.5
LF choke (L6)	1
1F1 primary total	8.5
1F1 secondary total	8.5
1F2 primary total	8.5
1F2 secondary total	8.5
1F3 primary total	7.5
1F3 secondary total	3.0
Driver transformer primary) (T1)	120
Driver transformer secondary total)	60
Speaker transformer primary total) (T2)	3.0
Speaker transformer secondary)	Less than 1 ohm.

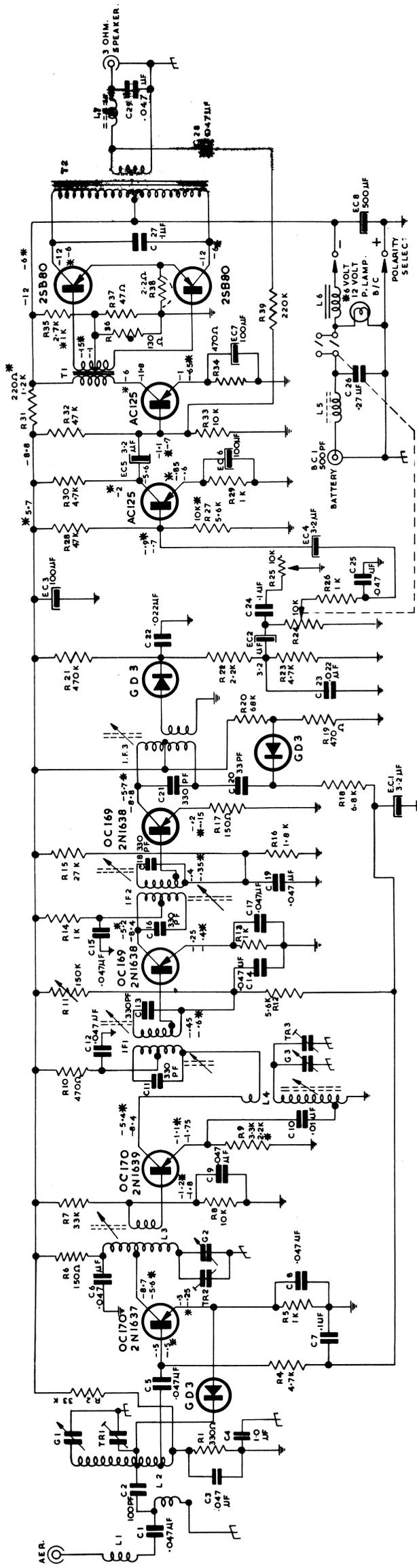
SERVICE HINTS

- Extreme care should be used to avoid accidental shorting of transistor elements to circuit ground. This is especially true of the output transistors. If a terminal of the driver transformer secondary should accidentally be grounded for a few seconds, the output transistors would be permanently damaged.
- Since a transistor needs only low voltage applied to its terminals for conduction, testing continuity of a circuit which includes a transistor can result in misleading indications and damage to the transistor. To avoid this, remove the transistor from the circuit board before making continuity tests.
- Voltmeters used for test purposes must have a sensitivity of at least 20,000 ohms. per volt. The use of low impedance meters will give misleading results as serious shunting effects will occur. When checking for a circuit fault causing excessive battery drain, an overall current measurement and supplementary voltage measurements should be made.
- Signal tracing by signal injection from a signal generator is carried out on transistor radios in exactly the same manner as has been done for many years with conventional valve radios. The signal generator should be connected in series with a capacitor (.1 uf) to avoid shorting out bias voltages.
- The output of this receiver is of the 'Class B' type. It should be noted that in 'Class B' output, the battery current increases with increase in power output.
- Transistors and printed circuit board can be damaged by excessive heat. Whenever soldering is necessary on the printed circuit board use a soldering iron which is both HOT and CLEAN. Do not hold the soldering iron on a soldering point any longer than is absolutely necessary. This minimises the amount of heat which will be radiated from the point of soldering. When soldering or unsoldering a transistor grasp the transistor lead with a pair of long-nose pliers to provide a heat sink. Excessive heat can damage a transistor.



