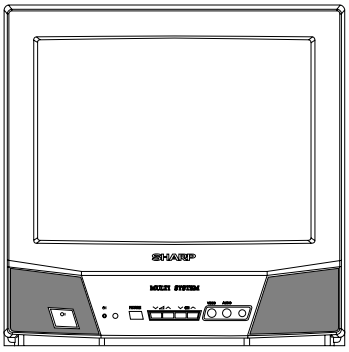
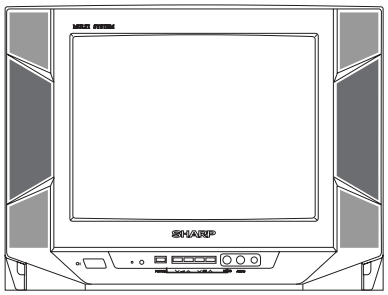
SHARP

SERVICE MANUAL

SX0M220A1-RU/



(20A1-RU, 21A1-RU)



(21A2-RU)

COLOUR TELEVISION

Chassis No. UA-1

MODELS

20A1-RU
21A1-RU
21A2-RU

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

FEATURE

- Multi 18 Systems
- Full Auto Channel Preset and Auto Channel Skip
- 100-CH Program Memory
- High Contrast Picture
- Black Stretch Circuit
- CATV (Hyper Band) Ready < Used Frequency Synthesizer Tuner>
- AVL (Sound Keeper) Function
- Hotel Mode
- On Timer / Sleep Timer / Reminder Timer
- Colour Comb Filter Function (NTSC only)
- Blue Back Noise Mute
- Rear AV-In/Out Terminals and Front AV-In
- English and Russian OSD

CONTENTS

WARNING

The chassis in this receiver is partially hot. Use an isolation transformer between the line cord plug and power receptacle, when servicing this chassis. To prevent electric shock, do not remove cover. No user – serviceable parts inside. Refer servicing to qualified service personnel.

SHARP CORPORATION

SPECIFICATIONS

Convergence ..... Self Convergence System
Focus ..... Electrostatic Focus High Bi-Potential

Sweep Deflection ..... Magnetic
Intermediate Frequencies
  Picture IF Carrier 38.9MHz
  Sound IF Carrier Frequency
    5.5MHz 33.4MHz
    6.0MHz 32.9MHz
    6.5MHz 32.4MHz
  Colour Sub-Carrier Frequency 34.47MHz

Power Input ..... 110 ~ 240V AC 50/60 Hz
Power Consumption
    21A2-RU 88W
    21A1-RU 85W
    20A1-RU 84W

Audio Power Output Rating
    21A1-RU, 20A1-RU ..... 3.0W (at Max.)
    21A2-RU ..... 5.0W (at Max.)

Speaker
  Size
    21A1-RU, 20A1-RU ..... 5 x 9 cm Elliptic (1 pc)
    21A2-RU ..... 5 x 9 cm Elliptic (2 pcs.)
  Voice Coil Impedance ..... 16 ohms at 400 Hz

Aerial Input Impedance
  VHF/UHF ..... 75 ohms Unbalanced
  Receiving System ..... PAL B/G, D/K, I / SECAM
    NTSC 3.58/4.43 MHz (AV)

Tuner Ranges
  • VHF-Channels ..... E1 (48.25MHz) thru E12 (224.25MHz)
    C1 (49.75MHz) thru C12 (216.25MHz)
    S1 (105.25MHz) thru S41 (463.25MHz)
  • UHF-Channels ..... E21 (471.25MHz) thru E69 (855.25MHz)
    C13 (471.25MHz) thru C57 (863.25MHz)

Dimensions
  21A2-RU ..... Width: 594.0mm
    Height: 465.0mm
    Depth: 484.0mm
    Weight (approx.): 20.5 kg
  21A1-RU ..... Width: 499.0mm
    Height: 474.0mm
    Depth: 486.0mm
    Weight (approx.): 20.0 kg
  20A1-RU ..... Width: 499.0mm
    Height: 474.0mm
    Depth: 487.0mm
    Weight (approx.): 17.2 kg

Cabinet Material ..... All Plastics

Specifications are subject to change without prior notice.

IMPORTANT SERVICE NOTES

Maintenance and repair of this receiver should be done by qualified service personnel only.

SERVICE OF HIGH VOLTAGE SYSTEM AND PICTURE TUBE

When servicing the high voltage system, remove static charge from it by connecting a 10K ohm Resistor in series with an insulated wire(such as a test probe) between picture tube dag and 2nd anode lead. (AC line cord should be disconnected from AC outlet.)

1. **Picture tube in this receiver employs integral implosion protection.**
2. **Replace with tube of the same type number for continued safety.**
3. **Do not lift picture tube by the neck.**
4. **Handle the picture tube only when wearing shatterproof goggles and after discharging the high voltage completely.**

X-RAY

This receiver is designed so that any X-Ray radiation is kept to an absolute Minimum. Since certain malfunctions or servicing may produce potentially hazardous radiation with prolonged exposure at close range, the followin precautions should be observed:

1. **20A1-RU : When repairing the circuit, be sure not to increase the high voltage to more than 26.4kVmax (at beam 0.1 μA) for the set.**
   21A1/2-RU :When repairing the circuit, be sure not to increase the high voltage to more than 26.5kVmax (at beam 0.1 μA) for the set.
2. **20A1-RU : To keep the set in a normal operation, be sure to make it function on 24.5kV±1.5kV(at beam 1100 μA) in the case of the set. The set has been factory -Adjusted to the above-mentioned high voltage.**
   21A1/2-RU :To keep the set in a normal operation, be sure to make it function on 24.8kV±1.5kV(at beam 1100 μA) in the case of the set. The set has been factory -Adjusted to the above-mentioned high voltage.
   *** If there is a possibility that the high voltage fluctuates as a result of the repairs, never forget to check for such high voltage after the work.**
3. **Do not substitute a picture tube with unauthorizerd types and/or brands which may cause excess X-ray radiation.**

BEFORE RETURNING THE RECEIVER

Before returning the receiver to the user, perform the following safety Checks.

1. **Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the receiver.**
2. **Inspect all protective devices such as non-metallic control knobs, insulating fishpapers, cabinet backs, adjustment and compartment covers or shields, isolation resistor- capacity networks, mechanical insulators etc.**

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.

1. Setting the service mode by the microprocessor.

①. Short JA 122 & JA 124 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 122 & JA 124 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 122 & JA 124 for 1 second and release to switch to the service mode position and turn on the main power switch.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 & 6.

③. Make sure the data need modify or not (Initial data).

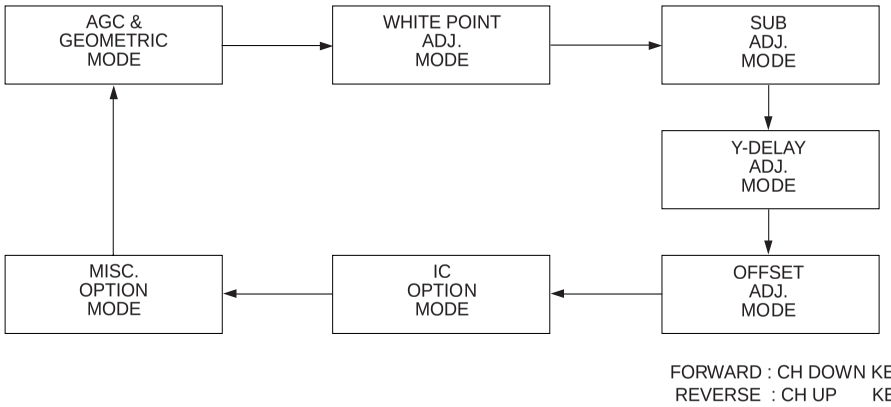
Note: Once the chassis has been assembly together and ready to be POWER ON for the FIRST TIME, make sure to short JA122 & JA124 to switch to the service mode position first and then turn on the main power switch (See 2-(1) above).

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

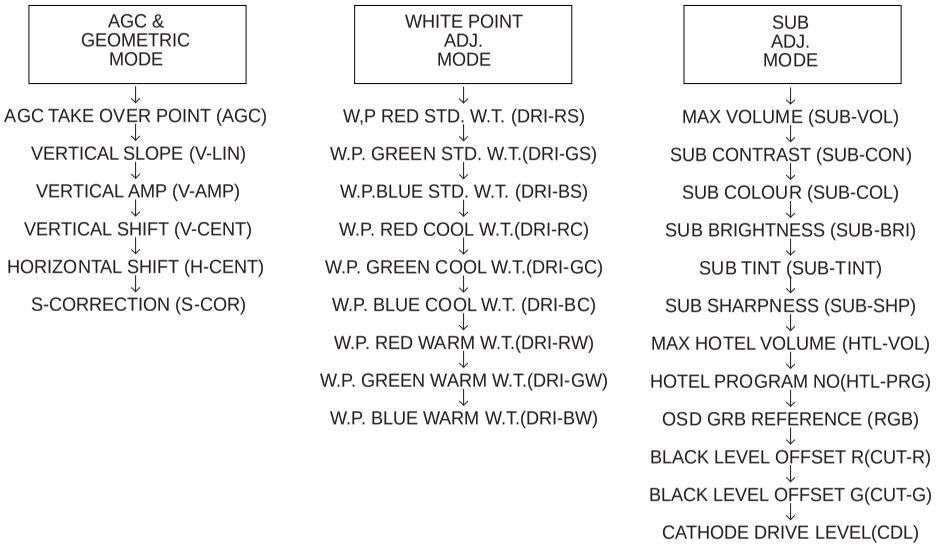
3. For reference please check with memory map (UA1 Series type RH-IX3368CE Attachment)

■ SERVICE MODE

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



FORWARD : CH DOWN KEY
REVERSE : CH UP KEY



FORWARD : CH DOWN KEY
REVERSE : CH UP KEY
* ( ) means OSD display.

USER DATA IN SERVICE MODE

* While SERVICE mode ON, EEPROM DATA will switch to the service data.
  Also, once SERVICE mode OFF, EEPROM will switch back to previous USER DATA.
* In the service mode, the user data establish as below,

MODE	USER DATA
CONTRAST	MIN (1/60)
COLOUR	MIN (1/60)
BRIGHTNESS	MIN (1/60)
TINT	MIN (1/60)
SHARPNESS	MIN (1/60)
WHITE TEMP	STANDARD
S-VOLUME	MIN (1/60)
BLUE BACK	OFF
C SYSTEM	AUTO
S SYSTEM	*1

*1 : For each CH, before changing service mode setting.

The flow of Mode lists as following,

* Direct Key-in Step1 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 TINT	**SUB TINT**
SHARPNESS UP	**SUB-SHP**

AFTER SHORT JA 122 & JA 124 ,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	
S-CORRECTION	S-COR	0~63	0	FIX	
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	32	FIX	
WHITE POINT GREEN COOL WHITE TEMP	DRI-GC	0~63	32	FIX	(DRI-GS)-7 DATA
WHITE POINT BLUE COOL WHITE TEMP	DRI-BC	0~63	32	FIX	(DRI-BS)DATA
WHITE POINT RED WARM WHITE TEMP	DRI-RW	0~63	25	FIX	
WHITE POINT GREEN WARM WHITE TEMP	DRI-GW	0~63	32	FIX	(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 (50 *3)	FIX	
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	ADJ	
MAX HOTEL VOLUME	HTL-VOL	0~63	32	ADJ	
HOTEL PROGRAM NUMBER	HTL-PRG	0~99 OR>99FOR NONE	255	FIX	
OSD GRB REFERENCE	RGB	0~15	15	FIX	
BLACK LEVEL OFF-SET R	CUT-R	0~15	8	FIX	
BLACK LEVEL OFF-SET G	CUT-G	0~15	8	FIX	
CATHODE DRIVE LEVEL	CDL	0~15	0	FIX	
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	FIX	
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	FIX	
COLOUR OFFSET (SECAM)	COL-OS	0~15	8	FIX	
COLOUR OFFSET (NTSC358)	COL-03	0~15	4	FIX	
COLOUR OFFSET (NTSC443)	COL-O4	0~15	4	FIX	
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	FIX	
SHARPNESS OFFSET (NTSC443)	SHP-O4	0~15	8	FIX	

EEPROM ITEMS	OSD	DATA LENGTH	INITIAL DATA	FIX/ADJ	REMARK
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	ONLY BLK
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	FIX	
SOUND SYSTEM DK	S-DK	0(DISABLE)/1(ENABLE)	0	FIX	
SOUND SYSTEM I	S-I	0(DISABLE)/1(ENABLE)	0	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	FIX	
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	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)	1	FIX	*1
ARABIC LANGUAGE	ARA	0(DISABLE)/1(ENABLE)	1	FIX	*1
MALAY LANGUAGE	MAL	0(DISABLE)/1(ENABLE)	1	FIX	*1
CHINESE LANGUAGE	CHI	0(DISABLE)/1(ENABLE)	1	FIX	*1
FRENCH LANGUAGE	FRE	0(DISABLE)/1(ENABLE)	1	FIX	*1
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(BRAZIL)/1(ARGENTINA	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	

NOTE :

FIXED DATA,PLEASE DO NOT CHANGE WITHOUT SPECIFIC INSTRUCTION."

*1: MANUALLY CHANGE 1 TO 0.

INITIAL SETTING

(1). In service mode, After execute select POS 1, store the following tuning data in EEPROM.

MCL1		
CH-NO	Fv (MHz)	SOUND SYS
0		
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	885.25	M
35	112.25	B/G
36	168.25	B/G
37		
38	294.25	B/G
39	463.25	B/G
40		
41	647.25	B/G
42	663.25	B/G
43	679.25	B/G

MCL1		
CH-NO	Fv (MHz)	SOUND SYS
44	174.95	B/G
45	175.55	B/G

SHIPPING SETTING & CHECKING

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

ITEMS	DATA SETTING
LAST PROGRAM/CHANNEL	1
FLASHBACK PROGARM/CH	1
DIGIT	1
C-SYSTEM	AUTO
S-SYSTEM	D/K
SKIP	OFF
AFC	ON
VOLUME	1
CONTRAST	60 (MAX)
COLOUR	0 (CENTER)
BRIGHTNESS	0 (CENTER)
TINT	0 (CENTER)
SHARPNESS	0 (CENTER)
WHITE TEMP	STANDARD
REMINDER TIMER	In-active, "--:--"
ON TIMER	In-active, "--:--"
OFF TIMER	In-active, "--:--"
LAST POWER	POWER-ON
LANGUAGE	RUSSIAN
BLUE BACK MUTE	OFF
HOTEL MODE	OFF
0 CHANNEL SKIP	ON

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

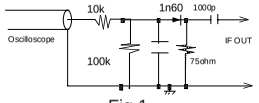
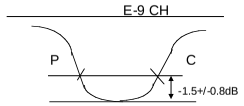
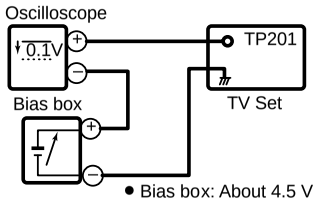
MODEL	LANGAUGE	SOUND SYSTEM
RU	RUSSIAN	D/K

FACTORY SETTINGS BY MODELS (Reference: Geomagnetism Adjustment)

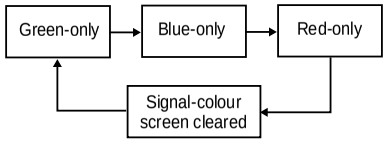
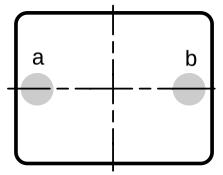
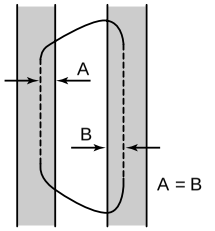
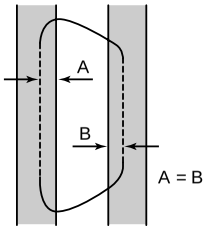
MODEL	Geomagnetism (H,V) nT	Background	Lang.	S-SYS
J (RU)	"45,000" "20,000"	7500K	RUSSIAN	D/K

*OSD LANG MUST BE SET IN SERVICE MODE,BUT IT'S BETTER TO WRITE IN EEPROM.
LANGUAGE QUANTITIES:ENGLISH/RUSSIAN

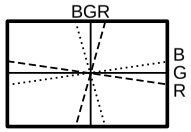
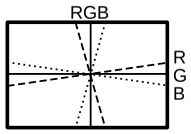
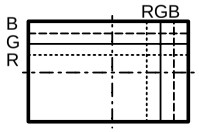
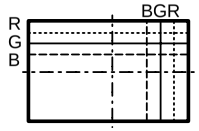
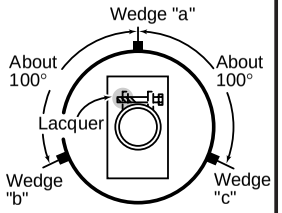
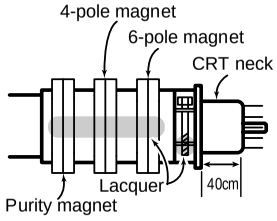
PIF ADJUSTMENT

No.	Adjusting point	Adjusting procedure/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 (I²C 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 "AG" mode in service mode. Adjust the "AG" bus data to obtain the Tuner output pin drop 0.1V 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±1dBμV(75 ohm open), instead of 57±1dBμV (75 ohm open).** **Precaution: The loss of using impedance adapter**

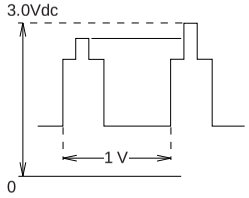
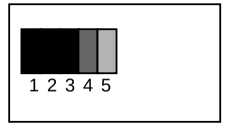
PURITY ADJUSTMENT

No.	Adjusting point	Adjusting procedure/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.** **Vertical Bv : +0.040 mT (0.40 gauss)** **Horizontal Bh: +0.020 mT (0.20 gauss)** **(See page 6.)** 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.** **Note: Set the service mode by TP1001 & TP1002 (short) then press factory process R/C RGB key to change to RGB mono colour mode.** * 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) * Press R/C RGB key for 1 second in NORMAL MODE, the colour will change to RGB mono colour mode. The TEXT Key "R. G. Cy" Key can be directly use to change to other colours screen.

