

**ELECTRONICS DIVISION** 

## SERVICE INFORMATION

TELEVISION
CHASSIS T12V3C

**MODELS** 

T23L2

T23L3

T25L1

T25C1

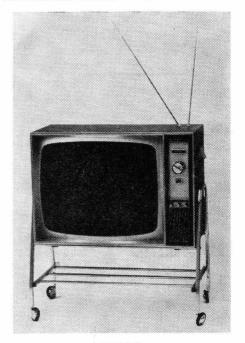
### GENERAL INFORMATION . . .

With the exception of picture tubes and loudspeakers, the listed models are all electrically identical. However, there is a slight mechanical variation between the 23" and 25" models in the mechanical arrangement of the outrigger control panels to accommodate the differing control escutcheons.

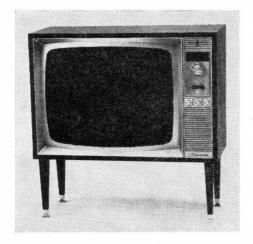
	Models	Picture Tube Type
Picture Tubes		
ricture Tubes		
	T23L2 \\ T23L3 \	23GSP4 23FSP4A or equivalent
	T25L1 }	25NP4 25SBP4 or equivalent
Loudspeakers		
Louuspeakers		
	The vary	ing types are detailed in the list of replacement parts.

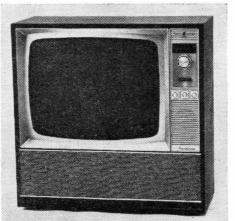
**OPERATING VOLTAGE:** These receivers are designed to operate from a nominal 240V 50 c/s AC supply. To provide for variations in supply voltages three tappings 220V, 240V and 260V are provided on the mains transformer. A clip-terminated wander lead is provided for easy selection of the most appropriate tap. CAUTION: Disconnect mains plug before making tap adjustment.

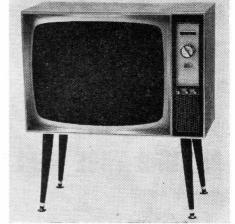
LOCATION OF COMPONENTS: Refer to diagram on lid of EHT compartment.



T23L3





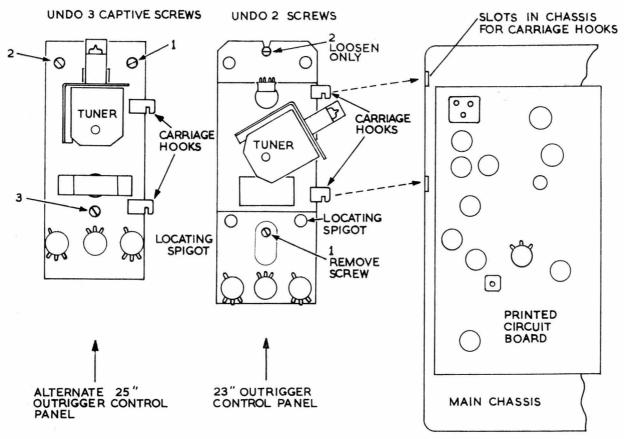


T25L1 T25C1 T23L2

GENERAL ELECTRIC-KIRBY APPLIANCES LTD Electronics Division, 26 Watson Road, Padstow, NSW

Issued May 1966

# **DISASSEMBLY PROCEDURE**



## TO REMOVE CHASSIS

- 1. Remove all control knobs except the on-off pushbutton.
- ${\bf 2.}$  Disconnect any external leads from the antenna terminal block and remove back cover.
  - 3. Remove two self-tapping screws holding antenna block to cabinet.
- 4. Remove two screws from the lugs at the top of the main chassis, lower chassis to horizontal position.
- 5. Disconnect EHT lead from CRT, yoke plug, CRT socket and speaker leads at the speaker.
  - 6. Return chassis to vertical position but do not secure.
- 7. Loosen and/or remove necessary screws from outrigger control panel (see diag.). Withdraw control panel and mount it on the side of the main chassis using the lugs and slots provided; secure by using a screw from the back cover through the hole provided in the upper lug of the outrigger panel.
- **8.** Lower chassis to about 45° and lift main chassis and control panel out of the brackets. Three legs are provided on the main chassis to allow it to be laid flat for transporting without damage.

