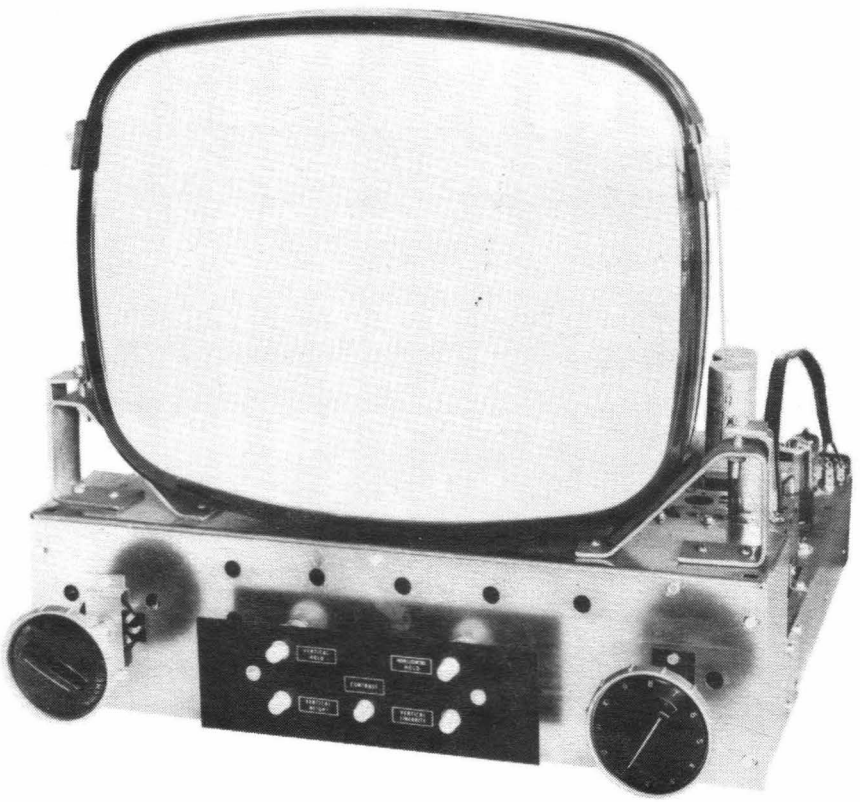
T.V. 171 SERIES

TELEVISION RECEIVER CHASSIS

MAINTENANCE MANUAL



COVERING MODELS - 171 BR
171 CR

ISSUED BY THE SERVICE DEPARTMENT

STANDARD TELEPHONES & CABLES PTY. LTD.

ISSUED FREE TO S.T.C. ACCREDITED RETAILERS.

ADDITIONAL COPIES - 3/6

INDEX

GENERAL INFORMATION

INTRODUCTION

This manual has been published to assist you in obtaining the best possible Installation, Operation and Service from the S.T.C. T171 Television Receiver.

It will be appreciated that the manual, although fairly comprehensive, is nevertheless unable to cover every possible installation to service problem which will occur from time to time. We have therefore established a Technical Advice Service whereby a mechanic who is experiencing difficulty in the field may, by contacting the Service Department, obtain additional information or advice on any particular problem.

Chassis Production Coding.

To facilitate and coordinate the handling of production changes both in the factory and in the field, a production changes both in the factory and in the field, a production coding system has been established for these chassis.

The initial production will be indicated by means of a stencilled number - T171 - situated on the rear apron of the chassis immediately above the serial number.

The number T171 indicates the chassis production series, whilst any modifications which occur will be indicated as follows: T171/1, T171/2, etc.

Where modifications occur a "Technical Flash" will be issued by the Service Department giving details of the modification and where possible the reason for doing so.

Spare Parts

A replacement parts list is included in the manual to assist you in the correct identification and chassis location of defective parts.

When making an order or request for parts, please quote the following:-

1. The quantity required;
2. The circuit reference and/or the part number;
3. The part description;
4. The colour (where applicable);
5. The chassis production coding number.

Example: Please supply:

1 S.P.40543J 1000 Ohms W.W. Potentiometer suitable for T171/? television receiver.

When returning defective parts, valve or cathode ray tubes for examination under the terms of the Television Receiver Warranty, please ensure that the parts are adequately packed against damage in transit.

Please quote the following :

1. The Chassis Production Coding Number.
2. The Chassis Serial Number.
3. The Receiver Owner's Name and Address.
4. The date of Sale
5. If the receiver was originally purchased from a company other than the service company give details.
6. Reason for return of the defective part and where possible the electrical or mechanical defect.

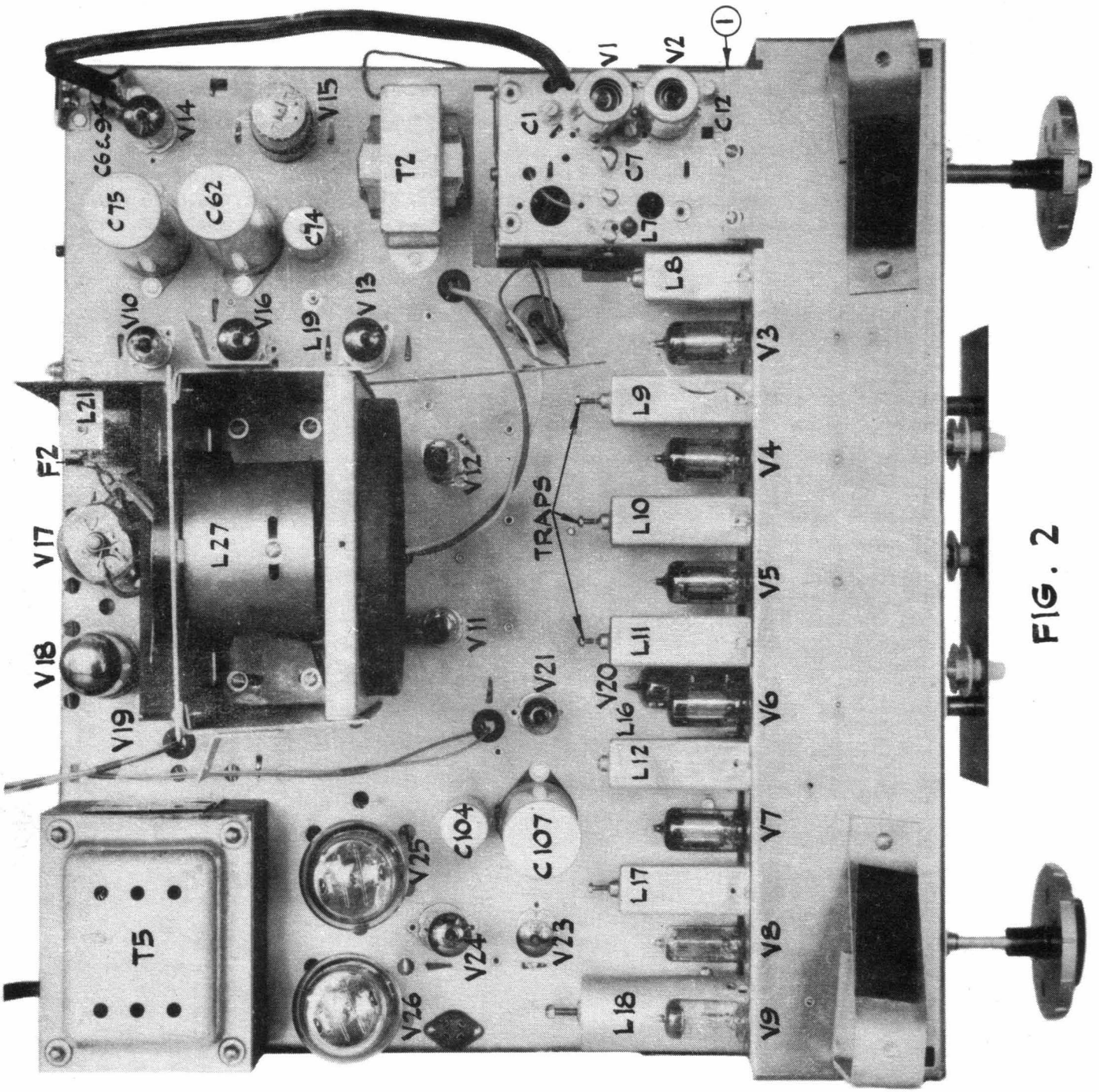

V1
V2
C1
C12
C7
L7
L8
V3
L9
V4
L10
V5
L11
V6
L12
V7
L17
V8
L18
V9
V20
L16
V21
V11
V12
TRAPS
V13
L19
V16
V10
C74
C62
C75
C66-94
V14
V15
T2
V17
F2
L21
L27
V18
V19
C104
C107
V25
V24
V23
V26
T5
1

FIG. 2

SPECIFICATION

This Television Receiver is designed to operate on the Australian 625 line 50 field system.

The main features of the circuit are the use of automatic frequency control, keyed amplified automatic gain control and multi channel turret tuner. The receiver has high sensitivity and wide bandwidth and utilises the intercarrier principle. An aluminised seventeen inch electro-statically focussed cathode ray tube is fitted.

There are 25 valves in the receiver plus a germanium diode and the cathode ray tube.

The valve complement is as follows :

CIRCUIT REF.	TYPE	FUNCTION
V1	ECC84	RF Amplifier on tuner chassis
V2	ECF82	Frequency converter and local oscillator on tuner chassis.
V3	6BW7	First IF Amplifier
V4	6BW7	Second IF Amplifier
V5	6BW7	Third IF Amplifier
V6	6BW7	Fourth IF Amplifier
V7	6BW7	First sound IF Amplifier
V8	6AU6	Second sound IF Amplifier
V9	6AL5	Ratio Detector
V10	6AU6	Keyed AGC Amplifier
V11	6BA6	Synchronizing Amplifier
V12	6AU6	Synchronizing Separator
V13	12AU7	Synchronizing Phase Inverter & Horizontal AFC
V14	12AU7	Vertical Blocking Oscillator and Discharge
V15	6AH4GT	Vertical Output
V16	12AU7	Horizontal Multivibrator
V17	6CU6	Horizontal Output
V18	6U4GT	Damping Diode
V19	R19	EHT Rectifier
V20	6BX6	1st Video Amplifier
V21	6AM5	Video Output
V22	AW43.20	Cathode Ray Picture Tube
V23	6AT6	Audio Amplifier and AGC Clamp
V24	6BW6	Audio Output
V25	5U4G	Mains Rectifier
V26	5U4G	Mains Rectifier

AERIAL

The aerial input impedance is 300 ohms balanced.

TUNING RANGE

Channels 1 to 10 - (Australian frequency allocations)

INTERMEDIATE FREQUENCIES:

Picture	I.F. Carrier	36.0 Mc/s
Sound	I.F. Carrier	30.5 Mc/s
Intercarrier	Sound I.F.	5.5 Mc/s

BANDWIDTH

At the 3db points better than 4.0 Mc/s
At the 6db points better than 4.6 Mc/s.

TIME BASE NON-LINEARITY:

Better than 10%

POWER SUPPLY:

230 and 240 volts A.C. 50 cycles.