CONVERGENCE ADJUSTMENT

No.	Adjusting point	Adjusting procedure/conditions	Waveform and others
1	**CONVERGENC 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.	 Fig. 5-1  Fig. 5-2  Fig. 5-3  Fig. 5-4  

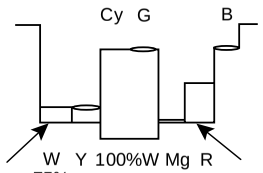
CRT CUT-OFF, BACKGROUND AND SUB-CONTRAST ADJUSTMENT

No.	Adjusting point	Adjusting procedure/conditions	Waveform and others
1	**CRT CUTOFF ADJUSTMENT (I²C BUS CONTROL)**	1. Switch TV to VIDEO mode,BLUE BACK OFF, with NO VIDEO signal. 2. Press R/C to set Picture Normal condition. 3. Connect the oscilloscope to Red OUT from IC801.(TP852) Range : 1 V/Div (DC) Sweep : 5 msec/Div 4. Adjust SCREEN VR ,so that the tip of signal reach 3.0 Vdc + 0.1 Vdc.	
2	**SUB-BRIGHT-NESS ADJUSMENT (I²C BUS CONTROL)**	1. Call " SUB-BRI" in service mode. (Receive Cross-hatch pattern with 5 black level windows) 2. Adjust the " SUB BRIGHT " bus data in order that the line 1, 2 and 3 have the same darkness wherelse line 4 is slightly brighter than line 1, 2 and 3 and finally line 5 will be the brighter than line 4.	 1, 2, 3 are in same black level.
3	**WHITE BAL-ANCE SERV-ICE MODE ADJ. (I2C BUS CONTROL)**	1. Receive the "Monoscope Pattern" signal. 2. Press R/C to set Picture NORMAL condition. 3. Connect the DC miliammeter between the TP 602 (-) TP 603 (+). 4. Check Beam current should be around 1100μA) 5. Set it to service mode and adjust the DRI-GS, & DRI-BS data to have a colour temperature of 7500°K (white). 6. Receive "WHITE" pattern, WITH BURST signal, and set BRIGHTNESS Y by generator, to ** 10 cd/m2 (MINOLTA CA-100) by reducing LUMINATE Y signal. 7. Adjust "CUT-R" & "CUT-G" to get 7,500. 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 700μA.** * ADJUST DRI-GC/GW, DRI-BC/BW as following DATA, after finishing DRI-BS and DRI-GS DATA ADJUSTMENT. DRI-RW=32 (FIXED), DRI-GW="DRI-GS"-7*, DRI-BW="DRI-BS"-7*DRI-RC=25*, DRI-BC="DRI-BS", DRI-GC="DRI-GS"-7*	Refer to Page 6. # 7500° K X : 0.300 Y : 0.310 (MINOLTA COLOUR ANALYZER CA-100) *NOTE: Above DATA can be UP/DOWN by volume key. LOW HIGH 14" 10cd/m2 200cd/m2 20"/21" 10cd/m2 120cd/m2 * 7500° K DRI-GW="DRI-GS"DATA-5 DRI-BW="DRI-BS" DATA-5
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 (+) and TP602 (–). (Full Scale: 3 mA Range) 4. Beam current must be within 1100 ± 100 μA.	

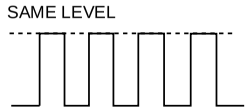
HORIZONTAL AND VERTICAL DEFLECTION LOOP ADJUSTMENT

No.	Adjusting point	Adjusting procedure/conditions	Waveform and others
1	**V-SLOPE(I²C 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 (I²C 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 (I²C 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	**S-CORRECTION (I²C BUS CONTROL)**	**FIXED DATA, NO NEED TO ADJUST.**	
5	**H - CENTER**	1. Call the "H-CENT" mode. 2. Increase or decrease "H-CENT" by Volume key to center the picture horizontal.	
6	**Focus adjustment**	1. Receive the "Monoscope Pattern" signal. 2. Press R/C to set Picture NORMAL condition. 3. Adjust the focus control to get the best focus.	

PAL CHROMA ADJUSTMENT

No.	Adjusting point	Adjusting procedure/conditions	Waveform and others
1	**SUB COLOUR (I²C 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(TP854). • 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 Colour Bar be at the same level shown as **Fig. 8**. 5. Clear the SERVICE mode.	 **Fig. 8**

NTSC CHROMA ADJUSTMENT

No.	Adjusting point	Adjusting procedure/conditions	Waveform and others
1	**SUB-TINT (I²C BUS CONTROL)**	1. Receive the "NTSC3.58 Colour Bar" signal through AV in. 2. Connect the oscilloscope to TP853 (Pin (5) of P882) 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. 9. 4. Clear the SERVICE mode.	 Fig. 9

PROTECTOR OPERATION CHECKING

No.	Adjusting point	Adjusting procedure/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 D607 cathode (R606 side). 3. Set voltage of Bias Box to 18V and make sure the protector is not work. 4. Set voltage of Bias Box to 27V, and make sure the protector is work.	
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.	Adjusting point	Adjusting procedure/conditions	Waveform and others
1	**VIDEO AND AUDIO OUTPUT CHECK**	1. Receive the "PAL Color Bar" signal (100% White Color 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 output 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, AV1, AV2 & TV again and the video & audio output are according to the input terminal for each mode.	

FUNCTION OPERATION CHECKING (VIDEO AND AUDIO)

No.	Adjusting point	Adjusting procedure/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 thru AV in. 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	**Notes:If nothing is display mean contrast, colour, bright, tint, 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.	Adjusting point	Adjusting procedure/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 "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.	
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 and Russian.	

MEMORY MAP

ADDRESS	DATA								MICON	EEPROM	EEPROM	CHASSIS		CTV FINAL		LAST INITIAL	REMARK
(HEX)	D7	D6	D5	D4	D3	D2	D1	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE	SETTING DATA	
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 (COOL)						20	00-3F							
1A			DRIVE-G (COOL)						20	00-3F							
1B			DRIVE-B (COOL)						20	00-3F							
1C			DRIVE-R (WARM)						20	00-3F							
1D			DRIVE-G (WARM)						20	00-3F							
1E			DRIVE-B (WARM)						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-PROGRAM-NUM						FF	00-FF							
2A																	
2B																	
2C																	
2D					OSD-RGB-REFERENCE				0F	00-0F							
2E					CUTOFF LEVEL -OFFSET R				08	00-0F							
2F					CUTOFF LEVEL -OFFSET G				08	00-0F							
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 N443)				0C	00-0F							
39					Y-DELAY (AV N358)				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 (N433)				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	
(HEX)	D7	D6	D5	D4	D3	D2	D1	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA		SETTING DATA	REMARK
40					SHARPNESS-OFFSET (SECAM)				04	00-0F							
41					SHARPNESS-OFFSET (N358)				0C	00-0F							
42					SHARPNESS-OFFSET (N433)				08	00-0F							
43																	
44	FCO	ACL	OSO	EHT	EVG	FFI	AVL	BKS		00-FF							
45	SCM	N443	N358	PB-SEC	BG	I	DK	M		00-FF							
46	SM		FMWS	AV	BTSC	HTL	VMC	VMI		00-FF							
47	HP2	FSL	RUS	FRA	CHN	MLY	ARB	THA		00-FF							
48					AGC		BIL	CPT		00-FF							
49																	
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	POWER								00	00-01							
5D	WHITE-TEMP								00	00-02							
5E	BLUE BACK								00	00-01							
5F	LANGUAGE								00	00-07							
60	DIGIT								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)										O1O: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	
(HEX)	D7	D6	D5	D4	D3	D2	**D1**	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE	SETTING DATA	REMARK
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	DATA								MICON	EEPROM	EEPROM	CHASSIS		CTV FINAL		LAST INITIAL	
(HEX)	D7	D6	D5	D4	D3	D2	D1	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE	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																	POS 46
FF																	
MODEL									MODEL								
LETTER NO.									LETTER NO.								

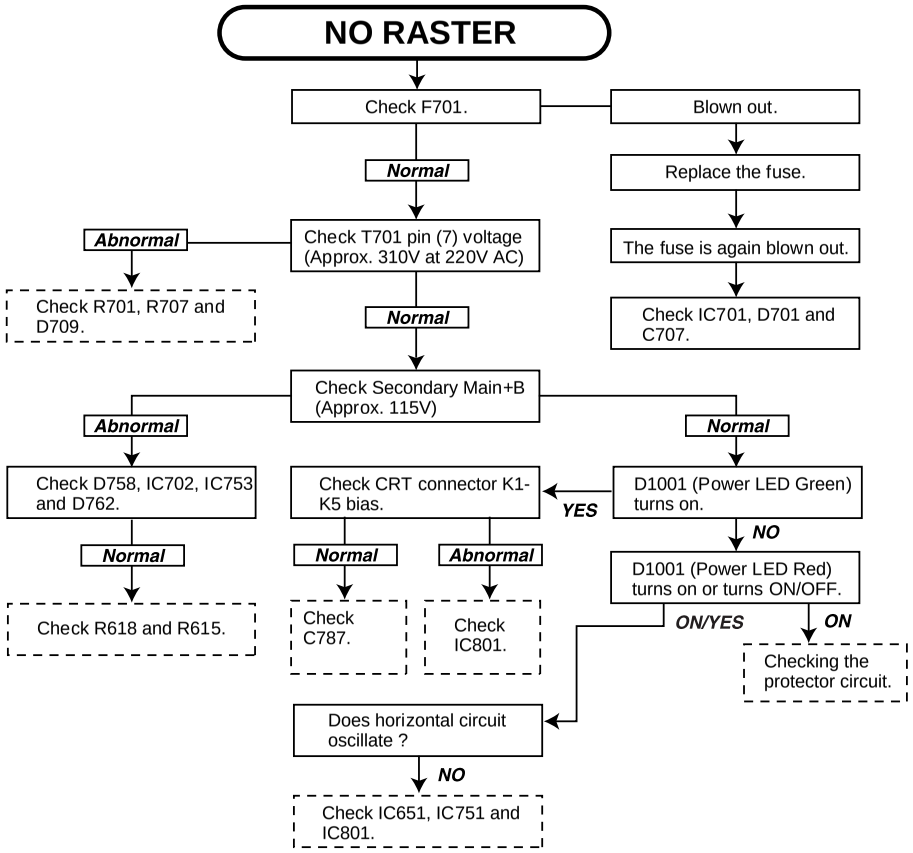
ADDRESS	DATA								MICON	EEPROM	EEPROM	CHASSIS		CTV FINAL		LAST INITIAL	
(HEX)	D7	D6	D5	D4	D3	D2	D1	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE	SETTING DATA	REMARK
100																	POS 46
101	TUNING FREQUANCY (HIGHER PART)																POS 47
102	TUNING FREQUANCY (LOWER 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	DATA								MICON	EEPROM	EEPROM	CHASSIS		CTV FINAL		LAST INITIAL	
(HEX)	D7	D6	D5	D4	D3	D2	**D1**	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE	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																	POS 89
MODEL									MODEL								
LETTER NO.									LETTER NO.								

ADDRESS	DATA								MICON	EEPROM	EEPROM	CHASSIS		CTV FINAL		LAST INITIAL	
(HEX)	D7	D6	D5	D4	D3	D2	D1	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE	SETTING DATA	REMARK
180																	POS 89
181																	
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.								

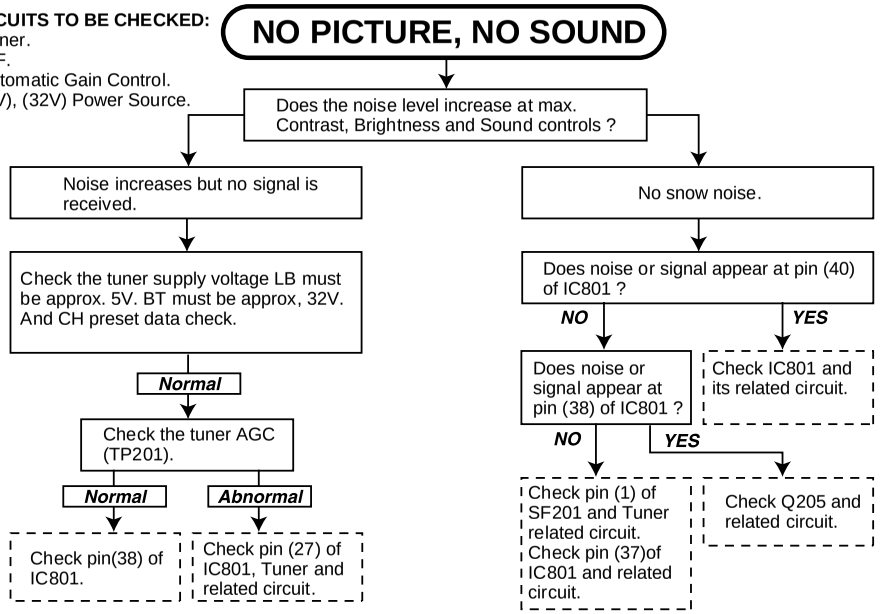
ADDRESS	DATA								MICON	EEPROM	EEPROM	CHASSIS		CTV FINAL		LAST INITIAL	
(HEX)	D7	D6	D5	D4	D3	D2	D1	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE	SETTING DATA	REMARK
1C0																	
1C1																	
1C2																	
1C3																	
1C4																	
1C5																	
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.								

TROUBLE SHOOTING TABLE

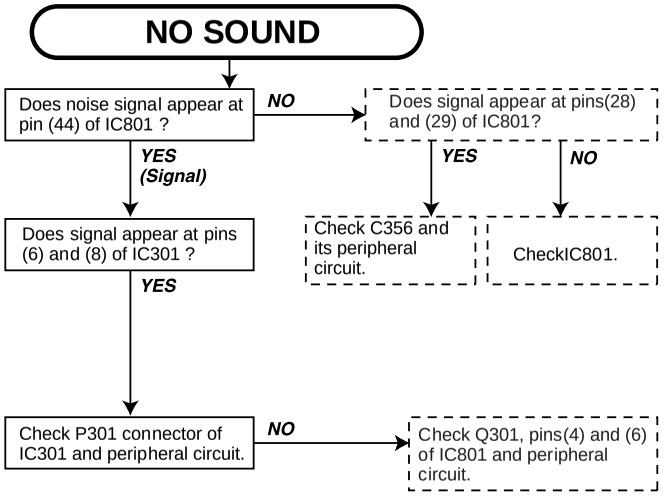


TROUBLE SHOOTING TABLE (Continued)

CIRCUITS TO BE CHECKED:
- Tuner.
- PIF.
- Automatic Gain Control.
- (5V), (32V) Power Source.



CIRCUITS TO BE CHECKED:
- Sound system pins (28) and (44) of IC801.
- Sound Detector Circuit.
- Sound Switch and Att. Control.
- Audio Output Circuit.



TROUBLE SHOOTING TABLE (Continued)

NEITHER VERTICAL NOR HORIZONTAL SYNCHRONIZATION

CIRCUIT TO BE CHECKED:
- Sync. Separator Circuit.

Check pins(16), (17) and (34) of IC801.

DEFECTIVE VERTICAL AMP. AND VERTICAL LINEARITY

Readjust vertical size. (Bas Data)

Vertical linearity and size is abnormal.

Check R504, R503, R506, R513, C517 and D501.

NO VERTICAL SCAN

Check IC501.

- ***Normal*** → Check C503 and C507.
- ***Abnormal*** → Check IC501.

TROUBLE SHOOTING TABLE (Continued)

NO SPECIFIC COLOUR

Is some colour produced in B/W broadcast reception ?

- ***NO*** → Check IC801, R801, R802, R803, D804, D805, D806 and Q801.
- ***YES*** → Is the white balance properly adjusted ?
  - ***NO*** → Readjust the white balance.
  - ***YES*** →
    - The picture colour is cyan. → Check Q870, Q885 and their adjacent circuits.
    - The picture colour is magenta. → Check Q871, Q883 and their adjacent circuits.
    - The picture colour is yellow. → Check Q872, Q887 and their adjacent circuits.

NO SPECIFIC COLOUR "PAL"/"SECAM" (NO COLOUR SYNCHRONIZATION)

Check IC801 and bias control circuit.

Normal

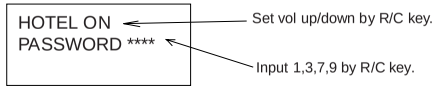
Check X1001.(12MHz)

UA1 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.

