

# SERVICE MANUAL

3 PIECE RADIOGRAM ...

CONSOLE RADIOGRAM ...

**TL-4Z**

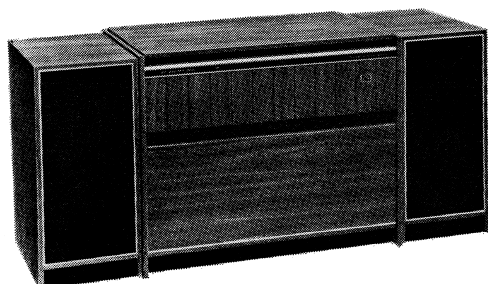
**TL-44**



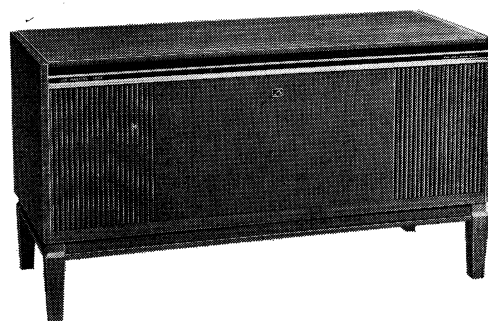
## "HIS MASTER'S VOICE"

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**E.M.I. (AUSTRALIA) LIMITED**  
(INCORPORATED IN N.S.W.)

6 PARRAMATTA ROAD  
HOMEBUSH, N.S.W.



**TL-4Z**



**TL-44**

Chassis Type TL is common to both TL-4Z, TL-44

## TECHNICAL SPECIFICATIONS

HMV 'INTERCEPTOR' ... Model TL-4Z

HMV 'STATESMAN' ... Model TL-44

### CONTROLS:

Power On-Off  
Radio-Gram  
Volume  
Balance  
Tuning  
Bass  
Treble

### ADDITIONAL FACILITIES:

5 pin D.I.N. socket providing stereo input and output;  
6.5mm phone jack for use with stereo head-phones from 8 ohms to 1000 ohms impedance.  
Speakers switch out when phones are connected.

### TRANSISTOR AND DIODE COMPLEMENT:

Tuner:  
1 type BF 195

2 type BF 194

1 type BA 217

1 type BA 216

Main Amp.:

2 type BC 159

2 type BC 148

2 type BC 157

4 type BC 147

2 type BD 135

2 type BD 136

Power Supply:

4 diodes BY 126/100 (Rectifiers)

### POWER OUTPUT:

5 watts R.M.S. per channel (total 30 watts peak)

### LOUDSPEAKERS:

Magnavox Type 8JX-15 ohms

**April, 1973**

**Part No. 684-1731**

#### DIMENSIONS:

##### TL-4Z SPEAKER BOXES

Height	574mm (22 $\frac{5}{8}$ "")
Width	266mm (10 $\frac{1}{2}$ "")
Depth	432mm (17"

##### TL-4Z CONTROL UNIT

Height	584mm (23"
Width	725mm (28 9/16"
Depth	446mm (17 9/16"

##### Complete Model Weight:

Packed	55.3Kg (122 lb.)
Unpacked	45.8Kg (101 lb.)

##### TL-44

Height	590mm (23 $\frac{1}{4}$ "")
Width	1073mm (42 $\frac{1}{4}$ "")
Depth	440mm (17 $\frac{1}{4}$ "")
Weight: Packed	40Kg (88 lb.)
Unpacked	37Kg (81.5 lb.)

#### TONE CONTROLS:

Separate bass and treble

#### RECORD CHANGER:

C129-A-1 4-speed auto with cueing lever

#### PICK-UP CARTRIDGE (B.S.R. type SC5M):

HMV type PC27 Ceramic

#### STYLUS (B.S.R. type ST14D):

HMV HV11D, Diamond .7 mil tip for stereo/mono,  
Sapphire 2.5 mil tip for 78

#### RADIO TUNING RANGE:

525-1800 KHz  
455 KHz Intermediate Frequency

#### MAINS SUPPLY:

230-250 Volts 50 Hz

#### POWER CONSUMPTION:

Radio 10-25 watts  
Gram 20-35 watts

## DISMANTLING

### MODEL TL-4Z

#### (1) Speaker Access:

Remove screws and lift out back panel of speaker boxes.

