

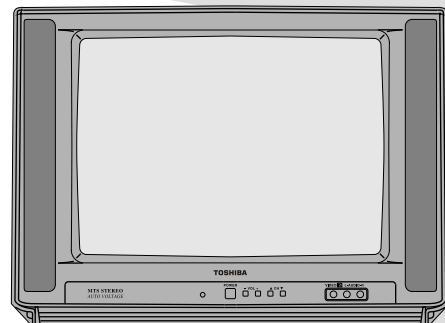
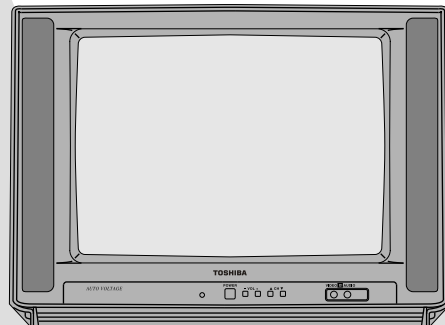
TOSHIBA

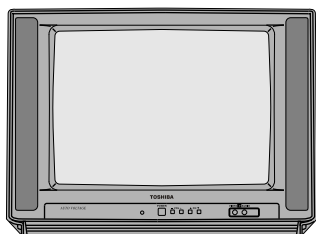
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SERVICE MANUAL

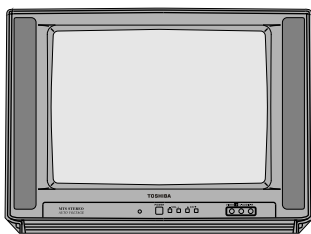
COLOR TELEVISION

20AR20
20AR30





20AR20



20AR30

COLOR TELEVISION

Chassis No. SN-70A

MODELS

20AR20/30

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.

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ELECTRICAL SPECIFICATIONS

POWER INPUT	110-220 V AC 50/60 Hz
POWER RATING	
20AR20.....	88 W
20AR30.....	98 W
PICTURE SIZE	1,194cm ² (185sq inch)
CONVERGENCE	Magnetic
SWEEP DEFLECTION	Magnetic
FOCUS	QPF Electrostatic
INTERMEDIATE FREQUENCIES	
Picture IF Carrier Frequency	45.75 MHz
Sound IF Carrier Frequency	41.25 MHz
Color Sub-Carrier Frequency	42.17 MHz
	(Nominal)
AUDIO POWER	
OUTPUT RATING	
20AR20.....	1.3W (at 10% distortion)
20AR30.....	2.5W (at 10% distortion)

SPEAKER	
SIZE	9 cm x 5 cm
VOICE COIL IMPEDANCE	
20AR20.....	8 ohm at 400 Hz
20AR30.....	16 ohm at 400 Hz
ANTENNA INPUT IMPEDANCE	
VHF/UHF	75 ohm Unbalanced
TUNING RANGES	
VHF-Channels	2 thru 13
UHF-Channels	14 thru 69
CATV Channels	1 thru 125

Specifications are subject to change without prior notice.

IMPORTANT SERVICE SAFETY PRECAUTION

- **Service work should be performed only by qualified service technicians who are thoroughly familiar with all safety checks and the servicing guidelines which follow:**

WARNING

1. For continued safety, no modification of any circuit should be attempted.
2. Disconnect AC power before servicing.
3. Semiconductor heat sinks are potential shock hazards when the chassis is operating.
4. The chassis in this receiver has two ground systems which are separated by insulating material. The non-isolated (hot) ground system is for the B+ voltage regulator circuit and the horizontal output circuit. The isolated ground system is for the low B+ DC voltages and the secondary circuit of the high voltage transformer.
To prevent electrical shock use an isolation transformer between the line cord and power receptacle, when servicing this chassis.

SERVICING OF HIGH VOLTAGE SYSTEM AND PICTURE TUBE

When servicing the high voltage system, remove the static charge by connecting a 10k ohm resistor in series with an insulated wire (such as a test probe) between the picture tube ground and the 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 anode completely.

X-RADIATION AND HIGH VOLTAGE LIMITS

1. Be sure all service personnel are aware of the procedures and instructions covering X-radiation. The only potential source of X-ray in current solid state TV receivers is the picture tube. However, the picture tube does not emit measurable X-Ray radiation, if the high voltage is as specified in the "High Voltage Check" instructions.
It is only when high voltage is excessive that X-radiation is capable of penetrating the shell of the picture tube including the lead in the glass material. The important precaution is to keep the high voltage below the maximum level specified.
2. It is essential that servicemen have available at all times an accurate high voltage meter.
The calibration of this meter should be checked periodically.
3. High voltage should always be kept at the rated value –no higher. Operation at higher voltages may cause a failure of the picture tube or high voltage circuitry and;also, under certain conditions, may produce radiation in exceeding of desirable levels.
4. When the high voltage regulator is operating properly there is no possibility of an X-radiation problem. Every time a color chassis is serviced, the brightness should be tested while monitoring the high voltage with a meter to be certain that the high voltage does not exceed the specified value and that it is regulating correctly.
5. Do not use a picture tube other than that specified or make unrecommended circuit modifications to the high voltage circuitry.
6. When trouble shooting and taking test measurements on a receiver with excessive high voltage, avoid being unnecessarily close to the receiver.
Do not operate the receiver longer than is necessary to locate the cause of excessive voltage.

IMPORTANT SERVICE SAFETY PRECAUTION

(Continued)

BEFORE RETURNING THE RECEIVER

(Fire & Shock Hazard)

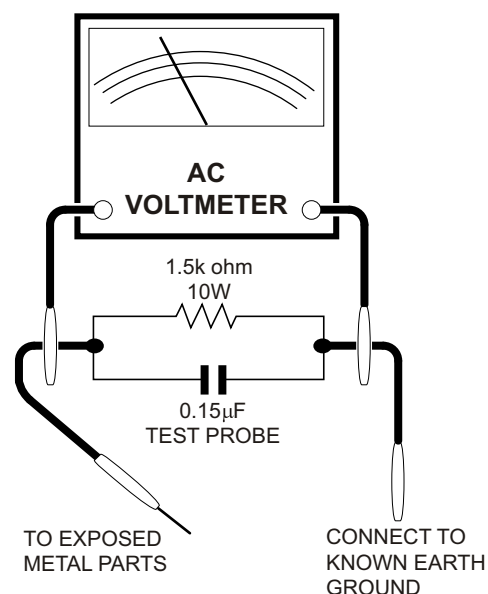
Before returning the receiver to the user, perform the following safety checks.

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 materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacity networks, mechanical insulators, etc.
3. To be sure that no shock hazard exists, check for leakage current in the following manner.
 - Plug the AC cord directly into a 110~220 volt AC outlet, (Do not use an isolation transformer for this test).
 - Using two clip leads, connect a 1.5k ohm, 10 watt resistor paralleled by a 0.15 μ F capacitor in series with all exposed metal cabinet parts and a known earth ground, such as electrical conduit or electrical ground connected to earth ground.
 - Use an AC voltmeter having with 5000 ohm per volt, or higher, sensitivity to measure the AC voltage drop across the resistor.

- Connect the resistor connection to all exposed metal parts having a return to the chassis (antenna, metal cabinet, screw heads, knobs and control shafts, escutcheon and etc.) and measure the AC voltage drop across the resistor.

All checks must be repeated with the AC Line cord plug connection reversed. (If necessary, a non-polarized adapter plug must be used only for the purpose of completing these check.)

Any current measured must not exceed 0.5 milliamp. Any measurements not within the limits outlined above indicate of a potential shock hazard and corrective action must be taken before returning the instrument to the customer.



SAFETY NOTICE

Many electrical and mechanical parts in television receivers have special safety-related characteristics. These characteristics are often not evident from visual inspection, nor can protection afforded by them be necessarily increased by using replacement components rated for higher voltage, wattage, etc.

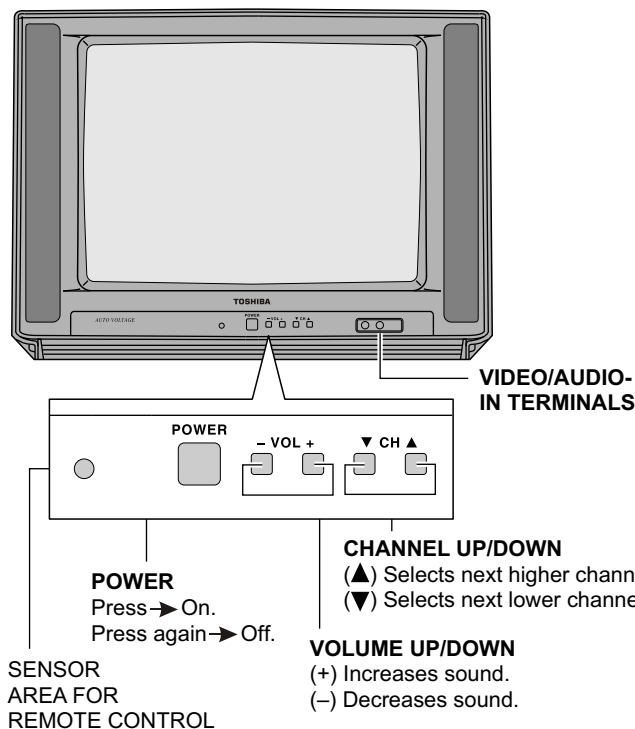
Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by " Δ " and shaded areas in the Replacement Parts Lists and Schematic Diagrams.

For continued protection, replacement parts must be identical to those used in the original circuit. The use of substitute replacement parts which do not have the same safety characteristics as the factory recommended replacement parts shown in this service manual, may create shock, fire, X-radiation or other hazards.

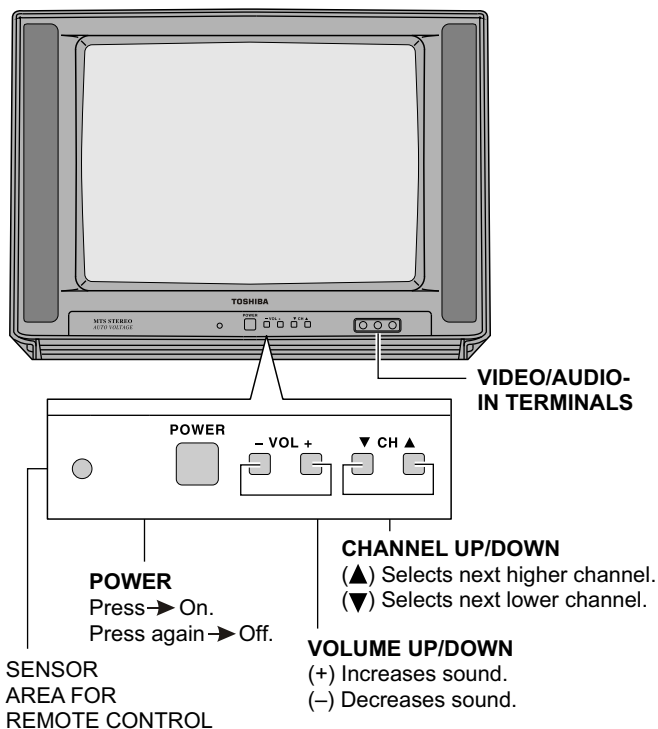
Location of Controls

Front Panel

20AR20



20AR30



Basic Remote Control Functions

POWER
Press → On.
Press again → Off.