Re-assembly is carried out in reverse order to the above procedure, care being taken to ensure that the earthy lead from the audio output transformer (black trace) is connected to the earthy side of the speaker voice coil.

## PICTURE TUBE REPLACEMENT

- 1. Remove chassis as detailed above.
- 2. Place receiver face down on a soft protective surface. Raise control panel end of cabinet about 3" with a pillow or soft pad.
- 3. First remove the CRT securing screw to which is attached the earthing spring. Disconnect the spring and remove the three remaining screws which secure the CRT to the mask.
  - 4. Carefully remove CRT.
- NB. Receivers equipped with a 23FSP4 require a 3/32" spacing washer between the picture tube ear and the mask mounting boss. These washers are not required when a 23GSP4 picture tube is used.

In receivers initially fitted with a 23GSP4 the 3/32" spacing washer will be fitted between the bell washer and the picture tube ear against the possibility of future replacement with a 23FSP4.

## LOCATION OF COMPONENTS ON PRINTED BOARD

#### **Resistors:**

R101 K1	R303 J4
R102 K5	R304 M6
R103 L2	R305 I5
R104 M3	R306 J5
R105 M2	R307 J4
R106 M5	R308 I4
R107 L1	R309 B4
R108 N3	R310 I4
R109 N3	R311 I2
R110 O5	R312 H1
R111 O4	R313 H1
R115 P2	R314 I1
R116 P2	R315 H7
R117 O1	R316 G9
R118 O3	R317 J7
R119 P4	R319 L10
R120 P6	R323 J9
R202 B2	R327 H10
R203 B3	R328 H9
R204 C3	R329 H9
R205 D4	R401 O8
R206 F2	R404 G7
R207 D4	R405 16
R208 E3	R406 F8
R209 E4	R407 F7
R210 E4	R408 C6
R211 H3	R409 D10
R215 G6	R410 B8
R226 G3	R412 D7
R301 I3	R413 B8
R302 J3	R414 B10

#### Condensers:

C102 J2
C103 K2
C104 L4
C105 K2
C106 M1
C107 O4
C108 O5
C109 M2
C110 N4
C113 O1
C114 Q4
C115 Q6
C116 P2
C201 B3
C202 B1
C203 B3
C204 B2
C205 B2
C201 C1
C211 F2
C212 E3
C214 F5
C215 G4
C217 G2
C217 G2
C217 G2
C218 G3
C208 B3
C209 E2
C210 C1
C211 F2
C212 E3
C208 B3
C209 E2
C210 C1
C211 F2
C212 E3
C213 E4
C214 F5
C215 G4
C217 G2
C219 I2
C302 A9
C303 M5
C304 B5
C305 I3
C306 H7
C307 G9
C308 G8
C309 K7
C311 K8
C311 K8
C311 K8
C311 K8
C311 K8
C311 K9
C314 M7
C406 F9
C409 E7
C410 E9
C411 A6
C412 E9
C411 C9

#### Coils:

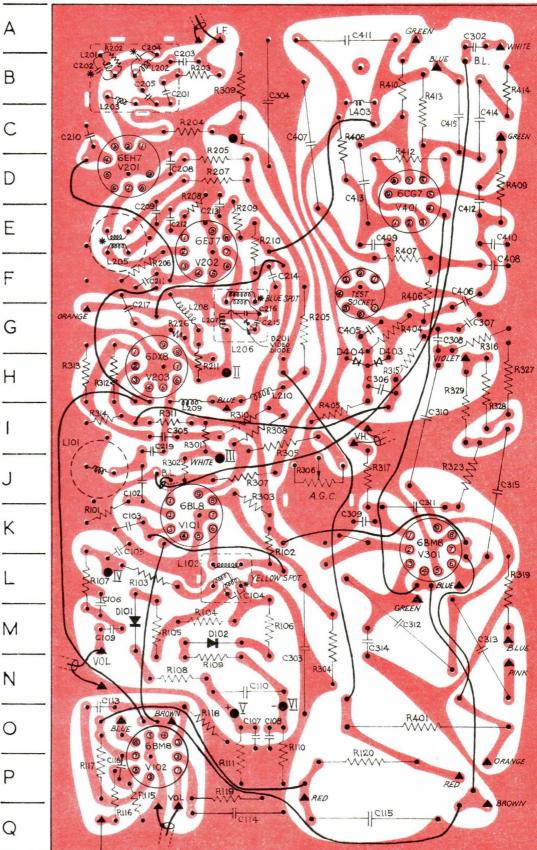
L101 J1 L102 L4 L201 B2 L202 B2 L202 B2 L205 E2 L206 G4 L207 G4 L208 G3 L209 I3 L210 H4 L403 C7