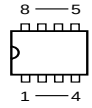
* We recommend
  Before set the hotel mode, it is better to choose ch 1 & set s-vol level Up to 75% full scale.
  After set hotel mode, starting channel will be always ch 1 & maximum sound level out will be set the half of full scale.
* If you set hotel mode in AV, starting channel will be the last ch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

CONDITION:

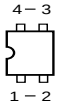
When using hotel mode, user can control "contrast", "brightness", "sharpness" and "tint" function.
But after power off, it will return to the initial setting.
You can't use:--
Preset mode
Fine tuning
Skip mode
System selection
The others function is allowed to be used.

SOLID STATE DEVICE BASE DIAGRAM

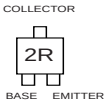
TOP VIEW



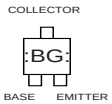
M24C04W



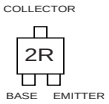
FX0008GE



D601A



B709A

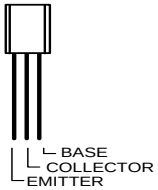


2SC2735

iX3368CE

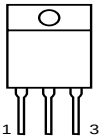
SIDE VIEW

2SC1815

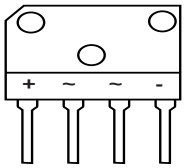


2SC2482

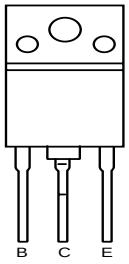
PST573J



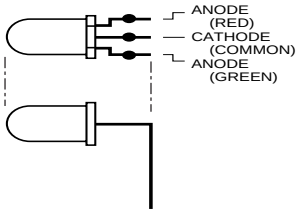
SE115N



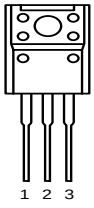
DX0386CE



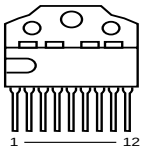
2SD1877
2SD2586



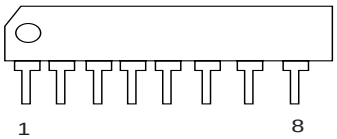
PX0423CE



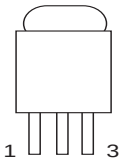
KA7808
KA7805



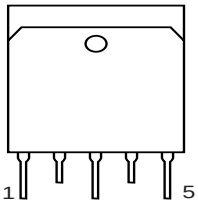
TDA7056A



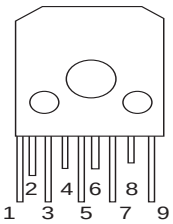
LA7016



TA48M033

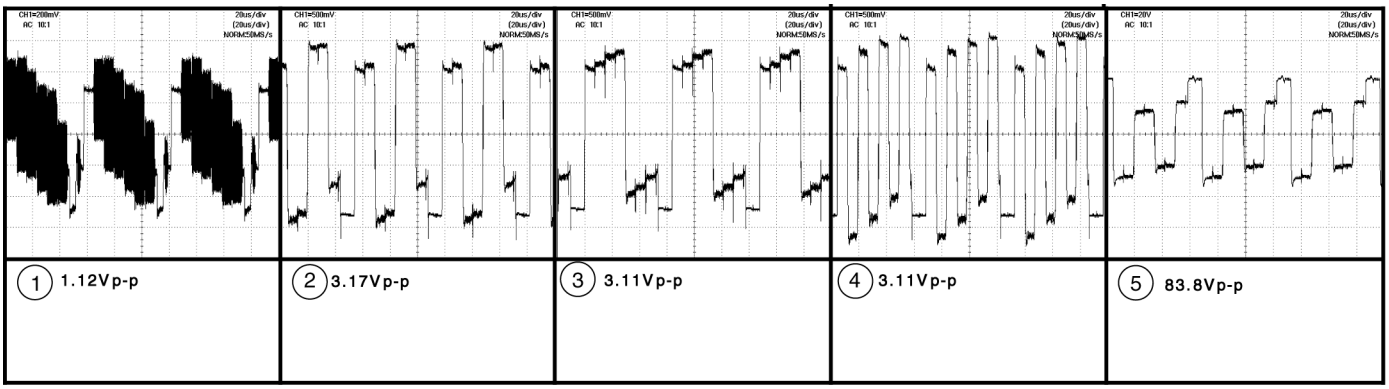


STRF6653
STRF6654

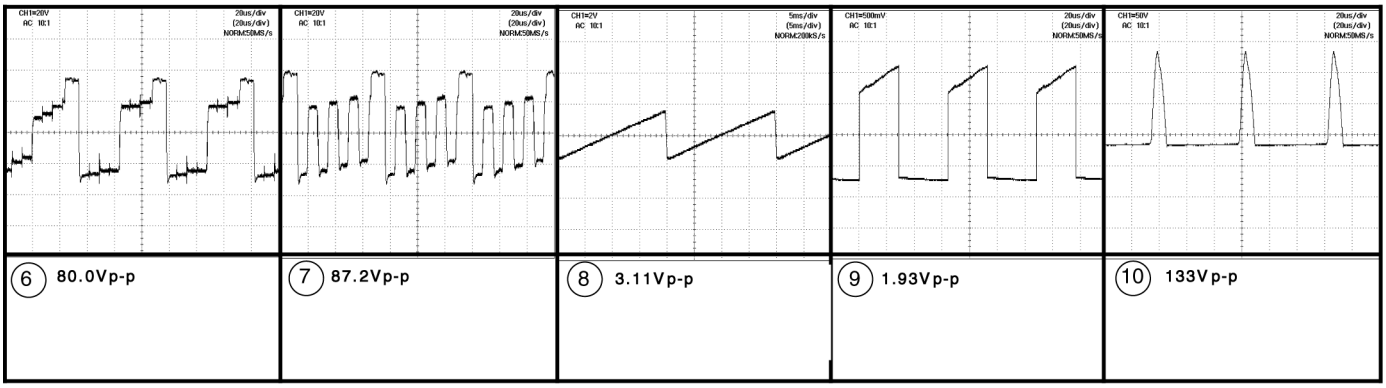


TDA8357

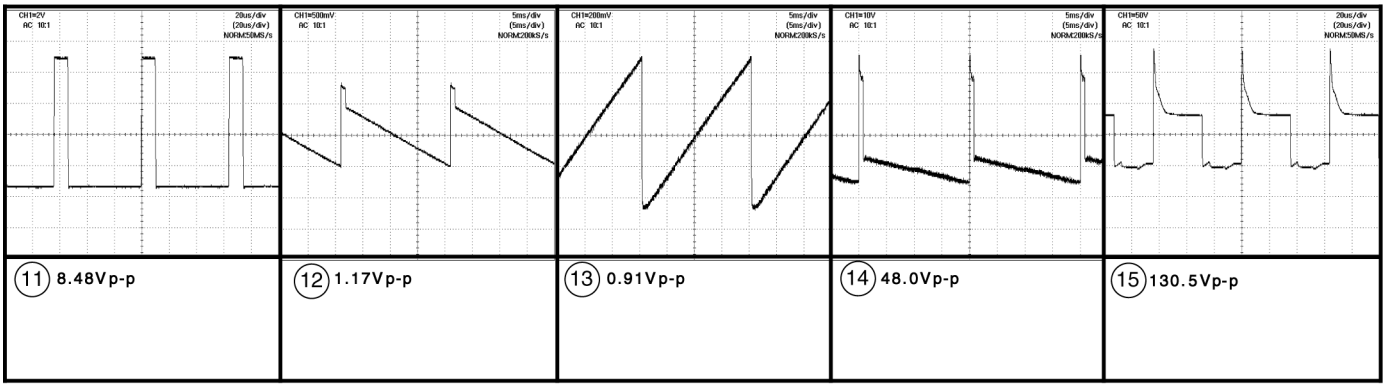
WAVEFORMS



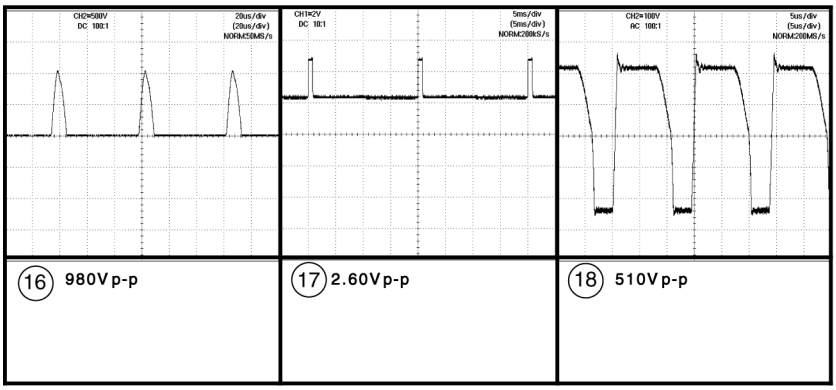
1 1.12Vp-p | 2 3.17Vp-p | 3 3.11Vp-p | 4 3.11Vp-p | 5 83.8Vp-p



6 80.0Vp-p | 7 87.2Vp-p | 8 3.11Vp-p | 9 1.93Vp-p | 10 133Vp-p

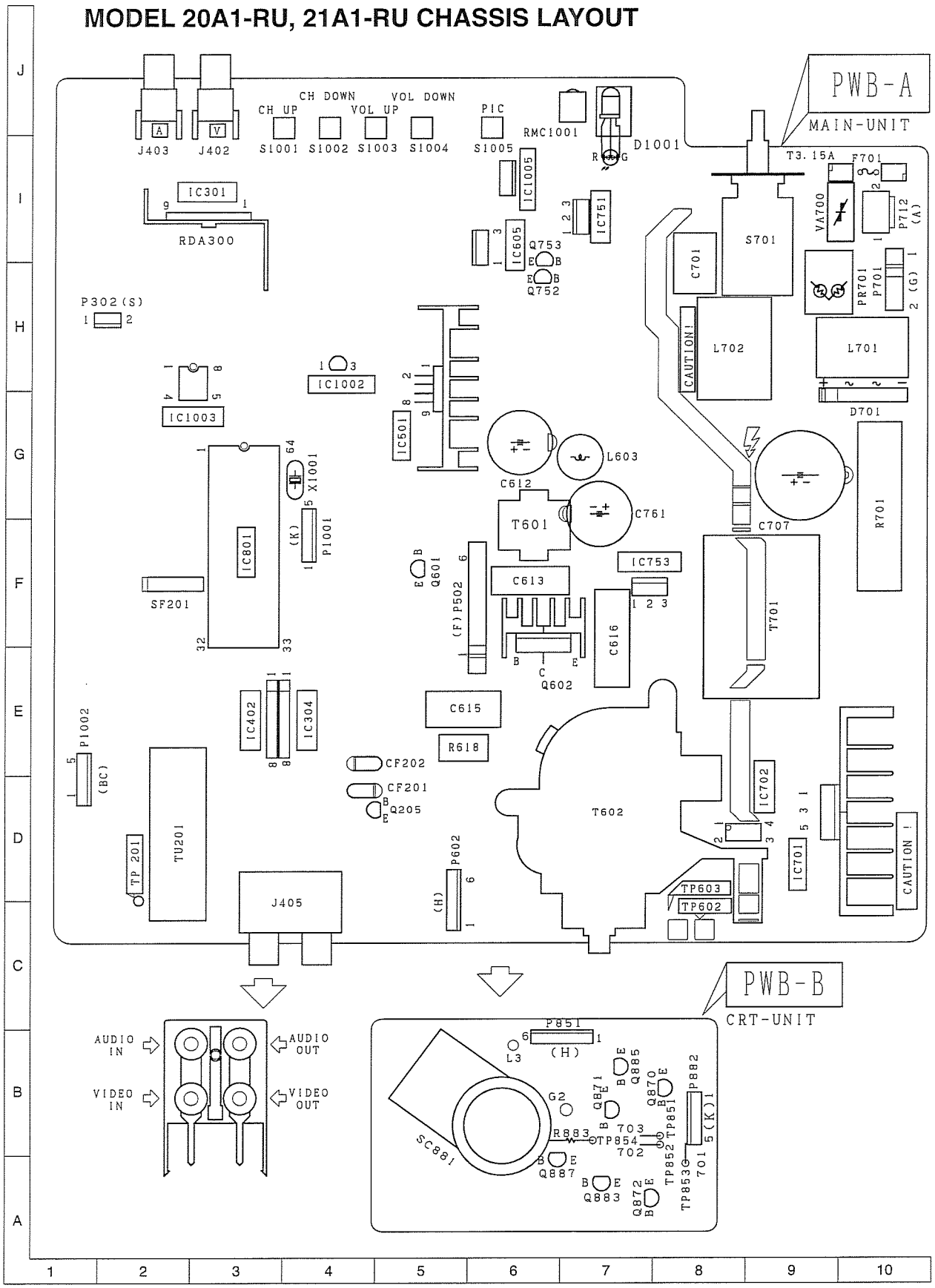


11 8.48Vp-p | 12 1.17Vp-p | 13 0.91Vp-p | 14 48.0Vp-p | 15 130.5Vp-p

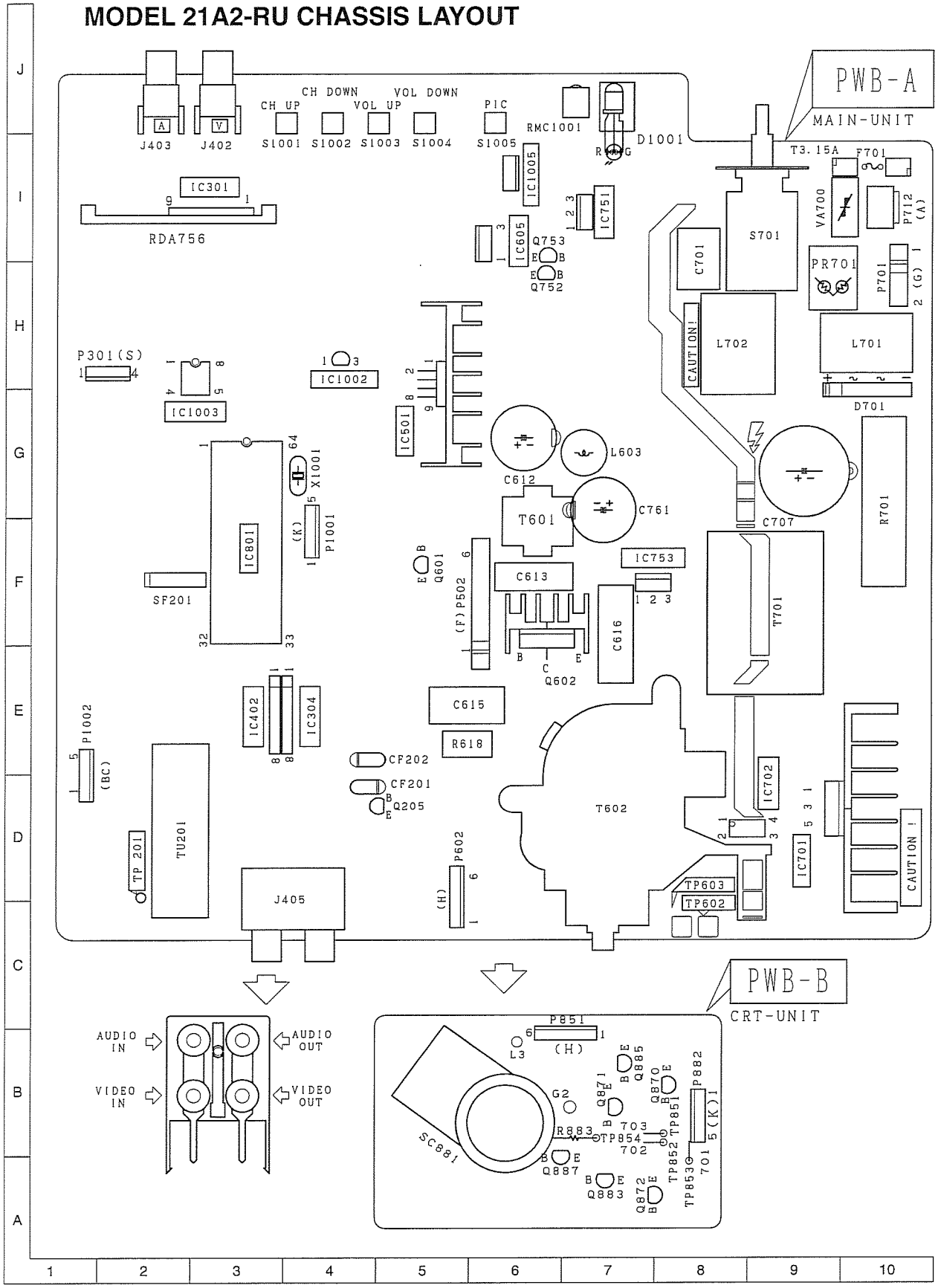


16 980Vp-p | 17 2.60Vp-p | 18 510Vp-p

MODEL 20A1-RU, 21A1-RU CHASSIS LAYOUT



MODEL 21A2-RU CHASSIS LAYOUT



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 " ⚠ " ( ) ARE IMPOTANT 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 unit of resistance "ohm" is omitted. (K = 1000 ohms, M = Mega ohm).*
2. *All resistors are 1/8 watt, unless otherwise noted.*
3. *All capacitors are μF, unless otherwise noted. (P = μμF).*

VOLTAGE MEASUREMENT CONDITIONS:

1. *Voltages in parenthesis measured with no signal.*
2. *Voltages without parenthesis measured with 3mV B & W or Colour signal.*
3. *All the voltages in each point are measured with VTVM.*

