SERVICE MANUAL

BATTERY PORTABLE RADIOGRAM CHASSIS TYPE JC

"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

BATTERY:
Eveready Type 2582.

BATTERY CONSUMPTION:

Radio: No Signal	15 mA
Radio: 1W Audio Output	120 mA
Gram: 1W Audio Output	150 mA

FREQUENCY RANGE:
525 Kc/s to 1750 Kc/s.

INTERMEDIATE FREQUENCY:
455 Kc/s.

SEMI-CONDUCTORS:

AF116N	(Germanium PNP) Frequency Changer
AF117N	(Germanium PNP) First IF Amplifier
AF117N	(Germanium PNP) Second IF Amplifier
2N2613	(Germanium PNP) Audio Amp.
SE6002	(Silicon NPN) Audio Driver
AC127	(Germanium NPN) Audio Output }
AC128	(Germanium PNP) Audio Output } Matched Pair.
OA90	(Germanium Diode) Auxiliary AGC
AB1101	(Silicon Diode) Detector and AGC

OUTPUT IMPEDANCE:
15 ohms at 400 c/s.

PART No. 683-5101

March, 1965.

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AF116N (Germanium PNP) Frequency Changer
AF117N (Germanium PNP) First IF Amplifier

SEMI-CONDUCTORS (continued)
AF117N (Germanium PNP) Second IF Amplifier
2N2613 (Germanium PNP) Audio Amp.
SE6002 (Silicon NPN) Audio Driver
AC127 (Germanium NPN) Audio Output
AC128 (Germanium PNP) Audio Output
Matched Pair.
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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 disconnecting the battery.

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 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 to connect the emitters of these transistors to earth. The voltage at the emitters should be approximately —5.9 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 attentuator 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 high output levels.

When making output measurements, an output meter having a resistance of at least 250 ohms may be connected across the speaker voice coil. Do not use a meter of lower resistance.

DISMANTLING

To gain access to the underside of the motor board, proceed as follows:

Check that the pickup arm is securely fastened to the rest.

Remove the two screws located in the lower sections of the cabinet hinges.

Lift back of motor board, which is now free to pivot up and forward through an arc, so that it comes to rest on the bench in front of the cabinet, with underside up.

Speaker, mechanism and chassis are now accessible for inspection and test.

Access to the underside of the printed board can be gained by first withdrawing all knobs and then by removing the three screws holding the chassis to the motor board.

Before unscrewing the two screws fixing the printed board to the chassis, particular care should be taken to unsolder the lead from the board, to the loopstick, and any other leads which may hinder the operation to be carried out.

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 realigned. IF alignment should always precede RF alignment. An output meter is connected across the voice coil of the 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 is relieved.

(c) The thread in the former may be damaged if the core is wound in and forced against the circuit board. A light torque should be all that is normally required to turn the core.

IF ALIGNMENT

(1) Set the signal generator to 455 Kc/s, with 30% modulation at 400 c/s. Turn the receiver volume control fully clockwise and set the tuning control to the LF end of the band.

(2) Inject a signal into the aerial section of the gang. Adjust the cores of T5, T4 and T3 for maximum reading on the output meter.

RF ALIGNMENT

(1) Set the controls as for IF alignment. A coil comprising 3 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 and distant not less than one foot from it.

(2) Check that, when the gang capacitor is fully enmeshed, the points coincide with the setting lines. If necessary, the pointers may be adjusted by releasing the two grub screws on the coupling to the gang. After adjustment, the grub screws should be tightened.