#### (2) To Remove Mechanism:

Remove 3 screws from underside of grooved front panel.

Slide grooved front panel down and out.

Through access hole at rear of cabinet, release the spring catch, by turning to a vertical position.

Ensure pickup arm is clipped to arm rest.

Withdraw mechanism by lifting to the left and upwards.

Remove pickup plug.

Unplug power leads.

#### (3) To Remove Chassis:

Pull off 5 control knobs.

Remove nut on "phones" socket. Remove front panel as for (2).

Slacken screws holding speaker socket clamp and aerial termination, release speaker and aerial lead assemblies (attached to chassis) from rear of cabinet.

Unplug pickup and disconnect record changer power supply.

Remove bracket supporting chassis adjacent to power transformer.

With a firm hold on the chassis, remove 2 gold screws in front wall of record changer compartment.

### MODEL TL-44

Remove Power lead plug from Power Point Socket.

#### (1) Speaker Access:

Remove 2 screws retaining top front aluminium trim.

Remove 5 wood screws (retaining baffle) from underside front of cabinet and 5 wood screws into top front of baffle.

Swing baffle out and withdraw it downwards.

Quick connect leads may be unplugged and speakers removed.

#### (2) To Remove Mechanism:

Through access hole at rear of cabinet, release the spring catch, by turning to a vertical position.

Ensure pickup arm is clipped to arm rest.

Withdraw mechanism by lifting it to the left and upwards.

Remove pickup lead connectors from P.U. panel noting sequence.

Release power leads from terminal block.

#### (3) To Remove Chassis:

First remove baffle as in (1) above.

Pull off 5 control knobs.

Remove nut on "phones" socket.

Loosen transit bracket screw adjacent to the power transformer.

Unscrew external aerial lead from underside of terminal.

Unplug pickup lead and unscrew three mains lead connections from record player compartment. Unplug speaker lead.

With a firm hold on the chassis, remove 2 gold screws in front wall of compartment.

## SERVICE NOTES

Transistors can be permanently damaged by excessive external or self-generated heat. When servicing, observe the following precautions:

Supply polarity should never be reversed. Do not replace component without unplugging appliance.

When soldering transistor leads, use a small iron. Solder as rapidly as possible, keeping well clear of the transistor body.

Preferably use a low-voltage iron.

Disconnect transistors before making transistor or circuit checks with an ohm-meter. Failure to do so will give misleading results.

When taking voltage measurements, avoid accidental short-circuits by the volt-meter probes.

The output transistors are operated in a complementary symmetry configuration. Care must be taken not to connect the collectors of these transistors to earth.

Fault finding can be carried out in the usual manner, keeping in mind that a transistor failure is unlikely.

When using a signal generator, a DC blocking capacitor should be used in the live lead to prevent disturbance of the transistor DC circuits.

The output must be correctly loaded during these tests. If the output load is reduced below that correct value, the maximum dissipation of the output transistors could be exceeded. An output meter, connected across the speaker voice coil, should have a resistance of not less than 200 ohms.

### IMPORTANT

It is desirable that, when any repairs are done to the audio amplifiers, the supply rail be reduced to half the nominal voltage to enable a performance check without the possibility of damage due to faulty components, etc.

This is best done by inserting a series resistor of approximately 2.2K ohms between the rectifier diodes and the supply rail before the electrolytic filter capacitor.

The supply rail (under no-signal conditions) will be roughly halved, as will the voltage at the junction of output collectors.

The amplifiers will continue to operate, but at reduced power and with non-symmetrical clipping. If the amplifiers do not operate, do not restore the full supply rail voltage until the fault has been rectified.