**TOP VIEW OF SET
SHOWING COMPONENT LAYOUT**

FERRIS ALL TRANSISTOR CAR RADIO - MODEL 145 - (REVISED)



- R1 - 330 Ω
- R2 - 33 K
- R3 - 100K
- R4 - 4.7K
- R5 - 10K
- R6 - 150K
- R7 - 33K
- R8 - 10K
- R9 - 3.3K
- R10 - 470Ω
- R11 - 150K
- R12 - 5.6K
- R13 - 1K
- R14 - 1K
- R15 - 27K
- R16 - 1.8K
- R17 - 150Ω
- R18 - 6.8K
- R19 - 470Ω
- R20 - 68K
- R21 - 470K
- R22 - 2.2K
- R23 - 4.7K
- R24 - 10K

- R25 - 10K POTENTIOMETER
- R26 - 1K 10% RESISTOR
- R27 - 5.6K 10% RESISTOR
- R28 - 47K 10% RESISTOR
- R29 - 1K 10% RESISTOR
- R30 - 4.7K 10% RESISTOR
- R31 - 1.2K 10% RESISTOR
- R32 - 47K 10% RESISTOR
- R33 - 10K 10% RESISTOR
- R34 - 470Ω 10% RESISTOR
- R35 - 2.7K 10% RESISTOR
- R36 - 100Ω NTC RESISTOR
- R37 - 2Ω 10% RESISTOR
- R38 - 2.2K 10% RESISTOR
- R39 - 220K 10% RESISTOR

- C1 - 100pF CAPACITOR
- C2 - 0.047μF CAPACITOR
- C3 - 0.047μF CAPACITOR
- C4 - 1.0μF 200V PAPER CAPACITOR
- C5 - 0.047μF 25V CAPACITOR
- C6 - 0.047μF 25V CAPACITOR
- C7 - 1μF 25V CAPACITOR
- C8 - 0.047μF 25V CAPACITOR
- C9 - 0.047μF CAPACITOR
- C10 - 0.1μF CAPACITOR
- C11 - 330PF CAPACITOR
- C12 - 0.047μF CAPACITOR
- C13 - 330PF CAPACITOR
- C14 - 0.047μF CAPACITOR
- C15 - 0.047μF CAPACITOR
- C16 - 330PF CAPACITOR
- C17 - 0.047μF CAPACITOR
- C18 - 330PF CAPACITOR
- C19 - 0.047μF CAPACITOR
- C20 - 33PF CAPACITOR
- C21 - 0.022μF CAPACITOR
- C22 - 0.022μF CAPACITOR
- C23 - 0.022μF CAPACITOR
- C24 - 1μF CAPACITOR
- C25 - 0.047μF CAPACITOR
- C26 - 27μF CAPACITOR
- C27 - 1μF CAPACITOR
- C28 - 0.047μF CAPACITOR
- C29 - 0.047μF CAPACITOR

- C30 - 33PF CAPACITOR
- C31 - 330PF CAPACITOR
- C32 - 0.022μF CAPACITOR
- C33 - 47K CAPACITOR
- C34 - 0.022μF CAPACITOR
- C35 - 10K CAPACITOR
- C36 - 10K CAPACITOR
- C37 - 10K CAPACITOR
- C38 - 10K CAPACITOR
- C39 - 10K CAPACITOR
- G1 - 3 GANG TUNING CAPACITOR
- G2 - 200 X 200 PF X 98 PF OSCILLATOR SECTION
- G3 - OSCILLATOR SECTION
- L1 - AERIAL CHOKE - TYPE 6108
- L2 - AERIAL COIL - TYPE 7113
- L3 - R.F. COIL - TYPE 7202
- L4 - OSC. COIL - TYPE 7320
- L5 - H.F. CHOKE - R.B.28
- L6 - L.F. CHOKE - TYPE B116
- L7 - FERRITE BEAD CHOKE - TYPE 6109

- TR1 - 2 GANG TRIMMER
- TR2 - GANG TRIMMER
- TR3 - GANG TRIMMER
- EC1 - 3-2μF 6V ELECTRO
- EC2 - 3-2μF 6V ELECTRO
- EC3 - 100μF 16V ELECTRO
- EC4 - 3-2μF 6V ELECTRO
- EC5 - 3-2μF 6V ELECTRO
- EC6 - 100μF 4V ELECTRO
- EC7 - 100μF 4V ELECTRO
- EC8 - 500μF 16V ELECTRO
- T1 - DRIVER TRANS. - 5207
- T2 - OUTPUT TRANS. - 4318-12VOLT
- T3 - 4318-6

BAND COVERAGE - 525 - 1620 KC/5
 F. FREQUENCY - 455 KC

TOTAL BATTERY CURRENT - 150 MA. AT 12VOLT
 - 200 MA. AT 6VOLT

COLLECTOR CURRENT OF O/P STAGE
 FOR ZERO SIGNAL. 3 MA. AT 12 VOLTS.
 6 MA. AT 6 VOLTS.

