WESTINGHOUSE SERVICE MANUAL FOR 36 SERIES

WESTINGHOUSE Factory Supervised Service

TELEVISION

Issued by: **EMAIL LIMITED**
Consumer Products Division (Sydney)

CHASSIS DESIGNATION

Chassis No.	Model	Kinescope	Tuner
36-06	W2340	23CP4	44000 (TA1)
36-10	W2341	23CP4	44000 (TA1)

GENERAL DESCRIPTION

These chassis are fitted in 19 valve, A.C. operated Television Receivers.

Features of design include: Three stage i.f. amplifier; gated a.g.c.; phase discriminator a.f.c. horizontal system; horizontal and vertical sweep stabilization; 114° deflection; electrostatic dynamic focus; aluminised kinescope; intercarrier 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 maximum.

UNDISTORTED AUDIO POWER OUTPUT: 2.5 watts max.

VIDEO RESPONSE ..... To 4.25 Mc/s

FOCUS ..... Electrostatic (Low Voltage)

DEFLECTION ..... 114° Magnetic

TUNER ..... See table above

VALVE COMPLEMENT:

1 (V1) Radiotron 6ES8 ..... R.F. Amplifier
2 (V2) Radiotron 6HG8 .. R.F. Oscillator and Converter
(V2) Radiotron 6HG8 (TA1) ..... R.F. Osc. & Conv.
(Valves 1 and 2 in Tuner)
3 (V101) Radiotron 6AU6 ..... Sound I.F.
4 (V102) Radiotron 6AL5 ..... Ratio Detector
5 (V103) Radiotron 6AV6 Audio Amp. & A.G.C. Clamp
6 (V104) Radiotron 6AQ5 ..... Audio Output
7 (V201) Radiotron 6BZ6 ..... 1st Video I.F.
8 (V202) Radiotron 6CB6 ..... 2nd Video I.F.
9 (V203) Radiotron 6CB6 ..... 3rd Video I.F.
10 (V204) Radiotron 6EB8 .. Video Amp. & Sync. Amp.
11 (V205) Radiotron 6CG7 Video Control and Vert. Osc.
12 (V206) Radiotron 23CP4 ..... Kinescope
13 (V301) Radiotron 6HS8 Noise Gated A.G.C. & Sync. Sep.
14 (V302) Radiotron 6EM5 ..... Vertical Output
15 (V401) Radiotron 6AL5 ..... Phase Discriminator
16 (V402) Radiotron 6CG7 Buffer and Horizontal Oscillator
17 (V403) Radiotron 6CM5 ..... Horizontal Output
18 (V404) Radiotron 6AU4-GTA ..... Damper
19 (V405) Radiotron 1B3-GT ..... High Voltage Rectifier
MR201 OA80, OA90, etc. ..... Video Detector
MR401 1N1763 or 1N3194 ..... Rectifier
MR402 1N1763 or 1N3194 ..... Rectifier

April, 1964

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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 while handling kinescopes. 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.

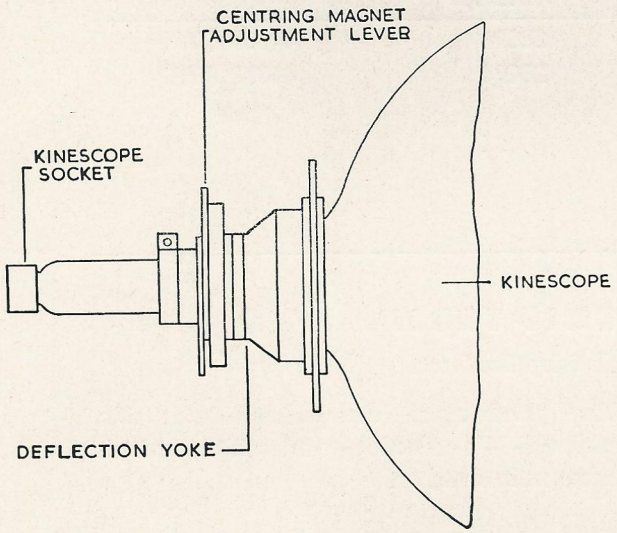


FIG. 1

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

FOCUS ADJUSTMENT

This is a factory adjustment and should not need resetting unless the Kinescope is replaced.
The wander lead is attached in turn to the three taps provided, and then left on the tap giving best overall focus at normal contrast and brightness.

