

General Information

1993

Chassis: PC-11A

CRT's:

A34KVK12XX

A48KMX12XX

Remote Control: 105-068R

Door Flap:

315-533A (14")

315-535C (20")

Main Power Button:

441-271A (14")

441-265A (20")

Battery Cover: 303-E27A

Specifications

Power Consumption:	70W (14") 80W (20")
Receiving TV System:	CCIR standard
Tuning:	40 voltage synthesiser
Audio Output:	3W
Antenna Input Impedance:	75 ohm IEC type (300 ohm using balun supplied)
Colour Receiving System:	PAL-1
Intermediate Frequency:	
Picture:	39.5 MHz
Sound:	33.5 MHz
Colour:	35.07 MHz
Receiving Channel:	UHF: 21 - 69 Ch
Power Source:	180 - 270V, 50/60 Hz
Picture Tube:	A34KVK12XX00N7KD (14") A48KMX12XX0N7KD (20")

Service

Adjustments

Safety Precautions

Warning: Before servicing this chassis read the Safety Instructions, Product Safety Notice and X-Ray Radiation Precautions described below.

Safety Instructions

- 1: Potential as high as 22,000 - 27,000 volts is present when this receiver is operating. Operation of the receiver outside the cabinet or with the back cover removed involves a shock hazard from the receiver.
- 2: Servicing should not be attempted by anyone who doesn't know the precautions necessary through and through when working on high voltage equipment.
- 3: Always discharge the picture tube anode to the chassis ground to reduce the shock hazard before removing the anode cap.
- 4: Perfectly discharge the high potential of the picture tube before handling.
Warning: Risk of implosion! Handle with care!
- 5: If any fuse in this TV receiver is blown replace it only with the fuse specified in the chassis parts list.
- 6: When replacing parts or circuit boards wind the lead wires around terminals before soldering.
- 7: When replacing a high wattage resistor (oxide metal film resistor) in circuit board keep the resistor 10mm away from circuit board.
- 8: Keep wires away from high voltage or high temperature components.
- 9: Before returning the set to the customer always perform an AC leakage current check on the exposed metallic parts of

the cabinet such as: antennas, terminals, screwheads, metal overlays, control shafts etc., to be sure the set is safe to operate without danger of electrical shock. since this TV has AVC (Automatic Voltage Control) circuit, it may be operated non-adjustably within the voltage area indicated on the label attached to the back cover. (Do not use a line isolation transformer during this check). Use an AC voltmeter having 1000 ohms per volt or more sensitivity in the following manner:

- 1: Connect a 1000 ohm resistor between a known good earth ground (water pipe, conduit etc.) and the exposed metallic parts, one at a time.
- 2: Measure the AC voltage across the combination of 1000 ohm resistor.
- 3: Reverse the AC plug at the AC outlet and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 1 volt RMS. This corresponds to 1 mA. AC.
Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.

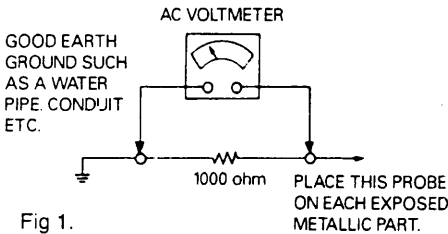


Fig 1.

X-Ray Radiation Precautions

- 1: Excessive high voltage can produce potentially hazardous X-Ray Radiation. To avoid such hazards, the high voltage must not be above the specified limit. The nominal value of the high voltage of this receiver is $???\pm 1.5$ kV at high beam current (maximum brightness)

under specified power source. The high voltage must not, under any circumstances, exceed 27.5 kV. Each time a receiver requires servicing the high voltage should be checked. It is recommended the reading of the high voltage be recorded as part of the service record. It is important to use an accurate and reliable high voltage meter.

- 2: The only source of X-Ray Radiation in this TV receiver is the picture tube. For continued X-Ray Radiation protection, the replacement tube must be exactly the same type as specified in the parts list.
- 3: Some parts in this receiver have special safety related characteristics for X-Ray Radiation protection. For continued safety, parts replacement should be undertaken only after referring to the Product Safety Notice below.

Product Safety Notice

Many electrical and mechanical parts in this chassis have special safety related characteristics. These characteristics are often passed without being noticed by a visual inspection and the X-ray radiation protection afforded by some of them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage etc. Replacement parts which have these special safety characteristics are identified by ! marks on the schematic diagram and the replacement parts list.

Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create X-Radiation.

Adjustment Instruction

Appliance
This instruction is applicable for all models using the PC-11A chassis.

Specification

Circumference Condition

If there is no particular guidance, adjust under the following condition:

- 1: Circumference temperature: $20^\circ \pm 5^\circ$ C.
- 2: Relative humidity: $65\% \pm 5\%$.

Necessary Instruments

- 1: Dual DC power supplier (0 - 20V).
- 2: Sweep Generator and marker unit of each system (PC: 38.9, 39.5, 5.5, 6 MHz).
- 3: Alignment Scope.
- 4: DC Voltmeter (high impedance).
- 5: Oscilloscope.

Signal

Use the standard colour signal which is supplied by the standard digital signal generator.

Operating Power Source

AC 180V - 270V, 50/60Hz.

General Alignment (Chassis only)

Preliminary Steps

- 1: Set all VR's to the mechanical centre position.
- 2: Disconnect the SUB CPT Board before adjusting the vertical oscillation frequency.
- 3: Check the SLIT1 (C229) that is opened or not.