REMOTE KEYPAD
Accesses any channel from keypad.

RETURN
Returns to previous channel.

VOLUME UP/DOWN
(+) Increases sound.
(-) Decreases sound.
• In menu mode, changes or selects the TV adjustments.

MUTE
Press → Mutes sound.
Press again → Restores sound.
• CLOSED CAPTION appears when sound is muted.

Infrared Transmitter Window

INPUT
Press → Switch to external video input mode.
Press again → Switch to TV mode.
See page [E 17](#).

CHANNEL UP/DOWN
(▲) Selects next higher channel.
(▼) Selects next lower channel.
• See pages [E 15](#), [E 16](#) for channel presetting.
• Moves the “◆” mark of the MENU screen.

MENU
Press → Accesses MAIN MENU.
Press again → Exits MAIN MENU.

DISPLAY
Press → Displays receiving channel for 4 seconds.
Press again → Removes display.
• Temporarily displays receiving channel when in Closed Caption mode.

TOSHIBA
CT-818

INSTALLATION AND SERVICE INSTRUCTIONS

Note: (1) When performing any adjustments to resistor controls and transformers use non-metallic screwdrivers or TV alignment tools.
(2) Before performing adjustments, the TV set must be on at least 15 minutes.

CIRCUIT PROTECTION

The receiver is protected by a 3.15A fuse (F701), mounted on PWB-A, wired into one side of the AC line input.

X-RADIATION PROTECTOR CIRCUIT TEST

After service has been performed on the horizontal deflection system, high voltage system, B+ system, test the X-Radiation protection circuit to ascertain proper operation as follows:

1. Apply 220V AC using a variac transformer for accurate input voltage.
2. Allow for warm up and adjust all customer controls for normal picture and sound.
3. Receive a good local channel.
4. Connect a digital voltmeter to TP653 and make sure that the voltmeter reads $20.6 \pm 1.5V$.
5. Apply external 26.8V DC at TP653 by using an external DC supply, TV must be shut off.
6. To reset the protector, unplug the AC cord and make a short circuit between TP651 and TP652. Now make sure that normal picture appears on the screen.
7. If the operation of the horizontal oscillator does not stop in step 5, the circuit must be repaired before the set is returned to the customer.

HIGH VOLTAGE CHECK

High voltage is not adjustable but must be checked to verify that the receiver is operating within safe and efficient design limitations as specified checks should be as follows:

1. Connect an accurate high voltage meter between ground and anode of picture tube.
2. Operate receiver for at least 15 minutes at 110~220V AC line voltage, with a strong air signal or a properly tuned in test signal.
3. Enter the service mode and select the service adjustment "S19" and Bus data "01" (Y-mute on).
4. The voltage should be approximately, 26.5kV (at zero beam).

If a correct reading cannot be obtained, check circuitry for malfunctioning components. After the voltage test, make Y-mute off to the normal mode.

For adjustments of this model, the bus data is converted to various analog signals by the D/A converter circuit.

Note: There are still a few analog adjustments in this series such as focus and master screen voltage. Follow the steps below whenever the service adjustment is required. See "Table-B" to determine, if service adjustments are Required.

1. Service mode

Before putting unit into the service mode, check that customer adjustments are in the normal mode. Use the reset function in the video adjustment menu to ensure customer controls are in their proper (reset) position.

To enter and exit service mode.

While pressing the Vol-up and Ch-up buttons at the same time, plug the AC cord into a wall socket. The TV is now switched on and enters service mode. To exit the service mode, turn the television off by pressing the power button.

2. Service number selection

Once in the service mode, press the Ch-up or Ch-down button on the remote controller or at the set. The service adjustment number will vary in increments of one, from "S01" to "M05". Select the item you wish to adjust.

3. Data number selection

Press the Vol-up or down button to adjust the data number.

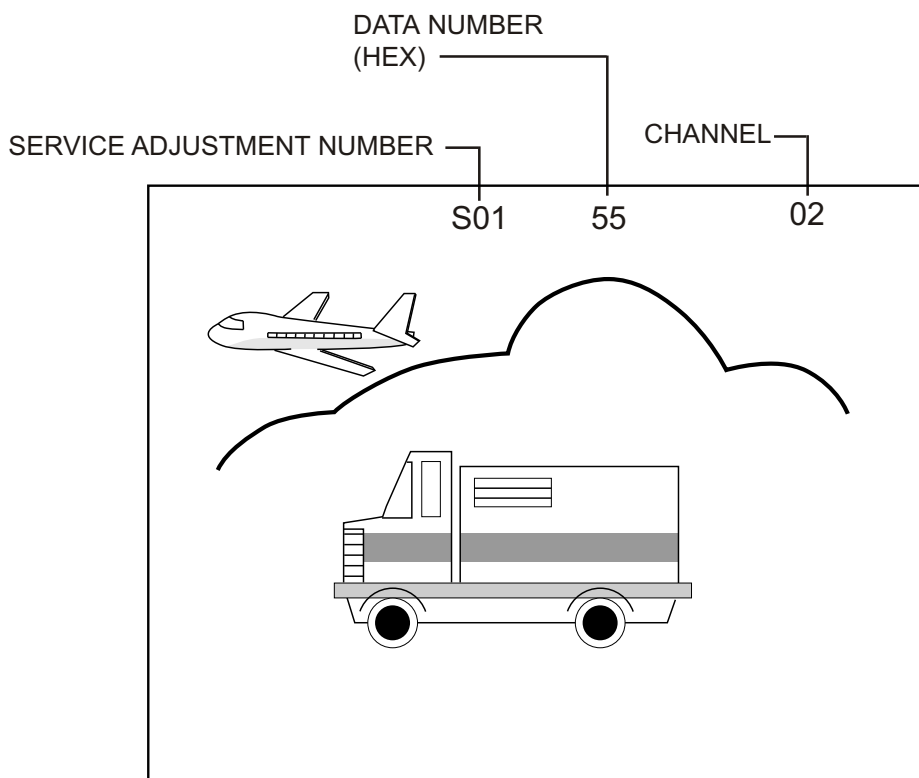


Figure A.

SERVICE NUMBER	ADJUSTMENT ITEM	DATA		ADJUSTMENT CONTENTS
		INITIAL VALUE	RANGE	
S01	PICTURE	55	00-7F	Must be set to "24" Must be set between "0" to "03"
S02	TINT	46	00-7F	
S03	COLOR	32	00-7F	
S04	BRIGHTNESS	40	00-7F	
S05	SHARPNESS	28	00-3F	
S06	VERTICAL PHASE	00	00-07	
S07	HORIZONTAL PHASE	12	00-1F	
S08	RF-AGC	2A	00-3F	
S09	VERTICAL AMP	20	00-3F	
S10	VCO	2C	00-7F	
S11	R CUT-OFF	00	00-FF	Must be set to "00" Must be set to "20"
S12	G CUT -OFF	00	00-FF	
S13	B CUT-OFF	00	00-FF	
S14	G GAIN	7F	00-FF	
S15	B GAIN	7F	00-FF	
S16	TRAP(3.58MHz)	00	00 or 01	
S17	BALANCE	20	00-3F	
S18	C.C.POSITION	18	00-7F	
S19	Y-MUTE / V-MUTE	00	00,01,03	
OP.	OPTION (Set to each model)	80	00-FF	
M01	MTS LEVEL	0A	00-0F	"00"=Normal, "01"=No-Y, "03"=No Vertical Must be set to "08"=20AR20, "09"=20AR30
M02	STEREO-VCO	20	00-3F	
M03	FILTER	1C	00-3F	
M04	LOW SEPARATION	20	00-3F	
M05	HIGH SEPARATION	1B	00-3F	

Table - A

Holding down both the CH-up/down buttons on the TV set at service mode for more than 2 seconds will automatically write the above initial values into IC2101.

PART REPLACED	ADJUSTMENT		NOTES
	NECESSARY	UNNECESSARY	
IC2001		X	Data is stored in IC2101.
IC201	X		The adjustment is needed to compensate for characteristics of parts including IC201.
IC2101	X		Holding down both the CH-up/down buttons on the TV set in the service mode for more than 2 seconds will automatically write the above initial values into IC2101.
CRT	X		Adjust items related to picture tube only.
IC3001 (20AR30)	X		Adjust items related to MTS only (M01~M05).

Table - B

■ SERVICE ADJUSTMENT

VCO Adjustment

1. Connect a digital voltmeter between pin (44) of IC201 and ground.
2. Receive a good local channel.
3. Enter the service mode and select the service adjustment "S10".
4. Adjust the data so that digital voltmeter reads 2.2V.
5. Adjustment is completed, remove the voltmeter, return to "normal" mode.

RF AGC Adjustment

1. Receive a good local channel.
2. Enter the service mode and select the service adjustment "S08".
3. Set the data value to point where no noise or beat appears.
4. Select another channel to confirm that no noise or beat appears.

Note 1 : You will have to come out of the service mode to select another channel.

Note 2 : Setting the data to "00" will produce a black raster.

Screen Adjustment

1. Connect a digital voltmeter between TP852 and TP853 on the CRT socket PWB.
Note : These test points may not be provided.
Then connect the voltmeter to both ends of R852 located near Q852 on the foil side.
2. Receive a good local channel.
3. Enter the service mode and select the service adjustment "S03" and set the data value to "00" to set the color level to minimum. (Record original data code under adjustment "S03" before changing) You may skip this step, if you selected a B/W picture or monoscope pattern.
4. Select the service adjustment "S19" and adjust the data value to "01", this turn off the luminance signal (Y-mute).
5. Select the service adjustment "S04" and adjust data value to obtain 0.17 volts on the oscilloscope screen.
6. Adjust the master screen control until the raster darkens to the point where raster is barely seen.
7. Adjust the service adjustments "S11" red, "S12" green and "S13" blue to obtain a good grey scale with normal whites at low brightness level.
8. Select the service adjustment "S19" and reset data to "00". Select the service adjustment "S03" and reset data to obtain normal color level.
9. Remove digital voltmeter, and reset the master screen control to obtain normal brightness range.

White Balance Adjustment

1. Receive a good local channel.
2. Enter the service mode and select the service adjustment "S03" and set to "00" (minimum color). "S03" does not have to be adjusted, if you selected a B/W picture or monoscope pattern.
3. Alternately adjust the service adjustment data of "S14" and "S15" until a good grey scale with normal whites is obtained.
4. Select the service adjustment "S03" and adjust data to obtain normal color level.

Sub-Picture Adjustment

1. Receive a good local channel.
2. Make sure the customer picture control is set to maximum.
3. Enter the service mode and select the service adjustment "S01".
4. Adjust the data value to achieve normal contrast range.