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.

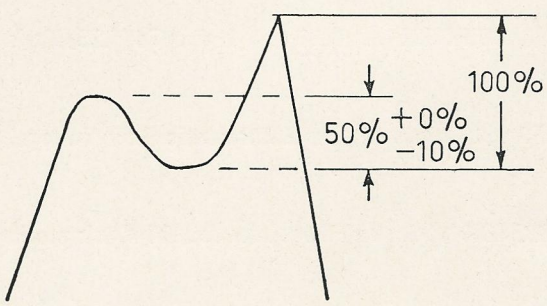
HORIZONTAL OSCILLATOR ADJUSTMENT

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 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.

OPERATING TESTS

CENTRING ADJUSTMENT

Centring of the electron beam is important for good linearity, horizontally and vertically. When the linearity has been adjusted as per following instructions, if the horizontal linearity is poor this indicates that the centring magnets require adjustment for horizontal centring. Similarly, if the vertical linearity is poor after adjusting the height and vertical linearity controls, this indicates the need for vertical centring.

Note: The centre of test patterns as transmitted on various channels may vary and should not be relied upon for centring purposes.

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 $\frac{1}{2}$" on either side of the kinescope mask with normal picture brightness.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS

Adjust the height control, RV307, for a picture of approximately $\frac{3}{4}$ 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 $\frac{1}{2}$" 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

This adjustment to be made only after all other adjustments have been checked.

Set the min. contrast and I.F. A.G.C. controls, RV302 and RV301, at their mid-positions.

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

Set the contrast control, RV201, to minimum (fully anti-clockwise).

Adjust the min. contrast control to give 15 volts p-p at the kinescope cathode.

Adjust contrast control to increase this to 20 volts p-p.

Adjust the I.F. A.G.C. for snow threshold. A clockwise rotation increases snow.

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.

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.)

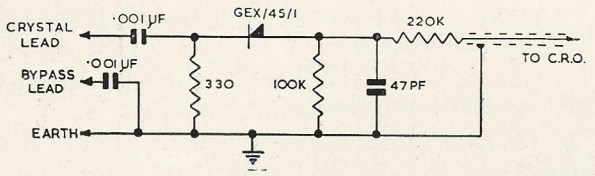


FIG. 2—CRYSTAL DETECTOR PROBE

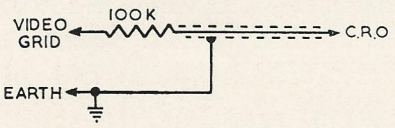


FIG. 3

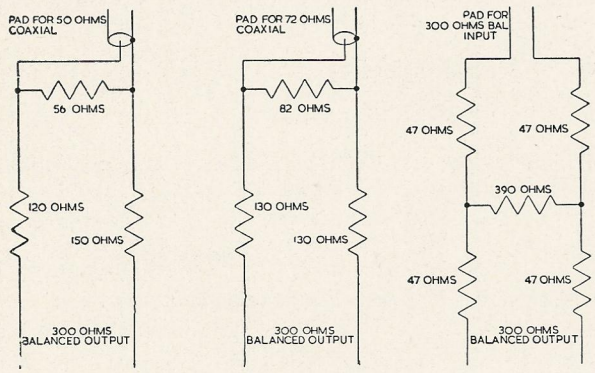


FIG. 4—SWEEP ATTENUATOR PADS

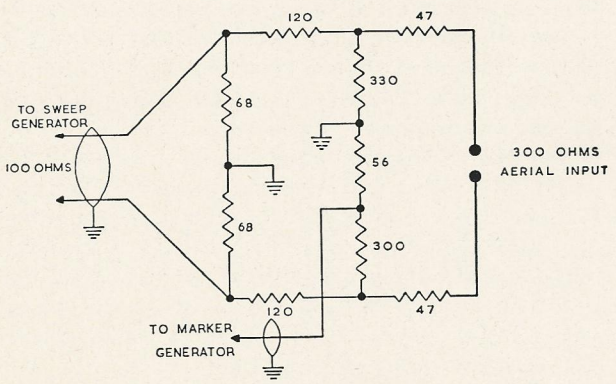


FIG. 5—INPUT PAD

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.