POWER CONSUMPTION:

240 Volt amperes.

SPEAKER:

Console Models - 8" permagnetic
" " - 8" x 9" permagnetic (alternative)
Table Models - 5" x 7" permangnetic

CONTROLS:

The following controls are placed at the front of the cabinet:

Channel Selector and Fine Tuning
On/Off Volume and Brightness

The Controls for Vertical Sychronizing, Vertical Height, Vertical Linearity, Horizontal Synchronizing and contrast are placed behind a spring hinged panel for adjustment when necessary. These controls are normally considered preset controls. There are two preset controls on the rear apron of the receiver chassis for coarse horizontal synchronizing and automatic gain control set. Preset adjustments are also provided for the adjustment of picture width, horizontal drive and horizontal linearity.

CIRCUIT DESCRIPTION

The tuner unit comprises a high frequency amplifier and a frequency converter. A separate set of coils is used for each channel, the coils being mounted in a twelve position turret. Electrical connections between the coils and associated circuits are made by silver contacts and wipers.

The RF Amplifier (V1) is an ECC84 double triode valve connected as a cascode amplifier. A tuned secondary transformer (L1) is used to match the 300 ohm balanced aerial feeder to the input grid of the cascode circuit. A bridge network is used to achieve minimum feedback, to reduce oscillator radiation and ensure that the input circuit is balanced.

A bandpass coupled circuit (L2) is used between the output of the cascode amplifier and the control grid of the pentode section of (V2) the ECF82 frequency converter valve.

The triode section of the frequency converter coil is connected as a Colpitts oscillator. The inductor of the oscillator circuit is wound on the same former as the bandpass coupling circuit and consequently the oscillator volts are mixed with the incoming high frequency signals. A high degree of oscillator stability is obtained by compensation using negative temperature coefficient capacitors.

Oscillator coil inductance is adjusted by means of a brass core. The other coils are adjusted by movement of the end turns.

The first tuned circuit of the intermediate frequency amplifier is connected to the plate of the pentode section of the ECF82. Test point T is provided for use in aligning the tuner coils.

The following ten channels are provided:-

Channel	Video Carrier	Sound Carrier
1	50.25 Mc/s	55.75 Mc/s
2	64.25 "	69.75 "
3	86.25 "	91.75 "
4	133.25 "	138.75 "
5	140.25 "	145.75 "
6	175.25 "	180.75 "
7	182.25 "	187.75 "
8	189.25 "	194.75 "
9	196.25 "	201.75 "
10	210.25 "	215.75 "

THE COMPOSITE IF. AMPLIFIER

The receiver utilises the intercarrier sound system with composite intermediate frequency amplification for video and sound.

The amplifier uses four 6BW7 valves (V3, V4, V5 and V6) and four tuned circuits (L9, L10, L11 and L12) arranged as a staggered quadruple. The coupling circuits L7 and L8 between the converter plate and the first IF amplifier grid form a bandpass circuit. The tuned circuits used in the amplifier are bifilar wound transformers.

A GD3 Germanium Diode rectifier is used as the detector and is connected inside the screening can of the final tuned circuit (L12). This reduces the feedback from the output to the input of the vision amplifiers. This reduces the feedback from the output to the input of the vision amplifiers.

SOUND INTERMEDIATE FREQUENCY AMPLIFIER

The sound intermediate frequency amplifier is tuned to 5.5 Mc/s the frequency difference between the sound and vision carrier. The input to the amplifier is connected to the video detector.

There are two stages of amplification using a 6BW7 (V7) and a 6AU6 (V8) valve. These are followed by a 6AL5 (V10) valve connected in a ratio detector circuit.

AUDIO AMPLIFIER

The output from the ratio detector is amplified by a 6AT6 (V23) valve which then drives the 6BW6 (V24) output stage. This can deliver 4 watts of audio power to the loudspeaker.

THE VIDEO AMPLIFIER:

Two stages of video amplification are used. The first amplified stage employs a 6BX6 (V20) and this is connected to the video detector. The output of the video detector is adjusted by means of the A.G.C. control (R58) to deliver 2.5 volts peak to peak signal at test point No. 4. The output of the video amplifier stage is capacitance coupled (C95) to the control grid of the video output valve type 6AM5 (V21). D.C. restoration is employed and this is accomplished in the grid circuit of V21 by R108, R109 and R110.

Compensation coils L22 and L23 are used to compensate for the effectoof valve and wiring capacitances in order to maintain the necessary high frequency response.

Two additional 5.5 Mc/s traps L25 and L26 are included in the circuit for the rejection of the sound intercarrier.

The overall gain of the video amplifier is varied by the contrast control (R36) which is connected in the cathode circuit of V20 and utilizes the principle of negative current feedback.

THE SYNCHRONIZING AMPLIFIER:

In order to reduce the capacitive loading on the video amplifier a separate video amplifier is used for the synchronizing and automatic gain control circuits.

The operating voltages of the 6BA6 synchronizing amplifier valve (V11) are adjusted to give the most favourable amplification of the synchronizing pulses relative to the video content. The output of this amplifier coupled to the 6AU6 synchronizing separator (V12) and the 6AU6 automatic gain control valve (10)

THE SYNCHRONIZING SEPARATOR:

The operating voltages of V11 the 6AU6 synchronizing separator valve are adjusted to produce the most favourable amplification and clipping of the synchronizing pulses.

THE AUTOMATIC FREQUENCY CONTROL CIRCUIT

One section of the 12AU7 double triode valve (V13A) is used to provide a stage of synchronizing pulse clipping. Resistive loads in the plate and cathode provide synchronizing pulses of equal magnitude but opposite polarity.

These pulses are applied to the grid and cathode of the other triode section of the valve (V13B). A saw-tooth waveform derived from the horizontal scanning output valve is applied to the plate of the a.f.c. valve. By comparing the phase of the synchronizing pulses and the saw-tooth waveform the tube produces a potential which is used to control the frequency of the horizontal multo-vibrator. This potential is zero when the natural frequency of the oscillator is the same as that of the synchronizing pulses. If the oscillator frequency increases a positive correcting voltage is produced and vice versa, at the junction of R91 and R92.

VERTICAL SYNCHRONIZING CIRCUIT

The vertical scanning oscillator is synchronized by taking the complete synchronizing pulse train from the plate of the clipper and passing it into the integrating circuit. The output from the integrating circuit is then applied to the vertical scanning oscillator (V14).

HORIZONTAL SCANNING CIRCUIT:

The driving circuit is a 12AU7 valve (V16) connected as a multi-vibrator. A parallel resonant circuit L19 is incorporated which improves the stability of the oscillator and gives it a more desirable frequency versus control potential characteristic. The Multi-vibrator is of the cathode coupled type and the controlling potential is applied to the otherwise unused control grid.

The output of the horizontal output valve type 6CU6 (V17) is coupled to the deflection coils L27 by means of an autotransformer T3. The core material of the transformer is a ferrite known as Feremic and the windings are of the wave wound type. The E.H.T. winding is wound over the coupling windings and the design of the unit is such that is has an adequately fast retrace time to meet the requirements of the 625 line system.

A 6U4GT (V18) rectifier is used to reclaim power from the deflection coils and thus improve the efficiency of operation.

The transformer produces a 13 KV supply potential for the picture tube final anode. The E.H.T. rectifier (V19) used is a type R19 or 1X2B.

VERTICAL SCANNING CIRCUIT:

The vertical scanning drive is obtained from a conventional blocking oscillator and discharge tube (V14). A triode valve type 6AH4 (V15) is used in the vertical output stage; the output is a transformer coupled to the deflection coils by means of the vertical output transformer (T2).

DEFLECTION COILS:

The horizontal and vertical deflection coils are contained by a ferrite sectionalised ring. Each set of coils are series connected.

THE AUTOMATIC GAIN CONTROL CIRCUIT:

The 6AU6 valve (V10) is used to provide the bias for the tuner and the first two intermediate frequency amplifier tubes.

The cathode of the tube is connected to a variable positive potential controlled by the automatic gain control potentiometer (R58).

The grid is directly connected to the synchronizing amplifier. The plate of the tube is fed from pulses taken from the secondary of the horizontal width transformer L20. By this method the current in the tube is established during the synchronizing pulse period only. The magnitude of the current is determined by the peak carrier level.

The current from the valve is fed into a network which applies bias at low signal levels to the intermediate frequency amplifiers only. As the signal to the receiver is increased, bias is then applied to the tuner unit. In this way, the most favourable signal to noise ratio is obtained at all levels of signal input.

The use of gated and amplified gain control ensures that the carrier level at the vision detector is constant for all signal input levels and is independent of picture content. The effects of interference are also kept to a minimum.

POWER SUPPLY:

The mains transformer T5 is designed for use with the appropriate supply voltage. Two 5U4G valves, V25 and V25 are used as mains rectifiers.

Filament windings on the transformer provide two separate 6.3 volt supplies.

UNPACKING & SET-UP INSTRUCTIONS

These receivers are shipped complete in one corrugated cardboard carton with the picture tube mounted. To properly unpack the receiver, refer to the unpacking instructions attached to the exterior of the shipping carton.

After the instrument has been unpacked, the following inspection checks and adjustments should be made before placing the receiver in operation.

1. General appearance and condition of the cabinet.
2. All tubes in place in their respective sockets and the picture tube socket on tight.
3. Mechanical operation of controls.
4. Check that the speaker plug is inserted in its socket on the chassis and that the high voltage anode lead is securely inserted in the socket on the exterior of the picture tube.

POWER SOURCE:

These instruments are designed for operation from an alternating current power source of from 230 to 240 volts at a frequency of 50 cycles per second.

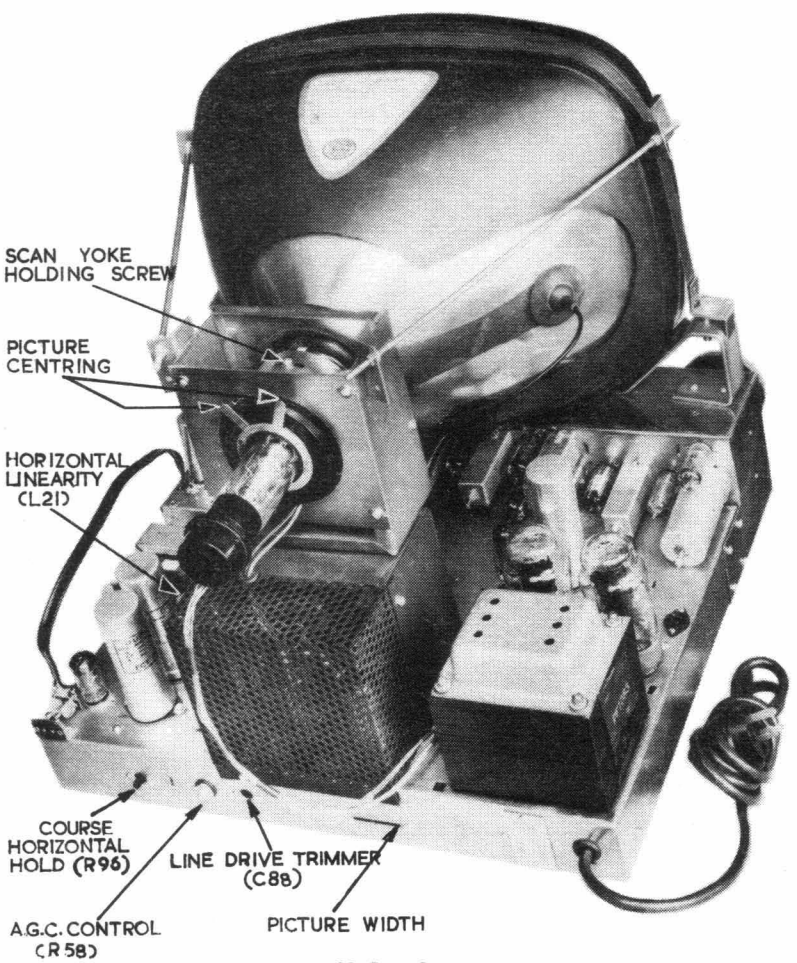


FIG. 3.