## ALIGNMENT PROCEDURE

In any case where a tuning component replacement has been made in either IF or RF circuits of the receiver, all circuits should be re-aligned. I.F. alignment should always precede R.F. alignment. An output meter, having a resistance of at least 200 ohms, should be connected across the voice coil of one speaker.

In carrying out the following operations, it is important that the input to the receiver from the signal generator should be kept low and progressively reduced as the circuits are brought into line, in order that overloading shall be avoided.

Note:

- (a) The tuning tool should be a small plastic screwdriver with a tip which fits cleanly into the tuning core.
- (b) When tuning the core, do not use any downward pressure, as the threaded former has enough resilience to detune the circuit, after the pressure has been released.

### IF ALIGNMENT

1. Set the signal generator to 455 KHz., with 30% modulation at 400 Hz. Turn the receiver volume control to maximum and set the tuning control to the LF end of the band.
2. Inject the signal into the aerial section of the gang. Adjust the cores of T5, T4 and T3, in that order, for maximum reading on the output meter. Start alignment of each IF transformer by first screwing its core well out, and then screwing the core into the coil until resonance is obtained.

### RF ALIGNMENT

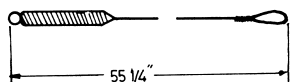
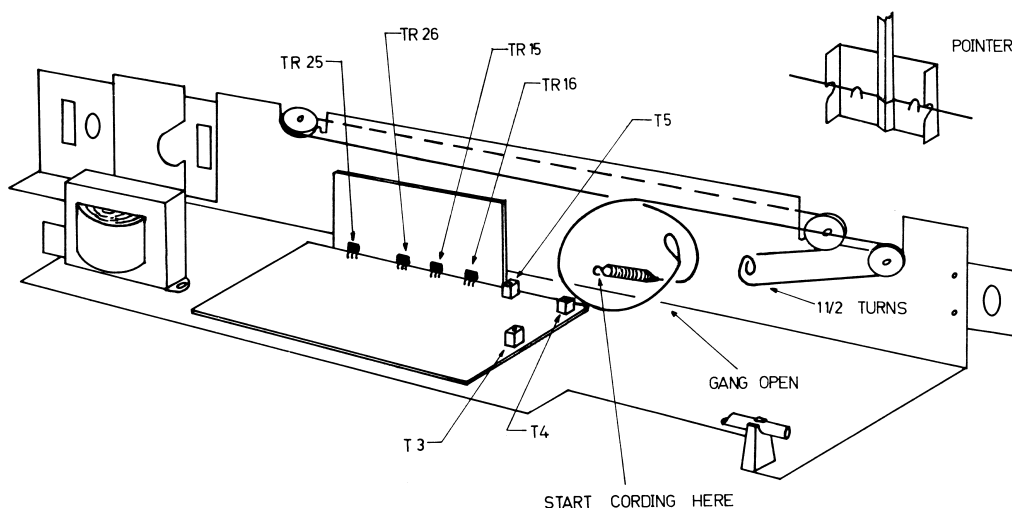
1. Set the controls as for IF alignments. Either connect a standard dummy aerial to external aerial lead or a coil comprising three turns of 16-gauge DCC wire about 12" in diameter should be connected across the output terminals of the generator. The coil is

placed concentric with the rod aerial at a distance of not less than one foot from it.

