SERVICE MANUAL

CONSOLE STEREOPHONIC RADIOGRAM **T8-49**

"HIS MASTER'S VOICE"

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

6 PARRAMATTA ROAD
HOMEBUSH, N.S.W.

SPECIFICATION

POWER SUPPLY:
240-250 volts, 50 Hz.

CONSUMPTION:
Amplifiers: 17mA (no signal)
Tuner: 10mA (no signal)
Gram: Less than 15 watts, including record changer.
Radio: Less than 5 watts normal listening.

INTERMEDIATE FREQUENCY:
455 KHz.

SEMI-CONDUCTORS:
SE1001 (Silicon NPN)—Frequency Changer

SEMI-CONDUCTORS (continued)
SE1001 (Silicon NPN)—1st IF Amplifier
SE1001 (Silicon NPN)—2nd IF Amplifier
OA90 (Germanium Diode)—Auxiliary AGC
OA90 (Germanium Diode)—Detector and AGC
2, SE4010 (Silicon NPN)—Audio Amplifiers
2, AX1108 (Silicon PNP)—Audio Drivers
2 { OC987 (Germanium NPN) } —Push/Pull Output
{ OC988 (Germanium PNP) } (Matched Pairs)
2, AS25—Silicon Power Diodes

SPEAKER IMPEDANCE:
27 ohms at 400 Hz. (Minimum permissible, 20 ohms).

May, 1968

Part No. 683-8281

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SERVICE NOTES

Transistors can be permanently damaged by excessive heat or by heat generated within the circuit by excessive current flow. When servicing this equipment, the following precautions should be taken to prevent damage.

Supply polarity should never be reversed. So do not remove or replace a circuit component without first switching off the power.

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

The use of a 240-volt soldering iron should be avoided, as leakage and capacitance effects can destroy a transistor. To avoid this problem, a low-voltage iron with a step-down transformer should be used.

To unsolder multi-terminal components, it is best to apply heat simultaneously to all terminals, using a special iron tip. If a normal iron tip is used, apply the iron to each soldered joint in turn, and brush away the solder with a stiff brush.

Disconnect transistors before making circuit checks with an ohm-meter. Failure to do so will give misleading results and the transistors may be damaged by excessive conduction caused by the ohm-meter battery. Check polarity of the ohm-meter leads; electrolytic capacitors may be damaged if the ohm-meter battery voltage is applied in reverse polarity.

When taking voltage measurements, avoid accidental short-circuits by the voltmeter 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. The voltage at the emitters should be approximately +14.5 volts.

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.

Before connecting the generator, adjust its attenuator for minimum output. Signal generators designed for vacuum tube circuits can often deliver more signal than a transistor can safely handle. The output must be correctly loaded with 27 ohms during these tests. If the output load is reduced below the correct value, the maximum dissipation of the output transistors will be exceeded at medium and high ouput levels, which may result in damage to these transistors. An output meter, connected across the speaker voice coil, should have a resistance of not less than 250 ohms.

The bias across the audio pre-amplifier and driver transistors should not be measured, as this will give misleading results.

DISMANTLING

Before Removing Chassis or Mechanism:

Remove five wood screws (retaining baffle) from underside front of cabinet. Swing baffle out to clear retaining strip and withdraw it downwards from front decorative retaining strip.

To Remove Mechanism:

Remove pickup lead plug from socket.

Release power leads from terminal block.

Through the top right-hand access hole at the rear of the cabinet, release the spring catch by turning it to a vertical position.

Withdraw mechanism by lifting it to the left and upwards.

To Remove Chassis:

Unscrew wooden strut located below the chassis.

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

Unclip external aerial lead from underside of terminal, and earthing lead from pickup socket to control panel escutcheon.

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 quick check on the performance to be made without the possibility of damage occurring due to faulty components, etc.

This is best done by inserting a series resistor of 1000 ohms between the rectifier diodes and the supply rail before the electrolytic filter capacitor.

With the function switch to "Gram," the supply rail (under no-signal conditions) will be 14.5 volts; the voltage at the junction R31/32 (Vm) will be 6.0 volts.

The amplifiers will continue to operate, but at reduced power and with non-symmetrical clipping of the output stage due to the shift in centre voltage Vm. 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 component replacement has been made in either IF or RF circuits of the receiver, all circuits should be re-aligned. IF alignment should always precede RF 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.