#### Miscellaneous:

 $\begin{array}{c} \rm{D101\ M2} \\ \rm{D102\ M4} \\ \rm{D201\ G4} \\ \rm{D403} \\ \rm{D404} \end{array}$ 

C117

	1	2	3	4	5	6	7	8	9	10
A	C	R202	04 - 3	LE.	• (		C411	GREEN	C302	<b>A</b> WHITE



\* INDICATES POSITION OF COLOUR SPOT ON COILS.

#### PRESET CONTROLS

PRESET CONTROLS
FINE TUNING. The tuner in the T12V3C chassis has preset fine tuning. This mechanism consists of a gear train which is automatically engaged when the front panel fine tuning control is rotated.

Preset fine tuning means that the fine tuning control actually sets up the correct tuning of the oscillator coil for each channel quite independently. The tuning core of each coil is terminated with a gear wheel which is part of the gear train mentioned above.

HORIZONTAL HOLD CONTROL

1. Short AFC voltage to ground (bridge pins 5 & 7 on test socket).

2. By-pass the horizontal stabilising coil with a 0.1 mfd 400V condenser connected from the plate end of the stab. coil to earth (connect condenser between pins 3 & 4 of test socket). test socket).
3. Float picture with the horizontal hold

control.

4. Remove the 0.1 mfd condenser and float the picture by adjusting the core of the horizontal stabilising coil.

5. Remove the short from the AFC line. N.B. The above adjustments are simplified by using the GE horizontal oscillator test jig which plugs directly into the 7-pin test socket on the printed panel. This test jig (Part No. M96002) which may be purchased through the spare parts department may be used not only with this series of receivers, but also with all earlier General Electric 23" and 25" receivers.

and 25" receivers.

AGC CONTROL. To adjust AGC, set tuner on an operating channel with contrast and brightness controls at maximum; turn AGC control anti-clockwise until the onset of overload indicated by an excessively dark picture accompanied by bending and buzz on sound. Turn back the AGC control 5° past the point where overload symptoms disappear.

Reduce brightness to normal and check that picture is maintained over the range of the contrast control. The AGC control should be set on the strongest local signal and rechecked after any adjustment of the horizontal linearity coil.

HORIZONTAL LINEARITY ADJUSTMENT. The horizontal linearity coil should be adjusted in conjunction with the yoke centering magnets. The coil has two peaks — the inner peak gives correct geometry and is normally set this way at the factory. The outer peak will increase the width while still maintaining correct geometry.

NB. It is essential that the chassis is vertical when adjusting the centering magnets.

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VERTICAL SIZE AND LINEARITY ADJUSTMENT

1. Set preset vertical linearity control to its mid position.

2. Adjust vert, size and vertical linearity controls until pattern is reduced 1" from top and bottom of screen.

3. Reduce brightness in order to see the raster outside the top and bottom section of picture.

4. Adjust preset vertical linearity control to ensure that the picture is not overlapping the raster at the top.

5. Adjust vertical linearity control in conjunction with the vertical size control to obtain good overall geometry.

VIDEO IF ALIGNMENT

1. Apply — 6V bias to the IF AGC Line (test point I).
2. Connect CRO via a 47K resistor to video test point II and

earth.

2. Connect CRO via a 47K resistor to video test point II and earth.

3. Turn brightness control to minimum, contrast control to maximum and AGC control fully anti-clockwise.

4. Turn tuner to blank channel.

5. Capacitively couple the output of a suitable IF sweep and marker generator via a half valve shield to the oscillator-mixer (6HG8) in the tuner.

