TECHNICAL INFORMATION AND SERVICE DATA

MANUFACTURERS AWA SUPERVISED SERVICE

A.W.A. RADIOLA
Television Receiver Chassis
34-50 Series

ISSUED BY AMALGAMATED WIRELESS (AUSTRALASIA) LTD.

GENERAL DESCRIPTION

The 34-50 series chassis are 20 valves, A.C.-operated Television Receivers.

Features of design include: Neutrode tuner; hinge-down chassis; three-stage I.F. amplifier; gated a.g.c.; phase discriminator a.f.c. horizontal system; frequency selective noise detector; horizontal and vertical sweep stabilisation; 110° deflection; electrostatic dynamic focus; aluminised kinescope; inter-carrier f.m. sound system; ratio detector.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

INTERMEDIATE FREQUENCIES:

Video I.F. Carrier Frequency ..... 36.875 Mc/s
Sound I.F. Carrier Frequency ..... 31.375 Mc/s

POWER CONSUMPTION: 170 Watts Max.

UNDISTORTED AUDIO POWER OUTPUT: 2.5 Watts Max.

VIDEO RESPONSE ..... to 4.5 Mc/s

FOCUS ..... Electrostatic (Low Voltage)

DEFLECTION ..... 110° Magnetic

VALVE COMPLEMENT:

1 (V1) Radiotron 6GK5 .. R.F. Amplifier } In tuner
2 (V2) Radiotron 6HG8 .. Oscillator Mixer }
3 (V101) Radiotron 6AU6 ..... Sound I.F.
4 (V102) Radiotron 6AL5 ..... Ratio Detector
5 (V103) Radiotron 6AV6 Audio Amp. and A.G.C. Clamp
6 (V104) Radiotron 6HG5 ..... Audio Output
7 (V201) Radiotron 6BZ6 ..... 1st Video I.F.
8 (V202) Radiotron 6EW6 ..... 2nd Video I.F.
9 (V203) Radiotron 6CB6 ..... 3rd Video I.F.
10 (V204) Radiotron 6EB8 .. Video Amp. and Sync. Amp.
11 (V205) Radiotron 6CG7 Video Control and Vert. Osc.
12 (V206) Radiotron 23CP4 or 25LP4 ..... Kinescope
13 (V207) Radiotron 6BQ7A .. Noise Detector and A.G.C. Compensator
14 (V301) Radiotron 6HS8 ..... A.G.C. and Sync. Sep.
15 (V302) Radiotron 6EM5 ..... Vertical Output
16 (V401) Radiotron 6AL5 ..... Phase Discriminator
17 (V402) Radiotron 6CG7 ..... Buffer and Hor. Osc.
18 (V403) Radiotron 6CM5 ..... Horizontal Output
19 (V404) Radiotron 6AU4-GTA ..... Damper
20 (V405) Radiotron IB3-GT ..... H.V. Rectifier

DIODES:

MR201 GD3, 1N87A or equivalent .... Video Detector
MR401 1N3194 ..... Rectifier
MR401 1N3194 ..... Rectifier

April, 1965

HIGH VOLTAGE WARNING

Operation of this receiver outside the cabinet involves a shock hazard from the receiver power supplies. Work on the receiver should not be attempted by anyone who is not thoroughly familiar with the precautions necessary when working on high voltage equipment. Do not operate the receiver with the high voltage compartment shield removed. Make sure that the earth strap between the chassis and the kinescope assembly is securely fastened before turning the receiver on.

KINESCOPE HANDLING PRECAUTIONS

Do not install, remove or handle the kinescope in any manner unless shatter-proof goggles are worn. People not so equipped should be kept away from the area where the kinescope is being handled. Keep the kinescope away from the body while handling.

When the receiver has been switched off after operating for a time, the kinescope will retain a certain charge. Therefore it is advisable to discharge it before handling.

OPERATING TESTS

DEFLECTION YOKE ADJUSTMENT (Fig. 1)

If the lines of the raster are not horizontal or squared with the kinescope, rotate the deflection yoke until this condition is obtained. Tighten the yoke clamp.

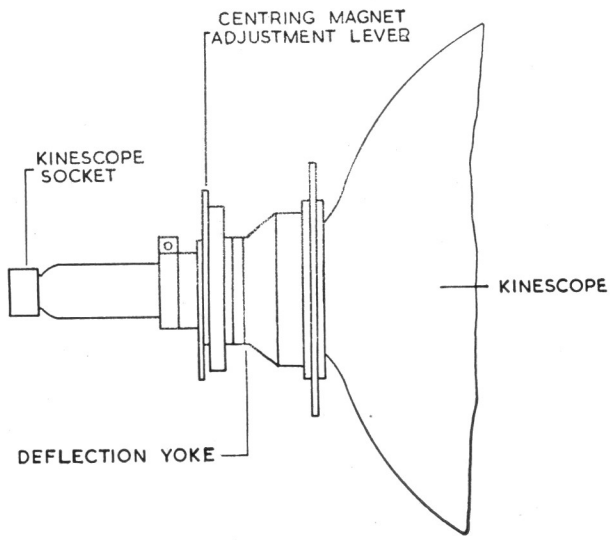


FIG. 1

NOTE: Rotational directions specified are viewed from the spindle end or, when no spindle is visible, from the rear cabinet end.

FOCUS ADJUSTMENT

This adjustment has been made at the factory and it should only be necessary to re-adjust if the kinescope is replaced. In this case adjust the focus control, RV402, until maximum definition of the line structure of the raster is obtained.

CHECK OF HORIZONTAL OSCILLATOR ADJUSTMENT

Turn the horizontal hold control to the extreme clockwise position. The picture should be out of synchronisation with a minimum of 10 bars slanting downwards towards the left. Turn the control slowly anti-clockwise. The number of diagonal black bars will gradually reduce and when only 1½ to 3 bars remain, the picture will synchronise with further slight anti-clockwise rotation of the control. The picture should remain synchronised for at least 4 full turns of additional anti-clockwise rotation of the control. Continue to turn the control anti-clockwise until synchronisation is lost. Turning the control beyond this point should produce a minimum of 6 bars before end of rotation or a minimum of 6 bars before interrupted oscillation (motor-boating) occurs.

The hold control should then be turned in a clockwise direction until synchronisation is just obtained. A further rotation of 1 to 1½ turns is the correct setting.

When the receiver passes the above checks and the picture is normal and stable the horizontal oscillator is correctly aligned and the "Horizontal Oscillator Adjustment" may be by-passed.

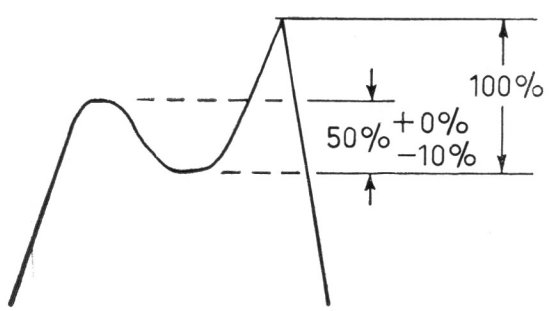
HORIZONTAL OSCILLATOR ADJUSTMENT

The adjustment of the horizontal oscillator is not considered to be part of the alignment procedure. The adjustment is made at the factory and should not require readjustment in the field. However, the adjustment should be carried out whenever components in the horizontal oscillator circuit are changed. The width should be correctly set before adjustments are carried out.

