SERVICE MANUAL

PORTABLE RADIO MODEL **JE-1J**

"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

FREQUENCY RANGE:
525-1650 kHz.

INTERMEDIATE FREQUENCY:
455 kHz.

BATTERY:
One Eveready Type 276-P.

BATTERY CONSUMPTION:
Zero Audio Output: Approximately 10 milliamperes.

SEMI-CONDUCTORS:

SE1010	(Silicon NPN) R.F. Amplifier	
SE1010	(Silicon NPN) Converter	
AX1202	(Silicon NPN) I.F. Amplifier	
AY1110	(Silicon PNP) A.F. Amplifier	
SE6002	(Silicon NPN) Audio Driver	
AC187	(Germanium NPN) Audio Output	Matched Pair
AC188	(Germanium NPN) Audio Output	Matched Pair
OA90	(Germanium Diode)) Audio Detector	
OA680	(Silicon Diode) A.G.C.	

LOUDSPEAKER:
7" x 4" Permanent Magnet—V/C Impedance at 400 Hz., 15 ohms. Undistorted power output (approx.), 500 mW.

DISMANTLING

To remove loopstick, dial lamp and dial cord assembly

1. Adjust the tuning control until the pointers are in the middle of the dial scale.
2. Remove the two countersunk screws—one on each end of the dial scale, together with the spire nuts located above the volume and tuning controls. Lift off the dial scale.
3. Remove the countersunk head screw which attaches the back plate to the rear of the cabinet near the external aerial indicator.
4. Push the aerial rod off its supports, towards the front of the cabinet.
5. By inserting a screwdriver between the tone control escutcheon and the back plate, lift the dial plate up and pull out, taking care not to damage the pointers.
6. To replace the back plate, reverse the procedure. Care should be taken to locate the red dial illumination button properly.

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April, 1968

Part No. 683-7901

SERVICE NOTES

Transistors can be permanently damaged by excessive external heat, or by heat generated within the circuit by excessive current flow. When servicing this equipment, the following precautions should be observed:

Supply polarity should never be reversed. Never remove or replace a transistor or 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 (IF transformers, etc.), it is best to apply heat simultaneously to all terminals, using a special iron tip. If a normal 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.

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 15 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 output levels.

Normal servicing and alignment can be done with only the cabinet back removed from the front assembly. For removal, unscrew the captive screw at the rear of the cabinet and pull out the end control knobs.

The printed circuit board can be serviced from both sides without disconnecting the leads. Care should be taken, however, not to disturb the trimmers or leads associated with the R.F. section of the board.

PRELIMINARY TESTS

Regardless of what the stated complaint may be, the following overall conditions should be checked:

1. Condition of the battery (voltage with the set turned on).
2. Overall current drain with no signal input (should be 9-14 mA).
3. Sensitivity by listening test.
4. Distortion by listening test.

NOTE: Since the audio amplifier is of complementary symmetry configuration, the emitters of the output transistors should never be shorted to either "+" or "—" rail.

ALIGNMENT TABLE

ORDER OF OPERATIONS	CONNECT GENERATOR TO	TUNE GENERATOR TO	TUNE RECEIVER TO	ADJUST FOR MAXIMUM PEAK OUTPUT
1	RF Section of gang	455 kHz.	L.F. Limit	Core T7
2	RF Section of gang	455 kHz.	L.F. Limit	Core T6
3	RF Section of gang	455 kHz.	L.F. Limit	Core T5
4	RF Section of gang	455 kHz.	L.F. Limit	Core T4
	Repeat steps 1-4 until maximum output is obtained *			
5	—	—	L.F. Limit	Pointers should lie on top and bottom markers on extreme right of dial.
6	Aerial Input**	600 kHz.	Bottom marker L.H. dial at 600 kHz.	Core Oscillator Coil (T3)***
7	Aerial Input	1500 kHz.	Bottom marker L.H. dial at 1500 kHz.	Oscillator Trimmer (VC5)
	Repeat 6 and 7			
8	Aerial Input	1500 kHz.	Bottom marker L.H. dial at 1500 kHz.	Aerial Trimmer (VC1)
9	Aerial Input	1500 kHz.	Bottom marker L.H. dial at 1500 kHz.	R.F. Trimmer (VC3)
10	Aerial Input	600 kHz.	Bottom marker L.H. dial at 600 kHz.	Aerial Coil (T1)****
11	Aerial Input	600 kHz.	Bottom marker L.H. dial at 600 kHz.	Core R.F. Coil****
	Repeat steps 8-11			

* These transformers are a very high Q miniature type. It should be appreciated then, that the amount of travel for the tuning core to cover its tuning range, is much less than in normal I.F. transformers. Tuning the I.F. thus becomes more critical, and the following hints will prove useful.