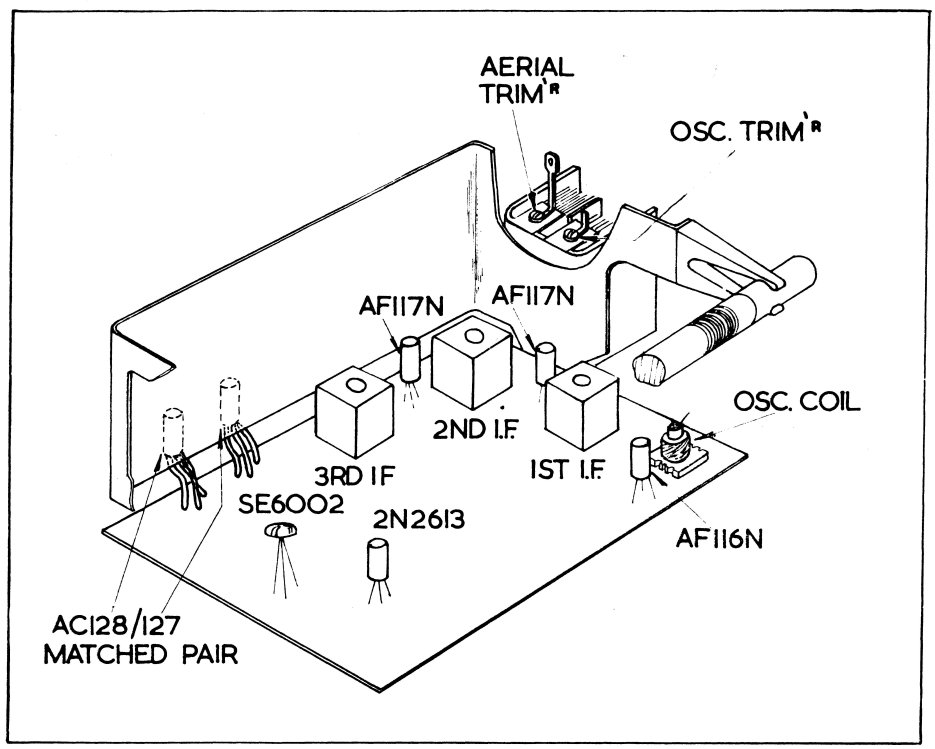
(3) Set signal generator to 600 Kc/s.

(4) Turn tuning control until the pointer is exactly over the 600 Kc/s calibration mark. Adjust the core in T2 for maximum reading on the output meter.

(5) Set signal generator to 1500 Kc/s.

(6) Turn tuning control until the pointer is exactly over the 1500 Kc/s calibration mark. Adjust VC3 and VC1 for maximum reading on the output meter.