6. Switch set on.

7. Vary the output of the sweep generator to obtain 2V p/p waveform on CRO.

8. In order to obtain the video IF response curve and the marker positions as shown in Fig. 1, proceed as follows:—

a. Remove the — 6V bias.

b. Tune trap coil L201 to 30.5 Mc/s | slugs tuned away.

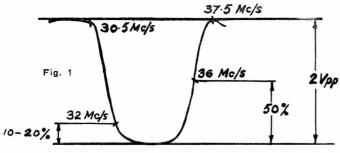
c. Tune trap coil L202 to 37.5 Mc/s | from printed board d. Replace the — 6V bias.

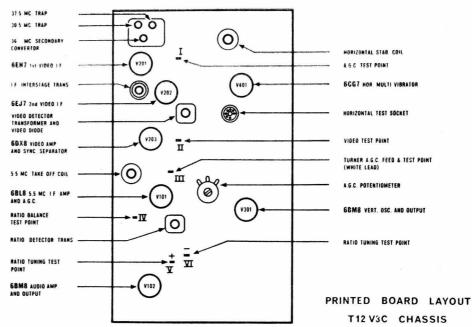
e. Tune video detector coil L206 from the top to peak around the 34 Mc/s position at the top of the curve.

f. Tune interstage coil L205 for the 32 Mc/s side of curve. g. Tune secondary converter L203 in conjunction with the IF transformer on the tuner for 36 Mc/s side as well as rounding off the top of the curve

h. Remove the — 6V bias and re-check trap marker position.

NB. The 37.5 Mc/s trap has considerably more suction than the 30.5 Mc/s trap. The waveform, with bias removed and these two traps correctly adjusted, is shown in Fig. 2.





i. Restore the—6V bias and if necessary re-tune coils adjusted in (e) (f) and (g) to obtain the overall response curve of Fig. 1.

#### VIDEO IF SENSITIVITY

1. Connect a suitable signal generator correctly terminated and internally modulated 30% at 1000 c/s via an 0.01 mfd capacitor to tuner test point TP1 (see inset on main circuit diagram). 2. Apply —2V bias via a 1 M $\Omega$  also to tuner test point TP1. NB. The 1 M $\Omega$  resistor should be mounted right at test point. 3. Connect CRO to cathode of the picture tube and use a 0.01 mfd capacitor to by-pass RF interference. 4. Tune generator to peak in the IF pass band and adjust output to obtain 20V pp waveform on CRO. 5. IF sensitivity should be better than 120  $\mu$ V.

#### OVERALL SENSITIVITY CHECK

1. Connect a suitable signal generator internally modulated 30% at 1000 c/s via a matching balun to the 300Ω antenna terminals.

2. Connect a CRO to the cathode of the picture tube and earth. Use an 0.01 mfd capacitor to by-pass RF interference.

3. Tune the signal generator through the pass band of the RF channels until a peak is found for each channel.

4. Adjust the output of the signal generator to obtain a 20V p/p waveform on the CRO.

5. Sensitivity should be better than 40 μV on all channels.

#### SOUND TRAP ALIGNMENT

A satisfactory adjustment of the 5.5 Mc/s trap may be obtained without instrumentation as follows:—

1. Select an operating channel.

2. Fine tune receiver toward the sound carrier (onset of sound

3. Adjust L211 (mounted on CRT socket) to minimise appearance of 5.5 Mc/s dots.

#### SOUND ALIGNMENT

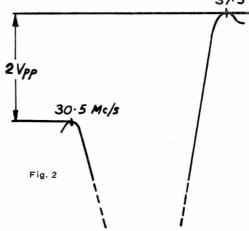
1. Apply a crystal calibrated 5.5 Mc/s signal to video test point