The horizontal oscillator may be adjusted by the following method:—

NOTE: Under normal circumstances, unless C408, C409 or L401 are replaced, no sine wave coil adjustment will be required, and the correct horizontal oscillator conditions will be obtained by following step 5 below.

1. Short circuit the sine wave coil, L401, and short circuit the phase discriminator test point to ground.
2. Adjust the horizontal hold control, TR401, until the picture is synchronised with the signal, i.e., picture sides are straight.
3. Remove short circuits from sine wave coil and phase discriminator test point.
4. With a c.r.o. at the horizontal oscillator transformer tap (red colour dot), adjust sine wave, L401, for a waveform as shown.



5. Set the horizontal hold control, TR401, for 0 volts d.c. at the phase discriminator test point.

CENTRING ADJUSTMENT

As the majority of test patterns transmitted contain horizontal and vertical bars, the correct procedure for centring adjustment horizontally or vertically is that the corresponding bars progressing outwards from the centre should have the same amount of pin-cushion distortion (if any).

The centring magnets are in the form of two discs mounted on the rear of the deflection yoke cap. When the magnets are rotated around the tube neck so that the levers are opposite, minimum centring effect with either lever is produced. To obtain correct centring of the picture the magnets are alternatively rotated with respect to each other.

CAUTION

Under no circumstances should the receiver be switched on with the deflection yoke removed from the picture tube. This may produce an undeflected spot which may damage the screen.

WIDTH AND HORIZONTAL LINEARITY ADJUSTMENTS

The width and horizontal linearity controls, RV401 and L403, are adjusted to produce best linearity with a picture of the correct width, i.e., with the picture extending approximately ½" on either side of the kinescope mask with normal picture brightness.

CHASSIS REMOVAL

The method of mounting used on this chassis adds to its ease of servicing. Two wing nuts secure the top of the chassis to the cabinet while the chassis base rests in special hinge brackets.

When access is required to both sides of the chassis, loosen all wing nuts and swing the chassis down to its horizontal rest. This can be done without interfering with the receiver operation.

Caution! Before and during this swing down operation, make sure that the kinescope and yoke leads do not foul on the kinescope neck or chassis components.

Should the complete chassis need removing only the following additional steps are necessary:

Remove the tuner and control panel assembly from the cabinet and attach it to the chassis (retaining screws and anchor points are provided along the i.f. side of the chassis for this purpose).

Unplug the yoke, kinescope socket, audio and ultor leads and disconnect the tuner earth strap.

Where a remote control unit is fitted disconnect the interconnecting cables.

If the cabinet is fitted with castors take any necessary precautions to compensate for the front weight bias when the chassis is removed.

Lift the chassis to a position slightly above the horizontal and the chassis assembly will be free to slide out of its hinge brackets.

Reassembly is the reverse of the above procedure.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS

Adjust the height control, RV307, for a picture of approximately ¾ of the normal size.

Adjust the vertical linearity control, RV305, to give a small amount of cramp at the top of the picture.

Adjust the height and top linearity controls, RV307 and RV306, to obtain a picture of normal height (approximately ½" of picture extending beyond the top and bottom of the kinescope mask).

Finally adjust the height, top linearity and vertical linearity controls for best linearity and correct height.

A.G.C. ADJUSTMENT

Set the min. contrast and I.F. A.G.C. controls at their mid positions.

Set the contrast and A.G.C. controls at their maximum clockwise positions.

With no signal input, short circuit the plate to screen of V202 (2nd Video I.F.) and adjust the A.G.C. Comp. Set control, RV309, to give + 130V D.C. at the plate of V207B (A.G.C. Compensator). Remove the short circuit.

Tune the receiver to a channel of a medium strength (1mV) or suitable attenuated strong signal.

Set the fine tuning and with contrast control at maximum contrast, adjust the A.G.C. control, RV302, for sync. clipping in the video amplifier and then back-off until clipping stops.

Set the contrast control for minimum contrast and adjust the min. contrast control to give 20 volts p-p at the kinescope cathode. Adjust the brightness control for normal brightness and the I.F. A.G.C. control for snow threshold.

REPLACEMENT OF FUSES

Two 1.5 amp. fuses are provided for mains and high tension protection. The location and function of these fuses are indicated on the layout diagram.

NOTE: In some early chassis a 3 amp. filament fuse was incorporated. To facilitate the hinge-down action, this has now been deleted.

ALIGNMENT PROCEDURE

TESTING INSTRUMENTS

To properly service the television receiver it is recommended that the following testing equipment be available—

(1) Television Sweep Generator.

(2) A.W.A. Cathode Ray Oscilloscope (C.R.O.), type 1A56069.

(3) A.W.A. Television Calibrator, type A56057.

(4) A.W.A. Voltohmyst, type 1A56074.

(5) A.W.A. Universal Measuring Bridge, type A56048.

TESTING PADS AND CIRCUITS

(Referred to in Alignment Procedure.)

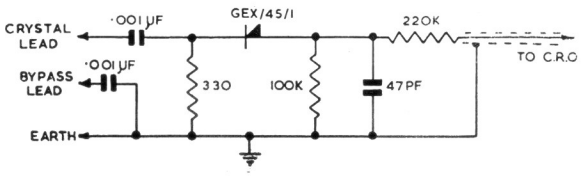


FIG. 2—CRYSTAL DETECTOR PROBE

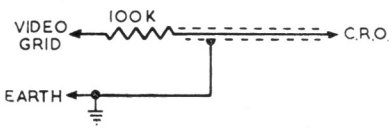


FIG. 3

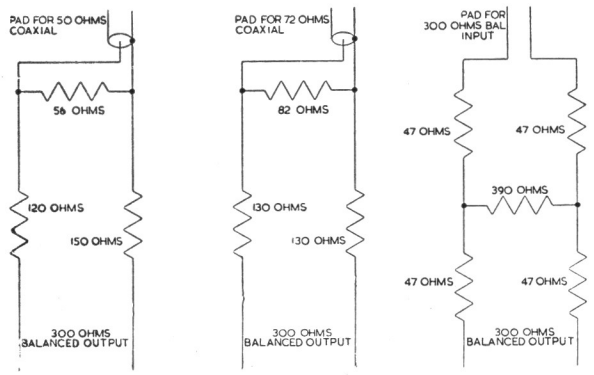


FIG. 4—SWEEP ATTENUATOR PADS

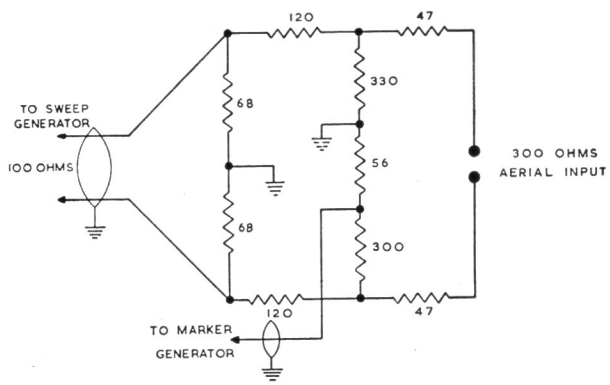


FIG. 5—INPUT PAD

RESPONSE CURVES

The response curves referred to throughout the alignment procedure were taken from a production set, but some variations can be expected.