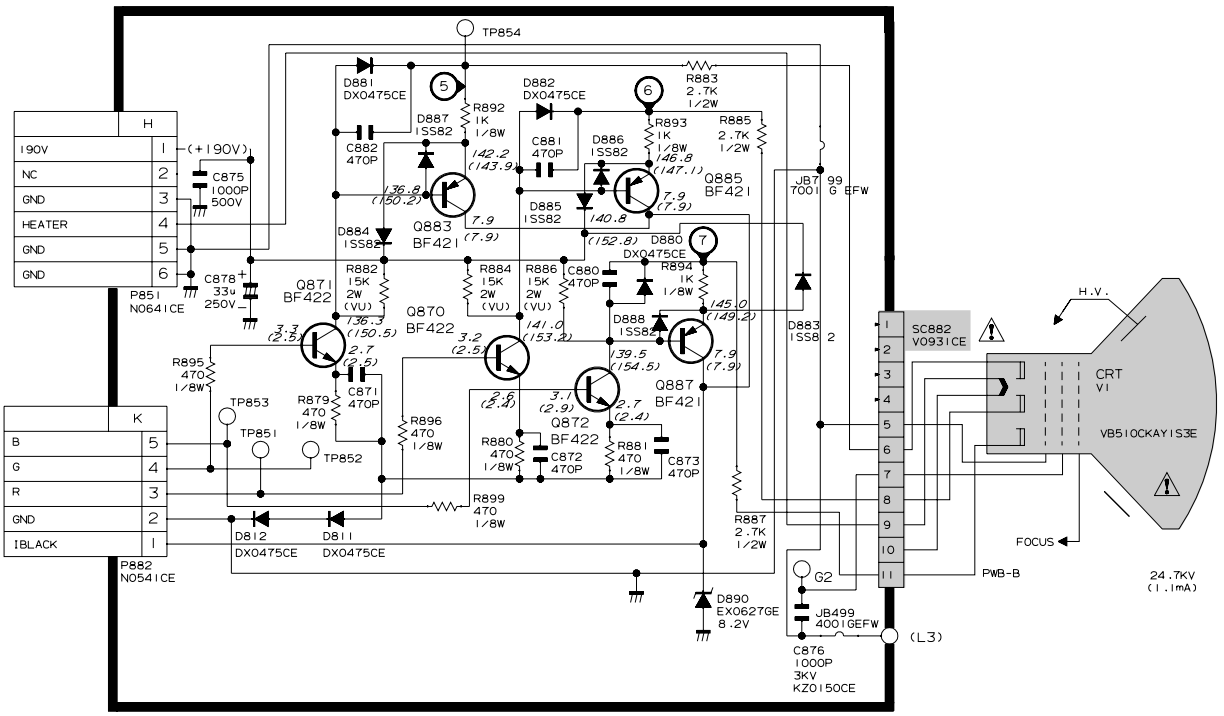
WAVEFORM MEASUREMENT CONDITIONS:

1. *The colour bar generator signal of 1.0V peak applied at pin (24) of IC201.*
2. *Approximately 4V AGC bias .*

SCHEMATIC DIAGRAM: CRT Unit

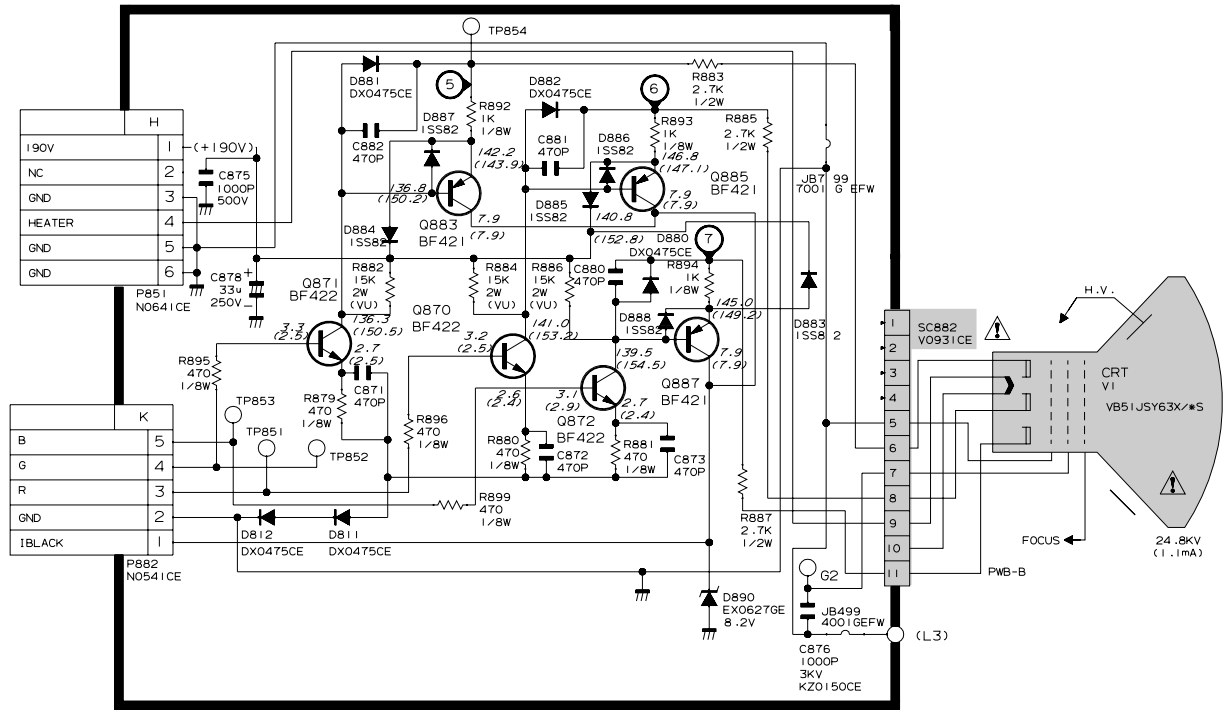
(MODEL 20A1-RU)

NOTE: 1.THE UNIT OF RESISTANCE "OHM" IS OMITTED
(K=1000 OHMS. M=MEGAOHM).
2.ALL RESISTORS ARE1/16W WATT.UNLESS OTHERWISE NOTED.
3.UNIT OF ALL CAPACITORS ARE F WITH PREFIX SYMBOL
(u. P. ETC).



(MODEL 21A1-RU/21A2-RU)

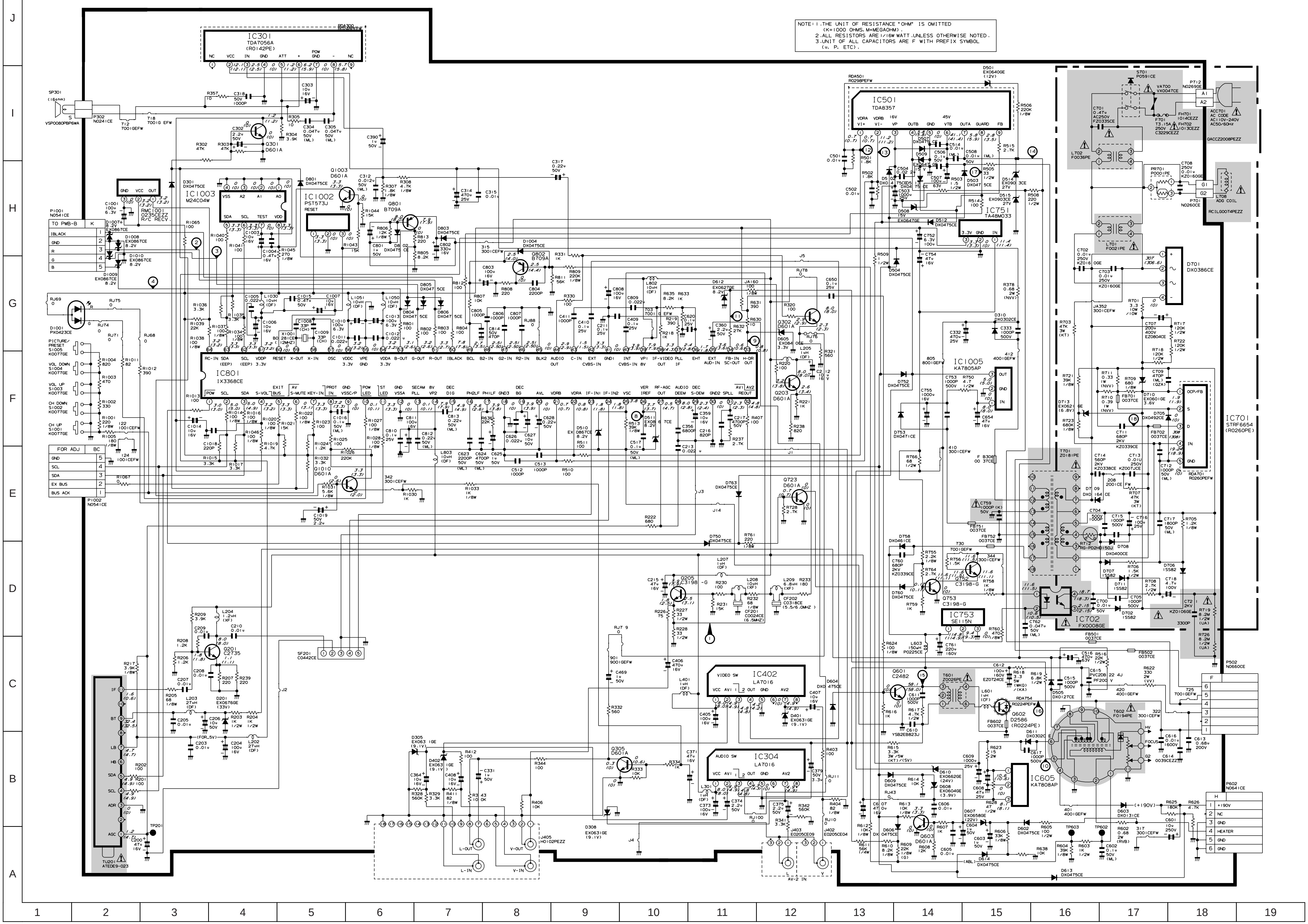
NOTE: 1.THE UNIT OF RESISTANCE "OHM" IS OMITTED
(K=1000 OHMS. M=MEGAOHM).
2.ALL RESISTORS ARE1/16W WATT.UNLESS OTHERWISE NOTED.
3.UNIT OF ALL CAPACITORS ARE F WITH PREFIX SYMBOL
(u. P. ETC).



20A1-RU
21A1-RU
21A2-RU

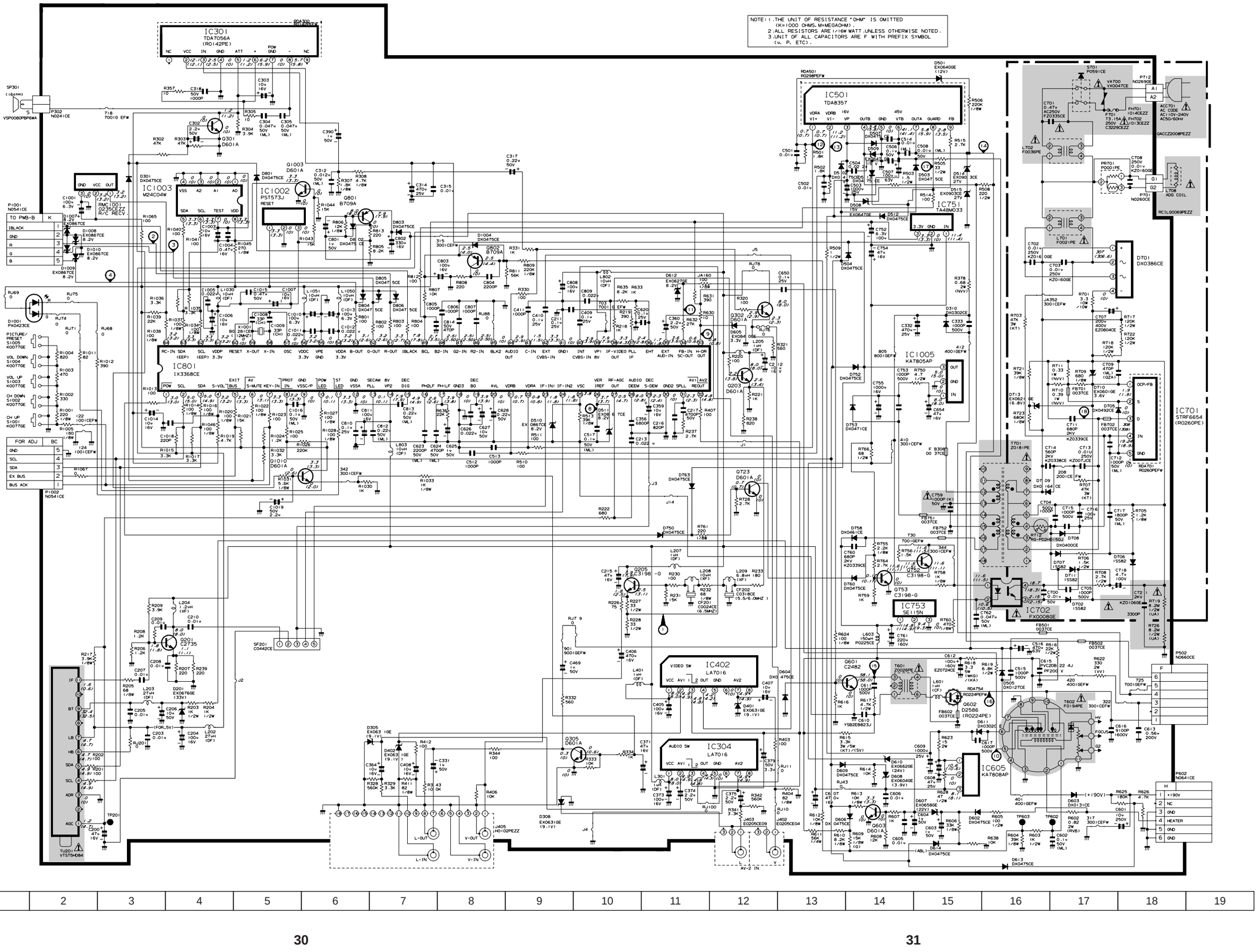
SCHEMATIC DIAGRAM: MODEL 20A1-RU MAIN Unit

NOTE: 1. THE UNIT OF RESISTANCE "OHM" IS OMITTED
(K=1000 OHMS, M=MEGAOHM).
2. ALL RESISTORS ARE 1/16W WATT. UNLESS OTHERWISE NOTED.
3. UNIT OF ALL CAPACITORS ARE F WITH PREFIX SYMBOL
(u, P, ETC).