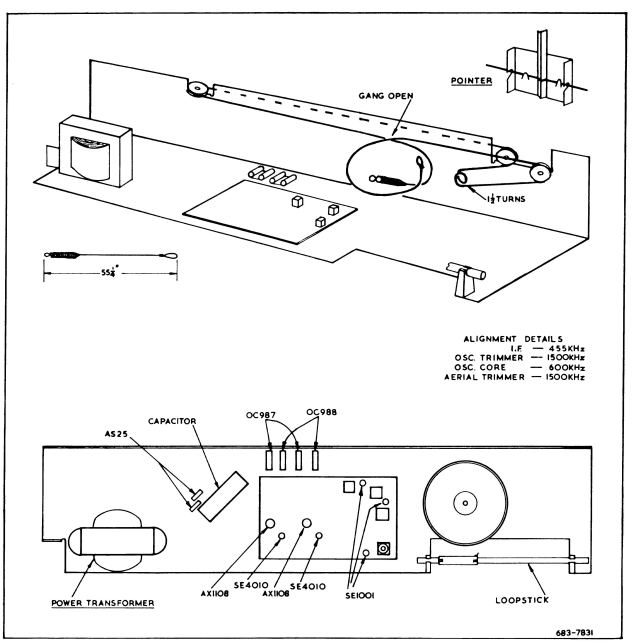
(b) When tuning the core, do not use any downward pressure, as the threaded former has enough resilience to de-tune the circuit, after the pressure has been released.

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 alignment. 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 pointers coincide with the setting lines when the gang capacitor is fully enmeshed. If necessary the pointers may be adjusted by releasing the two grub screws on the dial drum to the gang. After adjustment, the grub screws should be tightened.
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.



DIAL CORDING AND TRANSISTOR LOCATION

PARTS LIST — MODEL T8-49

REF.	PART NO.	DESCRIPTION
		RESISTORS
R1	740-0962	10K ± 5% ½W
R2	740-1102	2.7K ± 5% ½W
R3	740-1222	68K ± 5% ½W
R4	740-0012	470 ohms ± 10% ½W
R5	740-0322	1.2K ± 10% ½W
R6	740-0043	2.7K ± 10% ½W
R7	740-1532	18K ± 5% ½W
R8	740-1582	150K ± 5% ½W
R9	740-1262	330 ohms ± 5% ½W
R10	740-0682	680 ohms ± 10% ½W
R11	740-0862	18K ± 10% ½W
R12	740-0072	4.7K ± 10% ½W
R13	740-0022	1K ± 10% ½W
R14	740-0412	820 ohms ± 10% ½W
R15	740-0102	22K ± 10% ½W
R16	740-0252	1.5K ± 10% ½W
R17	740-0072	4.7K ± 10% ½W
R18	740-0252	1.5K ± 10% ½W
R19	740-0232	39K ± 10% ½W
R20	740-0132	82K ± 10% ½W
R21	740-0142	100K ± 10% ½W
R22	740-1642	300K ± 5% ½W
R23	740-1462	120K ± 5% ½W
R24	740-0342	470K ± 5% ½W
R25	740-0781	120K ± 10% ½W
R26	740-0082	10K ± 10% ½W
R27	740-0282	220 ohms ± 10% ½W
R28	740-0352	47K ± 5% ½W
R29	740-1382	1.8K ± 5% ½W
R30		Link
R31	740-1023	4.7 ohms ± 10% ½W
R32	740-1023	4.7 ohms ± 10% ½W
R33	740-1842	51 ohms ± 5% ½W
R34	740-0132	82K ± 10% ½W
R35	740-0142	100K ± 10% ½W
R36	740-1642	300K ± 5% ½W
R37	740-1462	120K ± 5% ½W
R38	740-0342	470K ± 5% ½W
R39	740-0781	120K ± 10% ½W
R40	740-0082	10K ± 10% ½W
R41	740-0282	220 ohms ± 10% ½W
R42	740-0352	47K ± 5% ½W
R43	740-1842	51 ohms ± 5% ½W
R44		Link
R45	740-1023	4.7 ohms ± 10% ½W
R46	740-1023	4.7 ohms ± 10% ½W
R47	740-1382	1.8K ± 5% ½W
R48	740-0043	2.7K ± 10% ½W
R49	740-0922	330 ohms ± 10% ½W
R50	740-0922	330 ohms ± 10% ½W
R51	740-0043	2.7K ± 10% ½W
R52	740-0152	150K ± 10% ½W
R53	740-0152	150K ± 10% ½W
R54, R56		Not Used
R57	740-0653	100 ohms ± 10% ½W
R58	740-0653	100 ohms ± 10% ½W
R59	740-1892	4.7 ohms ± 20% ½W

