

# SERVICE MANUAL

CONSOLE  
RADIOGRAMS

# TH-4S, TH-4T

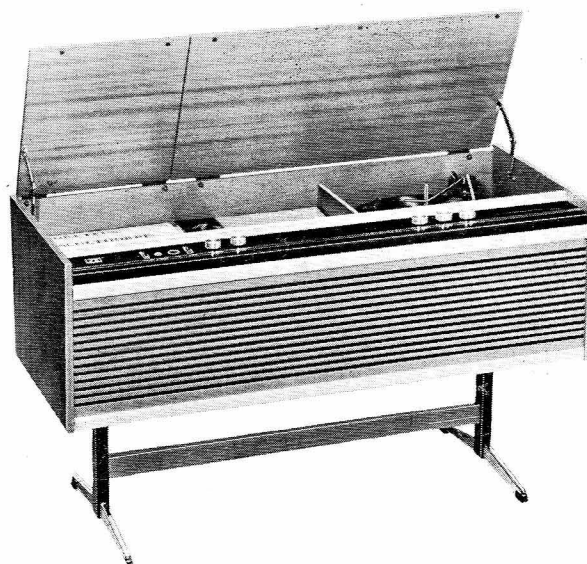


## "HIS MASTER'S VOICE"

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

**6 PARRAMATTA ROAD  
HOMEBUSH, N.S.W.**

Chassis type TH is common to both TH-4S and TH-4T



## SPECIFICATIONS

(For both models except where indicated)

### POWER SUPPLY:

230-250 volts, 50 Hz.

### CONSUMPTION:

Radio: 6-8 watts.  
Gram: 15-17 watts.

### POWER OUTPUT:

2 watts R.M.S. each channel  
Radio Tuning Range: 525-1800 KHz.

### SEMI-CONDUCTORS:

1 type BF195 .....	Mixer
2 type BF194 .....	I.F. Amplifier
2 type OA90 .....	Detector A.G.C.
2 type BC149 .....	Pre-Amplifier
2 type BC158 .....	Driver
2 pair type OC987, OC988 .....	Matched Output Pair
2 type BY126/100	Power Diode

### DIMENSIONS:

#### TH-4S:

Height	.... 23 15-16"
Width	.... 42 1-8"
Depth	.... 17 3-16"

#### TH-4T:

Height	.... 24"
Width	.... 42 3-8"
Depth	.... 17 3-10"

**PART No. 684-1161**

## DISMANTLING

### 1. **Speaker Access**

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

Swing baffle out to clear retaining cleat and withdraw it downwards from retaining groove.

### 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, noting sequence.

Release power leads from terminal block.

### 3. **To Remove Chassis**

First remove baffle as in 1. (above).

Unscrew transit screw spacer adjacent to the power transformer.

Unclip external aerial lead from underside of terminal and earthing lead to decorative trim.

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

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 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 emitters 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 680 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 emitters.

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.

### **CONVERSION TO 10 MM. I.F. TRANSFORMERS**

Early production of this model used 14 MM. transformers with external tuning capacitors. The alternative 10 MM versions using internal tuning capacitors, are shown on the parts list. Refer to previous T8 or 66 circuit diagrams for pin connections of 14 MM. version.

# 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.

## Components Peculiar to Model TH-4S

PART NO.	DESCRIPTION
192-4712	Cabinet, Maple
192-4722	Cabinet, Walnut
192-4792	Cabinet, Rosewood
192-4702	Cabinet, Teak
539-0442	Leg, Teak Inlay
539-0462	Leg, Walnut Inlay
539-0472	Leg, Black Inlay
754-0511	Retainer, Decorative Strip (Dial)

## Components Peculiar to Model TH-4T

PART NO.	DESCRIPTION
192-4732	Cabinet, Maple
192-4742	Cabinet, Walnut
192-4752	Cabinet, Teak