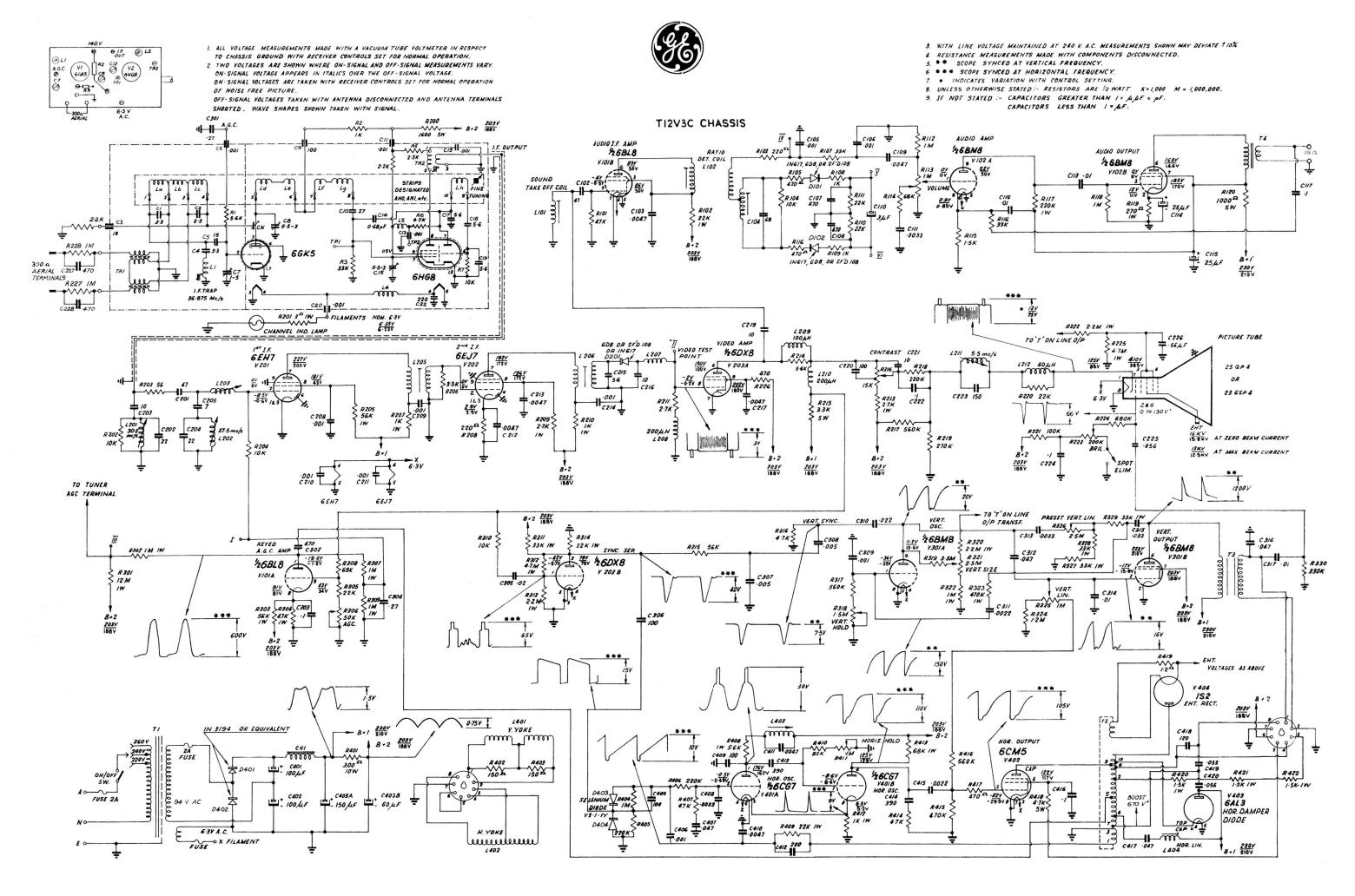
I. Apply a crystal state of the control of the cont

input signal to maintain 5V at test point V.

5. Increase signal input to give 8 to 9V at test point V. 6. Transfer VTVM to test point IV (input to de-emphasis netemphasis work) and adjust ratio detector coil secondary (top core) to give zero voltage indication on VTVM.

NB. In the field the ratio detector can be satisfactorily balanced by using a transmitted signal in place of a generator and carrying out the adjustment in 6 above.