CRITICAL LEAD DRESS

All leads in the i.f. section, particularly those on by-pass capacitors, must be kept as short as possible.

Wire wound resistors should be dressed away from neighbouring components.

NOTE: When two positions of the core appear to give the correct adjustments, the following apply:—

* Coil tuned with core close to chassis.

† Coil tuned with core close to can top, i.e., remote from chassis.

Make sure that bias voltages are correct, as incorrect voltages will lead to wrong adjustment.

When applying markers use smallest marker visible, otherwise response could be incorrectly displayed, i.e., removal of the marker generator should not change viewed shape of response.

Make sure that responses are viewed at correct output level as incorrect level will result in wrong adjustment. At lower levels detector non-linearity affects the shape, and at higher levels overload will alter the shape of the response.

SOUND I.F. ALIGNMENT

Connect the output of the television calibrator to the video detector test point and set the frequency to 5.5 Mc/s.

Connect the Voltohmyst d.c. probe to the sound peak test point and set the range switch to + 5 volts d.c.

Short circuit pin 1 of V203 (3rd video i.f. grid) to ground.

Adjust the following cores for peak output varying the input to maintain a reading of about 2 volts.

TR101 secondary (ratio detector bottom core)*.

TR101 primary (top core)†.

L101 (sound take off coil)*.

L206 (sound trap)*.

Repeat this sequence once.

Transfer the Voltohmyst probe to the sound zero test point.

Re-adjust TR101 secondary (bottom core) for zero reading on the Voltohmyst.

Set the calibrator modulation switch to 600 c/s.

Connect the c.r.o. to the video out test point through a crystal probe (Voltohmyst probe 2R56075 is suitable).

Re-adjust L206 (sound trap)* for minimum 600 c/s on the c.r.o.

Remove television calibrator, Voltohmyst and short circuit on V203 grid.

VIDEO I.F. ALIGNMENT

Turn RV301 to its extreme clockwise position when viewed from the wiring side.

Connect a source of —3 volts bias to the video I.F. at the I.F. A.G.C. test point and a source of —2.5 volts bias to the tuner a.g.c. terminal.

Connect the sweep generator to the aerial input terminals on the tuner and set both sweep generator and tuner to Channel 6.

Connect the c.r.o. vertical input to TP2 on the tuner through a shielded lead and blocking capacitor.

Check that the r.f. response viewed on the c.r.o. conforms with that shown in figure 6. A change in tuner bias may be necessary to obtain a flat tuner response.

Note: In figure 5 is shown a suggested input pad and a way the marker generator can be connected for checking the tuner response.

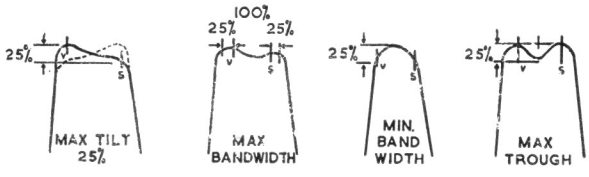


FIG. 6

Disconnect the c.r.o. from TP2 on the tuner and connect the crystal detector probe (figure 2) to pin 5 of V201 (1st video i.f. plate) and also by-pass pin 5 of V202 using the by-pass lead provided.

Set tuner oscillator frequency to 212.125 Mc/s ± 0.5 Mc/s using the fine tuning control. Set the sweep generator output to give maximum deflection on the c.r.o. of 0.3 volts p-p. It is suggested that the marker generator be connected to the centre spigot on the socket of V201 and the earth lead connected to the chassis.

Set the marker generator to 38.375 Mc/s and adjust L201 so that the marker appears in the dip of the response produced by the trap, i.e., tune the trap to 38.375 Mc/s.

Adjust L2*, L202* and C204 to produce the response on the c.r.o. shown in figure 7.

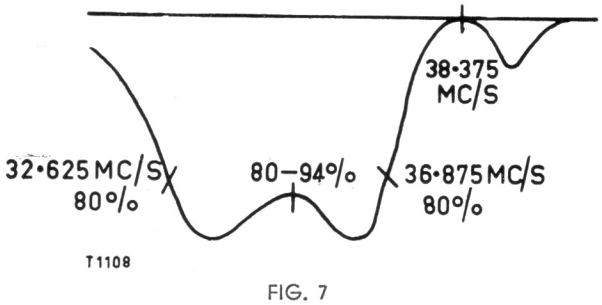


FIG. 7

L2* mainly affects the 36.878 Mc/s marker position.

L202* mainly affects tilt.

C204 mainly affects the band width.

Remove the crystal probe and connect the c.r.o. to the video detector test point using the network shown in figure 3. It is suggested that the marker generator remain connected to the centre spigot of the V201 socket.

Detune the noise detector, TR204, by winding both cores out as far as possible.

View the overall response with approximately 3 volts p-p output and adjust the accompanying sound trap, TR202 (top core), for minimum response at 30.875 Mc/s increasing the c.r.o. gain if necessary for easier adjustment of the trap.

Re-set the c.r.o. gain to give 3 volts p-p and adjust for a response as shown in figure 8.

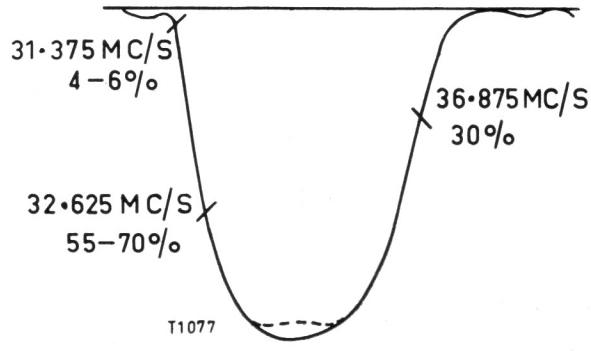


FIG. 8

Marker 36.875 Mc/s at 30% TR202*.

Marker 31.375 at 4%–6% TR201*.

No tilt TR203*.

Check that 32.625 Mc/s marker is at 55%-70%, otherwise re-adjust TR201* and correct tilt with TR203* if necessary.

TR204 is now aligned as follows:—

Connect the c.r.o. vertical input to pin 7 of V301 (6HS8) using the network shown in figure 3 and remove the 6HS8 valve.

Adjust the top core of TR204 to bring the 33 Mc/s marker to the top of the response curve and the bottom core for maximum symmetrical response as shown in figure 9.