Sub-Tint Adjustment

1. Receive a good local channel.
2. Set customer tint control to center of it's range.
3. Enter the service mode and select the service adjustment "S02".
4. Adjust "S02" data value to obtain normal flesh tones.

+115V DC REGULATOR Adjustment

The +115V DC Adj. control (R721) is adjusted at the factory. However, should readjustment be required, proceed as follows:

1. Actuate the receiver with 220V AC input voltage.
2. Select a local channel.
3. Connect positive lead of Digital Voltmeter to R603 TP751 (positive side) on PWB-A; negative lead to chassis ground.
4. Adjust R721 to obtain a +115V DC reading.

CAUTION: The reading should be within +115V –1VDC to ensure normal function and circuitry reliability.

Sub-Color Adjustment

1. Receive a good local channel.
2. Make sure the customer color control is set to center position .
3. Enter the service mode and select the service adjustment "S03".
4. Adjust "S03" data value to obtain normal color level.

Sub-Brightness Adjustment

1. Receive a good local channel.
2. Make sure the customer brightness control is set to center position.
3. Enter the service mode and select the service adjustment "S04".
4. Adjust "S04" data value to obtain normal brightness level.

Vertical-Size Adjustment

1. Receive a good local channel.
2. Enter the service mode and select the service adjustment "S09".
3. While observing the top and bottom of the screen, adjust "S09" data value to proper vertical size.

Vertical Phase Adjustment

1. Enter the service mode and select the service adjustment "S06".
2. Adjust data value to "00" ~ "03" so that picture is approximate center.

Note: This must be set "00" ~ "03" when adjust another data retrace line will be appear.

Horizontal Position Adjustment

1. Receive a good local channel.
2. Enter the service mode and select the service adjustment "S07".
3. Adjust "S07" data value so that picture is centered.

Caption Position Adjustment (Horizontal)

1. Receive a good local channel.
2. Enter the service mode and select the service adjustment "S18".
3. A black text box appears on the screen. (see **Figure B.** below)
4. Adjust "S18" data value so that text box is positioned in the center of the screen.

3.58MHz Trap Adjustment

1. Receive a good local channel.
2. Enter the service mode and select the service adjustment "S16".
3. This is a two position adjustment, "00" is ON, "01" is OFF.
4. Adjust data value to "00" for normal viewing.

Sharpness and Audio Balance Adjustments

1. Receive a good local channel.
2. Enter the service mode and select the service adjustments "S05" for sharpness and "S17" for balance.
- » **Sharpness Adjustment**
3. Adjust data value to "24"(center of data range) for sharpness adjustment.
- » **Audio Balance Adjustment**
4. Adjust data value to "20"(center of data range) for audio balance adjustment.

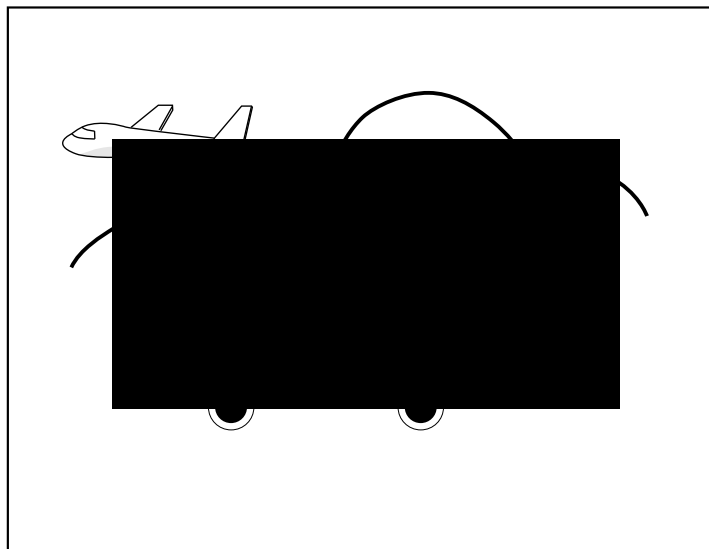


Figure B.

■ MTS ADJUSTMENT

(Only for 20AR30)

MTS Level Adjustment

1. Feed the following monaural signal to pin (14) of IC3001.

Monaural signal : 300Hz, 245mVrms

2. Connect the rms voltmeter to pin (39) of IC3001.
3. Enter the service mode and select the service adjustment "M01".
4. Adjust the data so that the rms voltmeter reads.
Spec.: 490 –10mVrms.

MTS VCO Adjustment

1. Keep the unit in no-signal state.
2. Connect the frequency counter to pin (39) of IC3001.
3. Connect a capacitor (100 μ F, 50V) in between positive(+) side of C3005 and ground.
4. Enter the service mode and select the service adjustment "M02"
5. Adjust the data so that the frequency counter reads.
Spec.: 62.94 –0.75kHz.

Filter Adjustment

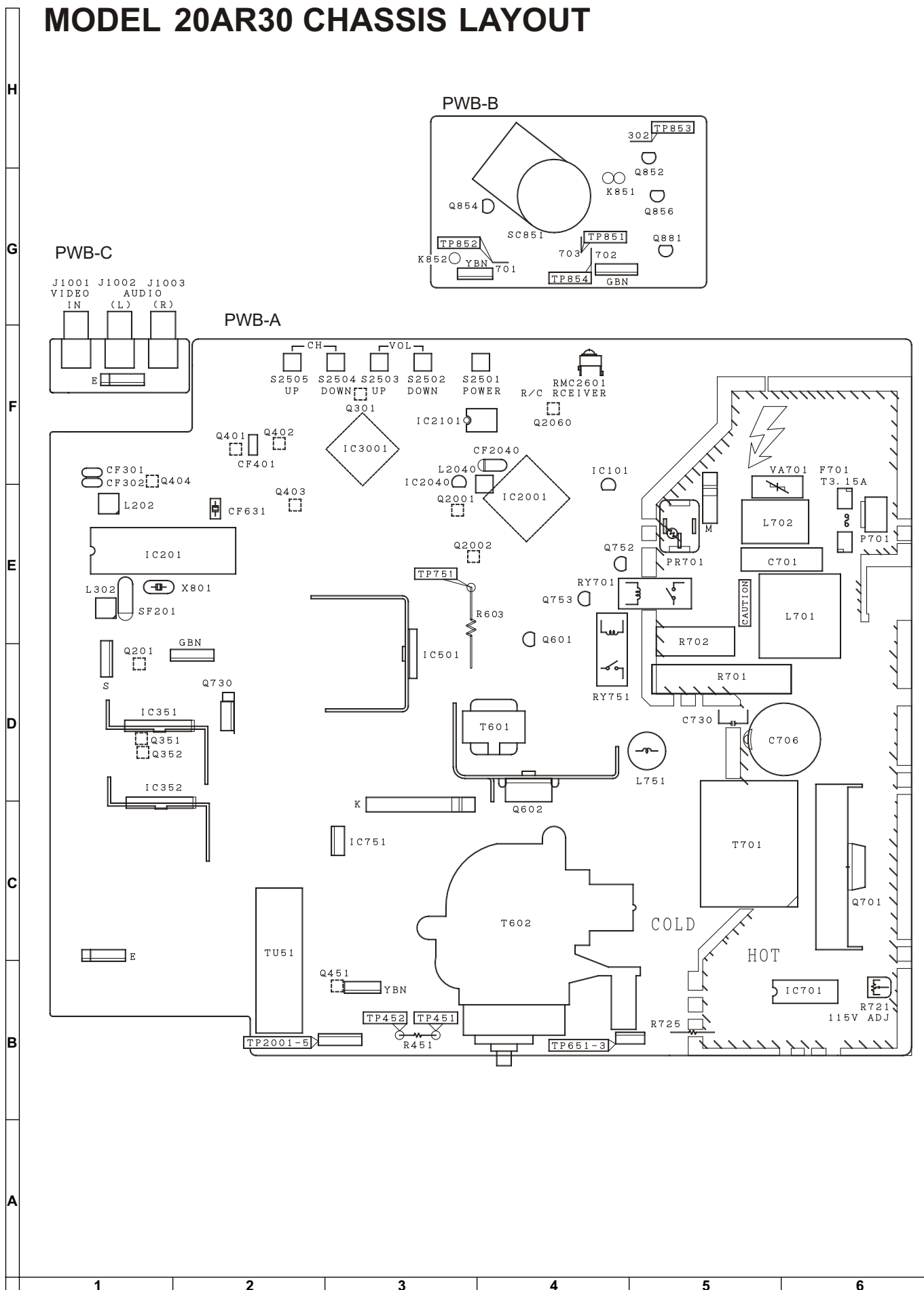
1. Feed the following stereo pilot signal to pin (14) of IC3001 .
Stereo pilot signal: 9.4kHz, 600mVrms.
2. Enter the service mode and select the service adjustment "M03".
3. Adjust the data at the point where "OK" appears on the screen. The "OK" represents the approximate center of the adjustable range of the data.

