HITACHI

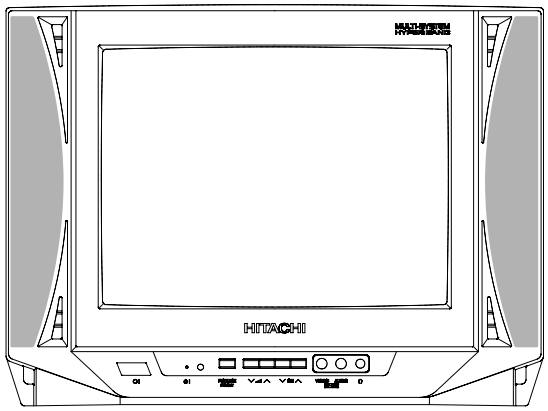
YS	No.

C14-RF60	
Destination	Code
HONG KONG	051
JAPAN TOURIST	981J

SERVICE MANUAL

PAL/SECAM/NTSC

GA1 Chassis



CAUTION: Before servicing this chassis, it is important that the service technician read the "IMPORTANT SERVICE NOTES" in this Service Manual.

CONTENTS

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

COLOUR TELEVISION

JULY 2003 Digital Media System Group, Hitachi Asia Ltd.

ADJUSTMENT PRECAUTIONS

This model's setting are adjusted in two different ways: through the I²C bus control and in the conventional analog manner. The adjustments via the I²C bus control include preset-only items and variable data.

CAUTION: Make sure TV Set is in "Normal Condition" before switch to Service Mode for adjustment.

1. Setting the service mode by the microprocessor.

1 Short JA 137 & JA 138 for 1 second and release to switch to the service mode position, and the microprocessor is in input mode. (Adjustment through the I²C bus control). (Use JWS Key to set as well).
2 Press the CH DOWN / UP key on the remote controller to get ready to select the mode one by one.
3 Press the CH DOWN / UP key on the remote controller to select the modes reversibly one by one.
4 Using the VOLUME UP/ DOWN key on the remote controller, the data can be modified.
5 Short JA 137 & JA 138 for 1 second and release to switch to the normal mode (OFF) position, and the microprocessor is in out of the service mode.

2. Factory Presetting.

1 Short JA 137 & JA 138 then turn "ON" the main power and release to switch to the Service Mode position.Initial values are automatically preset, only when a new EEPROM is used (Judge with the first 4 bytes).
2 The initial data are preset as listed in page 5.
3 Make sure the data need modify or not (Initial data).

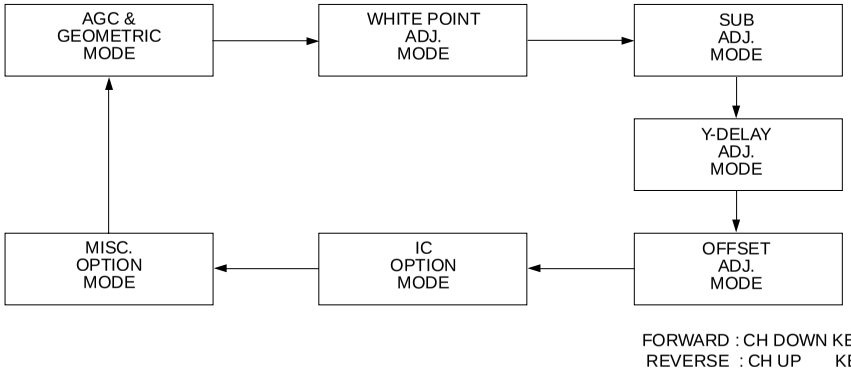
Note: Once the chassis has been assembly together and ready to be POWER ON for the FIRST TIME, make sure to short JA137 & JA138 to switch to the service mode position first and then turn on the main power switch (See 2-1 above).

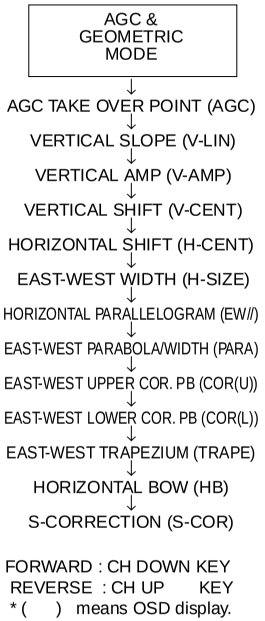
Precaution: If haven't done this initiation, it may possibly generate excessive Beam current.

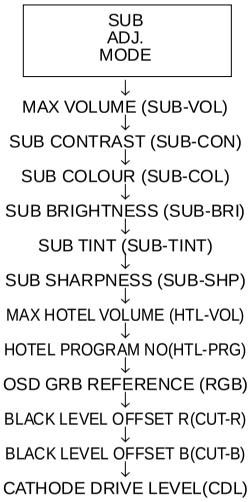
3. For reference please check with memory map (GA1 Series type RH-IX3368CE Attachment)

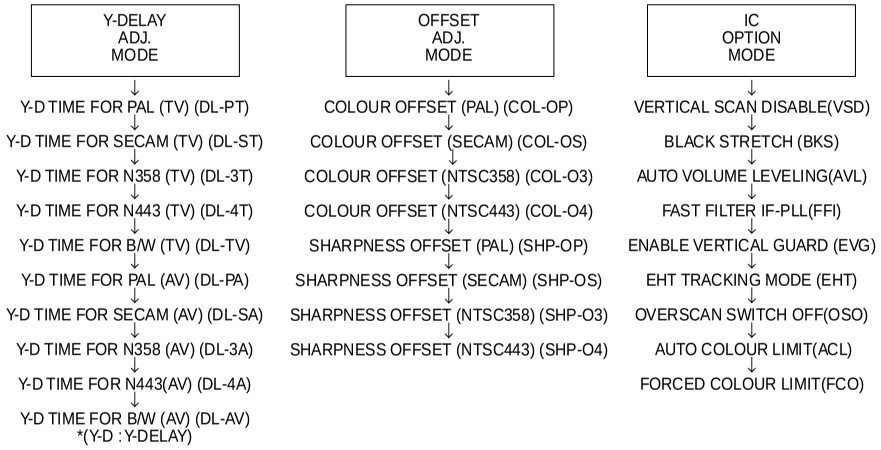
Ë SERVICE MODE

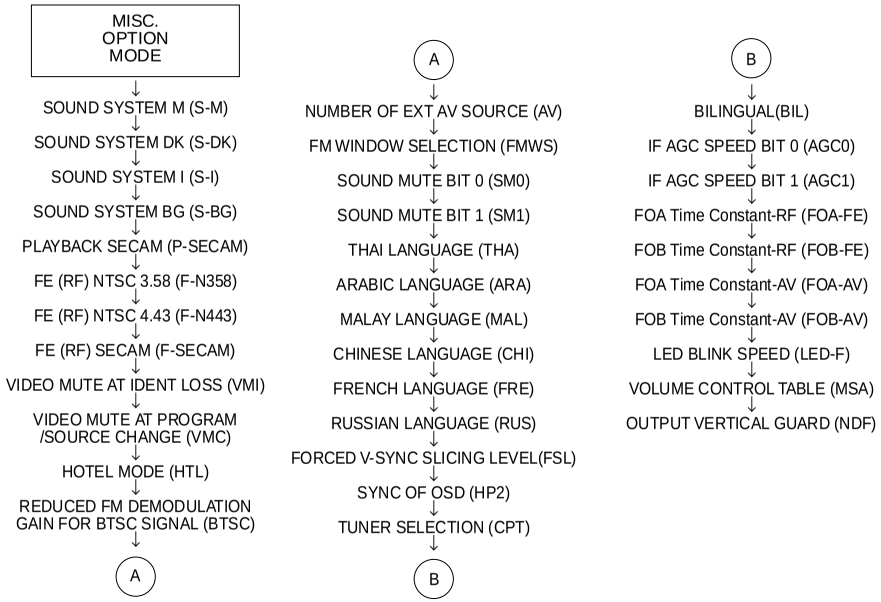
(1) In the Service Mode, Key is used to select the mode in the following order.











* Direct Key-in for service item in service mode

RC COMMAND	SERVICE-ITEM
FUNCTION	AGC
CONTRAST DOWN	V-LIN
COLOUR DOWN	V-AMP
BRIGHTNESS DOWN	V-CENT
TINT DOWN	H-CENT
SHARPNESS DOWN	EW / /
SYSTEM	HB
BLUEBACK	S-COR
TIMER	SUB-VOL
CONTRAST UP	SUB-CON
COLOUR UP	SUB-COL
BRIGHTNESS UP	SUB-BRI
TINT UP	SUB TINT
SHARPNESS UP	SUB-SHP

After short JA137& JA138, and turn on the main power switch, read data from EEPROM address 00H ~ 03H, and compare to the list below, if different, initialize the EEPROM.

Address	Data	Address	Data
00H:	55H	02H:	43H
01H:	4FH	03H:	A1H

EEPROM ITEMS	OSD	DATA LENGTH	INITIAL DATA	FIX/ADJ	REMARK
AGC TAKE OVER POINT	AGC	0~63	14	ADJ	
VERTICAL SLOPE	V-LIN	0~63	32	ADJ	
VERTICAL AMPLITUDE	V-AMP	0~63	32	ADJ	
VERTICAL SHIFT	V-CENT	0~63	32	ADJ	
HORIZONTAL SHIFT	H-CENT	0~63	32	ADJ	
EAST-WEST WIDTH	H-SIZE	0~63	32	*FIX	
HORIZONTAL PARALLELOGRAM	EW//	0~63	32	*FIX	
EAST-WEST PARABOLA/WIDTH	PARA	0~63	32	*FIX	
EAST-WEST UPPER CORNER PARABOLA	COR (U)	0~63	32	*FIX	
EAST-WEST LOWER CORNER PARABOLA	COR (L)	0~63	32	*FIX	
EAST-WEST TRAPEZIUM	TRAPE	0~63	32	*FIX	
HORIZONTAL BOW	HB	0~63	32	*FIX	
S-CORRECTION	S-COR	0~63	0	CHG	*1
WHITE POINT RED STD WHITE TEMP	DRI-RS	0~63	32	*FIX	
WHITE POINT GREEN STD WHITE TEMP	DRI-GS	0~63	32	ADJ	
WHITE POINT BLUE STD WHITE TEMP	DRI-BS	0~63	32	ADJ	
WHITE POINT RED COOL WHITE TEMP	DRI-RC	0~63	25	ADJ	
WHITE POINT GREEN COOL WHITE TEMP	DRI-GC	0~63	32	ADJ	(DRI-GS)-7 DATA
WHITE POINT BLUE COOL WHITE TEMP	DRI-BC	0~63	32	ADJ	SAME AS (DRI-BS) DATA
WHITE POINT RED WARM WHITE TEMP	DRI-RW	0~63	32	*FIX	
WHITE POINT GREEN WARM WHITE TEMP	DRI-GW	0~63	32	ADJ	(DRI-GS)-7 DATA
WHITE POINT BLUE WARM WHITE TEMP	DRI-BW	0~63	32	ADJ	(DRI-BS)-7 DATA
MAX VOLUME	SUB-VOL	0~63	63	*FIX	
SUB CONTRAST	SUB-CON	0~63	63	CHG	*7
SUB COLOUR	SUB-COL	0~63	32	ADJ	
SUB BRIGHTNESS	SUB-BRI	0~63	32	ADJ	
SUB TINT	SUB-TINT	0~63	32	ADJ	
SUB SHARPNESS	SUB-SHP	0~63	32 (20)	*FIX	
MAX HOTEL VOLUME	HTL-VOL	0~63	32	*FIX	
HOTEL PROGRAM NUMBER	HTL-PRG	0~99 OR>99FOR NONE	255	*FIX	
OSD GRB REFERENCE	RGB	0~15	15	CHG	*8
BLACK LEVEL OFF-SET R	CUT-R	0~63	32	ADJ	
BLACK LEVEL OFF-SET G	CUT-G	0~63	32	ADJ	
CATHODE DRIVE LEVEL	CDL	0~15	0	CHG	*2
Y-DELAY TIME FOR PAL(TV) [YD]	DL-PT	0~15	12	*FIX	
Y-DELAY TIME FOR SECAM(TV) [YD]	DL-ST	0~15	15	*FIX	
Y-DELAY TIME FOR N358 (TV) [YD]	DL-3T	0~15	12	CHG	*6
Y-DELAY TIME FOR N443 (TV) [YD]	DL-4T	0~15	12	*FIX	
Y-DELAY TIME FOR B/W (TV) [YD]	DL-TV	0~15	12	*FIX	
Y-DELAY TIME FOR PAL (AV) [YD]	DL-PA	0~15	12	*FIX	
Y-DELAY TIME FOR SECAM (AV) [YD]	DL-SA	0~15	15	*FIX	
Y-DELAY TIME FOR N358 (AV) [YD]	DL-3A	0~15	12	*FIX	
Y-DELAY TIME FOR N443 (AV) [YD]	DL-4A	0~15	12	*FIX	
Y-DELAY TIME FOR B/W (AV) [YD]	DL-AV	0~15	12	*FIX	
COLOUR OFFSET (PAL)	COL-OP	0~15	8	CHG	*3
COLOUR OFFSET (SECAM)	COL-OS	0~15	8	CHG	*3
COLOUR OFFSET (NTSC358)	COL-O3	0~15	4	CHG	*3
COLOUR OFFSET (NTSC443)	COL-O4	0~15	4	CHG	*3
SHARPNESS OFFSET (PAL)	SHP-OP	0~15	8	*FIX	
SHARPNESS OFFSET (SECAM)	SHP-OS	0~15	4	*FIX	
SHARPNESS OFFSET (NTSC358)	SHP-O3	0~15	12 (8)	*FIX	
SHARPNESS OFFSET (NTSC443)	SHP-O4	0~15	8	*FIX	
VERTICAL SCAN DISABLE	VSD	0(DISABLE)/1(ENABLE)	0	*FIX	
BLACK STRETCH	BKS	0(DISABLE)/1(ENABLE)	1	*FIX	
AUTOMATIC VOLUME LEVELING	AVL	0(DISABLE)/1(ENABLE)	1	*FIX	
FAST FILTER IF-PLL	FFI	0(DISABLE)/1(ENABLE)	0	*FIX	
ENABLE VERTICAL GUARD (RGB BLANKING)	EVG	0(DISABLE)/1(ENABLE)	1	*FIX	
EHT TRACKING MODE (HCO)	EHT	0(DISABLE)/1(ENABLE)	1	*FIX	
OVERSCAN SWITCH OFF	OSO	0(DISABLE)/1(ENABLE)	0	*FIX	
AUTO COLOUR LIMIT	ACL	0(DISABLE)/1(ENABLE)	0	*FIX	
FORCED COLOUR LIMIT	FCO	0(DISABLE)/1(ENABLE)	0	*FIX	
SOUND SYSTEM M	S-M	0(DISABLE)/1(ENABLE)	0	CHG	*4
SOUND SYSTEM DK	S-DK	0(DISABLE)/1(ENABLE)	1	*FIX	
SOUND SYSTEM I	S-I	0(DISABLE)/1(ENABLE)	1	*FIX	
SOUND SYSTEM BG	S-BG	0(DISABLE)/1(ENABLE)	1	*FIX	
PLAYBACK SECAM	P-SECAM	0(DISABLE)/1(ENABLE)	1	*FIX	
FE (RF) NTSC 3.58	F-N358	0(DISABLE)/1(ENABLE)	0	CHG	*5
FE (RF) NTSC 4.43	F-N443	0(DISABLE)/1(ENABLE)	1	*FIX	
FE (RF) SECAM	F-SECAM	0(DISABLE)/1(ENABLE)	1	*FIX	
VIDEO MUTE AT IDENT LOSS	VMI	0(DISABLE)/1(ENABLE)	1	*FIX	
VIDEO MUTE AT PROGRAM/SOURCE CHANGE	VMC	0(DISABLE)/1(ENABLE)	1	*FIX	
HOTEL MODE	HTL	0(DISABLE)/1(ENABLE)	0	*FIX	
REDUCED FM DEMODULATOR GAIN FOR BTSC SIGNAL	BTSC	0(DISABLE)/1(ENABLE)	0	*FIX	
NUMBER OF EXTERNAL AV SOURCE	AV	0 FOR1 AV/1 FOR 2AV	1 (0)	*FIX	
FM WINDOW SELECTION	FMWS	0(DISABLE)/1(ENABLE)	0	*FIX	
SOUND MUTE BIT 0	SM0	0(DISABLE)/1(ENABLE)	1	*FIX	
SOUND MUTE BIT 1	SM1	0(DISABLE)/1(ENABLE)	0	*FIX	
THAI LANGUAGE	THA	0(DISABLE)/1(ENABLE)	0	*FIX	
ARABIC LANGUAGE	ARA	0(DISABLE)/1(ENABLE)	1	*FIX	
MALAY LANGUAGE	MAL	0(DISABLE)/1(ENABLE)	1	*FIX	
CHINESE LANGUAGE	CHI	0(DISABLE)/1(ENABLE)	1	*FIX	
FRENCH LANGUAGE	FRE	0(DISABLE)/1(ENABLE)	1	*FIX	
RUSSIAN LANGUAGE	RUS	0(DISABLE)/1(ENABLE)	1	*FIX	
FORCED V-SYNC SLICING LEVEL	FSL	0(DISABLE)/1(ENABLE)	0	*FIX	
SYNC OF OSD	HP2	0(DISABLE)/1(ENABLE)	0	*FIX	
TUNER SELECTION (0:SHARP/ALPS;1:MURATA)	CPT	0(DISABLE)/1(ENABLE)	0	*FIX	
BILINGUAL	BIL	0(DISABLE)/1(ENABLE)	0	*FIX	
IF AGC SPEED BIT 0	AGC0	0(DISABLE)/1(ENABLE)	1	*FIX	
IF AGC SPEED BIT 1	AGC1	0(DISABLE)/1(ENABLE)	0	*FIX	
PHI-1 TIME CONSTANT (RF)	FOA-FE	0(DISABLE)/1(ENABLE)	0	*FIX	
PHI-1 TIME CONSTANT (RF)	FOB-FE	0(DISABLE)/1(ENABLE)	0	*FIX	
PHI-1 TIME CONSTANT (OFF AIR)	FOA-AV	0(DISABLE)/1(ENABLE)	1	*FIX	
PHI-1 TIME CONSTANT (OFF AIR)	FOB-AV	0(DISABLE)/1(ENABLE)	1	*FIX	
LED BLINK SPEED	LED_F	0(DISABLE)/1(ENABLE)	0 (1)	*FIX	
VOLUME CONTROL PWM TABLE	MSA	0(DISABLE)/1(ENABLE)	0 (1)	*FIX	
OUTPUT VERTICAL GUARD	NDF	0(DISABLE)/1(ENABLE)	0 (1)	*FIX	