A.L RESISTORS 1/2 WATT RATING
 UNLESS OTHERWISE STATED

NOTE: - ALL VOLTAGES CHECKED WITH
 40,000 Ω.P.V. METER AT
 ZERO SIGNAL INPUT

DO NOT OPERATE SET WITHOUT
 SPEAKER CONNECTED.

* THESE VALUES ARE FOR
 6VOLT SET



Installation Guide

MODELS 145 & 149

8 TRANSISTOR CAR RADIOS

VEHICLE	YEAR		RECEIVER TYPE & VOLTAGE		DASH FITTING KIT NO.		SPEAKER KIT NO.	AERIAL		REAR SHELF SPEAKER KIT NO.	RETAIL PRICE COMPLETE	
	145	149	145	149	145	149		145	149		EITHER MODEL	145
AUSTIN												
Cambridge & Westminster	54/58	54/58	Std. 12v	Std. 12v	AU10	U/D	278	620S	620S	-	41 gns.	47 gns.
Lancer Series I	58/59	58/59	"	"	U/D	"	811F	"	"	-	41 gns.	47 gns.
Lancer Series II	60/61	60/61	"	"	"	"	1474#	620	"	-	39 gns.	47 gns.
A40	59/63	59/63	"	"	"	"	1528	"	"	-	41 gns.	47 gns.
Cambridge A60	59/62	59/62	"	"	AU11	AU13	1185F	620S*	620S*	1185R	41 gns.	47 gns.
Freeway	62/63	62/63	"	"	AU12	AU12	1134	"	"	"	41 gns.	47 gns.
CHEVROLET												
Chev.	55/57	55/57	"	"	CH10	U/D	400	620S	620S	1258	41 gns.	47 gns.
Chev.	59/61	59/61	"	"	CH11	"	1322	"	"	"	41 gns.	47 gns.
Chev.	61/62	61/62	"	"	U/D	"	"	"	"	"	41 gns.	47 gns.
Bel-Air	61/62	61/62	"	"	U/D	"	"	"	"	"	41 gns.	47 gns.
CHRYSLER												
Royal AP1-2-3-4 & V4	57/60	57/60	"	"	CR10	"	599	"	"	811R	41 gns.	47 gns.
AP2/3, AP3/4, AP3/4V	60/62	60/62	"	"	CR11	CR14	"	"	"	"	41 gns.	47 gns.
Plymouth Series R & S	62/63	62/63	Spc. 12v	"	CR12	CR15	1333	"	"	1258	41 gns.	47 gns.
Plymouth AP/5-2-4-4H	63	63	Std. 12v	"	CR13	CR16	1596	"	"	"	41 gns.	47 gns.
CITROEN												
Parisienne IS19	60/62	60/62	Std. 6v	"	CT10	I/D	1058	620S*	"	-	41 gns.	47 gns.
Parisienne ID19	62/63	62/63	Std. 12v	"	"	"	"	"	"	-	41 gns.	47 gns.
DODGE												
Phoenix	62/63	62/63	"	"	D010	D011	1611	620S	"	-	41 gns.	47 gns.
DATSUN												
Bluebird	62/63	62/63	"	"	I/D	I/D	1058	620S*	620S*	-	41 gns.	47 gns.
FIAT												
500 & 600	58/61	58/61	"	"	U/D	U/D	1474#	620S	620S	-	39 gns.	47 gns.
1100	58/62	58/63	"	"	"	"	"	"	"	1185R	39 gns.	47 gns.
1100D Riviera	63	63	"	"	"	"	"	"	"	"	39 gns.	47 gns.
1800, 2100 & 2300	60/63	60/63	"	"	FT10	FT12	1529	620S*	620S*	-	41 gns.	47 gns.
1500	62/63	62/63	"	"	FT11	FT13	1388	"	"	-	41 gns.	47 gns.
FORD												