OPERATING PROCEDURE

The following procedure should be adopted when tuning the receiver for the first time or if the various controls have been disturbed since the receiver was last operated.

(a) Refer to Fig. 3. which shows the location of the controls.
(b) Turn the receiver on by rotating the ON-OFF SOUND VOLUME CONTROL in a clockwise direction Permit the receiver to establish an initial condition of stable operation by allowing two minutes to elapse then -
(c) Set the CHANNEL SELECTOR to the channel number of the desired transmitting station.
(d) Adjust the FINE TUNING CONTROL for the best (sharpest) detail in the picture (not necessarily the brightest picture), and good sound reproduction.
Do not endeavour to set the sound volume by rotating the FINE TUNING CONTROL for this purpose.
(e) Rotate the PICTURE BRIGHTNESS CONTROL from its extreme counter-clockwise position to a position where the picture tube screen is sufficiently lighted. The CONTRAST CONTROL has been preset in the factory and should not be readjusted unless the receiver is operating in areas of low signal strength in which case it may be necessary to increase the contrast by rotating the CONTRAST CONTROL clockwise.
(f) If the picture is broken up by a series of diagonal bars, adjust the HORIZONTAL HOLD CONTROL (R96). If the picture is off centre, adjust the HORIZONTAL HOLD CONTROL (R98).
(g) If the picture moves up or down, adjust the VERTICAL HOLD CONTROL.
(h) After sufficient time (approximately ten minutes) has been allowed for the components to reach their normal operating temperature, it may be necessary to readjust the FINE TUNING CONTROL as outlined in Step D.

SIMPLIFIED OPERATING PROCEDURE:

Use this procedure if controls have not been disturbed since the receiver was last operated.

(a) Turn the receiver on by rotating ON-OFF VOLUME CONTROL clockwise. Allow two minutes warm up period.
(b) Rotate the CHANNEL SELECTOR to the channel number of the desired transmitting station.
(c) Adjust the FINE TUNING CONTROL for best picture and good sound reproduction. Adjust the SOUND VOLUME CONTROL for desired sound level. DO NOT ROTATE TUNING TO ADJUST VOLUME.
(d) If the picture is broken up by diagonal bars, adjust the HORIZONTAL HOLD CONTROL (R96 and/or R98).
(e) If the picture moves up or down, adjust the VERTICAL HOLD CONTROL (R78).
(f) After approximately ten minutes, readjust the FINE TUNING CONTROL as outlined in Step C.

PRESET ADJUSTMENTS (FRONT)

The VERTICAL HEIGHT (R81) and VERTICAL LINEARITY CONTROLS (R87) have been preset at the factory for best operation and should not be reset unless absolutely necessary. If these controls are disturbed it will be necessary to reset them to obtain correct picture height and vertical linearity. As these control settings are not entirely independent of each other, then the adjustment is somewhat critical.

PRESET ADJUSTMENT (REAR)

Preset adjustments for horizontal drive (C88), horizontal linearity (L21) and horizontal width (L20) are provided and may require adjustment by the servicemen in some circumstances.

HORIZONTAL DRIVE CONTROL (C88)

With the raster synchronized by a test pattern signal this drive trimmer capacitor should be set so that the maximum drive is obtained without vertical white bars appearing in the raster just to the left of the centre.

With the trimmer set to its full clockwise position continue to turn the adjusting screw counterclockwise until the bar or bars disappear. This adjustment is best carried out when the receiver has been first switched on.

HORIZONTAL WIDTH CONTROL (L20)

After the horizontal drive has been correctly set the picture width can be adjusted by means of the slider adjustment on the rear skirt of the chassis. The picture width should be set so that with correct mains voltage the raster overscans the tube face proper by one-half of an inch at each side (This also applies to picture height.).

HORIZONTAL LINEARITY CONTROL (L21)

This preset adjustment provides a small degree of control over the horizontal linearity of the raster. When setting this slider adjustment a position should be selected near minimum inductance setting prior to excessive distortion being obtained at the centre of the raster. Care must be exercised when setting this adjustment.

HORIZONTAL HOLD CONTROL

Adjusting Procedure

1. Tune the receiver to a television transmission.
2. Short circuit the horizontal ringing coil L19.
3. Set the contrast control to a minimum and the brightness control so that the horizontal blanking bar can be seen.
4. Set the horizontal hold control (R98) to its central position.
5. Set the coarse horizontal hold control (R96) so that one quarter of an inch or the blanking bar can be seen at the right of the raster.

   (Note the picture centreing magnets on the deflection yoke will have to be set to show the right hand edge of the raster).

6. Remove the short circuit from L19.
7. Adjust the ringing coil inductance by means of the adjustable arc until the same amount of blanking bar is visible as in step 5.
8. Recentre the raster (picture) by means of the centreing magnets on the yoke.

PICTURE CENTREING

The picture (raster) after correctly synchronizing is centred by means of the centreing device on the yoke, the two sliding magnets being moved relative to each other to obtain the desired result.

If the single magnet type of centreing unit is used on the tube neck then centreing is obtained by rotating the unit about the neck of the tube and also by rotating the small magnet fitted in the top of the centreing unit pole pieces until the desired result is obtained.

A built in antenna is not provided in the receiver and consequently either an indoor aerial or an outdoor aerial must be used depending on the site of the installation.

The input impedance of the receiver is 300 ohms and balanced and a suitable connector is arranged on the receiver to permit connectnon of the 300 ohms flat twin lead from the aerial.

An effective antenna and transmission line system is a very important factor in obtaining good television reception in many areas where signal strength is not great and where interference conditions exist. If the installation is not properly made, satisfactory reception cannot be expected. The antenna used should be of a type and configuration chosen to suit the site conditions. A lightning arrester should be fitted in the lead-in cable.

RECEIVER LOCATION:

Selection of a suitable receiver location in the home or other place of installation should be decided upon only after the following factors have been taken into consideration.

1. The convenience of connecting the A/C power lead and the outdoor aerial lead in if required.
2. The location of the receiver should be such that no strong direct light from lamps or windows will fall on the picture tube or shine in the eyes of the viewers.
3. Sufficient space must be available in front of the receiver for the anticipated number of viewers. Normal viewing distance for a seventeen inch picture tube is eight to twelve feet in front of the receiver.
4. It is desirable that the receiver not be placed close to sources of heat such as, hot air vents or radiators and adequate clearance should be allowed at the back of the receiver to permit circulation of air through the rear of the cabinet.

CHECK OF OPERATION:

At the time of installation a final operating check of the receiver should be made. The necessary final adjustments to the preset controls should be made at this time to provide proper operation of the receiver. The customer should be instructed in the proper operation of the receiver, and cautioned that the non-operating controls should be adjusted only by an experienced television service man.

1. Check control knobs for clearance between inner and outer concentric knobs so that the rotation of each knob is independent of its associated inner or outer knob.
2. Insert the power lead plug into the 230 or 240 volt 50 cycle per second A.C. power outlet point.
3. Switch the receiver on at the power outlet and receiver ON-OFF CONTROL. Rotate the CHANNEL SELECTOR CONTROL to a channel on which a television program is being transmitted (preferably a test pattern program).
4. Adjust the FINE TUNING CONTROL for best picture with the volume control set at minimum volume. Then set the volume control for the desired sound level.
5. If difficulty is experienecd in obtaining a satisfactory picture, check the A.G.C. set adjustment in the rear skirt of the chassis. This control has been preset in the factory to produce 2.5 volt peak signal at the detector output and normally should not require adjustment.
6. Adjust the brightness, horizontal hold and vertical hold controls to obtain a picture. If necessary, readjust the fine tuning control for the best picture detail and the best sound.
7. Immediately a picture is obtained (within 30 seconds) adjust the Ion Trap magnet on the neck of the picture tube for maximum brightness. The magnet should be rotated and moved slowly backward and forward to obtain the maximum brightness. THIS DOES NOT APPLY TO TYPE AW43-20 - NO ION TRAP BEING REQUIRED.
8. Check the operation of the horizontal hold control by turning it to the full clockwise position. The picture should be just on the edge of sync. or just slightly out of sync. Rotate the horizontal hold control one quarter of a turn counterclockwise. The picture should fall into sync. condition.
9. Turn the horizontal hold control to the full counterclockwise position. The picture should fall out of sync. or approach this condition. Proper adjustment of the horizontal hold control is then at the midpoint of its rotation. If the operation of the horizontal hold control does not follow this pattern, a slight readjustment of the coarse horizontal hold control will be necessary. (See adjustment procedure)

12.

10. The vertical height, vertical linearity, horizontal width and horizontal linearity controls may require adjusting to obtain the best piecure geometry. The vertical height and vertical linearity adjustments are correlated, therefore these controls should be adjusted at the same time to provide proper height and good vertical linearity. The horizontal drive control should not require adjustment from its factory setting.
11. In order to eliminate corner cutting, it is important that the deflection yoke be positioned as far up as possible on the neck and seated against the bell of the tube. If it is necessary to move the yoke or to rotate it (if the picture is tilted), loosen the holding screw on the centre of the yoke support bracket. If the picture is not centred on the screen it can be corrected by means of the centreing magnets attached to the rear cover of the deflection yoke. The picture tube is electrostatically focussed and does not require any focus adjustments.
12. Readjust the Ion Trap Magnet for maximum brightness after any adjustments of the deflection yoke. (when used)
13. Readjust the width controls as required.
14. Recheck the horizontal hold control and determine that with the horizontal hold control adjusted to the centre of the hold range, the picture is centred horizontally.
15. Do not reset the contrast control from its factory set position unless absolutely necessary.
16. Turn the channel selector control to each channel on which reception is obtained. The picture should fall into sync. on all channels on which signals of normal strength are received.
17. Adjust the fine tuning control to obtain the best picture and check the quality of reception, picture and sound on all available television stations in the area.