REF.	PART NO.	DESCRIPTION
		RESISTORS (continued)
R60	740-1892	4.7 ohms ± 20% ½W
R61	Part of 259-0712	2.2K ± 10% 1W
		CAPACITORS
C1	271-1201	.01uF + 100% —0% 50V Ceramic
C2	271-1201	.01uF + 100% —0% 50V Ceramic
C3	280-3191	470pF ± 5% 100V Styroseal
C4	271-0731	.047uF +80% —20% 25V Ceramic
C5	271-0731	.047uF +80% —20% 25V Ceramic
C6	269-1041	10uF 6V Electro
C7	271-0731	.047uF +80% —20% 25V Ceramic
C8	280-3191	470pF ± 5% 100V Styroseal
C9	271-0731	.047uF +80% —20% 25V Ceramic
C10	271-0731	.047uF +80% —20% 25V Ceramic
C11	271-0731	.047uF +80% —20% 25V Ceramic
C12	280-3251	1000pF ± 5% 50V Styroseal
C13	271-0731	.047uF +80% —20% 25V Ceramic
C14	269-1251	50uF 25V Electro
C15	271-1271	.001uF ± 20% Type AY
C16	271-1271	.001uF ± 20% Type AY
C17	271-1271	.001uF ± 20% Type AY
C18	271-1201	.01uF +100% —0% 50V Ceramic
C19	271-0711	0.22uF +80% —20% 25V Ceramic
C20	271-0761	0.1uF +80% —20% 25V Ceramic
C21	269-1321	6.4uF 25V Electro
C22	271-0841	470pF ± 20% Type AY
C23		Not used
C24	283-1661	.022uF ± 10% 400V Polyester
C25	269-1431	2000uF 35V Electro
C26	269-1031	80uF 15V Electro
C27	271-1201	.01uF +100% —0% 50V Ceramic
C28	271-0711	0.22uF +80% —20% 25V Ceramic
C29	271-0761	0.1uF +80% —20% 25V Ceramic
C30	269-1321	6.4uF 25V Electro
C31	271-0841	470pF ± 20% Type AY
C32	283-1661	.022uF ± 10% 400V Polyester
C33	283-1261	.15uF ± 10% 160V Polyester
C34	269-1031	80uF 15V Electro
C35	283-1541	.0022uF ± 10% 400V Polyester

PARTS LIST — MODEL T8-49

REF.	PART NO.	DESCRIPTION
		CAPACITORS (continued)
C36	283-1541	.0022uF ± 10% 400V Polyester
C37	271-0801	.0047uF ± 20% 25V Ceramic
C38	271-0801	.0047uF ± 20% 25V Ceramic
C39	271-1621	47pF ± 10% NPO Disc
C40	271-1621	47pF ± 10% NPO Disc
C41	271-1181	.05uF +80% —20% 50V Ceramic
		POTENTIOMETERS
RV1, RV2	677-1781	2 x 2M Tapped 900K Curve 'B'—Volume
RV3	677-1771	500 ohms Curve 'A'—Balance
RV4, RV5	677-1791	2 x 50K Curve 'C'—Tone
		SEMI-CONDUCTORS
TR1	932-2281	SE1001—Frequency Changer
TR2	932-2281	SE1001—1st IF Amplifier
TR3	932-2281	SE1001—2nd IF Amplifier
TR4	932-2731	SE4010—Audio Amplifier
TR5	932-2521	AX1108—Audio Driver
TR6, TR7	932-2991	OC987, OC988 —Audio Output (matched pair)
TR8	932-2731	SE4010—Audio Amplifier
TR9	932-2521	AX1108—Audio Driver
TR10, TR11	932-2991	OC987, OC988 —Audio Output (matched pair)
MR1	932-0971	OA90—Auxiliary A.G.C.
MR2	932-0971	OA90—Detector and A.G.C.
MR3, MR6		Not used
MR7	932-2261	AS25—Power Diode
MR8	932-2261	AS25—Power Diode
		TRANSFORMERS
T1	253-0441	Aerial Rod Assembly
T2	257-0227	Oscillator Coil
T3	906-0762	1st IF Transformer
T4	906-0762	2nd IF Transformer
T5	906-0752	3rd IF Transformer
	904-0561	Mains Transformer
		MISCELLANEOUS
L1	259-0712	Aerial Loading Coil
VC1, VC2, VC3, VC4	281-0332	2-Gang Capacitor with Trimmers
RT1	752-0111	47 ohms ± 10% Thermistor
RT2	752-0111	47 ohms ± 10% Thermistor
	831-2781	Speaker, 8 PIX Magnavox, 27 ohms V.C.I.