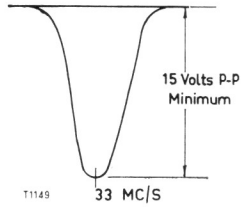


FIG. 9

With 3 volts p-p at the video detector and without adjustment of the sweep generator output or bias, the p-p voltage from the noise detector should not be less than 15 volts.

CIRCUIT CODE

RESISTORS

All Resistors composition type unless otherwise stated.

Code No.	DESCRIPTION			Part No.
R1	5.6K ohms	±20%	½ watt	611288
R2	1K ohms	±20%	½ watt	608030
R3	33K ohms	±20%	½ watt	614463
R4	2.2K ohms	±10%	1 watt	609446
R5	2.2K ohms	±20%	½ watt	609445
R6	4.7K ohms	±10%	1 watt	610966
R7	10K ohms	±20%	½ watt	612032
R8	Not used			
R9	2.2K ohms	±20%	½ watt	609445
R10	1 Megohm	±20%	½ watt	618020
R90	1 Megohm	±20%	½ watt	618020
R91	3.9K ohms	±10%	7 watts W.W.	610569
R101	56K ohms	±10%	½ watt	615161
R102	100 ohms	±10%	½ watt	604031
R103	56K ohms	±10%	1 watt	615165
R104	39K ohms	±10%	2 watts	614602
R105	47 ohms	±10%	½ watt	603091
R106	47K ohms	±10%	½ watt	614961
R107	4.7K ohms	±5%	½ watt	610964
R108	4.7K ohms	±5%	½ watt	610964
R109	10 Megohms	±10%	½ watt	619406
R110	56K ohms	±10%	½ watt	615161
R111	Not used			
R112	100K ohms	±10%	½ watt	616017
R113	47K ohms	±20%	½ watt	614968
R114	1.5 Megohms	±10%	1 watt	618263
R115	270 ohms	±10%	1 watt	605645
R116	680 ohms	±10%	5 watts W.W.	607290
R201	1K ohms	±20%	½ watt	608030
R202	2.2K ohms	±10%	½ watt	609442
R203	47 ohms	±10%	½ watt	603091
R204	12K ohms	±5%	½ watt	612512
R205	470 ohms	±10%	½ watt	606588
R206	120K ohms	±10%	½ watt	616261
R207	15K ohms	±10%	½ watt	612922
R208	27 ohms	±10%	½ watt	602593
R209	150K ohms	±10%	½ watt	616426
R210	8.2K ohms	±5%	½ watt	611847
R211	Not used			
R212	470 ohms	±10%	½ watt	606588
R213	150 ohms	±10%	½ watt	604677
R214	Not used			
R215	3.3K ohms	±10%	1 watt	610309
R216	Not used			
R217	3.9K ohms	±5%	½ watt	610560
R218	68 ohms	±10%	½ watt	603560
R219	22K ohms	±10%	½ watt	613653
R220	47K ohms	±10%	1 watt	614969
R221	Not used			
R222	470 ohms	±10%	½ watt	606588
R223	5.6K ohms	±5%	7 watts W.W.	611300
R224	4.7K ohms	±10%	½ watt	610932
R225	390K ohms	±10%	½ watt	617204
R226	180K ohms	±5%	1 watt	616561
R227	150K ohms	±5%	1 watt	616434
R228	Not used			
R229	3.3 Megohms	±10%	½ watt	618712
R230	Not used			
R231	120K ohms	±10%	½ watt	616261
R232	18K ohms	±10%	2 watts	613301
R233	12K ohms	±10%	½ watt	612507
R234	39K ohms	±10%	1 watt	614691
R235	12K ohms	±10%	½ watt	612507
R236	33K ohms	±10%	½ watt	614460

RESISTORS (Continued)

Code No.	DESCRIPTION			Part No.
R237	1K ohms	±10%	½ watt	608025
R301	470K ohms	±10%	½ watt	617356
R302	4.7 Megohms	±10%	1 watt	618941
R303	680K ohms	±10%	½ watt	617666
R304	33K ohms	±10%	½ watt	614460
R305	150K ohms	±10%	1 watt	616430
R306	Not used			
R307	10K ohms	±10%	1 watt	612033
R308	47K ohms	±10%	2 watts	614969
R309	6.8K ohms	±10%	1 watt	611530
R310	470K ohms	±10%	1 watt	617359
R311	Not used			
R312	1 Megohm	±10%	½ watt	618016
R313	680K ohms	±10%	1 watt	617669
R314	1.8 Megohms	±10%	½ watt	618362
R315	1 Megohm	±10%	1 watt	618021
R316	100K ohms	±10%	½ watt	616017
R317	1 Megohm	±10%	1 watt	618021
R318	120K ohms	±10%	½ watt	616261
R319	Not used			
R320	10K ohms	±10%	2 watts	612022
R321	Not used			
R322	10K ohms	±10%	2 watts	612022
R323	27K ohms	±10%	1 watt	614142
R324	6.8K ohms	±10%	½ watt	611526
R325	1.2 Megohms	±10%	1 watt	618146
R326	100K ohms	±10%	1 watt	616020
R327	3.3 Megohms	±20%	1 watt	618716
R328	220K ohms	±20%	½ watt	616725
R329	1 Megohm	±10%	1 watt	618021
R330	4.7K ohms	±10%	1 watt	610966
R331	Not used			
R332	1 Megohm	±10%	½ watt	618016
R333	330K ohms	±10%	½ watt	617108
R334	47K ohms	±10%	1 watt (BTAV)	614974
R335	820K ohms	±10%	1 watt (BTAV)	617848
R336	820K ohms	±10%	1 watt (BTAV)	617848
R337	1.5 Megohms	±10%	1 watt	618263
R338	1.2 Megohms	±10%	½ watt	618141
R339	47K ohms	±10%	½ watt	614961
R340	1 Megohm	±10%	1 watt	618021
R341	Not used			
R342	680 ohms	±10%	5 watts W.W.	607290
R343	10K ohms	±10%	2 watts	612022
R344	12K ohms	±10%	½ watt	612507
R345	220K ohms	±10%	1 watt	616726
R346	100K ohms	±10%	½ watt	616017
R347	1.2 Megohms	±10%	1 watt	618146
R348	1 Megohm	±10%	1 watt (BTAV)	618026
R349	100K ohms	±10%	1 watt	616020
R350	Not used			
R351	82K ohms	±10%	1 watt	615800
R352	100K ohms	±10%	½ watt	616017
R353	56K ohms	±10%	½ watt	615161
R354	1K ohms	±10%	½ watt	608025
R355	10 Megohms	±10%	1 watt	619410
R356	10 Megohms	±10%	1 watt	619410
R357	2.2 Megohms	±10%	1 watt	618488
R358	1 Megohm	±10%	1 watt	618021
R401	1 Megohm	±10%	½ watt	618016
R402	33K ohms	±10%	2 watts	614465
R403	1 Megohm	±10%	½ watt	618016

