PHILCO

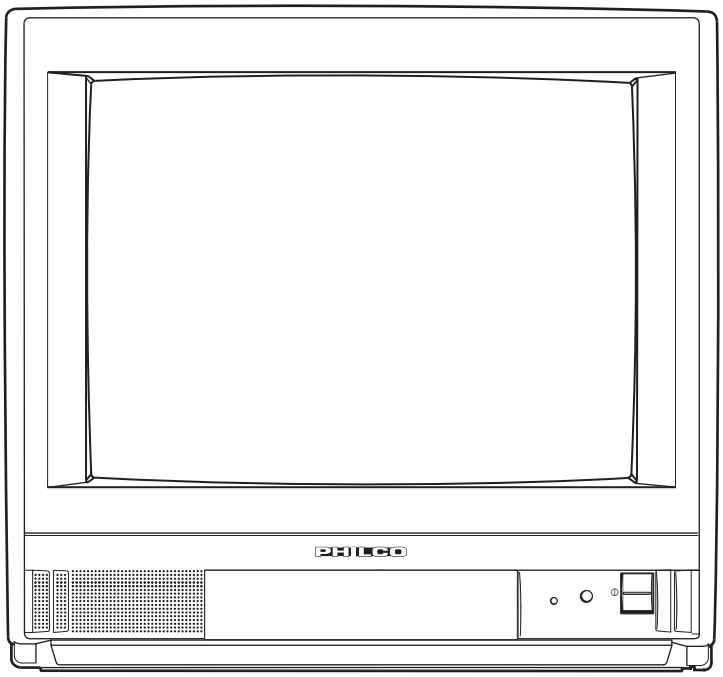
FILE NO.

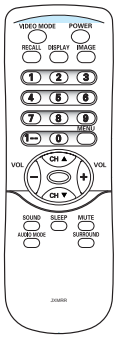
SERVICE MANUAL Colour Television

Model No. PM1414

(Argentina)

Service Ref. No. PM1414-00





Specifications

Power Source . . . . . .AC220V, 50Hz / 60Hz
Receiving System . . . . . .PAL (M/M, N/N), NTSC (M/M)
Channel Coverage
Antenna mode VHF: CH02-CH13, UHF: CH14-CH69
CATV mode VHF band: CH01-CH13, Mid band: CH14-CH22
Super band: CH23-CH36, Hyper band: CH37-CH64
Ultra band: CH65-CH94 and CH100-CH125
Low mid band: CH95-CH99
Video IF 45.75MHz
Aerial Input Impedance . . 75Ω
Ext. Terminals
Video inputs: Phono jack × 2 (1Vp - p, 75Ω)
Audio inputs: Phono jack × 2 (436mVrms, more than 40KΩ)
Headphone Jack (Mono) × 1
Sound Output (RMS) 2W
Speakers . . . . . 5 cm x 9 cm x 1 pc.
Dimensions . . . . . 377 (W) × 355 (H) × 384.5 (D)mm
Weight . . . . . approx. 8.7 Kg

Specifications subject to change without notice.

Product Code: 111342014

Original Version

Chassis Series: LA5-A

Give complete “SERVICE REF. NO.” for parts order or servicing. It is shown on the rating plate at the cabinet back of the unit.

This T.V. receiver will not work properly in foreign countries where the television transmission system and power source differ from the design specifications. Refer to the specification table.

F8FS

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Safety Notice

SAFETY PRECAUTIONS

1: An isolation transformer should be connected in the power line between the receiver and the AC line when a service is performed on the primary of the converter transformer of the set.

2: Comply with all caution and safety-related notes provided on the cabinet back, inside the cabinet, on the chassis or the picture tube.

3: When replacing a chassis in the cabinet, always be certain that all the protective devices are installed properly, such as, control knobs, adjustment covers or shields, barriers, isolation resistor-capacitor networks etc.. Before returning any television to the customer, the service technician must be sure that it is completely safe to operate without danger of electrical shock.

X-RADIATION PRECAUTION

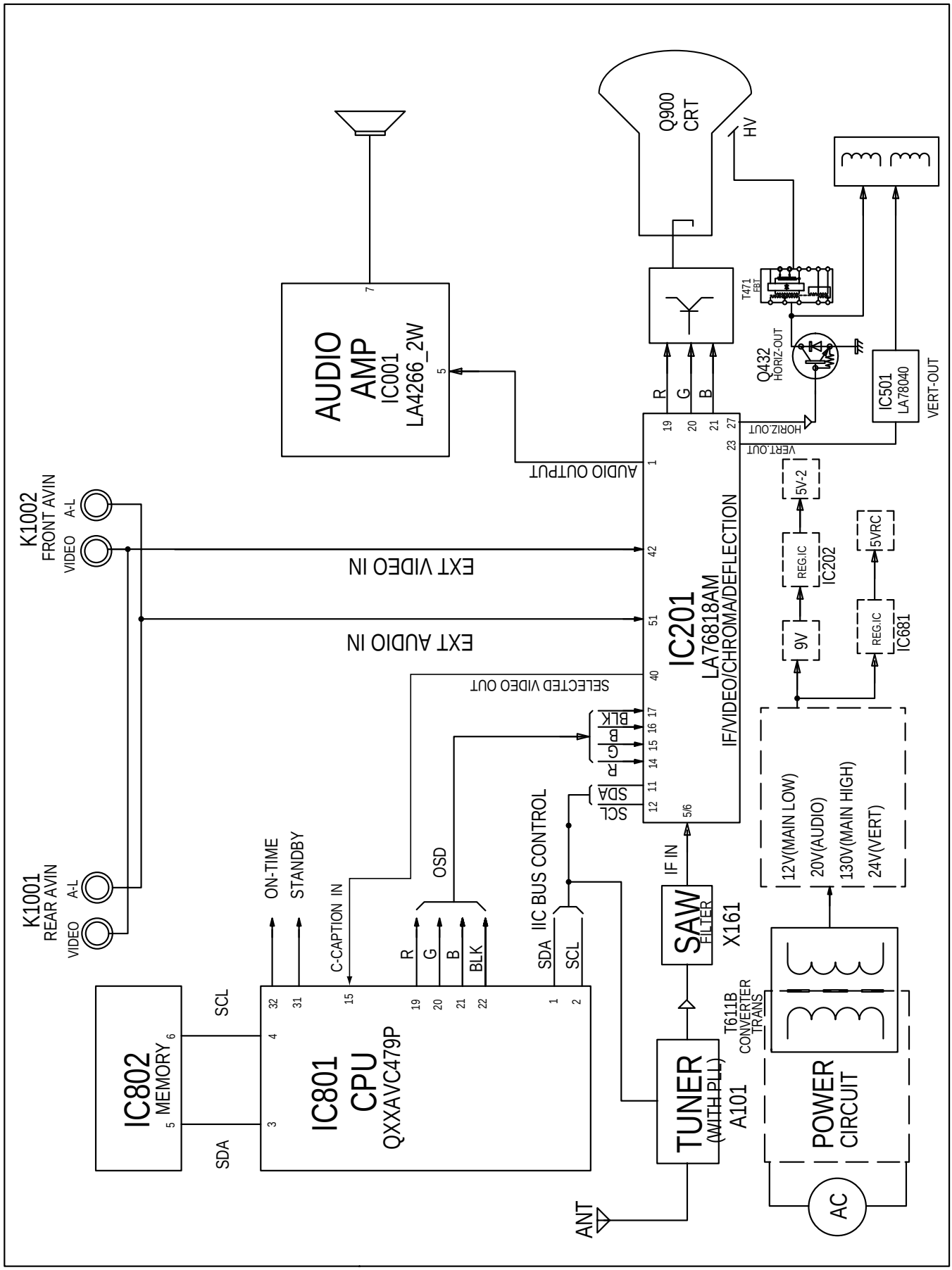
The primary source of X-RADIATION in television receiver is the picture tube. The picture tube is specially constructed to limit X-RADIATION emissions. For continued X-RADIATION protection, the replacement tube must be the same type as the original including suffix letter. Excessive high voltage may produce potentially hazardous X - RADIATION. To avoid such hazards, the high voltage must be maintained within specified limit. Refer to this service manual, high voltage adjustment for specific high voltage limit. If high voltage exceeds specified limits, take necessary corrective action. Carefully follow the instructions for + B1 volt power supply adjustment, and high voltage check to maintain the high voltage within the specified limits.

PRODUCT SAFETY NOTICE

Product safety should be considered when a component replacement is made in any area of a receiver. Components indicated by mark ⚠ in the parts list and the schematic diagram designate components in which safety can be of special significance. It is particularly recommended that only parts designated on the parts list in this manual be used for component replacement designated by mark ⚠ . No deviations from resistance wattage or voltage ratings may be made for replacement items designated by mark ⚠ .