Connecting Diagram of the Test Instruments (for VIF, ASC, AFT)

Caution: After connecting each connector of the chassis and jig, supply the power source.

- 1: When connecting RF-OUT terminal of the sweep generator to the input terminal of the chassis, use the ceramic condenser (0.01m F).
- * Adjusting VIF and AFT: Connect it to the Z201 INPUT terminal (P2).
- * Adjusting ASC: Connect it to the TUNER IF OUTPUT terminal (P1).
- * Adjusting SIF: Connect it to the Z202 INPUT terminal (P8).
- 2: When connecting the INPUT terminal of the Alignment Scope to the OUTPUT terminal of the chassis.
- * Adjusting VIF and ASC: Connect it to the IC201 AFT OUTPUT terminal (P6: pin 14 of IC201).
- * Adjusting AFT: Connect it to the IC201 AFT OUTPUT terminal (P5: pin 15 of IC201).
- * Adjusting SIF: Connect it to the SOUND RECTIFIER OUTPUT terminal (P7: deampasis terminal).
- 3: In case of the non A/V model or sensor model, connect the JIG (with 4.5V DC) to the pin 9 of IC201.

VIF Alignment

VIF Alignment Waveform

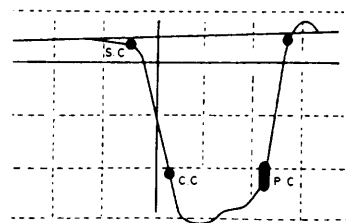


Fig 2.

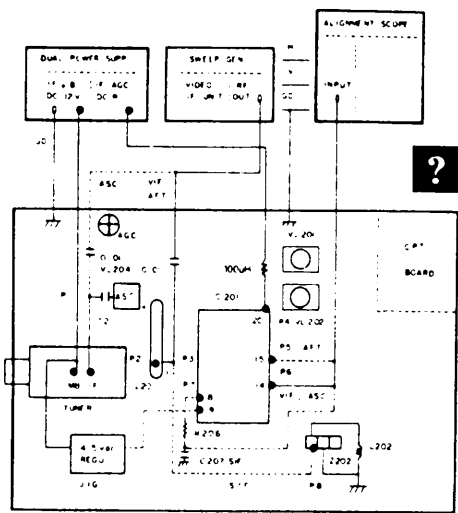


Fig 3.

Alignment Steps

- 1: Preliminary instrument settings.

Dual Power Supply		Sweep Generator		Alignment Scope	
IF+B	IF AGC	IF UNIT	RF ATT.	VERT.	HORI.
DC12V±0.1V	DC3V±0.1V	SYSTEM P.C (MHz) PAL -139.5	OUTPUT LEVEL IF: 90dBu RF: 60dBu (25dB attenuation)	POSITION CENTRE VARIABLE MAX	POSITION CENTRE GAIN (5.5 Columns)
FINE LEVEL: Mechanical centre position		PAL -B/G 38.9		V/DIV. 100mV (AC)	EXT.

- 2: Connect the chassis to the instrument as shown in fig. 2.
- 3: Adjust the P-P level of VIF waveform with the Alignment Scope is variable (3.5 columns).
- 4: Adjust the AGC voltage before the VIF waveform to be saturation.
- 5: Adjust the PC gain and the Band Width to be maximum at the Alignment Scope waveform with VL201.
- 6: Adjust step 3 again and then set the P-P level of the VIF waveform.
- 7: Afterwards, adjust the deviation of VIF saturate condition after fine tuning RF ATT of the Sweep Generator and then adjust steps 5 and 6.

AIF Alignment

AFT Alignment Waveform

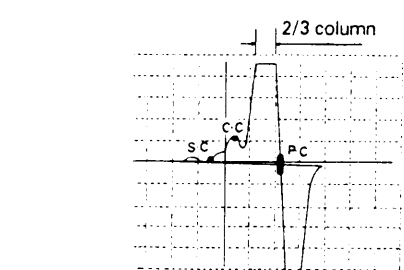


Fig 4.

Alignment Steps

- 1: The level condition of instrument is the same as the VIF Alignment step 7.

Note: The IF AGC voltage and the RF OUTPUT level of sweep generator are the same as the VIF alignment level.

- 2: Connect the chassis to the instrument as shown in fig. 2.
- 3: If necessary, adjust the AFT waveform with the vertical variable of the Alignment Scope (about 10 columns).
- 4: Adjust VL202 until the P.C. becomes to the RF REFERENCE voltage line on the Alignment Scope waveform, see fig. 4.