CIRCUIT CODE

CODE No.	DESCRIPTION	PART No.
	RESISTORS (Continued)	
R404	82K ohms ±10% ½ watt	615795
R405	68K ohms ±10% ½ watt	615494
R406	2.2K ohms ±10% ½ watt	609442
R407	220K ohms ±10% 1 watt	616737
R408	39K ohms ±10% ½ watt	614684
R409	100K ohms ±10% 1 watt	616020
R410	47 ohms ±10% ½ watt	603091
R411	Not used	
R412	680K ohms ±10% 1 watt	617669
R413	27K ohms ±10% 1 watt	614142
R414	820K ohms ±10% 1 watt (BTAV)	617848
R415	3.9K ohms ±10% 5 watts W.W.	610567
R416	1 Megohm ±10% 1 watt (BTAV)	618026
R417	22K ohms ±10% 1 watt	613658
R418	1.5 ohms ±10% ½ watt W.W.	600416
R419	470K ohms ±10% 1 watt	617359
R420	330K ohms ±10% 1 watt	617111
R421	Not used	
R422	68K ohms ±20% ½ watt	615499
R423	1K ohms ±20% ½ watt	608030
R424	47K ohms ±10% 1 watt (BTAV)	614974
R425	150 ohms ±10% ½ watt } In	601082
R426	150 ohms ±10% ½ watt } yoke	601082
R427	150 ohms ±10% 1 watt	604681
RV101	500K ohms Curve "C" Carbon, Tone*	
RV102	500K ohms Curve "C" Carbon, Volume (Sound)*	
RV201	500K ohms Curve "A" Carbon, Contrast*	
RV202	100K ohms Curve "A" Carbon, Min. Contrast	620322
RV301	200K ohms Curve "A" Carbon, I.F. A.G.C.	620487
RV302	20K ohms Curve "A" Carbon, A.G.C.	620262
RV303	Not used	
RV304	1 Megohm Curve "A" Carbon, Vert. Hold	600786
RV305	100K ohms Curve "A" Carbon, Vert. Linearity	620322
RV306	1 Megohm Curve "A" Carbon, Top Linearity	620769
RV307	1 Megohm Curve "A" Carbon, Height	620769
RV308	500K ohms Curve "A" Carbon, Brightness (Picture)*	
RV309	100K ohms Curve "A" Carbon, A.G.C. Comp. Set	620322
RV401	1 Megohm Curve "A" Carbon, Width	620769
RV402	2.5 Megohms Curve "A" Carbon, Focus	620781
	*Varies with models.	
	CAPACITORS	
C1	3.3pf ±10% NPO disc	220164
C2	2.2pf ±5% NPO disc	221494
C3	18pf ±5% NPO feed thru	220776
C4	3.3pf ±10% NPO disc	220164
C5	15pf ±5% NPO disc	220710
C6	0.001μf +100% —0% Hi-K feed thru	225011
C7	1-5pf trimmer	231144
C8	0.5-3pf trimmer	231122
C9	100pf ±7½% N3300 feed thru	222246
C10	27pf ±5% NPO disc	221071
C11	0.001μf +100% —0% Hi-K feed thru	225011
C12	0.5-3pf trimmer	231122
C13	0.001μf +100% —0% Hi-K feed thru	225011
C14	0.68pf ±20% NPO disc	220068
C15	470pf ±20% K2000 tubular	221972
C16	39pf ±10% N750 tubular	221294
C17	5.6pf +5% —0% N150 disc	220274
C18	5.6pf ±2½% N150 disc	220276
C19	5.6pf +0% —5% N150 disc	220275
C20	0.001μf +100% —0% Hi-K feed thru	225011
C21	0.01μf ±10% 125VW polyester	226378
C22	220pf ±20% Hi-K disc	223205
CN	Neutralising capacitance	
C91	0.0047μf +100% —0% K5000 disc	225980
C92	0.01μf ±10% 125VW polyester	226378
C101	6.8pf ±5% NPO tubular (in L101)	220378
C102	39pf ±5% N220 disc (in L101)	221292
C103	33pf ±5% NPO tubular	221161
C104	0.0033μf ±10% 400VW polyester	225793
C105	100pf ±5% 600VW polystyrene (in TR101)	222222
C106	470pf ±5% 600VW polystyrene	224212

Code No.	DESCRIPTION	Part No.
	CAPACITORS (Continued)	
C107	470pf ±5% 600VW polystyrene	224212
C108	0.001μf ±10% 400VW polyester	225060
C109	10μf 25VW Electrolytic	228771
C110	0.0047μf ±10% 400VW polyester	225953
C111	Not used	
C112	0.039μf ±10% 125VW polyester	226775
C113	0.01μf ±10% 125VW polyester	226378
C114	0.047μf ±10% 400VW polyester	226802
C115	40μf 16VW Electrolytic	229552
C116A	10μf 450VW } Electrolytic	229612
C116B	50μf 350VW } Electrolytic	
C117	0.0022μf ±10% 400VW polyester	225636
C201	5.6pf ±5% NPO disc	220269
C202	12pf ±5% NPO tubular	220556
C203	0.0047μf +100% —0% K5000 disc	225980
C204	4—10pf trimmer	231123
C205	0.0047μf +100% —0% K5000 disc	225980
C206	270pf ±5% 600VW polystyrene	223561
C207	0.001μf ±10% 400VW polystyrene	225062
C208	0.0047μf +100% —0% K5000 disc	225980
C209	470pf ±5% 600VW polystyrene	224212
C210	0.0047μf +100% —0% K5000 disc	225980
C211	33pf ±10% N750 tubular	220552
C212	0.0047μf +100% —0% K5000 disc	225980
C213	18pf ±5% NPO tubular (in TR202)	220775
C214	0.0047μf +100% —0% K5000 disc	225980
C215	0.001μf +80% —20% K2000 feed thru	225011
C216	0.0047μf +100% —0% K5000 disc	225980
C217	470pf ±5% 600VW polystyrene	224212
C218	2.2pf ±.5pf NPO disc (in TR203)	221494
C219	4.7pf ±10% N750 bead (in TR203)	220215
C220	2.2pf ±.5pf NPO disc	221494
C221	Not used	
C222	0.1μf ±10% 400VW polyester	227085
C223	0.0039μf ±5% 400VW polyester	225858
C224	39pf ±10% N220 disc	221292
C225	0.01μf +100% —0% K5000 disc	226307
C226	0.1μf ±10% 400VW polyester	227085
C227	0.47μf ±10% 125VW polyester	227495
C228	Not used	
C229	Not used	
C230	Not used	
C231	10μf 50VW Electrolytic	228751
C232	0.0047μf +100% —0% K5000 disc	225980
C233	33pf ±5% NPO tubular	221161
C301	0.1μf ±10% 125VW polyester	227086
C302	Not used	
C303	0.022μf ±10% 400VW polyester	226636
C304	0.0039μf ±10% 400VW polyester	225863
C305	0.1μf ±10% 400VW polyester	227085
C306	24μf 80VW Electrolytic	229319
C307	330pf ±10% 600VW polystyrene	223716
C308	0.033μf ±10% 400VW polyester	226739
C309	0.001μf ±10% 400VW polyester	225066
C310	Not used	
C311	Not used	
C312	0.01μf ±10% 400VW polyester	226365
C313	0.027μf ±10% 400VW polyester	226689
C314	0.0068μf ±5% 400VW polyester	226236
C315	Not used	
C316	2μf 500VW Electrolytic	227922
C317	4μf 450VW Electrolytic	228188
C318	0.012μf ±10% 400VW polyester	226526
C319	0.1μf ±10% 400VW polyester	227085
C320	0.0068μf ±10% 400VW polyester	226234
C321	330pf ±20% K1000 disc	223724
C322	0.1μf ±10% 400VW polyester	227085
C323	0.1μf ±10% 125VW polyester	227086
C324	0.0068μf ±10% 400VW polyester	226234
C325	0.047μf ±10% 400VW polyester	226802
C326A	10μf 450VW } Electrolytic	229612
C326B	50μf 350VW } Electrolytic	
C327	0.01μf ±10% 400VW polyester	226365
C328	0.022μf ±10% 400VW polyester	226636
C329	0.1μf ±10% 400VW polyester	227085
C330	Not used	
C331	0.1μf ±20% 600VW paper	227011
C401	150pf ±10% 600VW polystyrene	222698
C402	100pf ±10% 600VW polystyrene	222233