NOTE :

1) *FIX: PLEASE DO NOT CHANGE FIXED DATA WITHOUT SPECIFIC INSTRUCTION.
   Please set the EEPROM initial data according to the value in parenthesis ( ) before adjustment.
2) *1: S-COR ADJUST=17
3) *2: CDL ADJUST=5
4) *3: ADJUST COLOUR OFFSET AFTER ADJUST SUB-COLOUR
   COLOUR OFFSET (PAL) COL-OP : 8 -----> 14
   COLOUR OFFSET (SECAM) COL-OS : 8 -----> 14
   COLOUR OFFSET (NTSC358) COL-O3 : 4 -----> 10
   COLOUR OFFSET (NTSC443) COL-O4 : 4 -----> 10
5) *4: ADJUST S-M=1
6) *5: F-N358=1
7) *6: DL-3T=8
8) *7: SUB-CON=52
9) *8: RGB=6

INITIAL SHIPPING SETTING FOR PRESET TUNING

(1) Please set the MCL1.
(2) After set the MCL1, please set the INITIAL SETTING for each model.
INITIAL 2: Hong Kong models.
INITIAL 3: Japan Tourist models.

	MCL1	
CH-NO	Fv (MHz)	SOUND SYS
0	41.10	
1	48.25	B/G
2	62.25	B/G
3	77.25	D/K
4	175.25	B/G
5	182.25	B/G
6	183.25	D/K
7	191.25	D/K
8	196.25	B/G
9	199.25	M
10	210.25	B/G
11	224.25	B/G
12	471.25	B/G
13	487.25	I
14	503.25	B/G
15	575.25	B/G
16	583.25	B/G
17	599.25	B/G
18	621.25	M
19	639.25	D/K
20	703.25	B/G
21	735.25	I
22	767.25	B/G
23	815.25	B/G
24	855.25	I
25	855.25	B/G
26	55.25	M
27	83.25	M
28	183.25	M
29	193.25	M
30	217.25	M
31	471.25	M
32	477.25	M
33	693.25	M
34	41.10	
35	112.25	B/G
36	168.25	B/G
37	41.10	
38	294.25	B/G
39	463.25	B/G
40	41.10	
41	647.25	B/G
42	663.25	B/G
43	679.25	B/G
44	174.95	B/G
45	175.55	B/G
46	41.10	

* The Sound System of above channels will be changed accordingly, after pressing INITIAL key.
For example; pressing INITIAL2 and 3, all Sound Systems will be set to I and B/G.

SHIPPING SETTING & CHECKING

(1) The following default data has been factory-set for the E^2PROM follow by INITIAL setting.

ITEMS	DATA SETTING
LAST PROGRAM/CHANNEL	1
FLASHBACK PROGARM/CH	1
DIGIT	1
C-SYSTEM	AUTO
S-SYSTEM	*1
SKIP	OFF
AFC	ON
VOLUME	1
CONTRAST	(MAX)
COLOUR	(CENTER)
BRIGHTNESS	(CENTER)
TINT	(CENTER)
SHARPNESS	(CENTER)
WHITE TEMP	STANDARD
REMINDER TIMER	In-active, "--:--"
ON TIMER	In-active, "--:--"
OFF TIMER	In-active, "--:--"
LAST POWER	POWER-ON
LANGUAGE	*1
BLUE BACK MUTE	ON
HOTEL MODE	OFF
0 CHANNEL SKIP	ON
LAST TV/AV	TV

*1:Please refer defaults for LANGUAGE and SOUND SYSTEM per MODEL as follows.

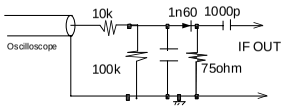
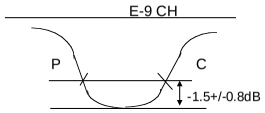
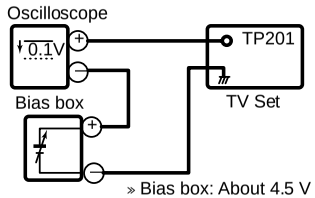
INITIAL	LANGUAGE	SOUND SYSTEM
2	CHINESE	I
3	ENGLISH	B/G

FACTORY SETTING BY MODEL
(Reference: Geomagnetism Adjustment)

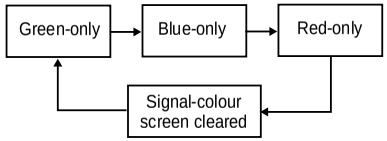
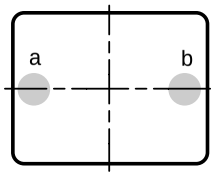
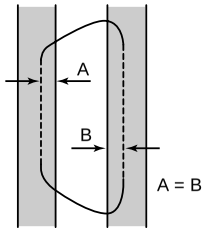
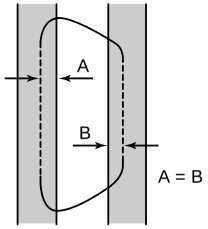
DESTINATION	MAGNETIC FIELD (V, H) nT	BACKGROUND	LANG.	S-SYS	LANG QTY
HONGKONG (051)	"20,000" "40,000"	12300K	CHINESE	I	6
JAPAN TOURIST (981J)	"35,000" "30,000"	12300K	ENGLISH	B/G	6

LANGUAGE QTY: ENGLISH/CHINESE/FRENCH/ARABIC/MALAY/RUSSIAN

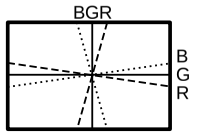
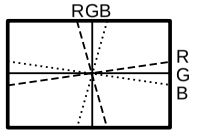
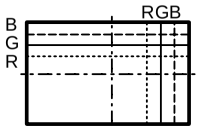
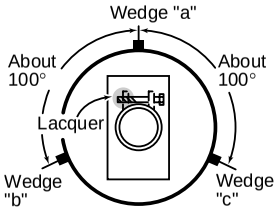
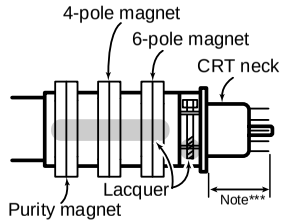
PIF ADJUSTMENT

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	**Tuner IFT (PRESET)**	1. Get the tuner ready to receive the CH. E - 9 signal,but with no signal input. Adjust the PLL data. 2. Connect the sweep generator's output cable to the tuner antenna. (RF SWEEP) 3. Adjust the sweep generator's to 80dBuV. 4. Connect the response lead (use LOW IMPEDANCE probe with wave detector ; see **Fig.1**) to the tuner's IF output terminal. (This terminal must have the probe alone connected). 5. Set the RF AGC to 0 - 6 V with no saturation with the waveform. 6. Adjust the tuner IF coil to obtain the waveform as shown in **Fig. 2**. Note: Be sure to keep the tuner cover in position during this adjustment.	 **Fig. 1**  **Fig. 2**
2	**RF-AGC TAKE OVER POINT ADJUSTMENT (I^2C BUS CONTROL)**	1. Receive "PAL COLOUR BAR" signal. » Signal Strength: 57 ±1 dBµV (75 ohm open) 2. Connect the oscilloscope to TP201 (Tuner's AGC Terminal) as shown in **Fig. 3**.  » Bias box: About 4.5 V **Fig. 3** 3. Call "AGC" mode in service mode. Adjust the "AGC" bus data to obtain the Tuner output pin drop 0.1 V below maximum voltage. 4. Change the antenna input signal to 63~67dBµV, and make sure there is no noise. 5. Turn up the input signal to 90~95 dBµV to be sure that there is no cross modulation beat.	**Note:** **For the 50 ohm signal strength gauge, when not using 50/75 impedance adapter, signal strength is 52 ±1 dBµV(75 ohm open), instead of 57±1 dBµV (75 ohm open).** **Precaution:** **The loss of using impedance adapter**

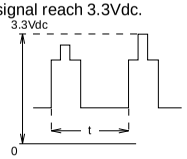
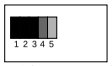
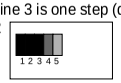
PURITY ADJUSTMENT

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	**PURITY ADJ.**	1. Receive the GREEN-ONLY signal. Adjust the beam current to about 500 µA. 2. Degauss the CRT enough with the degausing coil. **Note: Follow the Job Instruction Sheet to adjust the magnetic field.** 3. Maintain the purity magnet at the zero magnetic field and keep the static convergence roughly adjusted. 4. Observe the points a, b as shown in **Fig. 4-1** through the microscope. Adjust the landing to the rank A requirements. 5. Orient the raster rotation to 0 eastward. 6. Tighten up the deflection coil screws. » Tightening torque: 108 ± 20 N (11 ± 2 kgf) 7. Make sure the CRT corners landing meet the A rank requirements. If not, stick the magnet sheet to correct it. **Note:This adjustment must be done after warming up the unit for 30 minutes or longer with a beam current over 500 µA.** * For the following colours press R/C RGB key to change. 	 **Fig. 4-1**  **Fig. 4-2** Rank "A" (on the right of the CRT)  **Fig. 4-3** Rank "A" (on the left of the CRT)

CONVERGENCE ADJUSTMENT

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	**CONVERGENCE ADJ. (To be done after the purity adjustment.)**	1. Receive the "Crosshatch Pattern" signal. 2. Using the remote controller, call NORMAL mode. **STATIC CONVERGENCE** 1. Turn the 4-pole magnet to a proper opening angle in order to superpose the blue and red colours. 2. Turn the 6-pole magnet to a proper opening angle in order to superpose the green colour over the blue and red colours. **DYNAMIC CONVERGENCE** 1. Adjust the convergence on the fringes of the screen in the following steps. a) **Fig. 5-1**: Drive the wedge at point "a" and swing the deflection coil upward. b) **Fig. 5-2**: Drive the wedge at points "b" and "c" and swing the deflection coil downward. c) **Fig. 5-3**: Drive the "c" wedge deeper and swing the deflection coil rightward. d) **Fig. 5-4**: Drive the "b" wedge deeper and swing the deflection coil leftward. 2. Fix all the wedges on the CRT and apply glass tape over them. 3. Apply lacquer to the deflection yoke lock screw, magnet unit (purity, 4-pole, 6-pole magnets) and magnet unit lock screw. Finally received the Red-only and Blue-only signals to make sure there is no other colours on the screen. Note*** SAMSUNG CRT : 32mm CPT CRT : 35mm TOSHIBA CRT : 35mm	 **Fig. 5-1**  **Fig. 5-2**  **Fig. 5-3**  **Fig. 5-4**  