REF.	PART NO.	DESCRIPTION
		MISCELLANEOUS (continued)
	558-1631	Mechanism UA15SS3C/C1 Cartridge, ST3 Stylus
	740-0191	1M ± 10% ½W—Rumble Filter Resistor
SPARE PARTS		
	192-3591	Cabinet, Maple
	192-3601	Cabinet, Walnut
	192-3611	Cabinet, Rosewood
	192-3621	Cabinet, Teak
	539-0281	Leg, Maple
	539-0291	Leg, Walnut
	539-0301	Leg, Rosewood
	539-0311	Leg, Teak
	517-2911	Knob, Tuning
	517-2921	Knob, Push-Button
	517-2931	Knob, Assembly
	561-2061	Medallion, 'Solid State'
	561-1432	Medallion, Trade Mark
	561-1011	Medallion, 'Automatic'
	403-3741	Escutcheon
	794-2121	Dial Scale, Window
	794-2141	Dial Scale, Screened
	895-0041	Terminal, Green
	824-1311	Miniature Jack Socket
	855-0671	Function Switch
	526-4463	Mains Lead
	932-1171	Lamp, 6.3V, .32A B/C
	211-0411	Cartridge, Type C1
	611-0551	Stylus, B.S.R. Type ST3
	160-0121	Bush
	297-0011	Dial Cord
	381-0142	Drum Dial
	671-0821	Pointer Assembly
	754-0241	Aerial Rod Retainer
	837-0961	Spindle, Tuning Assembly

