SERVICE MANUAL

3 PIECE STEREO RADIOGRAM TG-4M
1 PIECE (CONSOLE) RADIOGRAM TG-40

"HIS MASTER'S VOICE"

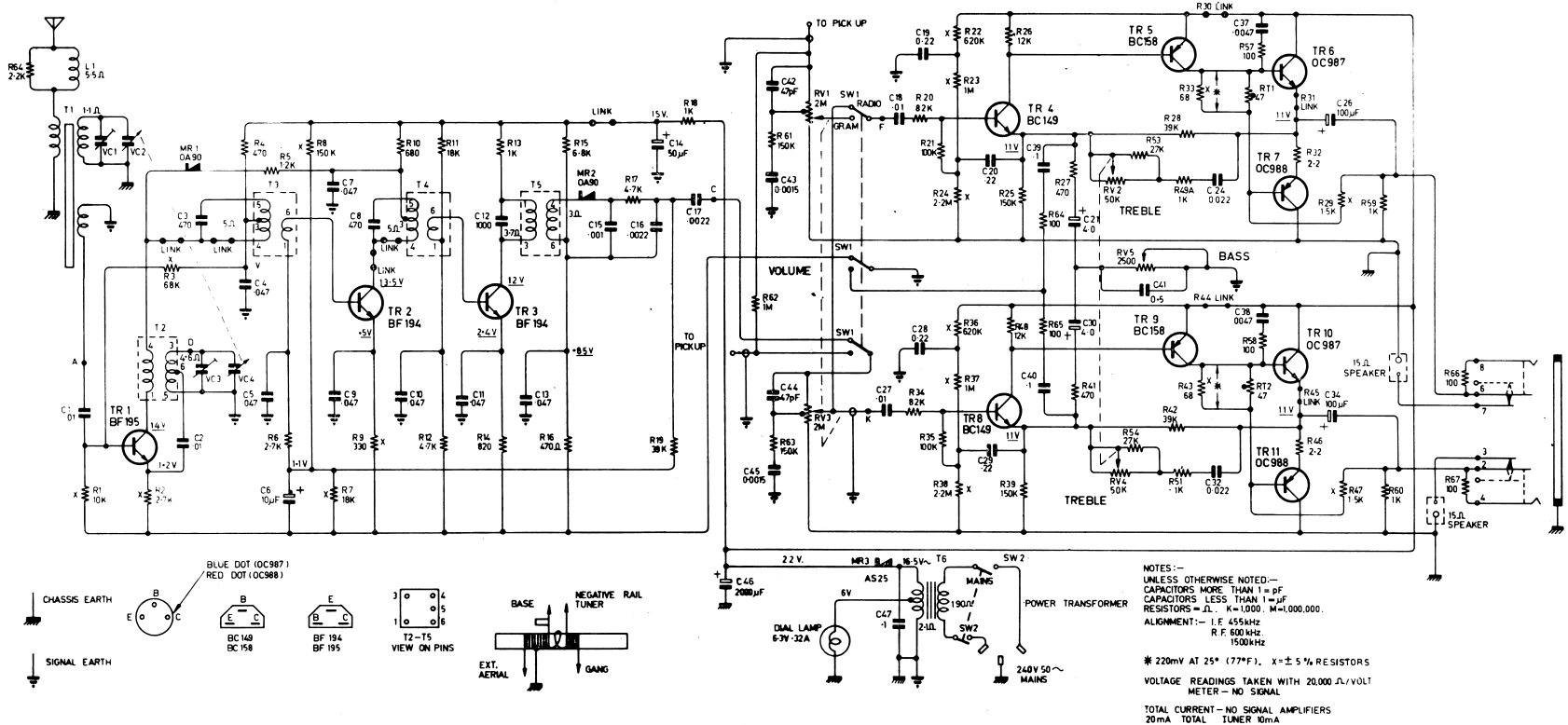
MANUFACTURED & DISTRIBUTED BY
E.M.I. (AUSTRALIA) LIMITED
(INCORPORATED IN N.S.W.)

6 PARRAMATTA ROAD
HOMEBUSH, N.S.W.

Chassis type TG is common to both TG-4M and TG-40, except that with TG-40 the main amplifier board is inclined to the heat sink by bending the printed circuit board bush support lugs. It will also be noted that model TG-4M uses the same 3 piece cabinet as model 07-4M and that the audio amplifier board and controls are common to both 07 and TG.