ALIGNMENT PROCEDURE

VIDEO I.F. ALIGNMENT

Turn RV301 to its extreme clockwise position when viewed from the wiring side and connect the junction of R301 and R303 to earth.

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 TP1 on the tuner through a shielded lead.

Check that the r.f. response viewed on the c.r.o. conforms with that shown in figure 6.

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

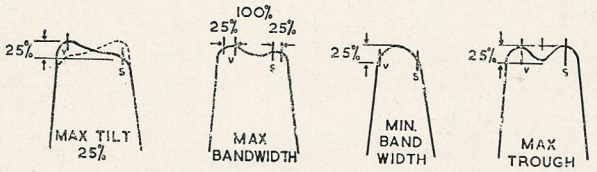


FIG. 6

Disconnect the c.r.o. from TP1 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 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 TR2,† L202* and trimmer C204 to produce the response on the c.r.o. shown in figure 7.

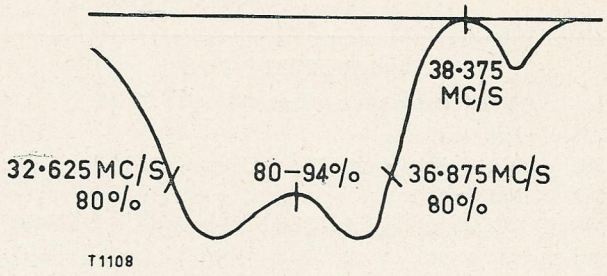


FIG. 7

TR2† mainly affects 36.875 Mc/s marker position.

L202* mainly affects tilt.

C204 mainly affects the band width.

OVERALL ALIGNMENT

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 V201 socket.

View 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.

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

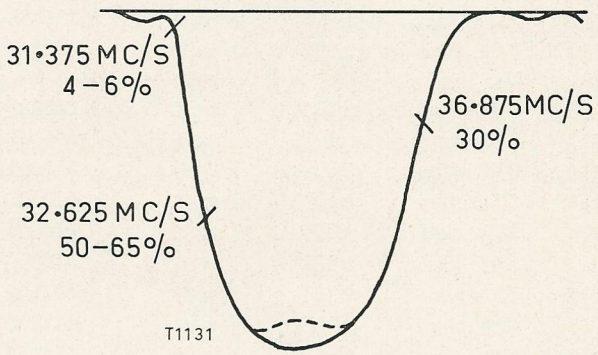


FIG. 8

Marker 36.875 Mc/s at 30% TR202*.

Marker 31.375 Mc/s at 4%-6% TR201*.

No tilt TR203*.

Check that 32.625 Mc/s marker is at 50%-65%, otherwise re-adjust TR201* and correct tilt with TR203* if necessary.

CIRCUIT CODE

RESISTORS

All Resistors carbon unless otherwise stated.

Code No.	DESCRIPTION			Part No.
R101	Not Used			
R102	220 ohms	±10%	½ watt	605253
R103	Not Used			
R104	33K ohms	±10%	2 watts	614465
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	330K ohms	±10%	½ watt	617108
R111	Not Used			
R112	470K ohms	±10%	½ watt	617356
R113	Not Used			
R114	Not Used			
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	±5%	½ watt	609444
R203	47 ohms	±10%	½ watt	603091
R204	8.2K ohms	±5%	½ watt	611847
R205	470 ohms	±10%	½ watt	606588
R206	120K ohms	±10%	½ watt	616261
R207	15K ohms	±10%	½ watt	612922
R208	39 ohms	±10%	½ watt	602914
R209	150K ohms	±10%	½ watt	616426
R210	8.2K ohms	±5%	½ watt	611847
R211	Not Used			
R212	1.5K ohms	±10%	½ watt	608705
R213	150 ohms	±10%	½ watt	604677
R214	39K ohms	±10%	1 watt	614691
R215	3.3K ohms	±10%	1 watt	610309
R216	33K ohms	±10%	½ watt	614460
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	Not Used			
R223	5.6K ohms	±5%	7 watts W.W.	611300
R224	Not Used			
R225	390K ohms	±10%	½ watt	617204
R226	180K ohms	±5%	1 watt	616561
R227	150K ohms	±5%	1 watt	616434
R228	100K ohms	±5%	1 watt	616024
R229	3.3 Megohms	±10%	½ watt	618712
R230	Not Used			
R231	120K ohms	±10%	½ watt	616261
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	2 x 47K ohms	±10%	1 watt	614969
R309	8.2K ohms	±10%	1 watt	611849
R310	470K ohms	±10%	1 watt	617359