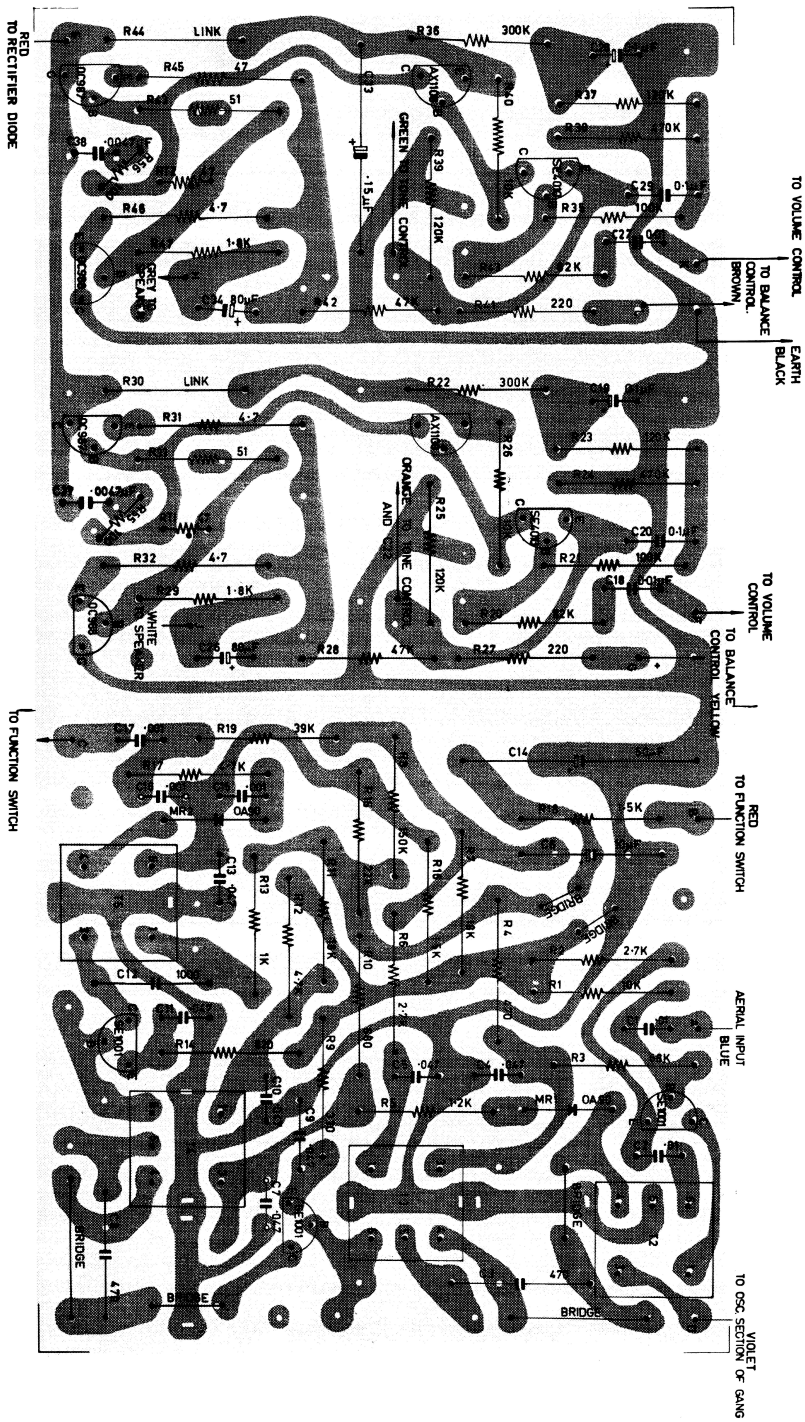
DIMENSIONS

	Packed	Unpacked
Height	20¼"	23⅛" (incl. 6" legs)
Width	45¾"	42⅛"
Depth	18¾"	17"

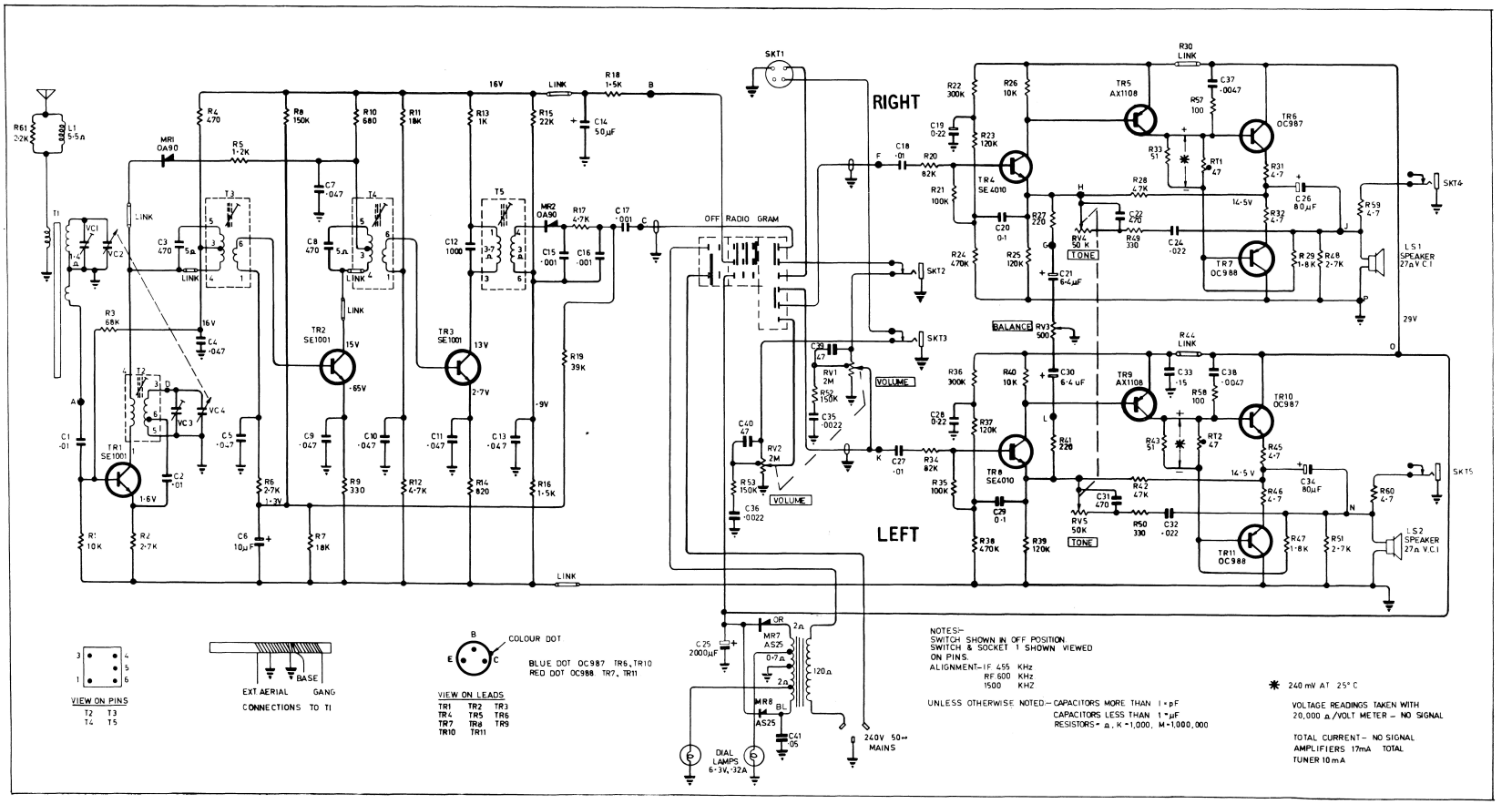
WEIGHT

Gross	74 lbs.
Nett	58 lbs.

