SERVICE MANUAL

TELEVISION CHASSIS TYPE **V3**

"HIS MASTER'S VOICE"

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

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

SPECIFICATIONS

POWER SUPPLY:
230, 240, 250 volts, A.C., 50 c/s.

CONSUMPTION:
230 watts.

AERIAL INPUT:
300 ohms balanced.

INTERMEDIATE FREQUENCIES:
Vision Carrier: 36.875 Mc/s.
Sound Carrier: 31.375 Mc/s.

FUSES:
Mains: FS1, FS2 — 2 amps. each.
H.T.: FS3 — 2 amps.
FS4 — 250 mA.

VALVES AND SEMI-CONDUCTORS

V1	6ES8	RF Amplifier
V2	6HG8	Frequency Changer
V3	6EH7	1st IF Amplifier
V4	6EH7	2nd IF Amplifier
V5	6EJ7	3rd IF Amplifier
V6	6CK6	Video Amplifier
V7	6DX8	Noise Inverter and AGC
V8	6BA8	Sync Separator
V9	6BX6	Inter-Carrier Amplifier

VALVES AND SEMI-CONDUCTORS
(Continued)

V10	6BX6	Limiter
V11	6GW8	Sound Amplifier and Output
V12	6GV8	Vertical Oscillator and Output
V13	12AT7	Reactance Valve
V14	6DX8	Horizontal Oscillator & Driver
V15	6CM5	Horizontal Output
V16	1S2	EHT Rectifier
V17	6AL3	Damper Diode
MR1	OA90	Video Detector
MR2	OA90	Inter-Carrier Detector
MR3		
MR4	OA210	HT Rectifier
MR5	OA210	HT Rectifier
MR6	M3	AGC Clamp
MR7	BA100	Sync Level Detector
MR8	OA91	Noise Clipper
MR9	AA119	Ratio Detector
MR10	AA119	Ratio Detector
MR11	BA122	Phase Discriminator
MR12	BA122	Phase Discriminator
MR13	OA91	Pulse Clipper
MR14	OA610	Blanking Clamp
MR15	OA610	Rectifier (Remote Control)
MR16	OA610	Rectifier (Remote Control)
MR17	OA91	Protection Diode

CAUTION

The normal B+ voltages in these receivers are dangerous. Use extreme caution when servicing. The high voltage at the picture tube anode (17,000 volts) will give an unpleasant shock but does not supply enough current to give a fatal shock. However, secondary human reactions to otherwise harmless shocks have been known to cause injury.

Always discharge the picture tube to the chassis, or to its aquadag coating, before handling the tube. The picture tube is highly evacuated and, if broken, it may violently expel glass fragments. When handling the picture tube, always wear goggles.

PART No. 683-5841

October, 1965.

DISMANTLING

TO HINGE DOWN CHASSIS

1. Remove back.
2. Swing chassis down.

TO REMOVE TUNER

1. Pull off Channel Selector, Brightness, Picture, Sound and Off-On knobs.
2. Remove two screws holding black fibre cover.
3. Slacken wing-nut under tuner chassis assembly.
4. Unscrew captive screw at top of tuner bracket and withdraw tuner assembly.
5. Tuner may be hooked to left side of main chassis by dropping tongue on tuner bracket into slot provided. Slide tuner forward and tighten self-tapping screw.

TO REMOVE CHASSIS AND TUNER

1. Unplug yoke, picture tube, speaker and EHT leads.
2. Tilt chassis to approximately 45 degrees and lift clear of pivots.

TO REMOVE PICTURE TUBE

1. Remove chassis and tuner as above.
2. Remove four screws holding picture tube and lift out.

ADJUSTMENTS

MAINS VOLTAGE. Before leaving the factory, the mains input is set to the 240-volt tap on the transformer. Tappings are also provided for 230 and 250 volts, for use where necessary. To make the alteration, withdraw the captive plug, rotate it until the required voltage is opposite the arrow and then replace the plug.

HORIZONTAL HOLD. This is set at the factory and normally should not need further adjustment. However, after change of components it may be necessary to readjust. The procedure is as follows:

Remove the 12AT7 reactance valve V13 and short-circuit the sync pulses at the test point, between V7 and V8. Adjust the discriminator transformer (T8) slug until the picture floats weakly in lock.

Replace the 12AT7 and adjust the horizontal hold control until the picture again locks weakly.

Remove the short-circuit at the test point and the picture should lock immediately. Check that immediate locking occurs when the channel switch is operated.

CONTRAST RANGE & NOISE INVERTER. The Contrast Range control may be adjusted by inserting a thin screwdriver into the shaft of the Picture Contrast control, after removing the knob.

1. Turn Picture Contrast control fully clockwise.
2. Turn Noise Inverter potentiometer (RV13) fully clockwise.
3. Select the strongest signal.
4. Advance Contrast Range potentiometer (RV3) until loss of sync occurs, and then back off to a point slightly beyond where sync is fully restored.
5. Adjust Noise Inverter potentiometer (RV13) until loss of sync is observed, and then back off to a point slightly beyond where sync is fully restored.

A.G.C. The pre-set AGC control should be set, when necessary, to the weakest signal i.e., that displaying the most "snow" or grey to white flecks in the picture. Adjust the control to the position which just reduces the snow to a minimum.

The receiver should then be checked on all channels to ensure that no overloading is evident, which may be due to the control being adjusted too far clockwise, and that the minimum noise condition has been achieved for all signals.

This control may need adjustment in strong signal areas to remove "herringbone" patterns.

BOOST VOLTAGE. The boost voltage may be adjusted, where necessary, by means of the pre-set control (RV12) adjacent to the horizontal output transformer. Access to this control is easier from the reverse side of the chassis, when it has been swung down.

Reduce the picture tube beam current to zero, by means of the Brightness control. The voltage, measured **across** C130 (.056uF) should be adjusted to 470 volts, which assures optimum picture width and EHT voltage.

Note: Do not use a meter protected with silicon diodes, as this gives a rectifying effect and results in an incorrect reading.

FOCUS. The only time that focus adjustment may be necessary is after replacement of the picture tube. The focus potentiometer, which is a strip pre-set type, is located on the edge of the chassis and adjacent to the EHT rectifier socket and is accessible when the chassis is swung down. Adjust for overall focus across the picture tube face.

LINEARITY. Before adjusting either vertical or horizontal linearity, the picture shift magnets should be neutralised. To do this, the two magnets should be rotated with respect to each other. The neutralised setting is such that, when the complete assembly is rotated, it has little effect on the picture position.

After adjustment has been made for best linearity, the picture may need to be recentred. The linearity should be retouched where necessary.

VERTICAL. The vertical linearity pre-set potentiometer, RV9, is located adjacent to the 6GV8 vertical oscillator and output valve. RV9 should be adjusted, in conjunction with the vertical height control, for best linearity, using a pattern on the screen.

HORIZONTAL. The horizontal linearity coil is situated adjacent to the EHT rectifier, and may be adjusted from the side of the chassis.

The core should be adjusted for best linearity, using a pattern on the screen. Two positions of the core provide suitable conditions, but the position in which the core is farthest out of the coil is the correct one. Readjustment of the boost control and interlocking adjustments may be necessary if the other position of the core is used.

PICTURE CENTRING. The picture may be centred by rotating the two shift magnets on the tube neck, behind the deflection yoke. Rotate the centring magnet assembly to shift the picture in the required direction, and move one of the magnets with respect to the other, to change the strength of the fields, and so the amount of picture shift.

PICTURE TILT. If the picture is not square with the edges of the mask, loosen the clamping ring on the deflection coils and rotate the assembly until the picture is squared up. Tighten the clamping ring and, if necessary, re-centre the picture.

SERVICE NOTE:

These receivers have a number of regulating devices, such as voltage dependent resistors and diodes, which are designed to correct departures from mean operating conditions.

In fault-tracing, a certain amount of masking of the true cause occurs and defective parts or incorrect operation may be difficult to isolate.

Servicemen are therefore advised to consider carefully any substitution of components or diagnosis of faults, before making adjustments, and so avoid unnecessary complications in repairs.