Separation Adjustment

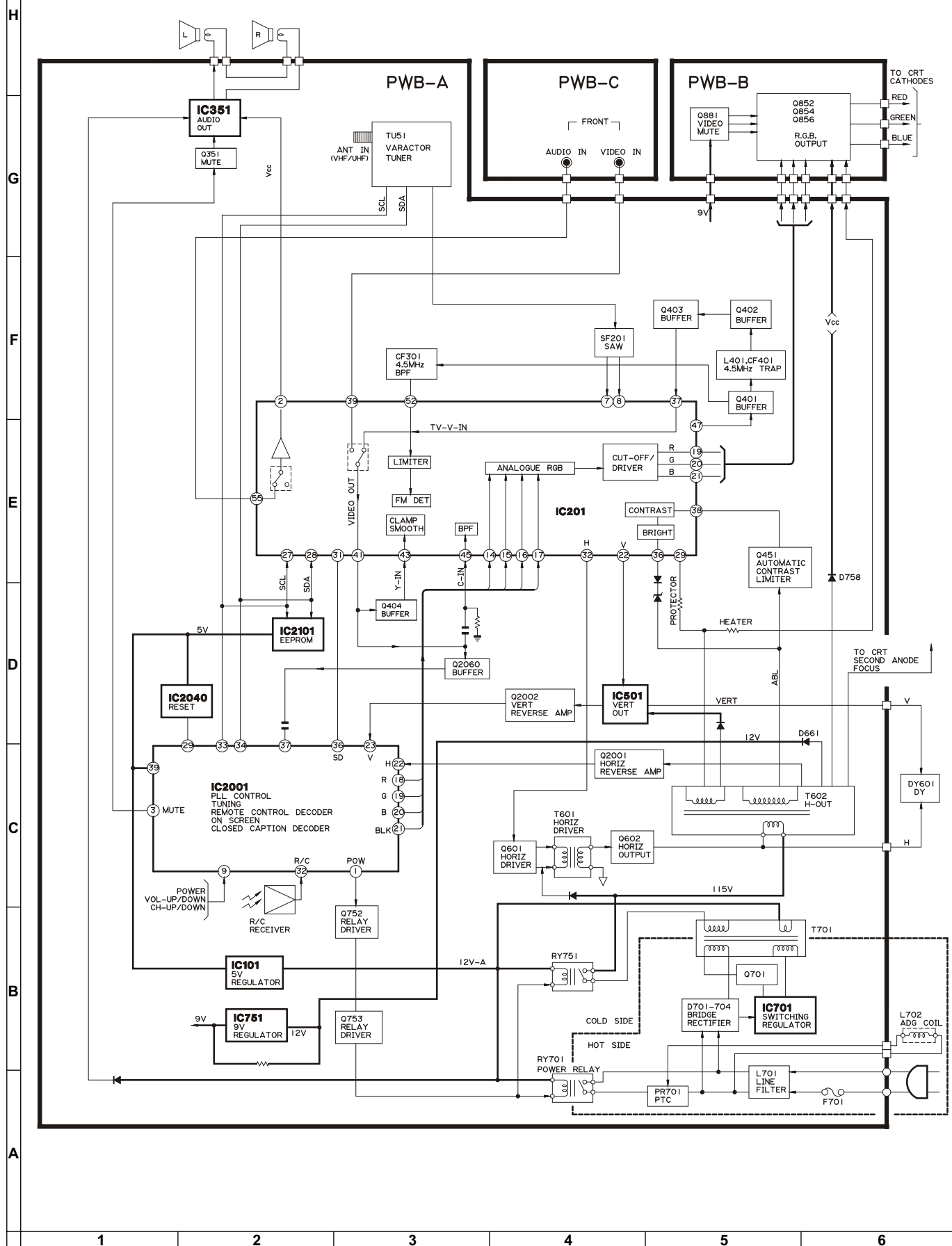
1. Connect the rms voltmeter to pin (39) of IC3001.
2. Receive the following composite stereo signal 1.
Composite stereo signal: 30% modulation, left channel only, noise reduction on, 300Hz
3. Enter the service mode and select the service adjustment "M04".
4. Adjust the data until the AC voltage reading of the rms voltmeter is minimum.
5. Receive the following composite stereo signal 2.
Stereo signal: 30% modulation, left channel only, noise reduction on, 3kHz
6. Enter the service mode and select the service adjustment "M05".
7. Adjust the data until the AC voltage reading of the rms voltmeter is minimum.
8. Take the above steps 1 thru 8 again for fine adjustment.



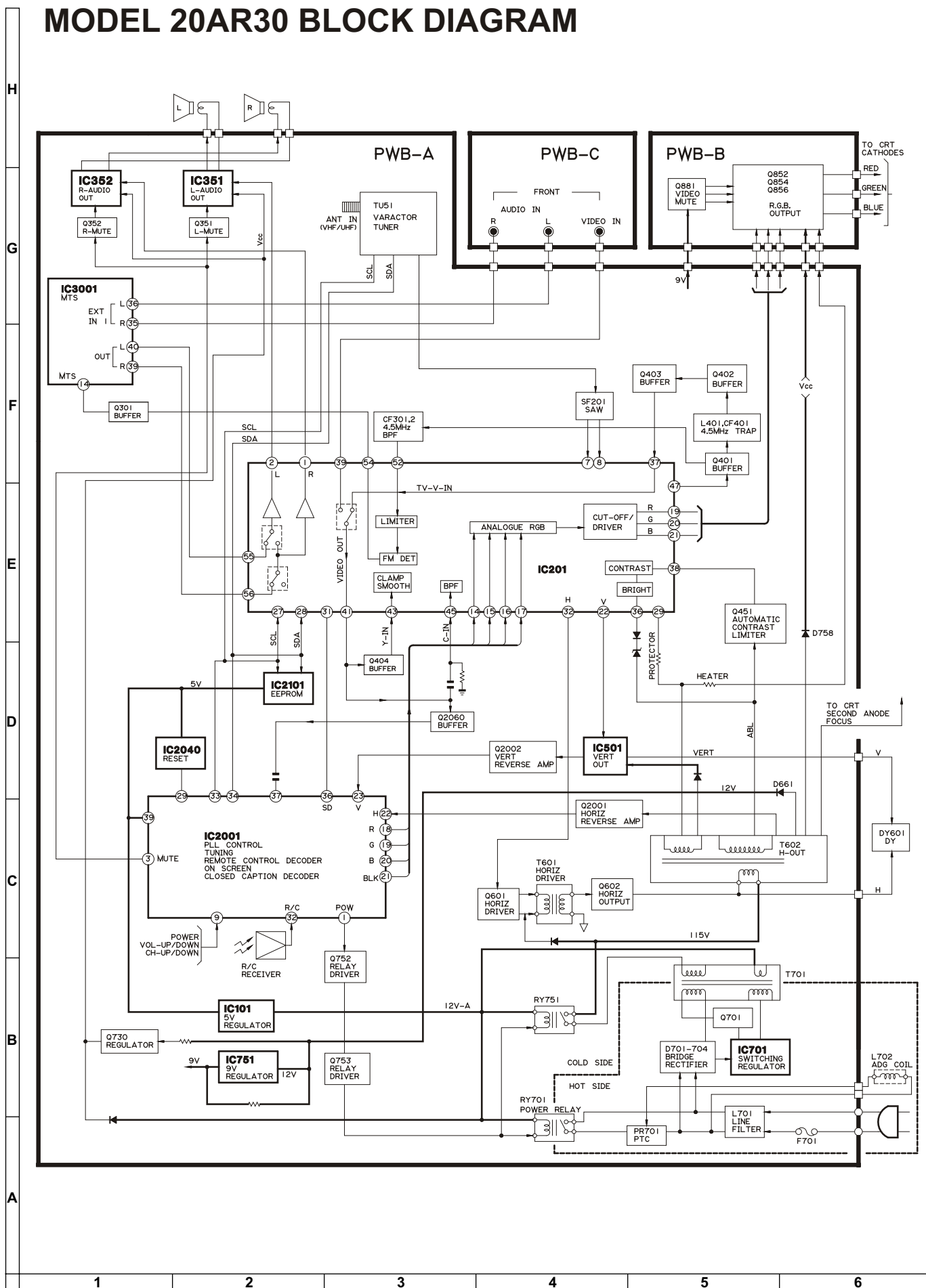
MODEL 20AR30 CHASSIS LAYOUT



MODEL 20AR20 BLOCK DIAGRAM



MODEL 20AR30 BLOCK DIAGRAM



DESCRIPTION OF SCHEMATIC DIAGRAM

NOTES:


1. The unit of resistance "ohm" is omitted.
($K=k\Omega=1000\Omega$, $M=M\Omega$)
2. All resistors are 1/16 watt, unless otherwise noted.
3. All capacitors are μF , unless otherwise noted.
($P=pF=\mu\mu F$)
4. (G) indicates -2% tolerance may be used.
5. \perp indicates line isolated ground.
6. ∇ indicates hot ground.

VOLTAGE MEASUREMENT CONDITIONS:

1. All DC voltages are measured with DVM connected between points indicated and chassis ground, line voltage set at 110~220VAC and all controls set for normal picture unless otherwise indicated.
2. All voltages measured with 1000 μ V B & W or Color signal.

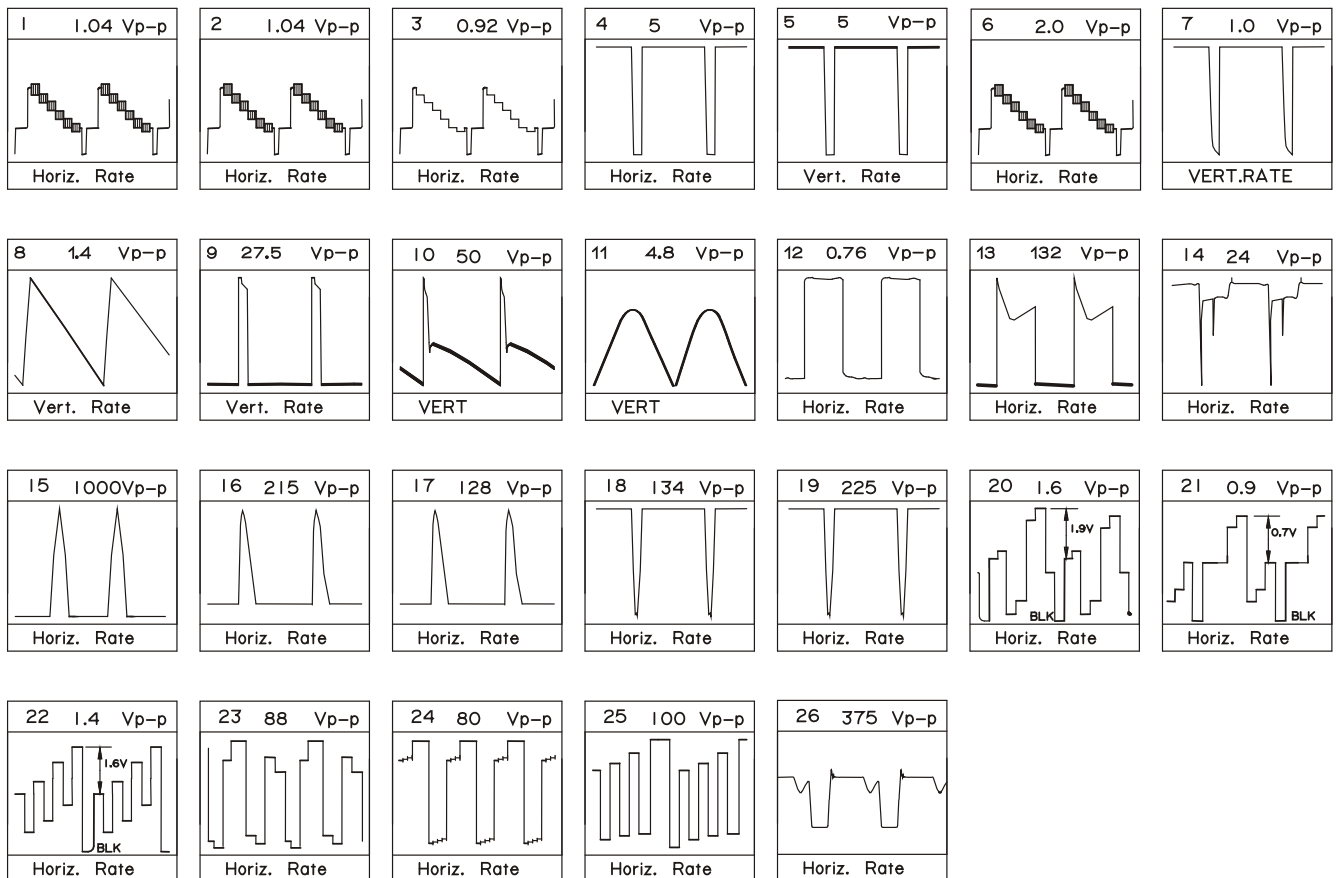
WAVEFORM MEASUREMENT CONDITIONS:

1. Photographs taken on a standard gated color bar signal, the tint setting adjusted for proper color. The wave shapes at the red, green and blue cathodes of the picture tube depend on the tint, color level and picture control.
2. \bigcirc indicates waveform check points (See chart, waveforms are measured from point indicated to chassis ground.)