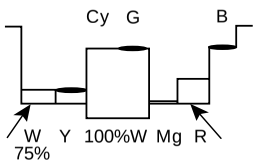
CRT CUT-OFF, BACKGROUND AND SUB-CONTRAST ADJUSTMENT

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	**CRT CUTOFF ADJUSTMENT (I^2C BUS CONTROL)**	Remark 1. Before CRT cutoff adjustment, SUB-BRIGHT, DRI-RS/RW/RC, DRI-GS/GW/GC, DRI-BS/BW/BC, CUT-R and CUT-G must be INITIAL DATA. 2. CRT Cutoff adjustment must be done inside a dark room. 1. Switch TV to VIDEO mode,BLUE BACK OFF, with NO VIDEO signal. 2. Press R/C to set Picture Normal condition. 3. First, off the screen by adjust screen variable resistor. *4. Next, checking AKB circuit function by slowly increase screen variable resistor until colour raster suddenly on and off (AKB start function). 5. Then continue adjust until retrace line appear. 6. Finally, slowly decrease the screen variable resistor until screen retrace line cut off. (Not Raster) Note : Must confirm the AKB function in set before continue the next adjustment.	* Alternative Procedure: (1) Step (1), (2), (3) and (4) are same as beside procedure. (2) Then continue adjust until retrace line appear and make sure the colour appear whether red, green or blue. (3) Connect the oscilloscope to related test points as below which is based on colour appear at (2) RED = TP47R, GREEN = TP47G, BLUE = TP47B. (4) Then adjust Screen VR until the tip of signal reach 3.3Vdc. 
2	**SUB-BRIGHTNESS ADJUSMENT (I^2C BUS CONTROL)**	1. Call " SUB-BRI" in service mode. (Receive Crosshatch pattern with 5 black level windows) 2. Adjust the " SUB BRIGHT " bus data in order that the line 1and 2 have the same darkness wherelse line 3 is one step (data) brighter than line 2. Finally data minus 1 to make line 1, 2, and 3 are in same level (darkness). 3. Clear the SERVICE mode.	1  Line 3 is one step (data) brighter than line 2 2 
3	**WHITE BALANCE SERVICE MODE ADJ (I^2C BUS CONTROL)**	1. Receive the "WHITE" pattern with BURST signal. 2. Press R/C to set Picture NORMAL condition. 3. Connect the DC miliammeter between TP602 (-) TP603 (+). 4. Check Beam current should be around 800 µA. 5. Set it to service mode and adjust the DRI-GS, & DRI-BS data to have a colour temperature of 12300°K (white). * Note . 6. Receive "WHITE" pattern, WITH BURST signal, and set BRIGHTNESS Y by generator, to **10 cd/m2 (MINOLTA CA-100) by reducing LUMINANCE Y signal. 7. Adjust "CUT-R" & "CUT-G" to get desired colour temperature #. Then go back NORMAL mode (HIGH BRIGHT) to check colour temperature. If out of range, back to (1). **Note:This adjustment must be done after warming up the unit for 30 minutes or longer with a beam current over 500µA.** * ADJUST DRI-GC/GW, DRI-BC/BW as following DATA, after finishing DRI-BS and DRI-GS DATA ADJUSTMENT. DRI-RW = 32 (FIXED), DRI-RS = 32 (FIXED) DRI-BC = "DRI-BS"	# 12300°K X : 0.272 Y : 0.275 (MINOLTA COLOUR ANALYZER CA-100) *Note: Above Data can be UP/DOWN by Volume key. LOW HIGH 10cd/m2 200cd/m2 * 12300°K DRI-GW="DRI-GS"-7 DRI-BW="DRI-BS"-7 DRI-GC="DRI-GS"-7 DRI-RC=25
4	**Maximum beam check**	1. Receive the "Monoscope Pattern" signal. 2. Press R/C to set Picture NORMAL condition. 3. Connect the DC miliammeter between TP603 (+) & TP602 (–). (Full Scale: 3 mA Range) 4. Beam current must be within 800 ± 100 µA.	

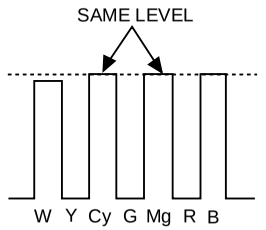
HORIZONTAL AND VERTICAL DEFLECTION LOOP ADJUSTMENT

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	**V-LIN (I^2C BUS CONTROL)**	1. Receive Monoscope Pattern Signal. 2. Call the "V-LIN" mode. 3. Increase or decrease "V-LIN" by Volume key till the horizontal line in the center of monoscope is just at the position where the blanking starts.	
2	**V-CENTER (I^2C BUS CONTROL)**	1. Call the "V-CENT" mode. 2. Increase or decrease "V-CENT" by Volume key till the picture is centered.	
3	**V-AMP (I^2C BUS CONTROL)**	1. Call the "V-AMP" mode. 2. Increase or decrease "V-AMP" by Volume key to set overscan of 9.5% typical. Adjustment Spec 9.5% range +1% -0%.	
4	**H-CENTER (I^2C BUS CONTROL)**	1. Call the "H-CENT" mode. 2. Increase or decrease "H-CENT" by Volume key to center the picture horizontal.	
5	**S-CORRECTION (I^2C BUS CONTROL)**	1. SET DATA TO 17. * Check the E-5 CH Monoscope Pattern then re-adjust V-Slope, V-Shift and V-Amp to makesure adjustment is in acceptable Ring-Shaped.	
6	**SUB-SHARPNESS**	1. SET DATA TO 20.	
1	**Focus**	1. Receive the "Monoscope Pattern" signal. 2. Press R/C to set Picture NORMAL condition. 3. Adjust the focus control to get the best focusing.	

PAL CHROMA ADJUSTMENT

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	**SUB COLOUR (I^2C BUS CONTROL)**	1. Receive the "PAL Colour Bar" signal. 2. Press R/C to set Picture Normal condition. 3. Connect the oscilloscope to Red cathode(D881 Cathode). » Range : 20 V/div. (AC) (Using 10:1 probe) » Sweep time : 10 µsec/div. 4. Using the R/C call "SUB COL" in SERVICE mode. Adjust SUB COLOUR bus data, so that the 75% White & Red portions of PAL Color Bar be at the same level shown as **Fig. 6-1**. Before adjust SUB-COL, make sure COL-OP=8, COL-OS88, COL-03=4, COL-04=4. 5. After adjust SUB-COLOUR, change colour off set. **COL-OP : 8 ------> 14 COL-O3 : 4 ------> 10** **COL-OS : 8 ------> 14 COL-O4 : 4 ------> 10** 6. Clear the SERVICE mode.	 **Fig. 6-1**

NTSC CHROMA ADJUSTMENT

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	**SUB-TINT (I^2C BUS CONTROL)**	1. Receive the "NTSC 3.58 Colour Bar" signal thru AV in. 2. Connect the oscilloscope to TP47B (P882 pin 5) BLUE-OUT. » Range : 100mV/div. (AC)(Use Probe 10:1) » Sweep time : 10 µsec/div. 3. Call the "SUB-TINT" mode in service mode. Adjust the "SUB-TINT" bus data to obtain the waveform shown as **Fig. 7-1**. 4. Clear the SERVICE mode.	 **Fig. 7-1**

PROTECTOR OPERATION CHECKING

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	**BEAM PROTECTOR**	1. Receive "Monoscope Pattern" signal. 2. Set CONTRAST MAX. 3. Set BRIGHT MAX. 4. During the Collector & Emitter of Q883/5/7 short, make sure the protector ON and switch to standby mode.	* Select one of Q883/5/7 to do each short test.
2	**H. V PROTECTOR**	1. Receive "Monoscope Pattern" signal. 2. Connect output of Bias Box to D603 cathode (R610 side). 3. Set voltage of Bias Box to 18V and make sure the protector is not working. 4. Set voltage of Bias Box to 27V, and make sure the protector is working.	
3	**Other protectors**	1. Once finish rectified Electrolytic Capacitor short testing in +B line, check all possible damaged components on +B line. (Use random selected set for inspection)	

A/V INPUT AND OUTPUT CHECKING

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	**VIDEO AND AUDIO OUTPUT CHECK**	1. Receive the "PAL Colour Bar" signal (100% White Colour Bar, Sound 400 Hz 100% Mod). 2. Terminate the Video output with a 75 ohm impedance. Make sure the output is as specified (1.0 Vp-p ±3 dB). 3. Terminate the Audio output with a 10k ohm impedance. Make sure the O/P is as specified (1.76 Vp-p ±3 dB).	
2	**VIDEO AND AUDIO INPUT CHECK**	1. Using the TV/AV key on the remote controller, make sure that the modes change in order of TV, AV & TV again and the video & audio output are according to the input terminal for each mode.If connect input to Front and Rear AV terminal, input terminal of Front AV will be selected.	

FUNCTION OPERATION CHECKING (VIDEO AND AUDIO)

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	**CONTRAST key**	1. Receive "Monoscope Pattern" signal. 2. Set P-Mode to select CONTRAST. 3. Press Volume Up/Down key to check whether the CONTRAST effect is OK or not.	
2	**COLOUR key**	1. Receive "Color Bar" signal. 2. Set P-Mode to select COLOUR. 3. Press Volume Up/Down key to check whether the COLOUR effect is OK or not.	
3	**BRIGHTNESS key**	1. Receive "Monoscope Pattern" signal. 2. Set P-Mode to select BRIGHTNESS. 3. Press Volume Up/Down key to check whether the BRIGHTNESS effect is OK or not.	
4	**TINT key**	1. Receive the "NTSC Colour Bar" signal. 2. Set P-Mode to select TINT. 3. Press Volume Up/Down key to check TINT, UP for GREEN direction and DOWN for PURPLE direction whether is OK or not.	
5	**SHARPNESS Key**	1. Receive "Monoscope Pattern" signal. 2. Set P-mode to select SHARPNESS. 3. Press Volume Up/Down key to check whether the SHARPNESS effect is OK or not.	
6	**CH DISPLAY COLOUR**	1. All Ch (1~99) will have an OSD display of the channel number in green colour under AFT ON condition.	
7	**NORMAL Key**	1. Once in PICTURE Mode, and theNORMAL key is pressed, all the settings will be present to normal setting. (Normal setting value for every mode). » CONTRAST : MAX » COLOUR : CENTER » BRIGHTNESS : CENTER » TINT : CENTER » SHARPNESS : CENTER	**Note: If nothing is display mean contrast, colour, bright, tint or sharpness are all in normal setting.**
8	**White Temp**	1. Receive "Monoscope Pattern" signal. 2. Set FUNCTION to select WHITE TEMP. 3. Press Volume Up/Down key to check WHITE TEMP Option, STANDARD: NORMAL SETTING, WARM for more REDDISH direction changing, COOL for more BLUISH direction changing.	

FUNCTION OPERATION CHECKING (VIDEO AND AUDIO) (Continued)

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
9	**COLOUR SYSTEM**	1. Receive the "PAL COLOUR BAR" signal, press the COLOUR SYSTEM key to select modes except PAL, check the COLOUR is not working properly. Then, select the "PAL" mode. Check again its colour so that it is working properly. 2. Receive "SECAM COLOUR BAR" signal, press COLOUR SYSTEM key to select modes except SECAM, check the COLOUR is not working properly. Then, select the "SECAM" mode. Check again its colour so that it is working properly. 3. Receive "NTSC 4.43/3.58 COLOUR BAR" signal, press COLOUR SYSTEM key to select modes except N4.43/3.58, check the COLOUR is not working properly. Then, select the "NTSC 4.43/3.58" mode. Check again its colour so that it is working properly. 4. Receive "NTSC 4.43/3.58 COLOUR BAR" signal thru AV, press COLOUR SYSTEM key to select modes except N4.43/3.58, check the COLOUR is not working properly. Then, select the "NTSC 4.43/3.58" mode. Check again its colour so that it is working properly.	
10	**SOUND SYSTEM**	1. Receive "PAL-D/K" signal, press the "SOUND SYSTEM" to select B/G, I. Check the sound output is not working properly. Select D/K and check the sound output to make sure it is working properly. 2. Receive "PAL-I" signal, press the "SOUND SYSTEM" to select B/G, D/K. Check the sound output is not working properly. Select I and check the sound output to make sure it is working properly. 3. Receive "PAL-B/G" signal, press the "SOUND SYSTEM" to select I, D/K. Check the sound output is not working properly. Select B/G and check the sound output to make sure it is working properly. 4. Receive "NTSC-M" signal, press the "SOUND SYSTEM" to select B/G, D/K and I, check the sound output is not working properly. Select M and check the sound output to make sure it is working properly.	
11	**NOISE MUTE CHECKING**	1. Receive "PAL COLOUR BAR" signal. 2. Turn up the volume control to maximum, make sure the sound is heard from the speakers. Then put the unit in no signal state. 3. Check the sound mute is effective. 4. Finally turn sound level of CTV to minimum.	
12	**OSD LANGUAGE QUANTITY CHECK**	Check OSD LANGUAGE quantity and type as English, Russian, Chinese, French, Arabic and Malay.	