REMOTE CONTROL

The remote control unit is connected to the receiver by fitting a small 9-pin plug (PL3) into the socket (SKT3) at the rear of the chassis on the L.H. end of the mains and fuse panel and accessible through the hole in the back. With mains power connected and the receiver mains switched "on," the receiver may be switched "on" or "off" by the slide switch on the side of the remote handpiece, which completes the circuit from the full wave rectifier MR15, MR16, through the relay winding RLB back to earth. Power is supplied to RLB winding which closes and makes contact B1, completing the primary circuit for the receiver mains transformer T1; B2, which supplies an AC voltage from the secondary of the remote operations mains transformer T10 to the index transformers T11 and T12, and the pilot lamp in the handset; B3, which earths the resistor network in the picture tube grid; B4, which adds filter capacity to the supply voltage for the transistor and RLB.

A condition now exists when channel changing may take place.

In this condition the "rest" or "normal," the base of the transistor is held at a very low potential, and there is little or no potential difference between the emitter and the base.

OPERATING SEQUENCE

After selection of the appropriate channel by the remote control channel switch, if the "mute-start" push-button in the handpiece is operated, the following steps take place:

- PSA-1 makes and shorts the limiter HT to earth, via R90, muting the sound.
- PSA-2 makes and shorts the emitter of the transistor to earth, causing heavy

current to flow through the transistor and the coil of RLA.

When RLA operates:

Contacts A1 close and supply AC mains power to the channel changing motor.

Contacts A2 close and short-circuit PSA2, earthing the emitter of the transistor.

Contacts A3 close and short PSA-1 contacts holding the muting on the sound while channel changing.

Contacts A4 close and short the picture tube grid to earth via R155 resistor, muting the picture.

All actions occur simultaneously.

Since an unequal voltage will appear at the base and emitter of the transistor when a change of tappings has been made on the indexing transformers, current will flow in the collector circuit and the relay RLA will be held closed until the voltages are equalised.

Simultaneously, with the closing of A1 contacts when relay RLA is operated, the tuning motor commences to operate and the cam-operated contacts MSB close. This shorts the RLA relay to earth by-passing the transistor. This is a sensing device and stops the channel switching motor at a precise position when it opens at the selected channel. At such time there will be no unequal voltages applied to the base and emitter of the transistor, no current will flow through the relay RLA and it will cease to operate, opening the "A" contacts. The contacts of MSB open at each channel position, but if heavy current is flowing through the transistor due to unequal voltage applied at the base and emitter, this holds RLA closed, and the motor will continue to operate until the selected position has been reached.

When the relay RLA ceases to operate:

Contacts A4 open and remove short and picture appears.

Contacts A3 open and remove short and sound is restored.

Contacts A2 open and remove short on PSA-2, Mute-Start switch.

Contacts A1 open and remove mains supply from motor.

All actions occur simultaneously.

When the "On-Off" switch (SD) in the handpiece is switched "off," relay RLB operates and opens contacts:

B4, to remove the additional filter across the relay and transistor supply voltage.

B3, to remove the earth from the CRT grid voltage divider, immediately placing a positive bias on the grid to allow beam current to flow and discharge the EHT, preventing a bright spot appearing on the screen.

B2, to remove AC voltage from the indexing transformers in the remote control unit.

B1, to remove power from the receiver mains transformer.

A pin in the centre of the plug PL3, when inserted into the socket SKT3, open-circuits three leaf spring contacts which are used for the following purposes:

MSA1 contacts are in parallel with the mains "on-off" switch (SD) on the remote control unit.

MSA2 completes the speaker transformer secondary.

MSA3 earths the contrast control voltage divider network.

When the plug PL3 is inserted:

MSA1 contacts open and remote control "on-off" switch (SD) becomes operative.

MSA2 removes the earth on the contrast control circuit and substitutes the remote control contrast potentiometer.

MSA3 transfers the sound output for the speaker circuit into the remote control unit where selection of speakers and/or hearing-aid outlet is made, together with control of volume.

Channel selection may be effected immediately the receiver is switched on, unlike previous models, when a delay was entailed while the valves reached operating temperatures.

Volume of the receiver may be adjusted at the remote handpiece for both local and remote speakers by variation of the sound limiter HT using the remote volume control.

Two sockets are available on the side of the remote handpiece for hearing-aid plugs. Insertion of the hearing-aid plug into SKT4 with the "local-remote" speaker switch in the remote position, removes sound from the speaker and supplies sound to the hearing-aid only. If SKT5 is used, sound is supplied to the hearing-aid and the remote speaker. A separate volume control is provided for hearing-aid adjustment; however, no hearing-aid sound will be available if the main or remote speaker volume control is turned to minimum position.

Hearing-aid sound, operating with separate control of volume, is available either with remote control or local speakers.

For the remote controls to be fully effective, the receiver sound and picture controls should be well-advanced. If these controls are so set, removal of the remote control plug PL3 will not disturb the contrast or sound when the receiver is operating normally. All adjustments may then be made at the receiver.

INTER-CARRIER ALIGNMENT

The following equipment is necessary:

(i) An RF Oscillator, capable of being set accurately to 5.5 Mc/s.

(ii) A 20,000 ohms/volt multimeter.

(iii) A peak-to-peak detector, as shown in Fig. 1.

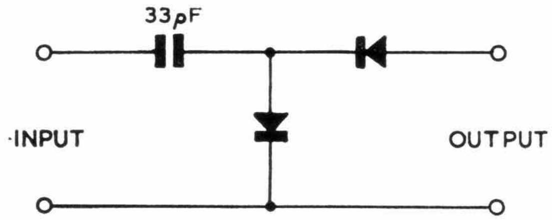


Fig. 1. Peak-to-Peak Detector.

5.5 MC/S. TRAP L42

L42 is a trap tuned to 5.5 Mc/s. This is set at the factory and normally should not need further adjustment.

Should it be necessary to re-tune L42, the following method is recommended.

(1) Inject 5.5 Mc/s at approximately 100 mV, between the junction of L28 and MR1, and earth.

(2) Connect the input of the peak-to-peak detector to the CRT cathode, pin 7. Connect the output of the peak-to-peak detector to a multimeter, set to a low DC voltage range.

(3) Adjust the core of L42 to give a minimum reading on the meter.

PEAKING COIL ADJUSTMENT

Connect the 5.5 Mc/s oscillator to the junction of L31 and MR2. Connect the multimeter, set to a low DC voltage range, across R89. Adjust the core in L33 for maximum response.

INTER-CARRIER TRANSFORMER IFT5

With the 5.5 Mc/s oscillator and the multimeter still connected as above, adjust both primary and secondary cores in IFT5 for maximum response.

RATIO DETECTOR TRANSFORMER IFT6

With the 5.5 Mc/s oscillator still connected as above, connect the multimeter between the junction of R92 and R93, and earth. Adjust the secondary core (nearest chassis) so that a positive or negative reading is obtained. Adjust the primary core so that this reading shows a maximum. Then adjust the secondary for zero reading. Instead of the 5.5 Mc/s oscillator, an off air signal may be used for all the above adjustments.

VISION I.F. ALIGNMENT

The following equipment is necessary:

(i) A sweep generator, covering the range 28 to 40 Mc/s.

(ii) A marker generator, covering the same range.

(iii) A C.R.O.

These instruments should be interconnected as described in the instructions supplied with the sweep generator. The sweep generator should be terminated with a resistor equal to its output impedance and connected to the receiver as shown in Fig. 2.

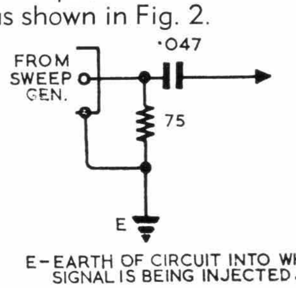


Fig. 2.

Because of the high gain of all receivers, care should be taken to ensure that all components replaced are on short leads and are placed in exactly the same position as the original part.

Care must also be taken to prevent feedback in interconnecting leads of the alignment equipment.

NOTE (1). Throughout the alignment, the display should be adjusted so that the response is accurately set between the reference level and the base line from a signal of about 2 volts peak-to-peak. The output of the IF strip should be maintained at that level by varying the output from the sweep generator and not the gain of the display unit.

NOTE (2). Coupling between stages will not require adjusting, unless either IFT1, IFT2 or IFT3 has been replaced.

NOTE (3). Cores in L21, L24, L26, L26a, IFT3 and L31 are set in the position furthest from the chassis.