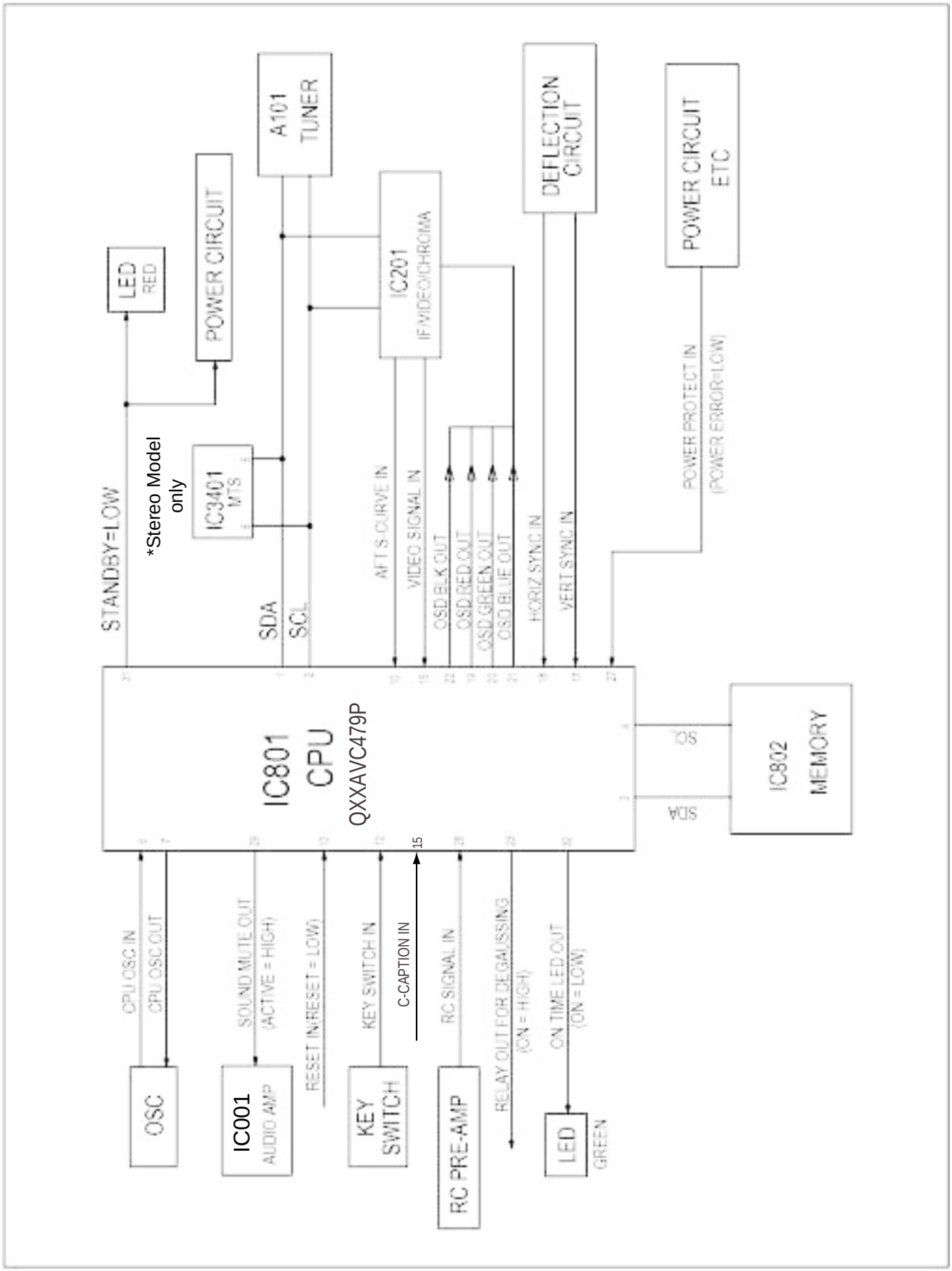
Chassis Block Diagrams

MAIN SIGNAL PROCESSING CIRCUIT



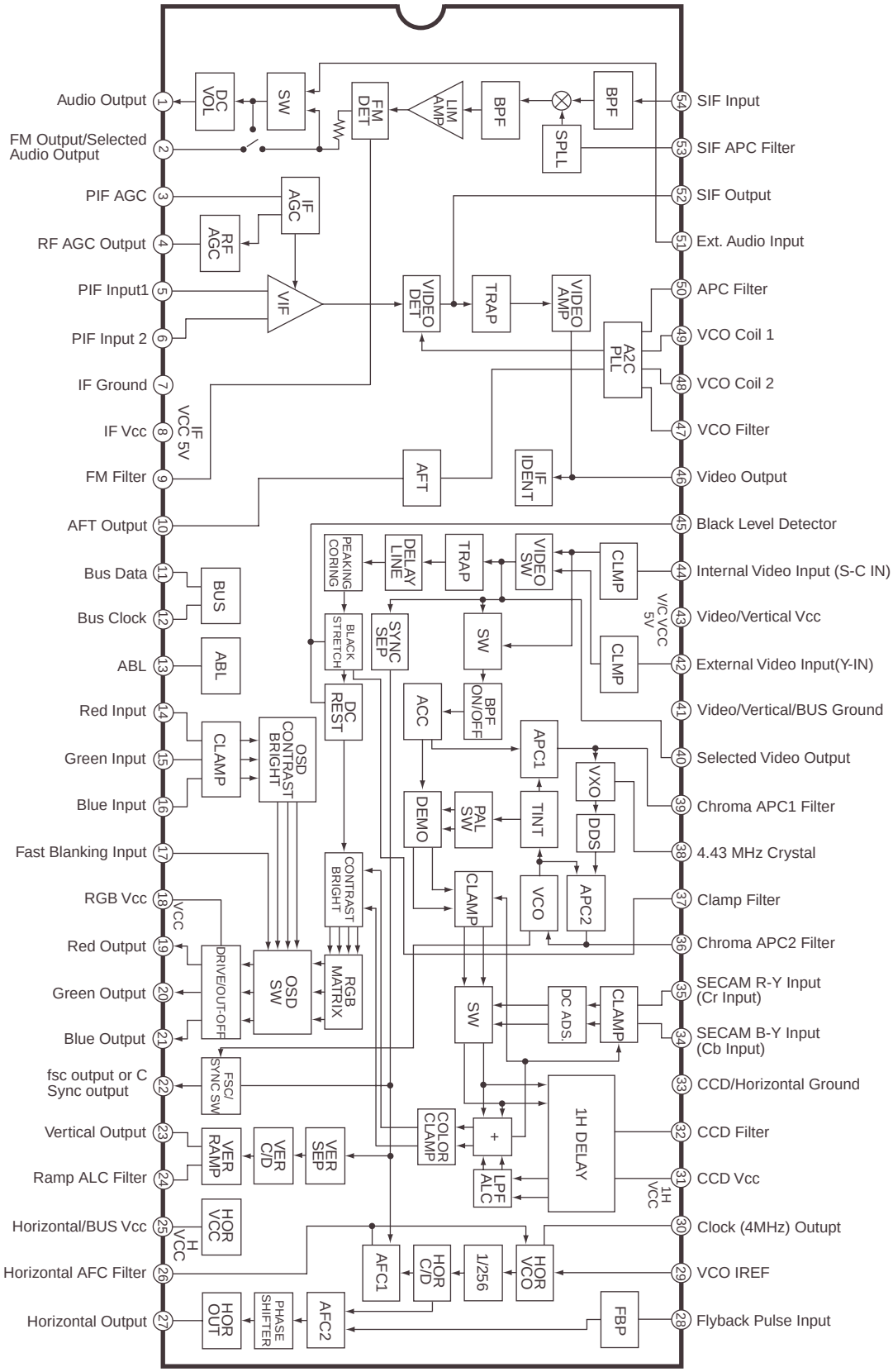
Chassis Block Diagrams

SYSTEM CONTROL



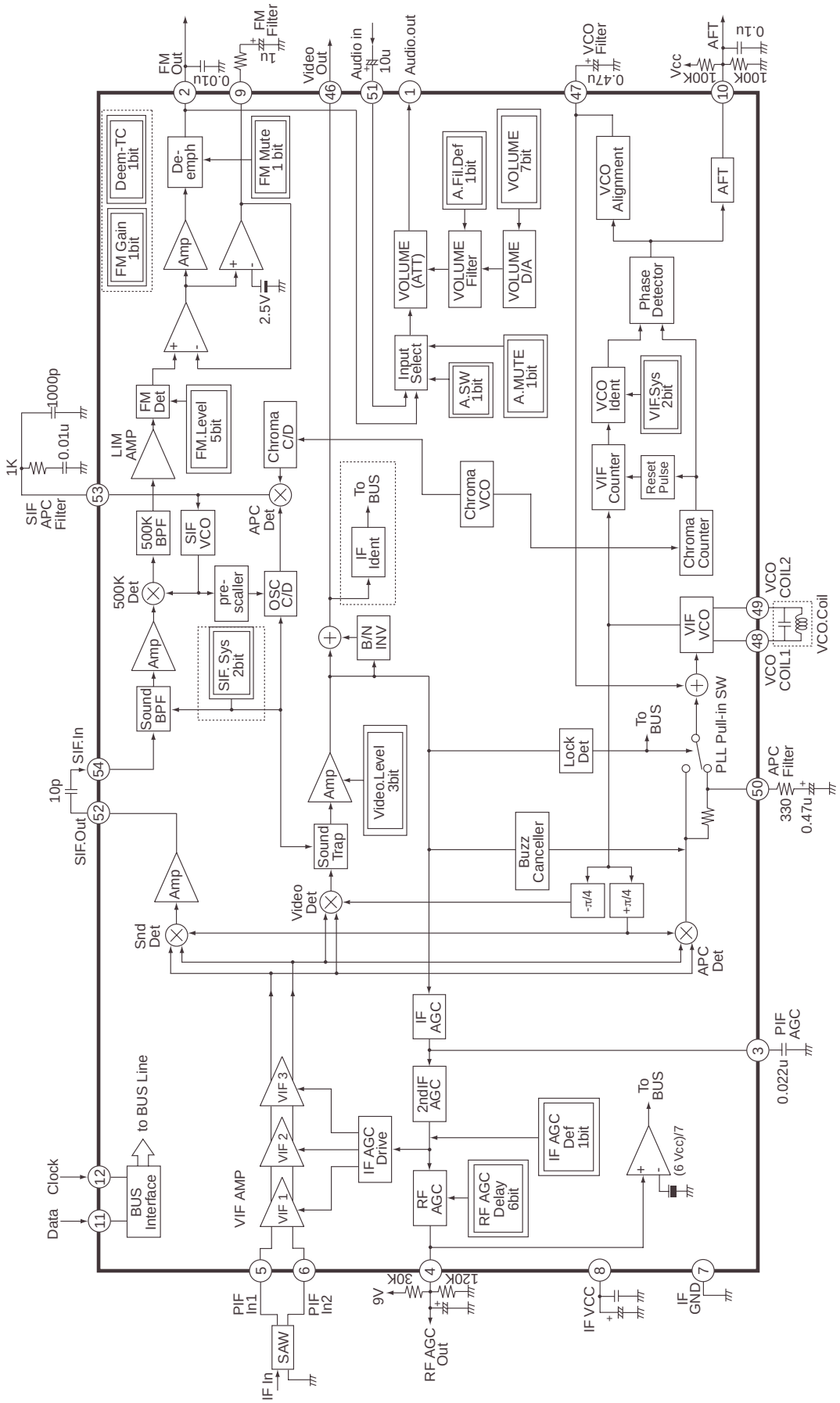
IC Block Diagrams

IC201 < IF/Video/Chroma/Def. > LA76818A



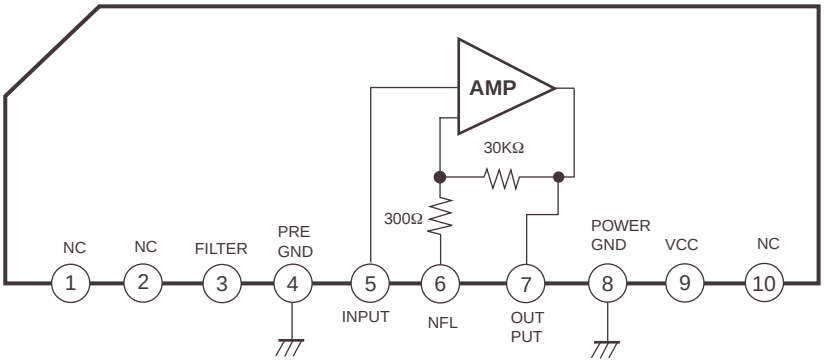
IC Block Diagrams

IC201 <IF System Block Diagram> LA76818A

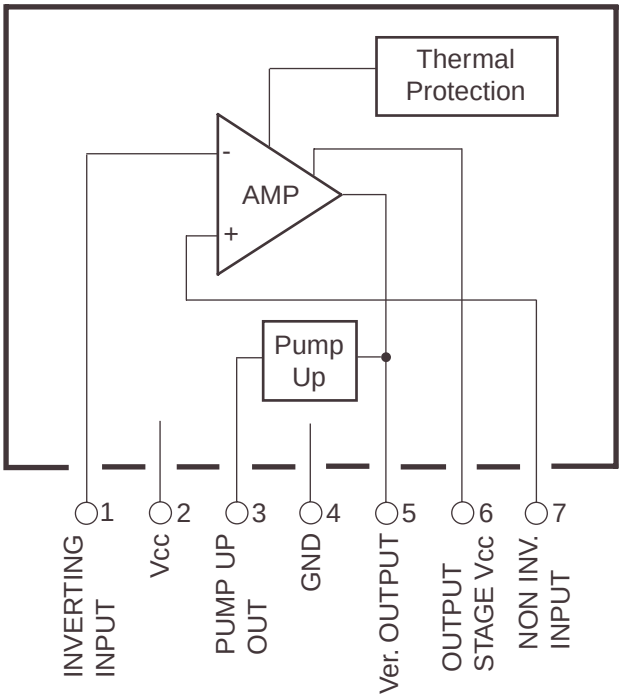


IC Block Diagrams

IC001 < Audio AMP. > LA42052-E



IC501 < Vertical Output > LA78040N, TDA9302H



Service Adjustments

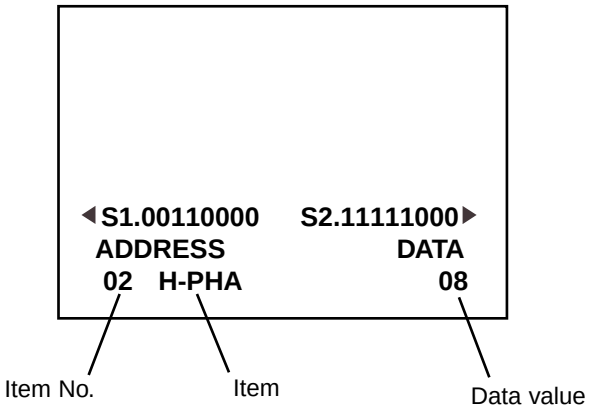
General

This set has an On-screen Service Menu system included in the CPU thar allows remote operation for most of the service adjustments.

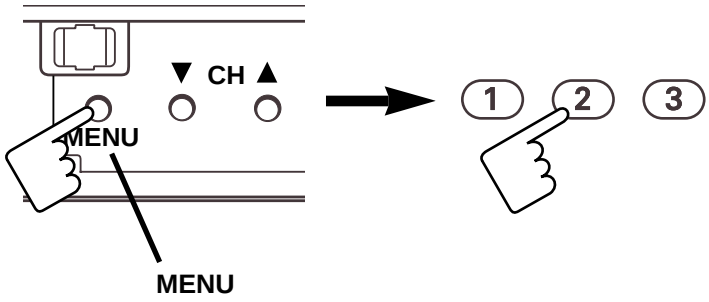
Service Adjustment-1

1. Enter the Service Menu

While pressing the **MENU** button on the television, press the Number Key **2** on the remote control unit. The Service Menu now appear.



[Service Mode Display]

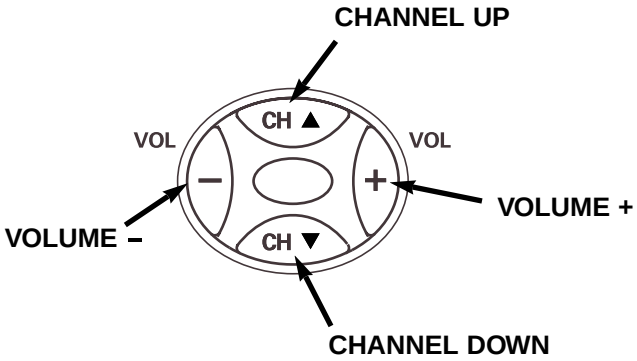


[Entering the Service Menu]

2. Service Adjustments:

Press the **CHANNEL UP** or **CHANNEL DOWN** button on the remote control handset to select the desired service menu item you want to adjust.

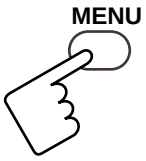
Use the **VOLUME +** or **–** to adjust the data. The **+** or **–** button will increase or decrease the data sequentially.



[Service Adjustment]

3. Exit from the Service Menu

Press the **MENU** button to turn off the Service Menu display.
The data which is set in the service mode is stored into the memory IC automatically.



[Exit from the Service Menu]

Service Adjustments

On-screen Service Menu

Following table shows the initial values which have been stored in the CPU ROM, and items for the service adjustments.

No.	Item	Initial value	Range	Description
01	RFAGC	06	00~63	RF AGC adjustment
02	H-PHA	08	00~31	H-PHASE adjustment (50Hz)
03	V-POS	32	00~63	Vertical position adjustment (50Hz)
04	V-SIZ	54	00~127	Vertical size adjustment (50Hz)
05	V-SCO	17	00~31	Vertical-S compensation (50Hz)
06	VLIN	15	00~31	Vertical linearity adjustment (50Hz)
07	H-P60	+4	-16~+15	Difference value of H-PHASE adjustment (60Hz)
08	V-P60	0	-32~+31	Difference value of V-POSITION adjustment (60Hz)
09	V-S60	+1	-64~+63	Difference value of V-SIZE adjustment (60Hz)
10	VSC60	0	-16~+15	Difference value of Vertical-S compensation (60Hz)
11	VLI60	+1	-16~+15	Difference value of Vertical linearity adjustment (60Hz)
12	OSDHP	30	01~255	OSD horizontal remark position
13	OSDC	50	00~127	OSD contrast
14	V-SCP	07	00~07	V-SIZE COMP (50Hz)
15	SBIAS	70	00~127	Sub Bias adjustment
16	RBIAS	00	00~255	Red Bias adjustment
17	GBIAS	00	00~255	Green Bias adjustment
18	BBIAS	00	00~255	Blue Bias adjustment
19	RDRIV	63	00~127	Red Drive adjustment
20	GDRIV	07	00~15	Green Drive adjustment
21	BDRIV	63	00~127	Blue Drive adjustment
22	– –	– –	– –	White balance (a lateral line)
23	DRV	– –	– –	Brightness and dark of White balance adjustment
24	B-YD	10	00~15	B-Y DC Level
25	R-YD	10	00~15	R-Y DC Level
26	B-YND	0	-16~+15	Difference value of NTSC B-Y DC Level
27	R-YND	0	-16~+15	Difference value of NTSC R-Y DC Level
28	G-YA	00	00,01	G-Y Angle
29	RBGB	08	00~15	R-Y/B-Y Gain Balance
30	RBAG	08	00~15	R-Y/B-Y Angle
31	G-YAN	00	00,01	Difference value of NTSC G-Y Angle
32	RBGBN	0	-8~+7	Difference value of NTSC R-Y/B-Y Gain Balance
33	RBABN	0	-8~+7	Difference value of NTSC R-Y/B-Y Angle
34	COGV	01	00~03	Coring gain
35	BLK	03	00~03	BLK. STR. Start (W/Defeat)
36	BLKG	03	00~03	BLK. STR. Gain
37	BRTA	00	00, 01	BRT. ABL Defeat
38	BRST	00	00, 01	Mid. Stp. Defeat
39	BRTH	00	00~07	Bright. ABL. Threshold
40	WPL	00	00~03	WPL Ope. Point (W/Defeat)
41	YGAM	00	00~03	Y Gamma Start
42	PORW	00	00, 01	AV Mode Pre/Over SW
43	PORS	02	00~03	AV Mode Pre/Over-shoot adjustment
44	RFCO	0	00~03	Difference Value of RF Corring Gain
45	PORWN	01	00, 01	RF Pre/Over SW
46	PORSN	03	00~03	RF Pre/Over-shoot adjustment
47	TINT	0	-16~+15	Tint
48	SHRF	0	-16~+15	Difference Value of RF Sharpness
49	TEXC	08	00~127	OSD Text Contrast
50	AUFL	00	00, 01	Auto. Fresh

To be continued.

Service Adjustments

No.	Item	Initial value	Range	Description
51	COOP	07	00~07	Colour Killer
52	Y-APF	01	00, 01	Y-APF Select
53	DEEM	00	00, 01	De-emphasis TC
54	V-LVL	04	00~07	Video Level
55	FMLVL	16	00~31	FM Level
56	TTEST	00	00~07	Trap Test
57	IFOM-S	00	00, 01	Over Mod. SW
58	IFMN-S	00	00, 01	Audio Monitor SW, Monitor/FM
59	IFTRPS	01	00, 01	IC Built-in SIF Trap ON/OFF
60	IFMLVL	136	00~255	Video Level Coarse Adjustment & Mod. Operating Dot Setting
61	VBSW	00	00, 01	VBLK SW
62	FBTS	00	00, 01	FBP Blanking SW
63	HBLKL	06	00~07	H-Blanking Control Left
64	HBLKR	04	00~07	H-Blanking Control Right
65	AFCRF	00	00, 01	Adjustment of AFC Gain & Gate (RF)
66	VSURF	00	00, 01	Adjustment of Vertical Sync. Separation Sensitivity (RF)
67	CDMRF	00	00~07	Vertical Count Down Loop Adjustment (RF)
68	AFCAV	00	00, 01	Adjustment of AFC Gain & Gate (AV)
69	VSUAV	00	00, 01	Adjustment of Vertical Sync. Separation Sensitivity (AV)
70	CDMAV	00	00~07	Vertical Count Down Loop Adjustment (AV)
71	HLK-T	00	00, 01	H-lock, V-Det. (RF)
72	HLK-V	00	00, 01	H-lock, V-Det. (AV)
73	VCO-SW	00	00, 01	C. VCO Adjustment SW
74	VCOADJ	03	00~03	C. VCO Adjustment
75	GRAY	00	00, 01	Gray Mode
76	CROSS	00	00~03	Cross Black/White
77	HL-SW	01	00, 01	Half Tone ON/OFF
78	HL-TON	00	00~03	Half Tone Level
79	AVNCON	64	00~127	Contrast (No Signal in AV)
80	AVNBRI	64	00~127	Brightness (No Signal in AV)
81	POMT	12	00~127	Power Mute Time
82	CHMT	12	00~31	Channel Mute Time
83	SYST	03	00~255	System-N
84	RELAY	80	00~255	Power Relay Time
85	CCD	31	00~31	Horizontal Remark Position Compensation Register
86	TVAVTM	00	00~255	AV/TV Mute Time

Important Notice:
Do not attempt to adjust service adjustments not listed on below otherwise it may cause loss of performance and for correct operation.