2. Check that the pointer coincides with the setting line when the gang capacitor is fully enmeshed. If necessary, the pointer may be shifted.
3. Set signal generator to 600 KHz.
4. Turn tuning control until the pointer is exactly over the 600 KHz calibration mark. Adjust the core in T2 for

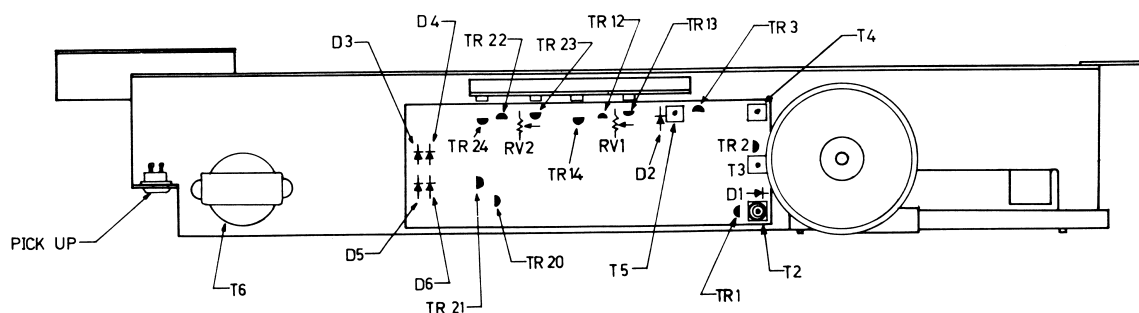
maximum reading on the output meter.

5. Set signal generator to 1500 KHz.
6. Turn tuning control until the pointer is exactly over the 1500 KHz calibration mark. Adjust VC3 and VC1, in that order, for maximum reading on the output meter.
7. Repeat operations 3 to 6 for optimum alignment.



#### ALIGNMENT DETAILS

IF	— 455 KHz
OSC TRIMMER	— 1500 KHz
OSC CORE	— 600 KHz
AERIAL TRIMMER	— 1500 KHz



## PARTS LIST

REF.	PART NO.	DESCRIPTION	REF.	PART NO.	DESCRIPTION
<b>CAPACITORS</b>			<b>CAPACITORS (continued)</b>		
C1	283-6621	.01uF $\pm$ 10% 100V Greencap	C21	283-6621	.01uF $\pm$ 10% 100V Greencap
C2	271-0731	.047 $\pm$ 80% —20% 25V Redcap	C22	271-0731	.047 $\pm$ 80% —20% 25V Redcap
C4	283-6621	.01uF $\pm$ 10% 100V Greencap	C23	271-0831	1uF $\pm$ 80% —20% 3V
C5	271-0731	.047 $\pm$ 80% —20% 25V Redcap	VC1 } VC2 } VC3 } VC4 }	281-0332	Capacitor Tuning M.S.P.
C6	271-0731	.047 $\pm$ 80% —20% 25V Redcap	<b>POTENTIOMETERS</b>		
C7	271-0731	.047 $\pm$ 80% —20% 25V Redcap	RV1	677-2461	500 Ohm—Preset
C9	271-0731	.047 $\pm$ 80% —20% 25V Redcap	RV2	677-2461	500 Ohm—Preset
C10	271-0731	.047 $\pm$ 80% —20% 25V Redcap	RV3 RV8	677-1781	2 Meg Ohm Tap 900K Ohm—Volume
C12	271-0731	.047 $\pm$ 80% —20% 25V Redcap	RV4 RV7	677-2661	1 Meg Ohm—Treble
C13	271-1271	.001uF $\pm$ 20% Disc Style AY	RV5 RV6	677-2661	1 Meg Ohm—Bass