HEADPHONE JACK CHECKING

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	**HEDPHONE OUTPUT CHECKING**	1. Receive PAL Colour PAR with SOUND 400Hz 100% MODULATION (±50KHz Dev) 2. Maximun volume, and check the headpone output with 400Hz sound and no sound out from speaker	

MEMORY MAP

ADDRESS	DATA								MICON	EEPROM	EEPROM	CHASSIS		CTV FINAL		LAST INITIAL SETTING DATA	REMARK
(HEX)	D7	D6	D5	D4	D3	D2	D1	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE		
00	PASS WORD								55	00-FF							
01	PASS WORD								4F	00-FF							
02	PASS WORD								43	00-FF							
03	PASS WORD								A1	00-FF							
04																	
05																	
06	AGC TAKE-OVER								0E	00-3F							
07	V-SLOPE								20	00-3F							
08	V-AMPLITUDE								20	00-3F							
09	V-CENTER								20	00-3F							
0A	H-CENTER								20	00-3F							
0B	H-SIZE								20	00-3F							
0C	EW-PARALLELOGRAM								20	00-3F							
0D	EW-PARABOLA/WIDTH								20	00-3F							
0E	EW-UPPER CORNER								20	00-3F							
0F	EW-LOWER CORNER								20	00-3F							
10	EW-TRAPEZIUM								20	00-3F							
11	HORIZONTAL-BOW								20	00-3F							
12	S-CORRECTION								00	00-3F							
13																	
14																	
15																	
16	DRIVE-R (STANDARD)								20	00-3F							
17	DRIVE-G (STANDARD)								20	00-3F							
18	DRIVE-B (STANDARD)								20	00-3F							
19	DRIVE-R (WARM)								20	00-3F							
1A	DRIVE-G (WARM)								20	00-3F							
1B	DRIVE-B (WARM)								20	00-3F							
1C	DRIVE-R (COOL)								19	00-3F							
1D	DRIVE-G (COOL)								20	00-3F							
1E	DRIVE-B (COOL)								20	00-3F							
1F																	
20																	
21																	
22	SUB-VOLUME								3F	00-3F							
23	SUB-CONTRAST								3F	00-3F							
24	SUB-COLOUR								20	00-3F							
25	SUB-BRIGHTNESS								20	00-3F							
26	SUB-TINT								20	00-3F							
27	SUB-SHARPNESS								20	00-3F							
28	HTL-VOLUME								20	00-3F							
29	HTL-POSITION								FF	00-FF							
2A																	
2B																	
2C																	
2D	OSD-REFERENCE								0F	00-0F							
2E	CUTOFF LEVEL -OFFSET R								20	00-3F							(1) 20th August 2001 Change of range & default.
2F	CUTOFF LEVEL -OFFSET G								20	00-3F							
30	CATHODE DRIVE LEVEL								00	00-0F							
31	Y-DELAY (TV PAL)								0C	00-0F							
32	Y-DELAY (TV SECAM)								0F	00-0F							
33	Y-DELAY (TV N358)								0C	00-0F							
34	Y-DELAY (TV N443)								0C	00-0F							
35	Y-DELAY (TV BW)								0C	00-0F							
36	Y-DELAY (AV PAL)								0C	00-0F							
37	Y-DELAY (AV SECAM)								0F	00-0F							
38	Y-DELAY (AV N358)								0C	00-0F							
39	Y-DELAY (AV N443)								0C	00-0F							
3A	Y-DELAY (AV BW)								0C	00-0F							
3B	COLOUR-OFFSET (PAL)								08	00-0F							
3C	COLOUR-OFFSET (SECAM)								08	00-0F							
3D	COLOUR-OFFSET (N358)								04	00-0F							
3E	COLOUR-OFFSET (N443)								04	00-0F							
3F	SHARPNESS-OFFSET (PAL)								08	00-0F							
MODEL									MODEL								
LETTER NO.									LETTER NO.								

ADDRESS	DATA								MICON	EEPROM	EEPROM	CHASSIS		CTV FINAL		LAST INITIAL SETTING DATA	REMARK
(HEX)	D7	D6	D5	D4	D3	D2	D1	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE		
40	SHARPNESS-OFFSET (SECAM)								04	00-0F							
41	SHARPNESS-OFFSET (N358)								0C	00-0F							
42	SHARPNESS-OFFSET (N443)								08	00-0F							
43																	
44	FCO	ACL	OSO	EHT	EVG	FFI	AVL	BKS	1B	00-FF							
45	SECAM	N443	N358	PB-SECAM	BG	I	DK	M	DE	00-FF							
46	SM1	SM0	FMWS	AV	BTSC	HTL	VMC	VMI	53	00-FF							
47	HP2	FSL	RUS	FRA	CHN	MLY	ARB	THA	3E	00-FF							
48	FOB-AV	FOA-AV	FOB-FE	FOA-FE	AGC1	AGC0	BIL	CPT	C4	00-FF							
49						NDF	MSA	LED-F	00	00-03							(1) 20th August 2001: Added 3 new items.
4A																	
4B																	
4C	VOLUME								01	00-3C							
4D	CONTRAST								3C	00-3C							
4E	COLOUR								1E	00-3C							
4F	BRIGHTNESS								1E	00-3C							
50	TINT								1E	00-3C							
51	SHARPNESS								1E	00-3C							
52																	
53																	
54																	
55	POSITION/AV1/AV2								01	00-FF							
56	FAV-POS A								0A	00-FF							
57	FAV-POS B								14	00-FF							
58	FAV-POS C								1E	00-FF							
59	FAV-POS D								28	00-FF							
5A																	
5B																	
5C	LAST POWER MODE								00	00-01							
5D	WHITE-TEMP								00	00-02							
5E	BLUE BACK								00	00-01							
5F	LANGUAGE								00	00-07							
60	LAST DIGIT MODE (1 OR 2)								00	00-01							
61																	
62	SKIP 0	SKIP 1	SKIP 2	SKIP 3	SKIP 4	SKIP 5	SKIP 6	SKIP 7	80	00-FF							
63	SKIP 8	SKIP 9	SKIP 10	SKIP 11	SKIP 12	SKIP 13	SKIP 14	SKIP 15	00	00-FF							
64	SKIP 16	SKIP 17	SKIP 18	SKIP 19	SKIP 20	SKIP 21	SKIP 22	SKIP 23	00	00-FF							
65	SKIP 24	SKIP 25	SKIP 26	SKIP 27	SKIP 28	SKIP 29	SKIP 30	SKIP 31	00	00-FF							
66	SKIP 32	SKIP 33	SKIP 34	SKIP 35	SKIP 36	SKIP 37	SKIP 38	SKIP 39	00	00-FF							
67	SKIP 40	SKIP 41	SKIP 42	SKIP 43	SKIP 44	SKIP 45	SKIP 46	SKIP 47	00	00-FF							
68	SKIP 48	SKIP 49	SKIP 50	SKIP 51	SKIP 52	SKIP 53	SKIP 54	SKIP 55	00	00-FF							
69	SKIP 56	SKIP 57	SKIP 58	SKIP 59	SKIP 60	SKIP 61	SKIP 62	SKIP 63	00	00-FF							
6A	SKIP 64	SKIP 65	SKIP 66	SKIP 67	SKIP 68	SKIP 69	SKIP 70	SKIP 71	00	00-FF							
6B	SKIP 72	SKIP 73	SKIP 74	SKIP 75	SKIP 76	SKIP 77	SKIP 78	SKIP 79	00	00-FF							
6C	SKIP 80	SKIP 81	SKIP 82	SKIP 83	SKIP 84	SKIP 85	SKIP 86	SKIP 87	00	00-FF							
6D	SKIP 88	SKIP 89	SKIP 90	SKIP 91	SKIP 92	SKIP 93	SKIP 94	SKIP 95	00	00-FF							
6E	SKIP 96	SKIP 97	SKIP 98	SKIP 99					00	00-FF							
6F																	
70																	
71																	
72																	
73																	
74	TUNING FREQUANCY (HIGHER PART)										S-SYS						POS 0
75	TUNING FREQUANCY (LOWER PART)										000:BG						
76	S-SYS			AFT	(auto)			C-SYS			001:I						
77	TUNING FREQUANCY (HIGHER PART)										010:DK						POS 1
78	TUNING FREQUANCY (LOWER PART)										011:M						
79	S-SYS			AFT	(auto)			C-SYS									
7A	TUNING FREQUANCY (HIGHER PART)										AFT						POS 2
7B	TUNING FREQUANCY (LOWER PART)										0:OFF						
7C	S-SYS			AFT	(auto)			C-SYS			1:ON						
7D	TUNING FREQUANCY (HIGHER PART)																POS 3
7E	TUNING FREQUANCY (LOWER PART)																
7F	S-SYS			AFT	(auto)			C-SYS									
MODEL									MODEL								
LETTER NO.									LETTER NO.								

ADDRESS	DATA								MICON	EEPROM	EEPROM	CHASSIS		CTV FINAL		LAST INITIAL SETTING DATA	REMARK
(HEX)	D7	D6	D5	D4	D3	D2	D1	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE		
80	TUNING FREQUANCY (HIGHER PART)																POS 4
81	TUNING FREQUANCY (LOWER PART)																
82	S-SYS			AFT	(auto)			C-SYS									
83	TUNING FREQUANCY (HIGHER PART)																POS 5
84	TUNING FREQUANCY (LOWER PART)																
85	S-SYS			AFT	(auto)			C-SYS									
86	TUNING FREQUANCY (HIGHER PART)																POS 6
87	TUNING FREQUANCY (LOWER PART)																
88	S-SYS			AFT	(auto)			C-SYS									
89	TUNING FREQUANCY (HIGHER PART)																POS 7
8A	TUNING FREQUANCY (LOWER PART)																
8B	S-SYS			AFT	(auto)			C-SYS									
8C	TUNING FREQUANCY (HIGHER PART)																POS 8
8D	TUNING FREQUANCY (LOWER PART)																
8E	S-SYS			AFT	(auto)			C-SYS									
8F	TUNING FREQUANCY (HIGHER PART)																POS 9
90	TUNING FREQUANCY (LOWER PART)																
91	S-SYS			AFT	(auto)			C-SYS									
92	TUNING FREQUANCY (HIGHER PART)																POS 10
93	TUNING FREQUANCY (LOWER PART)																
94	S-SYS			AFT	(auto)			C-SYS									
95	TUNING FREQUANCY (HIGHER PART)																POS 11
96	TUNING FREQUANCY (LOWER PART)																
97	S-SYS			AFT	(auto)			C-SYS									
98	TUNING FREQUANCY (HIGHER PART)																POS 12
99	TUNING FREQUANCY (LOWER PART)																
9A	S-SYS			AFT	(auto)			C-SYS									
9B	TUNING FREQUANCY (HIGHER PART)																POS 13
9C	TUNING FREQUANCY (LOWER PART)																
9D	S-SYS			AFT	(auto)			C-SYS									
9E	TUNING FREQUANCY (HIGHER PART)																POS 14
9F	TUNING FREQUANCY (LOWER PART)																
A0	S-SYS			AFT	(auto)			C-SYS									
A1	TUNING FREQUANCY (HIGHER PART)																POS 15
A2	TUNING FREQUANCY (LOWER PART)																
A3	S-SYS			AFT	(auto)			C-SYS									
A4	TUNING FREQUANCY (HIGHER PART)																POS 16
A5	TUNING FREQUANCY (LOWER PART)																
A6	S-SYS			AFT	(auto)			C-SYS									
A7	TUNING FREQUANCY (HIGHER PART)																POS 17
A8	TUNING FREQUANCY (LOWER PART)																
A9	S-SYS			AFT	(auto)			C-SYS									
AA	TUNING FREQUANCY (HIGHER PART)																POS 18
AB	TUNING FREQUANCY (LOWER PART)																
AC	S-SYS			AFT	(auto)			C-SYS									
AD	TUNING FREQUANCY (HIGHER PART)																POS 19
AE	TUNING FREQUANCY (LOWER PART)																
AF	S-SYS			AFT	(auto)			C-SYS									
B0	TUNING FREQUANCY (HIGHER PART)																POS 20
B1	TUNING FREQUANCY (LOWER PART)																
B2	S-SYS			AFT	(auto)			C-SYS									
B3	TUNING FREQUANCY (HIGHER PART)																POS 21
B4	TUNING FREQUANCY (LOWER PART)																
B5	S-SYS			AFT	(auto)			C-SYS									
B6	TUNING FREQUANCY (HIGHER PART)																POS 22
B7	TUNING FREQUANCY (LOWER PART)																
B8	S-SYS			AFT	(auto)			C-SYS									
B9	TUNING FREQUANCY (HIGHER PART)																POS 23
BA	TUNING FREQUANCY (LOWER PART)																
BB	S-SYS			AFT	(auto)			C-SYS									
BC	TUNING FREQUANCY (HIGHER PART)																POS 24
BD	TUNING FREQUANCY (LOWER PART)																
BE	S-SYS			AFT	(auto)			C-SYS									
BF	TUNING FREQUANCY (HIGHER PART)																POS 25
MODEL									MODEL								
LETTER NO.									LETTER NO.								

ADDRESS (HEX)	DATA D7	D6	D5	D4	D3	D2	D1	D0	MICON DEFAULT	EEPROM RANGE	EEPROM WRITE(CPU)	CHASSIS CHECK DATA	CHASSIS CHECK TYPE	CTV FINAL CHECK DATA	CTV FINAL CHECK TYPE	LAST INITIAL SETTING DATA	REMARK
C0	TUNING FREQUANCY (LOWER PART)																POS 25
C1	S-SYS			AFT	(auto)			C-SYS									
C2	TUNING FREQUANCY (HIGHER PART)																POS 26
C3	TUNING FREQUANCY (LOWER PART)																
C4	S-SYS			AFT	(auto)			C-SYS									
C5	TUNING FREQUANCY (HIGHER PART)																POS 27
C6	TUNING FREQUANCY (LOWER PART)																
C7	S-SYS			AFT	(auto)			C-SYS									
C8	TUNING FREQUANCY (HIGHER PART)																POS 28
C9	TUNING FREQUANCY (LOWER PART)																
CA	S-SYS			AFT	(auto)			C-SYS									
CB	TUNING FREQUANCY (HIGHER PART)																POS 29
CC	TUNING FREQUANCY (LOWER PART)																
CD	S-SYS			AFT	(auto)			C-SYS									
CE	TUNING FREQUANCY (HIGHER PART)																POS 30
CF	TUNING FREQUANCY (LOWER PART)																
D0	S-SYS			AFT	(auto)			C-SYS									
D1	TUNING FREQUANCY (HIGHER PART)																POS 31
D2	TUNING FREQUANCY (LOWER PART)																
D3	S-SYS			AFT	(auto)			C-SYS									
D4	TUNING FREQUANCY (HIGHER PART)																POS 32
D5	TUNING FREQUANCY (LOWER PART)																
D6	S-SYS			AFT	(auto)			C-SYS									
D7	TUNING FREQUANCY (HIGHER PART)																POS 33
D8	TUNING FREQUANCY (LOWER PART)																
D9	S-SYS			AFT	(auto)			C-SYS									
DA	TUNING FREQUANCY (HIGHER PART)																POS 34
DB	TUNING FREQUANCY (LOWER PART)																
DC	S-SYS			AFT	(auto)			C-SYS									
DD	TUNING FREQUANCY (HIGHER PART)																POS 35
DE	TUNING FREQUANCY (LOWER PART)																
DF	S-SYS			AFT	(auto)			C-SYS									
E0	TUNING FREQUANCY (HIGHER PART)																POS 36
E1	TUNING FREQUANCY (LOWER PART)																
E2	S-SYS			AFT	(auto)			C-SYS									
E3	TUNING FREQUANCY (HIGHER PART)																POS 37
E4	TUNING FREQUANCY (LOWER PART)																
E5	S-SYS			AFT	(auto)			C-SYS									
E6	TUNING FREQUANCY (HIGHER PART)																POS 38
E7	TUNING FREQUANCY (LOWER PART)																
E8	S-SYS			AFT	(auto)			C-SYS									
E9	TUNING FREQUANCY (HIGHER PART)																POS 39
EA	TUNING FREQUANCY (LOWER PART)																
EB	S-SYS			AFT	(auto)			C-SYS									
EC	TUNING FREQUANCY (HIGHER PART)																POS 40
ED	TUNING FREQUANCY (LOWER PART)																
EE	S-SYS			AFT	(auto)			C-SYS									
EF	TUNING FREQUANCY (HIGHER PART)																POS 41
F0	TUNING FREQUANCY (LOWER PART)																
F1	S-SYS			AFT	(auto)			C-SYS									
F2	TUNING FREQUANCY (HIGHER PART)																POS 42
F3	TUNING FREQUANCY (LOWER PART)																
F4	S-SYS			AFT	(auto)			C-SYS									
F5	TUNING FREQUANCY (HIGHER PART)																POS 43
F6	TUNING FREQUANCY (LOWER PART)																
F7	S-SYS			AFT	(auto)			C-SYS									
F8	TUNING FREQUANCY (HIGHER PART)																POS 44
F9	TUNING FREQUANCY (LOWER PART)																
FA	S-SYS			AFT	(auto)			C-SYS									
FB	TUNING FREQUANCY (HIGHER PART)																POS 45
FC	TUNING FREQUANCY (LOWER PART)																
FD	S-SYS			AFT	(auto)			C-SYS									
FE	TUNING FREQUANCY (HIGHER PART)																POS 46
FF	TUNING FREQUANCY (LOWER PART)																
MODEL									MODEL								
LETTER NO.									LETTER NO.								