Cores in L22, L23, IFT1, L25, and L26 are set in position nearest the chassis.

OPERATION 1.

(a) Connect a bias supply of —18 volts across IF AGC smoothing capacitor C59.

(b) Connect display unit between L29 and R38 junction and earth.

(c) Remove cores from L24, L26, L26a and L31.

OPERATION 2.

(2) Using the terminating network as shown in Fig. 1, connect sweep output between pin 2 of V5 and earth.

(b) Adjust the cores of L27 and IFT3 to obtain the response of Fig. 3a (Stage 1).

(c) If IFT3 has been replaced it will be necessary to adjust the coupling by closing the spacing of the two windings of IFT3 until desired bandwidth is achieved.

(d) If a dip appears in the response, remove it by screwing the core in L25 away from the chassis.

OPERATION 3.

(a) Remove the sweep from V5 and connect it as shown by Figure 1 to pin 2 of V4.

(b) Maintaining the level of the display unit constant by varying the sweep output, adjust the cores of L25 and IFT2 to obtain the response of Figure 3b (Stage 2).

(c) If a dip appears in the response, remove it by screwing the core in L23 away from the chassis.

(d) If IFT2 has been replaced, it will be necessary to adjust the coupling by closing the spacing between the two windings of IFT2 until the desired bandwidth is achieved.

OPERATION 4.

(a) Remove the sweep from V4 and connect it to pin 2 of V3.

(b) Adjust the cores of L23 and IFT1 to obtain the response of Figure 3c (Stage 3).

(c) If a dip appears in this response, remove it by shorting out the coaxial lead from the tuner.

(d) If IFT1 has been replaced, it will be necessary to adjust the coupling by closing the spacing of the windings of IFT1 until the desired bandwidth is achieved.

OPERATION 5.

(a) Remove sweep from V3 and connect it to the IF test point on tuner, located adjacent to the converter valve. Switch tuner to the position between Channel 11 and Channel 0.

(b) Adjust the cores in L11 (IF output coil located adjacent to V2 on the tuner, and L21 to obtain the response of Figure 3d (Stage 4).

OPERATION 6.

(a) Insert a core into L24 and adjust to a minimum at 38.375 Mc/s by varying the spacing between L23 and L24. Ensure that the response at 38.375 Mc/s is at least 60 dB below peak response. To do this, increase the sweep generator output by 40 dB, reset the base line with the vertical shift control if necessary, and the 20 dB will represent the —60 dB point required below the reference level.

(b) Adjust the core in L22 to read a minimum at 28.375 Mc/s.

(c) Insert a core in L26 and adjust together with the spacing of L25 and L26 to ensure that the responses at 31.375 Mc/s is between 25 and 28 dB below the peak response. Use method in (a) but increase output by only 20 dB.

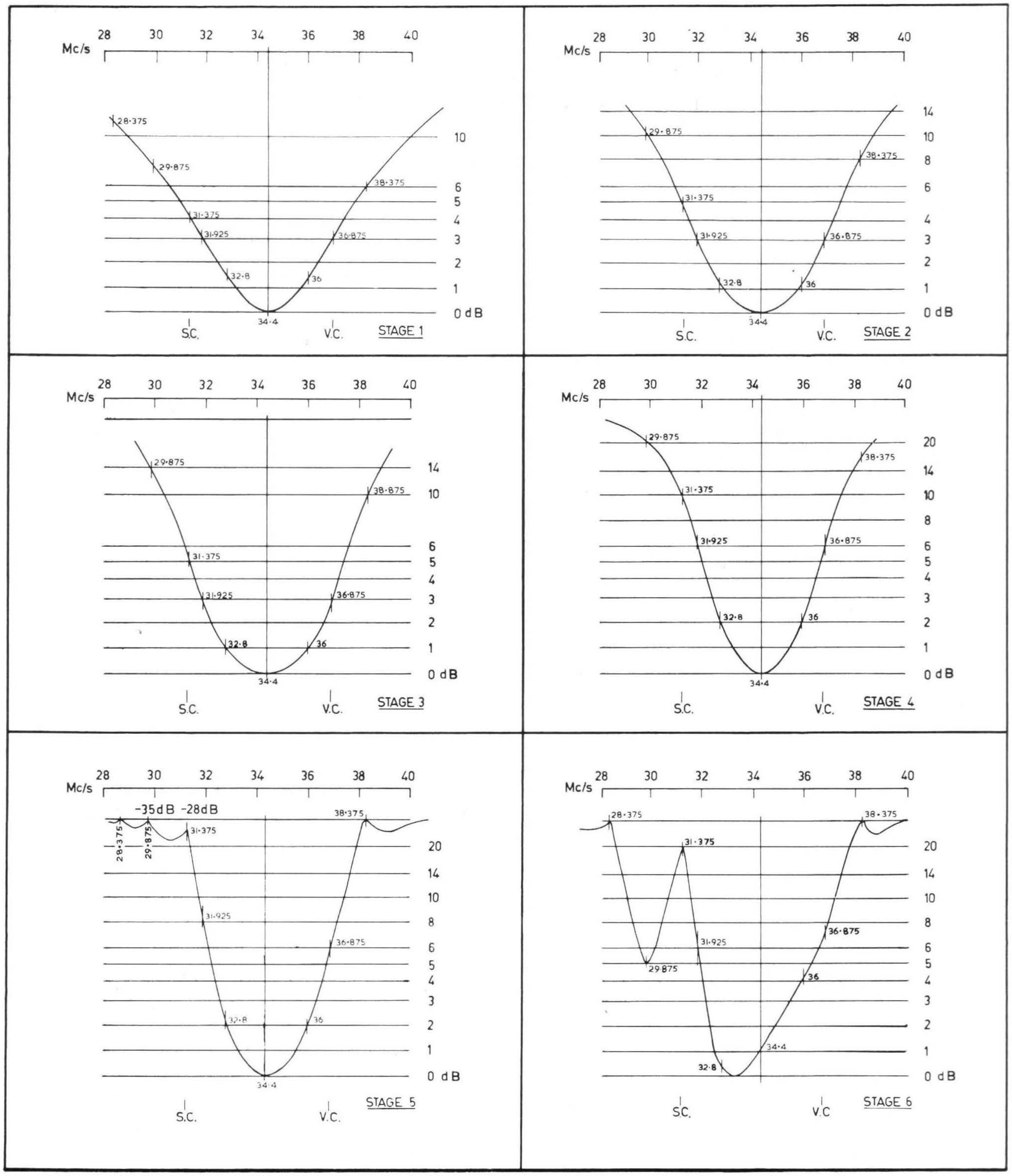
(d) Insert a core in L31 and adjust by varying the coupling between L31 and L27 so that the response at 29.875 Mc/s is 35 dB below the peak response. (It may be found necessary to readjust L27 to maintain the response shape as shown in 3e (Stage 5).

(e) Adjust L26a on former of IFT2, such that it widens the response of L24, but at the same time, care must be taken to ensure that it leaves the main response shape substantially unchanged.

(f) Remove bias battery, and check that the response curve remains substantially unchanged.

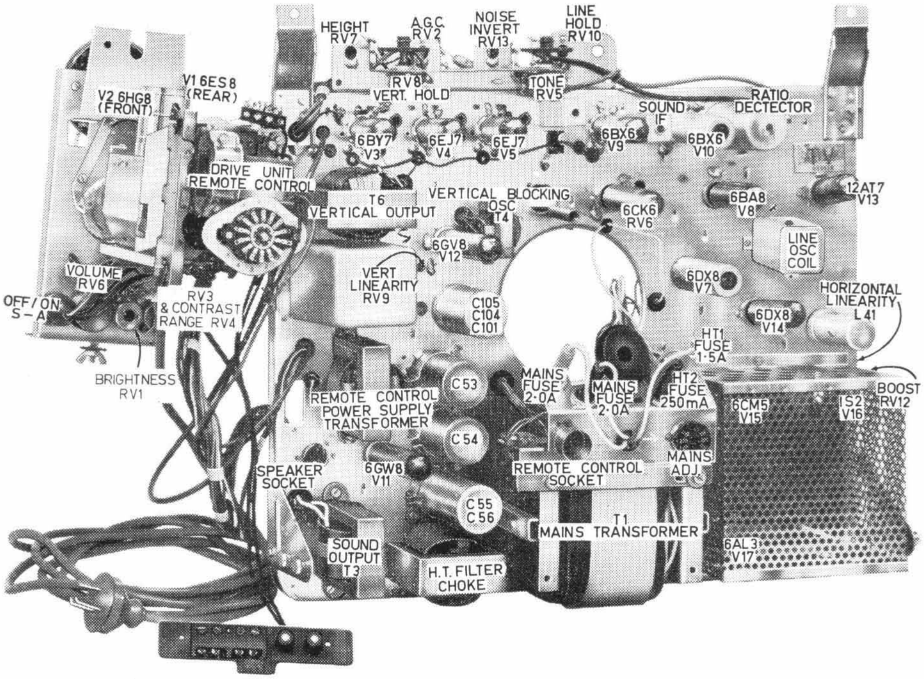
(g) Replace bias and connect display unit to test point on L33. Check to see that the response to the sound IF detector is similar to response of 3f (Stage 6).