CIRCUIT CODE

Code No.	DESCRIPTION	Part No.
	CAPACITORS (Continued)	
C403	0.0015μf ±10% 400VW polyester	225390
C404	390pf ±5% 600VW polystyrene	223885
C405	0.047μf ±10% 125VW polyester	226804
C406	470pf ±10% 600VW polystyrene	224207
C407	270pf ±5% 1000VW mica	223553
C408	0.0068μf ±5% 600VW polystyrene	226231
C409	0.0033μf ±10% 400VW polyester	225793
C410	0.0012μf ±5% 1000VW mica	225307
C411	Not used	
C412	2.2pf ±.5pf NPO disc	221494
C413	0.0012μf ±10% 600VW polystyrene	225303
C414	0.01μf +100% —0% K5000 disc	226307
C415	2μf 300VW Electrolytic	227923
C416	0.047μf ±10% 1000VW paper	226831
C417	0.047μf ±10% 1000VW paper	226831
C418	68pf ±10% 4000VW N750 disc	221965
C419	560pf ±10% 2500VW N1500 tubular	224484
C420	270pf ±10% 2500VW N750 disc	223554
C421	0.27μf ±10% 400VW paper	227428
C422	0.5μf ±20% 200VW AEE W48	229116
C423	0.001μf +100% —0% K5000 tubular	225010
C424	0.004/μf ±10% 400VW polyester	225953
C425	270pf ±10% 2500VW N750 disc	223554
C426	200μf 200VW Electrolytic	229751
C427	200μf 200VW Electrolytic	229751
C428	150μf 400VW Electrolytic	229739
	INDUCTORS	
L1	36.875 Mc/s Trap	41859
L2	Converter I.F. Coil	41859
L3	Not used	
L4	Oscillator Filament Choke	41866
L5	Screen Inductor Coil	45017
La-Lh	Tuning Coil Assembly	
	Channel 0	45055
	Channel 1	45056
	Channel 2	45057
	Channel 3	45058
	Channel 4	45059
	Channel 5	45060
	Channel 5A	45061
	Channel 6	45062
	Channel 7	45063
	Channel 8	45064
	Channel 9	45065
	Channel 10	45066
	Channel 11	45067
L101	Sound I.F.	43336
L201	38.375 Mc/s Trap	43580
L202	I.F. Input	
L203	Detector Filter	40323
L204	Detector Filter	49671
L205	Detector Peaking Coil (250μH)	40117
L206	5.5 Mc/s Trap	43593
L207	Video Ampl. Series Peaking Coil	41423
L208	Choke Link	52738
L401	Sine Wave	52150
L402	H.F. Choke (1.5μH)	214516
L403	Horizontal Linearity	43264
L404-L407	Yoke (23")	43660
	Yoke (25")	43665
L408	H.T. Filter Choke	40113C
	TRANSFORMERS	
TR1	Balun Assembly	44009
TR101	Ratio Detector	40077
TR102	Speaker Transformer*	
TR201	1st Video I.F.	40902
TR202	2nd Video I.F.	41407
TR203	3rd Video I.F.	41933
TR204	Noise Detector	43338
TR301	Vertical Blocking Oscillator	43643A
TR302	Vertical Output	43340A
TR401	Horizontal Hold	51694
TR402	Horizontal Output	43646
TR403	Horizontal Feedback	43344A
TR404	Power Transformer	51839A
	*Varies with models	

Code No.	DESCRIPTION	Part No.
	VALVES AND DIODES	
V1	Radiotron 6GK5	
V2	Radiotron 6HG8	
V101	Radiotron 6AU6	
V102	Radiotron 6AL5	
V103	Radiotron 6AV6	
V104	Radiotron 6HG5	
V201	Radiotron 6BZ6	
V202	Radiotron 6EW6	
V203	Radiotron 6CB6	
V204	Radiotron 6EB8	
V205	Radiotron 6CG7	
V206	Radiotron 23CP4, 25LP4	
V207	Radiotron 6BQ7-A	
V301	Radiotron 6HS8	
V302	Radiotron 6EM5	
V401	Radiotron 6AL5	
V402	Radiotron 6CG7	
V403	Radiotron 6CM5	
V404	Radiotron 6AU4-GTA	
V405	Radiotron IB3-GT	
MR201	AWV IN87A or equivalent	
MR401	AWV IN3194	
MR402	AWV IN3194	
	MISCELLANEOUS	
SG401	Spark Gap (BTS Blank)	600000
VDR301	Voltage Dependent Resistor E298ED/A260	619561
VDR302	Voltage Dependent Resistor E298ED/A260	619561
VDR401	Voltage Dependent Resistor E298ZZ/06	619562
TH401	1 ohm at 25°C NTC Thermistor	893707
	MECHANICAL	
	Anode Cap and Lead, Hor. Output	40044
	Cap Ass'y, Yoke	41185
	Clamp, Body, Power Cable	208056
	Clamp, Lock, Power Cable	208057
	Clamp, Yoke Cap	41186
	E.H.T. Box Lid	41310
	E.H.T. Box Side	41309
	Fuse Holder, H.T.	49075
	Fuse Holder, Mains	40845
	Fuse Holder, Pilot Lamp, Tuner	43566
	Lead Ass'y, Ultor	49545
	Lid, I.F. Shield	42426
	Screen, Valve (5)	653013
	Screen, Valve (1)	653014
	Shield Ass'y, Corona	41062
	Shield Ass'y, Video Det.	42378
	Shield, Tunnel	42429
	Socket, 4 Pin, Wafer	793287
	Socket, 7 Pin with Saddle	794615
	Socket, 7 Pin with Skirt	794569
	Socket, 7 Pin, Push-in	794579
	Socket, 8 Pin, Wafer	793033
	Socket, 8 Pin, Moulded Mica	794582
	Socket, 9 Pin	793058
	Socket, 9 Pin Mica Filled	794640
	Socket, 9 Pin Moulded	794599
	Test Point Assembly	41085