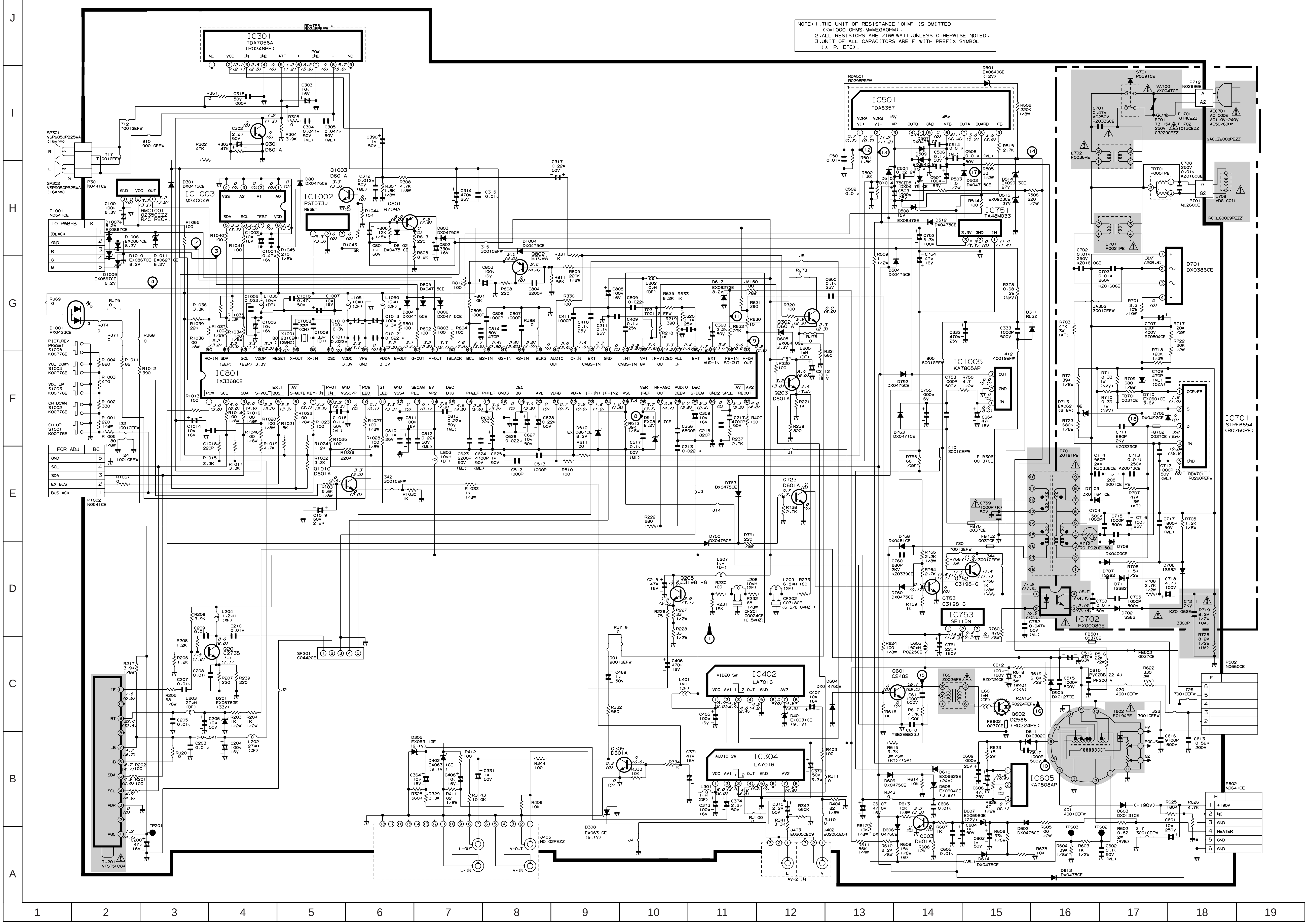
20A1-RU
21A1-RU
21A2-RU

SCHEMATIC DIAGRAM: MODEL 21A1-RU MAIN Unit



20A1-RU
21A1-RU
21A2-RU

SCHEMATIC DIAGRAM: MODEL 21A2-RU MAIN Unit

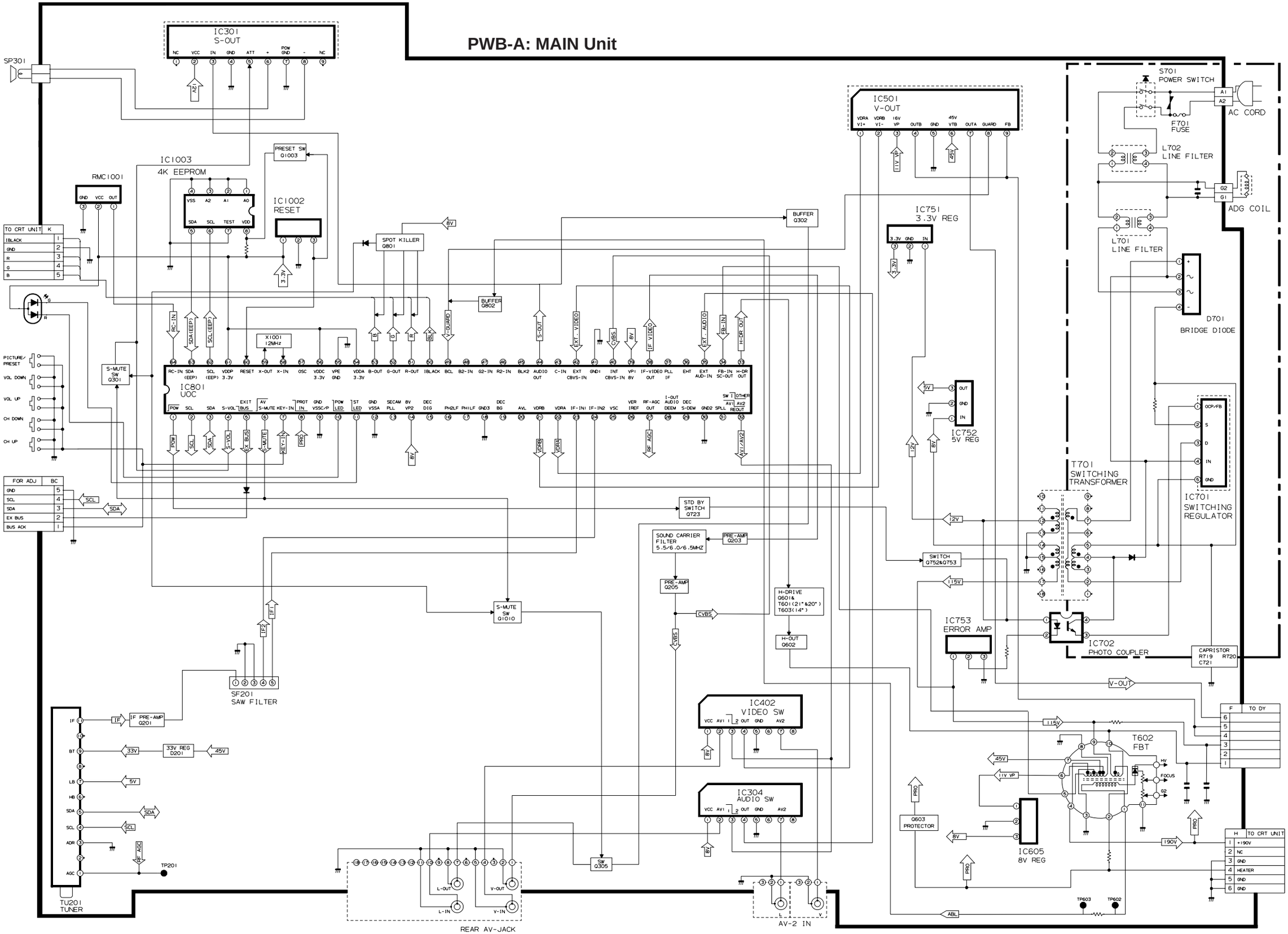


NOTE: 1.THE UNIT OF RESISTANCE "OHM" IS OMITTED (K=1000 OHMS, M=MEGAOHM).
2.ALL RESISTORS ARE 1/16W WATT.UNLESS OTHERWISE NOTED.
3.UNIT OF ALL CAPACITORS ARE F WITH PREFIX SYMBOL (u, P, ETC).

20A1-RU
21A1-RU
21A2-RU

BLOCK DIAGRAM - 1/3:MODEL 20/21A1-RU MAIN Unit

PWB-A: MAIN Unit



20A1-RU
21A1-RU
21A2-RU

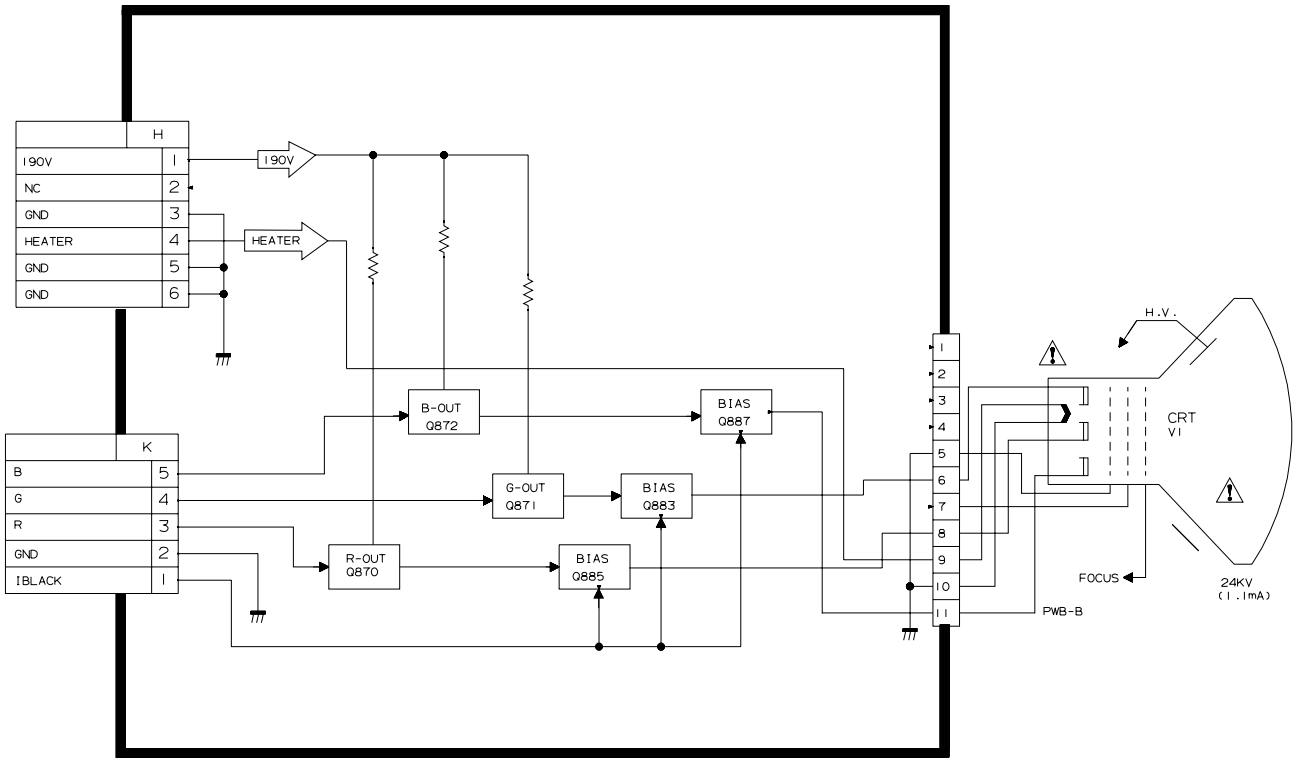
BLOCK DIAGRAM - 2/3:MODEL 21A2-RU MAIN Unit

PWB-A: MAIN Unit

IC301 S-OUT
SP301
SP302
RMC1001
IC1003 4K EEPROM
IC1002 RESET
PRESET SW Q1003
TO CRT UNIT K
SPOT KILLER Q801
BUFFER Q802
BUFFER Q302
X1001 12MHz
IC801 UOC
PICTURE/ PRESET
VOL DOWN
VOL UP
CH DOWN
CH UP
S-MUTE SW Q301
FOR ADJ BC
S-MUTE SW Q1010
IC501 V-OUT
IC751 3.3V REG
IC752 5V REG
S701 POWER SWITCH
F701 FUSE
AC CORD
L702 LINE FILTER
ADG COIL
L701 LINE FILTER
D701 BRIDGE DIODE
T701 SWITCHING TRANSFORMER
IC701 SWITCHING REGULATOR
STD BY SWITCH Q723
SOUND CARRIER FILTER 5.5/6.0/6.5MHZ
PRE-AMP Q203
PRE-AMP Q205
H-DRIVE Q601& T601(21"&20") T603(14")
H-OUT Q602
SWITCH Q752&Q753
IC753 ERROR AMP
IC702 PHOTO COUPLER
CAPRISTOR R719 R720 C721
V-OUT
IC402 VIDEO SW
IC304 AUDIO SW
T602 FBT
F TO DY
H TO CRT UNIT
Q603 PROTECTOR
IC605 8V REG
SF201 SAW FILTER
IF PRE-AMP Q201
33V REG D201
TU201 TUNER
TP201
SW Q305
REAR AV-JACK
AV-2 IN
TP603
TP602
ABL

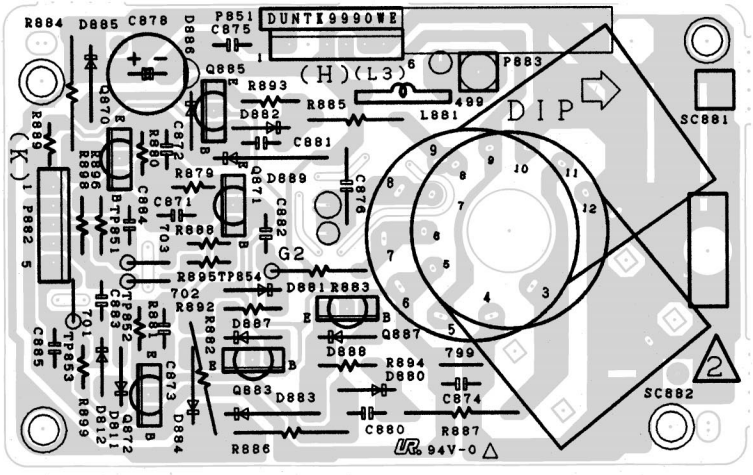
BLOCK DIAGRAM - 3/3:CRT Unit

PWB-B: CRT Unit



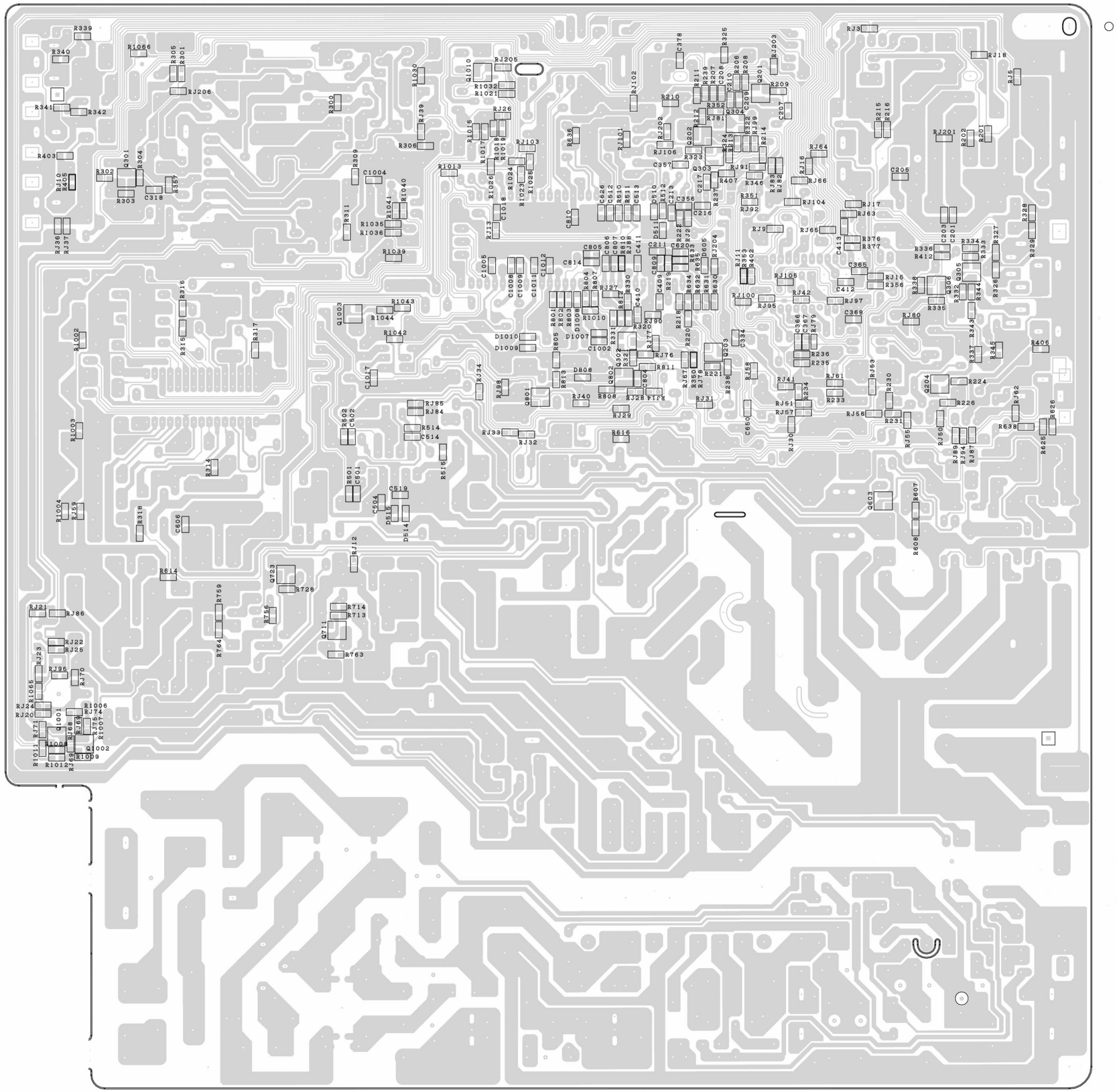
PRINTED WIRING BOARD ASSEMBLIES

PWB-B: CRT Unit (Wiring Side)



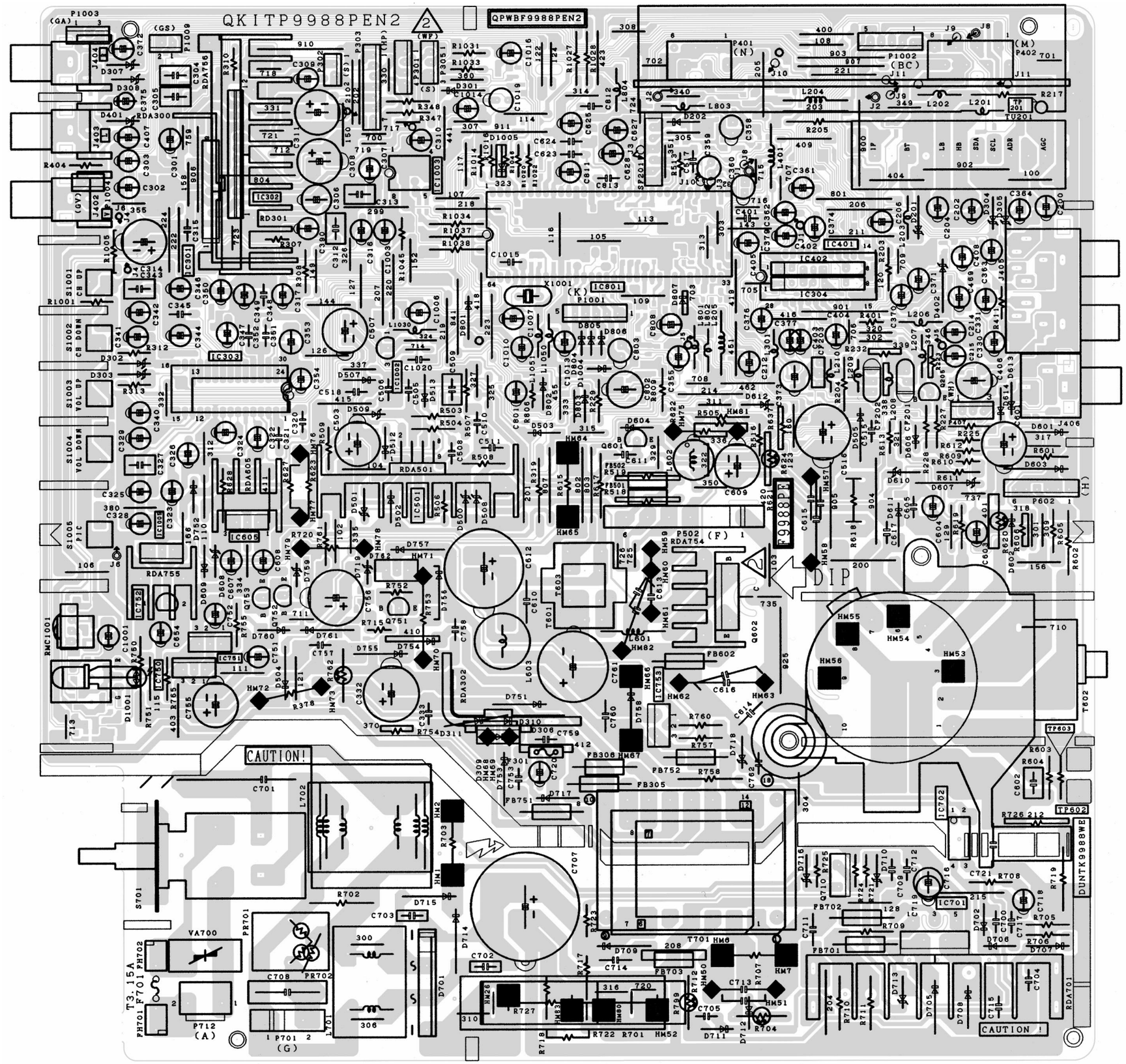
20A1-RU
21A1-RU
21A2-RU

PWB-A: MAIN Unit (Wiring Side)



20A1-RU
21A1-RU
21A2-RU

PWB-A: MAIN Unit (Component Side)



PARTS LIST

PARTS REPLACEMENT

Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by "⚠" in the Replacement Parts Lists.
The use of a substitute replacement part which does not have the same safety characteristics as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. **MODEL NUMBER**
2. **REF. NO.**
3. **PART NO.**
4. **DESCRIPTION**

MARK ★ : SPARE PARTS-DELIVERY SECTION.