(h) Seal the coils of L24, L26, L26a, L31 and also IFT1, IFT2, and IFT3 with a light application of A1 adhesive.



STAGE 1
STAGE 2
STAGE 3
STAGE 4
STAGE 5
STAGE 6
Mc/s
28 30 32 34 36 38 40
S.C.
V.C.
0 dB
-35dB -28dB
28·375
29·875
31·375
31·925
32·8
34·4
36
36·875
38·375
38·875

Fig. 3

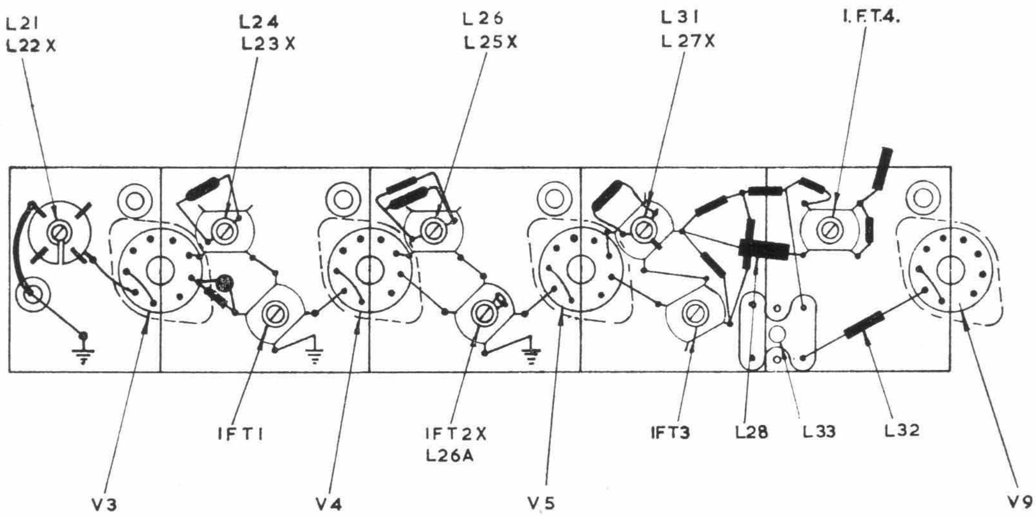


FOR: RV6

READ: V6

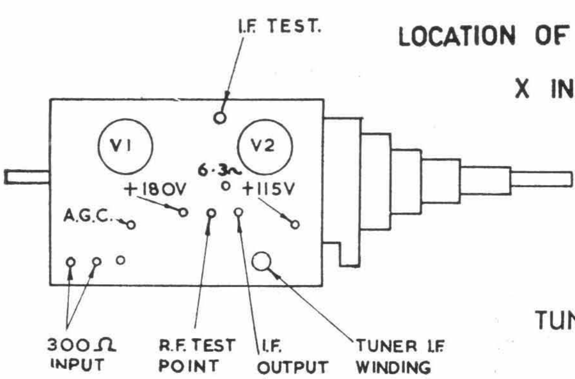
BACK VIEW OF CHASSIS V3.

"H.M.V" CHASSIS TYPE V3.



LOCATION OF COILS FROM UNDERSIDE OF CHASSIS

X INDICATES COIL NEAREST CHASSIS



TUNER TYPE NT3011

PARTS LIST — CHASSIS V3

RESISTORS

NOTE: All resistors are ½ watt rating and ± 10% tolerance, except where noted.

REF.	PART NO.	DESCRIPTION
R21	740-0412	820 ohms
R22	740-0032	2.2K
R22a	740-0273	150 ohms Morganite
R23	740-0983	22 ohms Morganite
R24	740-0653	100 ohms Morganite
R25	742-0512	2.2K 1W
R26	740-0102	22K
R27		
R28	740-0412	820 ohms
R29	740-0653	100 ohms Morganite
R29a	740-0983	22 ohms Morganite
R30	742-0512	2.2K 1W
R30a	740-0102	22K
R31	740-0412	820 ohms
R31a	740-0062	3.9K
R32	740-0273	150 ohms Morganite
R33	750-0672	1.5K 5W
R34		
R35	740-0322	1.2K
R35a	740-0092	15K
R36	740-0732	12K
R37	740-0043	2.7K
R38	740-0252	1.5K
R39	Part of 259-1261	2.7K 1W. Former for Equalising Coil
R40	740-0922	330 ohms
R41	750-0702	2.7K ± 5% 7W
R42	740-0483	56 ohms Morganite
R43		
R44	740-0182	470K
R45	742-0192	1M 1W
R45a	740-0862	18K
R46	740-0082	10K
R47	740-0072	4.7K
R48	740-0242	33K
R49a	742-0642	180K 1W
R49b	742-0172	470K 1W
R50a	740-0382	6.8K
R50b	742-0122	150K 1W
R51	750-0622	250 ohms ± 5% 10W Cemcoat
R52	749-0142	1K ± 20% 2W
R53		
R54	750-0632	8.2K ± 5% 4W Metox
R55	742-0172	470K 1W
R56	742-0212	3.3M 1W
R57	742-0772	3.9M 1W
R58	742-0772	3.9M 1W
R59	742-0982	1.2M 1W
R60	749-0232	27K 2W
R61	750-0122	47K
R61a	750-0662	3.9K 4W
R62	740-0252	1.5K
R63	740-0252	1.5K
R64	740-0082	10K
R65	740-0212	3.3M
R66	740-0242	33K

RESISTORS (Continued)

REF.	PART NO.	DESCRIPTION
R67	740-0132	82K
R68	740-0232	39K
R69	740-0782	120K
R70	740-0862	18K
R71	740-0082	10K
R72	740-0082	10K
R73	742-1052	56K 1W
R74	740-0092	15K
R75	742-0092	47K 1W
R76	740-0092	15K
R77	740-0202	2.2M
R78	740-0242	33K
R79	740-0202	2.2M
R80	740-0082	10K
R81	742-0132	220K 1W
R82	740-0152	150K
R82a	742-0162	390K 1W
R83		
R84		
R85	740-0293	270 ohms Morganite
R86	740-0022	1K
R87	740-0142	100K
R88	740-0242	33K
R89	740-0082	10K
R90	749-0052	47K ± 20% 2W
R90a	740-0032	2.2K
R91		
R92	740-0112	27K
R93	740-0112	27K
R94	740-0122	47K
R95	740-0082	10K
R96	740-0082	10K
R97	740-0152	150K
R98	740-0152	150K
R99	740-0702	56K
R100		
R101	742-0022	4.7K 1W
R102	742-0132	220K 1W
R103	740-0052	3.3K
R104	740-0292	270 ohms
R105	740-0512	100K ± 20%
R106	740-0512	100K ± 20%
R107		
R108		
R109	740-0653	100 ohms Morganite
R110	740-0062	3.9K
R111	742-0112	100K 1W
R112	740-0232	39K
R112a	740-0142	100K
R112b	740-0082	10K
R113	740-0082	10K
R114	740-0082	10K
R115	740-0082	10K
R116	742-0172	470K 1W
R117	742-0022	4.7K 1W
R117a	742-0823	270 ohms 1W Morganite
R118	740-0082	10K
R119	740-0232	39K