(a) The tuning tool used should be a small plastic screwdriver, whose tip fits cleanly into the tuning core.

(b) When tuning the core, do not use any downward pressure, as the thread in the former has enough resilience to detune the I.F. when the pressure is removed.

(c) The thread in the former may be damaged if the core is wound in and forced against the printed board. This should never happen, as only a light torque is normally required to turn the tuning core.

** Use a resistor of 4.7K ohms in series with the generator for accurate alignment.

*** Rock the tuning control back and forth through the signal and allow for maximum of 1 pointer width error between the white line and 600 kHz. generator frequency for maximum output.

**** These coils have been pre-aligned in production and under normal conditions no adjustment is necessary. To find if these coils are aligned, place a piece of ferrite and then a piece of brass near the loopstick and into the top of the former of the R.F. coil. If the coils are properly aligned, the receiver's output will drop. If the output increases at any stage in this check, re-alignment of these coils is necessary.

NOTE: Earlier models of this receiver are fitted with a conventional 2-pole Off/On switch (Part No. 677-1711) attached to the volume control. Later models use a special "make-break" switch (Part No. 677-1712), one section of which shorts the external aerial to earth when the set is switched "off".

PARTS LIST — MODEL JE-1J

REF.	PART NO.	DESCRIPTION
	RESISTORS	
R1	Part of 259-0712	2.2K ± 10% 1W
R2	740-1012	220 ohms ± 5% ½W
R3	740-0032	2.2K ± 10% ½W
R4	740-0242	33K ± 10% ½W
R5	740-1342	15K ± 5% ½W
R6	740-1802	300 ohms ± 5% ½W
R7	740-1812	2K ± 5% ½W
R8	740-0352	47K ± 5% ½W
R9	740-1672	20K ± 5% ½W
R10	740-1152	3K ± 5% ½W
R11	740-0652	100 ohms ± 10% ½W
R12	740-1012	220 ohms ± 5% ½W
R13	740-1002	4.7K ± 5% ½W
R14	740-0072	4.7K ± 10% ½W
R15	740-0272	150 ohms ± 10% ½W
R16	740-0862	18K ± 10% ½W
R17	740-0332	100K ± 5% ½W
R18	740-1732	330K ± 5% ½W
R19	740-1771	680K ± 5% ½W
R20	740-0862	18K ± 10% ½W
R21	740-0132	82K ± 10% ½W
R22	740-0652	100 ohms ± 10% ½W
R23	740-0922	330 ohms ± 10% ½W
R24	740-1342	15K ± 5% ½W
R25	740-1012	220 ohms ± 5% ½W
R26	740-0642	1.5K ± 5% ½W