Anglia De-Luxe	60/63	60/63	"	"	FD15	FD15	1058	"	"	-	41 gns.	47 gns.
Customline & Fordomatic	58/61	58/61	"	"	FD11	U/D	1542	620S	620S	811R	41 gns.	47 gns.
Consul, Zephyr Mk II	56/59	58/59	"	"	FD10	"	753	620S*	"	"	41 gns.	47 gns.
Consul (New Dash)	59/62	59/62	"	"	FD12	"	911	"	"	"	41 gns.	47 gns.
Cortina	62/63	62/63	"	"	I/D	I/D	1058	"	620S*	-	41 gns.	47 gns.
Falcon XK	60/62	60/62	Spc. 12v	"	FD13	FD17	1489	"	"	1258	41 gns.	47 gns.
Falcon XL	62/63	62/63	"	"	"	"	"	"	"	"	41 gns.	47 gns.
Zephyr Mk III	62/63	62/63	Std. 12v	"	FD14	FD16	"	"	"	811R	41 gns.	47 gns.
HILLMAN												
Series I & II	57/58	57/58	"	"	HL10	HL12	573	620S	620S	1185R	41 gns.	47 gns.
Series III & IIIA	59/61	59/61	"	"	U/D	U/D	1186	"	"	"	41 gns.	47 gns.
Super Minx	62/63	62/63	"	"	I/D	I/D	1530	"	"	811R	41 gns.	47 gns.
Minx 1600	62/63	62/63	"	"	HL11	HL13	573	"	"	1185R	41 gns.	47 gns.
HUMBER												
Hawk Series III	63	63	"	"	HU12	HU13	1054	"	"	"	41 gns.	47 gns.
Snipe & Hawk	58/59	58/59	"	"	HU10	HU11	823	"	"	"	41 gns.	47 gns.
Snipe & Hawk	60/62	60/62	"	"	"	"	1054	"	"	"	41 gns.	47 gns.
Snipe Series IV	63	63	"	"	HU12	HU13	"	"	"	"	41 gns.	47 gns.
HOLDEN												
FE & FC	56/59	56/59	"	"	HN10	HN13	MSP9x6	"	"	-	41 gns.	47 gns.
FB & EK	60/62	60/62	Spc. 12v	"	HN11	HN14	"	620S*	620S*	811R	41 gns.	47 gns.
EH	63	63	Std. 12v	"	HN12	HN15	1467	"	"	"	41 gns.	47 gns.
EJ	62/63	62/63	"	"	"	"	"	"	"	"	41 gns.	47 gns.
MORRIS												
Oxford Series V	59/62	59/62	"	"	M010	M010	1134	"	"	1185R	41 gns.	47 gns.
Minor 1000	55/61	55/61	"	"	U/D	U/D	1474#	620S	620S	-	39 gns.	47 gns.
Major Series II	60/61	60/61	"	"	"	"	"	"	"	-	39 gns.	47 gns.
Mini-Minor 850	61/63	61/63	"	"	"	"	"	"	"	1185R	39 gns.	47 gns.
Elite	62/63	62/63	"	"	"	"	"	"	"	-	39 gns.	47 gns.
M.G.A. 1600	56/62	56/63	"	"	I/D	I/D	497	620S*	620S*	-	41 gns.	47 gns.
PEUGEOT												
403	57/62	57/62	"	"	"	"	566	"	"	-	41 gns.	47 gns.
404	62/63	62/63	"	"	PE10	U/D	-	620S	620S	1185R	41 gns.	47 gns.
RENAULT												
Dauphine	57/61	57/61	Std. 6v	Std. 6v	I/D	I/D	1058	"	620S	-	41 gns.	47 gns.
Cordini	59/61	59/61	"	"	"	"	"	"	"	-	41 gns.	47 gns.
Florde	61/62	61/62	"	"	"	"	"	"	"	-	41 gns.	47 gns.
R4	62/63	62/63	"	"	U/D	U/D	1474#	"	"	-	39 gns.	47 gns.