# **SPARE PARTS LIST**

MODELS T23L2, T23L3, T25L1 and T25C1

### SPECIAL RESISTORS

Part No.	Symbol	Description	
B25006	R120	1000 Ω 5W W/W 5% AB or PW5	
B25018	R200	1600 Ω 5W W/W 5% PW5	
B25007	R215	3.3K 5W W/W 5% AB or PW5	
B25012	R401	300 Ω 10W W/W 5% AB or PW10	
B25008	R418	4.7K 5W W/W 5% AB or PW5	
B25009	R419	1.2 Ω BW 3 10%	

#### **POTENTIOMETERS**

Part No.	Symbol	Description
B23070	R113	Volume control 1M Ω tapped 400K log. taper 20%.
B23066	R216	Contrast control 15K tapped 10K.
B23067	R223	Brightness control 200K linear.
B23071	R306	AGC control 50K linear Tab. mounting.
B23068	R318	Vertical hold control 1.5 MΩ linear Tab. mounting 20%.
B23083	R321	Vertical size control 2.5 M $\Omega$ linear Tab. mounting.
B23082	R325	Vertical linearity control $1M\Omega$ linear Tab. mounting.
B23083	R326	Preset vertical linear control 2.5 MΩ linear Tab. mounting.
B23069	R411	Horizontal hold control 0.1 M $\Omega$ linear Tab. mounting 20%.

#### CONDENSERS CERAMIC

Unless otherwise stated, values less than 1 in Microfarads. Values greater than 1 in Picofarad  $\pm$  Micro-Microfarads.

Part No.	Symbol	Description	
B18034	C102	47 pf 500V 5% N750 CDS	
B18001	C103	0.0047  mfd  500V  -20% + 50%	
	C104	Part of L102 assembly	
B18005	C105	0.001 mfd 500V HIK 'B' 20%	
B18005	C106	0.001 mfd 500V HIK 'B' 20%	
B18004	C107	470 pf 500V 20% C322BC/P470E	
B18004	C108	470 pf 500V 20% C322BC/P470E	
B18015	C109	0.0047 mfd 500V HIK 'D' 20%	
B18041	C111	0.0033  mfd  500V -20% + 50%	
B18042	C113	0.011  mfd  500V -20% + 50%	
B18007	C116	0.01 mfd 500V HIK 'DY' 20%	
B18034	C201	47 pf 500V 5% N750 CDS	
	C202	Part of L201 assembly	
B18018	C203	10 pf CDS 500V NPO 'A' 10%	
	C204	Part of L202 assembly	
B18071	C205	7 pf 500V CDS 'A' $\pm$ .25 pf N.P.O.	
B18005	C208	0.001 mfd 500V CDS HIK 'B' 20%	
B18005	C209	0.001 mfd 500V CDS HIK 'B' 20%	
B18005	C210	0.001 mfd 500V CDS HIK 'B' 20%	
B18005	C211	0.001 mfd 500V CDS HIK 'B' 20%	
B18001	C212	0.0047  mfd  500V - 20% + 50%	
B18001	C213	0.0047  mfd  500V -20% + 50%	
B18005	C214	0.001 mfd 500V CDS HIK 'B' 20%	
	C215	ACCRETATION OF THE PROPERTY OF	
		Part of L206 assembly	
	C216		
B18001	C217	0.0047  mfd  500V -20% + 50%	
B18018	C219	10 pf CDS 500V NPO 'A' 10%	
B18017	C220	100 pf 500V 10% C304AH/A100E	
B18018	C221	10 pf CDS 500V NPO 'A' 10%	
B18087	C223	150 pf 5% N750 'C'	
B18069	C227	470 pf 10% 2 KV CDH type BY	
B18069	C228	470 pf 10% 2 KV CDH type BY	
B18013	C302	470 pf CDH 2 kV HIK 'C' 20%	
B18027	C305	0.02 mfd GMV 500V CDS 'E'	
B18017	C306	100 pf 500V 10% C304AH/A100E	
B18019	C307	0.005 mfd CDS 500V HIK 'DY' 20%	
B18019	C308	0.005 mfd CDS 500V HIK 'DY' 20%	
B18005	C309	0.001 mfd 500V CDS HIK 'B' 20%	
B18007	C314	0.01 mfd 500V HIK 'DY' 20%	
B18007	C317	0.01 mfd 500V HIK 'DY' 20%	
B18017	C405	100 pf 500V 10% C304AH/A100E	
B18005	C406	0.001 mfd 500V 20% HIK 'B'	
B18006	C408	0.0033 mfd 500V 'CY' HIK	
B18017	C409	100 pf 500V 10% C304AH/A100E	
B18015	C410	0.0047 mfd 500V HIK 'D' 20%	
B18029	C412	200 pf 500V 10% N750	
B12001	C413	390 pf Mica 500V SM 10%	
B12001	C414	390 pf Mica 500V SM 10%	
B18039	C418	120 pf 3 kV N750 'D' 5%	