Recommended Safety Parts

Item	Part No.	Description
1	CI-14A50 (14")	2055-V0791Z CRT (with DY)
4	CI-14A50 (14")	170-799A Lead Set, Earth
5	CI-4A50 (14")	150-276F Degaussing Coil
6	CI-14A50 (14")	153-061M Deflection Yoke
11	CI-14A50 (14")	154-064J Flyback Transformer
17	CI-14A50 (14")	140-278C Main Switch
1	CI-20A50 (20")	2055-V0642W CRT (with DY)
4	CI-20A50 (20")	170-799C Lead Set, Earth
5	CI-20A50 (20")	150-276M Degaussing Coil
6	CI-20A50 (20")	153-151D Deflection Yoke
11	CI-20A50 (20")	154-177J Flyback Transformer
17	CI-20A50 (20")	140-278C Main Switch
Model: CI-20A50 20"		
C814, C815	181-192A	Capacitor KNB1531 0.1MF/250V (ISKRA)
C816	181-124A	Capacitor CE (400V/120UF)
C817	181-157A	Capacitor ECK - DNS 222 MEX
D806	0DD110009DA	Diode RM1 1AV 1.2A/600V 100A TP SKN
F801	131-085A	Fuse BSI Approved (kite mark)
FR311	0RF0102G609	Resistor, Fusible 10 1/4W 5% TA52
FR601	0RF0101J607	Resistor Fusible 1 1W 5% TA62
FR602	131-093A	Fuse Micro Ceramic Tube Type
FR704	0RS1800J607	Resistor Fix Metal Film Oxide 180 1W 5% TA62

Recommended Safety Parts Cont'd.

Item	Part No.	Description
FR709	0RS1201J607	Resistor Fix Metal Film Oxide 1.20K 1W 5% TA62
FR712	0RF0151J607	Resistor, Fusible 1.50 1W 5% TA62
FR716	0RF0101H609	Resistor, Fusible 1.0 1/2W 5% TA52
FR718	0RF0331H609	Resistor, Fusible 3.3 1/2W 5% TA52
FR814	0RF0101H609	Resistor, Fusible 1.0 1/2W 5% TA52
FR817	0RF0561J607	Resistor, Fusible 5.60 1W 5% TA62
FR819	0RF0331H609	Resistor, Fusible 3.3 1/2W 5% TA52
FR820	0RF0470H609	Resistor Fusible 0.47 1/2W 5% TA52
L803	150-839A	Coil Line Filter 39MH
Q801	0TR187800AA	Transistor 2SD1878
R813	180-783F	Resistor, RC 4700K 2W K Taping
T701	151-387A	Transformer H. Drive
T702	154-177J	FBT FCC (2) * 177J-19SP3
T801	151-346C	Transformer SMPS (PC-11A)
TH801	163-012L	PTH62D03BF180N270 (Murata)
Model: CI-14A50		
FR704	0RS1800H609	Resistor Fix Metal Film Oxide 180 1/2W 5% TA52
FR709	0RS1201H609	Resistor Fix Metal Film Oxide 1.2K 1/2W 5% TA52
FR712	0RF0121J607	Resistor, Fusible 1.20 1W 5% TA62
FR718	0RF0101H609	Resistor, Fusible 1.0 1/2W 5% TA52
Q801	0TR187700AA	Transistor 2SD1877 Sanyo
T702	154-064J	FBT FCB(2) * 064J-14SP3

Service Adjustments Cont'd.

ASC Alignment (40.4 MHz Trap)

Note: This alignment is only applicable to the ASC TRAP of PAL-B/G models (FTZ version).

ASC Alignment Waveform (Adjusted VIF Waveform)

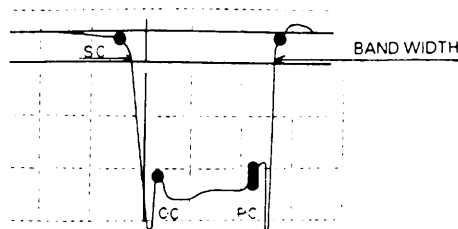


Fig 5.

Alignment Steps

- 1: The level condition of instrument is the same as the AFT Alignment step 4.
- 2: Connect the chassis to the instrument as shown in fig. 2.
- 3: Turn the VL204 (40.4 MHz TRAP) counter-clockwise with 4 - 5 turns. turn it to the clockwise and stop before the right bandwidth of the waveform is decreasing to perform this alignment.

SIF Alignment

SIF Alignment Waveform

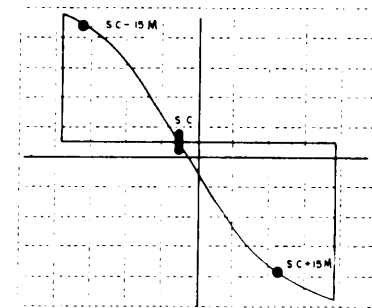


Fig 6.

Alignment Steps

- 1: Change the IF unit of the sweep generator to the sound unit of each system (PAL: 1:6.0 MHz, PAL-B/G: 5.5 MHz).
 - 2: Adjust the IF AGC voltage. The IF AGC voltage is the same as the AFT Alignment step 4.
 - 3: The level condition of instrument is the same as the ASC alignment step 3.
 - 4: Connect the chassis to the instrument.
 - 5: Adjust the SIF waveform with the vertical variable of the Alignment Scope (10 columns).
 - 6: Adjust the VL203 until the sound carrier (S.C.) becomes to vertical centre line and the S.C. ± 0.15 MHz mark line becomes as straight a line as possible.
- * When performed the VIF, AFT, ASC, SIF alignment:
- 1: Disconnect the chassis from instrument.
 - 2: Short the SLT1.
 - 3: Disconnect the SUP CPT board from the chassis.

Sync and PAL Matrix Alignment (Complete TV)

Connecting Diagram of Instrument.
(V. Synchronisation, H. Synchronisation, Colour Synchronisation).