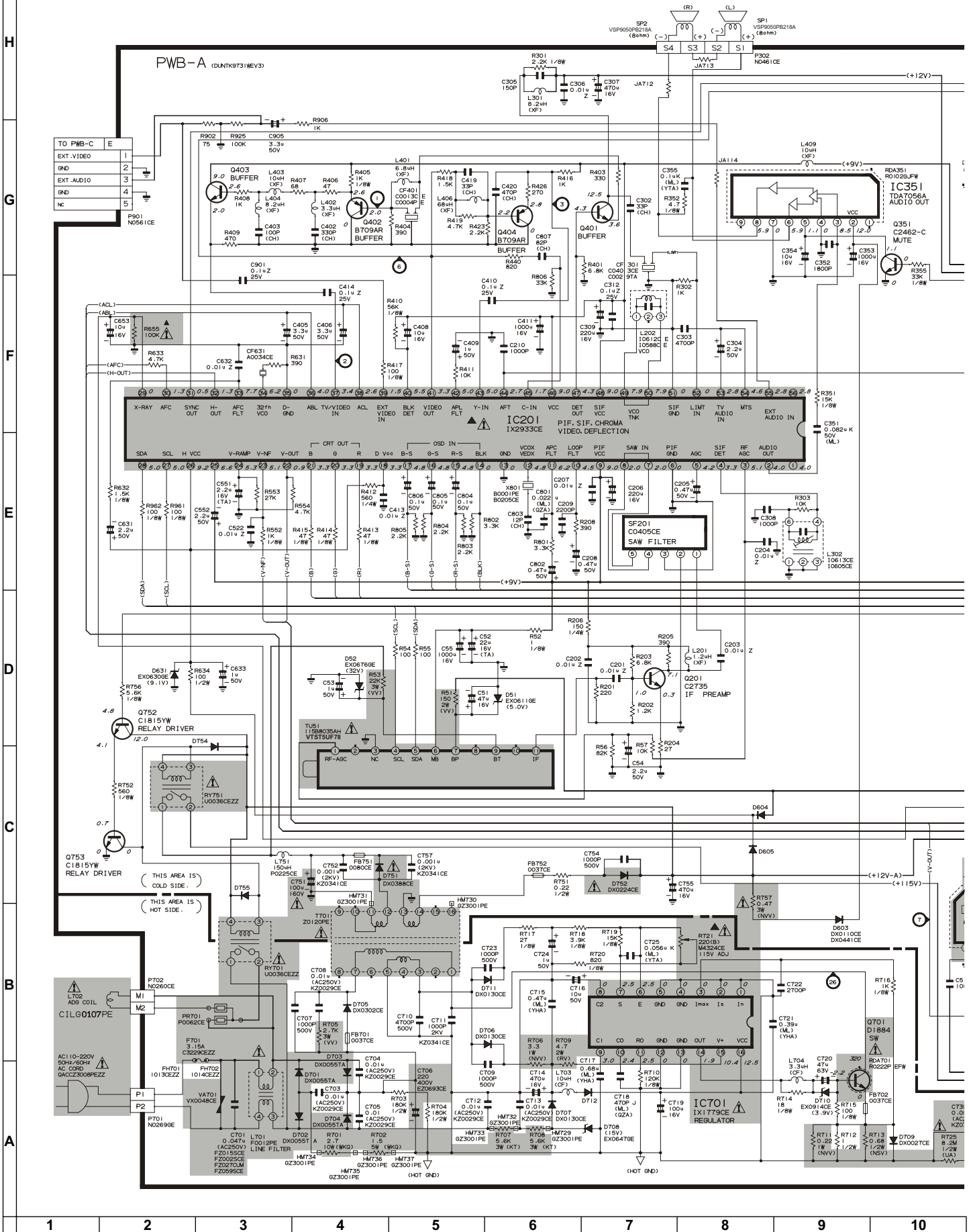
AND SHADED () COMPONENTS
= SAFETY RELATED PARTS.
MARK= X-RAY RELATED PARTS.

This circuit diagram is a standard one, printed circuits may be subject to change for product improvement without prior notice.