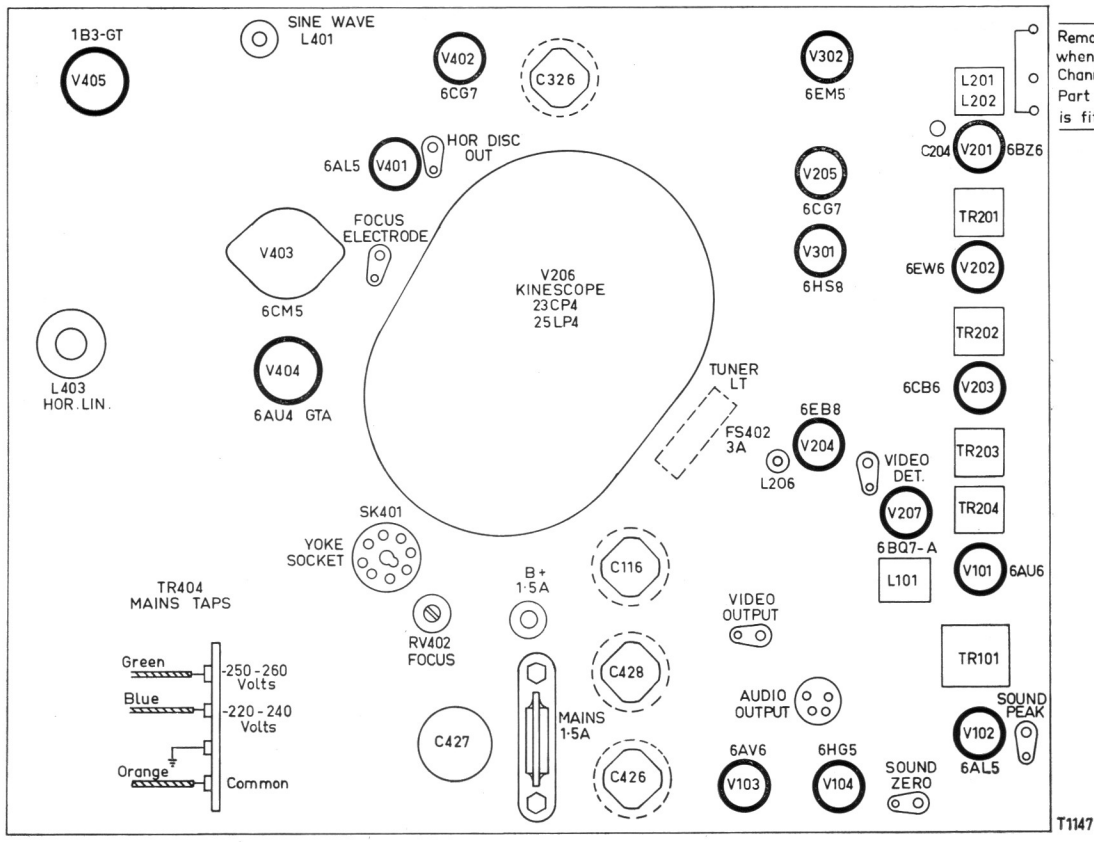
D.C. RESISTANCE OF WINDINGS

WINDING	D.C. RESISTANCE IN OHMS
Tuner Windings	*
L101 Sound I.F.	1.3
L201 38.375 Mc/s Trap	*
L202 Video I.F.	*
L203 Detector Filter Choke	4
L204 Detector Filter Choke	*
L205 Detector Peaking Coil	6
L206 5.5 Mc/s Trap	1.5
L207 Video Amp. Series Peaking	5
L401 Sine Wave Coil	55
L402 H.F. Choke	*
L403 Horizontal Linearity Coil	7
L404 Deflection Yoke	2.5
L405 Deflection Yoke	2.5
L406 Deflection Yoke	17
L407 Deflection Yoke	17
L408 H.T. Filter Choke	40
TR101 Ratio Detector	
Primary	9.5
Secondary	1
TR102 Speaker Transformer	
Primary	500
Secondary	2

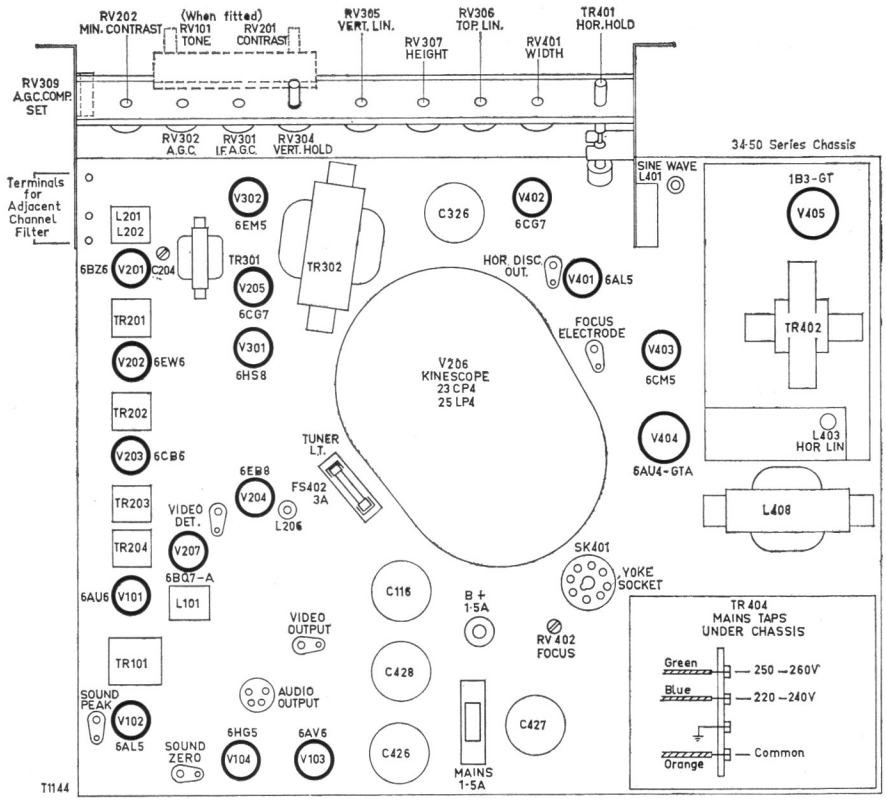
WINDING	D.C. RESISTANCE IN OHMS
TR201 1st Video I.F.	
Primary 1-2	*
Secondary 3-4	*
TR202 2nd Video I.F.	
Primary 1-4	*
Secondary	*
TR203 3rd Video I.F.	
Primary	*
Secondary	*
TR301 Vertical Oscillator Transformer	
Primary Bu-Gn	525
Secondary Ye-Bk	140
TR302 Vertical Output Transformer	
Primary Bu-Rd	350
Secondary Rd-Ye	1
TR401 Horizontal Oscillator Transformer	
Primary Rd-Anode	24
Secondary Rd-C407	88
TR402 Horizontal Output Transformer	
Primary 3-5	23
Secondary 4-7	7
Tertiary 5-Top Cap	415
Tertiary 1-2	1.5
TR403 Horizontal Feedback Transformer	
Primary Ye-Rd	1.9
Secondary Wh-Bk	450
TR404 Power Transformer	
Primary Gn-Or	10
Secondary Rd-Rd	4.5

* Less than 1 ohm.