Service Adjustments

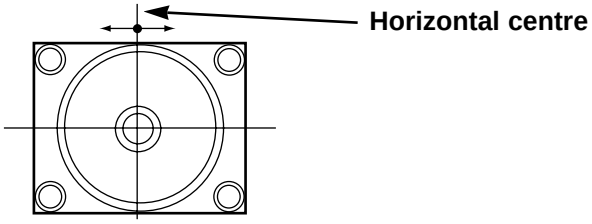
Item 01 [RFAGC] AGC

NOTE: Do not attempt this adjustment with weak signal.

(1) Tune the receiver to most clearest (or strongest) VHF station in your area. Set the brightness and contrast controls to maximum. Set the colour control to minimum.
(2) Select Item No. 01 [RFAGC] in the service mode.
(3) Change value until the snow noise just disappears.
(4) Exit from the service mode.

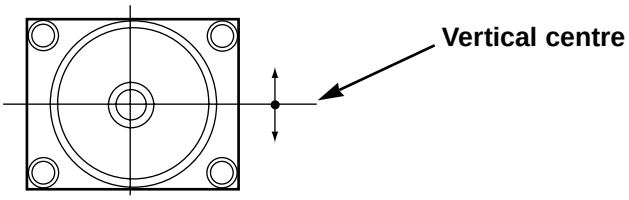
Item 02 [H-PHA] HORIZONTAL CENTRE

(1) Receive a monochrome circular pattern.
(2) Set the brightness and contrast to normal.
(3) Select Item No. 02 [H-PHA] in the service mode.
(4) Change value to be optimum horizontal centre position.
(5) Exit from the service mode.



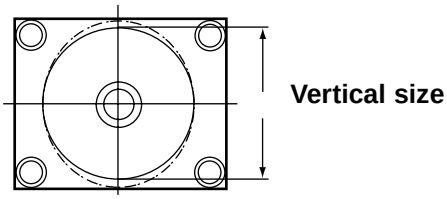
Item 03 [V-POS] VERTICAL CENTRE

(1) Receive a monochrome circular pattern.
(2) Set the brightness and contrast to maximum.
(3) Select Item No. 03 [V-POS] in the service mode.
(4) Change value to be optimum vertical centre position.
(5) Exit from the service mode.



Item 04 [V-SIZ] VERTICAL SIZE

(1) Receive a monochrome circular pattern.
(2) Set the brightness and contrast to maximum.
(3) Select Item No. 04 [V-SIZ] in the service mode.
(4) Change value to be optimum vertical size.
(5) Exit from the service mode.



Item 12 [OSDHP] OSD POSITION

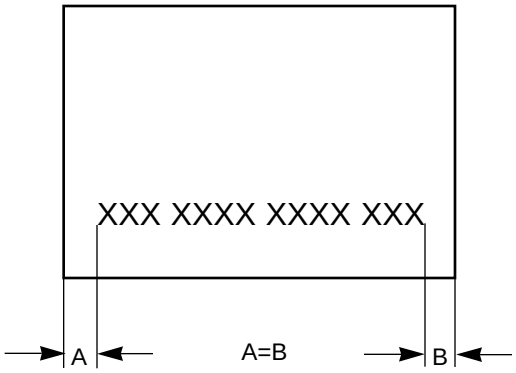
(1) Receive a monochrome circular pattern.
(2) Set the brightness and contrast to normal.
(3) Select Item No. 12 [OSDHP] in the service mode.
(4) Change value to be proper OSD position.
(5) Exit from the service mode.

Item 65 [AFCRF] AFC GAIN

(1) Switch on the TV.
(2) Select Item No. 65 [AFCRF] in service mode.
(3) Change data value to “01”.
(4) Exit from the service mode.

Item 85 [CCD] CAPTION H-POSITION ADJ.

(1) Tune receiver to a caption channel.
(2) Check that CAPTION position is in the horizontal center of the screen. If CAPTION center is too right or left, perform steps 3-6. (See figure below.)
(3) Select Item No. 85 [CCD] in the service mode.
(4) Adjust data with + or - key for proper horizontal center.
(5) Exit from the service mode



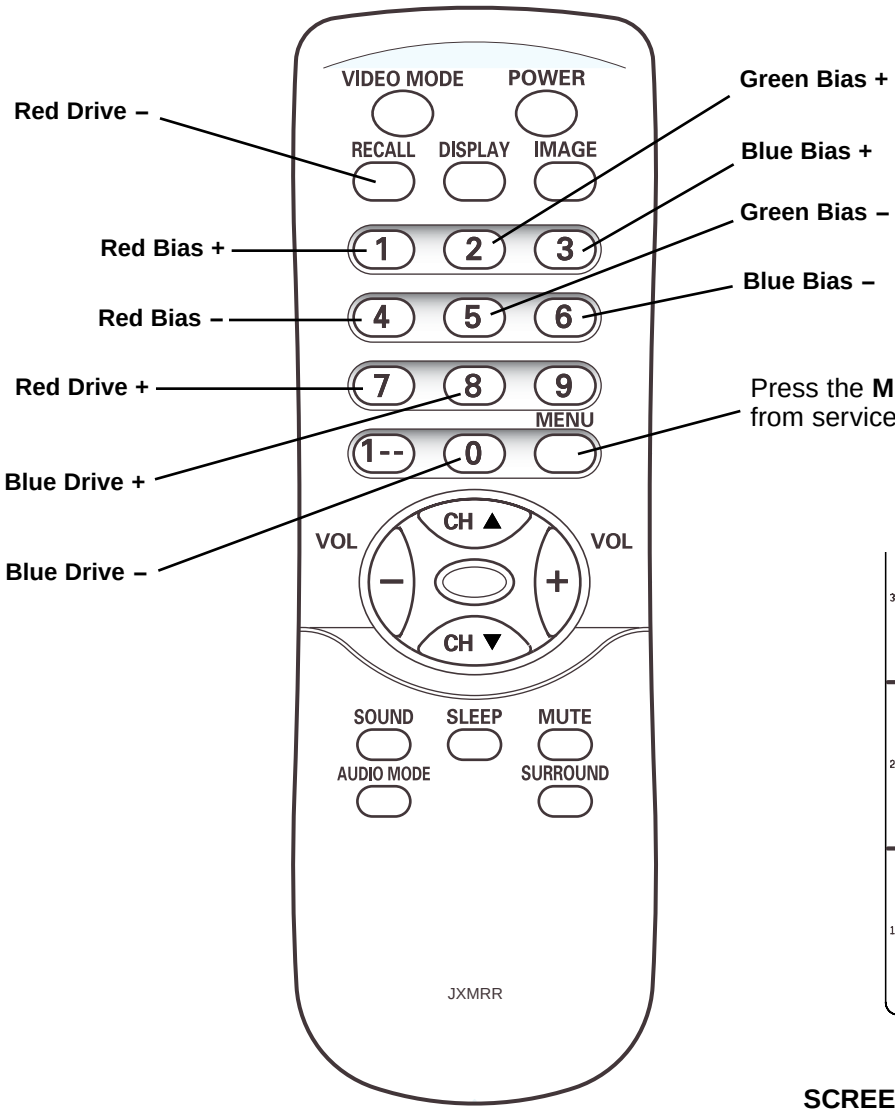
Caption H-position Adj.

Service Adjustments

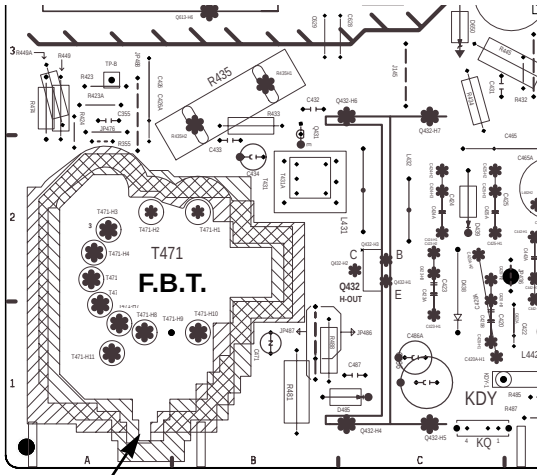
Items 16-23 GREY SCALE

(1) Receive a monochrome circular pattern.
(2) Set the brightness and colour to normal, contrast to maximum.
(3) Enter to the service mode.
(4) Set each value of Item-**16 RBIAS**, **17 GBIAS**, **18 BBIAS** mode to 00. Set each value of Item-**19 RDRIV**, **21 BDRIV** mode to 63, **20 GDRIV** to 07.
(5) Select Item-**22** mode to be one horizontal scanning line and turn the screen volume on the FBT to obtain just visible one coloured line.
(6) Press the **1 (Red Bias +)**, **4 (Red Bias –)**, **2 (Green Bias +)**, **5 (Green Bias –)**, **3 (Blue Bias +)** or **6 (Blue Bias –) button** to adjust the brightness of each colour until a dim white line produced. Please see the control button allocations in this mode.
(7) Select Item-**23 DRV** mode to enter the white balance adjusting mode.
(8) Press the **7 (Red Drive +)**, **RECALL (Red Drive –)**, **8 (Blue Drive +)** or **0 (Blue Drive –) button** alternately to produce normal black and white picture.
(9) Exit from the service mode.
(10) Check for proper grey scale tracking at all brightness levels.

NOTE: If the grey scale adjustment is made after picture tube replacement, check the high voltage.



MAIN BOARD



SCREEN VR
(Under side)

Service Adjustment-2

FINE TUNING

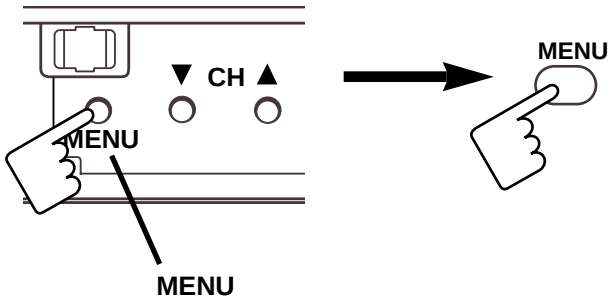
This adjustment is used to do a fine tuning of the channels with poor reception after they have been stored by the automatic tuning.
This function is available for one channel only and the fine-tuned channel is memorized into IC802 (EEPROM).

1. Enter the Service Menu

While pressing the **MENU** button on the television, press the "**4**" or MENU button on the remote control unit. The Service Menu now appear.

FINE TUNING	**–**	**+**

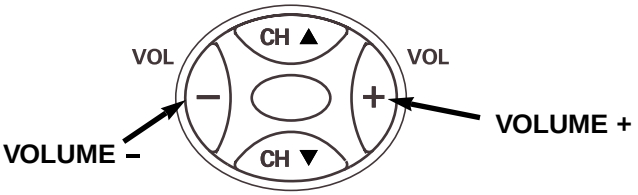
Fine tuning service mode



[Entering the Service Menu]

2. Service Adjustments:

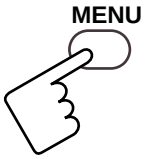
Press and hold the **VOLUME +** or **VOLUME –** button on the remote control handset or TV set to make fine tuning adjustment. Press and hold the **VOLUME +** button for higher frequency tuning, and press and hold the **VOLUME –** for lower frequency tuning.



[Service Adjustment]

Fine tuning data value will be automatically stored in memory.

To return to normal TV mode, press the **MENU** button on the TV set or remote control handset. (Or will automatically return to normal TV mode after 5 seconds.)



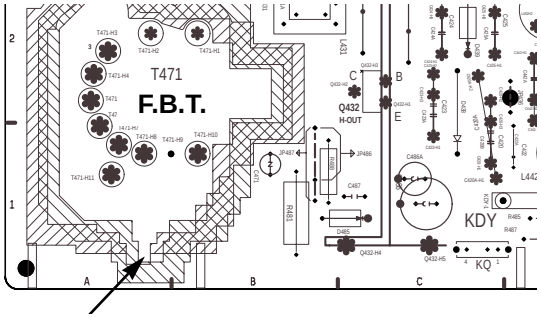
[Exit from the Service Menu]

Service Adjustments

Service Adjustment-3

FOCUS ADJUSTMENT

(1) Receive the monochrome circular pattern.
(2) Set the brightness to normal and contrast to maximum.
(3) Adjust the focus control on the F.B.T. for the best focus on the screen centre.



FOCUS VR (Upper side)

HIGH VOLTAGE CHECK

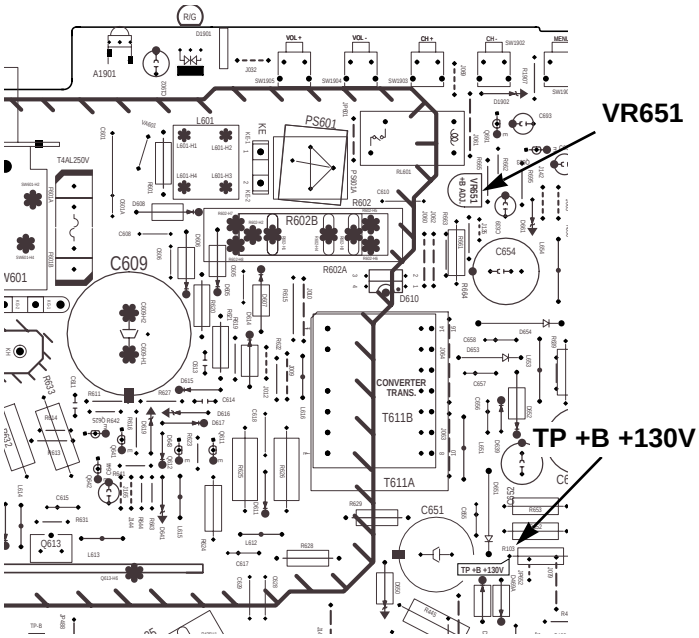
Note: *+B (+130V) Voltage Check and Grayscale Adjustment must be completed before attempting High Voltage Check.*

(1) Connect high voltage voltmeter negative lead to ground, and connect + lead to anode of picture tube.
(2) Tune receiver to an active channel and confirm TV is operating properly.
(3) The high voltage must be 14”=21KV ± 1KV, 20”/21”=25KV ± 1KV, 29”=26.5KV ± 1KV and less than 14”=25KV, 20”/21”=27.5KV, 29”=29.5KV at 0 beam current (Brightness and contrast minimum setting).

Note: If the picture tube is replaced, check the high voltage. The horiz. width adjustment affects the high voltage. Therefore, re-check the high voltage.