PARTS LIST — CHASSIS V3

RESISTORS (continued)

REF.	PART NO.	DESCRIPTION
R120	740-0202	2.2M
R121	740-0122	47K
R122	740-0302	1.8K
R123	742-0972	560 ohms 1W Morganite
R123a	742-0972	560 ohms 1W Morganite
R124	740-1043	27 ohms Morganite
R125	740-1043	27 ohms Morganite
R126	740-0072	4:7K
R127	742-0602	470 ohms 1W
R128	740-0082	10K
R128a	740-0852	560K
R129	740-0362	390K
R130	740-0362	390K
R131	740-0092	15K
R132	740-0142	100K
R133	740-0182	470K
R134	742-0052	22K 1W
R135	740-0082	10K
R136	740-0122	47K
R136a	740-0052	3.3K
R137	742-0492	68K 1W
R138	740-0232	39K
R139	742-0892	2.2M 1W
R140	742-0192	1M 1W
R141	740-0022	1K
R142	750-0362	2.7K 5W Type PW5
R143	742-0192	1M 1W
R144	749-0162	100K 2W
R145	742-0172	470K 1W
R146	742-0492	68K 1W
R147	742-0492	68K 1W
R148	Part of 908-0591	470 ohms 2W
R149	Part of 908-0591	1 ohm Resistance Wire
R150	740-0122	47K
R151	742-0772	3.9M 1W
R152	750-0602	22 ohms 5W Type PW5
R153	740-0092	15K
R154	740-0653	100 ohms
R155	742-0512	2.2K 1W
R156	740-0092	15K
R157	742-0112	100K 1W
R158	740-0262	560 ohms
R159		
R160	749-0362	150 ohms 2W

CAPACITORS

REF.	PART NO.	DESCRIPTION
C20	271-1141	18 pF ± 10% NPO Ceramic
C21	271-0911	.003 uF 500V Ceramic
C22	271-0911	.003 uF 500V Ceramic
C23	271-0621	.001 uF Lead Thru
C24	273-0591	68 pF ± 2½% MS Mica
C25	271-0911	.003 uF 500V Ceramic
C26	271-0731	.047 uF +30% —20% 25V Red Cap
C27	271-0281	.022 uF 100V Disc Ceramic
C28	271-0591	.0027 uF ± 20% K2000 Disc Ceramic

CAPACITORS (continued)

REF.	PART NO.	DESCRIPTION
C29	273-0591	68 pF ± 2½% MS Mica
C29a	271-0621	.001 uF Lead Thru
C30	271-0911	.003 uF 500V Ceramic
C30a	271-0281	.022 uF 100V Disc Ceramic
C31	271-0731	.047 uF +30% —20% 25V Red Cap
C32	271-0591	.0027 uF ± 20% K2000 Disc Ceramic
C33	273-0591	68 pF ± 2½% MS Mica
C34	271-0911	.003 uF 500V Ceramic
C35	271-1021	.001 uF +100% —20% Type AZ Disc Ceramic
C36	271-0911	.003 uF 500V Ceramic
C37	271-0591	.0027 uF ± 20% K2000 Disc Ceramic
C38	273-0591	68 pF ± 2½% MS Mica
C39	271-1091	12 pF ± 20% N330 Ceramic
C40	271-0121	5.6 pF NPO Ceramic
C41	271-0311	27 pF ± 5% NPO Tube
C42	271-0941	8.2 pF ± ½ pF NPO Disc Ceramic
C42a	271-0951	47 pF ± 10% NPO Ceramic
C42b	271-0951	47 pF ± 10% NPO Ceramic
C43	271-0621	.001 uF Lead Thru
C44	271-0351	33 pF ± 5% NPO Tube
C45		
C46		
C47		
C47a	283-1741	.1 uF ± 10% 400V Polyester
C48		
C49	283-1701	.047 uF ± 10% 400V Polyester
C49a	283-1581	.0047 uF ± 10% 400V Polyester
C50	283-1581	.0047 uF ± 10% 400V Polyester
C51	283-1721	.068 uF ± 10% 400V Polyester
C52a	269-0611	4 uF 300V Electro
C53	269-0521	100 uF 150V Insulated Electro
C54	269-0521	100 uF 150V Insulated Electro
C55, C56	269-0901	200 uF + 60 uF 275 VW Electro Type EMG8275
C57	271-0911	.003 uF 500V Ceramic
C58	271-0911	.003 uF 500V Ceramic
C59	283-1241	.1 uF ± 10% 160V Polyester
C60	283-2361	1.0 uF ± 20% 160V Polyester
C61, C62	269-1081	8 uF 100V Electro + 16 uF 300V Electro
C63	283-1701	.047 uF ± 10% 400V Polyester
C64	283-1281	.22 uF ± 10% 160V Polyester
C65	271-1031	82 pF ± 20% N330 Ceramic Tube
C66	271-1041	4.7 pF ± 1 pF NPO Disc
C67	271-1031	82 pF ± 20% N330 Ceramic Tube
C68	269-0941	8 uF 100V Electro
C69	283-1621	.01 pF ± 10% 400V Polyester
C70	283-1281	.22 uF ± 10% 160V Polyester
C71	283-1201	.047 uF ± 10% 400V Polyester

PARTS LIST — CHASSIS V3

CAPACITORS (continued)

REF.	PART NO.	DESCRIPTION
C72	283-1701	.047 uF ± 10% 400V Polyester
C73		
C74		
C75		
C76	271-0731	.047 uF +30% —20% 25V Red Cap
C77	271-0591	.0027 uF K2000 Disc
C78	271-0681	12 pF ± 5% NPO Disc
C79	271-0681	12 pF ± 5% NPO Disc
C80	271-0471	6.8 pF ± ¼ pF NPO Disc
C81	271-0591	.0027 uF K2000 Disc
C82	271-0621	.001 uF Lead Thru
C83	271-0601	10 pF ± 5% NPO Disc
C83a	271-0911	.003 uF 500V Ceramic
C84	271-0771	100 pF ± 5% NPO Disc
C85	280-1501	100 pF ± 5% 600V Styroseal
C86	280-1501	100 pF ± 5% 600V Styroseal
C87	283-1501	.001 uF ± 10% 400V Polyester
C88	269-0781	4 uF 25VW Electro
C89	283-1581	.0047 uF 400V Polyester
C90	271-0961	560 pF +100% —10% K2000 Ceramic
C91	283-1121	.01 uF ± 10% 160V Polyester
C92		
C93	269-0061	16 uF 300VW Electro
C94	269-1171	25 uF 6.4V Electro
C95	271-1061	15 pF ± 10% N330 Tube
C96	283-1701	.047 uF ± 10% 400V Polyester
C97		
C98	269-1171	25 uF ± 6.4V Electro
C99	283-1661	.022 uF ± 10% 400V Polyester
C100	283-1541	.0022 uF ± 10% 400V Polyester
C101	269-0981	50 uF 300V Electro with C104 and C105
C102	283-1541	.0022 uF ± 10% 400V Polyester
C103	283-1541	.0022 uF ± 10% 400V Polyester
C104	269-0981	24 uF 300V Electro with C101 and C105
C105	269-0981	100 uF 25V Electro with C101 and C104
C106	283-1621	.01 uF ± 10% 400V Polyester
C107	283-1281	.22 uF ± 10% 160V Polyester
C108	283-2361	1 uF ± 20% 160V Polyester
C109	283-1721	.068 uF ± 10% 400V Polyester
C110	271-0951	47 pF ± 10% Ceramic Tube
C111	283-1321	.47 uF ± 10% 160V Polyester
C112	271-0951	47 uF ± 10%Ceramic Tube
C113	283-1581	.0047 uF ± 10% 400V Polyester
C114	283-1581	.0047 uF ± 10% 400V Polyester
C115	283-1621	.01 uF ± 10% 400V Polyester
C116	283-1621	.01 uF ± 10% 400V Polyester
C117	280-1851	680 pF ± 10% 600V Styroseal
C118	271-0961	560 pF +100 —10% K200 Ceramic
C119	271-0911	.003 uF 500V Ceramic
C119a	271-0731	.047 uF +30% —20% 25V Red Cap

CAPACITORS (continued)