RESISTORS (Continued)

Code No.	DESCRIPTION			Part No.
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	10 Megohms	±10%	1 watt	619410
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 watt W.W.	607290
R343	10K ohms	±10%	2 watts	612022
R344	12K ohms	±10%	½ watt	612507
R345	330K ohms	±10%	1 watt	617111
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
R401	1 Megohm	±10%	½ watt	618016
R402	33K ohms	±10%	2 watts	614465
R403	1 Megohm	±10%	½ watt	618016
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	616734
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

CIRCUIT CODE

Code No.	DESCRIPTION	Part No.
	RESISTORS (Continued)	
R419	470K ohms ±10% 1 watt	617359
R420	330K ohms ±10% 1 watt	617111
R421	Not Used	
R422	2.2 Megohms ±20% ½ watt	618487
R423	1K ohms ±20% ½ watt	608030
R424	Not Used	
R425	150 ohms ±10% ½ watt } In yoke	
R426	150 ohms ±10% ½ watt }	
R427	150 ohms ±10% 1 watt	604681
RV101	500K ohms Curve "C" Carbon, Volume	
	36-06	620556
	36-10	620546
RV102	500K ohms Curve "F" Carbon, Tone	
	36-06 (W/S)	620651
	Curve "C" 36-10	620546
RV201	500K ohms Linear Carbon, Contrast	
	36-06	620540
	36-10	620545
RV301	200K ohms Linear Carbon I.F.A.G.C.	620487
RV302	20K ohms Linear Carbon Min. Contrast	620262
RV303	Not Used	
RV304	1.5 Megohms Linear Carbon Vert. Hold	620786
RV305	100K ohms Linear Carbon Vert. Linearity	620322
RV306	1 Megohm Linear Carbon Top Linearity	620769
RV307	1 Megohm Linear Carbon Height	620769
RV308	500K ohms Linear Carbon, Brightness	
	36-06,	620540
	36-10	620545
RV401	1 Megohm Linear Carbon Width	620769
	CAPACITORS	
C101	6.8pf ±5% NPO tubular (in L101)	220378
C102	39pf ±5% N220 disc (in L101)	221292
C103	Not Used	
C104	0.0033μf ±10% 400VW polyester	225793
C105	100pf ±5% 600VW styroseal (in TR101)	222222
C106	470pf ±5% 600VW styroseal	224212
C107	470pf ±5% 600VW styroseal	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	228775
C113	0.01μf ±10% 125VW polyester	226378
C114	0.0068μf ±10% 400VW polyester	226234
C115	Not Used	
C116A	10μf 450VW } Electrolytic	229612
C116B	50μf 350VW }	
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 styroseal	223561
C207	0.0047μf +100% —0% K5000 disc	225980

Code No.	DESCRIPTION	Part No.
	CAPACITORS (Continued)	
C208	0.0047μf +100% —0% K5000 disc	225980
C209	390pf ±5% 600VW styroseal	223885
C210	0.0047μf +100% —0% K5000 disc	225980
C211	Not Used	
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 styroseal	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	Not Used	
C226	0.1μf ±10% 400VW polyester	227085
C227	0.22μf ±10% 125VW polyester	227341
C301	0.1μf ±10% 125VW polyester	227086
C302	0.1μf ±10% 125VW polyester	227086
C303	0.022μf ±10% 400VW polyester	226636
C304	0.0039μf ±10% 400VW polyester	225863
C305	0.01μf ±10% 400VW polyester	226365
C306	0.5μf ±10% 125VW polyester	227495
C307	330pf ±10% 600VW styroseal	223716
C308	0.033μf ±10% 400VW polyester	226739
C309	0.001μf ±10% 400VW polyester	225060
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	0.1μf ±10% 400VW polyester	227085
C317	4μf 500VW 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% K2000 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 }	
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 styroseal	222698
C402	150pf ±10% 600VW styroseal	222698