Ref. No.	Part No.	★	Description	Code

PICTURE TUBE

⚠ V1	VB510CKAY1S3E	R	Picture Tube (20A1-RU)	CA
⚠ V1	VB51JSY63X/*S	R	Picture Tube (21A1-RU, 21A2-RU)	CE
⚠ L708	RCiLG0074PEZZ	R	Degaussing Coil (20A1-RU)	AQ
⚠ L708	RCILG0069PEZZ	R	Degaussing Coil (21A1-RU, 21A2-RU)	AR
	RCILH0146PEZZ	R	Defflection Yoke (21A1-RU, 21A2-RU)	BF
	QEARC2017PEZZ	R	Grounding Strap (20A1-RU, 21A1-RU)	AE
	QEARC2107PEZZ	R	Grounding Strap (21A2-RU)	AE
	PMAGF3046CEZZ	R	Magnet (21A1-RU, 21A2-RU)	AF
	LHLDP1066PE00	R	Holder	AC

PRINTED WIRING BOARD ASSEMBLY (NOT REPLACEMENT ITEM)

PWB-A	DUNTK9988WEX5	-	Main Unit (20A1-RU)	—
PWB-A	DUNTK9988WEW7	-	Main Unit (21A1-RU)	—
PWB-A	DUNTK9988WEX0	-	Main Unit (21A2-RU)	—
PWB-B	DUNTK9990WEW7	-	CRT Unit (20A1-RU)	—
PWB-B	DUNTK9990WEW2	-	CRT Unit (21A1-RU, 21A2-RU)	—

PWB-A DUNTK9988WEX5/W7/X0
MAIN UNIT

TUNER AND ASSEMBLY

NOTE: THE PARTS HERE SHOWN ARE SUPPLIED AS AN ASSEMBLY BUT INDEPENDENTLY.

⚠ TU201	VTUATEDE9-023	R	VHF Tuner (20A1-RU)	BB
⚠ TU201	VTUVTST5HD84/	R	VHF Tuner (21A1-RU,21A2-RU)	BB

Ref. No.	Part No.	★	Description	Code

INTEGRATED CIRCUITS

IC301	VHiTDA7056A-1	R	TDA7056A	AP
IC304	VHiLA7016//-1	R	LA7016	AH
IC402	VHiLA7016//-1	R	LA7016	AH
IC501	VHiTDA8357/-1	R	TDA8357J/N1/S1	AN
IC605	VHiKA7808AP-1	R	KIA7808API	AE
IC701	VHiSTRF6654-1	R	STR-F6654	AX
IC751	VHiTA48M033-1	R	TA48M033F	AH
IC753	VHiSE115N//-1	R	SE115N	AF
IC801	RH-iX3368CEN3	R	I.C.	BC
IC1002	VHiPST573J/-1	R	I.C.	AE
IC1003	VHiM24C04W/-1	R	I.C.	AG
IC1005	VHiKA7805AP-1	R	KIA7805API	AE

TRANSISTORS

Q201	VS2SC2735//1E	R	2SC2735	AC
Q203	VS2SD601A//-1	R	2SD601A	AC
Q205	VS2SC3198-G-1	R	2SC3198-G	AA
Q301	VS2SD601A//-1	R	2SD601A	AC
Q302	VS2SD601A//-1	R	2SD601A	AC
Q305	VS2SD601A//-1	R	2SD601A	AC
Q601	VS2SC2482//-1	R	2SC2482	AD
Q602	VS2SD2586//1E	R	2SD2586	AM
Q603	VS2SD601A//-1	R	2SD601A	AC
Q723	VS2SD601A//-1	R	2SD601A	AC
Q752	VS2SC3198-G-1	R	2SC3198-G	AA
Q753	VS2SC3198-G-1	R	2SC3198-G	AA
Q801	VS2SB709A//-1	R	2SB709A	AA
Q802	VS2SB709A//-1	R	2SB709A	AA
Q1003	VS2SD601A//-1	R	2SD601A	AC
Q1010	VS2SD601A//-1	R	2SD601A	AC

DIODES

D201	RH-EX0676GEZZ	R	Zener Diode	AA
D301	RH-DX0475CEZZ	R	Diode	AB
D305	RH-EX0631GEZZ	R	Zener Diode	AA
D308	RH-EX0631GEZZ	R	Zener Diode	AA
D310	RH-DX0302CEZZ	R	Diode (20A1-RU,21A1-RU)	AC
D311	VHDRL3Z////-1	R	RL3Z (21A2-RU)	AE
D401	RH-EX0631GEZZ	R	Zener Diode	AA
D402	RH-EX0631GEZZ	R	Zener Diode	AA
D501	RH-EX0640GEZZ	R	Zener Diode	AA
D502	RH-DX0475CEZZ	R	Diode	AB
D503	RH-DX0475CEZZ	R	Diode	AB
D504	RH-DX0475CEZZ	R	Diode	AB
D505	RH-DX0127CEZZ	R	Diode	AC
D507	RH-DX0475CEZZ	R	Diode	AB
D508	RH-EX0647GEZZ	R	Zener Diode	AA
D509	RH-EX0647GEZZ	R	Zener Diode	AA
D510	RH-EX0867CEZZ	R	Zener Diode	AC
D511	RH-EX0867CEZZ	R	Zener Diode	AC
D512	RH-DX0475CEZZ	R	Diode	AB
D513	RH-DX0475CEZZ	R	Diode	AB
D514	RH-EX0903CEZZ	R	Zener Diode	AC
D515	RH-EX0903CEZZ	R	Zener Diode	AC
D602	RH-DX0475CEZZ	R	Diode	AB
D603	RH-DX0131CEZZ	R	Diode	AC
D604	RH-DX0475CEZZ	R	Diode	AB
D605	RH-EX0840CEZZ	R	Zener Diode	AC
D606	RH-DX0475CEZZ	R	Diode	AB
D607	RH-EX0658GEZZ	R	Zener Diode	AA
D608	RH-EX0604GEZZ	R	Zener Diode	AB
D609	RH-DX0475CEZZ	R	Diode	AB
D610	RH-EX0662GEZZ	R	Zener Diode	AB
D611	RH-DX0302CEZZ	R	Diode	AC
D612	RH-EX0627GEZZ	R	Zener Diode	AA
D613	RH-DX0475CEZZ	R	Diode	AB
D614	RH-DX0475CEZZ	R	Diode	AB
D701	RH-DX0386CEZZ	R	Diode	AG
D702	VHD1SS82///1A	R	1SS82	AC
D705	RH-DX0492CEZZ	R	Diode	AE
D706	VHD1SS82///1A	R	1SS82	AC
D707	VHD1SS82///1A	R	1SS82	AC
D708	RH-DX0400CEZZ	R	Diode	AC
D709	RH-DX0164CEZZ	R	Diode	AC

Ref. No.	Part No.	★	Description	Code
D710	RH-EX0601GEZZ	R	Zener Diode	AA
D711	VHD1SS82///1A	R	1SS82	AC
D713	RH-EX0621GEZZ	R	Zener Diode	AB
D750	RH-DX0475CEZZ	R	Diode	AB
D752	RH-DX0475CEZZ	R	Diode	AB
D753	RH-DX0471CEZZ	R	Diode	AE
D758	RH-DX0461CEZZ	R	Diode	AG
D760	RH-DX0475CEZZ	R	Diode	AB
D763	RH-DX0475CEZZ	R	Diode	AB
D801	RH-DX0475CEZZ	R	Diode	AB
D802	RH-DX0475CEZZ	R	Diode	AB
D803	RH-DX0475CEZZ	R	Diode	AB
D804	RH-DX0475CEZZ	R	Diode	AB
D805	RH-DX0475CEZZ	R	Diode	AB
D806	RH-DX0475CEZZ	R	Diode	AB
D1001	RH-PX0423CEZZ	R	PhotoDiode	AD
D1004	RH-DX0475CEZZ	R	Diode	AB
D1007	RH-EX0867CEZZ	R	Zener Diode	AC
D1008	RH-EX0867CEZZ	R	Zener Diode	AC
D1009	RH-EX0867CEZZ	R	Zener Diode	AC
D1010	RH-EX0867CEZZ	R	Zener Diode	AC
D1011	RH-EX0627GEZZ	R	Zener Diode (21A2-RU)	AA
⚠ IC702	RH-FX0008GEZZ	R	PC123FY8	AE

PACKAGED CIRCUITS

⚠ VA700	RH-VX0047CEZZ	R	Varistor	AF
PR701	RMPTP0001PEZZ	R	Packaged Circuit	AN
X1001	RCRSB0281CEZZ	R	Crystal	AG

COILS

L202	VP-DF270K0000	R	Peaking 27µH	AB
L203	VP-DF270K0000	R	Peaking 27µH	AB
L204	VP-XF1R2K0000	R	Peaking 1.2µH	AB
L205	VP-DF1R0K0000	R	Peaking 1µH	AB
L207	VP-DF1R0K0000	R	Peaking 1µH	AB
L208	VP-XF100K0000	R	Peaking 10µH	AB
L209	VP-XF6R8K0000	R	Peaking 6.8µH	AB
L301	VP-DF1R0K0000	R	Peaking 1µH	AB
L401	VP-DF1R0K0000	R	Peaking 1µH	AB
L601	VP-CF1R0M0000	R	Peaking 1µH	AB
L603	RCiLP0225CEZZ	R	Coil	AF
⚠ L701	RCiLF0021PEZZ	R	Coil	AK
⚠ L702	RCiLF0036PEZZ	R	Coil	AN
L802	VP-DF100K0000	R	Peaking 10µH	AB
L803	VP-DF100K0000	R	Peaking 10µH	AB
L1030	VP-DF100K0000	R	Peaking 10µH	AB
L1050	VP-DF100K0000	R	Peaking 10µH	AB
L1051	VP-DF100K0000	R	Peaking 10µH	AB

FILTER

CF201	RFiLC0024CEZZ	R	Filter	AE
CF202	RFiLC0318CEZZ	R	Filter	AG
SF201	RFiLC0442CEZZ	R	Filter	AL

TRANSFORMERS

⚠ T601	RTRNZ0026PEZZ	R	Transformer	AH
⚠ T602	RTRNF0194PEN1	R	H-VOLT Transformer	AZ
⚠ T701	RTRNZ0181PEZZ	R	Transformer	AN

CAPACITORS

C200	VCEA0A1CW476M	R	47	16V	Electrolytic	AB
C203	VCKYCY1HF103Z	R	0.01	50V	Ceramic	AA
C204	VCEA0A1CW107M	R	100	16V	Electrolytic	AC
C205	VCKYCY1HF103Z	R	0.01	50V	Ceramic	AA
C206	VCEA0A1HW106M	R	10	50V	Electrolytic	AB
C207	VCKYCY1HF103Z	R	0.01	50V	Ceramic	AA
C208	VCKYCY1HF103Z	R	0.01	50V	Ceramic	AA
C209	VCKYCY1HF103Z	R	0.01	50V	Ceramic	AA
C210	VCKYCY1HF103Z	R	0.01	50V	Ceramic	AA
C211	VCKYCY1EF104Z	R	0.1	25V	Ceramic	AA
C212	VCEA0A1CW106M	R	10	16V	Electrolytic	AB
C213	VCKYCY1HF223Z	R	0.022	50V	Ceramic	AB
C215	VCEA0A1CW476M	R	47	16V	Electrolytic	AB
C216	VCKYCY1HB821K	R	820p	50V	Ceramic	AA
C217	VCKYCY1HB472K	R	4700p	50V	Ceramic	AA
C302	VCEA0A1HW225M	R	2.2	50V	Electrolytic	AB
C303	VCEA0A1CW106M	R	10	16V	Electrolytic	AB
C304	VCQYTA1HM473J	R	0.047	50V	Mylar	AA
C305	VCQYTA1HM473J	R	0.047	50V	Mylar	AA
C312	VCQYTA1HM123J	R	0.012	50V	Mylar	AA
C314	VCEA0A1EW477M	R	470	25V	Electrolytic	AD
C315	VCKYPA1HF103Z	R	0.01	50V	Ceramic	AA
C317	VCEA0A1HW224M	R	0.22	50V	Electrolytic	AB
C318	VCKYCY1HB102K	R	1000p	50V	Ceramic	AA
C331	VCEA0A1HW105M	R	1	50V	Electrolytic	AB
C332	VCEA0A1EW477M	R	470	25V	Electrolytic	AD
C333	VCKYPA2HB102K	R	1000p	500V	Ceramic	AA
C356	VCKYCY1HB682K	R	6800p	50V	Ceramic	AA
C359	VCEA9M1CW106M	R	10	16V	Electrolytic	AB
C360	VCEA9M1HW225M	R	2.2	50V	Electrolytic	AB
C364	VCEA0A1CW106M	R	10	16V	Electrolytic	AB
C371	VCEA0A1CW476M	R	47	16V	Electrolytic	AB
C373	VCEA0A1CW107M	R	100	16V	Electrolytic	AC
C374	VCEA0A1HW225M	R	2.2	50V	Electrolytic	AB
C375	VCEAEA1HW225M	R	2.2	50V	Electrolytic	AB
C379	VCEA0A1HW335M	R	3.3	50V	Electrolytic	AB
C390	VCEA0A1HW105M	R	1	50V	Electrolytic	AB
C405	VCEA0A1CW107M	R	100	16V	Electrolytic	AC
C406	VCEA0A1CW477M	R	470	16V	Electrolytic	AC
C407	VCEA0A1CW106M	R	10	16V	Electrolytic	AB
C408	VCEA0A1CW106M	R	10	16V	Electrolytic	AB
C409	VCKYCY1EF104Z	R	0.1	25V	Ceramic	AA
C410	VCKYCY1EF104Z	R	0.1	25V	Ceramic	AA
C411	VCKYCY1HB102K	R	1000p	50V	Ceramic	AA
C469	VCEA0A1HW105M	R	1	50V	Electrolytic	AB
C501	VCKYCY1HF103Z	R	0.01	50V	Ceramic	AA
C502	VCKYCY1HF103Z	R	0.01	50V	Ceramic	AA
C503	VCEA0A1EW108M	R	1000	25V	Electrolytic	AD
C504	VCKYCY1HF223Z	R	0.022	50V	Ceramic	AB
C506	VCQYTA1HM104J	R	0.1	50V	Mylar	AA
C507	VCEA0A1JW107M	R	100	63V	Electrolytic	AC
C508	VCQYTA1HM103J	R	0.01	50V	Mylar	AA
C512	VCKYCY1HB102K	R	1000p	50V	Ceramic	AA
C513	VCKYCY1HB102K	R	1000p	50V	Ceramic	AA
C514	VCKYPA1HF103Z	R	0.01	50V	Ceramic	AA
C515	VCKYPA2HB102K	R	1000p	500V	Ceramic	AA
C516	VCEA0A1JW477M	R	470	63V	Electrolytic	AE
C517	VCQYTA1HM104J	R	0.1	50V	Mylar	AA
C601	VCEAGA2EW106M	R	10	250V	Electrolytic	AC
C602	VCQYTA1HM104J	R	0.1	50V	Mylar	AA
C603	VCEA0A1HW105M	R	1	50V	Electrolytic	AB
C604	VCEA0A1HW105M	R	1	50V	Electrolytic	AB
C605	VCKYPA1HF103Z	R	0.01	50V	Ceramic	AA
C606	VCKYCY1HF103Z	R	0.01	50V	Ceramic	AA
C607	VCEA0A1CW477M	R	470	16V	Electrolytic	AC
C608	VCEA0A1EW476M	R	47	25V	Electrolytic	AB
C609	VCEA0A1EW108M	R	1000	25V	Electrolytic	AD
C610	VCFYSB2EB823J	R	0.082	250V	M.Polypro	AD
C611	VCKYPA2HB102K	R	1000p	500V	Ceramic	AA
C612	RC-EZ0724CEZZ	R	100	160V	Electrolytic	AG
C613	VCFPPD2DB684J	R	0.68 (20A1-RU)	200V	M.Polypro	AE
C613	VCFPPD2DB564J	R	0.56 (21A1-RU,21A2-RU)	200V	M.Polypro	AF
C614	RC-KZ0039CEZZ	R	Capacitor (20A1-RU)			AB
C615	VCFPVC2DB224J	R	0.22	200V	M.Polypro	AE
C616	VCFPPD3CA103H	R	0.01 (20A1-RU)	1600V	M.Polypro	AE
C616	VCFPPD3CA912H	R	9100p (21A1-RU,21A2-RU)	1600V	M.Polypro	AE
C617	VCKYPA2HB102K	R	1000p	500V	Ceramic	AA
C620	VCKYCY1EF104Z	R	0.1	25V	Ceramic	AA
C623	VCQYTA1HM222J	R	2200p	50V	Mylar	AA
C624	VCQYTA1HM472J	R	4700p	50V	Mylar	AB
C625	VCEA0A1HW105M	R	1	50V	Electrolytic	AB
C626	VCKYCY1HF223Z	R	0.022	50V	Ceramic	AB
C627	VCEA0A1HW106M	R	10	50V	Electrolytic	AB