The above readings were taken on a standard chassis, but substitution of materials during manufacture may cause variations, and it should not be assumed that a component is faulty if a slightly different reading is obtained.

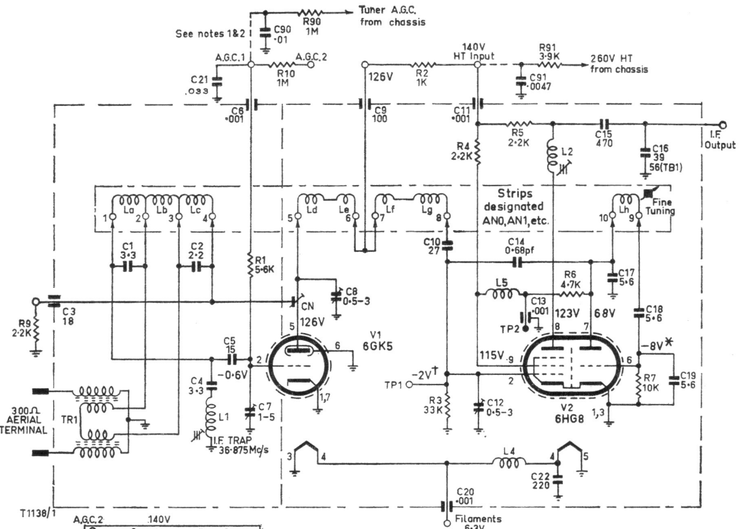


Under Chassis Location Chart



Top Chassis Location Chart

TB4 (45054) NEUTRODE TURRET TUNER



NOTES:(1) C21 and R10 are on TB1 (45051) Tuner only.

(2) C90, C91, R90 and R91 are used with TB4 (45054) Tuner only but are not mounted on the tuner chassis and are not supplied with a replacement tuner.

† Voltage at TP1 measured with 100K resistor, with short leads, in series with VTVM. This voltage may vary between −5V and −14V without loss of gain.

* Oscillator plate and grid voltages measured as above, Grid voltage varies from −6V(Ch1) to −12V(Ch0).

N.B. TP2 used for Tuner Sweep Alignment.

CIRCUIT VARIATIONS

The following changes have occurred since the circuit was drawn:—

To prevent 200 Mc/s oscillation in 2nd Video Amplifier at low bias—

C211, a 33pf ±10% N750 tubular capacitor, 220552, has been added in parallel with C207.

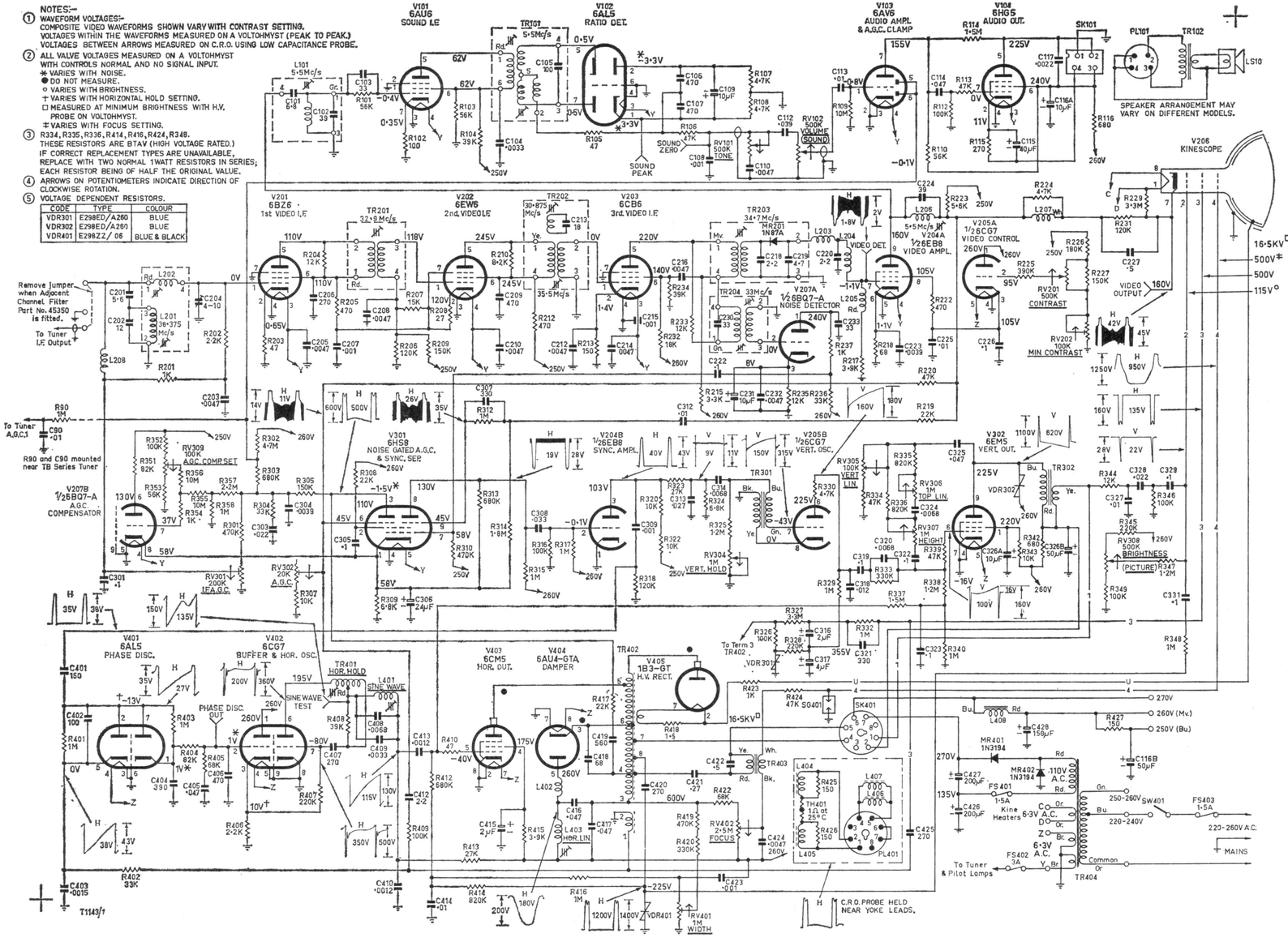
To improve discriminator phasing—

C430, a 15pf ±20% 3000VW N750 disc capacitor, 220711, has been added from junction of R402 and C403 to junction R424 and SG401.

To improve a.m. rejection of ratio detector—

L102, a Ratio Detector Choke, 52771, has been added in series with R105, which has been changed to 330 ohms ±5% ½ watt resistor, 605962.

CIRCUIT A.W.A. TELEVISION RECEIVER CHASSIS—34-50 SERIES



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