#### CONDENSERS FOIL IN MICROFARADS

Part No.	Symbol	Description
B14040	C117	0.1 mfd 200V 20% TFC Terathene
B14061	C222	0.1 mfd 400V 20% DFK 424 Polyester
B14061	C224	0.1 mfd 400V 20% DFK 424 Polyester
B14002	C225	0.056 mfd 400V 20% TPB 461 Paper
B14036	C226	0.56 mfd 600V 20% TPB 673 Paper
B14058	C301	0.27 mfd 160V 10% DFK 117 Polyester
B14061	C303	0.1 mfd 400V 20% DFK 424 Polyester
B14058	C304	0.27 mfd 160V 10% DFK 117 Polyester
B14020	C310	0.022 mfd 1000V 20% TPB 1056 Paper
B14030	C311	0.0022 mfd 1000V 20% DFB 1016 Paper
B14062	C312	0.047 mfd 630V 10% DFK 620 Polyester
B14027	C313	0.0033 mfd 2000V 20% TPB 2046 Paper
B14034	C315	0.033 mfd 1600V 10% TPB 1558 Paper
B14032	C316	0.047 mfd 600V 20% TPB 660 Paper
B14062	C407	0.047 mfd 630V 10% DFK 620 Polyester
B14059	C411	0.0047 mfd 400V 10% DFK 408 Polyester
B14060	C415	0.0022 mfd 400V DFK 404 Polyester
B14061	C416	0.1 mfd 400V 20% DFK 424 Polyester
B14025	C417	0.047 mfd 1000V 10% TPB 1060 Paper
B14026	C419	0.033 mfd 1000V 10% TPB 1058 Paper
B14022	C420	0.056 mfd 1000V 10% TPB 1061 Paper

#### MISCELLANEOUS AND APPEARANCE PARTS

Models T23L2 and T23L3

Part No.	•	Description
B74019		Tuner unit
B50264	1	Knob channel chrome-plated
B49035	Ì	Insert (aluminium/silver) for channel knob
B50263	,	Knob fine-tuning
B50270		Knob volume—contrast—brightness
B49017	٦	Disc fine-tuner coupling front
B49019	-	Disc fine-tuner coupling rear
B80060	1	Clip fine-tuner discs (3)
B49021	-	Disc channel indicator
B79236		Knob on/off
B50258		Control panel die-cast
B57045		Mask 23" die-cast
B92412		Cabinet body metal blackwood (maple)
B92418		Cabinet body metal walnut
B59066		Leg plastic 12" long maple
B59065		Leg plastic 12" long walnut
B84074		Back cover T23L2
B84077		Back cover T23L3
B55024		Cover picture tube
B97036		Loudspeaker 6" x 4"
B79169		Antenna rod (T23L3)
B61014		Switch on/off and spot eliminator
B91001		Channel indicator bulb 6.3V 0.3A E/S
M79240		Printed circuit panel complete with valves
NB.	Bra	acketed parts are not sold separately.

#### MISCELLANEOUS AND APPEARANCE PARTS

Models T25L1 and T25C1

Part No.	Description
B74019	Tuner unit
B50268 )	Knob channel gold-plated
B49036	Insert (aluminium/gold) for channel knob
B50269	Knob fine-tuning
B50265 )	Knob volume—contrast—brightness
B49034 (	Insert for volume—contrast—brightness knobs
B79236	Knob on/off
B49030 7	Disc fine-tuner coupling front
B49031	Disc fine-tuner coupling rear
B80060	Clip fine-tuner discs (3)
B49033	Disc channel indicator
B57042	Mask and control panel 25" moulded
B84074	Back cover
B55024	Cover picture tube
B59062	Leg moulded square 10" long maple T25L1
B59063	Leg moulded square 10" long walnut T25L1
B59064	Leg moulded square 10" long rosewood T25L1
B97036	Loudspeaker 6" x 4" T25L1
B97037	Loudspeaker 9" x 6" T25C1
B61014	Switch on/off and spot eliminator
B91001	Channel indicator bulb 6.3V 0.3A E/S
M79240	Printed circuit panel complete with valves
NB. Bi	racketed parts are not sold separately.