Ref. No.	Part No.	★			Description	Code
C628	VCEA0A1HW224M	R	0.22	50V	Electrolytic	AB
C650	VCKYCY1EF104Z	R	0.1	25V	Ceramic	AA
C654	VCEA0A1CW476M	R	47	16V	Electrolytic	AB
C700	VCQYTA1HM103J	R	0.01	50V	Mylar	AA
⚠ C701	RC-FZ033SCEZZ	R	0.047	AC250V	M.Polypro	AF
C702	RC-KZ0160GEZZ	R	0.01	250V	Ceramic	AC
C703	RC-KZ0160GEZZ	R	0.01	250V	Ceramic	AC
C704	VCKYPA2HB102K	R	1000p	500V	Ceramic	AA
C705	VCKYPA2HB102K	R	1000p	500V	Ceramic	AA
C707	RC-EZ0804CEZZ	R	200	400V	Electrolytic	AU
C708	RC-KZ0160GEZZ	R	0.01	250V	Ceramic	AC
C709	RC-QZA471TAYJ	R	470p	50V	Mylar	AB
C711	RC-KZ0339CEZZ	R	680p	2kV	Ceramic	AD
C712	VCQYTA1HM102J	R	1000p	50V	Mylar	AA
C713	RC-KZ007JCEZZ	R	0.01	250V	Ceramic	AC
C714	RC-KZ0338CEZZ	R	560p	2kV	Ceramic	AD
C715	VCKYPA2HB102K	R	1000p	500V	Ceramic	AA
C716	VCEA0A1EW107M	R	100	25V	Electrolytic	AC
C717	VCQYTA1HM182J	R	1800p	50V	Mylar	AA
C718	VCEAGA2AW475M	R	4.7	100V	Electrolytic	AB
⚠ C721	RC-KZ0106GEZZ	R	3300p	2kV	Ceramic	AG
C752	VCEA0A0JW107M	R	100	6.3V	Electrolytic	AB
C753	VCKYPA2HB102K	R	1000p	500V	Ceramic	AA
C754	VCEA0A1CW476M	R	47	16V	Electrolytic	AB
C755	VCEA0A1CW108M	R	1000	16V	Electrolytic	AD
⚠ C759	VCKYPA1HB102K	R	1000p	50V	Ceramic	AA
C760	RC-KZ0339CEZZ	R	680p	2kV	Ceramic	AD
C761	VCEA4W2CN227M	R	220	160V	Electrolytic	AG
C762	VCQYTA1HM473J	R	0.047	50V	Mylar	AA
C801	VCEA0A1HW105M	R	1	50V	Electrolytic	AB
C802	VCEA0A1CW337M	R	330	16V	Electrolytic	AC
C803	VCEA9M1CW107M	R	100	16V	Electrolytic	AB
C804	VCKYCY1HB222K	R	2200p	50V	Ceramic	AA
C805	VCKYCY1HB102K	R	1000p	50V	Ceramic	AA
C806	VCKYCY1HB102K	R	1000p	50V	Ceramic	AA
C807	VCKYCY1HB102K	R	1000p	50V	Ceramic	AA
C808	VCEA0A1CW107M	R	100	16V	Electrolytic	AC
C809	VCKYCY1HF223Z	R	0.022	50V	Ceramic	AB
C810	VCKYCY1EF104Z	R	0.1	25V	Ceramic	AA
C811	VCEA0A1CW107M	R	100	16V	Electrolytic	AC
C812	VCFYFA1HA224J	R	0.22	50V	M.Polypro	AB
C813	VCFYFA1HA224J	R	0.22	50V	M.Polypro	AB
C814	VCKYCY1HB471K	R	470p	50V	Ceramic	AA
C1001	VCEA0A0JW107M	R	100	6.3V	Electrolytic	AB
C1003	VCEA0A1CW106M	R	10	16V	Electrolytic	AB
C1004	VCKYCY1CF474Z	R	0.47	16V	Ceramic	AB
C1005	VCKYCY1HF223Z	R	0.022	50V	Ceramic	AB
C1006	VCEA0A1CW106M	R	10	16V	Electrolytic	AB
C1007	VCEA0A1CW106M	R	10	16V	Electrolytic	AB
C1008	VCCCCY1HH330J	R	33p	50V	Ceramic	AA
C1009	VCCCCY1HH330J	R	33p	50V	Ceramic	AA
C1010	VCEA0A0JW107M	R	100	6.3V	Electrolytic	AB
C1011	VCKYCY1HF223Z	R	0.022	50V	Ceramic	AB
C1012	VCKYCY1HF223Z	R	0.022	50V	Ceramic	AB
C1013	VCEA0A0JW107M	R	100	6.3V	Electrolytic	AB
C1014	VCEA0A1CW106M	R	10	16V	Electrolytic	AB
C1015	VCFYFA1HA474J	R	0.47	50V	M.Polypro	AC
C1016	VCQYTA1HM104J	R	0.1	50V	Mylar	AA
C1018	VCKYCY1HB221K	R	220p	50V	Ceramic	AA
C1019	VCEA9M1HW225M	R	2.2	50V	Electrolytic	AB
	RC-KZ0102GEZZ	R	Capacitor (21A1-RU)			AE

RESISTORS

JA160	VRD-RA2BE101J	R	100	1/8W	Carbon	AB
RJ2	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ5	VRN-MD2AL000J	R	0 (21A1-RU,21A2-RU)	1/10W	Metal Film	AA
RJ9	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ10	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ11	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ12	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ13	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ15	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ16	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ21	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ25	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ26	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ27	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ29	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ30	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ31	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ32	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ33	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ34	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ41	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ43	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ51	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ53	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ61	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ64	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ66	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ68	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ69	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ71	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ74	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ75	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ76	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ78	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ79	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ80	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ84	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ85	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ87	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ88	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ89	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ92	VRN-MD2AL000J	R	0 (21A1-RU,21A2-RU)	1/10W	Metal Film	AA
RJ94	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ96	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ97	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ100	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ103	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ105	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ202	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ204	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ205	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ206	VRS-CY1JF000J	R	0	1/10W	Metal Film	AA
RJ201	VRN-MD2AL000J	R	0 (21A1-RU,21A2-RU)	1/10W	Metal Film	AA
R201	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R202	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R203	VRD-RM2HD102J	R	1k	1/2W	Carbon	AA
R204	VRD-RM2HD102J	R	1k	1/2W	Carbon	AA
R205	VRD-RA2BE680J	R	68	1/8W	Carbon	AA
R206	VRN-MD2AL122J	R	1.2k	1/10W	Metal Film	AA
R207	VRN-MD2AL221J	R	220	1/10W	Metal Film	AA
R208	VRN-MD2AL122J	R	1.2k	1/10W	Metal Film	AA
R209	VRN-MD2AL392J	R	3.9k	1/10W	Metal Film	AA
R217	VRD-RA2BE392J	R	3.9k	1/8W	Carbon	AA
R218	VRN-MD2AL102J	R	1k	1/10W	Metal Film	AA
R219	VRN-MD2AL391J	R	390	1/10W	Metal Film	AA
R220	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R221	VRN-MD2AL102J	R	1k	1/10W	Metal Film	AA
R222	VRN-MD2AL681J	R	680	1/10W	Metal Film	AA
R226	VRN-MD2AL750J	R	75	1/10W	Metal Film	AA
R227	VRD-RM2HD330J	R	33	1/2W	Carbon	AA
R228	VRD-RM2HD330J	R	33	1/2W	Carbon	AA
R230	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R231	VRN-MD2AL153J	R	15k	1/10W	Metal Film	AA
R232	VRD-RA2BE680J	R	68	1/8W	Carbon	AA
R233	VRN-MD2AL181J	R	180	1/10W	Metal Film	AA
R237	VRN-MD2AL272J	R	2.7k	1/10W	Metal Film	AA
R238	VRN-MD2AL821J	R	820	1/10W	Metal Film	AA
R239	VRN-MD2AL221J	R	220	1/10W	Metal Film	AA
R302	VRN-MD2AL473J	R	47k	1/10W	Metal Film	AA
R303	VRN-MD2AL473J	R	47k	1/10W	Metal Film	AA
R304	VRN-MD2AL392J	R	3.9k	1/10W	Metal Film	AA
R305	VRN-MD2AL100J	R	10	1/10W	Metal Film	AA
R307	VRD-RA2BE182J	R	1.8k	1/8W	Carbon	AA
R308	VRD-RA2BE472J	R	4.7k	1/8W	Carbon	AA
R320	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA

Ref. No.	Part No.	★			Description	Code
R321	VRN-MD2AL561J	R	560	1/10W	Metal Film	AA
R328	VRN-MD2AL564J	R	560k	1/10W	Metal Film	AA
R329	VRN-MD2AL332J	R	3.3k	1/10W	Metal Film	AA
R330	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R331	VRN-MD2AL102J	R	1k	1/10W	Metal Film	AA
R332	VRN-MD2AL561J	R	560	1/10W	Metal Film	AA
R333	VRN-MD2AL103J	R	10k	1/10W	Metal Film	AA
R334	VRN-MD2AL102J	R	1k	1/10W	Metal Film	AA
R341	VRN-MD2AL332J	R	3.3k	1/10W	Metal Film	AA
R342	VRN-MD2AL564J	R	560k	1/10W	Metal Film	AA
R343	VRN-MD2AL104J	R	100k	1/10W	Metal Film	AA
R344	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R357	VRN-MD2AL100J	R	10	1/10W	Metal Film	AA
R378	VRN-VV3DBR68J	R	0.68	2W	Metal Film	AA
R403	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R404	VRD-RA2BE820J	R	82	1/8W	Carbon	AA
R406	VRN-MD2AL103J	R	10k	1/10W	Metal Film	AA
R407	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R411	VRD-RA2BE820J	R	82	1/8W	Carbon	AA
R412	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R501	VRN-MD2AL182J	R	1.8k	1/10W	Metal Film	AA
R502	VRN-MD2AL182J	R	1.8k	1/10W	Metal Film	AA
R503	VRD-RM2HD1R5J	R	1.5	1/2W	Carbon	AA
R505	VRG-PD2HD330J	R	33	1/2W	Fuse Resistor	AC
R506	VRD-RA2BE224J	R	220k	1/8W	Carbon	AA
R508	VRD-RM2HD221J	R	220	1/2W	Carbon	AA
R509	VRD-RM2HD1R0J	R	1	1/2W	Carbon	AA
R510	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R511	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R513	VRD-RA2BE393J	R	39k	1/8W	Carbon	AA
R514	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R515	VRN-MD2AL272J	R	2.7k	1/10W	Metal Film	AA
R516	VRD-RM2HD223J	R	22k	1/2W	Carbon	AA
R602	VRN-VV3DBR68J	R	0.68	2W	Metal Film	AA
			(20A1-RU)			
R602	VRN-VV3DBR82J	R	0.82	2W	Metal Film	AB
			(21A1-RU,21A2-RU)			
R603	VRD-RM2HD102J	R	1k	1/2W	Carbon	AA
R604	VRD-RA2BE393J	R	39k	1/8W	Carbon	AA
R605	VRD-RM2HD101J	R	100	1/2W	Carbon	AA
R606	VRD-RA2BE333J	R	33k	1/8W	Carbon	AA
R607	VRN-MD2AL102J	R	1k	1/10W	Metal Film	AA
R608	VRN-MD2AL123J	R	12k	1/10W	Metal Film	AA
R609	VRD-RA2BE223G	R	22k	1/8W	Carbon	AA
			(20A1-RU)			
R609	VRD-RA2BE153G	R	15k	1/8W	Carbon	AA
			(21A1-RU,21A2-RU)			
R610	VRD-RA2BE822J	R	8.2k	1/8W	Carbon	AA
R611	VRD-RA2EE563G	R	56k	1/4W	Carbon	AA
R612	VRD-RA2BE103J	R	10k	1/8W	Carbon	AA
R613	VRD-RA2BE103J	R	10k	1/8W	Carbon	AA
R614	VRN-MD2AL103J	R	10k	1/10W	Metal Film	AA
R615	VRS-KT3LB332J	R	3.3k	3W	Metal Oxide	AC
R616	VRN-MD2AL102J	R	1k	1/10W	Metal Film	AA
R617	VRD-RM2HD472J	R	4.7k	1/2W	Carbon	AA
R618	VRS-KA3HG3R3K	R	3.3	5W	Metal Oxide	AD
R619	VRD-RM2HD682J	R	6.8k	1/2W	Carbon	AA
R622	VRS-VV3DB331J	R	330	2W	Metal Oxide	AA
R623	VRS-VV3DB150J	R	15	2W	Metal Oxide	AA
R624	VRD-RA2BE101J	R	100	1/8W	Carbon	AB
R625	VRN-MD2AL184J	R	180k	1/10W	Metal Film	AA
R626	VRN-MD2AL472J	R	4.7k	1/10W	Metal Film	AA
R628	VRD-RM2HD470J	R	47	1/2W	Carbon	AA
R630	VRN-MD2AL100J	R	10	1/10W	Metal Film	AA
R631	VRN-MD2AL391J	R	390	1/10W	Metal Film	AA
R632	VRN-MD2AL273J	R	27k	1/10W	Metal Film	AA
R633	VRN-MD2AL102J	R	1k	1/10W	Metal Film	AA
R635	VRN-MD2AL822J	R	8.2k	1/10W	Metal Film	AA
R636	VRN-MD2AL223J	R	22k	1/10W	Metal Film	AA
R638	VRN-MD2AL103J	R	10k	1/10W	Metal Film	AA
R701	VRW-KQ4AC3R3K	R	3.3	10W	Cement	AE
R703	VRS-KT3LB473J	R	47k	3W	Metal Oxide	AE
R705	VRD-RA2BE122J	R	1.2k	1/8W	Carbon	AA
R706	VRD-RM2HD152J	R	1.5k	1/2W	Carbon	AA
R707	VRS-KT3LB473J	R	47k	3W	Metal Oxide	AE
R708	VRD-RM2HD272J	R	2.7k	1/2W	Carbon	AA
R709	VRD-RA2BE681J	R	680	1/8W	Carbon	AA
R710	VRN-VV3ABR39J	R	0.39	1W	Metal Film	AA
R711	VRN-VV3ABR33J	R	0.33	1W	Metal Film	AA
⚠ R712	VRG-PD2HD150J	R	15	1/2W	Fuse Resistor	AC
R717	VRD-RM2HD124J	R	120k	1/2W	Carbon	AA
R718	VRD-RM2HD124J	R	120k	1/2W	Carbon	AA
⚠ R719	VRC-UA2HG825K	R	8.2M	1/2W	Solid	AA
R721	VRD-RA2BE393J	R	39k	1/8W	Carbon	AA
R722	VRD-RM2HD124J	R	120k	1/2W	Carbon	AA
R723	VRD-RA2BE684J	R	680k	1/8W	Carbon	AA
⚠ R726	VRC-UA2HG825K	R	8.2M	1/2W	Solid	AA
R728	VRN-MD2AL272J	R	2.7k	1/10W	Metal Film	AA
R750	VRD-RM2HD4R7J	R	4.7	1/2W	Carbon	AA
R755	VRD-RA2BE222J	R	2.2k	1/8W	Carbon	AA
R756	VRN-MD2AL152J	R	1.5k	1/10W	Metal Film	AA
R758	VRD-RA2BE102J	R	1k	1/8W	Carbon	AA
R759	VRN-MD2AL102J	R	1k	1/10W	Metal Film	AA
R760	VRD-RA2BE471J	R	470	1/8W	Carbon	AA
R761	VRD-RA2BE221J	R	220	1/8W	Carbon	AA
R764	VRN-MD2AL272J	R	2.7k	1/10W	Metal Film	AA
R766	VRD-RM2HD680J	R	68	1/2W	Carbon	AA
R801	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R802	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R803	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R804	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R805	VRN-MD2AL822J	R	8.2k	1/10W	Metal Film	AA
R806	VRD-RA2BE123J	R	12k	1/8W	Carbon	AA
R807	VRN-MD2AL103J	R	10k	1/10W	Metal Film	AA
R808	VRN-MD2AL221J	R	220	1/10W	Metal Film	AA
R809	VRD-RA2BE224J	R	220k	1/8W	Carbon	AA
R811	VRN-MD2AL563J	R	56k	1/10W	Metal Film	AA
R812	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R813	VRN-MD2AL221J	R	220	1/10W	Metal Film	AA
R1001	VRD-RA2BE221J	R	220	1/8W	Carbon	AA
R1002	VRN-MD2AL331J	R	330	1/10W	Metal Film	AA
R1003	VRN-MD2AL471J	R	470	1/10W	Metal Film	AA
R1004	VRN-MD2AL821J	R	820	1/10W	Metal Film	AA
R1005	VRD-RA2BE181J	R	180	1/8W	Carbon	AA
R1011	VRN-MD2AL820J	R	82	1/10W	Metal Film	AA
R1012	VRN-MD2AL391J	R	390	1/10W	Metal Film	AA
R1013	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R1014	VRD-RA2BE101J	R	100	1/8W	Carbon	AB
R1015	VRN-MD2AL332J	R	3.3k	1/10W	Metal Film	AA
R1016	VRD-RA2BE101J	R	100	1/8W	Carbon	AB
R1017	VRN-MD2AL332J	R	3.3k	1/10W	Metal Film	AA
R1019	VRN-MD2AL472J	R	4.7k	1/10W	Metal Film	AA
R1020	VRD-RA2BE101J	R	100	1/8W	Carbon	AB
R1021	VRN-MD2AL153J	R	15k	1/10W	Metal Film	AA
R1022	VRD-RA2BE101J	R	100	1/8W	Carbon	AB
R1023	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R1024	VRN-MD2AL122J	R	1.2k	1/10W	Metal Film	AA
R1025	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R1026	VRN-MD2AL224J	R	220k	1/10W	Metal Film	AA
R1027	VRD-RA2BE101J	R	100	1/8W	Carbon	AB
R1028	VRD-RA2BE101J	R	100	1/8W	Carbon	AB
R1030	VRN-MD2AL102J	R	1k	1/10W	Metal Film	AA
R1031	VRD-RA2BE562J	R	5.6k	1/8W	Carbon	AA
R1032	VRN-MD2AL332J	R	3.3k	1/10W	Metal Film	AA
R1033	VRD-RA2BE102J	R	1k	1/8W	Carbon	AA
R1034	VRD-RA2BE101J	R	100	1/8W	Carbon	AB
R1035	VRN-MD2AL332J	R	3.3k	1/10W	Metal Film	AA
R1036	VRN-MD2AL332J	R	3.3k	1/10W	Metal Film	AA
R1037	VRD-RA2BE101J	R	100	1/8W	Carbon	AB
R1038	VRD-RA2BE101J	R	100	1/8W	Carbon	AB
R1039	VRN-MD2AL223J	R	22k	1/10W	Metal Film	AA
R1040	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R1041	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R1043	VRN-MD2AL153J	R	15k	1/10W	Metal Film	AA
R1044	VRN-MD2AL153J	R	15k	1/10W	Metal Film	AA
R1045	VRD-RA2BE271J	R	270	1/8W	Carbon	AA
R1046	VRD-RA2BE101J	R	100	1/8W	Carbon	AB
R1065	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R1067	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
	VRD-RA2BE393J	R	39k	1/8W	Carbon	AA
			(20A1-RU)			