+B POWER SUPPLY ADJUSTMENT

1. Connect a DC voltmetre to TP-”+B +130V” and the ground. Set the +B adjustment control (VR651) to middle range.
2. Set the brightness to normal and contrast to maximum.
3. Tune the receiver to anactive channel and synchronized picture.
4. Adjust +B voltage to 130± 1.0 volt DC by using VR651.



Protection Circuit

This TV set has a built-in power supply protection circuit. It is provided to protect the TV set in case of a power supply circuit malfunctions. When something abnormality occurs during TV reception, the TV set goes to the stand-by mode.

> When an abnormality occurs during TV reception, it causes pin 27 of the CPU to go continually Low voltage for about one second. The CPU detects that this has occurred and outputs the signal from pin 31 to switch off the power supply lines.

Releasing the protective circuit and restoring power supply

To release the protective circuit and restore power supply, turn the power to the TV set OFF and then ON again via either the main power switch or the ON-OFF button on the remote control. This will work only if the power supply trouble was temporary. If there is permanent trouble such as a damaged circuit, power cannot be restored and the circuit will have to be repaired.

Purity and Convergence Adjustment

CAUTION: The Convergence and Purity adjustments have been made at the factory. Readjustment should be made only after picture tube or deflection yoke replacement, following the steps below:

PURITY ADJUSTMENT

1. Demagnetize the picture tube and receiver using an external degaussing coil. When replacing picture tube or deflection yoke, mount deflection yoke and purity-convergence magnets assembly properly, see figures 1 and 4.
2. Turn Red and Blue guns off and provide only Green raster. Rotate Screen control to fully counterclockwise. Rotate Red and Blue Bias controls fully counterclockwise. Slowly rotate Green Bias control clockwise to produce Green raster.
3. Loosen the screw holding the Deflection Yoke and remove the 3 Rubber Wedges, and slide the Deflection Yoke fully forward.
4. Rotate and spread the Tabs of the two Purity Magnets to centre the vertical green belt in the picture screen. The Purity Magnets are also adjusted to obtain vertical centring of the raster.
5. Slowly slide the Deflection Yoke backward until a uniform green screen is obtained.
6. Check the purity of the red and blue screens for uniformity, turn off other colours to check this (use bias controls). Readjust the yoke position if necessary until all screens are pure.
7. Adjust each Bias control and screen control to obtain white raster. Refer to Gray Scale Adjustment. If part of the picture screen is coloured, adjust the Deflection Yoke position forward or backward slightly.
8. Tighten the mounting screw of the Deflection Yoke. Adjust Convergence next.

CENTRE CONVERGENCE ADJUSTMENT

1. Use a dot crosshatch pattern signal.
2. Turn Red and Blue guns on and turn off Green gun. Adjust the angle between the Tabs of the Four Pole Magnet 1 and 2, and superimpose the Red and Blue vertical lines in the centre area of the picture screen. Refer to figure 2.
3. Keeping the mutual angle of the Tabs of the Four Pole Magnet turn them together to superimpose the Blue and Red horizontal lines in the centre area of the picture screen. Refer to figure 2.
4. Turn Green gun on and adjust Six Pole Magnet 3 and 4 that the Green line superimposed on the Red/Blue lines.
   This is the same procedure used in steps 2 and 3.
   Refer to figure 3.

OUTER AREA CONVERGENCE ADJUSTMENT

Slightly loosen the screw holding the Deflection Yoke. Adjust the Deflection Yoke to converge the detail in the outer area (left side and right side) of the picture screen by orbital movement of the front of the Yoke, then secure the Deflection Yoke in appropriate position by putting the wedges as illustrated. Tighten screw holding the Deflection Yoke.

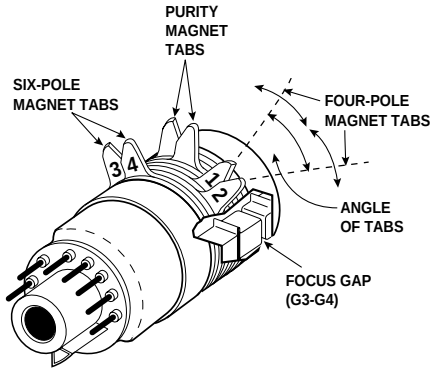


Figure 1. Purity and Convergence Magnets

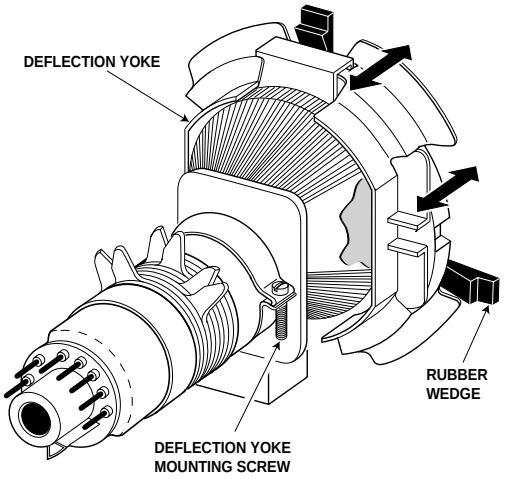


Figure 4. Deflection Yoke Movement

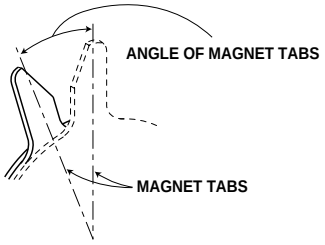


Figure 5. Adjusting Magnet

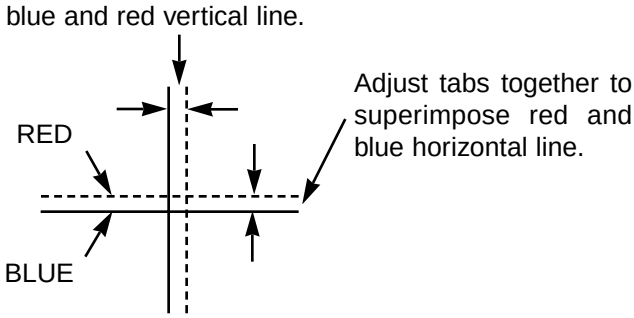


Figure- 2 BLUE AND RED LINE MOVEMENT

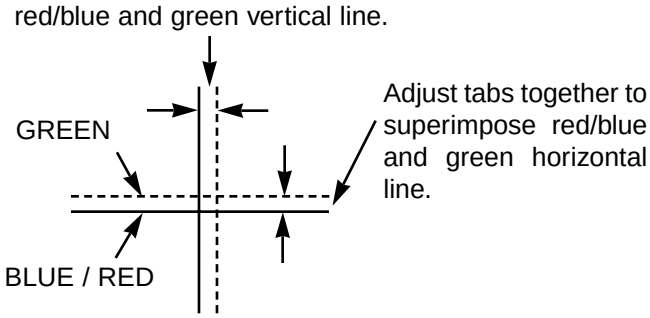
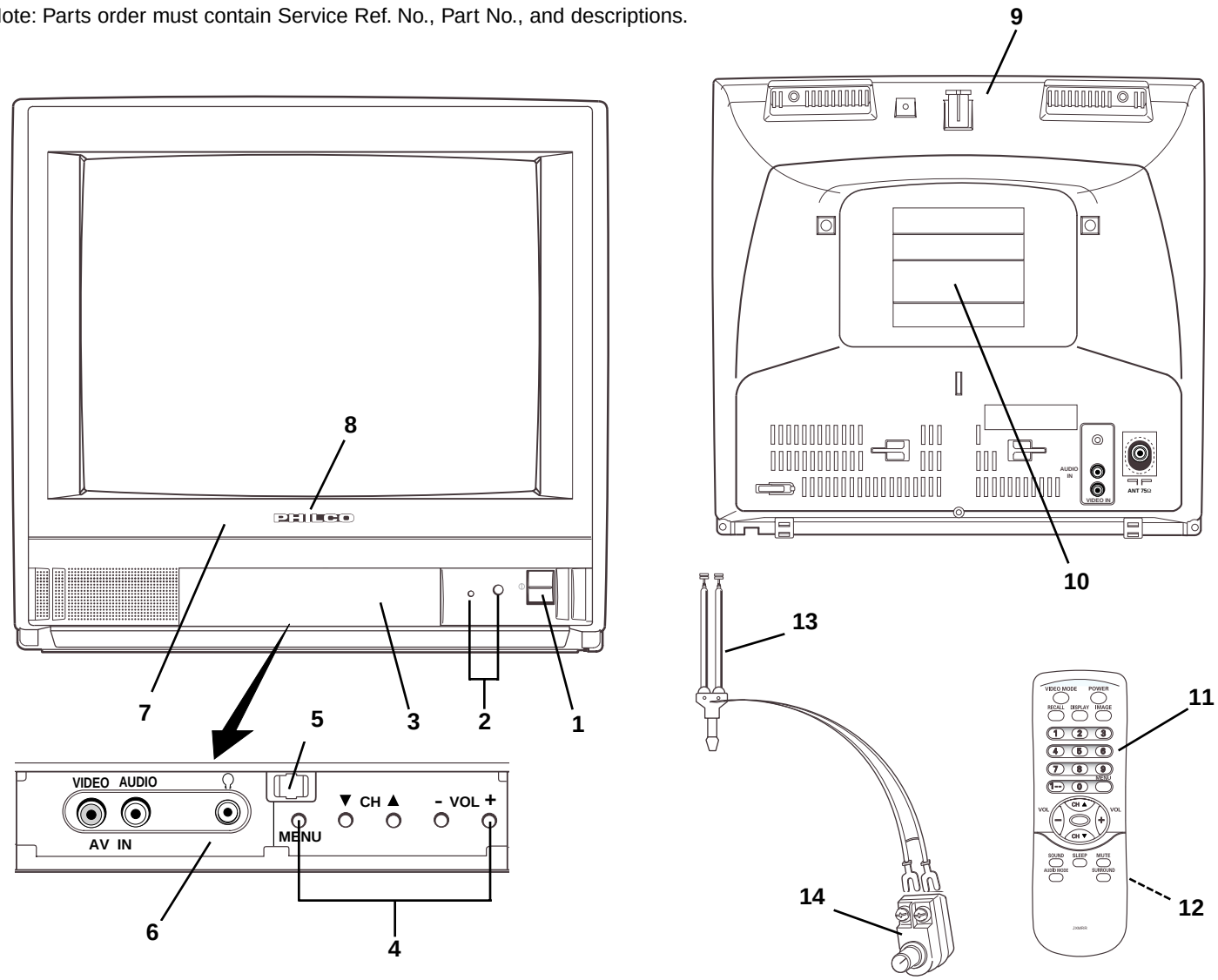


Figure- 3 BLUE/RED AND GREEN MOVEMENT

Cabinet Parts List

Note: Parts order must contain Service Ref. No., Part No., and descriptions.



Key No.	Part No.	Description	Key No.	Part No.	Description
1	610 278 1489	BUTTON POWER-F8FF			
	610 270 5591	SPRING-HKG-S6KL			
2	610 278 1595	DEC IND-F8FF			
3	610 278 1571	DOOR-F8FF			
4	610 277 8403	BUTTON UNITED-F8FE			
5	610 104 2505	LATCH PUSH,7.9X6.9BK			
6	610 277 9455	DEC CONTROL SHEET-F8FE			
7	610 278 1519	CABINET FRONT-F8FF			
8	610 318 0991	BADGE PHILCO-F8FS			
9	610 277 7352	CABINET BACK-F8FE			
10	610 317 6338	LABEL RATING-F8FS			
11	645 069 4608	ASSY,REMOCON JXMRR			
12	610 297 3723	RC-BATTERY LID-JXMRA			
13	610 217 1006	ROD ANTENNA ASSY			
or	645 012 0428	ROD ANTENNA ASSY			
14	645 004 3925	ANT MATCHING BOX			
or	645 005 0251	ANT MATCHING BOX			
	610 317 5492	INSTRUCTIONS MANUAL-F8FS			

Chassis Electrical Parts List

Product safety should be considered when a component replacement is made in any area of a receiver. Components indicated by a ⚠ mark in this parts list and the circuit diagram show components whose value have special significance to product safety. It is particularly recommended that only parts specified on the following parts list be used for components replacement pointed out by the mark.

Note: Parts order must contain Service Ref. No., Part No., and descriptions. The main PCB unit will be supplied without tuner and flyback transformer. They should be ordered separately.

Ref. No.	Part No.	Description

NOTES:

Read description in the Capacitor and Resistor as follows:

CAPACITOR

CERAMIC 100P K 50V

- Rated Voltage
- Tolerance Symbols:

Less than 10pF

A : Not specified	B : ±0.1pF	C : ±0.25pF
D : ±0.5pF	F : ±1PF	G : ±2pF
R : ±0.25-0pF	S : ±0-0.25pF	E : +0-1pF

More than 10pF

A : Not specified	B : ±0.1%	C : ±0.25%
D : ±0.5%	F : ±1%	G : ±2%
H : ±3%	J : ±5%	K : ±10%
L : ±15%	M : ±20%	N : ±30%
P : +100-0%	Q : +30-10%	T : +50-10%
U : +75-10%	V : +20-10%	W : +100-10%
X : +40-20%	Y : +150-10%	Z : +80-20%

- Rated value: P=pico farad, U=micro farad

Material:

CERAMIC..... Ceramic
MT-PAPER..... Metallized Paper
POLYESTER..... Polyester
MT-POLYEST..... Metallized Polyester
POLYPRO..... Polypropylene
MT-POLYPRO.... Metallized Polypropylene
COMPO FILM..... Composite film
MT-COMPO..... Metallized Composite
STYRENE..... Styrene
TA-SOLID..... Tantalum Solid
AL-SOLID..... Aluminium Solid
ELECT..... Electrolytic
NP-ELECT..... Non-polarised Electrolytic
OS-SOLID..... Aluminium Solid with Organic Semiconductive Electrolytic
DL-ELECT..... Double Layered Electrolytic

RESISTOR

CARBON 4.7K J A 1/4W

- Rated Wattage
- Performance Symbols:
  A: General B: Non flammable Z: Low noise
  Other: Temperature coefficient
- Tolerance Symbols:
  A: ±0.05% B: ±0.1% C: ±0.25% D: ±0.5%
  F: ±1% G: ±2% J: ±5% K: ±10%
  M: ±20% P: +5-15%
- Rated value, ohms:
  K: 1,000, M: 1,000,000

Material:

CARBON..... Carbon
MT-FILM..... Metal Film
OXIDE-MT..... Oxide Metal Film
SOLID..... Composition
MT-GLAZE..... Metal Glaze
WIRE WOUND... Wire Wound
CERAMIC RES.. Ceramic
FUSIBLE RES.... Fusible

Ref. No.	Part No.	Description

OUT OF CIRCUIT BOARD

PICTURE TUBE

⚠ Q901	414 010 4505	CRT A34EJL01X21

COIL

⚠ L901	652 001 4428	COIL,DEGAUSSING

MISCELLANEOUS

SP901	652 000 0650	SPEAKER,8
	652 001 3476	SPEAKER,8
⚠ W901	645 037 2490	CORD,POWER-2.4MK-A5102
W902	652 001 4527	ASSY,WIRE GND CONNECTOR F