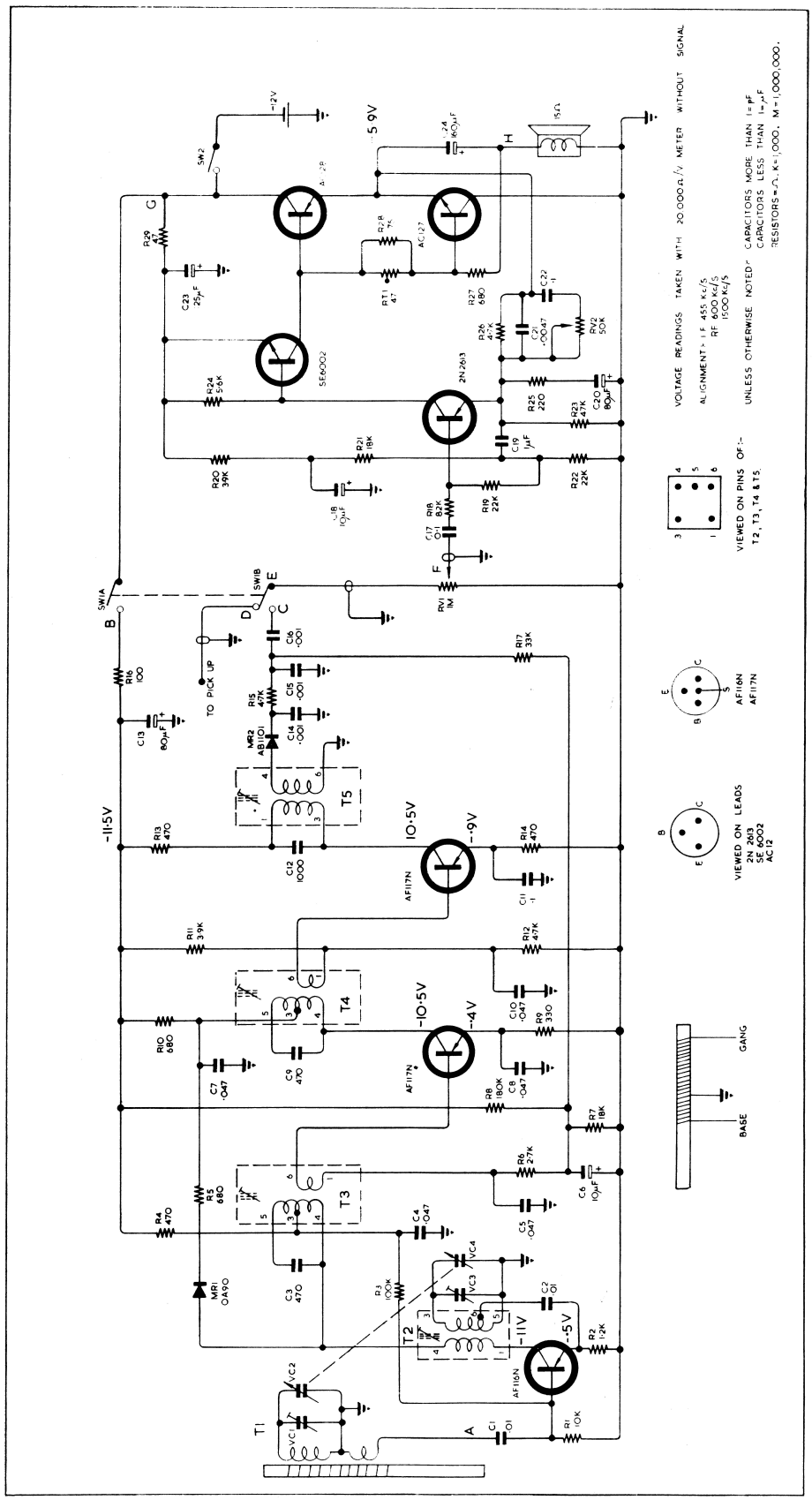
(7) Repeat operations (3) to (6) for optimum alignment.