CIRCUIT CODE

Code No.	DESCRIPTION	Part No.
	CAPACITORS (Continued)	
C403	0.0015μf ±10% 400VW polyester	225390
C404	390pf ±5% 600VW styroseal	223885
C405	0.047μf ±10% 125VW polyester	226804
C406	470pf ±10% 600VW polystyrene	224207
C407	270pf ±5% 1000VW mica	223553
C408	0.01μf ±5% 600VW styroseal	226335
C409	Not Used	
C410	0.0012μf ±5% 1000VW mica	225307
R411	Not Used	
C412	2.2pf ±.5pf NPO disc	221494
C413	0.0012μf ±10% 600VW styroseal	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% 400VW N750 disc	221965
C419	560pf ±10% 2500VW N1500 tubular	224484
C420	270pf ±10% 2500VW N750 disc	223554
C421	0.12μf ±10% 400VW paper	227250
C422	Not Used	
C423	0.001μf +100% —0% K5000 tubular	225010
C424	Not Used	
C425	270pf ±10% 2500VW N750 disc	223554
C426	100μf 200VW Electrolytic	229711
C427	100μf 200VW Electrolytic	229711
C428	100μf 350VW Electrolytic	229727
	INDUCTORS	
L101	Sound I.F.	43336
L201, L202	38.375 Mc/s Trap, I.F. Input	43580
L203	Detector Filter	40323
L204	Detector Filter	49671
L205	Detector Peaking Coil (250μH)	40117
L206	5.5 Mc/s Trap	43593
L207	Video Amp. Series Peaking Coil	51693
L401	Sine Wave	52150
L402	H.F. Choke (1.5μH)	214516
L403	Horizontal Linearity	43264
L404-L407	Yoke (when chassis behind kine.)	43660
	Yoke (when chassis under kine.)	43661
L408	H.T. Filter Choke	40113C
	TRANSFORMERS	
TR101	Ratio Detector	40077
TR102	Speaker Transformer	51862A
TR201	1st Video I.F.	40902
TR202	2nd Video I.F.	41407
TR203	3rd Video I.F.	41933
TR301	Vertical Blocking Oscillator	43643A
TR302	Vertical Output	43340A
TR401	Horizontal Blocking Oscillator	51694
TR402	Horizontal Output	43646
TR403	Not Used	
TR404	Power Transformer	43261C