610 315 1311 ASSY,PWB,MAIN F8FP 1AA0B10E695AA

TRANSISTOR

Q111	405 015 9701	TR 2SC2814-F4-TB
Q171	405 134 5905	TR 2SA1037AK-T146-R
	405 147 2205	TR 2SA1037AK-S-T146
	405 002 0308	TR 2SA1037K T146 R
	405 002 0407	TR 2SA1037K T146 S
	405 002 6706	TR 2SA1179-M6-TB
	405 002 6904	TR 2SA1179-M7-TB
	405 163 1503	TR 2SA1179N-M6-TB
	405 163 2708	TR 2SA1179N-M7-TB
	405 173 9605	TR 2SA1235A1E
	405 173 9704	TR 2SA1235A1F
Q261	405 134 5905	TR 2SA1037AK-T146-R
	405 147 2205	TR 2SA1037AK-S-T146
	405 002 0308	TR 2SA1037K T146 R
	405 002 0407	TR 2SA1037K T146 S
	405 002 6706	TR 2SA1179-M6-TB
	405 002 6904	TR 2SA1179-M7-TB
	405 163 1503	TR 2SA1179N-M6-TB
	405 163 2708	TR 2SA1179N-M7-TB
	405 173 9605	TR 2SA1235A1E
	405 173 9704	TR 2SA1235A1F
Q431	405 018 0507	TR 2SC3332-R
	405 018 0606	TR 2SC3332-S
Q432	406 017 1908	TR TT2140LS-YB11
Q527	405 014 4509	TR 2SC2412K T146 R
	405 014 4608	TR 2SC2412K T146 S
	405 015 8704	TR 2SC2812-L6-TB
	405 015 8902	TR 2SC2812-L7-TB
	405 163 1602	TR 2SC2812N-L6-TB0
	405 163 1701	TR 2SC2812N-L7-TB0
	405 173 9803	TR 2SC3928A1R
	405 173 9902	TR 2SC3928A1S
Q611	405 013 6801	TR 2SC2274-E
	405 013 7006	TR 2SC2274-F
Q612	405 006 6504	TR 2SA984-E
	405 006 6702	TR 2SA984-F
Q613	405 171 4107	TR 2SK2647
Q625	405 013 6801	TR 2SC2274-E

Ref. No.	Part No.	Description
	405 013 7006	TR 2SC2274-F
Q641	406 000 6804	TR 2SA1015-GR(SAN)
	405 001 7605	TR 2SA1015-Y(SAN)
	405 004 3208	TR 2SA564A-R(CU)
	405 151 3304	TR 2SA608NF-NPA
	405 006 1806	TR 2SA933S-R
Q642	405 011 8401	TR 2SC1740S-Q
	405 011 8500	TR 2SC1740S-R
	405 011 8609	TR 2SC1740S-S
	405 012 2002	TR 2SC1815-GR
	405 012 2309	TR 2SC1815-Y
	405 157 0505	TR 2SC536NF-NPA
	405 151 8705	TR 2SC536NG-NPA
	405 020 7501	TR 2SC945A-PA
	405 020 7709	TR 2SC945A-QA
Q651	405 011 8401	TR 2SC1740S-Q
	405 011 8500	TR 2SC1740S-R
	405 011 8609	TR 2SC1740S-S
	405 012 2002	TR 2SC1815-GR
	405 012 2101	TR 2SC1815-O
	405 012 2309	TR 2SC1815-Y
	405 157 0505	TR 2SC536NF-NPA
	405 151 8705	TR 2SC536NG-NPA
	405 020 7501	TR 2SC945A-PA
	405 020 7709	TR 2SC945A-QA
	405 020 7907	TR 2SC945A-RA
Q652	405 089 0000	TR 2SA1707-S
	405 089 0109	TR 2SA1707-T
	405 009 6907	TR 2SB985-S
	405 009 7003	TR 2SB985-T
Q654	405 059 9804	TR 2SD1913-Q-RA
	405 059 9903	TR 2SD1913-R-RA
Q661	405 014 4509	TR 2SC2412K T146 R
	405 014 4608	TR 2SC2412K T146 S
	405 015 8704	TR 2SC2812-L6-TB
	405 015 8902	TR 2SC2812-L7-TB
	405 163 1602	TR 2SC2812N-L6-TB0
	405 163 1701	TR 2SC2812N-L7-TB0
	405 173 9803	TR 2SC3928A1R
	405 173 9902	TR 2SC3928A1S
Q662	405 134 5905	TR 2SA1037AK-T146-R
	405 147 2205	TR 2SA1037AK-S-T146
	405 002 0308	TR 2SA1037K T146 R
	405 002 0407	TR 2SA1037K T146 S
	405 002 6706	TR 2SA1179-M6-TB
	405 002 6904	TR 2SA1179-M7-TB
	405 163 1503	TR 2SA1179N-M6-TB
	405 163 2708	TR 2SA1179N-M7-TB
	405 173 9605	TR 2SA1235A1E
	405 173 9704	TR 2SA1235A1F
Q663	405 014 4509	TR 2SC2412K T146 R
	405 014 4608	TR 2SC2412K T146 S
	405 015 8704	TR 2SC2812-L6-TB
	405 015 8902	TR 2SC2812-L7-TB
	405 163 1602	TR 2SC2812N-L6-TB0
	405 163 1701	TR 2SC2812N-L7-TB0
	405 173 9803	TR 2SC3928A1R
	405 173 9902	TR 2SC3928A1S
Q681	405 011 8401	TR 2SC1740S-Q
	405 011 8500	TR 2SC1740S-R
	405 011 8609	TR 2SC1740S-S
	405 012 2002	TR 2SC1815-GR
	405 012 2101	TR 2SC1815-O
	405 012 2309	TR 2SC1815-Y
	405 157 0505	TR 2SC536NF-NPA
	405 151 8705	TR 2SC536NG-NPA
	405 020 7501	TR 2SC945A-PA
	405 020 7709	TR 2SC945A-QA
	405 020 7907	TR 2SC945A-RA
Q693	405 011 8401	TR 2SC1740S-Q
	405 011 8500	TR 2SC1740S-R
	405 011 8609	TR 2SC1740S-S
	405 012 2002	TR 2SC1815-GR
	405 012 2309	TR 2SC1815-Y
	405 157 0505	TR 2SC536NF-NPA
	405 151 8705	TR 2SC536NG-NPA
	405 020 7501	TR 2SC945A-PA
	405 020 7709	TR 2SC945A-QA
Q818	405 014 4509	TR 2SC2412K T146 R
	405 014 4608	TR 2SC2412K T146 S
	405 015 8704	TR 2SC2812-L6-TB
	405 015 8902	TR 2SC2812-L7-TB
	405 163 1602	TR 2SC2812N-L6-TB0
	405 163 1701	TR 2SC2812N-L7-TB0
	405 173 9803	TR 2SC3928A1R
	405 173 9902	TR 2SC3928A1S
Q861	405 134 5905	TR 2SA1037AK-T146-R
	405 147 2205	TR 2SA1037AK-S-T146
	405 002 0308	TR 2SA1037K T146 R
	405 002 0407	TR 2SA1037K T146 S
	405 002 6706	TR 2SA1179-M6-TB
	405 002 6904	TR 2SA1179-M7-TB
	405 163 1503	TR 2SA1179N-M6-TB
	405 163 2708	TR 2SA1179N-M7-TB
	405 173 9605	TR 2SA1235A1E
	405 173 9704	TR 2SA1235A1F
Q871	405 014 4509	TR 2SC2412K T146 R
	405 014 4608	TR 2SC2412K T146 S
	405 015 8704	TR 2SC2812-L6-TB
	405 015 8902	TR 2SC2812-L7-TB
	405 163 1602	TR 2SC2812N-L6-TB0
	405 163 1701	TR 2SC2812N-L7-TB0
	405 173 9803	TR 2SC3928A1R
	405 173 9902	TR 2SC3928A1S
Q881	405 014 4509	TR 2SC2412K T146 R
	405 014 4608	TR 2SC2412K T146 S
	405 015 8704	TR 2SC2812-L6-TB
	405 015 8902	TR 2SC2812-L7-TB
	405 163 1602	TR 2SC2812N-L6-TB0
	405 163 1701	TR 2SC2812N-L7-TB0
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	405 173 9902	TR 2SC3928A1S
Q886	405 014 4509	TR 2SC2412K T146 R
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	405 015 8902	TR 2SC2812-L7-TB
	405 163 1602	TR 2SC2812N-L6-TB0
	405 163 1701	TR 2SC2812N-L7-TB0
	405 173 9803	TR 2SC3928A1R
	405 173 9902	TR 2SC3928A1S
INTEGRATED CIRCUIT		
IC001	409 472 4408	IC LA4266-E
IC201	409 517 5902	IC LA76818A
IC202	409 241 5407	IC BA178M05T
	409 265 4806	IC L78M05CV
	409 172 1509	IC MC78M05CT
	409 320 5700	IC UPC78M05AHF
IC501	409 507 0900	IC LA78040N
	409 510 1109	IC TDA9302H
IC681	409 241 5407	IC BA178M05T
	409 265 4806	IC L78M05CV
	409 172 1509	IC MC78M05CT
	409 320 5700	IC UPC78M05AHF

Ref. No.	Part No.	Description
IC801	410 527 1907	IC LC863440W-53Z0-TLM
IC802	409 495 7004	IC CAT24WC04P
	409 470 3403	IC KS24C041C
	409 427 4705	IC M24C04-BN6
	410 499 0908	IC AT24C04-10PI-2.7
CAPACITOR		
C004	404 084 4204	ELECT 4.7U M 50V
C005	404 089 2700	ELECT 100U M 25V
C007	403 342 3300	CERAMIC 0.1U K 25V
C008	403 342 3300	CERAMIC 0.1U K 25V
C031	404 089 2700	ELECT 100U M 25V
C035	403 045 1504	ELECT 1000U M 25V
C041	403 047 5005	ELECT 470U M 25V
C101	403 044 1703	ELECT 470U M 16V
C106	403 051 3103	ELECT 47U M 50V
C107	404 084 4303	ELECT 47U M 50V
	403 051 3103	ELECT 47U M 50V
C111	403 215 2201	CERAMIC 0.01U K 50V
C112	403 215 2201	CERAMIC 0.01U K 50V
C113	403 215 2201	CERAMIC 0.01U K 50V
C120	403 224 6603	CERAMIC 0.022U Z 50V
C121	403 215 2201	CERAMIC 0.01U K 50V
C122	403 042 2405	ELECT 100U M 16V
C132	403 048 6308	ELECT 0.47U M 50V
C134	404 084 3900	ELECT 10U M 50V
C135	403 048 6308	ELECT 0.47U M 50V
C138	403 284 4304	CERAMIC 0.022U K 50V
C171	403 155 2101	CERAMIC 1500P K 50V
C172	403 215 2201	CERAMIC 0.01U K 50V
C178	404 084 3801	ELECT 1U M 50V
C1902	403 050 2800	ELECT 22U M 50V
C201	403 086 2300	NP-ELECT 1U M 50V
C202	403 058 2604	POLYESTER 0.015U J 50V
	403 179 3207	POLYESTER 0.015U J 50V
C203	403 215 2201	CERAMIC 0.01U K 50V
C204	403 049 4204	ELECT 10U M 50V
C205	403 049 4204	ELECT 10U M 50V
C209	403 048 6308	ELECT 0.47U M 50V
C210	403 047 5005	ELECT 470U M 25V
C212	403 155 4204	CERAMIC 15P J 50V
C221	403 342 3300	CERAMIC 0.1U K 25V
C222	403 342 3300	CERAMIC 0.1U K 25V
C223	403 342 3300	CERAMIC 0.1U K 25V
C224	403 342 3300	CERAMIC 0.1U K 25V
C225	403 049 0008	ELECT 1U M 50V
C226	403 086 2300	NP-ELECT 1U M 50V
C227	403 049 4204	ELECT 10U M 50V
C230	403 215 2201	CERAMIC 0.01U K 50V
C231	403 260 2904	MT-COMPO 0.33U J 50V
C232	403 260 2904	MT-COMPO 0.33U J 50V
C233	403 045 1504	ELECT 1000U M 25V
C240	403 215 2201	CERAMIC 0.01U K 50V
C243	403 215 2201	CERAMIC 0.01U K 50V
C244	403 051 3103	ELECT 47U M 50V
C245	403 086 2300	NP-ELECT 1U M 50V
C246	403 049 0008	ELECT 1U M 50V
C247	403 049 9803	ELECT 2.2U M 50V
C273	403 342 3300	CERAMIC 0.1U K 25V
C358	403 049 0008	ELECT 1U M 50V
C423	404 080 6608	MT-POLYPRO 6800P H 1.5K
	403 348 0600	MT-POLYPRO 6800P H 1.5K
C426	403 066 6106	MT-POLYEST 0.47U J 250V
C432	403 075 7101	CERAMIC 1000P K 500V
C433	403 076 3102	CERAMIC 3900P K 500V
C434	403 051 3103	ELECT 47U M 50V
C441	403 346 6901	MT-POLYPRO 0.22U J 250V

Ref. No.	Part No.	Description
C442	403 346 6901	MT-POLYPRO 0.22U J 250V
C469	403 049 4204	ELECT 10U M 50V
C471	404 056 5208	NP-ELECT 2.2U M 100V
	404 056 5307	NP-ELECT 2.2U M 100V
	404 045 6605	NP-ELECT 2.2U M 50V
C486	403 055 8401	ELECT 22U M 250V
C510	404 084 4204	ELECT 4.7U M 50V
	403 051 0607	ELECT 4.7U M 50V
C514	403 049 4204	ELECT 10U M 50V
C515	403 045 9807	ELECT 2200U M 25V
C517	403 053 2104	ELECT 220U M 35V
C518	403 069 0507	CERAMIC 1000P K 50V
C520	403 064 1202	POLYESTER 0.1U K 100V
	403 276 9706	POLYESTER 0.1U K 100V
C521	403 054 1502	ELECT 470U M 35V
C524	403 219 4904	MT-COMPO 0.27U J 50V
C527	403 049 4204	ELECT 10U M 50V
⚠ C601	404 072 7705	MT-POLYEST 0.068U M 250V
	404 079 6503	MT-POLYEST 0.068U M 250V
	404 073 7506	MT-POLYEST 0.068U M 275V
	404 092 0700	MT-POLYEST 0.068U M 275
C608	403 076 6707	CERAMIC 1000P K 1K
	403 312 8205	CERAMIC 1000P K 1K
C609	404 038 1600	ELECT 100U M 400V
	404 067 4009	ELECT 100U M 400V
	404 069 5707	ELECT 100U M 400V
⚠ C610	404 073 3904	CERAMIC 1000P K 250V
	404 073 2105	CERAMIC 1000P M 250V
	404 071 3302	CERAMIC 1000P M 400V
	404 086 0907	CERAMIC 1000P M 400V
C611	403 056 9704	POLYESTER 0.01U J 50V
	403 178 9309	POLYESTER 0.01U J 50V
C613	403 181 8207	POLYESTER 0.1U K 50V
C614	403 237 7901	MT-COMPO 0.22U J 50V
C615	403 325 5109	CERAMIC 220P K 1K
C617	403 325 5109	CERAMIC 220P K 1K
C618	403 083 8107	POLYPRO 0.01U J 630V
⚠ C628	404 073 5106	CERAMIC 470P K 250V
	404 073 3300	CERAMIC 470P M 250V
	404 071 4507	CERAMIC 470P K 400V
	404 087 0302	CERAMIC 470P M 400V
⚠ C629	404 073 4505	CERAMIC 2200P K 250V
	404 073 2907	CERAMIC 2200P M 250V
	404 071 4101	CERAMIC 2200P M 400V
	404 084 5904	CERAMIC 2200P M 400V
C639	403 049 0008	ELECT 1U M 50V
C643	403 043 7409	ELECT 3300U M 16V
C644	404 084 4105	ELECT 3.3U M 50V
	403 046 1602	ELECT 3.3U M 25V
C651	404 073 9005	ELECT 220U M 160V
C652	404 087 3402	ELECT 1000U M 35V
	403 052 8503	ELECT 1000U M 35V
C654	403 045 9807	ELECT 2200U M 25V
C655	403 247 5003	CERAMIC 470P K 1K
	403 269 1809	CERAMIC 470P K 1K
C656	403 222 1303	CERAMIC 1000P K 1K
	403 271 9602	CERAMIC 1000P K 1K
C657	403 247 5003	CERAMIC 470P K 1K
	403 269 1809	CERAMIC 470P K 1K
C658	403 247 5003	CERAMIC 470P K 1K
	403 269 1809	CERAMIC 470P K 1K
C663	404 084 3801	ELECT 1U M 50V
	403 049 0008	ELECT 1U M 50V
C664	404 084 2705	ELECT 10U M 16V
	403 041 8804	ELECT 10U M 16V
C665	403 043 0202	ELECT 220U M 16V
C681	403 040 5408	ELECT 2200U M 10V