ADDRESS (HEX)	DATA D7	D6	D5	D4	D3	D2	D1	D0	MICON DEFAULT	EEPROM RANGE	EEPROM WRITE(CPU)	CHASSIS CHECK DATA	CHASSIS CHECK TYPE	CTV FINAL CHECK DATA	CTV FINAL CHECK TYPE	LAST INITIAL SETTING DATA	REMARK
100	S-SYS			AFT	(auto)			C-SYS									POS 46
101	TUNING FREQUANCY (HIGHER PART)																POS 47
102	TUNING FREQUANCY (LOWER PART)																
103	S-SYS			AFT	(auto)			C-SYS									
104	TUNING FREQUANCY (HIGHER PART)																POS 48
105	TUNING FREQUANCY (LOWER PART)																
106	S-SYS			AFT	(auto)			C-SYS									
107	TUNING FREQUANCY (HIGHER PART)																POS 49
108	TUNING FREQUANCY (LOWER PART)																
109	S-SYS			AFT	(auto)			C-SYS									
10A	TUNING FREQUANCY (HIGHER PART)																POS 50
10B	TUNING FREQUANCY (LOWER PART)																
10C	S-SYS			AFT	(auto)			C-SYS									
10D	TUNING FREQUANCY (HIGHER PART)																POS 51
10E	TUNING FREQUANCY (LOWER PART)																
10F	S-SYS			AFT	(auto)			C-SYS									
110	TUNING FREQUANCY (HIGHER PART)																POS 52
111	TUNING FREQUANCY (LOWER PART)																
112	S-SYS			AFT	(auto)			C-SYS									
113	TUNING FREQUANCY (HIGHER PART)																POS 53
114	TUNING FREQUANCY (LOWER PART)																
115	S-SYS			AFT	(auto)			C-SYS									
116	TUNING FREQUANCY (HIGHER PART)																POS 54
117	TUNING FREQUANCY (LOWER PART)																
118	S-SYS			AFT	(auto)			C-SYS									
119	TUNING FREQUANCY (HIGHER PART)																POS 55
11A	TUNING FREQUANCY (LOWER PART)																
11B	S-SYS			AFT	(auto)			C-SYS									
11C	TUNING FREQUANCY (HIGHER PART)																POS 56
11D	TUNING FREQUANCY (LOWER PART)																
11E	S-SYS			AFT	(auto)			C-SYS									
11F	TUNING FREQUANCY (HIGHER PART)																POS 57
120	TUNING FREQUANCY (LOWER PART)																
121	S-SYS			AFT	(auto)			C-SYS									
122	TUNING FREQUANCY (HIGHER PART)																POS 58
123	TUNING FREQUANCY (LOWER PART)																
124	S-SYS			AFT	(auto)			C-SYS									
125	TUNING FREQUANCY (HIGHER PART)																POS 59
126	TUNING FREQUANCY (LOWER PART)																
127	S-SYS			AFT	(auto)			C-SYS									
128	TUNING FREQUANCY (HIGHER PART)																POS 60
129	TUNING FREQUANCY (LOWER PART)																
12A	S-SYS			AFT	(auto)			C-SYS									
12B	TUNING FREQUANCY (HIGHER PART)																POS 61
12C	TUNING FREQUANCY (LOWER PART)																
12D	S-SYS			AFT	(auto)			C-SYS									
12E	TUNING FREQUANCY (HIGHER PART)																POS 62
12F	TUNING FREQUANCY (LOWER PART)																
130	S-SYS			AFT	(auto)			C-SYS									
131	TUNING FREQUANCY (HIGHER PART)																POS 63
132	TUNING FREQUANCY (LOWER PART)																
133	S-SYS			AFT	(auto)			C-SYS									
134	TUNING FREQUANCY (HIGHER PART)																POS 64
135	TUNING FREQUANCY (LOWER PART)																
136	S-SYS			AFT	(auto)			C-SYS									
137	TUNING FREQUANCY (HIGHER PART)																POS 65
138	TUNING FREQUANCY (LOWER PART)																
139	S-SYS			AFT	(auto)			C-SYS									
13A	TUNING FREQUANCY (HIGHER PART)																POS 66
13B	TUNING FREQUANCY (LOWER PART)																
13C	S-SYS			AFT	(auto)			C-SYS									
13D	TUNING FREQUANCY (HIGHER PART)																POS 67
13E	TUNING FREQUANCY (LOWER PART)																
13F	S-SYS			AFT	(auto)			C-SYS									
MODEL									MODEL								
LETTER NO.									LETTER NO.								

ADDRESS (HEX)	DATA D7	D6	D5	D4	D3	D2	D1	D0	MICON DEFAULT	EEPROM RANGE	EEPROM WRITE(CPU)	CHASSIS CHECK DATA	CHASSIS CHECK TYPE	CTV FINAL CHECK DATA	CTV FINAL CHECK TYPE	LAST INITIAL SETTING DATA	REMARK
140	TUNING FREQUANCY (HIGHER PART)																POS 68
141	TUNING FREQUANCY (LOWER PART)																
142	S-SYS			AFT	(auto)			C-SYS									
143	TUNING FREQUANCY (HIGHER PART)																POS 69
144	TUNING FREQUANCY (LOWER PART)																
145	S-SYS			AFT	(auto)			C-SYS									
146	TUNING FREQUANCY (HIGHER PART)																POS 70
147	TUNING FREQUANCY (LOWER PART)																
148	S-SYS			AFT	(auto)			C-SYS									
149	TUNING FREQUANCY (HIGHER PART)																POS 71
14A	TUNING FREQUANCY (LOWER PART)																
14B	S-SYS			AFT	(auto)			C-SYS									
14C	TUNING FREQUANCY (HIGHER PART)																POS 72
14D	TUNING FREQUANCY (LOWER PART)																
14E	S-SYS			AFT	(auto)			C-SYS									
14F	TUNING FREQUANCY (HIGHER PART)																POS 73
150	TUNING FREQUANCY (LOWER PART)																
151	S-SYS			AFT	(auto)			C-SYS									
152	TUNING FREQUANCY (HIGHER PART)																POS 74
153	TUNING FREQUANCY (LOWER PART)																
154	S-SYS			AFT	(auto)			C-SYS									
155	TUNING FREQUANCY (HIGHER PART)																POS 75
156	TUNING FREQUANCY (LOWER PART)																
157	S-SYS			AFT	(auto)			C-SYS									
158	TUNING FREQUANCY (HIGHER PART)																POS 76
159	TUNING FREQUANCY (LOWER PART)																
15A	S-SYS			AFT	(auto)			C-SYS									
15B	TUNING FREQUANCY (HIGHER PART)																POS 77
15C	TUNING FREQUANCY (LOWER PART)																
15D	S-SYS			AFT	(auto)			C-SYS									
15E	TUNING FREQUANCY (HIGHER PART)																POS 78
15F	TUNING FREQUANCY (LOWER PART)																
160	S-SYS			AFT	(auto)			C-SYS									
161	TUNING FREQUANCY (HIGHER PART)																POS 79
162	TUNING FREQUANCY (LOWER PART)																
163	S-SYS			AFT	(auto)			C-SYS									
164	TUNING FREQUANCY (HIGHER PART)																POS 80
165	TUNING FREQUANCY (LOWER PART)																
166	S-SYS			AFT	(auto)			C-SYS									
167	TUNING FREQUANCY (HIGHER PART)																POS 81
168	TUNING FREQUANCY (LOWER PART)																
169	S-SYS			AFT	(auto)			C-SYS									
16A	TUNING FREQUANCY (HIGHER PART)																POS 82
16B	TUNING FREQUANCY (LOWER PART)																
16C	S-SYS			AFT	(auto)			C-SYS									
16D	TUNING FREQUANCY (HIGHER PART)																POS 83
16E	TUNING FREQUANCY (LOWER PART)																
16F	S-SYS			AFT	(auto)			C-SYS									
170	TUNING FREQUANCY (HIGHER PART)																POS 84
171	TUNING FREQUANCY (LOWER PART)																
172	S-SYS			AFT	(auto)			C-SYS									
173	TUNING FREQUANCY (HIGHER PART)																POS 85
174	TUNING FREQUANCY (LOWER PART)																
175	S-SYS			AFT	(auto)			C-SYS									
176	TUNING FREQUANCY (HIGHER PART)																POS 86
177	TUNING FREQUANCY (LOWER PART)																
178	S-SYS			AFT	(auto)			C-SYS									
179	TUNING FREQUANCY (HIGHER PART)																POS 87
17A	TUNING FREQUANCY (LOWER PART)																
17B	S-SYS			AFT	(auto)			C-SYS									
17C	TUNING FREQUANCY (HIGHER PART)																POS 88
17D	TUNING FREQUANCY (LOWER PART)																
17E	S-SYS			AFT	(auto)			C-SYS									
17F	TUNING FREQUANCY (HIGHER PART)																POS 89
MODEL									MODEL								
LETTER NO.									LETTER NO.								

ADDRESS (HEX)	DATA D7	D6	D5	D4	D3	D2	D1	D0	MICON DEFAULT	EEPROM RANGE	EEPROM WRITE(CPU)	CHASSIS CHECK DATA	CHASSIS CHECK TYPE	CTV FINAL CHECK DATA	CTV FINAL CHECK TYPE	LAST INITIAL SETTING DATA	REMARK
180	TUNING FREQUANCY (LOWER PART)																POS 89
181	S-SYS			AFT	(auto)			C-SYS									
182	TUNING FREQUANCY (HIGHER PART)																POS 90
183	TUNING FREQUANCY (LOWER PART)																
184	S-SYS			AFT	(auto)			C-SYS									
185	TUNING FREQUANCY (HIGHER PART)																POS 91
186	TUNING FREQUANCY (LOWER PART)																
187	S-SYS			AFT	(auto)			C-SYS									
188	TUNING FREQUANCY (HIGHER PART)																POS 92
189	TUNING FREQUANCY (LOWER PART)																
18A	S-SYS			AFT	(auto)			C-SYS									
18B	TUNING FREQUANCY (HIGHER PART)																POS 93
18C	TUNING FREQUANCY (LOWER PART)																
18D	S-SYS			AFT	(auto)			C-SYS									
18E	TUNING FREQUANCY (HIGHER PART)																POS 94
18F	TUNING FREQUANCY (LOWER PART)																
190	S-SYS			AFT	(auto)			C-SYS									
191	TUNING FREQUANCY (HIGHER PART)																POS 95
192	TUNING FREQUANCY (LOWER PART)																
193	S-SYS			AFT	(auto)			C-SYS									
194	TUNING FREQUANCY (HIGHER PART)																POS 96
195	TUNING FREQUANCY (LOWER PART)																
196	S-SYS			AFT	(auto)			C-SYS									
197	TUNING FREQUANCY (HIGHER PART)																POS 97
198	TUNING FREQUANCY (LOWER PART)																
199	S-SYS			AFT	(auto)			C-SYS									
19A	TUNING FREQUANCY (HIGHER PART)																POS 98
19B	TUNING FREQUANCY (LOWER PART)																
19C	S-SYS			AFT	(auto)			C-SYS									
19D	TUNING FREQUANCY (HIGHER PART)																POS 99
19E	TUNING FREQUANCY (LOWER PART)																
19F	S-SYS			AFT	(auto)			C-SYS									
1A0																	AV1
1A1																	
1A2	(auto)							C-SYS									
1A3																	AV2
1A4																	
1A5	(auto)							C-SYS									
1A6																	
1A7																	
1A8																	
1A9																	
1AA																	
1AB																	
1AC																	
1AD																	
1AE																	
1AF																	
1B0																	
1B1																	
1B2																	
1B3																	
1B4																	
1B5																	
1B6																	
1B7																	
1B8																	
1B9																	
1BA																	
1BB																	
1BC																	
1BD																	
1BE																	
1BF																	
MODEL									MODEL								
LETTER NO.									LETTER NO.								