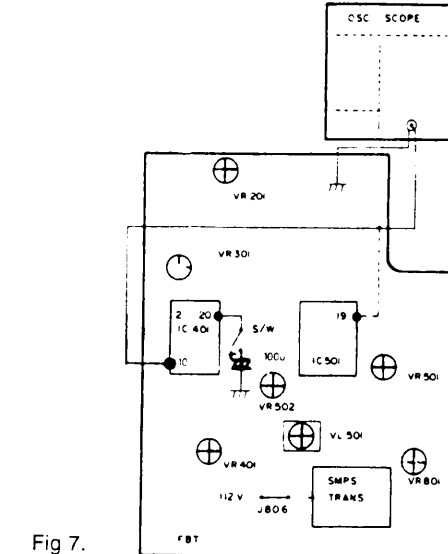


Fig 7.

- * V. Sync alignment: Connect the SCOPE to the V. output terminal (pin 10 of IC401).
- * H. Sync Alignment: Ground the synchronisation input terminal (pin 20 of IC401) with a capacitor (0.1mF).
- * Colour Sync/PAL Matrix Alignment: Connect the SCOPE to the B-out terminal (pin 19 of IC501).

Caution: After connecting each connector of the chassis and jig correctly, supply the power source.

Preliminary Steps

- 1: Set the screen and focus volume of FBT to the mechanical centre position.
- 2: Put the CPT PCB ASSY on the CPT and connect the power cord to the power source.

V. Sync Alignment Steps

- 1: Connect the chassis to instrument as shown in fig. 7.
- 2: Turn the TV on (non signal).
- 3: Press the SVC 1 key on the remote control unit to put TV screen into normal light (brightness, colour, contrast: 80%).
- 4: Adjust the VR301 until the V. Oscillating frequency becomes 46.0 ± 0.5 Hz.

+B (112V) Simple Alignment & H. Sync Alignment Steps

- 1: Input the standard colour signal with 60dB (PAL - 1: 30CH, PAL - B/G: 0.5CH).
- 2: Adjust the VR801 for the +B (112V) voltage (by H. Size).
- 3: If you have noise, remove it by adjusting VR201.
- 4: Switch the S/W of jig on (short).
- 5: Adjust the VR402 to keep the vertical and horizontal sync on the screen.
- 6: Switch the S/W of jig off (open).

Colour Sync & PAL Matrix Alignment

Colour Alignment Waveform

- * Circumference Condition: Scope range (Volts/DIV: 1V, SEC/DIV: 5mS).
- 2: Standard Colour Signal (60dB).

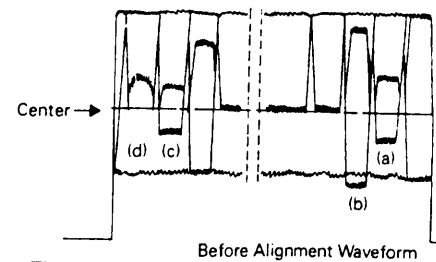


Fig 8.

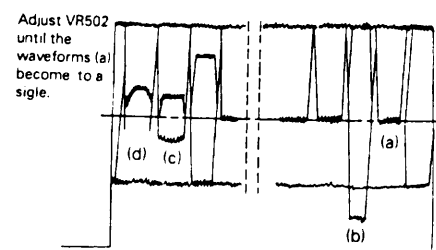


Fig 9.

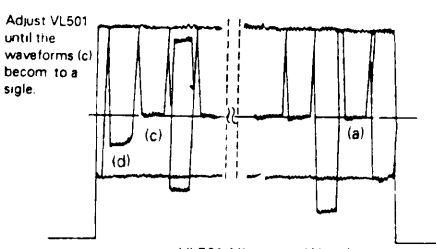


Fig 10.

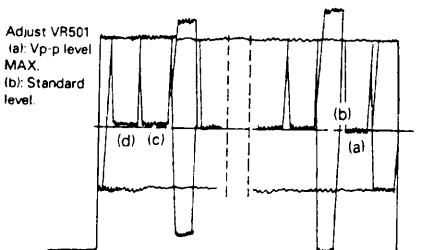


Fig 11.

Colour Alignment Steps

- 1: Connect the chassis to the instrument.
- 2: Input the standard colour signal with 60dB.
- 3: Adjust the VR501 until the colour level becomes to max.
- 4: Adjust the VR502 until it becomes to the waveform Fig 9.
- 5: Adjust the VR501 until it becomes to the waveform Fig 10.
- 6: If necessary re-adjust step 3 and 4.
- 7: Adjust the VR501 until it becomes to the waveform Fig 11.

General Alignment (Complete TV)

Main +B (112V) Alignment

- 1: Turn the TV on (the TV must be operated for at least 10 mins. prior to alignment).
- 2: Input the standard colour signal with 60dB (PAL - 1: 30CH, PAL - B/G: 0.5CH).
- 3: Press the SVC 1 key on the remote control unit to put the TV screen into normal light.
- 4: Adjust the VR801 until the voltage of the TP112V (J806) becomes to 112V under the screen size 20" (tolerance $+0.2$, -0.0 V).