R27	740-0462	33 ohms ± 10% ½W
R28	740-1042	27 ohms ± 10% ½W
	CAPACITORS	
C1	271-0731	.047uF +80% —20% 25V Redcap
C2	271-0731	.047uF +80% —20% 25V Redcap
C3	271-0731	.047uF +80% —20% 25V Redcap
C4	280-3081	330pF ± 5% 100V Styroseal
C5	271-1201	.01uF +100% —0% 50V National
C6	269-1171	25uF 6.4V Electro
C7	280-3081	330pF ± 5% 100V Styroseal
C8	271-0731	.047uF +80% —20% 25V Redcap
C9	271-0731	.047uF +80% —20% 25V Redcap
C10	280-3081	330pF ± 5% 100V Styroseal
C11	271-1501	.0047uF +80% —20% 25V Redcap
C12	280-3081	330pF ± 5% 100V Styroseal
C13	271-0841	470pF ± 20% Disc Type AY
C14	271-0841	470pF ± 20% Disc Type AY
C15	269-1351	200uF 10V Electro
C16	271-1201	.01uF +100% —0% 50V National
C17	271-0761	.1uF +80% —20% 25V Redcap
C18	269-1211	12.5uF 25V Electro
C19	271-1481	.003uF ± 20% Disc
	CAPACITORS (continued)	
C20	271-1151	.047uF ± 20% 25V Redcap
C21	269-1351	200uF 10V Electro
C22	269-1351	200uF 10V Electro
C23	271-1201	.01uF +80% —20% 50V National
	POTENTIOMETERS	
RV1	677-1712	100K—Volume and Switch
RV2	677-1701	100K—Tone Control
	SEMI-CONDUCTORS	
TR1	932-2681	SE1010—RF Amplifier
TR2	932-2681	SE1010—Oscillator Mixer
TR3	932-3051	AX1202—IF Amplifier
TR4	932-2891	AY1110—Audio Pre-amplifier
TR5	932-2581	SE6002—Audio Drive
TR6	932-2901	AC188 Complementary
TR7		AC187 Pair—Output
MR1	932-3071	OA680—AGC Control
MR2	932-0971	OA90—Detector
	TRANSFORMERS	
T1	253-0372	Aerial Rod Assembly
T2	255-0052	RF Transformer
T3	257-0227	Oscillator Coil
T4	906-0481	IF1 Transformer
T5	906-0491	IF2 Transformer
T6	906-0501	IF3 Transformer
T7	906-0842	IF4 Transformer
	MISCELLANEOUS	
VC1, VC3, VC5	281-0232	3 Gang Capacitor
VC2	281-0031	Trimmer Philips
VC4	281-0031	Trimmer Philips
VC6	281-0031	Trimmer Philips
L1	Part of 259-0712	Aerial Loading Coil
RT1	752-0121	110 ohm Thermistor
LS1	831-1823	Speaker, 15 ohms, 4 x 7 PG
Lamp	932-1791	Lamp, 12V 2W
	SPARE PARTS	
	189-1831	Cabinet Back, Charcoal
	189-1841	Cabinet Back, Tan
	189-1851	Cabinet Back, Red
	190-3141	Cabinet Front
	294-1411	Container Earpiece, Charcoal
	294-1421	Container Earpiece, Tan
	294-1431	Container Earpiece, Red
	831-2081	Earpiece and Plug
	416-0081	Foot
	526-4371	Lead, Aerial and Earth
	297-0111	Dial Cord
	381-0191	Drum Assembly
	453-1591	Grille
	470-0291	Handle Bar
	470-0301	Handle End, L.H.