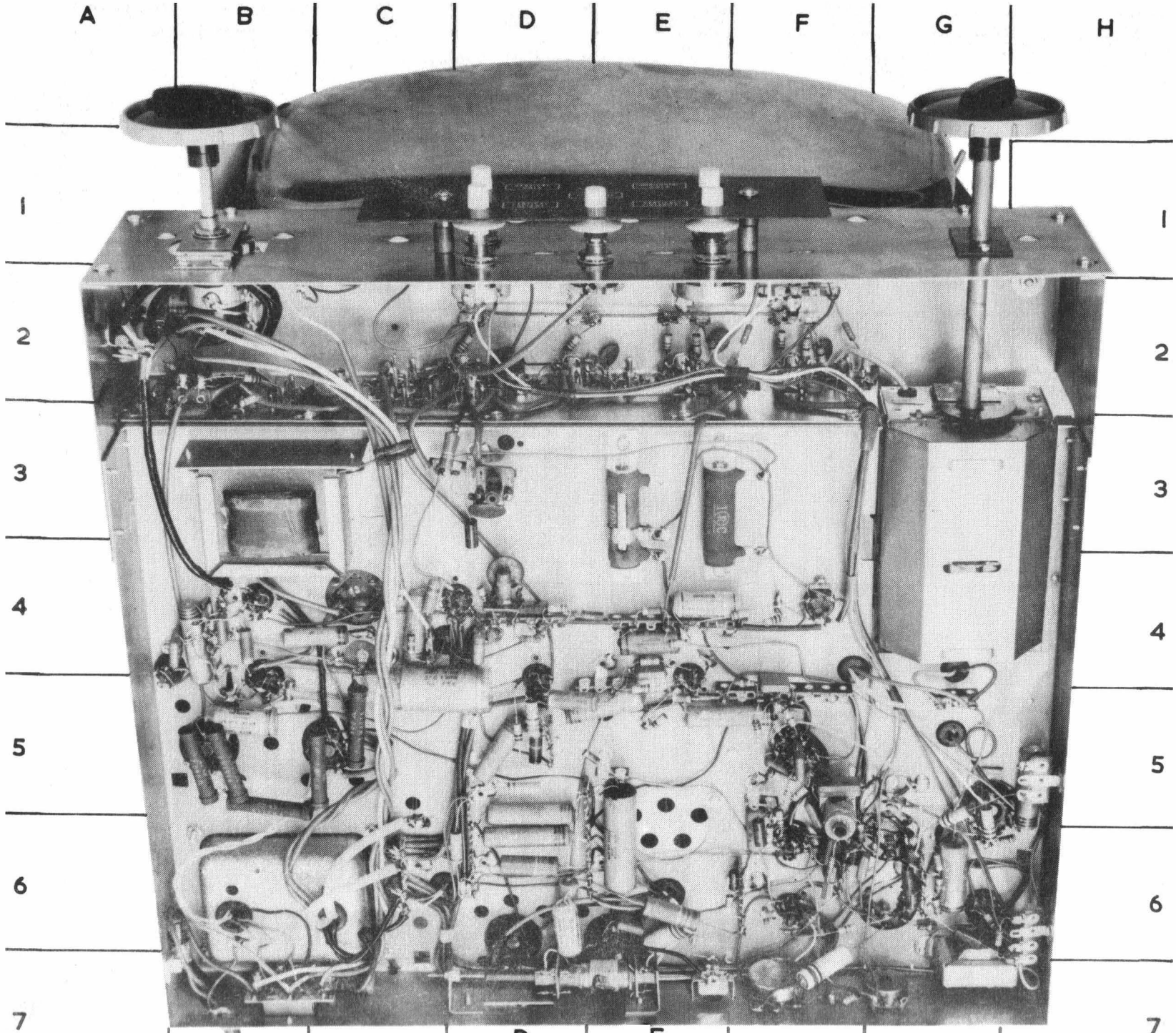


FIG. 4

FAULT FINDING IN THE RECEIVER

In the event of a fault developing in the receiver, the effects upon the picture can be of considerable assistance to the service mechanic in localizing the cause of the fault. The information given below is intended to facilitate the quick diagnosis of faults from the indication shown on the picture, and also gives details of the effects of component failure in various parts of the receiver.

SYMPTOM	POSSIBLE CAUSE	REMARKS
1. No raster, no sound	(a) Blown fuse (f1) (b) O/c Mains Switch (R48) O/c Mains Cable	(a) S/c V25, V26 or B + line S/c. (b) The valve heaters will not light
2. No raster, sound O.K.	(a) No E.H.T. Volts (b) Faulty C.R.T. (c) Faulty Brightness Control Circuit	(a) E.H.T. rectifier faulty (V19) Check V18, V17, V16 also F.2 and T. 3.
3. Raster, but no sound or or picture (no snow)	(a) Check V3, V4, V5, V6 also Video Detector (b) Faulty Sync. Amp. V.11.	(a) Apply C.R.O. at test point No. 4. (b) Check A.G.C. Volts
3a. As above, but with hissing on sound and snow on picture	(a) V.1 or V.2 faulty (b) Faulty Tuner (c) Faulty A.G.C. Clamp V23	(a) Replace V1 and V2 (b) Replace tuner (check other channels) (c) Check A.G.C. clamp voltage
4. Picture O.K. no sound	(a) Fault in sound section	(a) Check audio section V23, V24 (b) Check sound IF.V7, V8, V9.
5. Uncontrollable Brightness	(a) Video Output Valve V21 (b) Faulty C.R.T. (V22)	(a) Check V21 and C.R.T. Base volts (b) Check by new C.R.T.
6. Bright Horizontal Line	(a) Vertical timebase failure	(a) Check timebase circuit V14, V15, T1 and T2. (b) Vertical Scan Coil s/c to o/c (L27)
7. Defocussed vertical line line	(a) Line deflector coils s/c or o/c (b) O/c L2, C94 (c) S/c C39	(a) Check by substitution (b) " " (c) Replace C39
8. Line fold over and bright vertical line on left of picture	(a) V18 6U4GT low emission	(a) Check by substitution
9. Sound on Vision (picture ripple) audio gain minimum	(a) RF oscillator off tune	(a) See under Alignment Instructions. RF Oscillator Adjustment
10. Sound Pattern on Picture (varies with audio output)	(a) Microphony (b) Smoothing Faults	(a) May be caused by any valve or C.R.T. microphonic (b) Check C107 and C62

SYMPTOM	POSSIBLE CAUSE	REMARKS
11. Picture moving up or down - uncontrollable	(a) Vertical Hold (R78) inoperative (b) R77, R78, C71 or T1. faulty, also check V14.	(a) Control o/c or disconnected (b) Check for alteration in value.
12. No horizontal hold	(a) Horizontal hold (R98) (b) R95, R96, R97, R98, C83 faulty also V16.	(a) Check at the junction of R91 and R92 for D.C. potential indication. (b) Check for alteration in value.
13. No horizontal or vertical hold. Picture and sound otherwise O.K.	(a) Sync. circuit faulty. V12, V13.	(a) Check components and valves.
14. Corner cutting on picture.	(a) C.R.T. displaced (b) Deflection Yoke (L27) insufficiently forward (c) Picture centreing incorrectly adjusted.	(a) Inspect C.R.T. mounting. (b) See under Check of Operation, item No. 11. (c) See under Operating Procedure Picture Centreing.
15. Hum on sound	(a) L18 off tune or F9 faulty (b) Smoothing faults (c) Overloading in high signal area.	(a) Check alignment of Ratio Detector. (b) Usually will show on picture also. (c) Adjust A.G.C. control R58 or fit attenuator.
16. Overshoot and/or lack of definition	(a) RF Oscillator mis-tuned (b) Faulty alignment (c) Faulty Video Section	(a) Check other channels (b) Check alignment (c) Check video amp circuit

8:1 Removal of the Chassis

The following procedure should be adopted when removing the chassis from the cabinet.

1. Remove the cabinet back; this is held in place by several small wood screws.
2. Remove the five chassis receiving bolts.
3. Disconnect the loudspeaker plug and also the cabinet screen earthing bond.
4. Remove the four main control knobs and withdraw the chassis from the cabinet.

NOTE: Although it is possible to remove the chassis from the table model cabinet without removing the loudspeaker, it may be found more desirable to first remove the loudspeaker. The loudspeaker is secured into the cabinet by four small woodscrews.

8:2 Cleaning the Safety Glass

To remove the safety glass the chassis has first to be removed from the cabinet, after which the following procedure should be adopted:

1. Place the cabinet face downwards on the bench.
2. Remove the five mask securing clips and withdraw the mask.
3. The safety glass may now be removed.
4. The glass can be cleaned with any suitable cleaning material.
5. Before replacing the safety glass it is suggested that the cabinet be thoroughly cleaned to prevent any small particles of dust and other foreign matter from falling in between the glass and the screen after reassembly.
6. To reassemble, reverse the procedure.

8:3 Removing the Picture Tube

To remove the picture tube the following procedure should be used:-

1. Remove the tube socket and Ion Trap when used from the neck of the tube.
2. Remove the second anode high voltage connector from the side of the tube.
3. Discharge the tube using an insulated test prod. Connect one end of a test lead to the chassis and insert the probe end into the high voltage connection on the side of the tube.
4. Loosen the clamp strap assembly around the bell of the tube and withdraw the tube through the deflection yoke from the front of the chassis.

To install a new picture tube the above procedure should be reversed. Care must be taken to correctly and quickly set the Ion Trap megnet (when used). Extreme caution must be exercised at all times when handling picture tubes. Protective goggles should be used.

8:4 Removal of the Deflection Yoke

When replacing the deflection yoke the following procedure is recommended:

1. Remove the C.R.T. valve socket.
2. Remove the Ion Trap and/or picture centreing magnet (when fitted) from the neck of the picture tube.
3. Remove the back cover plate from the deflection yoke.
4. Note the wiring colour code and connections, after which disconnect the wires from the yoke.
5. Remove the scan yoke holding screw.
6. The deflection yoke may now be slid off the neck of the picture tube.
7. To refit, reverse the procedure.

8:5 Replacing the Tuner Unit

When replacing the tuner unit the following procedure should be adopted:

1. Remove the chassis from the cabinet.
2. Place the chassis on the service bench with the front of the chassis towards the front of the bench.
3. Remove the tuner supplies plug from the socket located on the main chassis.
4. Turn the chassis on to its left hand side (this is the side where the power supply is located).
5. Unscrew the turret support bracket.
6. Disconnect the converter coupling cable from L8 (note the connections).
7. The tuner unit may now be withdrawn from the underside of the chassis.
8. To refit the tuner reverse the procedure.
9. Check the receiver alignment (See Alignment Instructions).

Equipment required:

The following is a list of the Test Equipment that is required for proper alignment of this receiver.

The equipment should meet the specifications stated. The actual alignment of the video (composite) and sound intermediate frequency sections requires the use of a RF Signal Generator and Vacuum Tube Voltmeter. The RF Sweep Generator and Cathode Ray Oscilloscope are required to check the overall RF, IF and sound IF response curves.

1. RF Sweep Generator.

(a) Centre frequency ranges

5	-	6 Mc/s
29	-	39 "
49	-	92 "
132	-	146 "
174	-	216 "

(b) Sweep Width
Variable to 15 Mc/s on all ranges except the 5 to 6 Mc/s range for which the sweep width required is 500 Kc/s

(c) Output
Variable with at least 0.1 volt (from maximum setting of attenuator). Constant output on all ranges with flat output at all attenuator positions.

2. RF Signal (Marker) Generator

(a) Frequency range for sound IF adjustment.

5.5 Mc/s crystal controlled oscillator with provision for at least two additional markers at ± 100 Kc/s about the 5.5 Mc/s value.

(b) Frequency range for composite IF adjustments.

28.0 to 39.0 Mc/s - with means for checking the frequency at fixed points against a crystal calibrator.

(c) Frequency Range for RF Adjustment.

Either crystal controller markers or markers capable of being set to an accuracy of (at least) 0.1% are required for the provision of the video and sound carrier markers for each channel listed below.

Channel No.	Video Carrier	Sound Carrier
1	50.25 Mc/s	55.75 Mc/s
2	64.25 "	69.75 "
3	86.25 "	91.75 "
4	133.25 "	138.75 "
5	140.25 "	145.75 "
6	175.25 "	180.75 "
7	182.25 "	187.75 "
8	189.25 "	194.75 "
9	196.25 "	201.75 "
10	210.25 "	215.75 "

3. Cathode Ray Oscilloscope

(a) Wideband vertical deflection
(b) Vertical input provided with a calibrated attenuator
(c) Low capacity probe

4. Vacuum Tube Voltmeter

(a) High input impedance
(b) Low voltage range (1.5 volts D.C.)