# **PARTS LIST — MODELS TH-4S and TH-4T**

REF.	PART NO.	DESCRIPTION	REF.	PART NO.	DESCRIPTION
CAPACITORS (TUNER)			CAPACITORS (MAIN AMP.) (continued)		
C1	271-1201	.01 $\pm$ 100% —0% 50V Ceramic	C38	271-1501	.0047 $\pm$ 80% —20% 25V Redcap
C2	271-1201	.01 $\pm$ 100% —0% 50V Ceramic	C39	271-1271	.001 mFd $\pm$ 20% Ceramic
C3	280-3191	.470 pF $\pm$ 5% 125V Styro (14 MM. Only)	C40	271-1271	.001 mFd $\pm$ 20% Ceramic
C4	271-0731	.047 mFd $\pm$ 80% —20% 25V Ceramic	C41	271-0731	.047 mFd $\pm$ 80% —20% 25V Ceramic
C5	271-0731	.047 mFd $\pm$ 80% —20% 25V Ceramic	C42	271-1441	47 pF $\pm$ 20% Ceramic
C6	269-1041	10 mFd 6V Electrolytic	C43	283-1541	.0022 uF $\pm$ 10% 400V Polyester
C7	271-0731	.047 mFd $\pm$ 80% —20% 25V Ceramic	C44	271-1441	47 pF $\pm$ 20% Ceramic
C8	280-3191	.470 pF $\pm$ 5% 125V Styro (14 MM. Only)	C45	283-1541	.0022 uF $\pm$ 10% 400V Polyester
C9	271-0731	.047 mFd $\pm$ 80% —20% 25V Ceramic	C47	271-0761	.1 mFd $\pm$ 80% —20% 25V Redcap
C10	271-0731	.047 mFd $\pm$ 80% —20% 25V Ceramic	C64	269-0971	2000 mFd 25VW
C11	271-0731	.047 mFd $\pm$ 80% —20% 25V Ceramic	C65	280-5201	.5 uF $\pm$ 20% 50V Lac. Film
C12	280-3251	1000 pF $\pm$ 5% 50V Styro (144 MM. Only)	C66	280-5201	.5 uF $\pm$ 20% 50V Lac. Film
C13	271-0731	.047 mFd $\pm$ 80% —20% 25V Ceramic	TRANSFORMERS AND COILS		
C14	269-1541	50 mFd 35V Electro	L1	259-0712	Coil, Aerial Loading
C15	271-1271	.001 mFd $\pm$ 20% Ceramic	T1	253-0442	Coil, Aerial Rod
C16	271-1321	.0022 mFd $\pm$ 20% Ceramic	T2	257-0227	Coil, Oscillator
C17	271-1321	.0022 mFd $\pm$ 20% Ceramic	T3	906-0764	Transformer, I.F., 14MM.
VC1 } VC2 } VC3 } VC4 }	281-0332	{ Capacitor Variable M.S.P. with Trimmers	T3	906-1051	Transformer, I.F., 10MM.
CAPACITORS (MAIN AMP.)			T4	906-0764	Transformer, I.F., 14MM.
C18	283-5621	.01 mFd $\pm$ 10% 50V Polyester	T4	906-1051	Transformer, I.F., 10MM.
C19	280-5201	.5 mFd $\pm$ 10% 50V Polyester	T5	906-0753	Transformer, I.F., 10MM.
C20	271-0761	0.1 uF $\pm$ 80% —20% Redcap	T5	906-1081	Transformer, I.F., 14MM.
C25	269-0991	3.5 mFd 6.4VW Electro	T6	904-0731	Transformer, Mains
C24	271-1391	.022 $\pm$ 20% 25V Redcap	SEMI-CONDUCTORS		
C26	269-1031	80-100 mFd 16VW Electro	TR1	932-3211	BF195—Mixer
C27	283-5621	.01 mFd $\pm$ 10% 50V Polyester	TR2	932-3221	BF194—I.F. Amplifier
C28	280-5201	.5 mFd $\pm$ 10% 50V Polyester	TR3	932-3221	BF194—I.F. Amplifier
C29	271-0761	0.1 uF $\pm$ 80% —20% 25V Redcap	TR4	932-3201	BC149—Audio Pre-Amp.
C32	271-1391	.022 $\pm$ 20+ 25V Redcap	TR5	932-3441	BC158—Audio Driver
C33	269-1251	47 mFd 25VW Electro	TR6 } TR7 }	932-2991	{ OC987/OC988—Audio Out- put—Matched Pair
C34	269-1031	80-100 mFd 16VW Electro	TR8	932-3201	BC149—Audio Pre-Amp.
C22	269-1211	12.5 mFd 25VW Electro	TR9	932-3441	BC158—Audio Driver
C23	269-1211	12.5 mFd 25VW Electro	TR10 } TR11 }	932-2991	{ OC987/OC988—Audio Out- put—Matched Pair
C37	271-1501	.0047 $\pm$ 80% —20% 25V Redcap	MR1	932-0971	OA90—Aux. A.G.C. Diode
			MR2	932-0971	OA90—Detector and A.G.C.
			MR3	932-2261	AS25 or BY126/100—Power Diode
MISCELLANEOUS			MISCELLANEOUS		
			RV1 } RV3 }	677-1781	{ 2 x 2M—Tapped 900K— Volume
			RV2 } RV4 }	677-1791	2 x 50K—Treble
			RV5	677-2401	500 ohms—Bass
			RV6	677-1771	500 ohms—Balance

# **PARTS LIST — MODELS TH-4S and TH-4T**

REF.	PART NO.	DESCRIPTION	REF.	PART NO.	DESCRIPTION
<b>MISCELLANEOUS (continued)</b>			<b>MISCELLANEOUS (continued)</b>		
SW1	855-0921	Switch—Function	611-0621	Stylus ST12—Double Sap-	
SW2	855-0871	Switch—Mains		phire 78 and LP/Stereo	
RT1	752-0111	47 ohms 10 %—Thermistor	611-0631	Stylus ST15—Double Sap-	
RT2	752-0111	47 ohms 10 %—Thermistor		phire LP/Stereo both sides	
	831-3202	Loudspeaker 8"—15 ohms	611-0641	ST14D—Sapphire 78,	
	297-0011	Dial—Cord		Diamond, LP/Stereo	
	381-0142	Drum—Dial	403-4831	Escutcheon—Control	
	561-1301	Medallion—Trademark		Indicator	
	671-0821	Pointer—Assembly	754-0521	Retainer—Decorative Strip	
	794-2554	Scale—Dial		(Baffle)	
	824-1561	Socket—6.5 MM.	895-0041	Terminal—Green	
	932-1171	Lamp—Dial	517-3591	Knob Assembly (Pointer)	
	824-1451	Socket—D.I.N.	517-3551	Knob Assembly (Tuning)	
	558-2041	Mechanism C110 or			
		C123/A/2 C/W SC5M—			
		Cartridge, and ST12—			
		Stylus			
		Cartridge—B.S.R. SC5M C/W			
		ST12—Stylus			