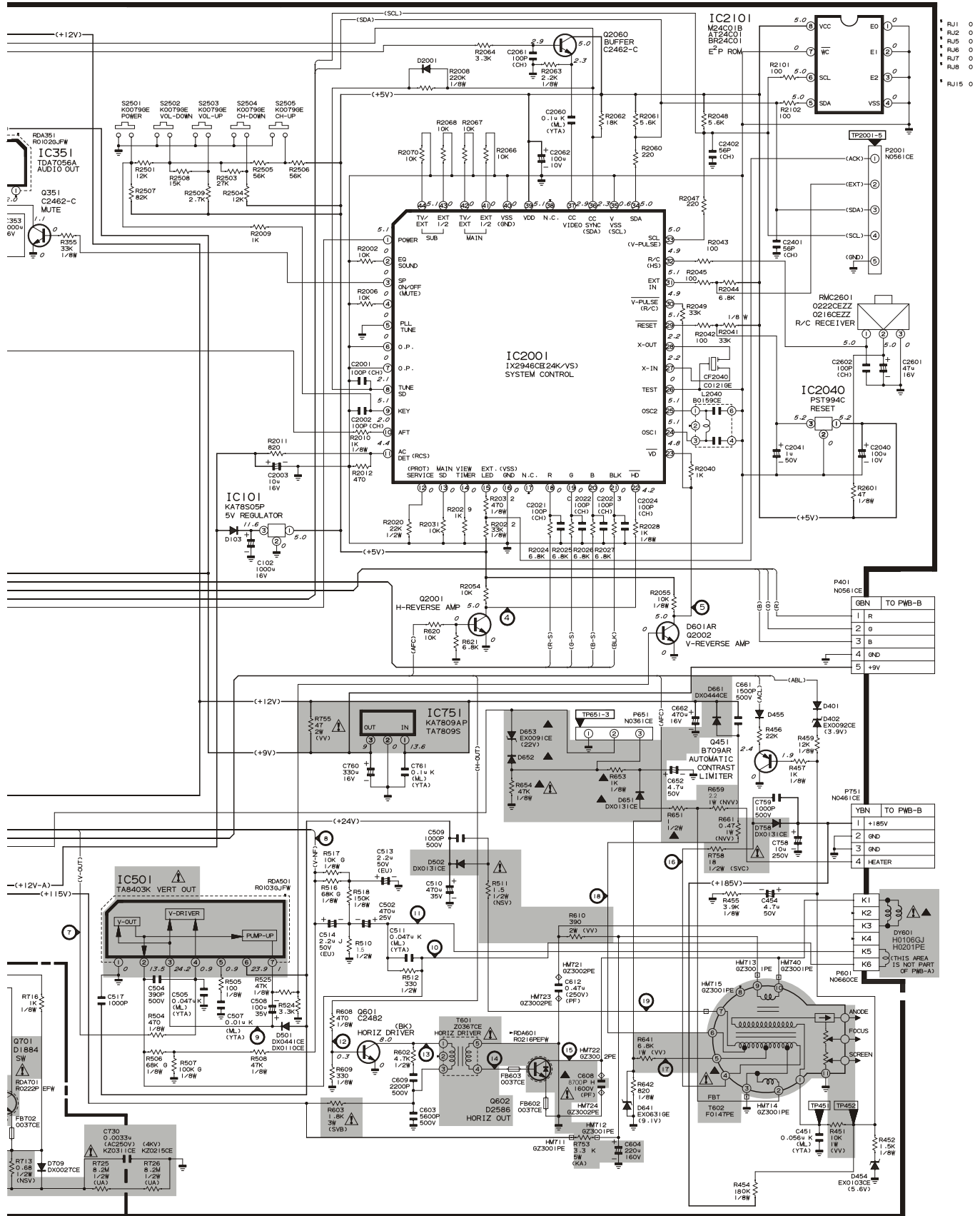
WAVEFORMS



MODEL 20AR20 SCHEMATIC DIAGRAM : MAIN Unit

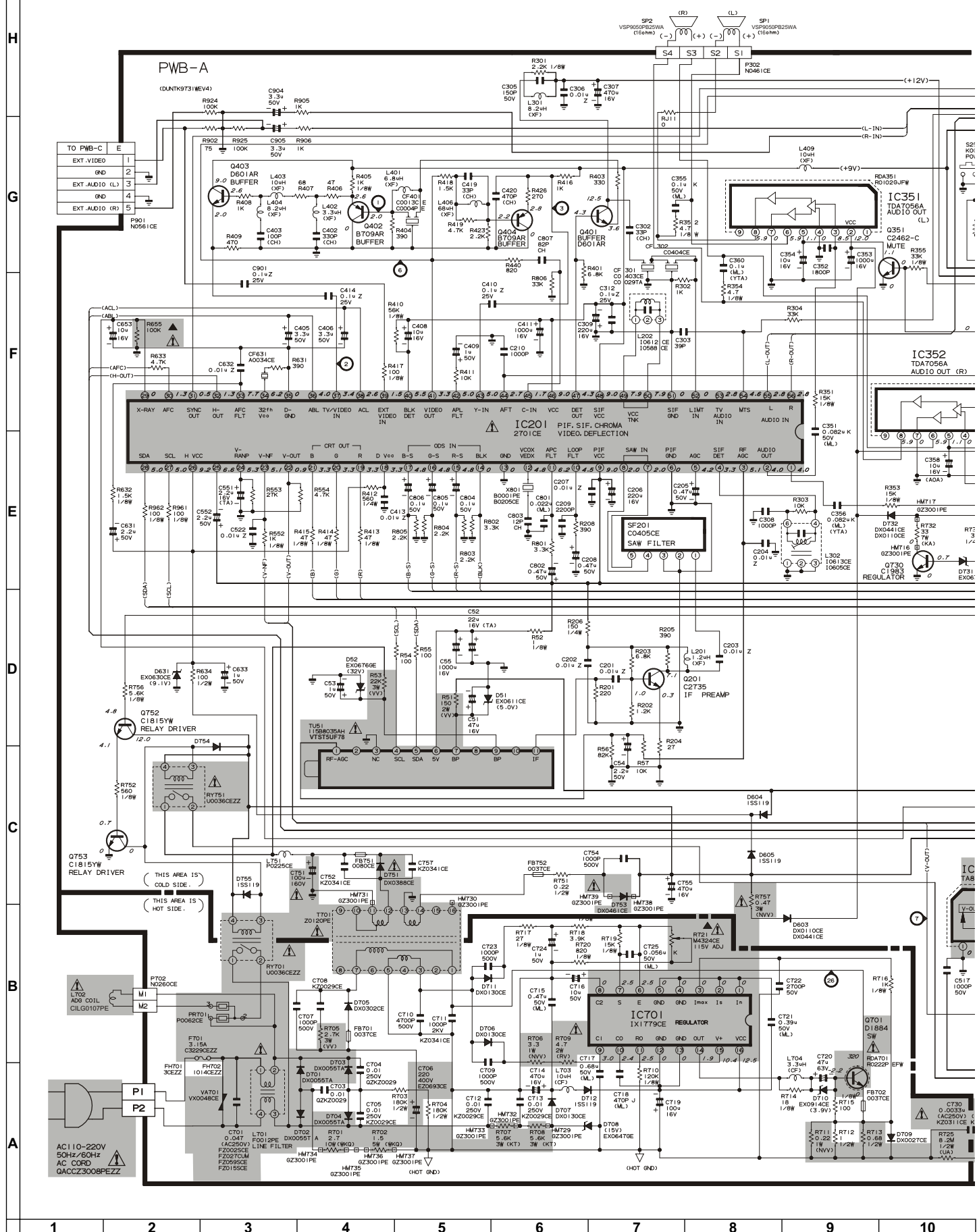


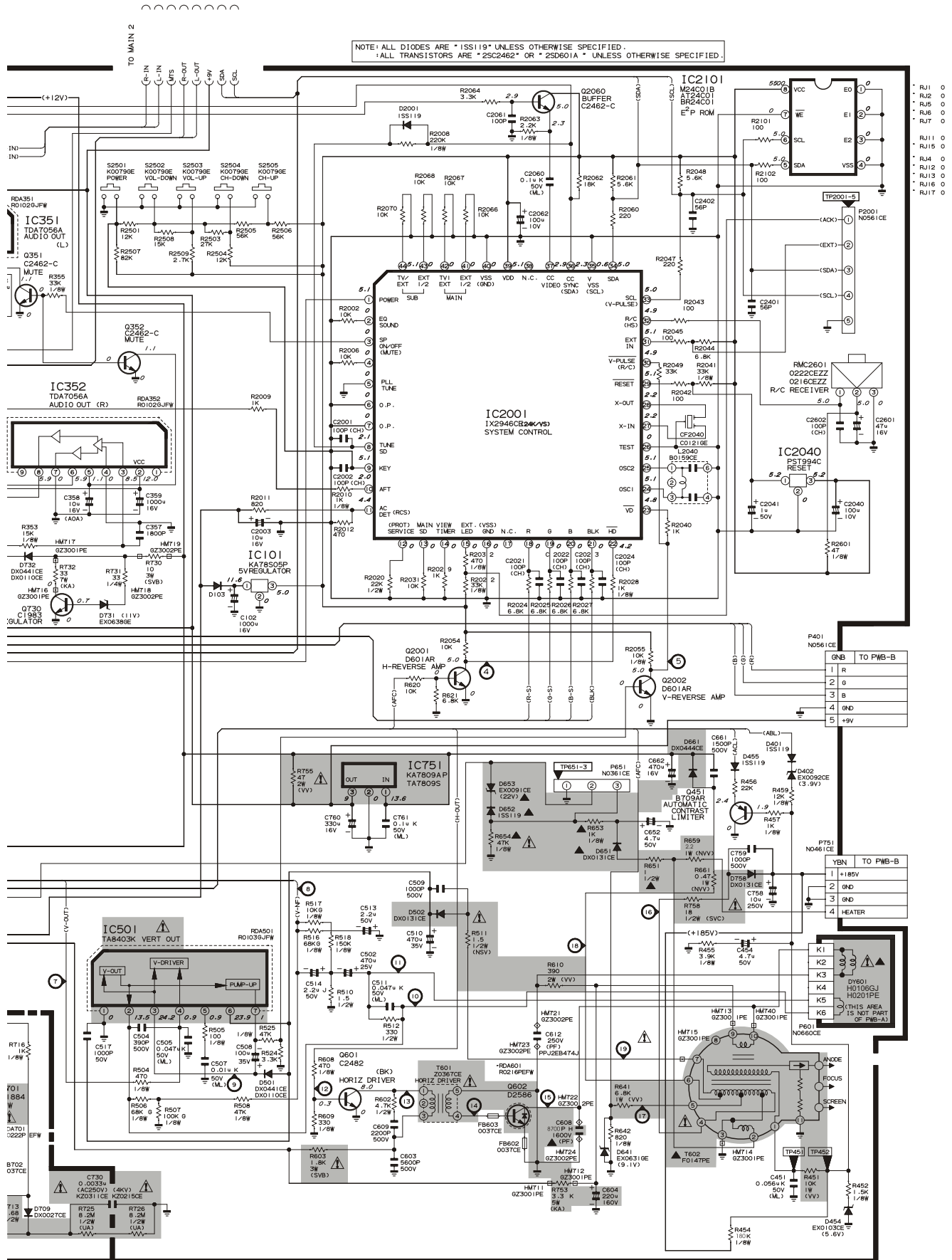
NOTE: ALL DIODES ARE "1SS119" UNLESS OTHERWISE SPECIFIED.
ALL TRANSISTORS ARE "2SC2462" OR "2SD601A" UNLESS OTHERWISE SPECIFIED.



RJ1 0
RJ2 0
RJ3 0
RJ4 0
RJ5 0
RJ6 0
RJ7 0
RJ8 0
RJ15 0

MODEL 20AR30 SCHEMATIC DIAGRAM : MAIN-1 Unit





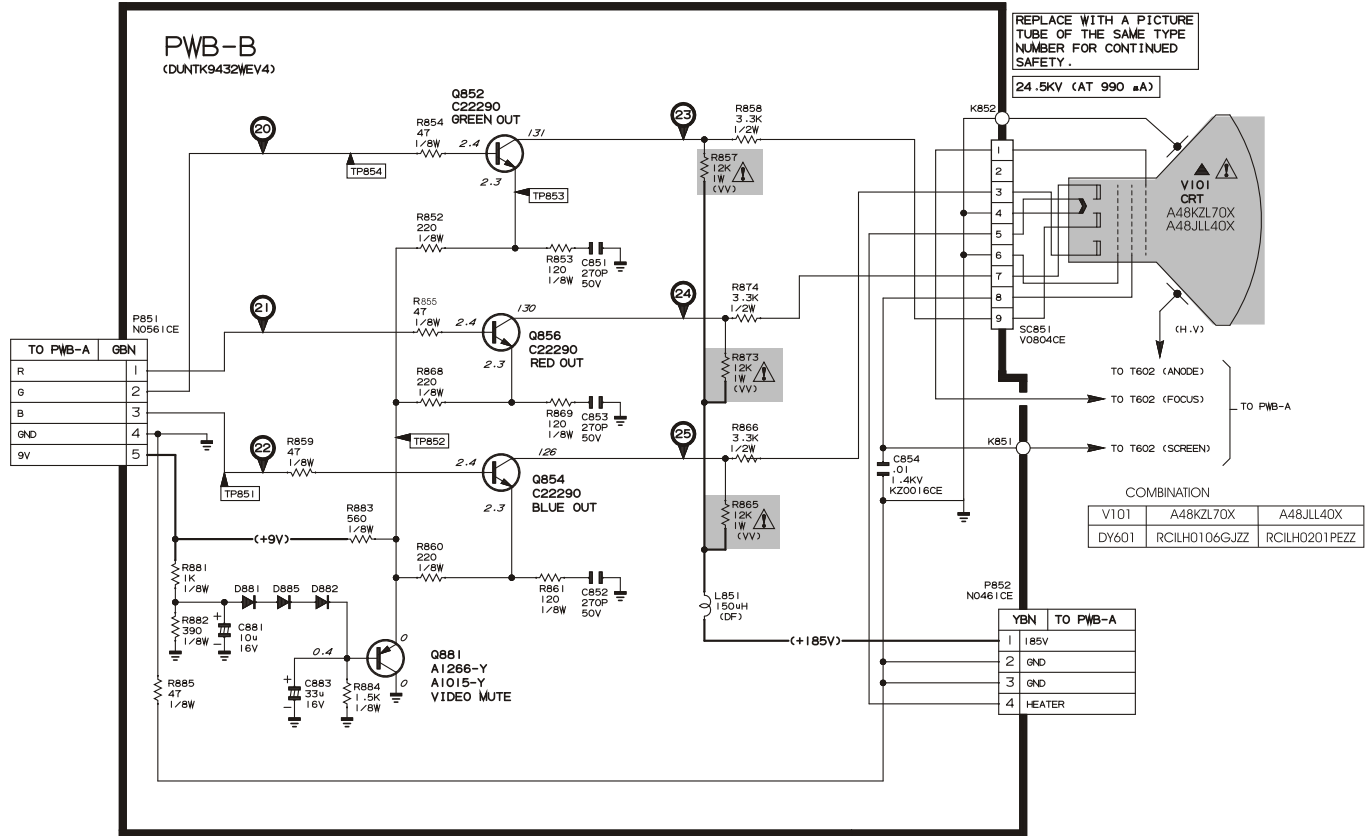
20



SCHEMATIC DIAGRAM : FRONT AV and CRT Unit

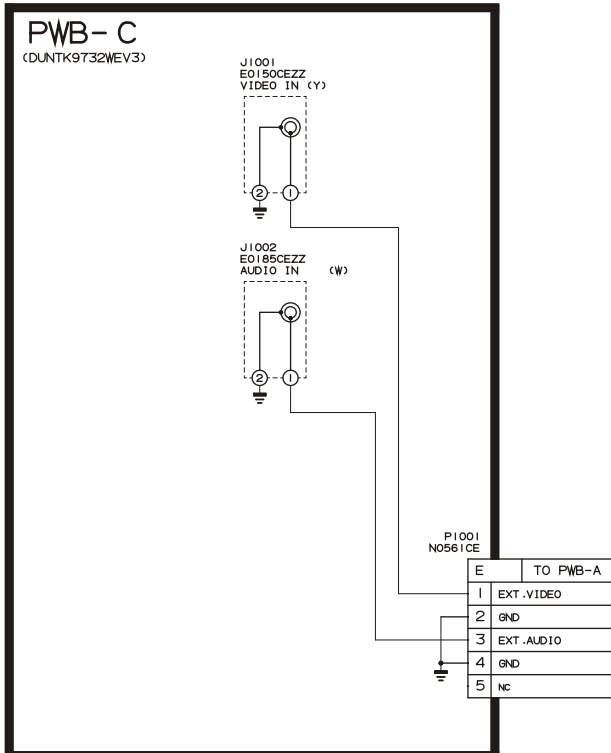
CRT

NOTE: ALL DIODES ARE *ISS119 *DX00456E *OR *DX0446CE *UNLESS OTHERWISE SPECIFIED.