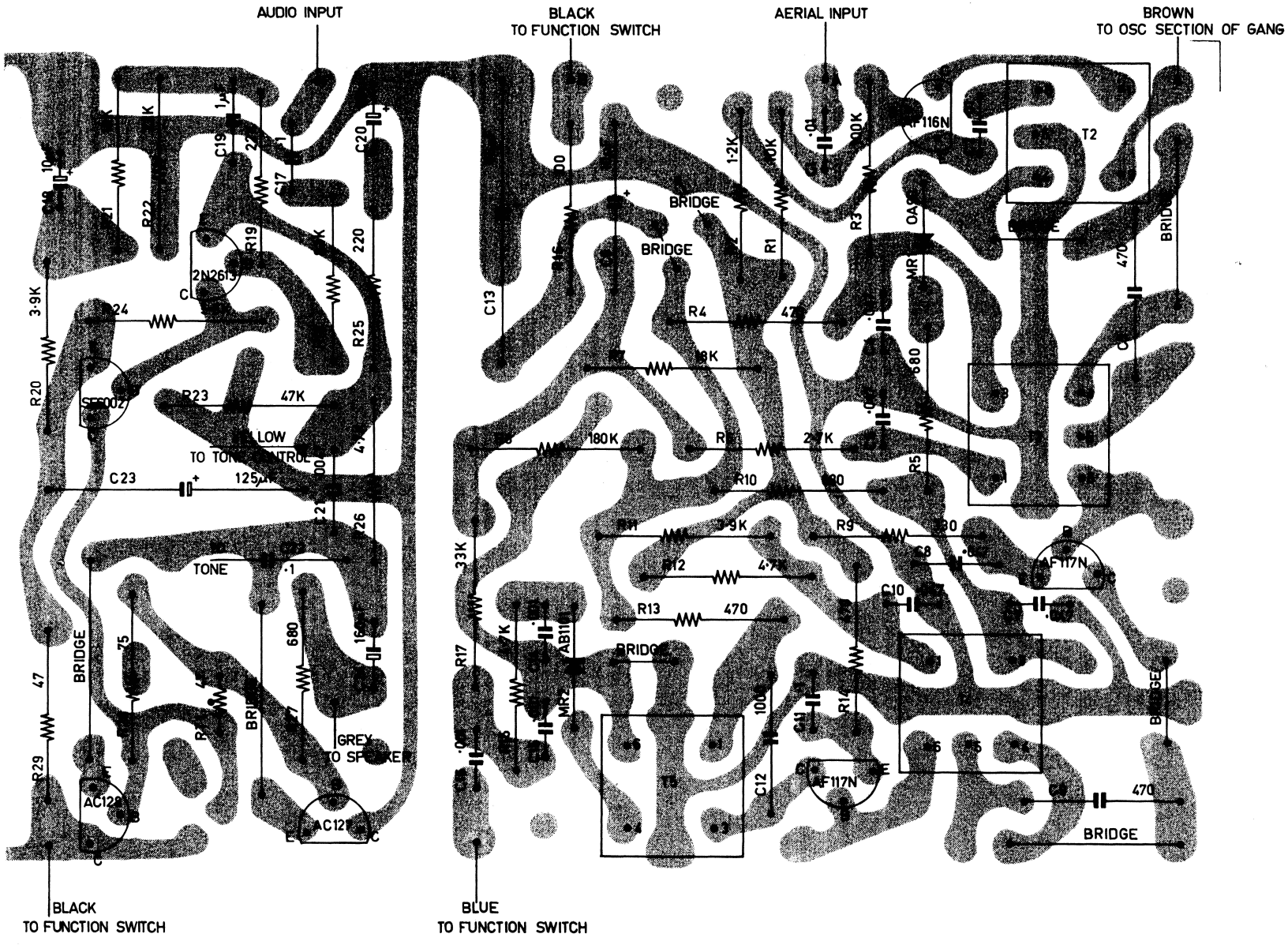


PARTS LIST — CHASSIS TYPE JC

REF.	PART NO.	DESCRIPTION
		RESISTORS
R1	740-0962	10K 5% ½W
R2	740-1192	1.2K 5% ½W
R3	740-1582	150K 5% ½W
R4	740-0012	470 ohms 10% ½W
R5	740-0682	680 ohms 10% ½W
R6	740-0042	2.7K 10% ½W
R7	740-1532	18K 5% ½W
R8	740-1602	180K 5% ½W
R9	740-0922	330 ohms 10% ½W
R10	740-1292	680 ohms 5% ½W
R11	740-0232	39K 10% ½W
R12	740-0072	4.7K 10% ½W
R13	740-0012	470 ohms 10% ½W
R14	740-0012	470 ohms 10% ½W
R15	740-0072	4.7K 10% ½W
R16	740-0653	100 ohms 10% ½W
R17	740-0242	33K 10% ½W
R18	740-0132	82K 10% ½W
R19	740-0102	22K 10% ½W
R20	740-0062	3.9K 10% ½W
R21	740-1532	18K 5% ½W
R22	740-1542	22K 5% ½W
R23	740-0122	47K 10% ½W
R24	740-1142	5.6K 10% ½W
R25	740-0282	220 ohms 10% ½W
R26	740-0072	4.7K 10% ½W
R27	740-0682	680 ohms 10% ½W
R28	740-1612	75 ohms 5% ½W
R29	740-0712	47 ohms 10% ½W
		CAPACITORS
C1	271-0741	.01uF +80% —20% 25V Redcap
C2	271-0741	.01uF +80% —20% 25V Redcap
C3	280-3191	470pF 5% 125V Styroseal
C4	271-0731	.047uF +80% —20% 25V Redcap
C5	271-0731	.047uF +80% —20% 25V Redcap
C6	269-1041	10uF 6V Electro
C7	271-0731	.047uF +80% —20% 25V Redcap
C8	271-0731	.047uF +80% —20% 25V Redcap
C9	280-3191	470pF 5% 125V Styroseal
C10	271-0731	.047uF +80% —20% 25V Redcap
C11	271-0761	.1uF +80% —20% 25V Redcap
C12	280-3251	.001uF 5% 50V Styroseal
C13	269-0801	80uF 10V Electro
C14	271-1271	.001uF 20% Type AY Ceramic
C15	271-1271	.001uF 20% Type AY Ceramic
C16	271-1271	.001uF 20% Type AY Ceramic
C17	271-0761	.1uF +80% —20% 25V Redcap
C18	269-1131	10uF 16V Electro
C19	271-0831	1uF +80% —20% 3V Redcap
C20	269-1031	80uF 15V Electro