Ref. No.	Part No.	Description
C691	403 039 6508	ELECT 100U M 10V
C693	403 043 9106	ELECT 47U M 16V
C801	403 155 4204	CERAMIC 15P J 50V
C802	403 157 2505	CERAMIC 27P J 50V
C803	403 215 2201	CERAMIC 0.01U K 50V
C805	403 049 4204	ELECT 10U M 50V
C824	403 342 3300	CERAMIC 0.1U K 25V
C835	403 049 0008	ELECT 1U M 50V
C837	403 145 9905	CERAMIC 22P J 50V
C838	403 145 9905	CERAMIC 22P J 50V
C841	403 145 9905	CERAMIC 22P J 50V
C842	403 145 9905	CERAMIC 22P J 50V
C851	403 157 3106	CERAMIC 56P J 50V
C852	403 157 3106	CERAMIC 56P J 50V
C853	403 157 3106	CERAMIC 56P J 50V
C861	403 049 0008	ELECT 1U M 50V
C862	403 342 3300	CERAMIC 0.1U K 25V
C880	403 155 2200	CERAMIC 3300P K 50V
C891	403 049 0008	ELECT 1U M 50V
C893	403 049 9803	ELECT 2.2U M 50V
C894	403 281 5007	CERAMIC 0.033U K 25V
C896	403 113 3805	CERAMIC 1000P K 50V
RESISTOR		
R003	401 027 6905	CARBON 750 JA 1/6W
R005	401 025 1308	CARBON 150 JA 1/6W
R006	401 026 8108	CARBON 4.7 JA 1/6W
R011	401 105 3406	MT-GLAZE 27K JA 1/16W
R019	401 007 7601	CARBON 150 JA 1/2W
R029	401 007 7601	CARBON 150 JA 1/2W
R041	401 012 5708	CARBON 1K JA 1/4W
R1004	401 027 6608	CARBON 75 JA 1/6W
R1011	401 105 0504	MT-GLAZE 1K JA 1/16W
R1013	401 105 0504	MT-GLAZE 1K JA 1/16W
R1014	401 105 0702	MT-GLAZE 100K JA 1/16W
R103	401 061 8101	OXIDE-MT 39K JA 1W
R106	401 024 6700	CARBON 100 JA 1/6W
R107	401 105 0405	MT-GLAZE 100 JA 1/16W
R108	401 105 2102	MT-GLAZE 18K JA 1/16W
R109	401 105 8203	MT-GLAZE 68K JA 1/16W
R111	401 105 0504	MT-GLAZE 1K JA 1/16W
R112	401 105 6001	MT-GLAZE 5.6K JA 1/16W
R114	401 105 4007	MT-GLAZE 330 JA 1/16W
R115	401 027 2105	CARBON 56 JA 1/6W
R116	401 105 4403	MT-GLAZE 39 JA 1/16W
R130	401 105 7909	MT-GLAZE 0.000 ZA 1/16W
R132	401 105 5202	MT-GLAZE 470 JA 1/16W
R140	401 105 5905	MT-GLAZE 560 JA 1/16W
R141	401 105 5905	MT-GLAZE 560 JA 1/16W
R171	401 105 1402	MT-GLAZE 150 JA 1/16W
R172	401 105 4601	MT-GLAZE 3.9K JA 1/16W
R173	401 024 7004	CARBON 1K JA 1/6W
R176	401 105 0603	MT-GLAZE 10K JA 1/16W
R1902	401 105 2102	MT-GLAZE 18K JA 1/16W
R1903	401 105 6605	MT-GLAZE 6.8K JA 1/16W
R1904	401 105 5301	MT-GLAZE 4.7K JA 1/16W
R1905	401 105 3307	MT-GLAZE 2.7K JA 1/16W
R1906	401 105 2805	MT-GLAZE 2.2K JA 1/16W
R1907	401 026 0607	CARBON 270 JA 1/6W
R1908	401 105 0405	MT-GLAZE 100 JA 1/16W
R1910	401 105 0405	MT-GLAZE 100 JA 1/16W
R1911	401 105 5202	MT-GLAZE 470 JA 1/16W
R1912	401 026 9600	CARBON 470 JA 1/6W
R211	401 025 1308	CARBON 150 JA 1/6W
R212	401 105 1402	MT-GLAZE 150 JA 1/16W
R221	401 105 0504	MT-GLAZE 1K JA 1/16W
R222	401 105 0504	MT-GLAZE 1K JA 1/16W

Ref. No.	Part No.	Description
R223	401 105 0504	MT-GLAZE 1K JA 1/16W
R224	401 105 5301	MT-GLAZE 4.7K JA 1/16W
R225	401 105 5301	MT-GLAZE 4.7K JA 1/16W
R226	401 105 3406	MT-GLAZE 27K JA 1/16W
R227	401 105 4205	MT-GLAZE 33K JA 1/16W
R228	401 024 7707	CARBON 100K JA 1/6W
R229	401 105 6704	MT-GLAZE 680K JA 1/16W
R230	401 026 9303	CARBON 47 JA 1/6W
R234	401 105 0900	MT-GLAZE 120 JA 1/16W
R235	401 105 0900	MT-GLAZE 120 JA 1/16W
R236	401 105 0900	MT-GLAZE 120 JA 1/16W
R243	401 068 3703	OXIDE-MT 470 JA 2W
R244	401 105 5400	MT-GLAZE 47K JA 1/16W
R245	401 105 5400	MT-GLAZE 47K JA 1/16W
R263	401 105 0603	MT-GLAZE 10K JA 1/16W
R264	401 024 9008	CARBON 120 JA 1/6W
R265	401 105 3901	MT-GLAZE 33 JA 1/16W
R267	401 026 9600	CARBON 470 JA 1/6W
R271	401 105 0405	MT-GLAZE 100 JA 1/16W
R272	401 105 0405	MT-GLAZE 100 JA 1/16W
R280	401 105 0405	MT-GLAZE 100 JA 1/16W
R286	401 203 9904	MT-GLAZE 4.7K FA 1/16W
R289	401 105 0405	MT-GLAZE 100 JA 1/16W
R291	401 068 1600	OXIDE-MT 4.7 JA 2W
R351	401 105 7404	MT-GLAZE 8.2K JA 1/16W
R352	401 012 7009	CARBON 10K JA 1/4W
R354	401 025 8208	CARBON 22K JA 1/6W
R355	401 012 7009	CARBON 10K JA 1/4W
R356	401 105 0603	MT-GLAZE 10K JA 1/16W
R357	401 026 7002	CARBON 3.9K JA 1/6W
R358	401 105 7909	MT-GLAZE 0.000 ZA 1/16W
R423	401 012 8105	CARBON 100K JA 1/4W
R423A	401 021 4105	CARBON 56K JA 1/4W
R424	401 024 7004	CARBON 1K JA 1/6W
R426	401 024 7400	CARBON 10K JA 1/6W
R430	401 105 0504	MT-GLAZE 1K JA 1/16W
R432	401 024 7004	CARBON 1K JA 1/6W
R433	401 058 3706	OXIDE-MT 1K JA 1W
R434	401 059 6706	OXIDE-MT 180 JA 1W
R435	402 069 8704	WIRE WOUND 8.2 KA 7W
	402 074 5309	WIRE WOUND 8.2 KA 7W
	402 098 0700	WIRE WOUND 8.2 KA 7W
R442	401 058 9807	OXIDE-MT 12K JA 1W
R475	401 009 5803	CARBON 330 JA 1/2W
R479	401 105 7404	MT-GLAZE 8.2K JA 1/16W
R481	401 068 1600	OXIDE-MT 4.7 JA 2W
R510	401 024 7400	CARBON 10K JA 1/6W
R511	401 024 7400	CARBON 10K JA 1/6W
R514	401 027 8602	CARBON 8.2K JA 1/6W
R515	401 025 4606	CARBON 18K JA 1/6W
R516	401 024 9701	CARBON 12K JA 1/6W
R518	401 057 9907	OXIDE-MT 1.5 JA 1W
R519	401 024 5604	CARBON 1 JA 1/6W
R522	401 026 0607	CARBON 270 JA 1/6W
R524	401 066 0308	OXIDE-MT 180 JA 2W
R527	401 027 3003	CARBON 56K JA 1/6W
R528	401 059 3903	OXIDE-MT 1.5K JA 1W
R529	401 058 3706	OXIDE-MT 1K JA 1W
⚠ R601	401 008 8607	CARBON 220K JA 1/2W
R602B	402 060 8109	WIRE WOUND 3.9 KA 5W
	402 072 4205	WIRE WOUND 3.9 KA 5W
	402 097 9902	WIRE WOUND 3R9 KA 5W
R611	401 020 0801	CARBON 470 JA 1/4W
⚠ R613	402 001 8106	FUSIBLE RES 680 J- 1/4W
R614	401 025 8208	CARBON 22K JA 1/6W
R615	401 025 7409	CARBON 220 JA 1/6W
R616	401 025 4606	CARBON 18K JA 1/6W

Ref. No.	Part No.	Description
R619	401 016 1508	CARBON 22 JA 1/4W
R620	401 010 4802	CARBON 470K JA 1/2W
R621	401 010 4802	CARBON 470K JA 1/2W
R622	401 019 9600	CARBON 47 JA 1/4W
R623	401 026 4902	CARBON 330K JA 1/6W
⚠ R624	402 001 8502	FUSIBLE RES 10 J- 1/2W
R625	401 069 4501	OXIDE-MT 68K JA 2W
R626	401 069 4501	OXIDE-MT 68K JA 2W
R627	401 025 8208	CARBON 22K JA 1/6W
⚠ R628	402 000 8305	SOLID 5.6M KA 1/2W
⚠ R629	402 000 8305	SOLID 5.6M KA 1/2W
R631	401 027 0309	CARBON 47K JA 1/6W
R632	401 180 8402	OXIDE-MT 0.47 JA 2W
R633	401 180 8402	OXIDE-MT 0.47 JA 2W
R641	401 024 7400	CARBON 10K JA 1/6W
R642	401 027 0309	CARBON 47K JA 1/6W
R643	401 025 4606	CARBON 18K JA 1/6W
R644	401 025 8208	CARBON 22K JA 1/6W
R652	401 012 7009	CARBON 10K JA 1/4W
⚠ R653	645 017 6944	PROTECTOR,1.5A 125V
R655	401 012 7009	CARBON 10K JA 1/4W
R656	401 060 7402	OXIDE-MT 270 JA 1W
R657	401 009 9801	CARBON 3.9K JA 1/2W
R658	401 064 5305	OXIDE-MT 1.5 JA 2W
R661	401 012 8105	CARBON 100K JA 1/4W
R662	401 026 9907	CARBON 4.7K JA 1/6W
R663	401 014 6109	CARBON 150K JA 1/4W
R664	401 060 9307	OXIDE-MT 27K JA 1W
R665	401 013 6407	CARBON 12K JA 1/4W
R666	401 105 2904	MT-GLAZE 22K JA 1/16W
R667	401 105 0603	MT-GLAZE 10K JA 1/16W
R669	401 067 3100	OXIDE-MT 3.9 JA 2W
R670	401 057 8009	OXIDE-MT 1 JA 1W
R671	401 105 5301	MT-GLAZE 4.7K JA 1/16W
R672	401 024 9701	CARBON 12K JA 1/6W
R673	401 105 0702	MT-GLAZE 100K JA 1/16W
R681	401 105 2904	MT-GLAZE 22K JA 1/16W
R682	401 105 6100	MT-GLAZE 560K JA 1/16W
R691	401 105 0603	MT-GLAZE 10K JA 1/16W
R693	401 105 4601	MT-GLAZE 3.9K JA 1/16W
R694	401 105 0504	MT-GLAZE 1K JA 1/16W
R695	401 021 4105	CARBON 56K JA 1/4W
R696	401 105 5400	MT-GLAZE 47K JA 1/16W
R697	401 105 5400	MT-GLAZE 47K JA 1/16W
R698	401 105 0504	MT-GLAZE 1K JA 1/16W
R801	401 105 3505	MT-GLAZE 270K JA 1/16W
R804	401 105 7909	MT-GLAZE 0.000 ZA 1/16W
R805	401 105 7909	MT-GLAZE 0.000 ZA 1/16W
R811	401 105 5400	MT-GLAZE 47K JA 1/16W
R812	401 105 0603	MT-GLAZE 10K JA 1/16W
R813	401 105 0603	MT-GLAZE 10K JA 1/16W
R814	401 105 0603	MT-GLAZE 10K JA 1/16W
R816	401 105 0603	MT-GLAZE 10K JA 1/16W
R818	401 024 7004	CARBON 1K JA 1/6W
R819	401 105 0603	MT-GLAZE 10K JA 1/16W
R830	401 024 7004	CARBON 1K JA 1/6W
R831	401 026 9600	CARBON 470 JA 1/6W
R832	403 157 3601	CERAMIC 100P J 50V
R834	401 105 0603	MT-GLAZE 10K JA 1/16W
R835	401 105 0603	MT-GLAZE 10K JA 1/16W
R836	401 105 0603	MT-GLAZE 10K JA 1/16W
R837	401 105 5301	MT-GLAZE 4.7K JA 1/16W
R838	401 105 5301	MT-GLAZE 4.7K JA 1/16W
R839	401 105 4007	MT-GLAZE 330 JA 1/16W
R840	401 105 4007	MT-GLAZE 330 JA 1/16W
R841	401 105 5301	MT-GLAZE 4.7K JA 1/16W
R842	401 105 5301	MT-GLAZE 4.7K JA 1/16W
R851	401 025 1605	CARBON 1.5K JA 1/6W
R853	401 027 8602	CARBON 8.2K JA 1/6W
R855	401 027 8602	CARBON 8.2K JA 1/6W
R857	401 027 8602	CARBON 8.2K JA 1/6W
R861	401 105 1501	MT-GLAZE 1.5K JA 1/16W
R862	401 105 7404	MT-GLAZE 8.2K JA 1/16W
R863	401 105 5301	MT-GLAZE 4.7K JA 1/16W
R866	401 024 6700	CARBON 100 JA 1/6W
R869	401 024 6700	CARBON 100 JA 1/6W
R870	401 105 2904	MT-GLAZE 22K JA 1/16W
R871	401 105 0603	MT-GLAZE 10K JA 1/16W
R872	401 105 3406	MT-GLAZE 27K JA 1/16W
R873	401 105 4205	MT-GLAZE 33K JA 1/16W
R875	401 105 0603	MT-GLAZE 10K JA 1/16W
R876	401 105 6605	MT-GLAZE 6.8K JA 1/16W
R877	401 105 6001	MT-GLAZE 5.6K JA 1/16W
R881	401 105 4106	MT-GLAZE 3.3K JA 1/16W
R882	401 105 4106	MT-GLAZE 3.3K JA 1/16W
R883	401 105 4205	MT-GLAZE 33K JA 1/16W
R886	401 105 2904	MT-GLAZE 22K JA 1/16W
R888	401 105 5202	MT-GLAZE 470 JA 1/16W
R891	401 105 7305	MT-GLAZE 820 JA 1/16W
R892	401 105 5509	MT-GLAZE 470K JA 1/16W
R893	401 105 8005	MT-GLAZE 1M JA 1/16W
R894	401 105 0405	MT-GLAZE 100 JA 1/16W
R895	401 105 5202	MT-GLAZE 470 JA 1/16W
VARIABLE RESISTOR		
VR651	645 006 5125	VR,SEMI,2K N
	652 000 0100	VR,SEMI,2K N
TRANSFORMER		
T431A	652 001 1144	TRANS,DRIVE
⚠ T471	652 001 4251	TRANS,FLYBACK
⚠ T611B	652 001 4381	TRANS,POWER,PULSE
COIL		
L171	645 053 9015	TRANS,OSC,45.75MHZ
L431	610 032 5821	FILTER COIL
	645 008 5628	INDUCTOR,1U M
L432	645 002 2364	CORE,PIPE
L442	652 001 0338	INDUCTOR,665UH
⚠ L601	652 001 3162	LINE FILTER
L612	645 018 9722	CORE,PIPE
	652 001 0147	CORE,PIPE
L614	645 018 9722	CORE,PIPE
	652 001 0147	CORE,PIPE
L615	645 018 9722	CORE,PIPE
	652 001 0147	CORE,PIPE
L616	645 005 0763	CORE,PIPE
⚠ L653	645 017 6944	PROTECTOR,1.5A 125V
DIODE		
D003	407 012 4406	DIODE 1SS133
D102	407 099 5600	ZENER DIODE MTZJ6.8A
	407 057 4003	ZENER DIODE RD6.8EB1
	408 047 8605	ZENER DIODE MTZJ6.8A
D103	407 100 0204	ZENER DIODE MTZJ36A
	407 056 2307	ZENER DIODE RD36EB1
D106	407 206 5608	ZENER DIODE UDZS-TE-1710B
D107	407 206 5608	ZENER DIODE UDZS-TE-1710B
D1201	407 149 0807	DIODE 1SS355-TE-17
D1202	407 149 0807	DIODE 1SS355-TE-17
D1901	407 116 6504	LED SLP-181B-51
D1908	407 149 0807	DIODE 1SS355-TE-17
D1909	407 149 0807	DIODE 1SS355-TE-17
D1910	407 206 5608	ZENER DIODE UDZS-TE-1710B