PART NO. 684-0761

H. CLARK PTY. LTD., PRINTERS, MARRICKVILLE, N.S.W.



NOTES:—
UNLESS OTHERWISE NOTED:—
CAPACITORS MORE THAN 1 = pF
CAPACITORS LESS THAN 1 = μF
RESISTORS = Ω. K = 1,000. M = 1,000,000.
ALIGNMENT:— I.F. 455kHz
R.F. 600 kHz.
1500kHz

* 220mV AT 25° (77°F). X = ± 5 % RESISTORS

VOLTAGE READINGS TAKEN WITH 20,000 Ω/VOLT METER — NO SIGNAL

TOTAL CURRENT — NO SIGNAL AMPLIFIERS 20mA TOTAL TUNER 10mA

TG-4M AND TG-40 CIRCUIT DIAGRAM SHOWING 14 MM. I.F. TRANSFORMERS

SPECIFICATIONS

(For both models except where indicated)

POWER SUPPLY
240-250 volts 50 Hz.

CONSUMPTION
Radio: 3-9 watts.
Gram: 8-12 watts.

POWER OUTPUT
2 watts R.M.S. each channel (singly driven)
1.5 watts R.M.S. each channel (both driven)

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
1 type BY126/100	Power Diode

DIMENSIONS:

4M Main Unit:

Height with lid	6"
Height without lid	$3\frac{1}{4}$"
Width	$15\frac{7}{8}$"
Depth	$15\frac{3}{8}$"

4M Speaker Units:

Height	13"
Width	9"
Depth	6"

Total Weight (Unpacked) 25lb.
Total Weight (Packed) 28lb.

Model 40

Height with legs	21-11/16"
Width	$29\frac{1}{8}$"
Depth	$16\frac{1}{4}$"

Weight (Unpacked) $39\frac{1}{2}$lb.
Weight (Packed) 45lb.

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 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 the 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

DISMANTLING

(1) A. TG-4M CHASSIS ACCESS:

Remove screw from under control unit, bend hardboard base, releasing from side retaining grooves.

CHASSIS REMOVAL AND POTENTIOMETER ACCESS (BOTH MODELS):

Remove knobs, withdraw P.K. screw retaining chassis, spacer, and escutcheon via escutcheon bracket, located between 2000 mFd and P.C.B., remove nut from phone jack.

MECHANISM REMOVAL:

Remove base as in (1) A, removing circlips and washers.

SPEAKER ACCESS:

Using a suitable length screwdriver and light, withdraw rear side screws retaining speaker baffle.

(2) A. TG-40 CHASSIS ACCESS:

Insert protective material between extrusion ends and cabinet. Remove 2 "Phillips" head screws retaining escutcheon and chassis assembly, slide and swing assembly backwards to expose chassis and P.C. board wiring.

B. SPEAKER ACCESS:

Withdraw 4 countersunk screws, located at front of cabinet base, releasing baffle.

C. MECHANISM REMOVAL:

Remove baffle as in B, then remove 2 screws fixing mechanism cover retainer. Release circlips and washers.

IMPORTANT:

It is desirable that, when any repairs are done to the audio amplifiers, the supply rail be reduced to half the normal 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 100 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.

CARTRIDGE REPLACEMENT MODEL TG-40:

(1) Remove counterweight by sliding from rear of arm for easy access.

(2) Noting colour coding, unplug leads from rear of cartridge.

(3) Unscrew Phillips head screw from under head/shell and withdraw head/shell cartridge assembly.

Replacement is a reversal of the above, using care when routing wires back into plastic moulding to clear screw.

CONVERSION TO 10 MM. I.F. TRANSFORMERS

Early production of this model used 14 MM. transformers with external tuning capacitors, as shown on the circuit diagram. The alternative 10 MM. versions using internal tuning capacitors, are shown on the parts list. Refer to separate diagram for pin connections.

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.