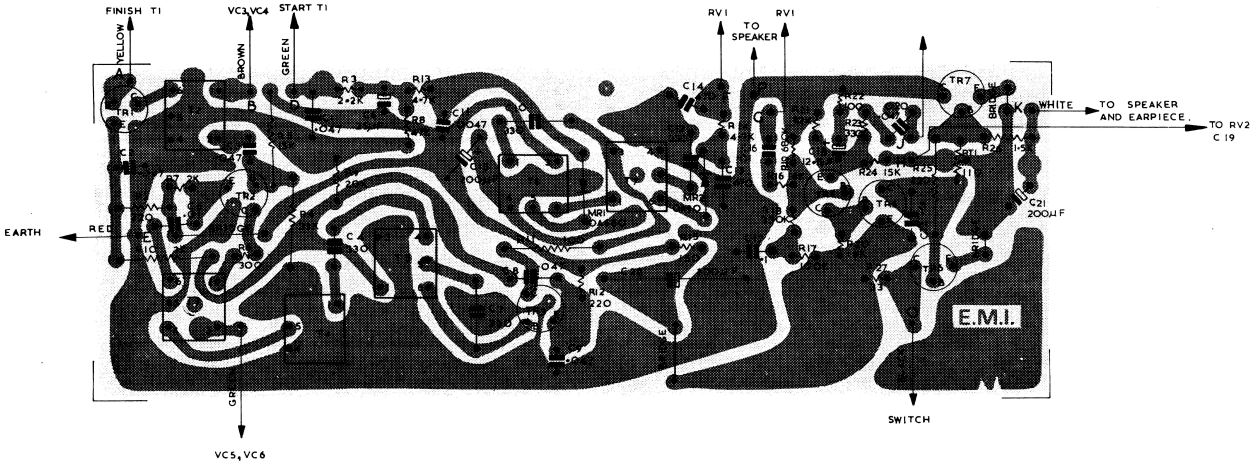
PARTS LIST — MODEL JE-1J

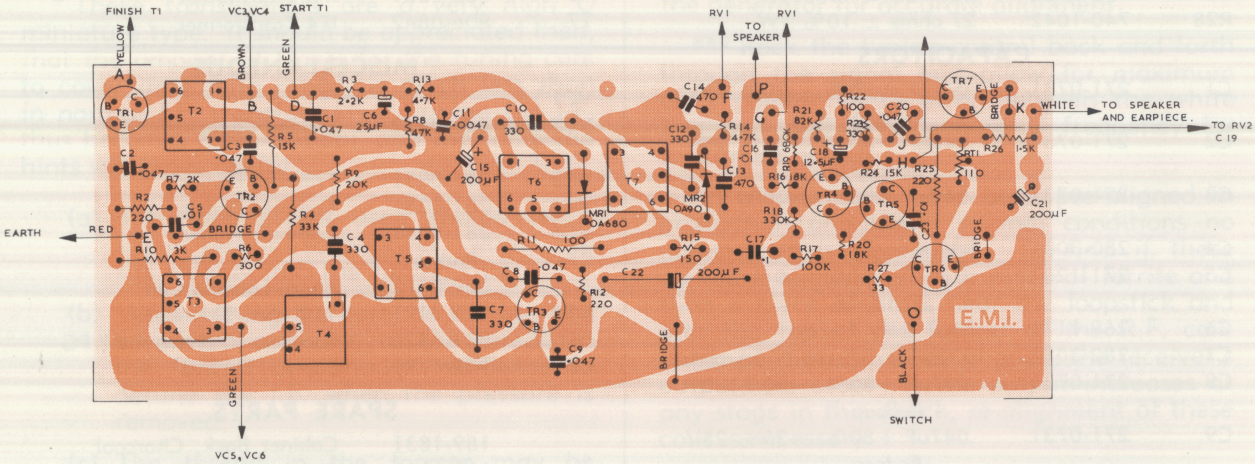
REF.	PART NO.	DESCRIPTION
	SPARE PARTS (continued)	
	470-0311	Handle End, R.H.
	517-2831	Knob, Tone
	517-2841	Knob, Indicator Lamp
	526-6741	Lead Assy., Battery
	561-1941	Medallion, Trade Mark
	561-1951	Medallion, "Challenge"
	664-3001	Plate, Dial Back
	671-0782	Pointer
	794-2042	Scale, Dial
	794-2051	Scale, Control Indicator
	814-1951	Screw, Captive