Ref. No.	Part No.	Description
D249	407 099 6003	ZENER DIODE MTZJ9.1B
D352	407 063 8705	ZENER DIODE MTZJ5.1C
	407 056 9801	ZENER DIODE RD5.6EB1
D421	407 099 7208	ZENER DIODE MTZJ16A
	407 054 7007	ZENER DIODE RD16EB1
D441	407 006 6300	DIODE ERC05-10B
	407 009 6901	DIODE RM11C
D450	407 149 0807	DIODE 1SS355-TE-17
D451	407 149 0807	DIODE 1SS355-TE-17
D467	408 008 2406	DIODE 1N4148
	407 013 4306	DIODE 1S2076A
D468	408 008 2406	DIODE 1N4148
	407 012 4406	DIODE 1SS133
	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
D476	401 024 7400	CARBON 10K JA 1/6W
D501	407 005 7308	DIODE EM01Z
	407 005 8602	DIODE ERA15-02
	408 009 9008	DIODE BYD33D
D512	407 005 7308	DIODE EM01Z
	407 005 8602	DIODE ERA15-02
	408 009 9008	DIODE BYD33D
D605	407 006 6300	DIODE ERC05-10B
	407 009 6901	DIODE RM11C
D606	407 006 6300	DIODE ERC05-10B
	407 009 6901	DIODE RM11C
D607	407 006 6300	DIODE ERC05-10B
	407 009 6901	DIODE RM11C
D608	407 006 6300	DIODE ERC05-10B
	407 009 6901	DIODE RM11C
⚠ D610	407 234 8701	PHOTO COUPLE PC123X5YFZ
	407 230 3908	PHOTO COUPLE PC123Y52
	407 231 7707	PC TLP421F(D4-BL)
D611	407 146 8103	DIODE EG01C
D612	407 005 9807	DIODE ERA81-004
D614	407 007 6606	DIODE ES1
D616	407 099 7901	ZENER DIODE MTZJ20B
	407 055 1806	ZENER DIODE RD20EB2
D617	408 008 2406	DIODE 1N4148
	407 012 4406	DIODE 1SS133
	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
D619	407 063 9306	ZENER DIODE MTZJ7.5C
	407 057 6502	ZENER DIODE RD7.5EB3
D643	407 012 4406	DIODE 1SS133
D646	408 008 2406	DIODE 1N4148
	407 012 4406	DIODE 1SS133
	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
D651	407 009 8806	DIODE RU3AM
D652	407 007 7801	DIODE EU2Z
	408 045 7907	DIODE EU2
D653	407 106 2806	DIODE RU3YX
	408 045 8508	DIODE RU3YX
D654	407 106 2806	DIODE RU3YX
	408 045 8508	DIODE RU3YX
D655	408 008 2406	DIODE 1N4148
	407 012 4406	DIODE 1SS133
	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
D661	407 099 5501	ZENER DIODE MTZJ6.2C
	407 057 2801	ZENER DIODE RD6.2EB3
D662	407 099 5600	ZENER DIODE MTZJ6.8A
	408 047 8605	ZENER DIODE MTZJ6.8A
D664	407 099 6102	ZENER DIODE MTZJ10B
	407 054 0008	ZENER DIODE RD10EB2
	408 047 2306	ZENER DIODE MTZJ10B
D671	408 008 2406	DIODE 1N4148
	407 012 4406	DIODE 1SS133
	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
D692	407 149 0807	DIODE 1SS355-TE-17
D693	408 008 2406	DIODE 1N4148
	407 012 4406	DIODE 1SS133
	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
D694	407 149 0807	DIODE 1SS355-TE-17
D801	407 206 5608	ZENER DIODE UDZS-TE-1710B
D802	407 206 5608	ZENER DIODE UDZS-TE-1710B
D803	407 206 5608	ZENER DIODE UDZS-TE-1710B
D804	407 206 5608	ZENER DIODE UDZS-TE-1710B
D805	407 206 5608	ZENER DIODE UDZS-TE-1710B
D861	407 055 7907	ZENER DIODE RD3.6EL
	408 041 2005	ZENER DIODE RD3.6EL
MISCELLANEOUS		
⚠ F601	423 028 8603	FUSE 250V 4A
	423 024 8409	FUSE 250V 4A
	423 007 2103	FUSE 250V 4A
F601A	645 000 5077	HOLDER,FUSE
	645 016 0479	HOLDER,FUSE
F601B	645 000 5077	HOLDER,FUSE
	645 016 0479	HOLDER,FUSE
A101	645 064 2777	TUNER,U/V
A1901	645 047 6228	UNIT,REMOCON RECEIVER
K1001	645 015 7462	JACK,RCA-2(3-1)
	652 000 1602	JACK,RCA-2
K1002A	645 002 1817	TERMINAL,BOARD
	652 000 2098	JACK,RCA-2
K1921	645 006 4708	JACK,PHONE D3.6
	652 000 0155	JACK,PHONE D3.5
⚠ PS601	408 046 4400	TH PTDAA1BF9R0Q200
SW1901	645 003 4701	SWITCH,PUSH 1P-1TX1
	645 019 4887	SWITCH,PUSH 1P-1TX1
	645 027 7382	SWITCH,PUSH 1P-1TX1
SW1902	645 003 4701	SWITCH,PUSH 1P-1TX1
	645 019 4887	SWITCH,PUSH 1P-1TX1
	645 027 7382	SWITCH,PUSH 1P-1TX1
SW1903	645 003 4701	SWITCH,PUSH 1P-1TX1
	645 019 4887	SWITCH,PUSH 1P-1TX1
	645 027 7382	SWITCH,PUSH 1P-1TX1
SW1904	645 003 4701	SWITCH,PUSH 1P-1TX1
	645 019 4887	SWITCH,PUSH 1P-1TX1
	645 027 7382	SWITCH,PUSH 1P-1TX1
SW1905	645 003 4701	SWITCH,PUSH 1P-1TX1
	645 019 4887	SWITCH,PUSH 1P-1TX1
	645 027 7382	SWITCH,PUSH 1P-1TX1
⚠ SW601	645 050 4129	SWITCH,PUSH POWER 2P-2T
	652 001 4565	SWITCH,PUSH POWER 2P-2T
X161	421 009 9403	SAW F TSF5246P
X211	652 001 0154	OSC,CRYSTAL 4.433619MHZ
X801	645 004 1938	OSC,CRYSTAL 32.768KHZ
	645 004 1945	OSC,CRYSTAL 32.768KHZ

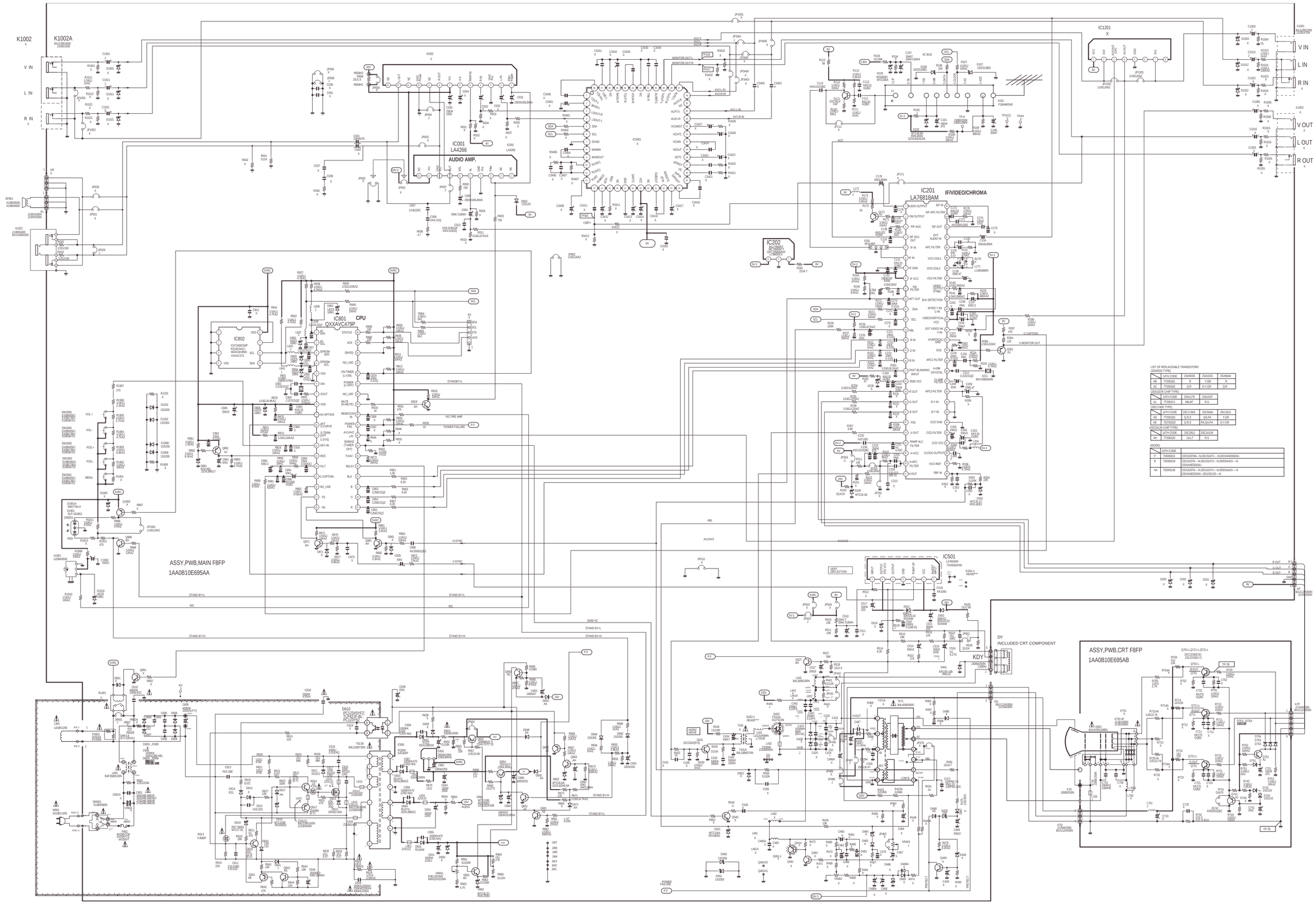
610 315 1328 ASSY,PWB,CRT F8FP 1AA0B10E695AB

Ref. No.	Part No.	Description
TRANSISTOR		
Q741	405 134 5905	TR 2SA1037AK-T146-R
	405 147 2205	TR 2SA1037AK-S-T146
	405 002 0308	TR 2SA1037K T146 R
	405 002 0407	TR 2SA1037K T146 S
	405 002 6706	TR 2SA1179-M6-TB

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
	405 002 6904	TR 2SA1179-M7-TB			
	405 163 1503	TR 2SA1179N-M6-TB			
	405 163 2708	TR 2SA1179N-M7-TB			
	405 173 9605	TR 2SA1235A1E			
	405 173 9704	TR 2SA1235A1F			
Q751	405 134 5905	TR 2SA1037AK-T146-R			
	405 147 2205	TR 2SA1037AK-S-T146			
	405 002 0308	TR 2SA1037K T146 R			
	405 002 0407	TR 2SA1037K T146 S			
	405 002 6706	TR 2SA1179-M6-TB			
	405 002 6904	TR 2SA1179-M7-TB			
	405 163 1503	TR 2SA1179N-M6-TB			
	405 163 2708	TR 2SA1179N-M7-TB			
	405 173 9605	TR 2SA1235A1E			
	405 173 9704	TR 2SA1235A1F			
CAPACITOR					
C701	403 157 6305	CERAMIC 270P K 50V			
C711	403 157 6305	CERAMIC 270P K 50V			
C721	403 157 6305	CERAMIC 270P K 50V			
C731	403 077 2807	CERAMIC 1000P Z 2K			
C741	403 049 0008	ELECT 1U M 50V			
C751	403 044 1703	ELECT 470U M 16V			
RESISTOR					
R701	401 105 4007	MT-GLAZE 330 JA 1/16W			
R703	401 105 2706	MT-GLAZE 220 JA 1/16W			
R704	401 058 9807	OXIDE-MT 12K JA 1W			
R705	401 009 1508	CARBON 2.7K JA 1/2W			
R711	401 105 4007	MT-GLAZE 330 JA 1/16W			
R713	401 105 2706	MT-GLAZE 220 JA 1/16W			
R714	401 058 9807	OXIDE-MT 12K JA 1W			
R715-M	401 009 1508	CARBON 2.7K JA 1/2W			
R721	401 105 4007	MT-GLAZE 330 JA 1/16W			
R723	401 105 2706	MT-GLAZE 220 JA 1/16W			
R724	401 058 9807	OXIDE-MT 12K JA 1W			
R725-M	401 009 1508	CARBON 2.7K JA 1/2W			
R732	401 015 6504	CARBON 2.2 JA 1/4W			
	402 086 3904	CARBON 2.2 JA 1/4W			
R741	401 020 0801	CARBON 470 JA 1/4W			
R742	401 105 1501	MT-GLAZE 1.5K JA 1/16W			
R744	401 105 1402	MT-GLAZE 150 JA 1/16W			
R751	401 105 7909	MT-GLAZE 0.000 ZA 1/16W			
R752	401 105 0603	MT-GLAZE 10K JA 1/16W			
R753	401 105 0603	MT-GLAZE 10K JA 1/16W			
DIODE					
D741	407 012 4406	DIODE 1SS133			
D742	407 012 4406	DIODE 1SS133			
D751	407 012 4406	DIODE 1SS133			
D752	407 012 4406	DIODE 1SS133			
D753	407 012 4406	DIODE 1SS133			
D754	407 012 4406	DIODE 1SS133			
MISCELLANEOUS					
⚠K701-M	645 025 6097	SOCKET,CRT 8P			

July/’04

PHILCO



LIST OF REPLACEABLE TRANSISTORS

2SA933S TYPE)

	14TH CODE	2SA933S	2SA1015	2SA564A
AB	TT200181	R	Y,GR	R
AC	TT200182	Q,R	O,Y,GR	Q,R

2SA1037K CHIP TYPE)

	14TH CODE	2SA1179	2SA1037
A1	TT200221	M6,M7	R,S

2SC1740S TYPE)

	14TH CODE	2SC1740S	2SC945A	2SC1815
AD	TT200183	Q,R,S	Q,A,PA	Y,GR
AE	TQ700182	Q,R,S	RA,QA,PA	O,Y,GR

2SC2412K CHIP TYPE)

	14TH CODE	2SC2812	2SC2412K
AH	TT200220	L6,L7	R,S

(DIODE)

	14TH CODE	
P	TD000021	DO1532076A---N,DO1523471---N,DO1XAAE00634---
R	TD000019	DO1532076---N,DO1523473---N,DO0D544ZX---N DO1XAAE00634---
AA	TD000192	DO1532076---N,DO1523473---N,DO0D544ZX---N DO1XAAE00634--,DO1S5133---N

THE SERVICE PRECAUTION:
The area enclosed by this line(⚠) is directly connected with AC mains voltage. When servicing the area, connect an isolating transformer between TV receiver and AC line to eliminate hazard of electric shock.