PARTS LIST: 3-PIECE STEREO — 1-PIECE (CONSOLE) RADIOGRAMS — TG-4M, TG-40

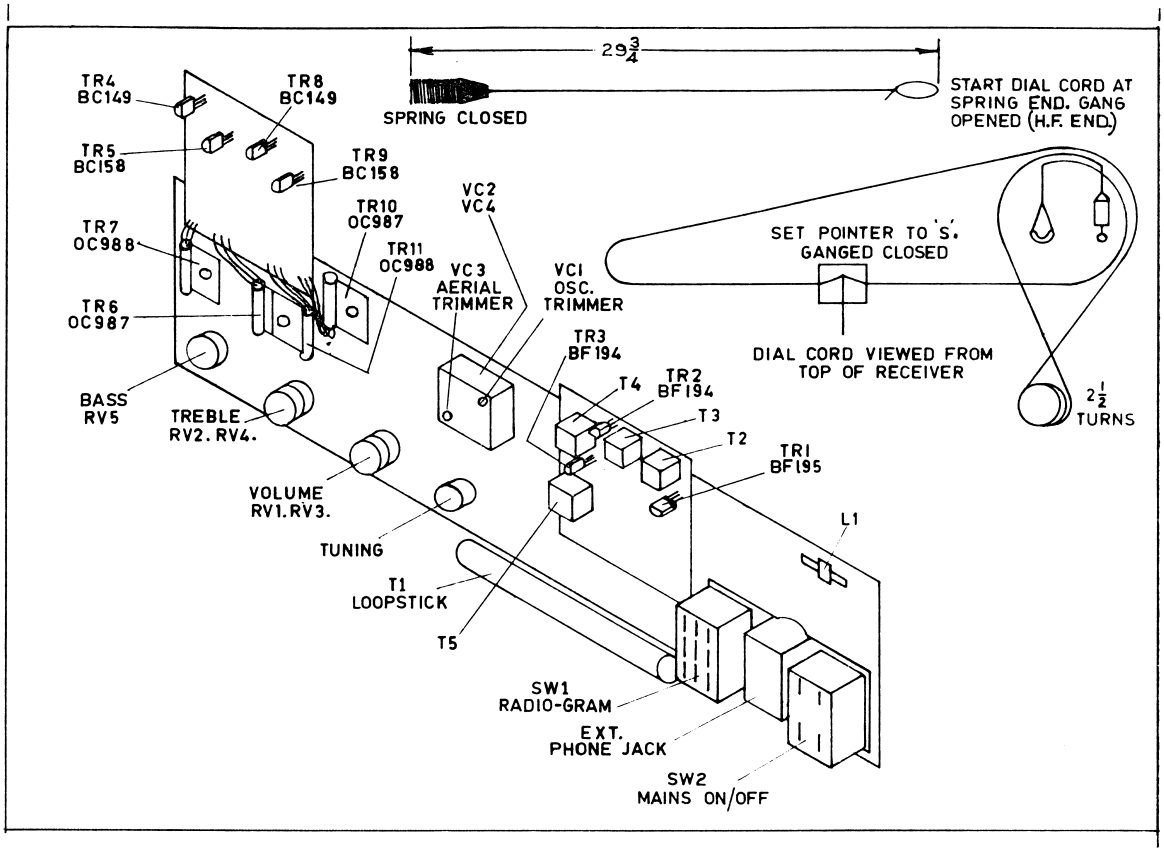
REF.	PART NO.	DESCRIPTION
		CAPACITORS (TUNER)
C1	271-1201	.01 +100% —0% 50V Ceramic
C2	271-1201	.01 +100% —0% 50V Ceramic
C3	280-3191	470pF ± 5% 125V Styro (14MM Only)
C4	271-0731	.047 mFd +80% —20% 25V Ceramic
C5	271-0731	.047 mFd +80% —20% 25V Ceramic
C6	269-1041	10 mFd 6V Electrolytic
C7	271-0731	.047 +80% —20% 25V Ceramic
C8	280-3191	470pF ± 5% 125V Styro (14MM Only)
C9	271-0731	.047 mFd +80% —20% 25V Ceramic
C10	271-0731	.047 mFd +80% —20% 25V Ceramic
C11	271-0731	.047 mFd +80% —20% 25V Ceramic
C12	280-3251	1000pF ± 5% 50V Styro (14MM Only)
C13	271-0731	.047 mFd +80% —20% Ceramic (25V)
C14	269-1541	50 mFd 35V Electro
C15	271-1271	.001 mFd ± 20% Ceramic
C16	271-1321	.0022 mFd Ceramic
C17	271-1321	.0022 mFd Ceramic
VC1, VC2, VC3, VC4	281-0471	Capacitor Variable 'PHILIPS'
		CAPACITORS (MAIN AMP)
C18	283-5621	.01 mFd ± 10% 50V Polyester
C19	271-0711	.22 mFd +80% —20% 25V Redcap
C20	271-0711	.22 mFd +80% —20% 25V Redcap
C21	269-0781	4 mFd 25V Electro
C24	271-1391	.022 ± 20% 25V Redcap
C26	269-1031	80-100 mFd 16VW Electro
C27	283-5621	.01 mFd ± 10% 50V Polyester
C28	271-0711	.22 mFd +80% —20% 25V Redcap
C29	271-0711	.22 mFd +80% —20% 25V Redcap
C30	269-0781	4 mFd 25VW Electro
C32	271-1391	.022 —20% 25V Redcap
C34	269-1031	80-100 mFd 16VW Electro
C37	271-1501	.0047 +80% —20% 25V Redcap
C38	271-1501	.0047 +80% —20% 25V Redcap
C39	283-5241	.1 mFd ± 20% 50V Polyester
C40	283-5241	.1 mFd ± 20% 50V Polyester