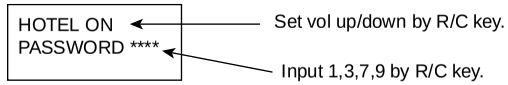
ADDRESS	DATA								MICON	EEPROM	EEPROM	CHASSIS		CTV FINAL		LAST INITIAL SETTING DATA	REMARK
(HEX)	D7	D6	D5	D4	D3	D2	D1	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE		
1C0																	
1C1																	
1C2																	
1C3																	
1C4																	
1C5																	
1C6																	
1C7																	
1C8																	
1C9																	
1CA																	
1CB																	
1CC																	
1CD																	
1CE																	
1CF																	
1D0																	
1D1																	
1D2																	
1D3																	
1D4																	
1D5																	
1D6																	
1D7																	
1D8																	
1D9																	
1DA																	
1DB																	
1DC																	
1DD																	
1DE																	
1DF																	
1E0																	
1E1																	
1E2																	
1E3																	
1E4																	
1E5																	
1E6																	
1E7																	
1E8																	
1E9																	
1EA																	
1EB																	
1EC																	
1ED																	
1EE																	
1EF																	
1F0																	
1F1																	
1F2																	
1F3																	
1F4																	
1F5																	
1F6																	
1F7																	
1F8																	
1F9																	
1FA																	
1FB																	
1FC																	
1FD																	
1FE																	
1FF																	
MODEL									MODEL								
LETTER NO.									LETTER NO.								

GA1 HOTEL MODE APPLICATION

How to enable/disable the "Hotel Mode?"

Ans: a) Press the R/C (FUNCTION) {1} key until language selection appear, within five second press the (one/two digit) {2} key and keep pressing it for five second, then you can see the hotel mode with four digits password.

b) Key in the four digits password starting with number "1", "3", "7", "9", then the hotel mode will be enable, you can switch on/off the hotel mode by using R/C (volume up/down) {3} key.



#1 Ch 1 is your selected channel for hotel mode.

* We recommend
  Before set the hotel mode, it is better to choose ch 1 & set s-vol level Up to 75% full scale. After set hotel mode, starting channel will be always ch 1 & maximum sound level out will be set the half of full scale.
* If you set hotel mode in AV, starting channel will be the last ch which you received before power off (same as normal operation)

CONDITION:

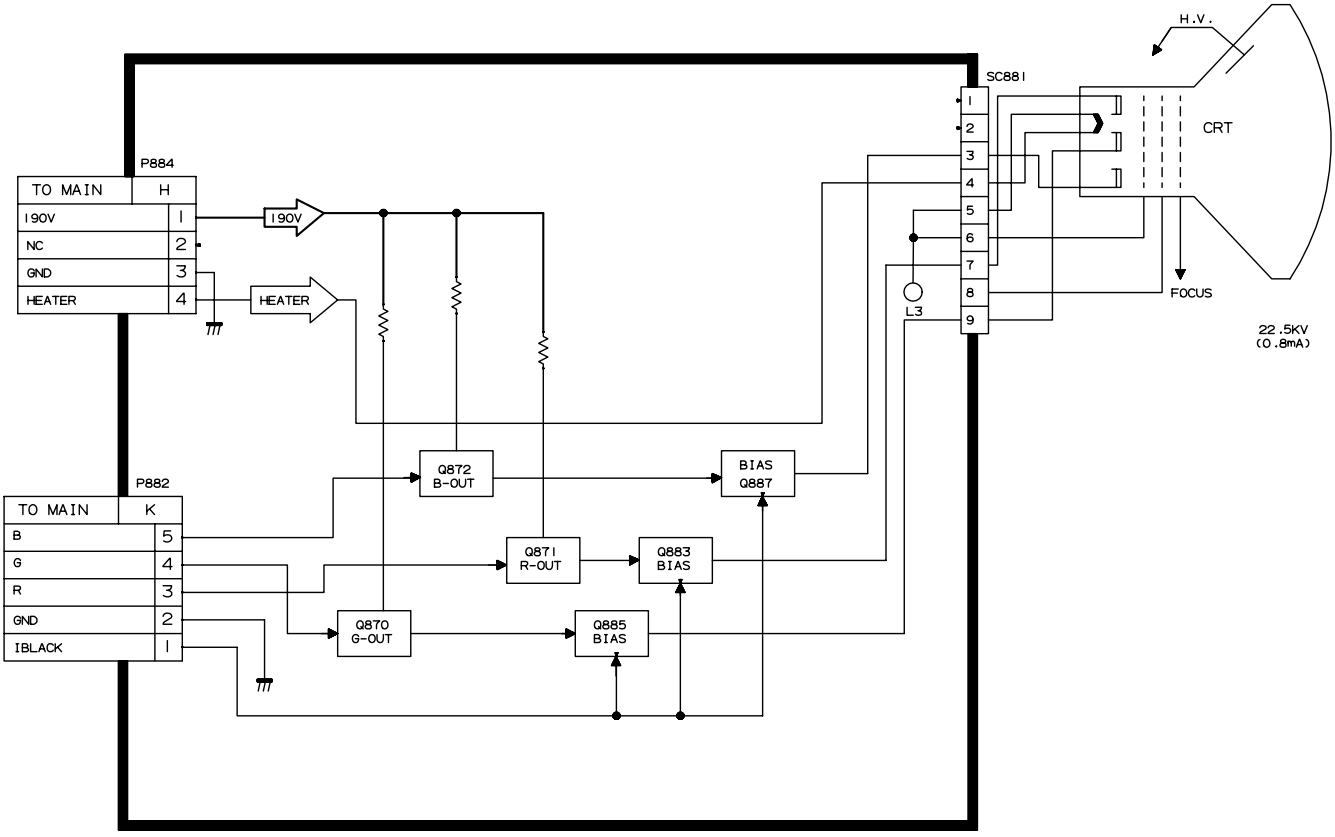
When using hotel mode, user can control "contrast", "brightness", "sharpness" and "tint" function.
But after power off, it will return to the initial setting.
You can't use:–

- Preset mode
- Fine tuning
- Skip mode
- System selection

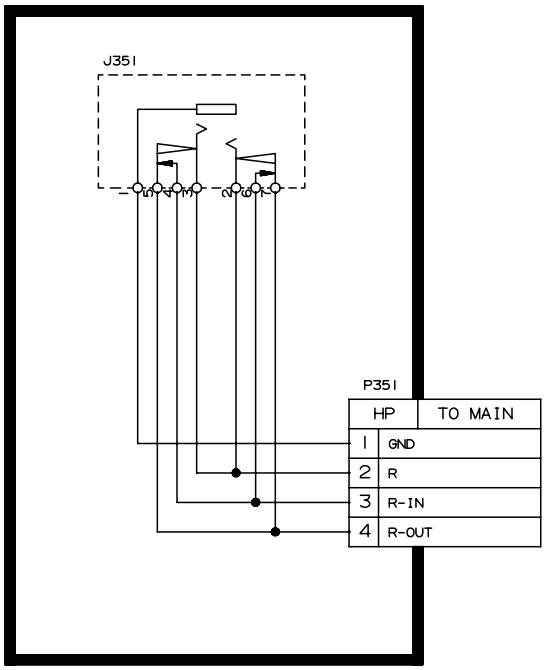
The others function is allowed to be used.