(c) A high voltage probe is required for measuring the EHT voltage for the picture tube. These instruments are not usually very accurate and should be used as a guide only for this purpose.

GENERAL

During alignment of a television receiver, the test signal obtained from the signal generator and/or sweep generator should not be stronger than that required to produce the desired oscilloscope pattern/or voltmeter reading. When using the voltmeter for indication, the signal should be no stronger than that required to produce a reading of 1.0 to 1.5 volts at the video detector test point No. 4. When using the oscilloscope for display purposes, it should be operated at high gain.

All chassis and connecting leads must, in operation, be "cold", touching the leads with the hand should produce no change in the reproduced scope pattern of meter reading. If the hand does produce a change, evidently there is present an unstable condition which must be corrected by better grounding together of the chassis and all instruments in use.

Under normal conditions, complete alignment of a television receiver will not be necessary. The circuits employed are sufficiently stable that they will not require alignment unless the adjustments have been tampered with, or if components in these circuits become defective and are replaced. In the case where the receiver does not require a complete realignment, information is furnished in the following paragraphs which will enable the serviceman to perform the necessary adjustments in the proper manner.

To perform a complete realignment, the chassis must be removed from the cabinet. The most convenient position of the receiver chassis on the service bench, for alignment purposes, is with the chassis turned on its left-hand side (this is the side where the power supply is located). In this position, all adjustments are readily accessible.

When performing a complete realignment, it is suggested that the following sequence of adjustments be observed:-

1. Sound Ratio Detector
2. Sound IF Amplifiers
3. 5.5 Mc/s Video Trap
4. Converter coupling circuits
5. Composite IF Trap Adjustments
6. Composite IF Transformers
7. RF Oscillator Adjustments
8. RF and Converter Adjustments

SOUND RATIO DETECTOR:

1. Connect the high side of the signal generator to test point No. 6 the 6AU6 (V8) limiter grid (pin 1) via a .01 mF capacitor and the low side of the generator to ground. Set the generator frequency to 5.5 Mc/s. This 5.5 Mc/s signal should be accurately calibrated since the alignment of the sound channel at any improper frequency will cause distortion or even complete loss of the sound.
2. Connect the vacuum tube voltmeter to the test point No. 7 in series with a 1 megohm resister and set it to the 15 volt range.
3. Adjust the primary of L18 (bottom) for maximum reading on the meter.
4. Connect the vacuum tube voltmeter to test point No. 8.
5. Adjust the secondary tuning L18 top for zero reading. This adjustment will provide a positive or a negative reading on the meter. The proper setting is the point of zero output on the meter as the reading swings from positive to negative value.

As a final check of the ratio detector alignment, connect the sweep generator to test point No. 6 the 6AU6 (V8) limiter grid (pin 1). Adjust the sweep generator output for approx. 500 Mc/s sweep with a centre of 5.5 Mc/s. Connect the Oscilloscope to test point No. 8 and chassis to observe the response curve. The ideal curve is shown fig. 5.

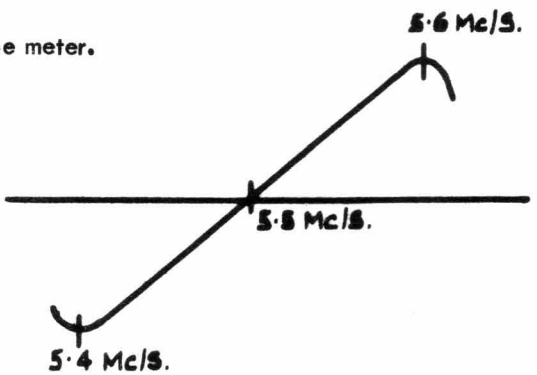


FIG. 5

If it is not symmetrical, adjust the secondary top of L18 to obtain symmetry.
Markers at 5.4 and 5.6 Mc/s should be used to determine the peak to peak bandwidth of the ratio detector.

SOUND IF TRANSFORMERS:

1. Connect the high side of the signal generator to test point No. 3, the grid (pin 2) of the 4th IF amplifier tube V6. Set the generator to 5.5 Mc/s.
2. Connect the vacuum tube voltmeter to the test point No. 5 in series with a 1 megohm resistor.
3. Adjust the primary (bottom) and secondary (top) of L17 and the primary (bottom) of L16 to give maximum indication on the electronic testmeter.
4. Connect the sweep generator to test point No. 3 the grid (pin 2) of the 4th IF amplifier tube V6 and the oscilloscope to observe the response at test point No. 5. With the generator set to give a sweep width of approx. 1 megacycle per second, the ideal response curve is shown in fig. 6 and shows symmetry about the 5.5 Mc/s marker.
5. Small departures from the initial settings may be made to obtain symmetry, provided the gain is not permitted to deteriorate to any extent.

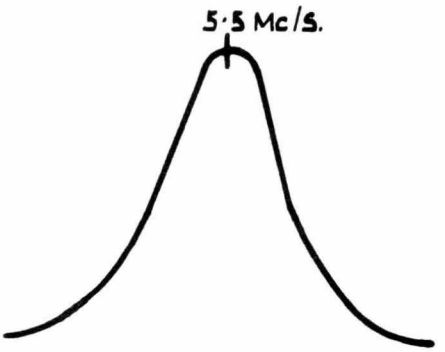


FIG. 6.

5.5 Mc/s VIDEO TRAP ADJUSTMENT:

1. Connect a signal generator capable of providing a 5.5 Mc /s accurately calibrated signal across the video detector load resistor R32 test point No. 4.
2. Connect the radio frequency A.C. probe of the vacuum tube voltmeter between the cathode and ground of V21 test point B.
3. Increase the output of the signal generator to obtain a convenient reading on the vacuum tube voltmeter.
4. Adjust the trap tuning cores of L25 and L26 with an insulated screwdriver to obtain a minimum reading on the testmeter.

COMPOSITE IF TRAP ADJUSTMENT:

1. Remove the keyed AGC amplifier valve V10 from its socket.
2. Connect an external bias supply of approx. -3.5 volts between the junction of resistors R50 and R52 and ground test point No. 9. This bias potential can be obtained from a 9V bias battery and potentiometer network.
3. Connect the vacuum tube voltmeter across the video detector load resistor R32 via a 10K ½ watt carbon resistor test point No. 4.
4. Connect the signal generator to the grid of the 6U8 (ECF82) (V2) converter (pin2) through a .01 mF capacitor. Insert the .01 mfd condenser through the small round hole on the side of the tuner at test point No. 1.

Caution Do not move or reposition any components associated with the converter circuitry.

5. Set the channel selector to a position between channels.
6. Adjust the signal generator to provide each of the following frequencies and adjust the corresponding trap coil to provide a minimum reading on the meter.
   (a) 29.0 Mc/s L9 (top) Adjacent channel Video Trap
   (b) 37.5 Mc/s L10 (top) Adjacent channel Sound Trap
   (c) 30.5 Mc/s L11 (top) Sound Carrier Trap

In the foregoing adjustments, it may be possible to run the tuning cores through the coils and obtain two nulls. The correct null (minimum) will be the one which occurs when the cores are nearest the outer edge of the coils. If the cores are not correctly positioned, improper coupling will result, thus causing incorrect overall response.

CONVERTER COUPLING CIRCUIT:

1. Connect a sweep generator to the converter grid test point No. 1 through a .01 mf capacitor and adjust its centre frequency to approx 35.5 Mc/s with 10 Mc/s sweep width.
2. Connect the signal generator to the converter grid through a .01 mF capacitor.
3. Connect an external bias supply of approx -3.5 volts between the junction of resistors R50 and R52 and ground. This bias potential can be obtained from a 9V bias battery and potentiometer network. The Keyed AGC amplifier valve V10 must be removed from its socket for this alignment.
4. Disconnect the lead from L9 to the plate (pin 7) of V3 (Test point No. 3.)
5. Connect a 180 ohm ½ watt ∝ carbon resistor between pins 7 and 8 of V3.
6. Connect the oscilloscope, through the probe circuit shown in Fig. 9 between pin 7 and ground of V3.
7. Adjust the signal generator to produce markers at 31.5 Mc/s and 35.1 Mc/s.
8. Adjust the converter transformer L7 to peak at 31.5 Mc/s and the conductance L8 to peak at 35.1 Mc/s to produce a curve similar to that shown in Fig. 7.

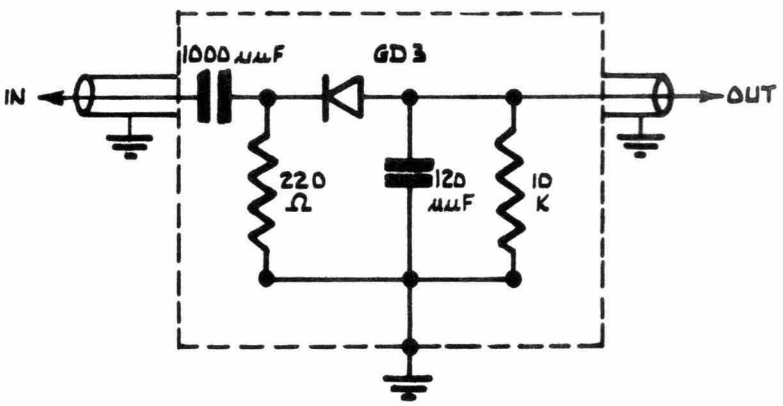


FIG. 9.

VIDEO (COMPOSITE) IF TRANSFORMER ADJUSTMENTS:

1. Remove the keyed AGC amplifier tube V10 from its socket.
2. Connect an external bias supply of approx. -3.5 volts between the junction of resistors R50 and R51 and ground. (Test point No. 9). This bias potential can be obtained from a 9V bias battery and potentiometer network.
3. Connect the vacuum tube voltmeter across the video detector load resistor R32 test point No. 4 via a 10K ½ watt carbon resistor at the detector end of the shielded lead.

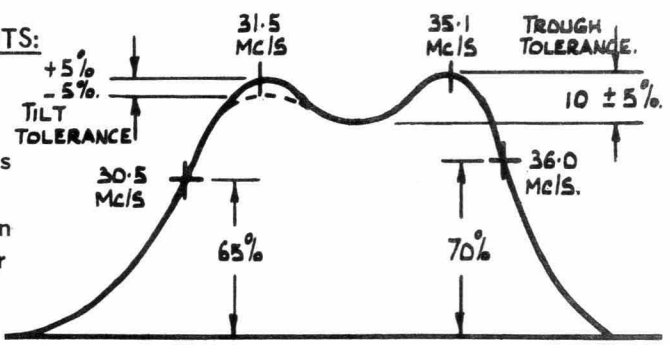


FIG. 7.

4. Connect the signal generator to a short tube shield placed over the converter tube and ground. Set the band selector to a free position.
5. Adjust the signal generator to provide each of the following frequencies in turn and adjust the corresponding coil tuning core to obtain minimum reading on the meter.

(a)	32.3 Mc/s	L9 bottom
(b)	35.8 "	L10 "
(c)	31.3 "	L11 "
(d)	34.1 "	L12 "

When tuning these circuits the tuning core should be moved from the full out position to the first position of tuning. Do not tune coils on the inner peak. If the tuning cores are moved through any great change in position then the trap adjustments should be checked or at least note made of the fact that the trap settings are to be checked on sweep operation.