SEE OVER

INSTALLATION GUIDE FOR MODELS 145 & 149 CAR RADIOS

VEHICLE	YEAR		RECEIVER TYPE & VOLTAGE		DASH FITTING KIT NO.		SPEAKER KIT NO. EITHER MODEL	AERIAL		REAR SHELF SPEAKER KIT NO. EITHER MODEL	RETAIL PRICE COMPLETE	
	145	149	145	149	145	149		145	149		145	149
ROVER												
75-90-100-105	50/62	50/62	Std.12v	Std.12v	R010	U/D	1185F	620S	620S	-	41 gns.	47 gns.
SIMCA												
Aronde P60	60/62	60/63	Sp.c.12v	"	S110	S111	811F	"	"	1185R	41 gns.	47 gns.
STANDARD												
Spacemaster III	56/62	56/63	Std.12v	"	SD10	SD11	758	620S*	620S*	"(149)	41 gns.	47 gns.
STUDEBAKER												
Lark	61/62	61/62	"	"	I/D	U/D	1533	620S	620S	1258	41 gns.	47 gns.
Lark VIII Cruiser	62/63	62/63	"	"	ST10	"	"	"	"	"	41 gns.	47 gns.
SINGER												
Gazelle Series II	57/61	57/61	"	"	HL10	HL12	573	"	"	1185R	41 gns.	47 gns.
SUNBEAM												
Rapier Series II	58/60	58/60	"	"	"	"	"	"	"	811R	41 gns.	47 gns.
TRIUMPH												
Herald	59/63	59/63	"	"	U/D	U/D	811F 1474#	"	"	-	41 gns. 39 gns.	47 gns.
UNIVERSAL UNDER-DASH												
ALL 6 VOLT VEHICLES			Std.6v	Std.6v	"	"	1474#	To suit.		To Suit.	39 gns.	47 gns.
ALL 12 VOLT VEHICLES			Std.12v	Std.12v	"	"	"	"		"	39 gns.	47 gns.
VAUXHALL												
Velox & Cresta	58/63	58/63	"	"	VA10	"	1058	620S	620S	744	41 gns.	47 gns.
Velox & Cresta PB	63	63	"	"	VA15	VA17	"	620S*	620S*	1531R	41 gns.	47 gns.
Victor FD Series	58/60	58/60	"	"	VA12	U/D	"	620S	620S	-	41 gns.	47 gns.
Victor	61/62	61/62	"	"	VA13	"	"	"	"	1185R	41 gns.	47 gns.
Victor FB Series	62	62	"	"	VA14	VA16	"	"	"	"	41 gns.	47 gns.
Victor VX 4/90	62/63	62/63	"	"	VA15	VA17	"	620S*	620S*	"	41 gns.	47 gns.
VOLKSWAGEN												
Sedan 1200	58/63	58/63	Std.6v	Std.6v	VW10	VW12	632	De-luxe S/Mount	De-luxe S/Mount	-	41 gns.	47 gns.
Sedan 1500	63	63	"	"	VW11	VW11	1535	620*	620*	-	41 gns.	47 gns.
Kombi	54/62	54/62	"	"	U/D	U/D	408	3 pce S/Mount	3 pce S/Mount	-	41 gns.	47 gns.
Karmann Ghia	62/63	62/63	"	"	I/D	I/D	Mag.525	620S	620S	-	41 gns.	47 gns.
VOLVO												
122S	62/63	62/63	Std.12v	Std.12v	I/D	I/D	-	"	"	1185R	41 gns.	47 gns.
WOLSELEY												
15/60	59/62	59/62	"	"	W010	W011	1134	"	"	"	41 gns.	47 gns.
24/80	62/63	62/63	"	"	"	"	"	"	"	"	41 gns.	47 gns.

PLEASE NOTE:

DASH FITTINGS: I/D in Dash Fitting Column indicates set may be fitted in dash but does not require a dash fitting kit.
U/D in Dash Fitting Column indicates set can only be fitted under dash.

SPEAKERS: # indicates special "Pick-a-Back" Speaker in Housing, which may be attached to under side of receiver.
The letters F and R following Speaker Kit No. indicate front or rear mounting.
Where twin speakers (front and rear) are used, a "Y" Speaker Extension Piece should be used, "Y" Piece Retail 8/-.

In cases where kits are listed under both "Speaker Kit" and "Rear Shelf Speaker Kit" headings, the rear speaker is an optional extra priced as set out in our car radio accessory price list.

AERIALS: Model 620S is a Standard Top Cowl Aerial with a 4 ft. 6 in. extended length. It is also available in 620SS (1 ft. 10 in. extended) and 620L (6 ft. extended).
620SS - No additional cost.
620L - Add 6/6.

* - against recommended aerial indicates a Model 703 or 704 Fully Retractable may be used.
703 - add £1.17. 9
704 - add £2. 7. 9

N.B. Aerials recommended have been found the most suitable for the various vehicles listed - however, many cars can be fitted with single or twin rear fender mounting aerials to suit customer preference.

FERRIS BROS. PTY. LIMITED

(A Division of Ferris Industries Limited)

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