REF.	PART NO.	DESCRIPTION
C120	271-0961	560 pF +100% —10% K2000 Ceramic
C121	283-1581	.0047 uF ± 10% 400V Polyester
C122	271-0911	.003 uF 500V Ceramic
C123	271-0991	220 pF ± 10% 2KV Ceramic Tube
C124	271-1001	220 pF ± 20% K2000 Ceramic
C125	284-0661	.022 uF ± 20% 600V Polester
C126	Part of 908-0591	330 pF ± 10% 5KVW Ceramic
C127	284-1281	.22 uF ± 20% 1000V Polyester
C128	271-0901	68 pF ± 20% 3KVW Ceramic Disc
C129	284-2701	.047 uF ± 10% 1000V Polyester
C130	284-1211	.056 uF ± 10% 1000V Polyester
C131	283-1781	.22 uF ± 10% 400V Polyester
C132	271-1051	18 pF ± 10% 3KVW Ceramic Disc
C133	271-0781	.035 uF 2KVW Double Disc Ceramic
C134	271-0781	.035 uF 2KVW Double Disc Ceramic
C135	269-0761	25 uF 50VW Electro
C136	269-1091	10 uF 50VW Electro

COILS

REF.	PART NO.	DESCRIPTION
L21, L22	259-1321	1st IF Grid Coil / 28.375 Mc/s Trap
L23, L24	259-1391	1st IF Anode Coil / 38.375 Mc/s Trap
L25, L26	259-1401	2nd IF Anode Coil / 31.375 Mc/s Trap
L26a	Part of 906-0631	38.375 Mc/s Trap
L27	259-1411	3rd IF Anode Coil
L28	259-0955	Grid Peaking Choke
L29	259-1432	Choke
L30	259-1432	Choke
L31	Part of 259-1411	29.875 Mc/s Trap
L32	259-1432	Choke
L33	259-1421	Intercarrier Detector Coil
L34, L35	259-1261	Equalising Coil
L36	908-0621	Video Peaking Transformer
L37	259-0045	Antiparasitic Coil
L38	259-0045	Antiparasitic Coil
L39	259-0045	Antiparasitic Coil
L40	259-0045	Antiparasitic Coil
L41	259-1251	Linearity Coil
L42	259-1541	5.5 Mc/s Trap Coil

POTENTIOMETERS

REF.	PART NO.	DESCRIPTION
RV1	677-1341	500K Curve 'A'—Brightness
RV2	677-0911	1M Curve 'A' Type EC—AGC
RV3, RV4	677-1152	50K Curve 'A'—Contrast Range / 25K Curve 'A'—Picture Contrast

PARTS LIST — CHASSIS V3

POTENTIOMETERS (continued)

REF.	PART NO.	DESCRIPTION
RV5	677-1113	1M 'Reverse C' Curve—Tone
RV6	677-1321	1M Curve 'A' tapped 500K—Volume
RV7	677-0921	50K Curve 'A' type EC—Height
RV8	677-1103	500K Curve 'A' I.R.C.—Vertical Hold
RV9	677-0511	10K Curve 'A' type EC—Vertical Linearity
RV10	677-1122	15K Curve 'A' type EC—Horizontal Hold
RV11	677-0891	2M $\pm$ 25% — Focus
RV12	677-0911	1M Curve 'A' type EC—Width
RV13	677-1122	15K Curve 'A' type EC—Noise Inverter
RV14	677-0971	1.5 Curve 'F' Hearing-Aid Volume
RV15	677-1191	250K Curve 'F' Remote Control Picture
RV16	677-1011	250K Curve 'G' Remote Control Volume

TRANSFORMERS

REF.	PART NO.	DESCRIPTION
T1	904-0501	Mains Transformer
T2	908-0643	Sync. Coupling Transformer
T3	905-0621	Audio Output Transformer
T4	908-0663	Blocking Osc. Transformer
T5	908-0671	Vertical Feedback Transformer
T6	905-0511	Vertical Output Transformer
T7	908-0612	Focus Transformer
T8	259-1621	Horizontal Oscillator Coil
T9	908-0591	Line Output Transformer. M.S.P.
IFT1	906-0621	Vision IFT
IFT2	906-0631	Vision IFT
IFT3	906-0641	Vision IFT
IFT5	906-0382	Sound IF Transformer
IFT6	906-0324	Ratio Detector
T10	904-0381	Remote Control Power Transformer
T11	908-0571	Indexing Transformer
T12	908-0571	Indexing Transformer

VALVES AND TRANSISTORS

REF.	PART NO.	DESCRIPTION
V1	932-1161	6ES8—RF Amplifier
V2	932-1921	6HG8—Frequency Changer
V3	932-1211	6EH7—1st IF Amplifier
V4	932-1211	6EH7—2nd IF Amplifier
V5	932-1221	6EJ7—3rd IF Amplifier
V6	932-0661	6CK6—Video Amplifier
V7	932-1081	6DX8—AGC and Noise Inverter
V8	932-2171	6BA8—Sync. Separator
V9	932-0521	6BX6—Sound IF Amplifier
V10	932-0521	6BX6—Limiter
V11	932-1771	6GW8—Audio Driver and Output
V12	932-2001	6GV8—Vertical Blocking Osc. and Vertical Output
V13	932-2091	12AT7—Reactance Valve
V14	932-1081	6DX8—Horizontal Oscillator and Horizontal Driver
V15	932-0531	6CM5—Horizontal Output

VALVES AND TRANSISTORS (continued)

REF.	PART NO.	DESCRIPTION
V16	932-0771	1S2—EHT Rectifier
V17	932-1151	6AL3—Damper Diode
	932-2651	AX1104 Transistor

DIODES

REF.	PART NO.	DESCRIPTION
MR1	932-0971	OA90—Video Detector
MR2	932-0971	OA90—Intercarrier Detector
MR3		
MR4, MR5	932-1071	OA210—HT Rectifier
MR6	932-0991	M3—AGC Clamp
MR7	932-2181	BA100—Sync. Level Detector
MR8	932-2031	OA91—Noise Clipper
MR9, MR10	932-2081	2-AA119—Ratio Detector Matched Pair
MR11, MR12	932-0991	BA122—Phase Discriminator
MR13	932-2031	OA91—Pulse Clipper
MR14	932-2191	OA610—Blanking Clamp
MR15	932-2191	OA610—Rectifier (Rem. Control)
MR16	932-2191	OA610—Rectifier (Rem. Control)
MR17	932-2031	OA91—Protection Diode