#### CONDENSERS ELECTROLYTIC

Part No.	Symbol	Description
B16031	C110	3 mfd 50V DCW ET0104T
B16014	C114	25 mfd 50V DCW ET1XT 25/50
B16036	C115	25 mfd 300V DCW ET3005T
B16034	C401	100 mfd 200V DCW EMG 1089 STM
B16033	C402	100 mfd 200V DCW EMG 1810 TM
B16035	C403A	150 mfd 350V DCW
	GAOOD	EMG 1802 TM
	C403B	60 mfd 300V DCW

#### COILS AND TRANSFORMERS

Part No.	Symbols	Description
B00053	L101	Sound take-off coil
B00054 7	L102	Ratio detector transformer (yellow dot)
B33055	L102	Shield can for L102
B00058	L201	30.5 Mc/s trap (blue dot)
B00059	L202	37.5 Mc/s (yellow dot)
B00057	L203	Secondary converter coil
B00056	L205	Video IF interstage (green dot)
B00055 )	L206	Video detector coupling (blue dot)
B33055 \		Shield can for L206
	L207	Peaking coil part of L206 assembly
B00016	L208	Peaking coil 200 μH (white dot)
B00020	L209	Peaking coil 100 μH includes R214 (yellow dot)
B00016	L210	Peaking coil 200 $\mu$ H (white dot)
B00052	L211	5.5 Mc/s trap
B00049	L212	Peaking coil 40 μH includes R220
B08008	L401	vertical deflection coils
	į	Yoke assembly {
	L402	horizontal deflection coils
B00060	L403	Horizontal stabilising coil
B00061	L404	Horizontal linearity coil
B02001	CH1	HT filter choke
B03016	T1	Power transformer
B04026	T2	Horizontal output transformer
B04027	T3	Vertical output transformer
B04028	<b>T4</b>	Audio output transformer
NB. B	racketed j	parts are not supplied separately.

#### COMMON RESISTORS IN OHMS

 $\begin{array}{cccc} \text{Carbon} & \frac{1}{2}W & 10\% & \text{unless noted} \\ K & \equiv & 1000 & M & \equiv & \text{Megohms} \end{array}$ 

Symbol	Description	Symbol	Description	Symbol	Description
R101	47K	R214	5.6K integral	R319	3.3M 1W
R102	22K 1W		with L209	R320	2.2M 1W
R103	220	R217	560K	R322	1M 1W
R104	10K	R218	220K	R323	470K 1W
R105	470	R219	270K	R324	1.2M
R106	470	R220	22K integral	R327	33K 1W
R107	33K		with L212	R328	33K 1W
R108	1K	R221	100K	R329	33K 1W
R109	1K	R222	2.2M 1W	R330	330K
R110	22K	R224	680K	R402	150 Part of
R111	22K	R225	4.7M 1W		deflection
R112	1M	R226	470 10%		yoke assy.
R114	68K	R227	1M 20%	R403	As above
R115	1.5K	R228	1M 20%	R404	1M
R116	33K	R301	12M 1W	R405	220K
R117	220K 1W	R302	1M 1W	R406	220K
R118	1 <b>M</b>	R303	56K 1W	R407	47K
R119	270 1W	R304	47K 1W	R408	5.6K 1W
R201	3 1W	R305	22K	R409	22K 1W
R202	10K	R307	1M 1W	R410	82K
R203	56K	R308	68K	R412	1K 1W
R204	10K	R309	1M 1W	R413	68K 1W
R205	56K 1W	R310	10K	R414	4.7K
R206	3.3K	R311	33K 1W	R415	470K
R207	1K 1W	R312	4.7M 1W	R416	560K
R208	220	R313	2.2M 1W	R417	470
R209	2.7K 1W	R314	22K 1W	R420	1.5K 1W
R210	1K 1W	R315	56K	R421	1.5K 1W
R211	2.7K	R316	4.7K	R422	1.5K 1W
R213	2.7K 1W	R317	560K		