6. Connect a sweep generator to the grid of the converter valve test point No. 1 via a .01 mF capacitor and an oscilloscope across the video detector load resistor (via a 10K resistor). The band selector must be set to a free position

6a. Alternative method of sweep injection

Connect the sweep generator to a short tube sheild placed over the converter tube and ground. Set the selector to a free position. (The sweep generator output will have to be increased slightly when using this method of injection).

7. Adjust the sweep generator to display the overall IF response curve and set the signal generator to note the response at the desired frequencies as seen in fig. 7.
8. Correct the response if necessary by retouching the composite IF tuning cores to obtain a response within the limits shown in Fig. 8.
9. Check that the trap coils are correctly set by noting that the trap frequency markers fall into the trough produced by trap attenuation and correct if necessary by returning the trap inductance concerned.

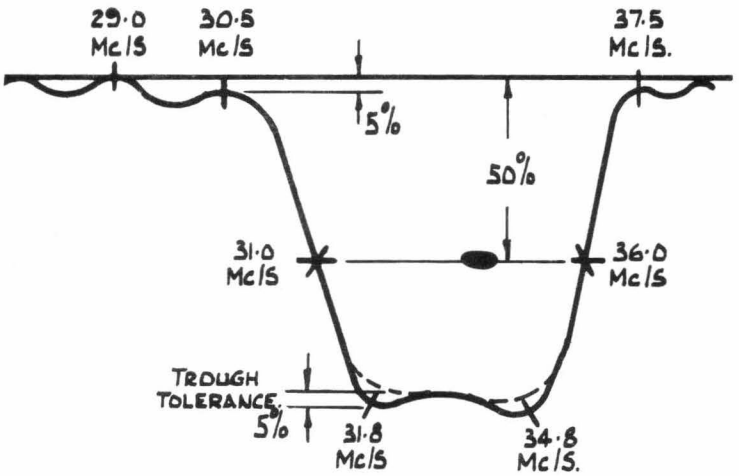


FIG. 8.

CAUTION: Care must be taken to avoid overloading the receiver circuits under test due to excessive sweep or marker signals. When peaking the circuits the d.c. level at the detector load must not exceed 1.5 volts and the amplitude of the response wave must not exceed 3 volts peak.

RF AND CONVERTER ADJUSTMENT:

1. Connect the sweep generator through a 300 ohm matching network or transformer to input (antenna) terminals of the receiver.
2. Connect the oscilloscope to the plate test point of the turret tuner unit via a low impedance crystal detector probe. Fig. 9.
3. Connect a bias battery and potentiometer network to the junction of R51 and R54 test point No. 19 and set the bias at this point to -0.5 volts.
4. Set the channel selector to channel 9.
5. Adjust the sweep generator to sweep channel 9 and adjust the signal generator to provide marker/signals at the picture and sound carrier frequencies for channel 9.
6. Adjust the two RF trimmers C1 and C7 and the converter trimmer C12 (all located on the top of the RF tuner) for the curve as shown in Fig.10 with manimum gain.
7. Adjust the sweep the signal generators progressively for each of the remaining channels 10, 8, 7 etc. Observe the response and check the position of the markers. The curves for all channels should be within the limits shown by the curves in Fig.10. If a particular channel does not fall within these limits, it is possible that a compromise can be made by adjusting the RF and converter trimmers as in steps 4, 5 and 6 to improve the channel that is out of limits. The response should then be checked on all other channels to determine the extent to which the other channels were affected by the compromise. (If this method proves unsatisfactory, the tuner should be returned for factory attention

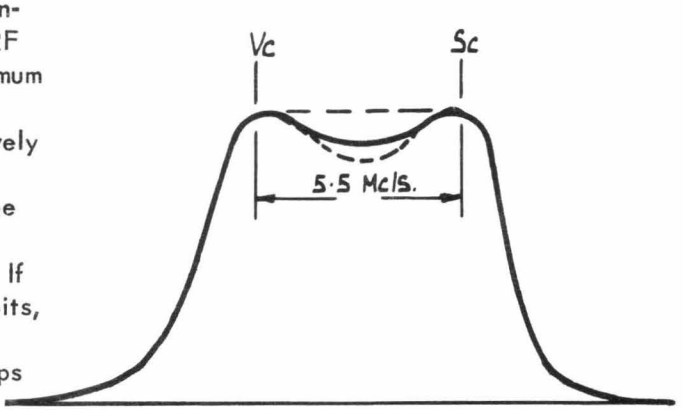


FIG. 10.

RF OSCILLATOR ADJUSTMENT:

1. Connect the sweep generator to the input (aerial) terminals of the receiver.
2. Connect the marker generator to the receiver input terminals.
3. Connect the oscilloscope across the video detector load resister R32 test point No. 4.
4. With the sweep generator set to sweep channel 9 and the signal generator set to the sound carrier frequency for channel 9, observe the response curve when the tuner unit is set to this channel (Note : the bias conditions for this test are the same as for the composite IF transformer adjustments).
5. With the fine tuning control fixed at its mid-positnon, check that thessound carrier frequency marker for all the remaining channels falls centrally into the sound carrier trough and make the necessary adjustments to ensure this is so. The adjustments are made by turning the brass screwed core to a position in the coil which produces the desired results. A thin non-metallic screwdriver is required for this adjustment.

   Note: The brass screw is accessible through the hold provided to the right of the turret spindle

171 REPLACEMENT PARTS LIST

VALVES

CIRCUIT REF.	GRID REF.	PART NO.	PART DESCRIPTION	REMARKS
V1	G3	ECC84	RF Amplifier	
V2	G3	ECF82	Frequency Converter	
V3	F2	6BW7	1st I.F. Amplifier	
V4	E2	6BW7	2nd I.F. Amplifier	
V5	D2	6BW7	3rd I.F. Amplifier	
V6	D2	6BW7	4th I.F. Amplifier	
V7	D2	6BW7	1st Sound I.F. Amplifier	
V8	V2	6AU6	2nd Sound I.F. Amplifier	
V9	A2	6AL5	Ratio Detector	
V10	F6	6AU6	Keyed AGC Amplifier	
V11	D4	6BA6	Synchronising Amplifier	
V12	E4	6AU6	Synchronising Separator	
V13	F5	12AU7	Synchronising Phase Inverter and Horizontal A.F.C.	
V14	G6	12AU7	Vertical Blocking Oscillator and Discharge.	
V15	B5	6AH4GT	Vertical Output	
V16	F6	12AU7	Horizontal Multivibrator	
V17	D6	6CU6	Horizontal Output	
V18	D6	6U4GT	Damping Diode	
V19	Fig 2	R19	EHT Rectifier	
V20	D2	6BX6	1st Video Amplifier	
V21	G4	6AM5	Video Output	
V22	Fig 2	AW43.20	Cathode Ray Picture Tube	
V23	B4	6AT6	Audio Amplifier and A.G.C. Clamp	
V24	B4	6BW6	Audio Output	
V25	C5	5U4G	Low Tension Power Rectifier	
V26	B5	5U4G	Low Tension Power Rectifier	

171 REPLACEMENT PARTS LIST

COILS AND TRANSFORMERS

CIRCUIT REF.	GRID REF.	PART NO.	PART DESCRIPTION	REMARKS
L8	F2	SP54078-A	Converter Coupling Coil Assy.	
L9	F2	74-SU-68A	1st I.F. Transformer	
L10	E2	74-SU-68B	2nd I.F. Transformer	
L11	D2	74-SU-68C	3rd I.F. Transformer	
L12	C2	74-SU-70A	Video Detector Transformer	
L13	E2	SP54001A	Heater Choke	
L14	D2	SP4001A	Heater Choke	
L15	C2	SP54003A	Series Compensation Coil	
L16	C2	SP54079A	Sound Coupling Coil Assy.	
L17	B2	74-SU-69A	Sound I.F. Transformer	
L18	A2	74-SU-71A	Ratio Detector Transformer	
L19	F5	SP54117A	Ringing Coil Assy.	
L20	E7	SP54005A	Width Control Coil Assy.	
L21	Fig. 2	SP54116A	Horizontal Linearity Coil	
L22	D3	SP54003B	Series Compensation Coil Assy.	
L23	D4	SP54003C	Series Compensation Coil Assy.	
L24	B3	192-SU-3J	Filter Choke	
L25	D3	SP54080A	5.5MC Trap Coil	
L26	D3	SP54080A	5.5MC Trap Coil	
L27	Fig. 2	X9831-704	Deflection Yoke	
T1	G7	RS50726	Blocking Oscillator Transformer	
T2	Fig. 2.	RS507.27	Vertical Output Transformer	
T3	Fig. 2	4568F 900	Rola Line O.P. Transformer	
T4	See loud speaker			
T5	B6	74-SU-75A	Power Transformer	

MISCELLANEOUS

CIRCUIT REF.	GRID REF.	PART NO.	PART DESCRIPTION	REMARKS
	Fig. 2	SP54017A	Stay Rod	
		SP54063A	Fuse Cover Plate	
	Fig. 2	SP54070A	HT Cap Shield	
		SP54076A	Spindle Support	
		SP54097A	Knob (Channel Selector)	
		SP54097B	Knob (Volume ON/OFF)	
		SP54098	Knob (Brightness)	
		SP54098	Knob (Fine Tuning)	
		SP54099B	Knob (Preset)	
		SP54094A	BRKT Aerial Socket	
		SP54089B	Bush (Tuner Spindle)	
		SP54118A	Turret Support Bracket	
		SP54074A	EHT Stand Off	
		SP54061A	Clamp Strap Assy.	
		SP54120A	Panel	
		SP54020A	Cabinet Table	
		SP54022A	Console Cabinet	
		SP54013A	Clamp Ring (Rubber)	
		SP54096A	Safety Screen	
		SP54073A	Indicator Plate (Preset)	
		SP54093A	Clamp Sleeving (Strap, Assy.)	
TURRET TUNER		SP54021	Kolster Brandt Turret Tuner C/W Valves	
		SP54018	EHT Anode Connector Shroud	
		SP54144	EHT Anode Connector	
F1			1¼ x ¼ Standard Glass 2AMP Fuse	
F2			1¼ x ¼ Standard Glass 250 MA Fuse	
V3 to V7 & V20	2	733/2/13	Carr Fastener 9 Pin Wafer Valve Sockets.	
V8 & V9		733/17/4	Carr Fastener 7 Pin Wafer Valve Sockets	
V10,11,12 21,23		S.T. 7	Teletron 7 Pin Moulded Valve Sockets	
V24,16, 14,13		S.T. 9	Teletron 9 Pin Moulded Valve Sockets	
V15,17, 18,25,26		S. 8	Ampenol 8 Pin Octal Valve Socket	
V19	Fig. 2		Teletron 9 Pin High Tension Valve Socket	
		SM22	McLellan Terminal Strip	

171 REPLACEMENT PARTS LIST

Miscellaneous Cont.