MISCELLANEOUS

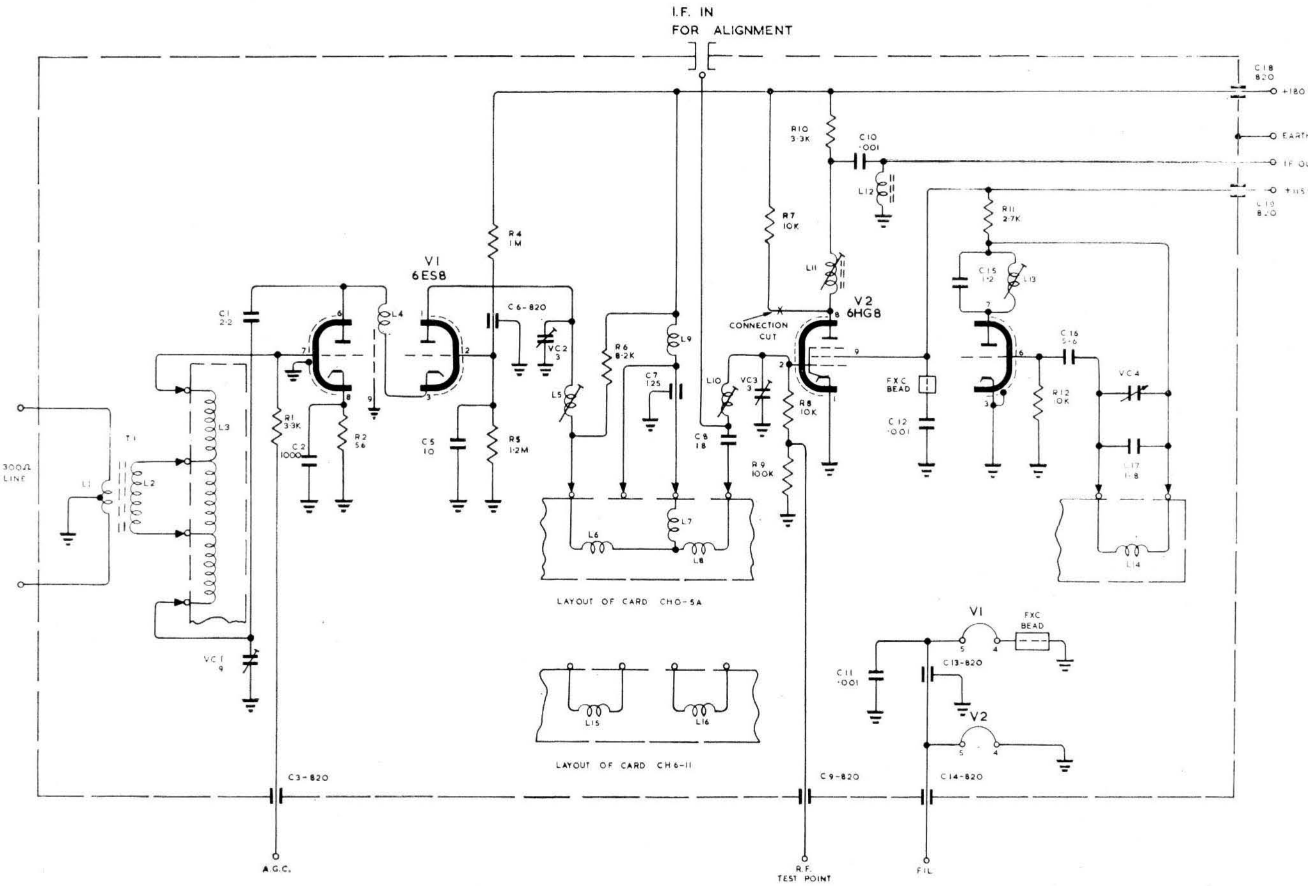
REF.	PART NO.	DESCRIPTION
CH1	232-0311	HT Choke
VDR1	750-0611	Voltage Dependent Resistor, type E299 DE/P350
VDR2	750-0571	Voltage Dependent Resistor, type E298 ZZ/06 Red Spot
VDR3	750-0281	Voltage Dependent Resistor, type E298 GO/A260 Blue Spot
FS1	431-0051	Fuse 2 amp. — Mains
FS2	431-0051	Fuse 2 amp. — Mains
FS3	431-0051	Fuse 2 amp.—HT Secondary
FS4	431-0031	Fuse 250 mA—HT Secondary
Tuner	224-1512	Tuner—Philips NT3011
SA	855-0711	DP Rotary On/Off Switch—Mains
Lamp	932-1171	6.3V .32A Bayonet Cap Lamp
	824-0691	Lamp Socket, A/NCO/8495/17
	160-0151	Tuner, Mounting Bush
	220-0001	Pointer, Drive Chain
	244-0881	Chain Sprocket Retaining Clips
	517-2081	Knob — rear pre-sets — Tone, Vertical Hold
	518-5051	Chain Sprocket Kit
	617-0211	¼" Wing Nut — tuner bracket fixing
	671-0641	Pointer
	840-0851	Chain Tensioning Spring
Yoke	259-1631	.M.S.P. 43662A
CRT	932-2641	25NP4
RLA	735-0041	Relay, 300 ohms coil, 4-pole. Normally open.
RLB	735-0051	Relay, 600 ohms coil, 4-pole. Normally open.
MSA-1, MSA-2, MSA-3	855-0651	On-Off Control/Speaker Control/Contrast Control. Leaf Switch operated by rem. control plug.
MSB	855-0481	Switch, Muting (Cam operated)

Correction of Part No. T6 (Vertical Output Transformer); for: 905-0511 read: 905-0642.

REF.	PART NO.	DESCRIPTION
		MISCELLANEOUS (continued)
SB	855-0531	Switch Wafer—1-pole, 14-pos.
SC	855-0441	Switch, Local / Remote Speaker. MSP77
SD	855-0441	Switch, On/Off. MSP77.
SE	855-0451	Switch, Channel Selector. OAK CK14.
	855-0541	Switch Wafer—1-pole, 14-pos. Aerial Selector
	577-0131	Motor, 240V.
	577-0141	Motor, plus driving dog
	306-0101	Clutch—driving dog
	306-0101	Clutch—driven dog
	837-0531	Spindle—driven dog and pinion mounting
	447-0051	Pinion
	664-1732	Rear bearing plate assembly. Plate with bearings, driven dog, pinion and spindle.
	447-0061	Gear, Idler
	447-0071	Gear, Crank driving
	654-0623	Crank with pin
	263-0051	Collar, Crank pin
	244-0811	Circlip, SCO1916, crank pin collar retaining
	954-0271	Geneva wheel assembly
	244-0771	Circlip, SCO1960/17/0. Geneva wheel assembly retaining
	664-1801	Front bearing plate assembly
	306-0131	Coupling, tuner, driving
	306-0121	Coupling, tuner, driven
	263-0061	Collar, driven tuner coupling

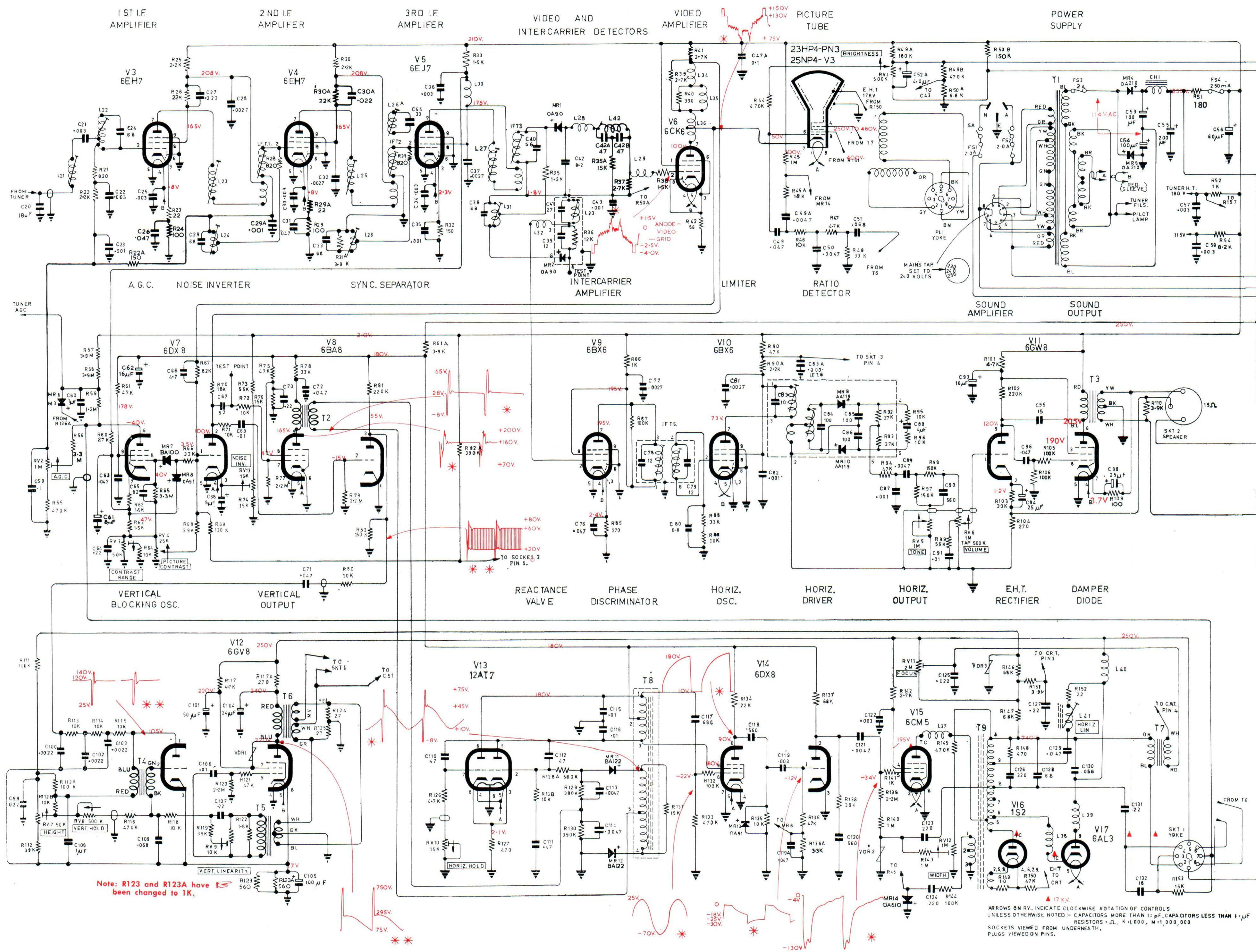
REF.	PART NO.	DESCRIPTION
		MISCELLANEOUS (continued)
SKT3	824-1201	Socket, remote control
	190-2501	Cabinet back
	244-0491	Circlip, ASCO/8169/17/0
	814-0961	Captive 4BA screw held by 244-0491
	190-2491	Cabinet front
	794-1301	Scale, channel indicator
	664-1701	Plate, scale backing
	372-0181	Disc, channel indicator
	517-1631	Knob, pre-selector
	840-0731	Spring, pre-selector knob
	517-1641	Knob, channel selector
	517-1891	Knob
	794-1261	Scale, hearing aid volume
	794-1271	Scale, picture
	794-1281	Scale, Volume
	453-1291	Speaker grille
	661-0231	Grille backing strip
	831-1391	Speaker, 2" MSP, type 2HB, 15 ohms
	757-0181	Speaker mounting rubber ring
	824-0841	Hearing Aid socket
	831-1331	Hearing Aid earpiece, 15 ohms, with lead and plug
	852-0221	Handset support
	770-0361	Anti-skid rubber balls
	961-0761	25 feet 9-core beige cable
	826-0001	Sleeve
	668-0581	Plug, 9-pin, XLM9/UTP1
	294-0971	Cover, 9-pin plug, 10B
PLP	932-1791	12V 2W lamp, Philips 12829.