REF.	PART NO.	DESCRIPTION
		CAPACITORS (continued)
C21	271-0801	.0047uF +80% —20% 25V Redcap
C22	271-0761	.1uF +80% —20% 25V Redcap
C23	269-0761	125uF 16V Electro
C24	269-0831	160uF 10V Electro
		POTENTIOMETERS
RV1	677-1261 See SW2	1M Curve 'C' with DPST SWITCH Volume Control
RV2	677-1251	50K Curve 'C' Tone Control
		SEMI-CONDUCTORS
TR1	932-1681	AF116N—Converter
TR2	932-1691	AF117N—First IF Amplifier
TR3	932-1691	AF117N—Second IF Amplifier
TR4	932-2571	2N2613—Audio Pre-Amplifier
TR5	932-2581	SE6002—Audio Driver
TR6, TR7	932-2591	AC128—Audio Output, AC127—Audio Output Matched Pair
MR1	932-0971	OA90—Auxiliary AGC
MR2	932-2601	AB1101—Signal Detector & AGC
		TRANSFORMERS
T1	253-0303	Aerial Rod Assembly
T2	257-0226	Oscillator Coil
T3	906-0761	IF Transformer
T4	906-0761	IF Transformer
T5	906-0751	IF Transformer
		MISCELLANEOUS
VC1, VC2, VC3, VC4	281-0332	2-Gang Capacitor With Trimmers
SW1	855-0701	Oak 2-Pole 2-Position Switch
SW2	Part of 677-1261	Battery On/Off Switch
RT1	752-0111	Thermistor, 47 ohms 20% Ducon


VOLTAGE READINGS TAKEN WITH 20,000Ω/V METER WITHOUT SIGNAL
ALIGNMENT:- I.F. 455 Kc/s
R.F. 600 Kc/s
1500 Kc/s
UNLESS OTHERWISE NOTED:- CAPACITORS MORE THAN 1=pF
CAPACITORS LESS THAN 1=μF
RESISTORS=Ω, K=1,000, M=1,000,000.
VIEWED ON PINS OF:-
T2, T3, T4 & T5
VIEWED ON LEADS
2N 2613
SE 6002
AC 12
AF116N
AF117N
GANG
BASE
-12V
5·9V
-11·5V
10·5V
-9V
-10·5V
-4V
-11V
-5V
TO PICK UP
SW1A
SW1B
SW2
T1
T2
T3
T4
T5
SE6002
2N2613
AC127
MR1 OA90
MR2 AB1101



COMPONENT LAYOUT (LOOKING ON COPPER SIDE).