RF AGC Alignment

- 1: Input the standard colour signal. [PAL - 1 (UHF): 60dB ± 1 , PAL - B/G (VHF): 60dB ± 1] to the TUNER RF input terminal.
- 2: Connect the digital multimeter to the TP.AGC (J203).
- 3: Adjust the VR201 as shown below:

Tuner System	B/G	I
G/S ALPS	4.8V ± 0.1	5.5V ± 0.1

Screen & White Balance Alignment

- 1: Input the standard colour signal.
- 2: Set the VR504, VR505, VR506 (adjusting the cut-off of R, G, B) and VR503, VR507 (adjusting the bias of R-Y, B-Y) to the mechanical centre position.
- 3: Adjust the screen voltage at the point which is the screen cut-off, after pressing the SVC 2 key on the remote control to put the TV screen into low light, (bright, colour, contrast is minimum).
- 4: Adjust the white balance after pressing the SVC 1 key to put the TV screen into normal light.
- 5: Adjust it, X = 281 ± 8 , Y = 288 ± 8 at the low light (6ft. L)/ high light (45ft. L), by using the Colour Analyser White Balance Checker.

Focus Alignment

- 1: Input the standard colour signal and press the SVC 2 key to put the TV screen into high light (bright, contrast maximum, colour minimum).
- 2: Adjust the focus to remove the Halo situation on the screen centre or edges and logo portion.

Horizontal and Shift Alignment

- 1: Input the standard colour signal.
- 2: Adjust VR401 until the screen becomes to horizontal centre.

Vertical Centre Alignment

- 1: Adjust SW701 (vertical centre SVC S/W) until the vertical centre of the pattern becomes to the effective screen centre of the CPT.

Vertical Amplitude and Linearity Alignment

- 1: Press the SVC 2 to put the TV screen into high light (bright and contrast Maximum, Colour minimum).
- 2: Adjust VR701 until the large circle over sweeps the top and bottom of the CPT by the same.
- 3: When the brightness is max. adjust VR702 until the large circle over sweeps the top and bottom of the CPT by 5mm.

Caution: after adjusting the vertical linearity (step 2) first, adjust the vertical size (step 3).

Purity and Convergence Adjustment

Caution: Convergence and purity have been factory aligned. Do not attempt to tamper with these alignments. However, the effects of adjacent receiver components, or replacement of picture tube or deflection yoke may require the need to re-adjust purity and convergence. Convergence magnet assembly and rubber wedges need mechanical positioning following figure 12.

Before attempting any convergence adjustments this receiver should be operated for at least 15 minutes.
If adjustment is required the adjustments should be made in the following sequence.

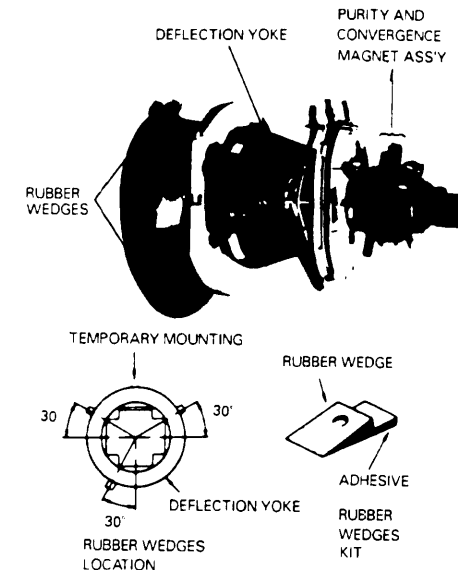


Fig 12.

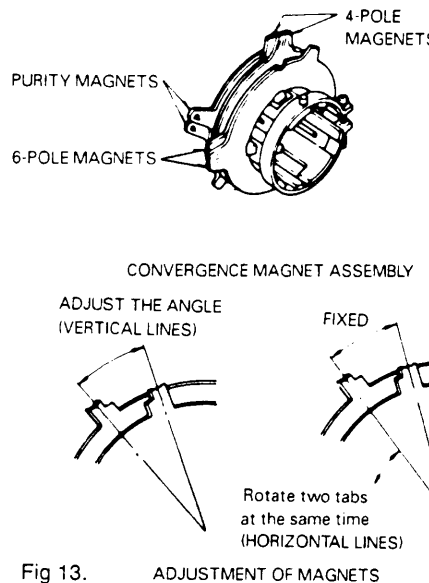


Fig 13.

Colour Purity Adjustment

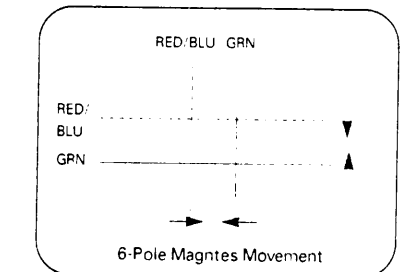
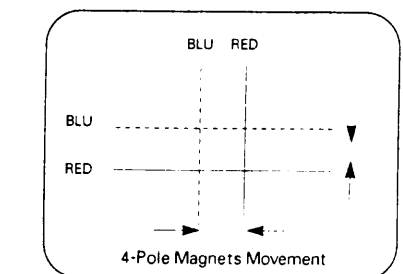
- 1: De-magnetise the picture tube and cabinet using a degaussing coil.
- 2: Turn the contrast and brightness controls to maximum.
- 3: Select the purity pattern consisting of green only on the pattern generator.
- 4: Loosen the clamp screw holding the yoke and slide the yoke backward to provide vertical green belt (zone) in the picture screen.
- 5: Remove the rubber wedges.
- 6: Rotate and spread the tabs of the purity magnet (see fig. 13) around the neck of the picture tube until the green belt is in the centre of the screen. At the same time, centre the raster vertically.
- 7: Move the yoke slowly forwards or backwards until a uniform green screen is obtained. Tighten the clamp screw of the yoke temporarily.
- 8: Check purity of the red and blue rasters by selecting the purity pattern of the pattern generator.
- 9: Obtain a white raster, referring to White Balance Adjustment.
- 10: Proceed with convergence adjustment.