C14	269-1741	47uF 25V Single Ended Electro	RV9	677-1771	500 Ohm—Balance
C15	271-1271	.001uF $\pm$ 20% Disc Style AY	<b>SEMI-CONDUCTORS</b>		
C16	269-1041	10uF 6V Single Ended Electro	TR1	932-3211	Transistor BF195
C17	271-1781	470pF $\pm$ 10% Disc Style AY	TR2	932-3221	Transistor BF194
C100 C200	271-2091	180pF $\pm$ 20% 500V Disc	TR3	932-3221	Transistor BF194
C101 C201	283-7171	.0015uF $\pm$ 10% AEE	TR10 TR20	932-3931	Transistor BC159
C102 C202	283-7181	.0015uF $\pm$ 10% 100V Greencap	TR11 TR21	932-3401	Transistor BC147
C103 C203	283-6741	0.1uF $\pm$ 10% 100V Greencap	TR12 TR22	932-3421	Transistor BC148
C104 C204	271-1981	22pF $\pm$ 5% N.P.O. Disc	TR13 TR23	932-3911	Transistor BC157
C105 C205	269-1641	2.2uF 35V Tantalum	TR14 TR24	932-3401	Transistor BC147
C106 C206	283-6741	0.1uF $\pm$ 10% 100V Greencap	TR15 TR25	932-4441	Transistor BD136
C107 C207	269-1741	47uF 25V Single Ended	TR16 TR26	932-4431	Transistor BD135
C108 C208	280-3581	.0018 $\pm$ 10% Styrofoam	D1	{ 932-2601 932-4371	Diode AB1101 or Alternative: Diode BA216
C109 C209	269-1741	47uF 25V Single Ended	D2	{ 932-2601 932-4461	Diode AB1101 or Alternative: Diode BA217
C110 C210	283-6741	0.1uF $\pm$ 10% 100V Greencap	D3	932-3041	Diode BY126/50
C111 C211	269-1771	220uF 28V Single Ended	D4	932-3041	Diode BY126/50
C112 C212	283-6781	0.22uF $\pm$ 10% 100V Greencap	D5	932-3041	Diode BY126/50
C18	283-6741	0.1uF $\pm$ 10% 100V Greencap	D6	932-3041	Diode BY126/50
C19	269-1431	2200uF 35V Double Ended Electro	<b>TRANSFORMERS</b>		
C20	283-6621	.01uF $\pm$ 10% 100V Greencap	T1	253-0501	Coil—Aerial Rod Assy. (including RA 1K Ohm $\pm$ 10% $\frac{1}{4}$ Watt 738-3481)