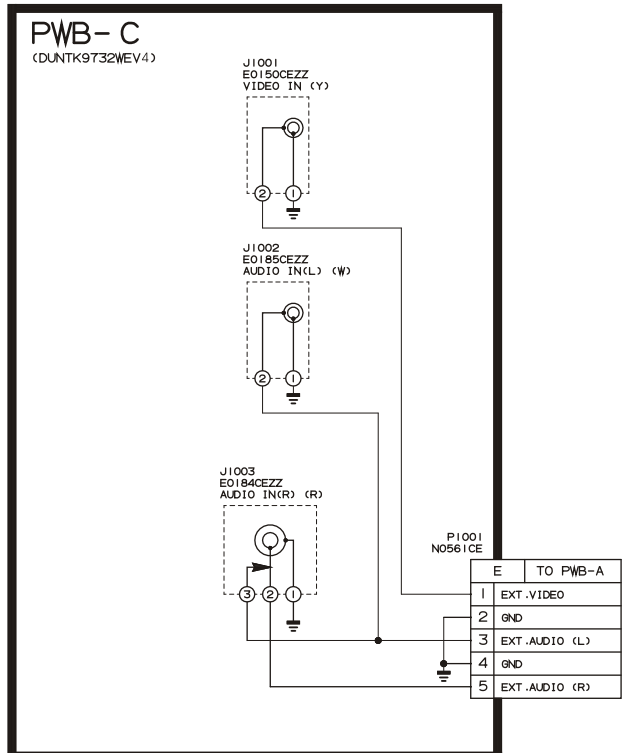
20AR20

FRONT AV



20AR30

FRONT AV



PRINTED WIRING BOARD ASSEMBLIES

H

G

F

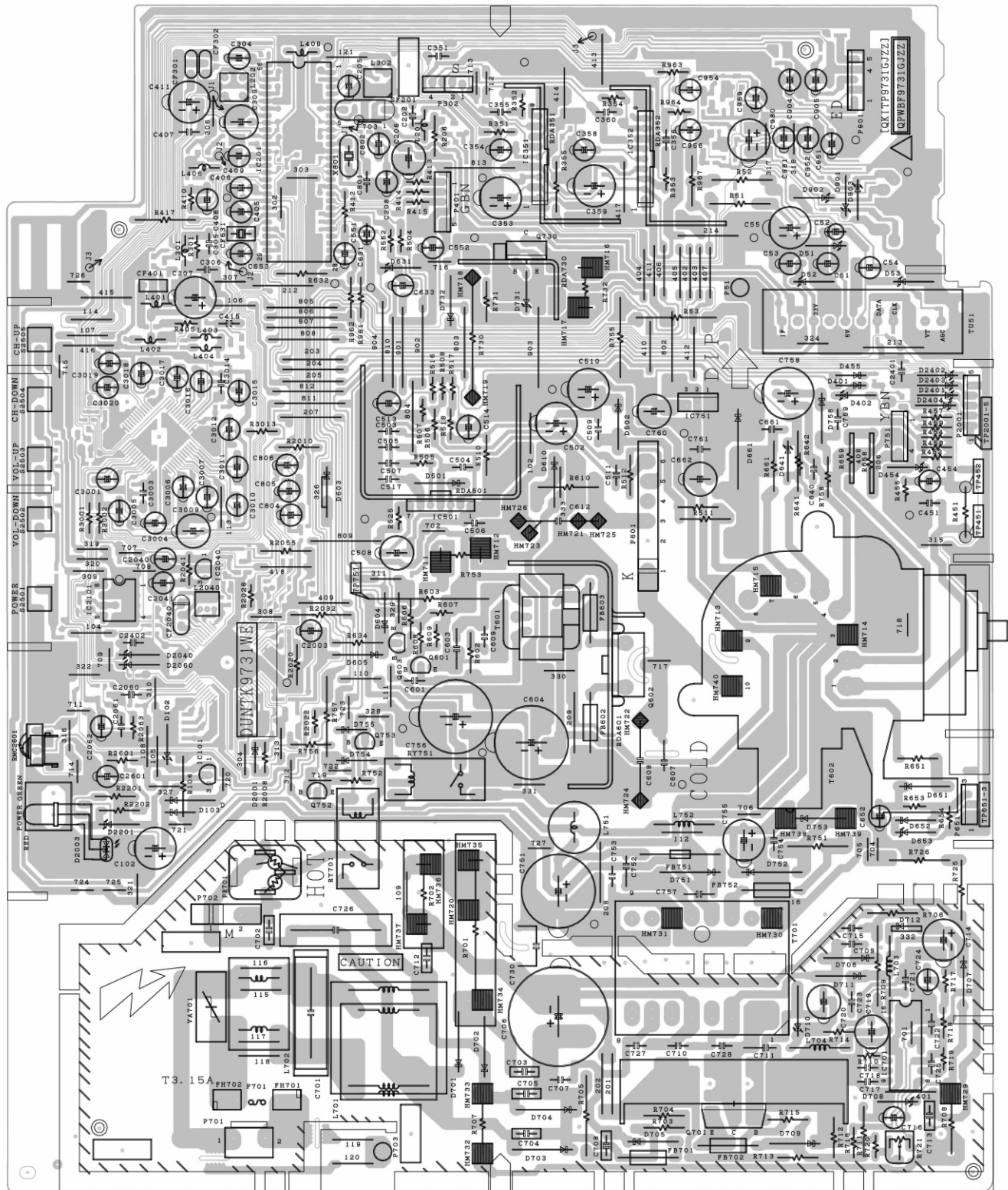
E

D

C

B

A



PWB-A: MAIN Unit (Wiring Side)

1

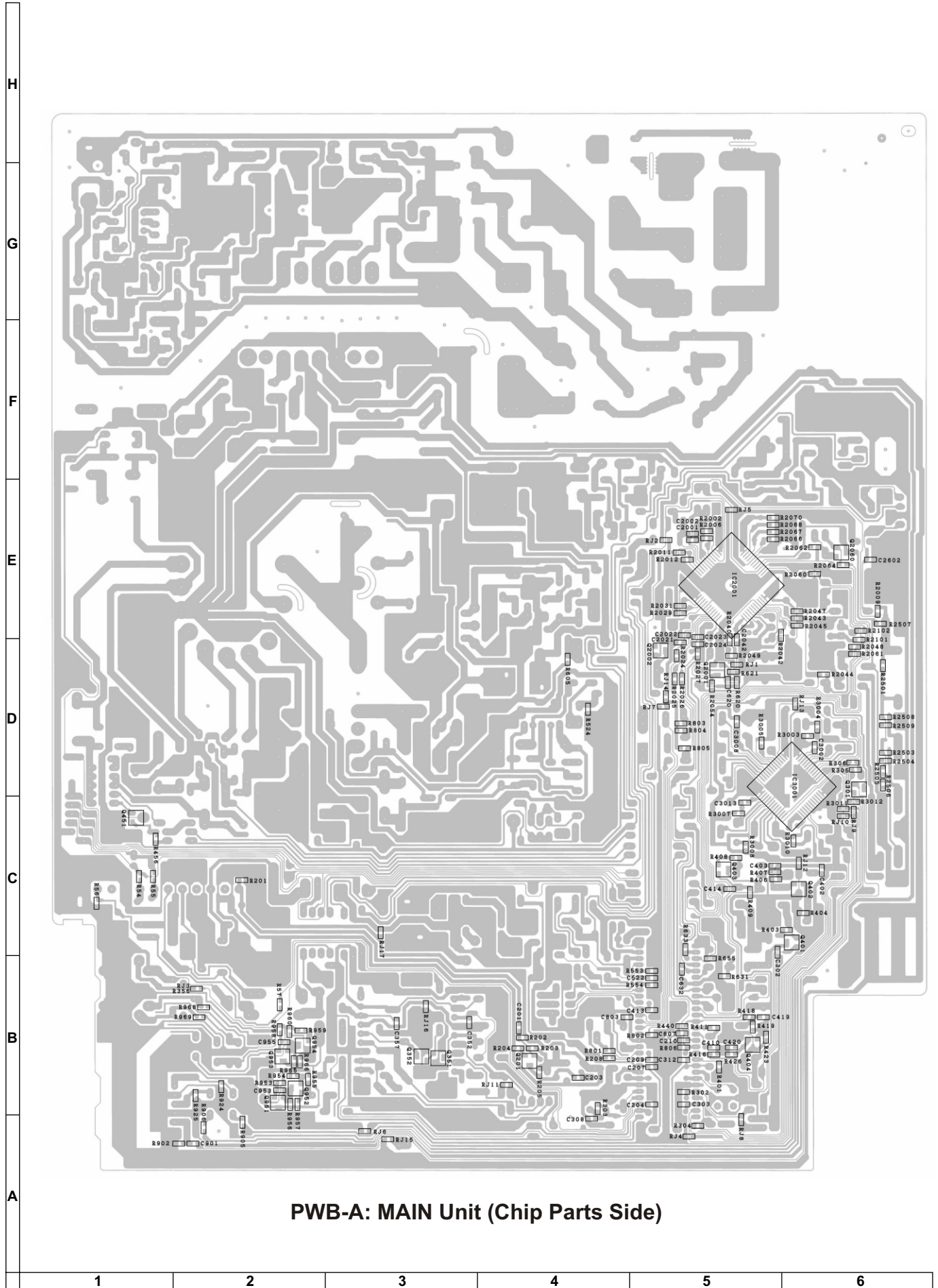
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3

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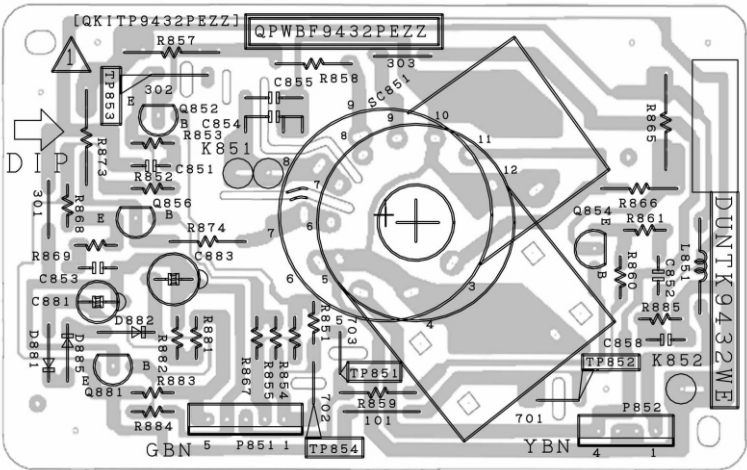
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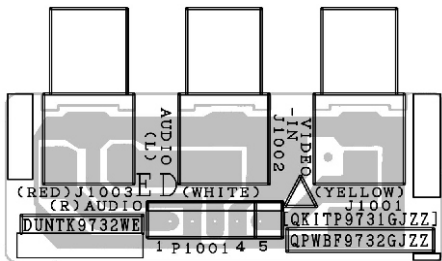
C

B

A



PWB-B: CRT Unit (Wiring Side)



PWB-C: FRONT AV Unit (Wiring Side)