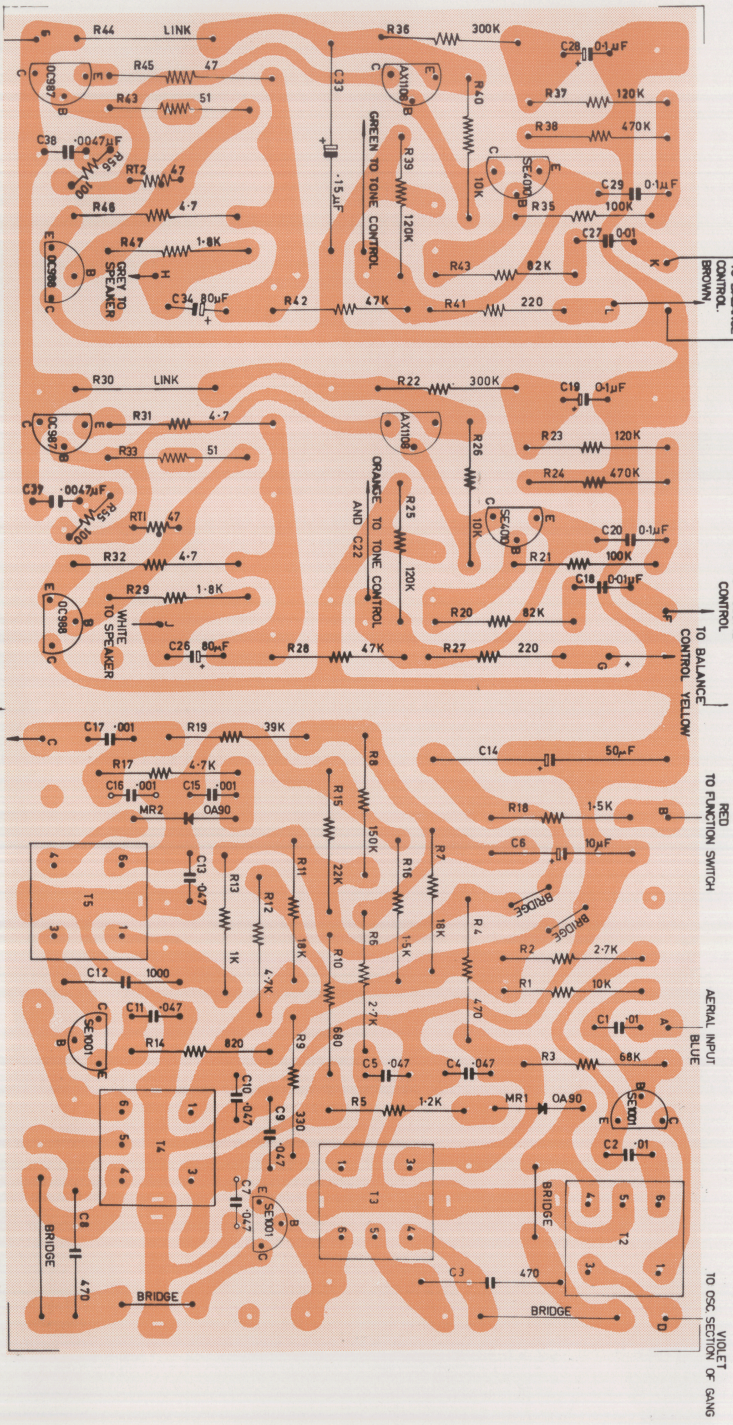
NOTE: On receivers after Serial No. 800—black wire from SKT1 to earth of C35 removed to reduce hum at minimum volume; electrostatic shield placed between mains switch and input wiring from SKT1 to reduce hum at maximum volume.



COMPONENT LAYOUT — VIEWED FROM COPPER SIDE



CIRCUIT DIAGRAM — T8 CHASSIS



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