Centre Convergence Adjustment

- 1: Receive a cross hatch pattern with a colour bar signal generator.
- 2: Adjust the brightness and contrast controls for a well defined pattern.
- 3: Adjust two tabs of the 4-pole magnets to change the angle between them (fig. 13) and superimpose the red and blue vertical lines in the centre area of the picture screen (fig. 14).
- 5: Adjust two tabs of 6-pole magnets to superimpose red/blue line with a green one. Adjusting the angle affects the vertical lines and rotating both magnets affects the horizontal lines.
- 6: Repeat adjustments 1, 2, and 3 keeping in mind red, green and blue movements, because 4-pole magnets and 6-pole magnets interact and make dot movement complex.

Circumference Convergence Adjustment

- 1: Loosen the clamping screw of DY to allow the yoke to tilt.
- 2: Adjust DY to obtain a better convergence in the circumference by orbital movement of the front of the yoke, then secure the DY in appropriate position by placing the wedges as shown in fig. 12. Tighten the screw holding the DY. Stick 3 adhesive tapes on wedges as shown in fig. 12.



Center Convergence by Convergence Magnets

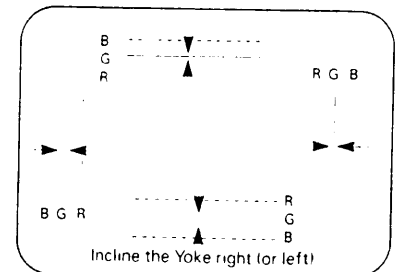
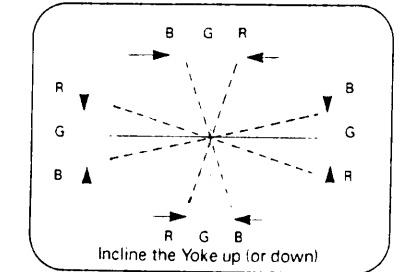
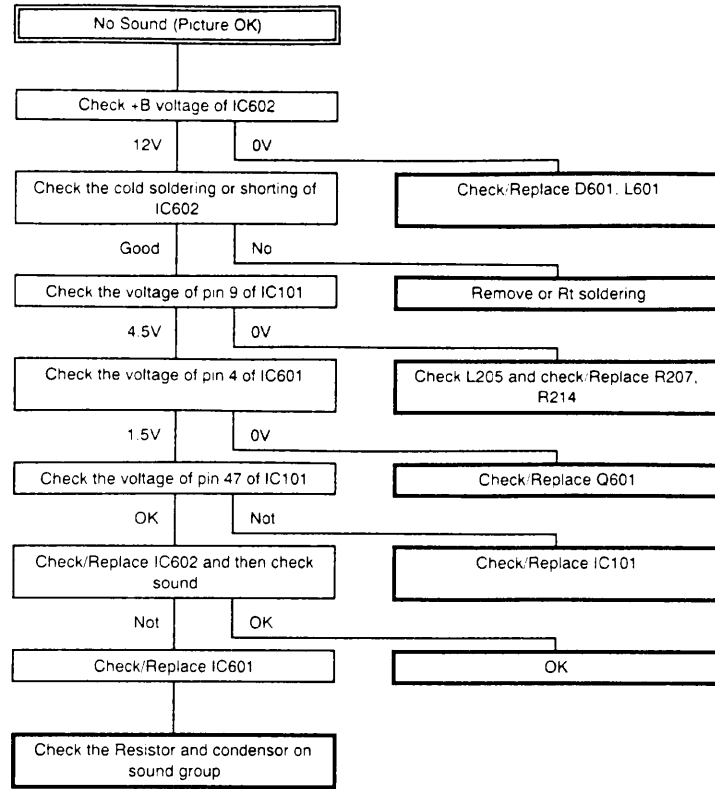
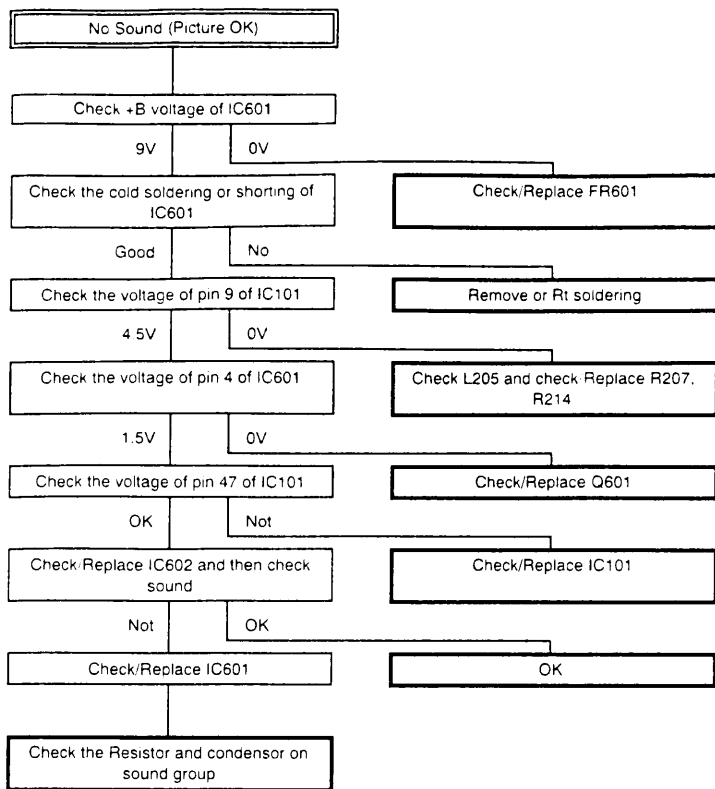
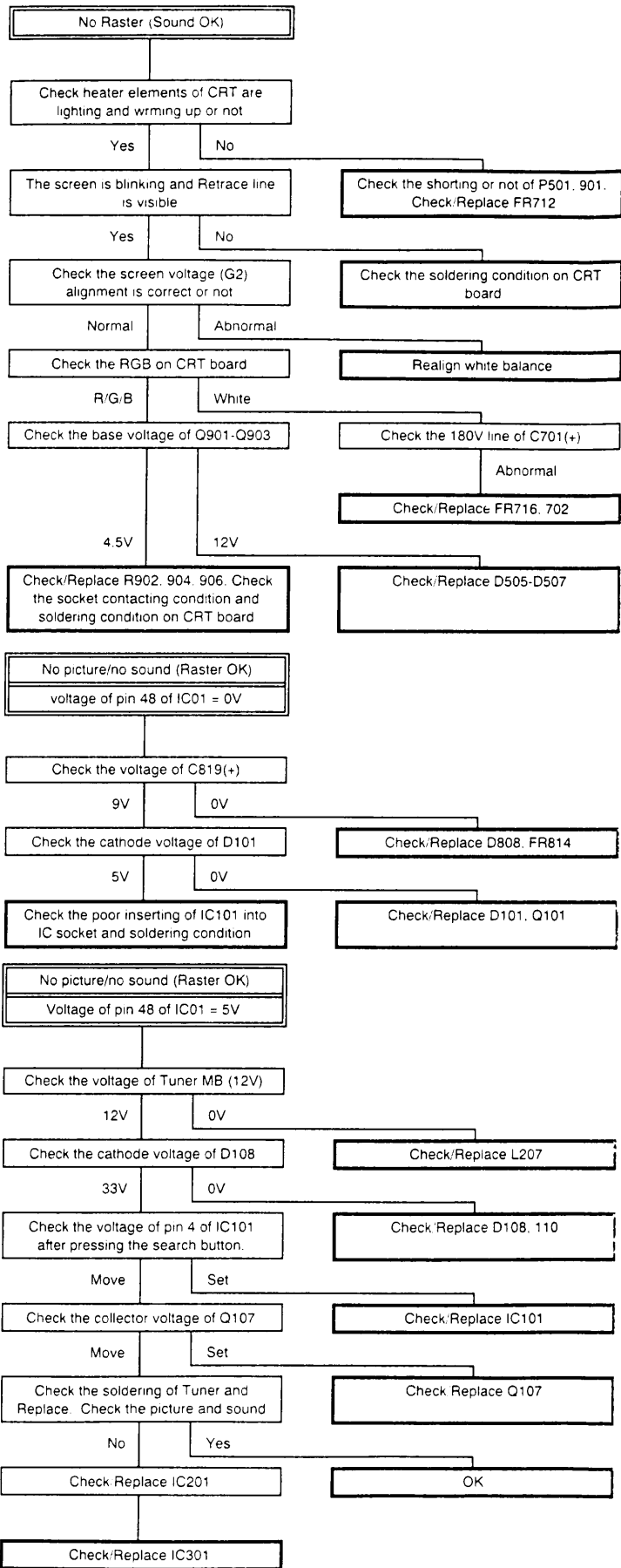
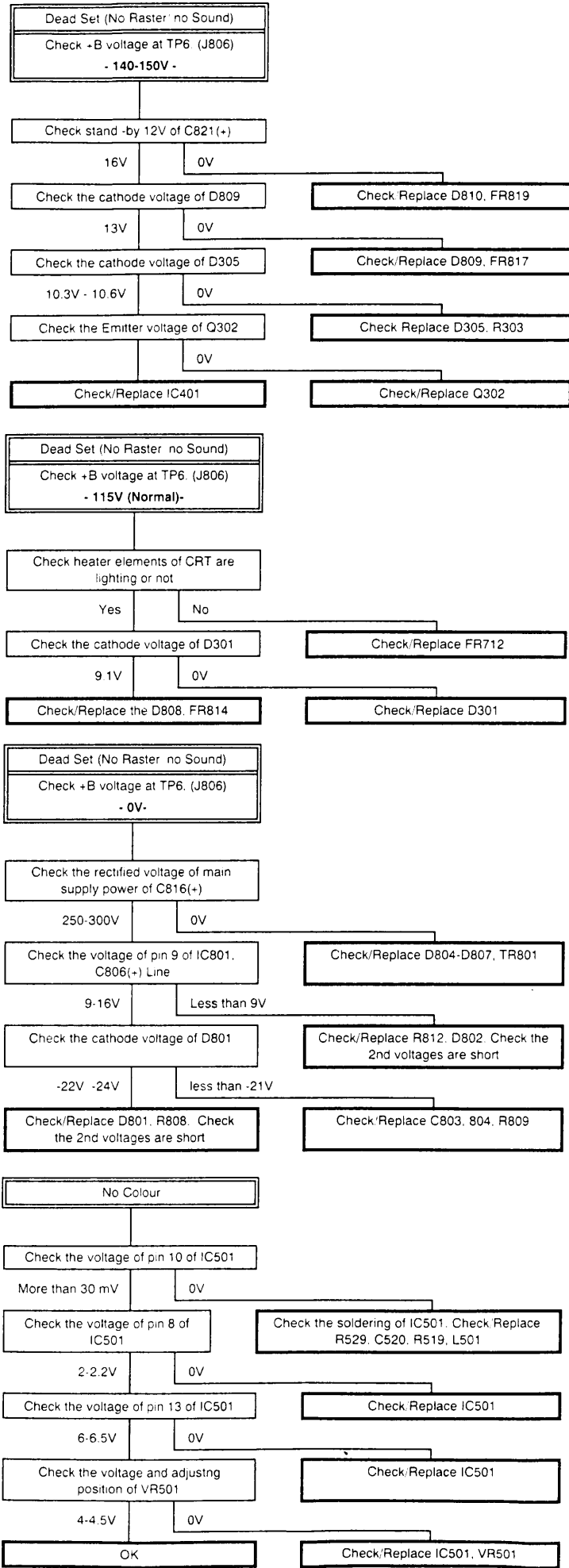
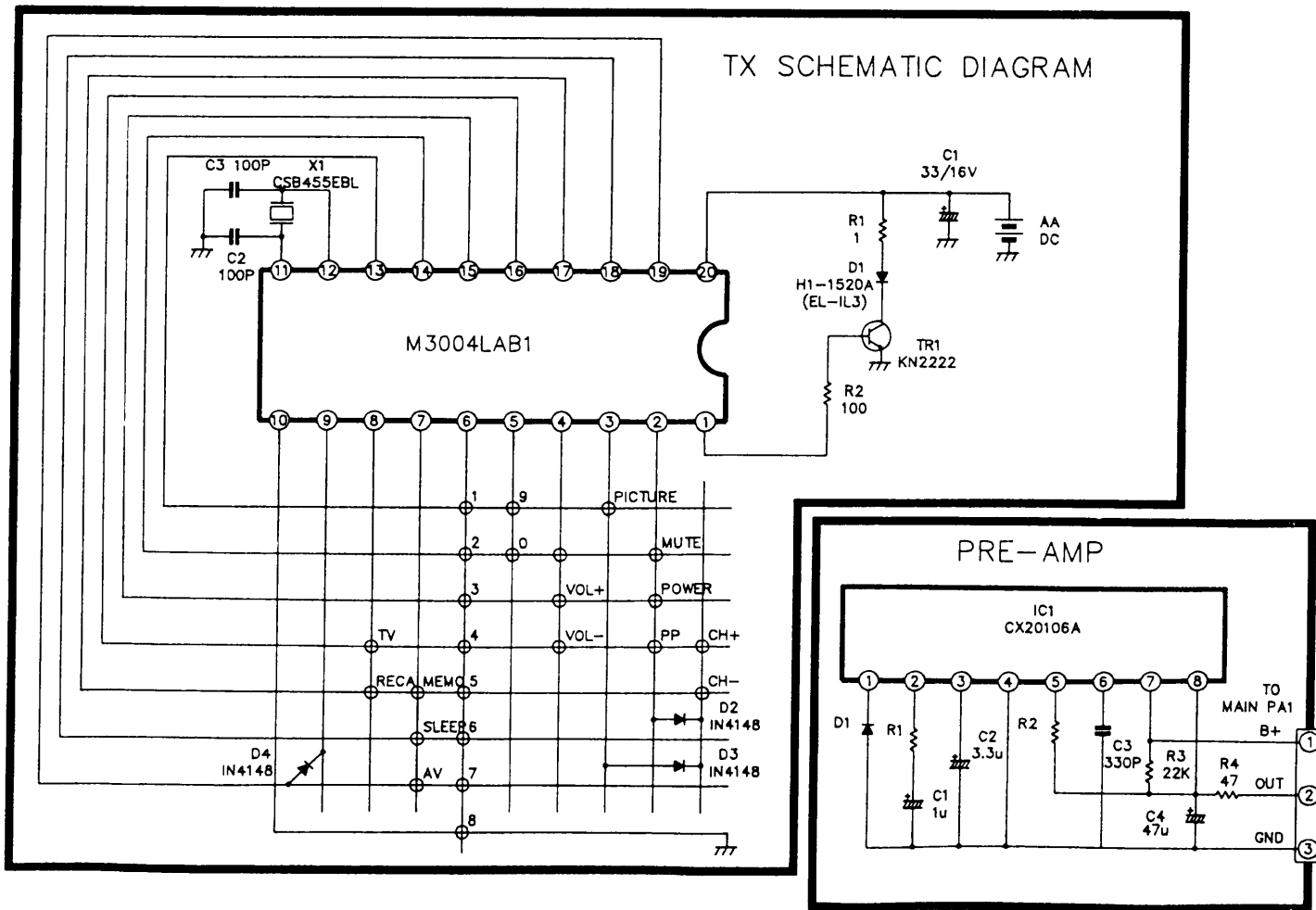


Fig 14.

Trouble Shooting Guides



Remote Control Diagram



Main Diagram

Waveforms