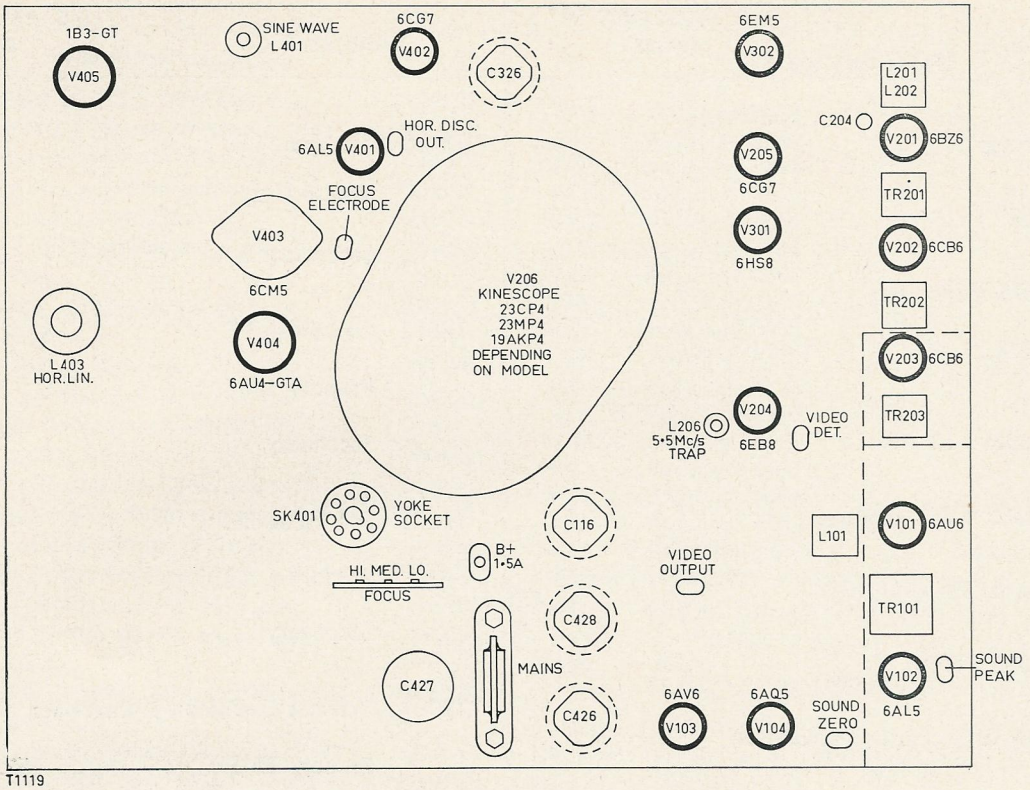
Code No.	DESCRIPTION	Part No.
	VALVES AND DIODES	
V101	Radiotron 6AU6	
V102	Radiotron 6AL5	
V103	Radiotron 6AV6	
V104	Radiotron 6AQ5	
V201	Radiotron 6BZ6	
V202	Radiotron 6CB6	
V203	Radiotron 6CB6	
V204	Radiotron 6EB8	
V205	Radiotron 6CG7	
V206	Radiotron 23CP4	
V301	Radiotron 6HS8	
V302	Radiotron 6EM5	
V401	Radiotron 6AL5	
V402	Radiotron 6CG7	
V403	Radiotron 6CM5	
V404	Radiotron 6AU4-GTA	
V405	Radiotron IB3-GT	
MR201	OA80, OA90 or equivalent	
MR401	AWV IN1763 or IN3194	
MR402	AWV IN1763 or IN3194	
	MISCELLANEOUS	
SG401	Spark Gap (BTS Blank)	600000
VDR301	Voltage Dependent Resistor Philips E298ED/A260	619561
VDR302	Voltage Dependent Resistor Philips E298ED/A260	619561
VDR401	Voltage Dependent Resistor Philips E298ZZ/06	619562
SW401	On-Off Switch	
	~~36-01, -05~~	~~858788~~
	36-~~03, -04~~ -10	857421
	36-~~02,~~ -06, -~~07, -08~~	On RV102
	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
	Insulator, Power Switch	38469
	Insulator, Pre-set Panel	42741
	Leads Ass'y, Mains	49793
	Leads Ass'y, Ultor	49545
	Lid, I.F. Shield	42426
	Panel Ass'y, Focus	64201
	Screen, Valve	653013
	Shield Ass'y, Corona	41062
	Shield Ass'y, Video Det.	42378
	Shield, Tunnel	42429
	Socket, Kinescope	794566
	Socket, 7 Pin with Saddle	794615
	Socket, 7 Pin with Skirt	794569
	Socket, 7 Pin Moulded Push-in	794579
	Socket, 8 Pin Wafer	793033
	Socket, 8 Pin Mica Filled	794582
	Socket, 9 Pin Moulded	794599
	Socket, 9 Pin Mica Filled	794640
	Test Point Assembly	41085