REF.	PART NO.	DESCRIPTION
		CAPACITORS (MAIN AMP) (Continued)
C41	280-5201	0.5 mFd ± 20% 50V
C42	271-1441	47pF ± 20% Ceramic
C43	283-1521	.0015 ± 10% 400V Polyester
C44	271-1441	47pF ± 20% Ceramic
C45	283-1521	.0015 ± 10% 400V Polyester
C46	269-0971	2000 mFd 25VW
C47	271-0761	.1 mFd +80% —20% 25V Redcap
		TRANSFORMERS AND COILS
L1	259-0712	Coil Aerial Loading
T1	253-0481	Coil Aerial Rod
T2	257-0227	Coil Oscillator
T3	906-0764	Transformer I.F. 14MM
T3	906-1051	Transformer I.F. 10MM
T4	906-0764	Transformer I.F. 14MM
T4	906-1051	Transformer I.F. 10MM
T5	906-0753	Transformer I.F. 14MM
T5	906-1081	Transformer I.F. 10MM
T6	904-0691	Transformer Mains
		SEMI-CONDUCTORS
TR1	932-3211	BF195—Mixer
TR2	932-3221	BF194—I.F. Amplifier
TR3	932-3221	BF194—I.F. Amplifier
TR4	932-3201	BC149—Audio Pre-Amp
TR5	932-3441	BC158—Audio Driver
TR6, TR7	932-2991	OC987/OC988—Audio Output Matched Pair
TR8	932-3201	BC149—Audio Pre-Amp
TR9	932-3441	BC158—Audio Driver
TR10, TR11	932-2991	OC987/OC988 Audio Output Matched Pair
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
RV1, RV3	677-2281	2 x 2M Tapped 900K—Vol.
RV2, RV4	677-2271	2 x 50K—Treble
RV5	677-2292	2500 ohms—Bass
SW1	855-0921	Switch Function
SW2	855-0871	Switch Mains
RT1	752-0111	47 ohms 10% Thermistor
RT2	752-0111	47 ohms 10% Thermistor
	831-3061	Loudspeaker E.M.I. 7" x 5" 15 ohms
	297-0101	Dial Cord
	381-0261	Drum Dial
	517-2861	Knob
	561-1301	Medallion, Trademark
	671-0931	Pointer Assembly

PARTS LIST: 3-PIECE STEREO — 1-PIECE (CONSOLE) RADIOGRAMS — TG-4M, TG-40

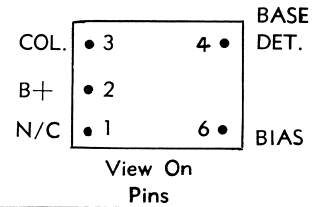
REF.	PART NO.	DESCRIPTION
		MISCELLANEOUS (Continued)
	794-2502	Scale Dial
	824-1561	Socket 6.5MM
	932-1171	Lamp Dial
		CABINET COMPONENTS PECULIAR TO MODEL TG-4M
	192-4631	Cabinet (3-piece), Teak and White
	192-4651	Cabinet, Teak Veneered (Oiled) (3-piece)
	192-4661	Cabinet, Walnut and White (3-piece)
	192-4671	Cabinet, Black and White (3-piece)
	211-0561	Cartridge, B.S.R. SX5M C/W ST15 Stylus
	294-1681	Cover, Dust (Top)
	403-4741	Escutcheon Function
	558-2201	Mechanism AA50 MK II C/W SX5M Cartridge ST15 Stylus
		or
	558-2211	Mechanism C114-A-4 C/W SX5M Cartridge and ST15 Stylus

REF.	PART NO.	DESCRIPTION
		CABINET COMPONENTS PECULIAR TO MODEL TG-4M (Continued)
	611-0621	ST12 Stylus Double Sapphire 78 and LP Stereo
	611-0631	ST15 Stylus, Double Sapphire LP Stereo both sides
	611-0641	ST14D Sapphire 78 Diamond LP Stereo
	794-2511	Scale Dark
		CABINET COMPONENTS PECULIAR TO MODEL TG-40
	192-4692	Cabinet Teak
	211-0571	SC7M Cartridge and ST16 Stylus
	294-1761	Cover (Top)
	294-1831	Cover Chassis
	403-4822	Escutcheon Function
	539-0451	Leg
	561-2621	Medallion Inlay
	558-2191	B.S.R. record changer type C124/A/1 fitted with SC7M cartridge and ST16 Stylus
	611-0651	ST16 Stylus Sapphire 78 and Sapphire LP Stereo
	794-2541	Scale Dark



TRANSISTOR LOCATION AND DIAL CORDING

black	906-1051	1st IFT TH, T8, TG, 67, 68, JH
		2nd IFT TH, T8, TG, 67, 68
brown	906-1061	1st IFT JB
		2nd IFT JB, JH
red	906-1071	3rd IFT JB, JH
orange	906-1081	3rd IFT TH, T8, TG, 67, 68
	10 MM I.F. TRANSFORMER	



10MM. I.F. CODING AND PIN CONNECTIONS