Ref. No.	Part No.	★	Description	Code
			SWITCH	
⚠ S701	QSW-P0591CEZZ	R	Switch	AQ
S1001	QSW-K0077GEZZ	R	Switch, CH UP	AB
S1002	QSW-K0077GEZZ	R	Switch, CH DOWN	AB
S1003	QSW-K0077GEZZ	R	Switch, VOL. UP	AB
S1004	QSW-K0077GEZZ	R	Switch, VOL. DOWN	AB
S1005	QSW-K0077GEZZ	R	Switch, PICTURE/PRESET	AB
			MISCELLANEOUS PARTS	
⚠ F701	QFS-C3229CEZZ	R	Fuse, T3.5A/250V	AD
FB306	RBLN-0037CEZZ	R	Ferrite Bead	AB
FB501	RBLN-0037CEZZ	R	Ferrite Bead	AB
FB502	RBLN-0037CEZZ	R	Ferrite Bead	AB
FB602	RBLN-0037CEZZ	R	Ferrite Bead	AB
FB701	RBLN-0037CEZZ	R	Ferrite Bead	AB
FB702	RBLN-0037CEZZ	R	Ferrite Bead	AB
FB751	RBLN-0037CEZZ	R	Ferrite Bead	AB
FB752	RBLN-0037CEZZ	R	Ferrite Bead	AB
⚠ FH701	QFSHD1014CEZZ	R	Fuse Holder	AC
⚠ FH702	QFSHD1013CEZZ	R	Fuse Holder	AC
J402	QJAKE0205CE04	R	Jack, AV-2 IN	AD
J403	QJAKE0205CE09	R	Jack, AV-2 IN	AD
J405	QJAKH0102PEZZ	R	Jack	AE
P301	QPLGN0441CEZZ	R	Plug, 4pin (21A2-RU)	AB
P302	QPLGN0241CEZZ	R	Plug,2pin (20A1-RU,21A1-RU)	AA
P502	QPLGN0660CEZZ	R	Plug, 6pin(F)	AC
P602	QPLGN0641CEZZ	R	Plug, 6pin(H)	AB
P701	QPLGN0260CEZZ	R	Plug, 2pin	AC
P712	QPLGN0269GEZZ	R	Plug, 2pin	AB
P1001	QPLGN0541CEZZ	R	Plug, 5pin(K)	AB
P1002	QPLGN0541CEZZ	R	Plug, 5pin(BC)	AB
RMC1001	RRMCU0235CEZZ	R	Remote Receiver	AK
TP201	QLUGP0102PEZZ	R	Lug	AA
RDA300	PRDAR0142PEFW	R	Heat Sink for IC301 (20A1-RU, 21A1-RU)	AD
RDA501	PRDAR0298PEFW	R	Heat Sink for IC501	AF
RDA701	PRDAR0260PEFW	R	Heat Sink for IC701	AH
RDA754	PRDAR0224PEFW	R	Heat Sink for Q602	AF
RDA756	PRDAR0142PEFW	R	Heat Sink for IC301(21A2-RU)	AD

PWB-B DUNTK9990WEW7/W2
CRT UNIT

			TRANSISTORS			
Q870	VSBF422////-1	R	BF422			AC
Q871	VSBF422////-1	R	BF422			AC
Q872	VSBF422////-1	R	BF422			AC
Q883	VSBF421////-1	R	BF422			AC
Q885	VSBF421////-1	R	BF422			AC
Q887	VSBF421////-1	R	BF422			AC
			DIODES			
D811	RH-DX0475CEZZ	R	Diode			AB
D812	RH-DX0475CEZZ	R	Diode			AB
D880	RH-DX0475CEZZ	R	Diode			AB
D881	RH-DX0475CEZZ	R	Diode			AB
D882	RH-DX0475CEZZ	R	Diode			AB
D883	VHD1SS82///1A	R	1SS82			AC
D884	VHD1SS82///1A	R	1SS82			AC
D885	VHD1SS82///1A	R	1SS82			AC
D886	VHD1SS82///1A	R	1SS82			AC
D887	VHD1SS82///1A	R	1SS82			AC
D888	VHD1SS82///1A	R	1SS82			AC
D890	RH-EX0627GEZZ	R	Zener Diode			AA
			CAPACITORS			
C871	VCKYPA1HB471K	R	470p	50V	Ceramic	AA
C872	VCKYPA1HB471K	R	470p	50V	Ceramic	AA
C873	VCKYPA1HB471K	R	470p	50V	Ceramic	AA
C875	VCKYPA2HB102K	R	1000p	500V	Ceramic	AA
C876	RC-KZ0150CEZZ	R	1000p	3kV	Ceramic	AB
C878	VCEAGA2EW336M	R	33	250V	Electrolytic	AD
C880	VCKYPA1HB471K	R	470p	50V	Ceramic	AA
C881	VCKYPA1HB471K	R	470p	50V	Ceramic	AA
C882	VCKYPA1HB471K	R	470p	50V	Ceramic	AA
			RESISTORS			
R879	VRD-RA2BE471J	R	470	1/8W	Carbon	AA
R880	VRD-RA2BE471J	R	470	1/8W	Carbon	AA
R881	VRD-RA2BE471J	R	470	1/8W	Carbon	AA
R882	VRS-VU3DE153J	R	15k	2W	Metal Oxide	AB
R883	VRD-RM2HD272J	R	2.7k	1/2W	Carbon	AA
R884	VRS-VU3DE153J	R	15k	2W	Metal Oxide	AB
R885	VRD-RM2HD272J	R	2.7k	1/2W	Carbon	AA
R886	VRS-VU3DE153J	R	15k	2W	Metal Oxide	AB
R887	VRD-RM2HD272J	R	2.7k	1/2W	Carbon	AA
R892	VRD-RA2BE102J	R	1k	1/8W	Carbon	AA
R893	VRD-RA2BE102J	R	1k	1/8W	Carbon	AA
R894	VRD-RA2BE102J	R	1k	1/8W	Carbon	AA
R895	VRD-RA2BE471J	R	470	1/8W	Carbon	AA
R896	VRD-RA2BE471J	R	470	1/8W	Carbon	AA
R899	VRD-RA2BE471J	R	470	1/8W	Carbon	AA
			MISCELLANEOUS PARTS			
P851	QPLGN0641CEZZ	R	Plug, 6pin(H)			AB
P882	QPLGN0541CEZZ	R	Plug, 5pin(K)			AB
⚠ SC882	QSOCV0931CEZZ	R	CRT Socket			AK

MISCELLANEOUS PARTS

⚠	QACCZ2008PEZZ	R	AC Cord	AM
	QCNW-2378PEZZ	R	Connecting Cord (20A1-RU, 21A1-RU)	AE
	QCNW-2381PEZZ	R	Connecting Cord (21A2-RU)	AG
	QCNW-2405PEZZ	R	Connecting Cord	AE
	QCNW-2433PEN1	R	Connecting Cord	AF
SP301	VSP0080PBP6WA	R	Speaker (20A1-RU, 21A1-RU)	AN
SP301	VSP9050PB25WA	R	Speaker (21A2-RU)	AM
SP302	VSP9050PB25WA	R	Speaker (21A2-RU)	AM

SUPPLIED ACCESSORIES

			ACCESSORIES	
	RRMCG1342PESA	R	Infrared Remote Control Unit	AU
	TCAUA0002PEZZ	R	Caution Card	AB
	TINS-6822PEZZ	R	Operation Manual (20A1-RU, 21A1-RU)	AF
	TINS-6827PEZZ	R	Operation Manual (21A2-RU)	AF

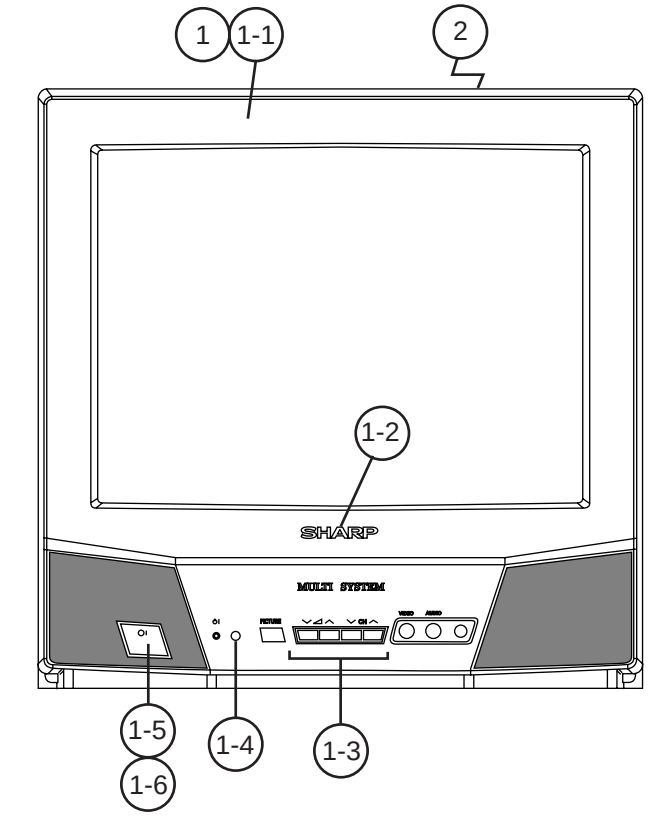
PACKING PARTS

< NOT REPLACEMENT ITEM >

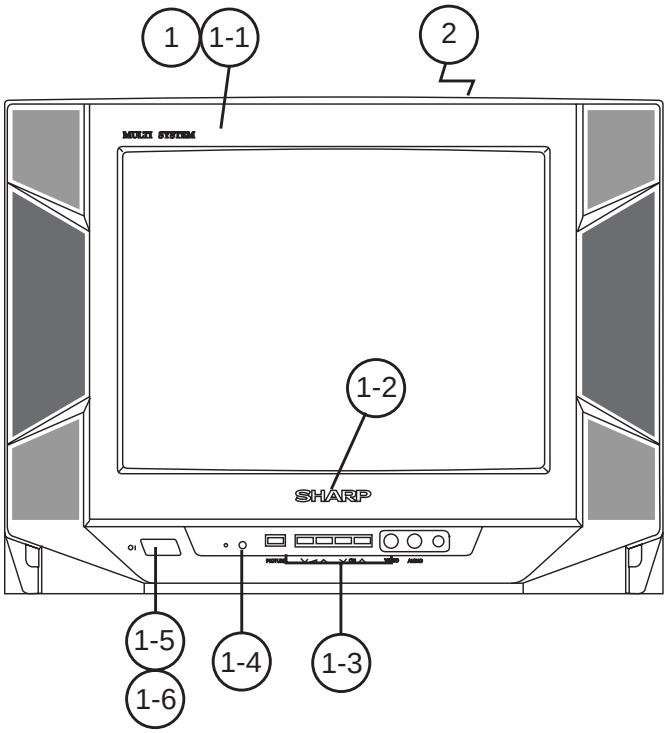
SPAKC6605PEZZ	-	packing case (20A1-RU)	—
SPAKC6598PEZZ	-	packing case (21A1-RU)	—
SPAKC6601PEZZ	-	packing case (21A2-RU)	—
SPAKX2721PEZZ	-	Buffer Material (20A1-RU, 21A1-RU)	—
SPAKX2719PEZZ	-	Buffer Material (21A2-RU)	—
SPAKP0099PEZZ	-	Wrapping Paper (20A1-RU)	—
SPAKP0119PEZZ	-	Wrapping Paper (21A2-RU)	—
SSAKH0016PEZZ	-	Polyethylene Bag (21A1-RU)	—
SSAKA0031PEZZ	-	Polyethylene Bag	—

CABINET PARTS

Ref. No.	Part No.	★	Description	Code
1	CCABA2549WEV0	R	Front Cabinet Ass'y (20A1-RU)	BF
1	CCABA2526WEV0	R	Front Cabinet Ass'y (21A1-RU)	BF
1	CCABA2530WEV0	R	Front Cabinet Ass'y (21A2-RU)	BF
1-1	Not Available	-	Front Cabinet (20A1-RU)	—
1-1	Not Available	-	Front Cabinet (21A1-RU)	—
1-1	Not Available	-	Front Cabinet (21A2-RU)	—
1-2	HBDGB0019PESB	R	SHARP Badge (20A1-RU, 21A1-RU)	AD
1-2	HBDGB0015PESB	R	SHARP Badge (21A2-RU)	AE
1-3	JBTN-0314PESA	R	Button, Control (20A1-RU, 21A1-RU)	AD
1-3	JBTN-0319PESA	R	Button, Control (21A2-RU)	AE
1-4	GCOVA0116PESA	R	R/C LED Cover (20A1-RU, 21A1-RU)	AC
1-4	GCOVA0115PESA	R	R/C LED Cover (21A2-RU)	AB
1-5	JBTN-0323PESA	R	Button, Power (20A1-RU)	AC
1-5	JBTN-0322PESA	R	Button, Power (21A1-RU)	AC
1-5	JBTN-0318PESA	R	Button, Power (21A2-RU)	AD
1-6	MSPRC0005PEFW	R	Power Button Spring (20A1-RU)	AB
1-6	MSPRC0008PEFW	R	Power Button Spring (21A1-RU, 21A2-RU)	AB
2	CCABB2403WEV3	R	Rear Cabinet (20A1-RU, 21A1-RU)	AZ
2	CCABB2394WEV2	R	Rear Cabinet (21A2-RU)	BA



(20A1-RU,21A1-RU)



(20A2-RU)

SHARP

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SHARP CORPORATION
AV Systems Group
Quality & Reliability Control Center
Yaita, Tochigi 329-2193, Japan