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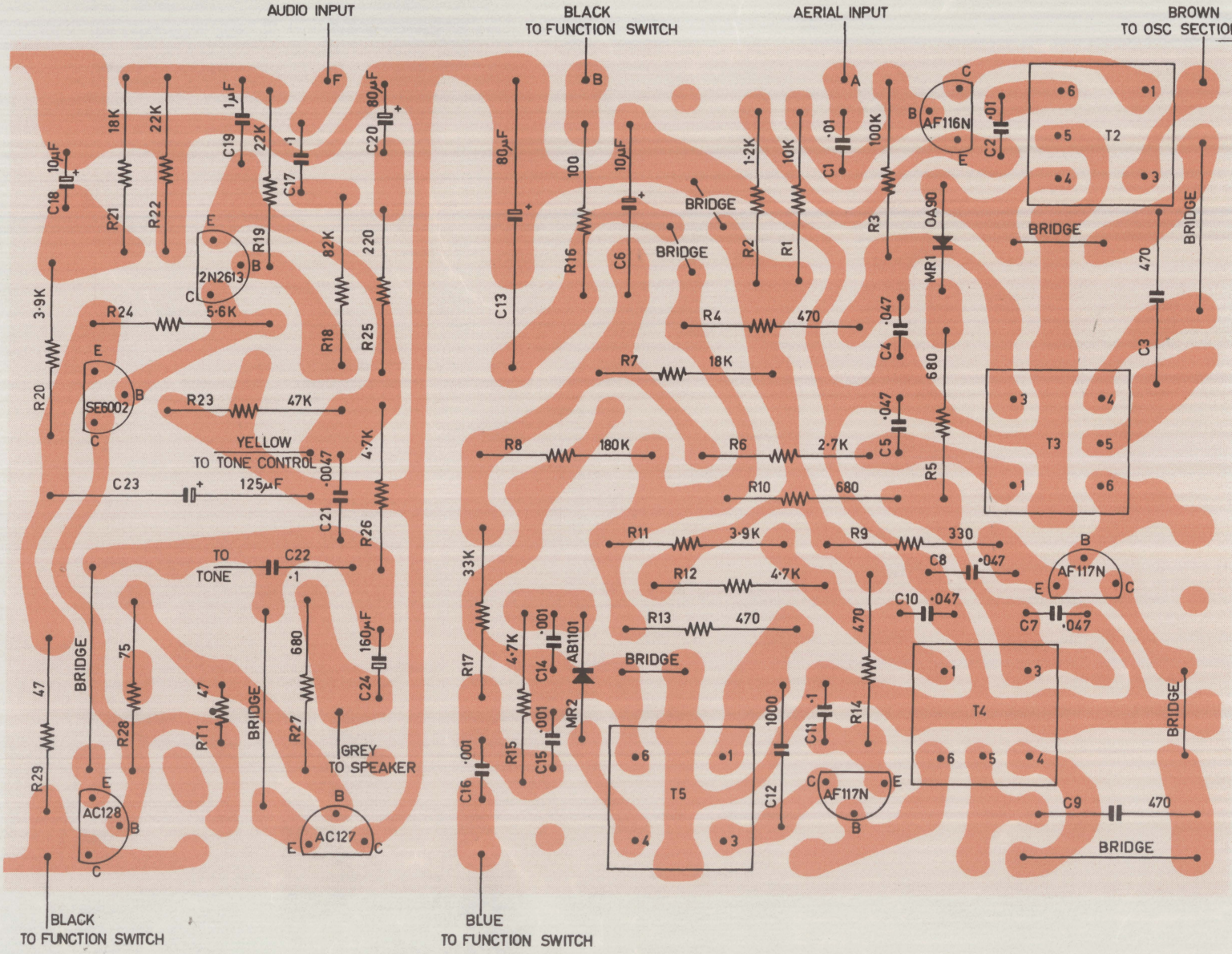
MARRICKVILLE, N.S.W.



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