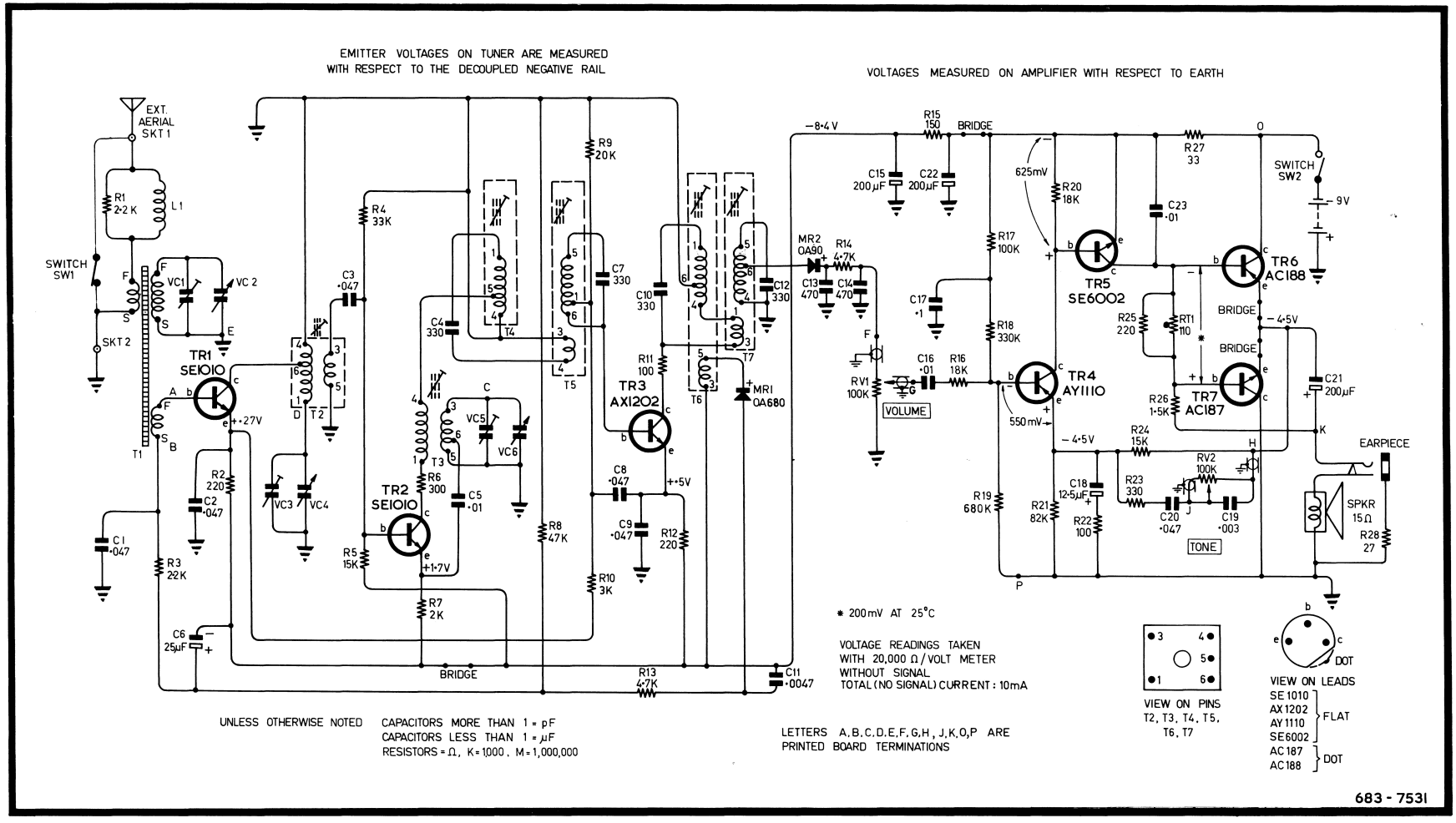
REF.	PART NO.	DESCRIPTION
	SPARE PARTS (continued)	
	824-0791	Socket, Aerial and Earth
	824-1311	Socket, Earpiece

CABINET DIMENSIONS

	Packed	Unpacked
Height	8"	$6\frac{3}{8}$"
Width	15"	$12\frac{1}{8}$"
Depth	$5\frac{1}{2}$"	3"
Weight Gross		7 lbs.
Nett		5 lbs. (including battery)




FINISH T1
YELLOW
VC3, VC4
BROWN
START T1
GREEN
RV1
TO SPEAKER
RV1
WHITE
TO SPEAKER AND EARPIECE.
TO RV2 C 19
EARTH
RED
BRIDGE
GREEN
VC5, VC6
BRIDGE
BLACK
SWITCH
E.M.I.
TR1
T2
TR2
T3
T4
T5
T6
T7
TR3
TR4
TR5
TR6
TR7
MR1 OA680
MR2 OA90
R1 2K
R2 220
R3 2·2K
R4 33K
R5 15K
R6 300
R7 2K
R8 47K
R9 20K
R10 2K
R11 100
R12 220
R13 4·7K
R14 4·7K
R15 150
R16 18K
R17 100K
R18 330K
R19 68K
R20 18K
R21 82K
R22 100
R23 330
R24 15K
R25 220
R26 1·5K
R27 33
RT1 110
C1 ·047
C2 ·047
C3 ·047
C4 330
C5 ·01
C6 25µF
C7 330
C8 ·047
C9 ·047
C10 330
C11 ·0047
C12 330
C13 470
C14 470
C15 200µF
C16 ·01
C17 1
C18 12·5µF
C19 ·01
C20 ·047
C21 200µF
C22 200µF



JE CHASSIS — CIRCUIT DIAGRAM
(Slat on transistor should be adjacent to emitter)

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