D.C. RESISTANCE OF WINDINGS

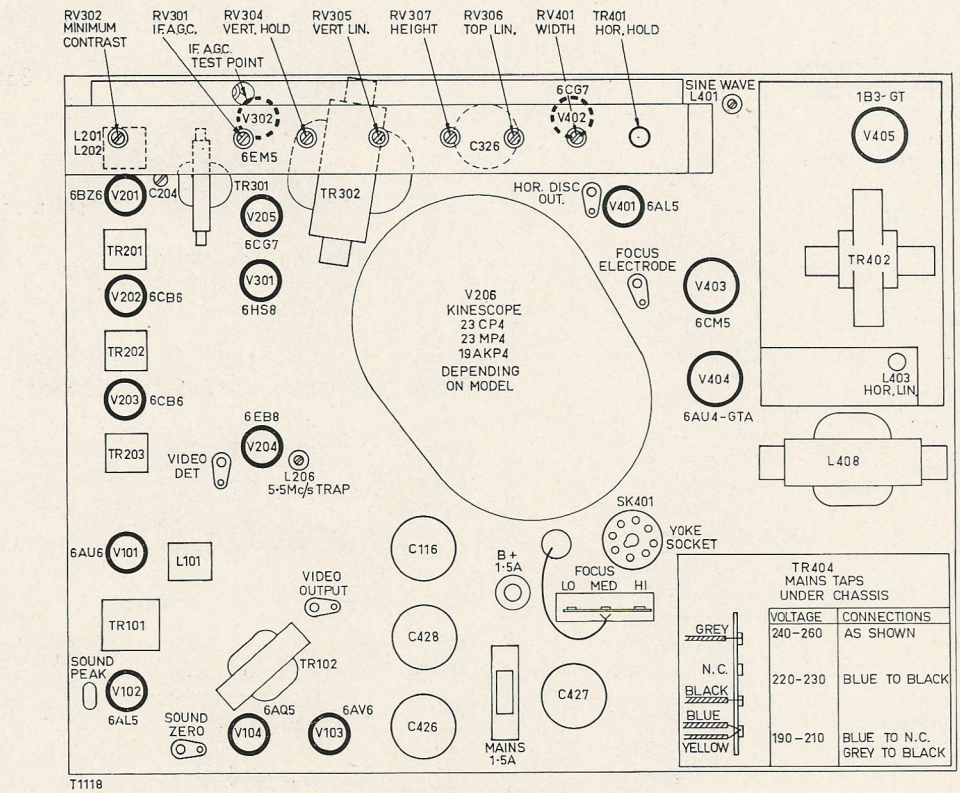
WINDING	D.C. RESISTANCE IN OHMS
Tuner Windings	*
L101 Sound I.F.	1.3
L201 38.375 Mc/s Trap	*
L202 Video I.F.	*
L203 Detector Filter Choke	4
L204 Detector Filter Choke	*
L205 Detector Peaking Coil	6
L206 5.5 Mc/s Trap	1.5
L207 Video Amp. Series Peaking	5
L401 Sine Wave Coil	55
L402 H.F. Choke	*
L403 Horizontal 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
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
TR404 Power Transformer	
Primary Gn-Wh	10
Secondary Rd-Rd	4
Motor Winding	2

* 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

CIRCUIT CHANGES

To improve synchronisation at minimum contrast setting:—

The value of C312 which was a 0.033μf $\pm$ 10% 600 VW paper capacitor 226731, is now 0.01μf.

R316 was omitted on some chassis.

To increase the vertical hold control range with all contrast control settings:—

The value of R313 which was a 220K ohms $\pm$ 10% $\frac{1}{2}$ watt resistor, 616721, is now 680K ohms.

The value of R324 which was a 2.7K ohms $\pm$ 10% $\frac{1}{2}$ watt resistor, 609862, is now 6.8K ohms.

To improve audio output on strong signals:—

The value of R104 which was a 39K ohms $\pm$ 10% 2 watts resistor, 614465, is now 33K ohms.

CIRCUIT TELEVISION RECEIVER CHASSIS – 36 SERIES

NOTES:–

① WAVEFORM VOLTAGES:–
COMPOSITE VIDEO WAVEFORMS SHOWN VARY WITH CONTRAST SETTING.
VOLTAGES WITHIN THE WAVEFORMS MEASURED ON A VOLTOHMYST (PEAK TO PEAK)
VOLTAGES BETWEEN ARROWS MEASURED ON C.R.O. USING LOW CAPACITANCE PROBE.

② ALL VALVE VOLTAGES MEASURED ON A VOLTOHMYST WITH CONTROLS NORMAL AND NO SIGNAL INPUT.
✳ VARIES WITH NOISE.
● DO NOT MEASURE.
∘ VARIES WITH BRIGHTNESS.
+ VARIES WITH HORIZONTAL HOLD SETTING.
□ MEASURED AT MINIMUM BRIGHTNESS WITH H.V. PROBE ON VOLTOHMYST.
‡ VARIES WITH FOCUS SETTING.

③ R334, R335, R336, R348, R414, R416.
THESE RESISTORS ARE BTAV (HIGH VOLTAGE RATED.)
IF CORRECT REPLACEMENT TYPES ARE UNAVAILABLE, REPLACE WITH TWO NORMAL 1WATT RESISTORS IN SERIES; EACH RESISTOR BEING OF HALF THE ORIGINAL VALUE.

④ ARROWS ON POTENTIOMETERS INDICATE DIRECTION OF CLOCKWISE ROTATION.

⑤ VOLTAGE DEPENDENT RESISTORS.

CODE	TYPE	COLOUR
VDR301	E298ED/A260	BLUE
VDR302	E298ED/A260	BLUE
VDR401	E298ZZ/ 06	BLUE/BLACK

⑥ TONE CONTROL NOT FITTED ON ALL RECEIVERS.

T1116/1