PRODUCT SAFETY NOTICE:
Product safety should be considered when a component replacement is made in any area of a receiver.
Components indicated by a mark ⚠ in this circuit diagram show components whose values have special significance to product safety. It is particularly recommended that only parts specified on the part service manual be used for components replacement pointed out by the mark.

CIRCUIT DIAGRAM NOTICE:
1. All resistance value are in ohms, K=1,000, M=1,000,000.
2. All resistance rated wattages are 1/6W unless otherwise noted.
3. Excepting electrolytic capacitors, all capacitance values of less than 1 are expressed in μ F and more than 1 are pF.
4. All capacitance rated voltages are 50V unless otherwise noted.
5. All inductance values are in μ H.
6. Voltage readings take with a "VTVM" are from point indicated chassis ground. Voltage readings taken by using NTSC colour bar signal are with all controls at normal position. Some voltage may vary with signal strength.
7. Waveform were taken with NTSC colour bar and controls adjusted for normal picture. Waveforms were taken by using a wide band oscillo-scope and a low capacity probe.
8. This circuit diagram covers a basic or representative chassis only. There may be some components or partial circuit differences between the actual chassis and the circuit diagram.
9. Parts specified with "X" are not installed in this model.
10. Parts specified with "J" are just jumper wires.
11. Expression of capacitance and resistance in circuit diagrme.

Capacitance (Example)
1000 C M 2000 D
- Characteristic
- Capacitance value (220pF)
- Allowable error (±20%) — J= ± 5%; K= ±10%; M= ±20%
- Kind (Ceramic) — T, A, U, D: Electrolytic; C, K, B: Ceramic; F: Mylar film; M, N: Polypropylene; Z: Metalized paper
- Rated voltage (1,000V)

Resistance (Example)
1/2 N J 1.2
- Resistance value (1.2Ω)
- Allowable error (±5%)
- Kind (M.carbon) — D: Carbon; N: Metalized carbon; S: Oxied metalized; W: Wire wounding; C: Solid
- Rated wattage (1/2W)

TRANSISTOR, DIODE AND INTEGRATED CIRCUIT TERMINAL GUIDE

C: COLLECTOR
B: BASE
E: EMITTER

A: ANODE
K: KATHODE

CHIP COMPONENTS
TRANSISTOR
DIODE
RESISTOR

N/2
N/2 + 1

PARTICULAR PARTS SYMBOL
FUSIBLE RESISTOR
NON POLE ELECTRIC CAPACITOR
POSISTER

PHILCO

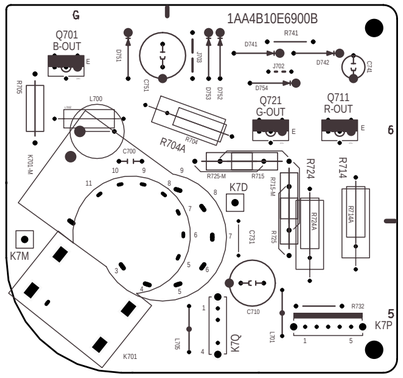
COLOUR TELEVISION

LA5-A CHASSIS SERIES

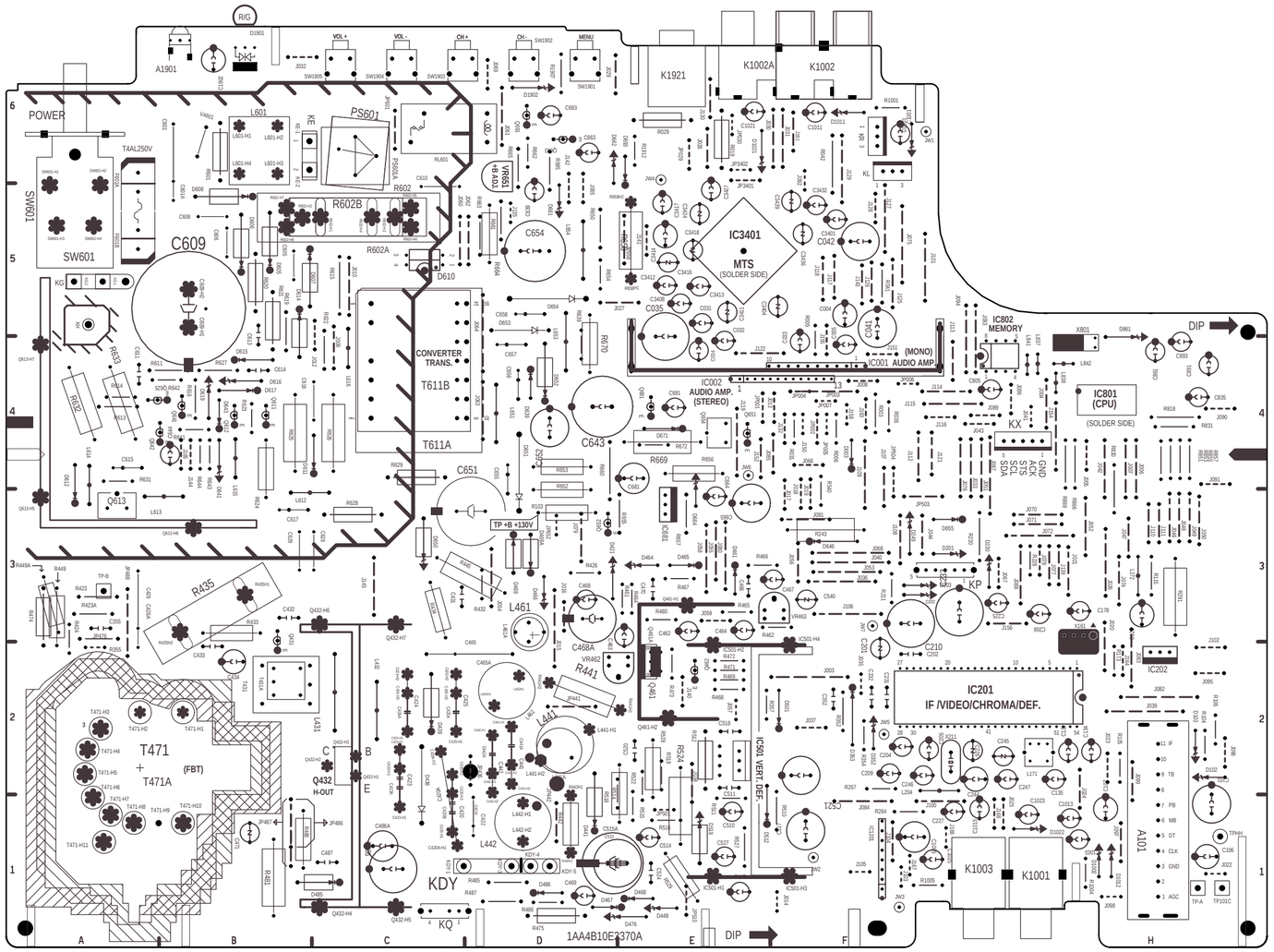
SERVICE REF. NO. PM1414-00

F8FS

CRT BOARD (Component Location)



MAIN BOARD (Component Location)



Waveforms & Voltages

(On the Main Board)

IC001 (AUDIO AMP.)

Pin-1	NC	**2**	NCV	**3**	1.1V	**4**	GND	**5**	0.7V	**6**	1.1V	**7**	7.3V	**8**	NC	**9**	14.8V
10	NC																

IC201 (IF/VIDEO/CHROMA)

Pin-1	2.3V	**2**	2.3V	**3**	2.7V	**4**	1.6V	**5**	2.9V	**6**	2.9V	**7**	GND	**8**	5.0V	**9**	2.3V
10	2.5V	**11**	4.7V	**12**	4.6V	**13**	3.6V	**14**	1.6V	**15**	1.6V	**16**	1.6V	**17**	0V	**18**	8.3V
19	2.6V	**20**	2.9V	**21**	2.8V	**22**	2.0V	**23**	2.4V	**24**	2.6V	**25**	5.1V	**26**	2.7V	**27**	0.9V
28	1.2V	**29**	1.7V	**30**	0.9V	**31**	4.5V	**32**	8.3V	**33**	GND	**34**	GND	**35**	GND	**36**	3.3V
37	1.8V	**38**	2.8V	**39**	3.5V	**40**	2.4V	**41**	GND	**42**	2.6V	**43**	5.0V	**44**	2.8V	**45**	2.6V
46	2.5V	**47**	3.7V	**48**	4.1V	**49**	4.1V	**50**	2.4V	**51**	2.2V	**52**	1.9V	**53**	2.4V	**54**	3.2V

IC202 (REG.)

Pin-1	7.7V	**2**	GND	**3**	5.0V

IC681 (REG.)

Pin-1	11.0V	**2**	GND	**3**	5.1V

IC501 (VERT. OUT)

Pin-1	2.5V	**2**	25.9V	**3**	2.1V	**4**	GND	**5**	12.3V	**6**	26.2V	**7**	2.5V

IC801 (CPU)

Pin-1	4.7V	**2**	4.6V	**3**	5.0V	**4**	5.0V	**5**	GND	**6**	2.0V	**7**	2.7V	**8**	5.0V	**9**	3.0V
10	3.6V	**11**	0.9V	**12**	0V	**13**	5.0V	**14**	3.4V	**15**	2.8V	**16**	0V	**17**	4.8V	**18**	4.2V
19	0V	**20**	0V	**21**	0V	**22**	0V	**23**	0V	**24**	0V	**25**	0V	**26**	0V	**27**	5.0V
28	4.9V	**29**	0V	**30**	GND	**31**	4.8V	**32**	4.9V	**33**	NC	**34**	0.1V	**35**	5.0V	**36**	5.0V

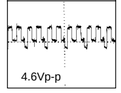
IC802 (MEMORY)

Pin-1	GND	**2**	GND	**3**	GND	**4**	GND	**5**	5.0V	**6**	5.0V	**7**	GND	**8**	5.0V

Q111	**Q171**	**Q261**	**Q431**	**Q432**	**Q527**	**Q613**	**Q651**	**Q681**	**Q654**	**Q818**	**Q861**
B 1.2V	B 2.3V	B 2.4V	B 0.3V	B -0.1V	B 0V	G 4.3V	B 0V	B 0.7V	B 9.8V	B 0V	B 4.4V
C 4.5V	C 0V	C 0V	C 14.5V	C 124.8V	C 5.0V	D 0V	C 9.9V	C 0.1V	C 9.6V	C 7.3V	C 5.0V
E 0.5V	E 2.9V	E 3.1V	E 0V	E 0V	E 0V	S 0V	E 0V	E 0V	E 9.1V	E 0V	E 5.0V

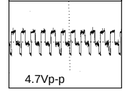
Q871	**Q881**	**Q886**
B -0.1V	B -0.4V	B 0.7V
C 4.8V	C 4.2V	C 0.1V
E 0V	E 0V	E 0V

IC201-pin19 <R out>



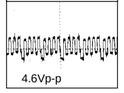
4.6Vp-p

IC201-pin20 <G out>



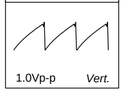
4.7Vp-p

IC201-pin21 <B out>



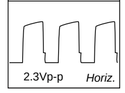
4.6Vp-p

IC201-pin23 <V drive>



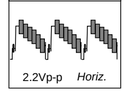
1.0Vp-p *Vert.*

IC201-pin27 <H drive>



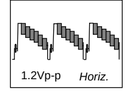
2.3Vp-p *Horiz.*

IC201-pin40 <Selected V out>



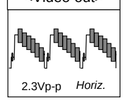
2.2Vp-p *Horiz.*

IC201-pin44 <Internal V in>



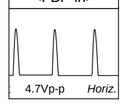
1.2Vp-p *Horiz.*

IC201-pin46 <Video out>



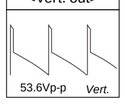
2.3Vp-p *Horiz.*

IC201-pin28 <FBP in>



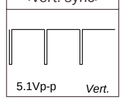
4.7Vp-p *Horiz.*

IC501-pin5 <Vert. out>



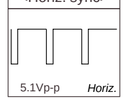
53.6Vp-p *Vert.*

IC801-pin17 <Vert. sync>



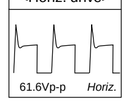
5.1Vp-p *Vert.*

IC801-pin18 <Horiz. sync>



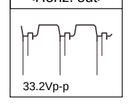
5.1Vp-p *Horiz.*

Q431-C <Horiz. drive>



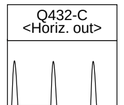
61.6Vp-p *Horiz.*

Q432-B <Horiz. out>



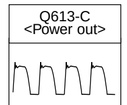
33.2Vp-p

Q432-C <Horiz. out>



1280Vp-p *Horiz.*

Q613-C <Power out>

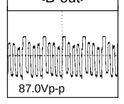


430Vp-p

(On the CRT Board)

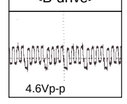
Q701	**Q711**	**Q721**	**Q741**	**Q751**
B 2.8V	B 2.6V	B 2.9V	B 0.7V	B 9.5V
C 89.6V	C 96.5V	C 88.7V	C 0V	C 0V
E 2.6V	E 2.5V	E 2.7V	E 1.4V	E 8.8V

Q701-C <B-out>



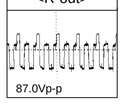
87.0Vp-p

Q701-B <B drive>



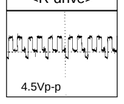
4.6Vp-p

Q711-C <R-out>



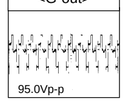
87.0Vp-p

Q711-B <R drive>



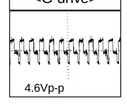
4.5Vp-p

Q721-C <G-out>



95.0Vp-p

Q721-B <G drive>



4.6Vp-p