## PARTS LIST

REF.	PART NO.	DESCRIPTION	REF.	PART NO.	DESCRIPTION
<b>TRANSFORMERS (continued)</b>			<b>RESISTORS (continued)</b>		
			All Resistors are ½ Watt		
T2	257-0228	Coil—M/W Oscillator	R118 R218	740-1571	12 Ohm ± 10%
T3	906-1051	Transformer—I.F.1	R119 R219	740-0021	1K Ohm ± 10%
T4	906-1051	Transformer—I.F.2	R120 R220	740-0021	1K Ohm ± 10%
T5	906-1081	Transformer—I.F.3	R121 R221	740-2131	1 Ohm Philips ½ W.
T6	904-0801	Transformer—Mains	R122 R222	740-2131	1 Ohm Philips ½ W.
<b>RESISTORS</b>			R123 R223	740-0041	2.7K Ohm ± 10%
All Resistors are ½ Watt			R125 R225	740-0272	150 Ohm ± 10%
<b>CABINET MODEL TL-4Z</b>					
R1	740-1221	68K Ohm ± 5%	192-5242	Cabinet Centre Piece—Teak	
R2	740-0961	10K Ohm ± 5%	192-5252	Cabinet Speakers—Teak	
R3	740-1101	2.7K Ohm ± 5%	192-5262	Cabinet Centre Piece—Walnut	
R4	740-0391	330K Ohm ± 10%	192-5272	Cabinet Speakers—Walnut	
R5	740-1311	2.2K Ohm ± 5%	403-5141	Escutcheon Control—Perspex	
R6	740-0041	2.7K Ohm ± 10%	754-0671	Retainer Decorative—Front	
R7	740-0321	1.2K Ohm ± 10%	754-0681	Retainer Decorative—Rear	
R8	740-0141	100K Ohm ± 10%	820-2511	Shield—Escutcheon	
R9	740-1101	2.7K Ohm ± 5%	<b>CABINET MODEL TL-44</b>		
R10	740-0941	6.8K Ohm ± 5%	192-5351	Cabinet—Maple	
R11	740-0861	18K Ohm ± 10%	192-5361	Cabinet—Danish Walnut	
R12	740-0071	4.7K Ohm ± 10%	192-5371	Cabinet—Teak	
R13	740-0411	820 Ohm ± 10%	192-5531	Cabinet—Black Walnut	
R14	740-0011	470 Ohm ± 10%	403-5261	Escutcheon Control—Perspex	
R15	740-0101	22K Ohm ± 10%	539-0571	Leg—Maple	
R16	740-0321	1.2K Ohm ± 10%	539-0581	Leg—Danish Walnut	
R17	740-0071	4.7K Ohm ± 10%	539-0591	Leg—Teak	
R18	740-1591	220K Ohm ± 5%	539-0621	Leg—Black Walnut	
R19	740-0051	3.3K Ohm ± 10%	617-2271	Wingnut 5/16" ESS (Leg Fixing)	
R20	740-0861	18K Ohm ± 10%	754-0701	Retainer Decorative—Front	
R21	740-0231	39K Ohm ± 10%	754-0711	Retainer—Angle	
R22	740-1541	22K Ohm ± 5%	820-2591	Shield (Escutcheon)	
R23	740-0672	680K Ohm ± 10%	<b>MISCELLANEOUS</b>		
R100A R200A	740-0182	470K Ohms ± 10% (TL-44 only)	160-0121	Bush—Dial Lamp	
R100 R200	740-0132	82K Ohm ± 10%	211-0521	Cartridge—PC24 C/W Diamond Sapphire Stylus, HV11D	
R101 R201	740-0111	27K Ohm ± 10%	297-0011	Cord—Dial, 57" (1448mm)	
R102 R202	740-1461	120K Ohm ± 5%	381-0142	Drum—Dial	
R103 R203	740-2141	360K Ohm ± 5%	406-0271	Eyelet (Dial Lamp Bush)	
R104 R204	740-0601	68 Ohm ± 10%	517-3551	Knob—Tuning	
R105 R205	740-0281	220 Ohm ± 10%	517-3591	Knob—Control (4 off)	
R106 R206	740-0141	100K Ohm ± 10%	526-6732	Lead—Mains	
R107 R207	740-0341	470K Ohm ± 5%	558-2281	Record Changer — BSR A123- A-2 or C129Q C/W SC5M (HMV PC24) CART. and Diamond / Sapphire Stylus (HMV HV11D)	
R108 R208	740-0221	180K Ohm ± 10%			
R109 R209	740-0731	12K Ohm ± 10%			
R110 R210	740-0771	39 Ohm ± 10%			
R111 R211	740-0021	1K Ohm ± 10%			
R112 R212	740-0091	15K Ohm ± 10%			
R113 R213	740-0601	68 Ohm ± 10%			
R114 R214	740-0011	470 Ohm ± 10%			
R115 R215	740-0051	3.3K Ohm ± 10%			
R116 R216	740-0081	10K Ohm ± 10%			
R117 R217	740-0411	820 Ohm ± 10%			

## PARTS LIST

REF.	PART NO.	DESCRIPTION	REF.	PART NO.	DESCRIPTION
<b>MISCELLANEOUS (continued)</b>			<b>MISCELLANEOUS (continued)</b>		
	561-1301	Medallion—Trade Mark		824-1451	Socket—D.I.N.
	611-0641	Stylus—Diamond LPs (ST14D) and Sapphire 78 (HMM HV11D)		824-1561	Socket—6.5mm Phone Jack
	671-0811	Pointer—Assembly		831-3301	Speaker—8JX 45 Hz 15 Ohms
	684-8602	Label—Stylus (Ident.)		837-0961	Spindle—Tuning Assy.
	794-2771	Scale—Dial	SW2	840-0252	Spring—Dial
	824-0691	Socket—Lamp (Spire)	SW1	855-0871	Switch (Rocker) 240V.
				855-0921	Switch—Function (Rocker)
				932-1171	Lamp, 6.3V. 0.32A.