CIRCUIT REF.	GRID REF.	PART NO.	PART DESCRIPTION	REMARKS
		SM23	McLellan Terminal Strip	
		SM25	McLellan Terminal Strip	
		SM28	McLellan Terminal Strip	
	B4 & F4	S524	Kelton 4 Pin Socket	
	Fig. 2	247/223/2	Kolster Brandt C.R.T. Base Cover	
		403/300	Kolster Brandt Mask	
		L677P	Belling Lee 300 OHM Aerial Plug	
	Fig. 2	L733/S	Belling Lee 300 ohm Aerial Socket	
	Fig. 2	54122A	Belling Lee Anode Spring Clip	
			Ring Grip 533 3 Pin Plug	
			10" Length 1" x 3/16" Rubber Strapping	
	SP	SP54125	Warning Transfer	
		SP28886A	STC Nameplate	
		SP54109A	Medallion	
		SP54134	Channel Indicator	
			Hoelle Tee Nut ¼" Whit	
			10 ft. 3 x 23/.0076 PVC Flex (Brown)	
		SP54077A	Fuse Panel Assy. (Mains)	
		SP54077B	" " " (HT)	
LOUDSPEAKER		517.77	Rola 5-7H/DCG87 Loudspeaker	(Table Model)
		517.78	M.S.P. 75PU/XA187 "	" "
		517.79	Rola 8M/CBG81 "	(Console Model)
		517.80	M.S.P. 96 PS/TV210 "	" "

RESISTORS

CIRCUIT REF.	GRID REF.	PART NO.	PART DESCRIPTION	REMARKS
R15	F2		9.1K Resistors ½W ± 10% I.R.C. B.T.S.	
R16	F2		33 ohm Resistor ½W ± 10% I.R.C. B.T.S.	
R17	F2		68 ohm Resistor ½W ± 10% I.R.C. B.T.S.	
R18	F2		12K Resistor ½W ± 10% I.R.C. B.T.S.	
R19	F2		1.2K Resistor ½W ± 10% I.R.C. B.T.S.	
R20	F2		12K Resistor ½W ± 10% I.R.C. B.T.S.	
R21	E2		33 ohm Resistor ½W ± 10% I.R.C. B.T.S	
R22	E2		68 ohm Resistor ½W ± 10% I.R.C. B.T.S.	
R23	E2		2.2K Resistor ½W ± 5% I.R.C. B.T.S	Inside I.F. can
R24	E2		1.2K Resistor ½W ± 10% I.R.C. B.T.S.	
R25	D2		3.9K Resistor ½W ± 10% I.R.C. B.T.S.	Inside I.F. can
R26	D2		270 ohm Resistor ½W ± 10% I.R.C. B.TS	
R27	D2		1.2K Resistor ½W ± 10% I.R.C. B.T.S.	
R28	D2		5.6K Resistor ½W ± 10% I.R.C. B.T.S.	Inside I.F. can
R29	C2		270 ohm Resistor ½W ± 10% I.R.C.B.T.S.	
R30	C2		5.6K Resistor ½W ± 10% I.R.C. B.T.S.	
R31	C2		1.2K Resistor ½W ± 10% I.R.C. B.T.S.	
R32	C2		1.8K Resistor ½W ± 10% I.R.C. B.T.S.	
R33	C2		2.2K Resistor ½W ± 10% I.R.C. B.T.S.	
R34	C2		13K Resistor ½W ± 10% I.R.C. B.T.S.	
R35	D2		68 ohm Resistor ½W ± 10% I.R.C. B.T.S.	
R36	D2	SP40534J	1000 ohm W.W. Potentiometer	Contrast Control
R37	C2		470 ohm Resistor ½W ± 10% I.R.C. B.TS	
R38	C2		91 ohm Resistor ½W ± 4% I.R.C. B.T.S.	
R39	B2		1K Resistor ½W ± 10% I.R.C. B.T.S.	
R40	B2		47K Resistor ½W ± 10% I.R.C. B.T.S.	
R41	B2		56K Resistor ½W ± 10% I.R.C. B.T.S.	
R42	B2		33K Resistor ½W ± 10% I.R.C. B.T.S.	
R43	B2		2.2K Resistor ½W ± 10% I.R.C. B.T.S.	
R44	A2		270 ohm Resistor ½W ± 10% I.R.C. B.T.S.	
R45	A2		24K Resistor ½W ± 5% I.R.C. B.T.S.	
R46	A2		6.8K Resistor ½W ± 10% I.R.C. B.T.S.	
R47	A2		6.8K Resistor ½W ± 10% I.R.C. B.T.S.	
R48	C2		13K Resistor ½W ± 10% I.R.C. B.T.S.	
R48B	B2	SP40534H	1 meg. Potentiometer	Volume Control
R48-BA	B2	SP40534H	500K Potentiometer	Brightness "

171 REPLACEMENT PARTS LIST

Resistors Cont.

CIRCUIT REF.	GRID REF.	PART NO.	PART DESCRIPTION	REMARKS
R49	C2		10K Resistor ½W ± 10% I.R.C. B.T.S.	
R50	E4		33K Resistor ½W ± 10% I.R.C. B.T.S.	
R51	F4		270K Resistor ½W ± 10% I.R.C. B.T.S.	
R52	E4		150K Resistor ½W ± 10% I.R.C. B.T.S.	
R53	F4		1K Resistor ½W ± 10% I.R.C. B.T.S.	
R54	F4		3.3 Meg. Resistor ½W ± 19% I.R.C.B.T.S	
R55	B5		2K Resistor 5W ± 5% I.R.C. AB CTG. "B" TERM 1.	
R55A	B5		2K Resistor 5W ± 5% I.R.C. AB CTG. "B" TERM 1	
R56	E5		27K Resistor ½W ± 10% I.R.C. B.T.S.	
R57	F6		820 ohm Resistor ½W ± 10% I.R.C. B.T.S	
R58	F7	SP30184AO	10K Potentiometer	A.G.C. Control
R59	F7		10K Resistor 2W ± 20% I.R.C. B.T.S.	
R60	F6		39K Resistor ½W ± 10% I.R.C. B.T.S.	
R61	E6		38K Resistor ½W ± 10% I.R.C. B.T.S.	
R62	D5		10K Resistor ½W ± 10% I.R.C. B.T.S.	
R63	D5		6.8K Resistor 1W ± 10% I.R.C. B.T.A.1	
R64	D5		10K Resistor 1W ± 10% I.R.C. B.T.A.1	
R65	E4		1.5. Meg. Resistor ½W ± 10% I.R.C. B.T.S	
R66	E5		13K Resistor ½W ± 5% I.R.C. B.T.S.	
R67	E5		39K Resistor ½W ± 10% I.R.C. B.T.S.	
R68	E5		390K Resistor ½W ± 10% I.R.C. B.T.S.	
R69	E5		100K Resistor ½W ± 10% I.R.C. B.T.S.	
R70	F5		2.2 Meg. Resistor ½W ± 10% I.R.C. B.TS	
R71	F5		3.9K Resistor ½W ± 10% I.R.C. B.T.S.	
R72	F5		10K Resistor ½W ± 10% I.R.C. B.T.S.	
R73	F5		3.9K Resistor ½W ± 10% I.R.C. B.T.S.	
R74	B6		33K Resistor ½W ± 10% I.R.C. B.T.S.	
R75	G6		8.2K Resistor ½W ± 10% I.R.C. B.T.S.	
R76	G6		8.2K Resistor ½W ± 10% I.R.C. B.T.S.	
R77	H6		1.5 Meg. Resistor ½W ± I.R.C. B.T.S.	
R78	D2	SP40534F	1 Meg. Potentiometer	Vertical hold control
R79	G5		10K Resistor 1W ± 10% I.R.C. B.T.A.1	
R80	G6		1 Meg. Resistor ½W ± 10% I.R.C. B.T.S.	
R81	D2	SP40534-E	2.5 Meg. Potentiometer	Vertical height control
R82	D6		150K Resistor ½W ± 10% I.R.C. B.T.S.	

Resistors Cont.

CIRCUIT REF.	GRID REF.	PART NO.	PART DESCRIPTION	REMARKS
R83	D6		56K Resistor ½W ± 10% I.R.C. B.T.S.	
R85	G6		2.2 Meg Resistor ½W ± 10% I.R.C.B.T.S.	
R86	G5		1 K Resistor ½W ± 10% I.R.C. B.T.S.	
R87	E2	SP30184AC	3K WW Potentiometer	Vert. Linearity control
R88	F6		470 ohm Resistor ½W ± 10% I.R.C.B.TS	
R89	F5		22K Resistor ½W ± 10% I.R.C. B.T.S.	
R90	F5		100K Resistor ½W ± 10% I.R.C. B.T.S.	
R91	F5		82K Resistor ½W ± 10% I.R.C. B.T.S.	
R92	F5		82K Resistor ½W ± 10% I.R.C. BTS.	
R93	F5		4.7 Resistor ½W ± 10% I.R.C. BTS. (Meg)	
R94	F5		12K Resistor ½W ± 10% I.R.C. B.T.S.	
R95	F6		8.2K Resistor ½W ± 10% I.R.C. BTS.	
R96	G7	SP30184AE	250K Potentiometer	Horizontal Hold Control (Rear)
R97	G7		56K Resistor ½W ± 10% I.R.C. BTS.	
R98	E2	SP40534-G	50K Potentiometer	Horizontal Hold control
R99	F6		120 K Resistor ½W ± 10% I.R.C. B.T.S.	
R10	F6		12K Resistor ½W ± 10% I.R.C. B.T.S.	
R101	E6		1 Meg. Resistor ½W ± 10% I.R.C. B.T.S.	
R102	E6		47 ohm Resistor ½W ± 10% I.R.C. BTS.	
R103	E6		110 ohm Resistor 1W ± 10% I.R.C. BT2	
R104	E6		120 ohm Resistor 1W ± 10% I.R.C. BT2	
R105	D6		17K Resistor 1W ± 5% I.R.C. BT2.	
R106	C3		15K Resistor 1W ± 5% I.R.C. BTA1	
R107	C3		15K Resistor 1W ± 5% I.R.C. BTA1	
R108	D4		12K Resistor ½W ± 10% I.R.C. BTS.	
R109	D4		12K Resistor 1W ± 5% I.R.C. BTA.1.	
R110	D4		12K Resistor 1W ± 5% I.R.C. BTA 1.	
R111	C4		18K Resistor 1W ± 10% I.R.C. BTA 1.	
R112	D4		15K Resistor ½W ± 10% I.R.C. BTS.	
R113	D4		270K Resistor ½W ± 10% I.R.C. BTS.	
R114	C4		560K Resistor ½W ± 10% I.R.C. BTS.	
R115	B2		1 Meg. Resistor ½W ± 10% I.R.C. BTS.	
R116	B4		10 Meg. Resistor ½W ± 10% I.R.C. BTS	
R117	B4		270K Resistor ½W ± 10% I.R.C. BTS.	
R118	B4		1.5 Meg. Resistor ½W ± 10% I.R.C.BTS	
R119	B4		47K Resistor ½W ± 10% I.R.C. BTS.	

Resistors Cont.