BLOCK DIAGRAM:CRT and HEADPHONE Unit

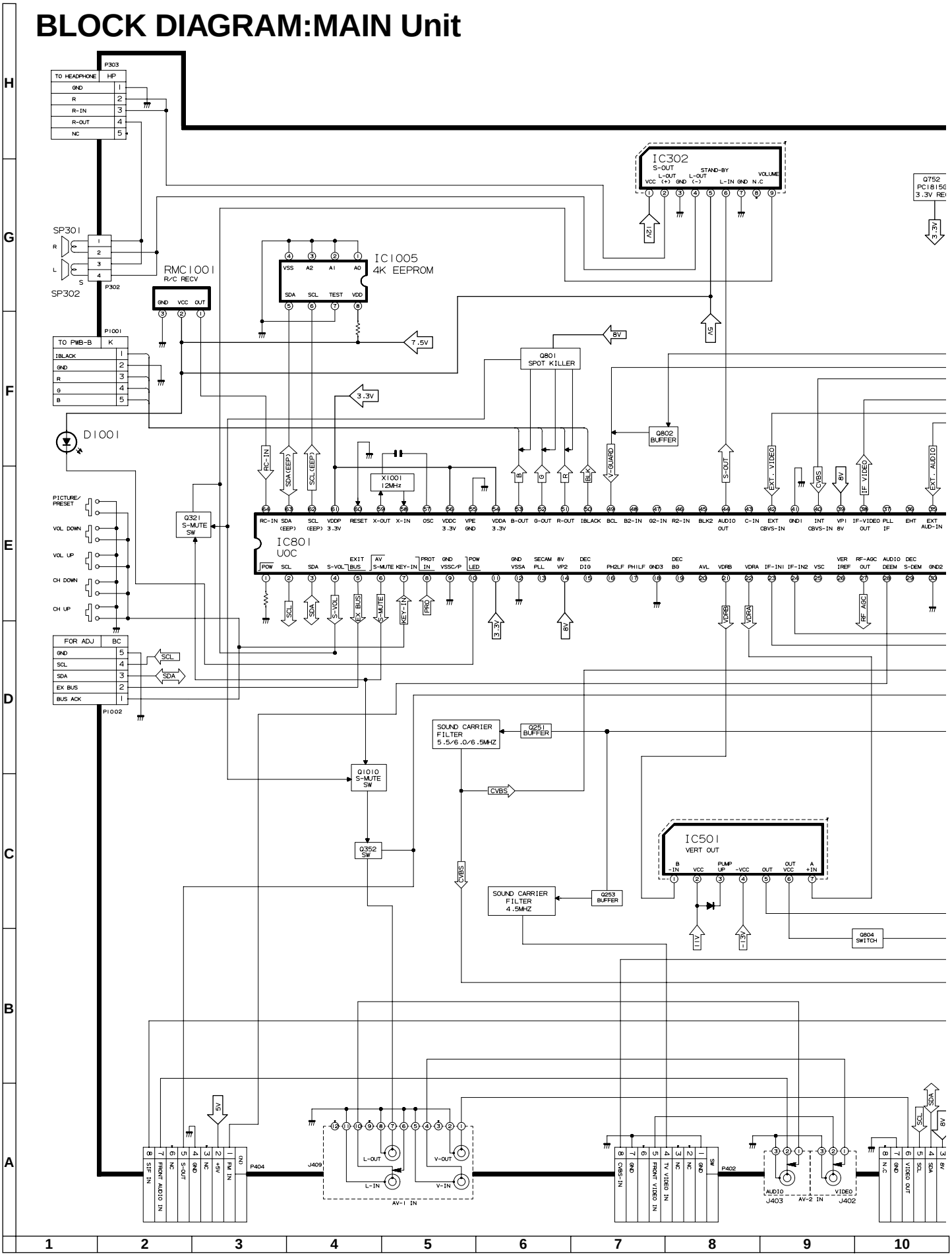
Ë CRT Unit

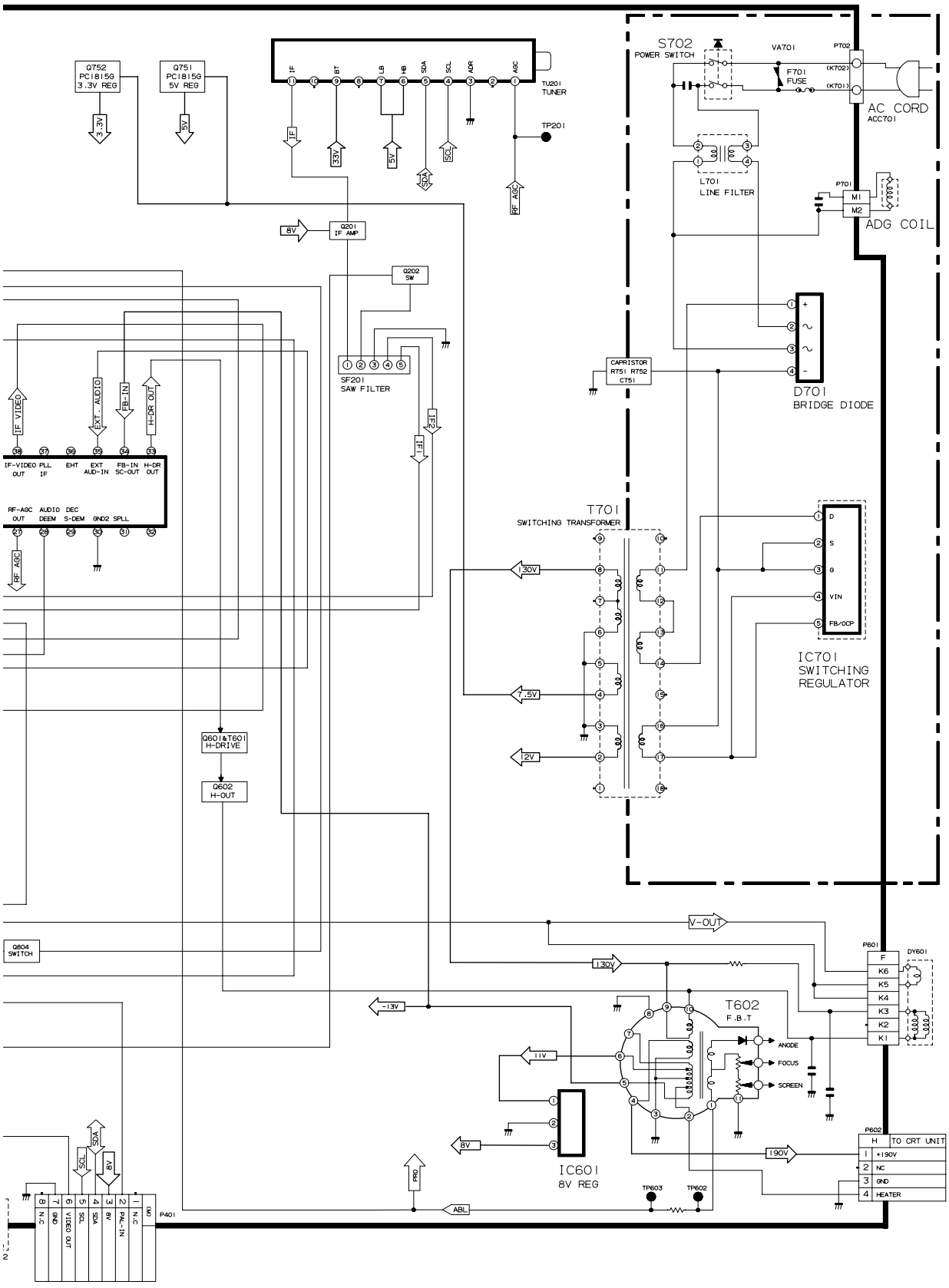


Ë HEADPHONE Unit



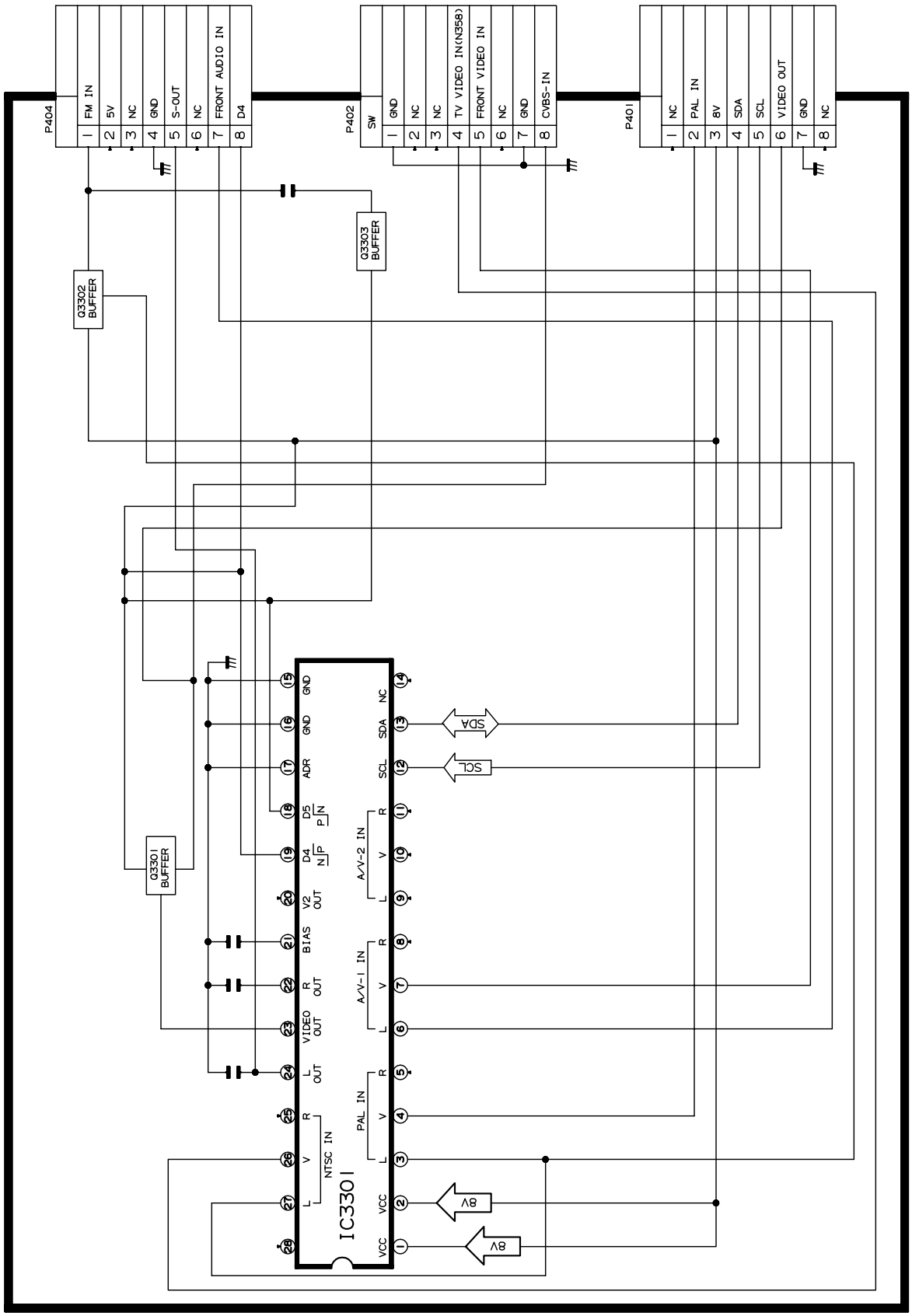
BLOCK DIAGRAM:MAIN Unit





10	11	12	13	14	15	16	17	18	19

BLOCK DIAGRAM:MULTI Unit



DESCRIPTION OF SCHEMATIC DIAGRAM

SAFETY NOTES:

1. *DISCONNECT THE AC PLUG FROM THE AC OUTLET BEFORE REPLACING PARTS.*
2. *SEMICONDUCTOR HEAT SINKS SHOULD BE REGARDED AS POTENTIAL SHOCK HAZARDS WHEN THE CHASSIS IS OPERATING.*

IMPORTANT SAFETY NOTICE:

PARTS MARKED WITH "å " ( ) ARE IMPORTANT FOR MAINTAINING THE SAFETY OF THE SET. BE SURE TO REPLACE THESE PARTS WITH SPECIFIED ONES FOR MAINTAINING THE SAFETY AND PERFORMANCE OF THE SET.

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.

NOTES:

1. *The nit of resistance "ohm" is omitted. (K = 1000 ohms, M = Meg ohm).*
2. *All resistors are 1/10 watt, unless otherwise noted.*
3. *All capacitors are µF, unless otherwise noted. (P = µµF).*

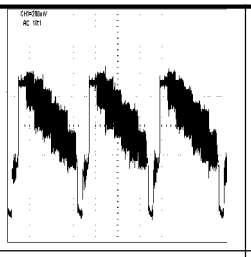
VOLTAGE MEASUREMENT CONDITIONS:

1. *Voltage in parenthesis measured with no Signal.*
2. *Voltages without parenthesis measured with 3mVB&W or Colour-Signal.*
3. *All the voltages in each point are measured with VTVM.*

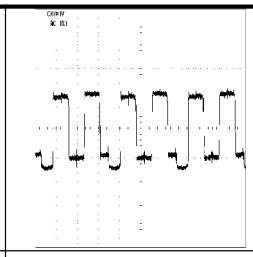
WAVEFORM MEASUREMENT CONDITIONS:

1. *Colour bar generator signal of 2.0V peak to peak applied at of Base Video Buffer Amp Q251.*
2. *Approximately 4.0 V AGC bias*

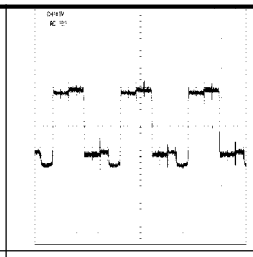
WAVEFORMS



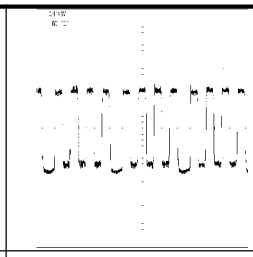
1) 1.0 Vp-p (H)



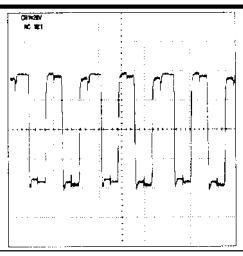
2) 3.0 Vp-p (H)



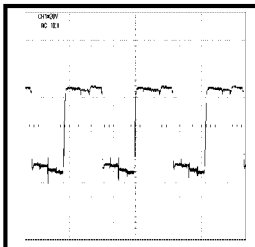
3) 3.1 Vp-p (H)



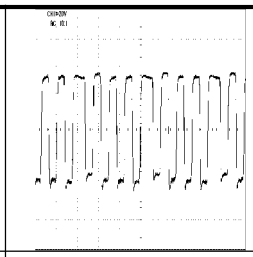
4) 3.1Vp-p (H)



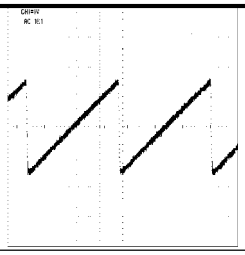
5) 78.4 Vp-p (H)



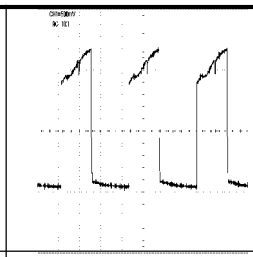
6) 70.0 Vp-p (H)



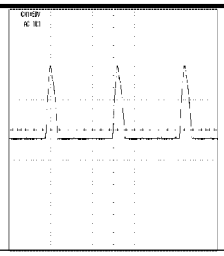
7) 79.2 Vp-p (H)



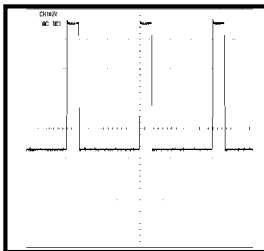
8) 3.2 Vp-p (V)



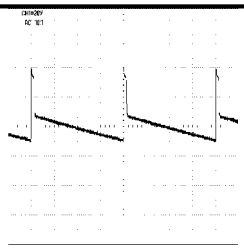
9) 2.32 Vp-p (H)



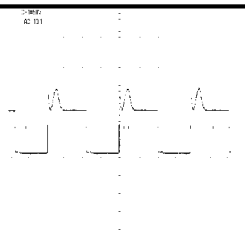
10) 122.0 Vp-p (H)



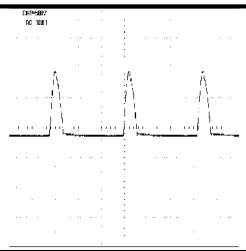
11) 8.8 Vp-p (H)



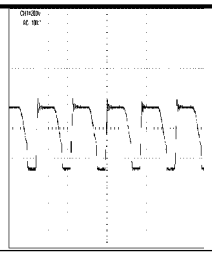
12) 50.0 Vp-p (V)



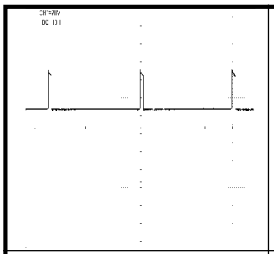
13) 110.0 Vp-p (H)



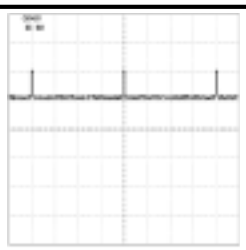
14) 1.1k Vp-p (H)