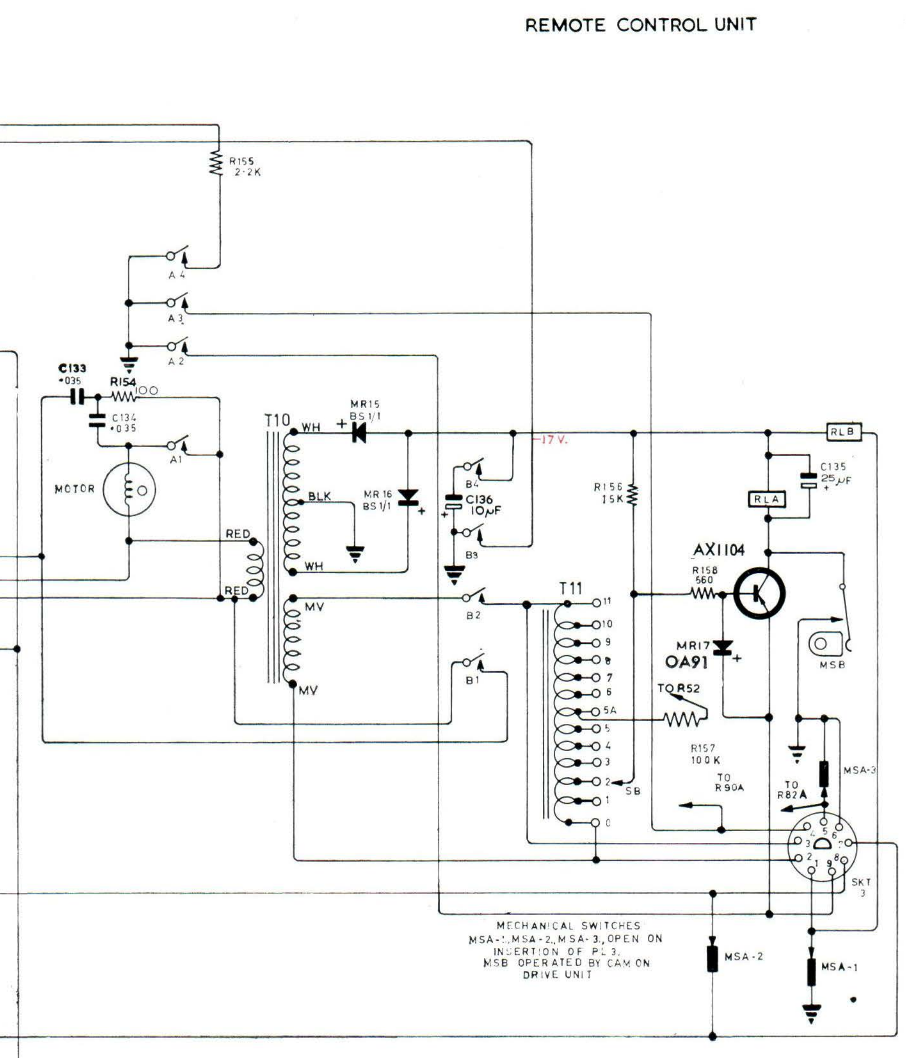
H. CLARK PTY. LTD.
Printers
MARRICKVILLE, N.S.W.



TUNER TYPE NT3011

"H.M.V." CHASSIS TYPE V3

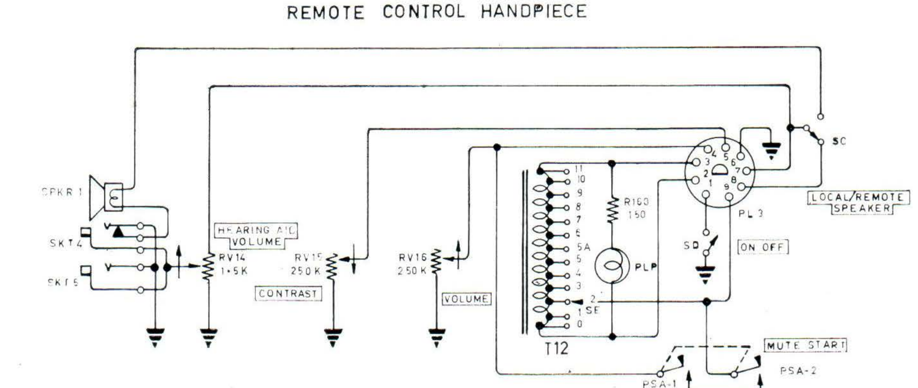




AFTER PRINTING OF THIS ISSUE, THE FOLLOWING CHANGES WERE MADE:

R51 (180 ohms 5% 10W) changed to 250 ohms 5% 10W (EMI Part No. 750-0622).
R52 (1K 20% 2W) changed to 1K 20% 4W PF4 (EMI Part No. 750-0822).
R109 (100 ohms) changed to 120 ohms ½W (EMI Part No. 740-0442).
R117 (4.7K 1W) changed to 6.8K ½W (EMI Part No. 740-0382).
R117a (270 ohms 1W) changed to 680 ohms 5W PW5 (EMI Part No. 750-0332).
R123, R123a (560 ohms 1W) changed to 1 only 390 ohms 2W (EMI Part No. 750-0832).
Primary winding of sound output transformer (RD terminal) now connected to 250V HT line instead of 210V HT line.

REMOTE CONTROL HANDPIECE



ARROWS ON RV.. INDICATE CLOCKWISE ROTATION OF CONTROLS
UNLESS OTHERWISE NOTED :- CAPACITORS MORE THAN 1 = pF, CAPACITORS LESS THAN 1 = μF
RESISTORS = Ω, K = 1,000, M = 1,000,000
SOCKETS VIEWED FROM UNDERNEATH.
PLUGS VIEWED ON PINS.

NOTE :- ALL VOLTAGES MEASURED WITH 20,000 Ω/V METER WITH RESPECT TO CHASSIS.
ALL CONTROLS SET FOR NORMAL OPERATION WITH SIGNAL APPLIED.
REMOTE CONTROL CHANNEL SELECTOR & RECEIVER CHANNEL SELECTOR BOTH ON CHANNEL 2.
▲ DO NOT MEASURE.
✱ SYNC. AT ½ LINE FREQUENCY.
✱✱ SYNC AT ½ FRAME FREQUENCY.
WAVEFORM PEAK VOLTAGES WITH RESPECT TO CHASSIS.