CIRCUIT REF.	GRID REF.	PART NO.	PART DESCRIPTION	REMARKS
R120	B4		470K Resistor ½W ± 10% I.R.C. BTS.	
R121	B4		250 ohm Resistor ½W ± 10% I.R.C. BTS	
R122	C5		500 ohm Resistor 5W ± 5% I.R.C. AB Ctg. B. Term 1.	
R123	E3		15K Variable Resistor 20W ± 5% I.R.C. D.G.A. CTG. B. TERM 2. c/w Mtg.ft.	
R124	E3		15K Resistor 20W ± 5% I.R.C. D.G. Ctg.B. Term 2. C/w Mtg. Feet	
R125	B5		2K Resistor 5W ± 5% Term 1 I.R.C. A.B. CTG. B.	
R126	B5		2K Resistor 5W ± 5% Term 1 I.R.C. AB. Ctg. G.	
R127	C6		56K Resistor ½W ± 10% I.R.C. BTS.	
R128	E4		470K Resistor ½W ± 10% " "	
R129	Fig. 3		560 ohm Resistor ½W ± 10% I.R.C. BTS	Inside L27
R130	Fig. 3		560 ohm Resistor ½W ± 10% " "	Inside L27

CAPACITORS

CIRCUIT REF.	GRID REF.	PART NO.	PART DESCRIPTION	REMARKS
C8	Fig. 2	2 Off	470 PF Isolating Condenser	
C23	F2		1000 P.F. Ducon Hi-K Disc Style "A" K5000	
C24	F2		4700 P.F. Ducon Hi-K Disc Style "C" K5000	
C25	F2		1000 p.f. " " "A"K5000	
C26	F2		1000 p.f. " " "A"K5000	
C27	E2		1000 p.f. " " "A"K5000	
C28	E2		4700 p.f. " " "C"K5000	
C29	E2		1000 p.f. " " "A"K5000	
C30	E2		1000 p.f. " " "A"K5000	
C31	E2		4700 p.f. " " "C"K5000	
C32	D2		1000 p.f. " " "A"K5000	
C33	D2		1000 p.f. " " "A"K5000	
C34	D2		4700 p.f. " " "C"K5000	
C35	D2		1000 p.f. " " "A"K5000	
C36	C2		.001 MFD AEE W99 600 VW	
C37	C3		68 p.f. ± 5% Ducon Hi-K Disc. Style "A" K5000	See L12
C38	C3		10 p.f. ± 5% " " "A"K5000	
C39	Fig. 3		72 p.f. ± 5% Ducon Hi-K Disc Style "A"K5000	Inside L27
C40				
C41	D2		100 p.f. Simplex MS ± 5%	
C42	C2		3.9 p.f. ± 0.2 p.f. Ducon N.P.O. Disc Style "A"	
C43	C2		.01 MFD AEE W99 200 VW	
C44	C2		.01 MFD AEE W99 200 VW	
C45	C2		4700 p.f. Ducon Hi-K Disc Style "C"K5000	
C46	B2		.01 MFD AEE W99 400 VW	
C47	B2		56 p.f. Ducon NPO Disc style "C" ± 2%	
C48	B2		.01 MFD AEE W99 400 VW	
C49	B2		.01 MFD AEE W99 400 VW	
C50	B2		.04 MFD AEE W99 200 VW	
C51	A2		330 p.f. Simplex MS ± 5%	
C52	B2		470 p.f. Simplex P.T. ± 10%	

171 REPLACEMENT PARTS LIST

Capacitors Cont.

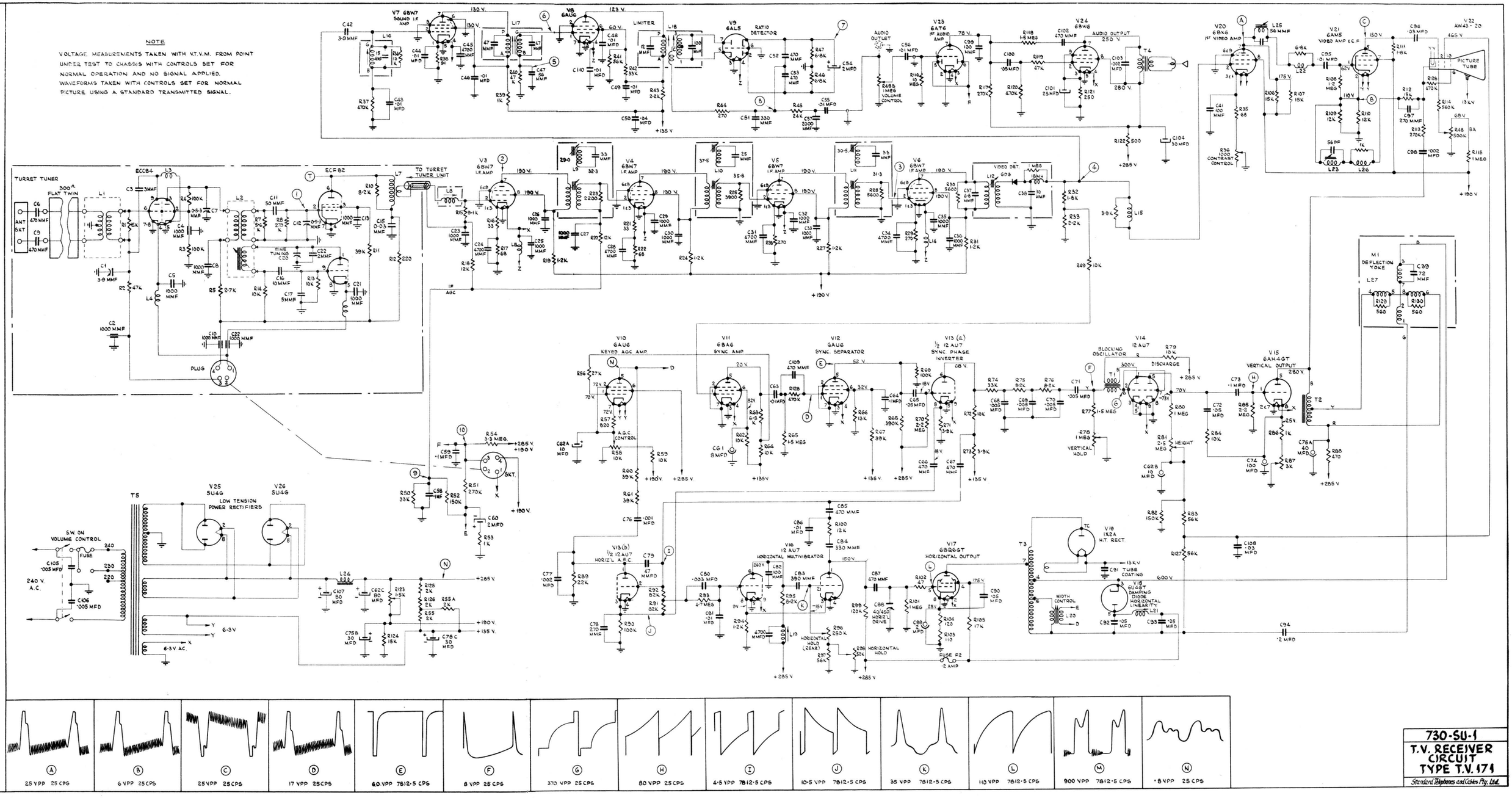
CIRCUIT REF.	GRID REF.	PART NO.	PART DESCRIPTION	REMARKS
C53	B2		470 p.f. Simplex PT ± 10%	
C54	B2		2 MFD Ducon ET1B 150 VW	
C55	A2		.01 MFD AEE W99 400 VW	
C56	A2		.01 MFD AEE W99 400 VW	
C57	A2		.002 MFD AEE W99 400 VW	
C58	E4		.1 MFD Ducon HS601 600 VW	
C59	B4		.1 MFD Ducon HS201 200 VW	
C60	E4		2MFD Ducon ET1B 150 BW	
C61	C5		8 MFD 11CC 300 VW Type ERK	
C62A	G6		(10 MFD Ducon ECT 187 350 VW	
C62B	G6		(10 MFD Ducon ECT 187 350 VW	
C62C	G6		(80 MFD Ducon ECT 187 400 VW	
C63	D4		.01 MFD HS611 600 VW Ducon	
C64	E5		.1 MFD HS601 600 VW Ducon	
C65	F5		.Of MFD HS615 600 VW Ducon	
C66	F5		470 p.f. Simplex P/T ± 10%	
C67	F4		470 p.f. Simplex P/T ± 10%	
C68	G6		.005 MFD AEE W99 400 VW	
C69	G6		.005 MFD AEE W99 400 VW	
C70	G6		.005 " " " "	
C71	G6		.005 " " " "	
C72	H5		.05 MFD HS615 600 VW	
C73	G6		.1 MFD HS601 600 VW	
C74	G5		100 MFD Ducon EC5C 50 VW	
C75A	G6		40 MFD Ducon ECT 188 40VW e/w Mtg. panel	
C75B	G6		30 mfd. Ducon ECT 188 400 VW c/w mtg. panel	
C75C	G6		30 MFD Ducon ECT 188 400 VW c/w Mtg. panel	
C76	F5		.001 MFD AEE V99 600 VW	
C77	F6		.002 MFD AEE W99 400 VW	
C78	F5		270 P.F. Simplex MS ± 20%	
C79	F5		47 p.f. Ducon NPO Disc ± 10% Style B	
C80	F6		.003 MFD AEE W99 600 VW	
C81	F6		.01 MFD HS611 600 VW Ducon	
C82	F6		100 P.F. Simplex ± 5% MS	

Capacitors Cont.

CIRCUIT REF.	GRID REF.	PART NO.	PART DESCRIPTION	REMARKS
C83	F6		390 p.f. Simplex ± 5% PT	
C84	F6		330 p.f. Simplex ± 10% MS	
C85	F5		470 p.f. Simplex ± 19% pT	
C86	F6		.01 MFD AEE W99 400 VW	
C87	E6		470 p.f. Simplex ± 10% P.T.	
C88	E7		40-450 p.f. Ducon CW0100 Compression type c/w mtg. brkt.	
C89	D6		2 MFD Ducon 150 VW	
C90	D6		.05 MFD HS615 600 VW	
C91			Tube Coating	
C92	D5		.05 mfd HS615 600 VW Ducon	
C93	D5		.05 mfd HS 615 600 VW Ducon	
C94	E6		.2 MFD HS402 400 VW Ducon	
C95	D3		.01 MFD AEE W99 400 VW	
C96	C4		.03 MFD HS613 600 VW Ducon	
C97	D4		270 p/f Simplex MS ± 20%	
C98	D4		.002 MFD AEE W99 400VW	
C99	B4		100 p.f. Simplex MS ± 54	
C100	B4		.05 mfd Ducon HS 614 600 VW	
C101	C4		25 mfd Ducon ET10769 40 VW	
C102	A4		470 P.f. Simplex PT ± 10%	
C103	B5		.002 MFD AEE W99 400VW	
C104	C4		30 Mfd. EC. 5G Ducon 400 VW	
C105	C7		.005 mfd. Ducon HS625 600 VW	
C106	C7		.005 MFD Ducon HS625 600VW	
C107	C4		80 mfd Ducon ECS 434 400 VW	
C108	D5		.03 MFD Ducon HS 613 600 VW	
C109	C4		470 p.f. Simplex PT ± 10 %	
C110	B2		.01 MFD AEE W99 200VW	

NOTE

VOLTAGE MEASUREMENTS TAKEN WITH V.T.V.M. FROM POINT UNDER TEST TO CHASSIS WITH CONTROLS SET FOR NORMAL OPERATION AND NO SIGNAL APPLIED. WAVEFORMS TAKEN WITH CONTROLS SET FOR NORMAL PICTURE USING A STANDARD TRANSMITTED SIGNAL.



730-SU-1

T.V. RECEIVER CIRCUIT TYPE T.V. 171

Standard Telephones and Cables Pty. Ltd.