15) 480.0 Vp-p

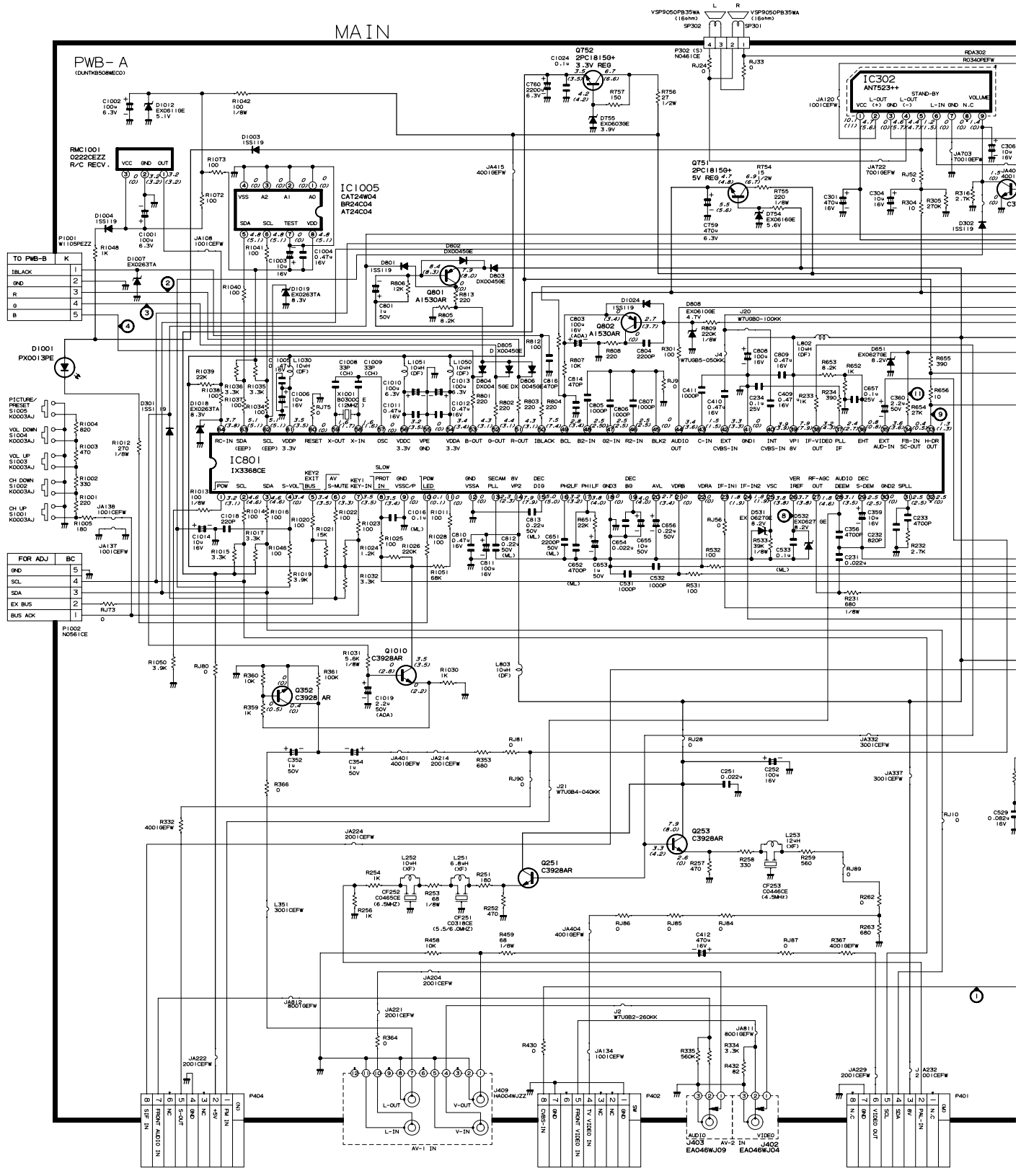


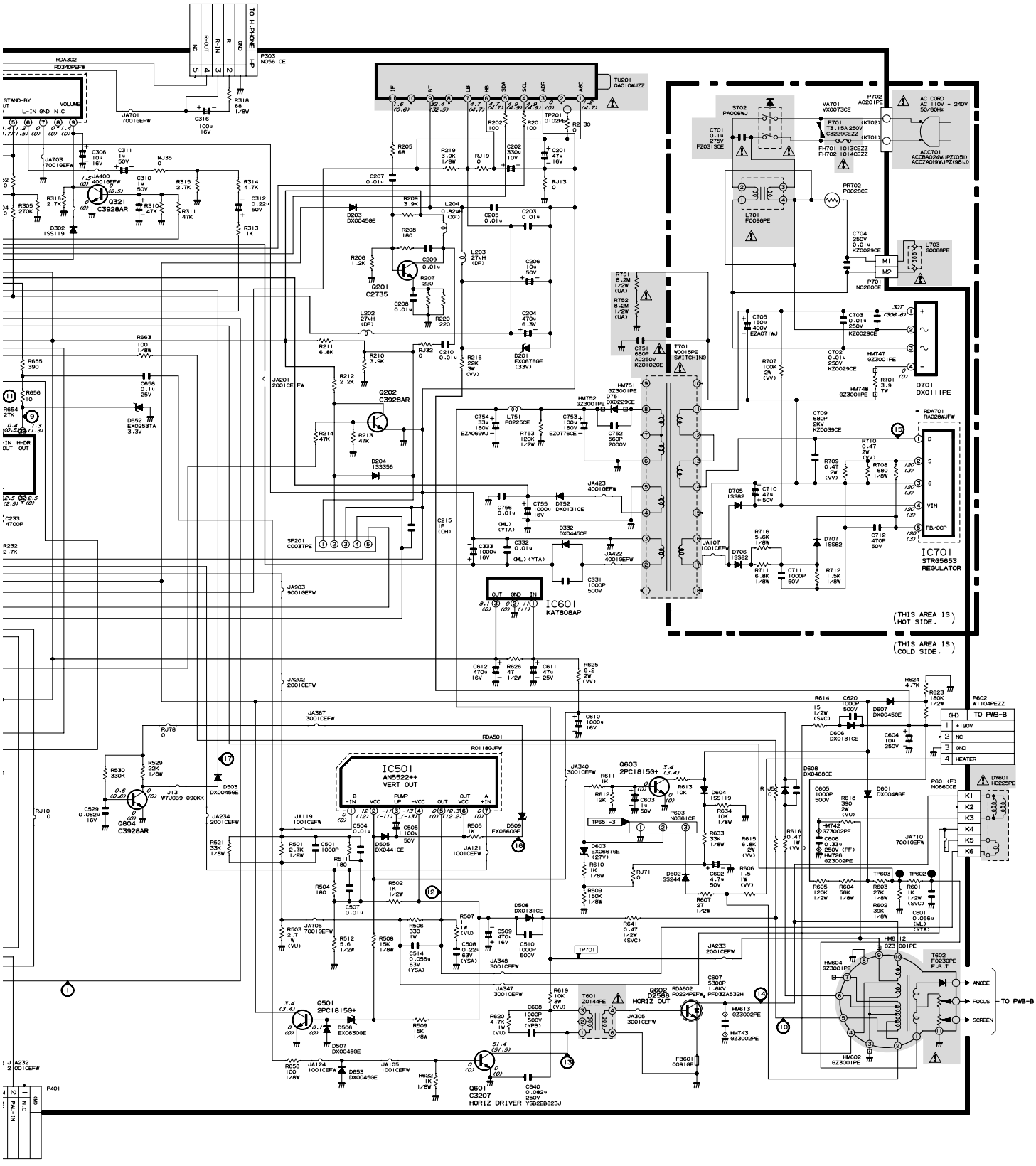
16) 28.0 Vp-p (V)



17) 2.08 Vp-p (V)

SCHEMATIC DIAGRAM:MAIN Unit

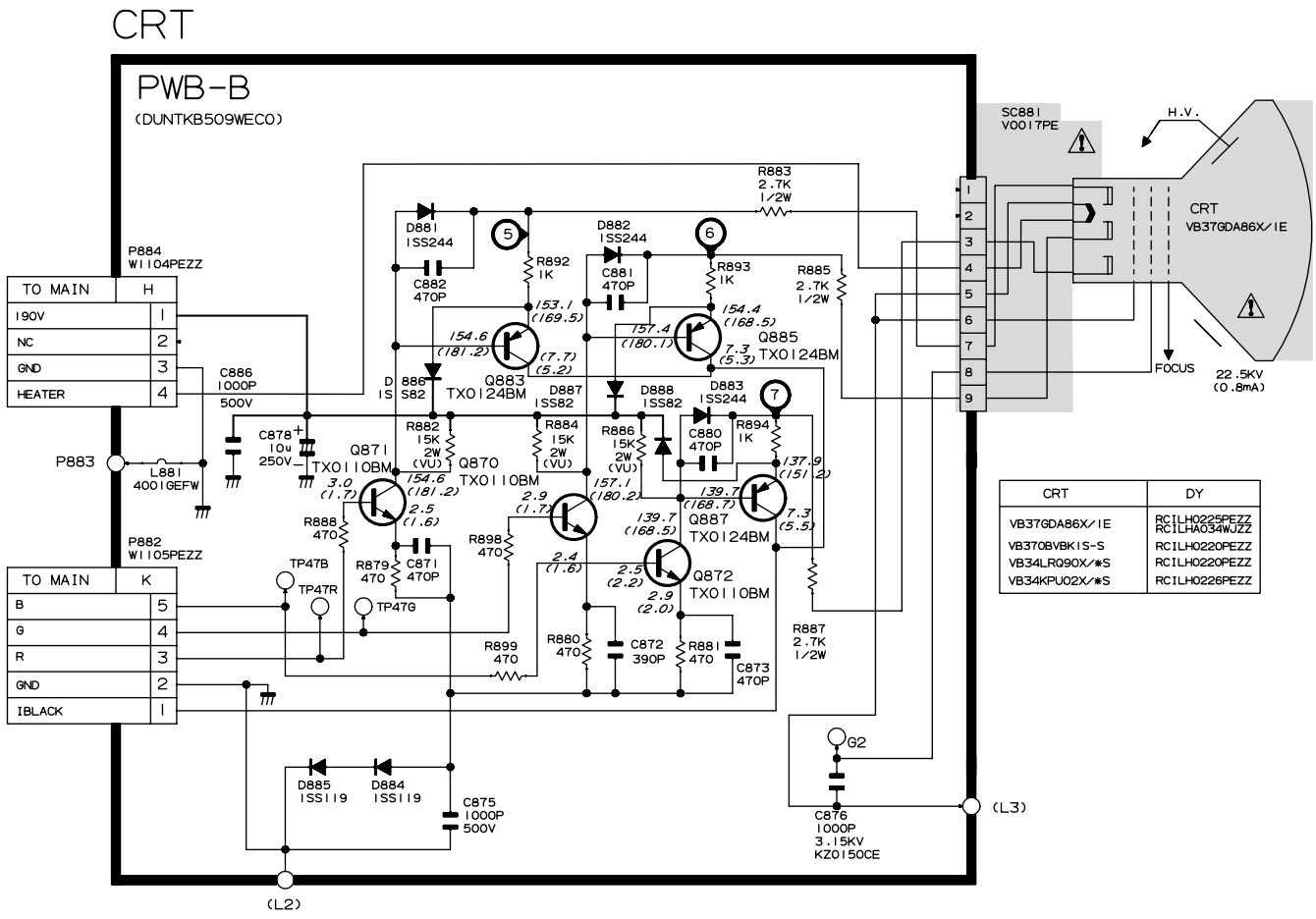




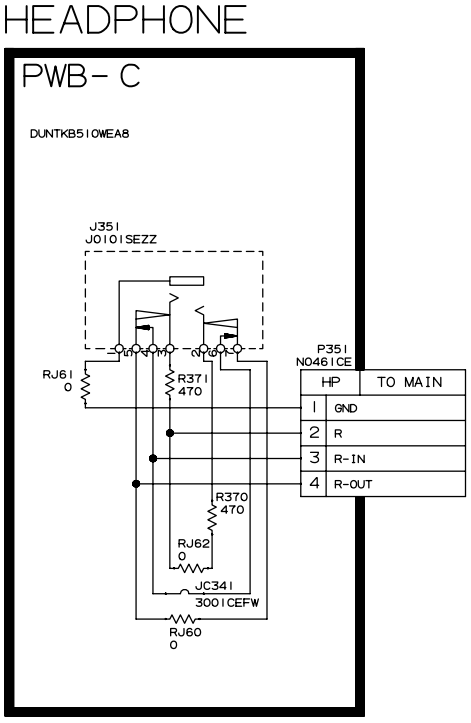
10	11	12	13	14	15	16	17	18	19

SCHEMATIC DIAGRAM:CRT and HEADPHONE Unit

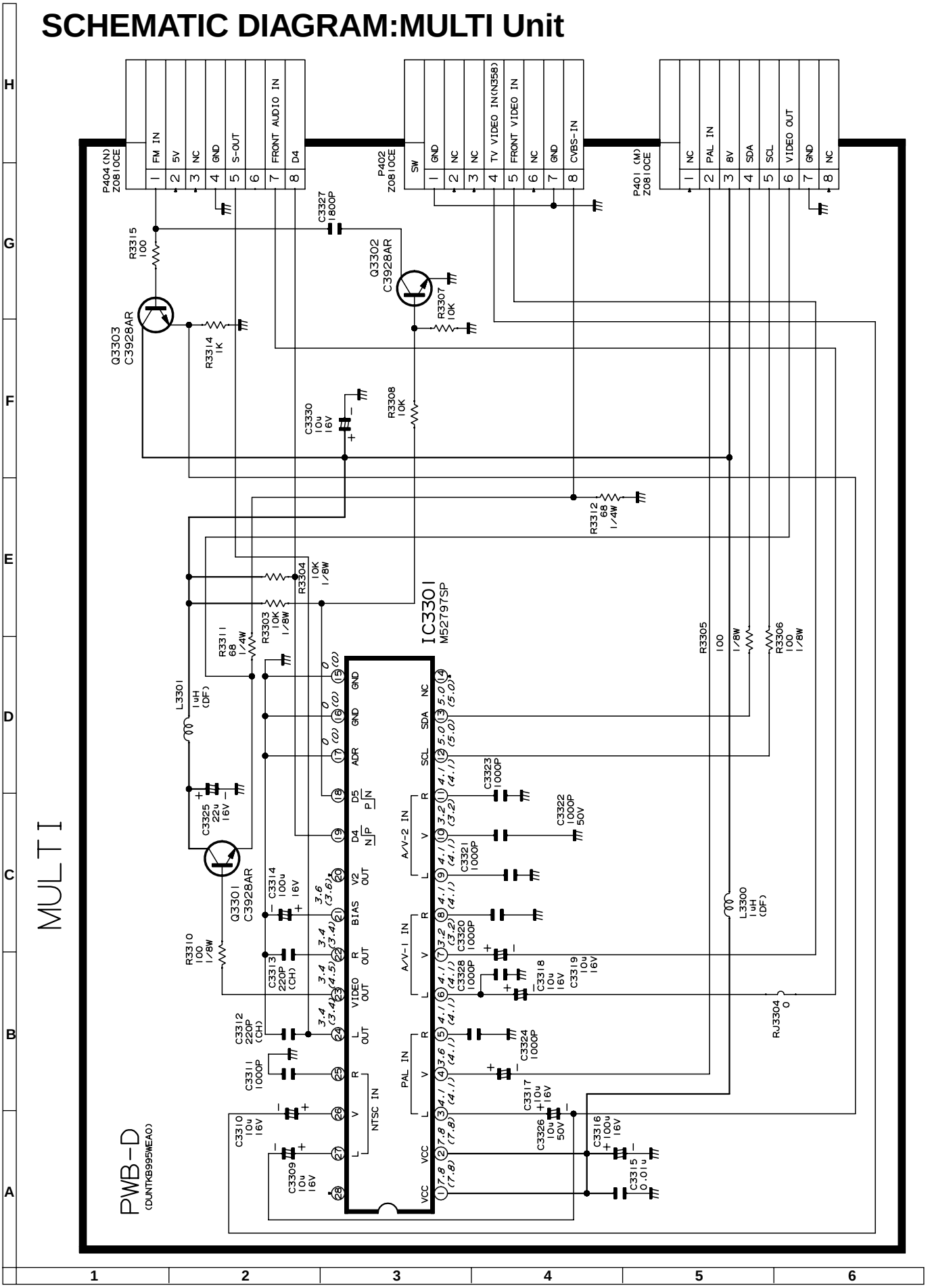
Ë CRT Unit



Ë HEADPHONE Unit

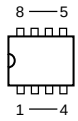


SCHEMATIC DIAGRAM:MULTI Unit

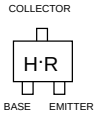


SOLID STATE DEVICE BASE DIAGRAM

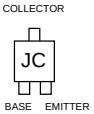
TOP VIEW



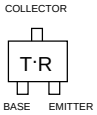
M24C04W
(BR24C04)
(CAT24W04)



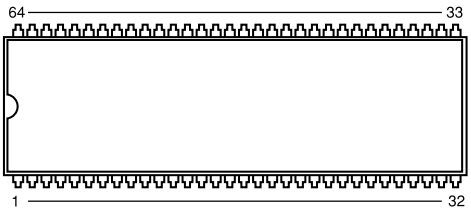
C3928AR



2SC2735



A1530AR



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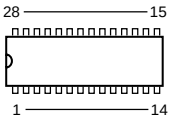
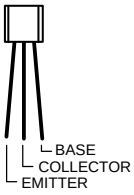
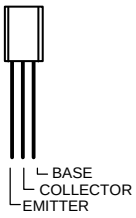


M52797SP

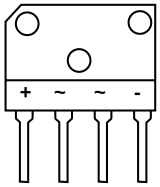
SIDE VIEW



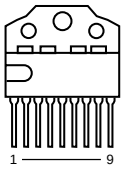
TX0110BM
TX0124BM



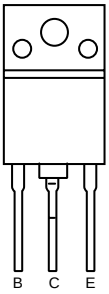
2PC1815
2SC3207



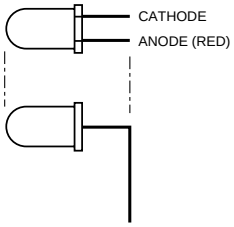
DX0111PE



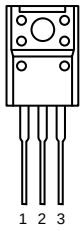
AN7523



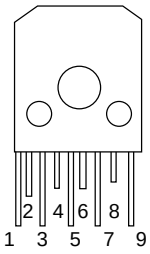
2SD2586



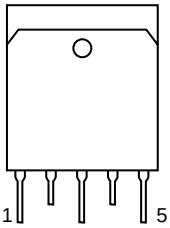
PX0013PE



KA7808A



AN5522



STRG5653