Loc.No.	Part No.	Ref. No.	Description
PWB-A: DUNTK9731WEV3(20AR20)			
PWB-A: DUNTK9731WEV4(20AR30)			
MAIN UNIT (Continued)			

△ AD100067	RH-DX0055TAZZ	D704	Diode
AD100071	RH-DX0302CEZZ	D705	Diode
0068	RH-DX0130CEZZ	D706	Diode
0068	RH-DX0130CEZZ	D707	Diode
AD100083	RH-EX0647GEZZ	D708	Zener Diode, 1.5V
AD100066	RH-DX0027CEZZ	D709	Diode
AD100085	RH-EX0914CEZZ	D710	Zener Diode, 3.9V
AD100069	RH-DX0130CEZZ	D711	Diode
AD100179	VHD1SS119/-1	D712	Diode
AD100082	RH-EX0638GEZZ	D731	Zener Diode, 11V(20AR30)
AD100073	RH-DX0441CEZZ	D732	Diode (20AR30)
△ AD100072	RH-DX0388CEZZ	D751	Diode
△ AD100070	RH-DX0224CEZZ	D752	Diode (20AR20)
△ AD100075	RH-DX0461CEZZ	D753	Diode (20AR30)
AD100179	VHD1SS119/-1	D754	Diode
AD100179	VHD1SS119/-1	D755	Diode
△ AD100069	RH-DX0131CEZZ	D758	Diode
AD100179	VHD1SS119/-1	D2001	Diode
△ AD100090	RH-VX0048CEZZ	VA701	Varistor

PACKAGED CIRCUITS

△ AD100091	RMPTP0062CEZZ	PR701	Packaged Circuit
AD100057	RCRSB0001PEZZ or	X801	Crystal
AD100058	RCRSB0205CEZZ		

FILTERS

AD100063	RFiLC0403CEZZ or	CF301	Ceramic Filter
AD100061	RFiLC0029TAZZ		
AD100064	RFiLC0404CEZZ	CF302	Ceramic Filter (20AR30)
AD100060	RFiLC0013CEZZ	CF401	Ceramic Filter
AD100059	RFiLA0034CEZZ	CF631	Ceramic Filter
AD100062	RFiLC0121GEZZ	CF2040	Ceramic Filter
AD100065	RFiLC0405CEZZ	SF201	SAW Filter

COILS

AD100193	VP-XF1R2K0000	L201	Peaking	1.2μH
AD100050	RCiLi0612CEZZ or	L202	IF Coil	
AD100049	RCiLi0588CEZZ			
AD100197	VP-XF8R2K0000	L301	Peaking	8.2μH
AD100051	RCiLi0613CEZZ	L302	VCO Coil	
AD100196	VP-XF6R8K0000	L401	Peaking	6.8μH
AD100194	VP-XF3R3K0000	L402	Peaking	3.3μH
AD100191	VP-XF100K0000	L403	Peaking	10μH
AD100197	VP-XF8R2K0000	L404	Peaking	8.2μH
AD100195	VP-XF680K0000	L406	Peaking	68μH
AD100191	VP-XF100K0000	L409	Peaking	10μH
AD100045	RCiLF0012PEZZ	L701	Coil S.P.	
AD100188	VP-CF100K0000	L703	Peaking	10μH
AD100189	VP-CF3R3K0000	L704	Peaking	3.3μH
AD100052	RCiLP0225CEZZ	L751	Coil	
AD100044	RCiLB0159CEZZ	L2040	Oscillation	Coil

TRANSFORMERS

△ AD100098	RTRNZ0367CEZZ	T601	T ransformer
△ AD100096	RTRNF0147PEZZ	T602	H-V olt Transformer
△ AD100097	RTRNZ0120PEZZ	T701	Transformer

CONTROL

△ AD100099	RVR-M4324CEZZ	R721	220(B) 1 15V Adj.
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CAPACITORS

[EL... Electrolytic, M-Poly... Metalized Polypro Film]

AD100126	VCEA0A1CW476M	C51	EL.	16V
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Loc.No.	Part No.	Ref. No.	Description
AD100177	VCSATA1CE226K	C52	16V T antalum
AD100130	VCEA0A1HW105M	C53	1.0 50V EL.
AD100135	VCEA0A1HW475M	C54	4.7 50V EL.
AD100127	VCEA0A1CW477M	C55	470 16V EL.
AD100121	VCEA0A1CW108M	C102	1000 16V EL.
AD100155	VCKYCY1HF103Z	C201	0.01 50V Ceramic
AD100160	VCKYP A1HF103Z	C202	0.01 50V Ceramic
AD100155	VCKYCY1HF103Z	C203	0.01 50V Ceramic
AD100155	VCKYCY1HF103Z	C204	0.01 50V Ceramic
AD100134	VCEA0A1HW474M	C205	0.47 50V EL.
AD100123	VCEA0A1CW227M	C206	220 16V EL.
AD100155	VCKYCY1HF103Z	C207	0.01 50V Ceramic
AD100134	VCEA0A1HW474M	C208	0.47 50V EL.
AD100152	VCKYCY1HB222K	C209	2200p 50V Ceramic
AD100150	VCKYCY1HB102K	C210	1000p 50V Ceramic
AD100110	VCCCCY1HH330J	C302	33p 50V Ceramic
AD100112	VCCCCY1HH390J	C303	39p 50V Ceramic
AD100153	VCKYCY1HB472K	C303	4700p 50V Ceramic
AD100132	VCEA0A1HW225M	C304	2.2 50V EL. (20AR20)
AD100157	VCKYPA1HB151K	C305	150p 50V Ceramic
AD100155	VCKYPA1HF103Z	C306	0.01 50V Ceramic
AD100127	VCEA0A1CW477M	C307	470 16V EL.
AD100150	VCKYCY1HB102K	C308	1000p 50V Ceramic
AD100123	VCEA0A1CW227M	C309	220 16V EL.
AD100149	VCKYCY1EF104Z	C312	0.1 25V Ceramic
AD100169	VCQYTA1HM123J	C351	0.012 50V Mylar
AD100151	VCKYCY1HB182K	C352	1800p 50V Ceramic
AD100121	VCEA0A1CW108M	C353	1000 16V EL.
AD100119	VCEA0A1CW106M	C354	10 16V EL.
AD100168	VCQYTA1HM104J	C355	0.1 50V Mylar
AD100174	VCQYTA1HM823J	C356	0.082 50V Mylar
AD100151	VCKYCY1HB182K	C357	1800p 50V Ceramic
AD100119	VCEA0A1CW106M	C358	10 16V EL. (20AR30)
AD100121	VCEA0A1CW108M	C359	1000 16V EL. (20AR30)
AD100168	VCQYTA1HM104J	C360	0.1 50V Mylar
AD100111	VCCCCY1HH331J	C402	330p 50V Ceramic
AD100108	VCCCCY1HH101J	C403	100p 50V Ceramic
AD100133	VCEA0A1HW335M	C405	3.3 50V EL.
AD100133	VCEA0A1HW335M	C406	3.3 50V EL.
AD100119	VCEA0A1CW106M	C408	10 16V EL.
AD100130	VCEA0A1HW105M	C409	1.0 50V EL.
AD100149	VCKYCY1EF104Z	C410	0.1 25V Ceramic
AD100121	VCEA0A1CW108M	C41 1	1000 16V EL.
AD100155	VCKYCY1HF103Z	C413	0.01 50V Ceramic
AD100149	VCKYCY1EF104Z	C414	0.1 25V Ceramic
AD100110	VCCCCY1HH330J	C419	33p 50V Ceramic
AD100113	VCCCCY1HH471J	C420	470p 50V Ceramic
AD100173	VCQYTA1HM563J	C451	0.056 50V Mylar
AD100135	VCEA0A1HW475M	C454	4.7 50V EL.
AD100128	VCEA0A1EW477M	C502	470 25V EL.
AD100164	VCKYPA2HB391K	C504	390p 500V Ceramic
AD100172	VCQYTA1HM473J	C505	0.047 50V Mylar
AD100167	VCQYTA1HM103J	C507	0.01 50V Mylar
AD100142	VCEAGA1VW107M	C508	100 35V EL.
AD100161	VCKYPA2HB102K	C509	1000p 500V Ceramic
AD100136	VCEA0A1VW477M	C510	470 35V EL.
AD100172	VCQYTA1HM473J	C511	0.047 50V Mylar
AD100139	VCEACA1HC225M	C513	2.2 50V EL.
AD100138	VCEACA1HC225J	C514	2.2 50V EL.
AD100156	VCKYPA1HB102K	C517	1000p 50V Ceramic
AD100155	VCKYCY1HF103Z	C522	0.01 50V Ceramic
AD100176	VCSATA1CE225K	C551	2.2 16V Tantalum
AD100132	VCEA0A1HW225M	C552	2.2 50V EL.
0314	VCKYPB2HB562K	C603	5600p 500V Ceramic
△ AD100166	VCEAGH2CW227M	C604	220 160V EL.
△ AD100144	VCFFPD3CA872H	C608	8700p 1.6kV M Poly
AD100163	VCKYP A2HB222K	C609	2200p 500V Ceramic
AD100145	VCFFPJ2EB474J	C612	0.47 250V M-Poly
AD100132	VCEA0A1HW225M	C631	2.2 50V EL.
AD100155	VCKYCY1HF103Z	C632	0.01 50V Ceramic
AD100130	VCEA0A1HW105M	C633	1.0 50V EL.

Loc. No.	Part No.	Ref. No.	Description
PWB-A: DUNTK9731WEV3(20AR20)			
PWB-A: DUNTK9731WEV4(20AR30)			
MAIN UNIT (Continued)			
	AD100135	VCEA0A1HW475M	C652 4.7 50V EL.
	AD100119	VCEA0A1CW106M	C653 1 16V EL.
	AD100162	VCKYPA2HB152K	C661 1500p 500V Ceramic
	AD100127	VCEA0A1CW477M	C662 470 16V EL.
△	AD100043	RC-FZ027SCEZZ	C701 0.047 AC250V Plastic
	AD100054	RC-KZ0029CEZZ	C703 0.01 AC250V Ceramic
	AD100054	RC-KZ0029CEZZ	C704 0.01 AC250V Ceramic
	AD100054	RC-KZ0029CEZZ	C705 0.01 AC250V Ceramic
△	0315	RC-EZ0804CEZZ	C706 220 400V EL.
	AD100161	VCKYPA2HB102K	C707 1000p 500V Ceramic
	AD100054	RC-KZ0029CEZZ	C708 0.01 AC250V Ceramic
	AD100161	VCKYPA2HB102K	C709 1000p 500V Ceramic
	AD100165	VCKYPA2HB472K	C710 4700p 500V Ceramic
	AD100056	RC-KZ0341CEZZ	C71 1 1000p 2kV Ceramic
	AD100054	RC-KZ0029CEZZ	C712 0.01 AC250V Ceramic
	AD100054	RC-KZ0029CEZZ	C713 0.01 AC250V Ceramic
	AD100127	VCEA0A1CW477M	C714 470 16V EL.
	AD100147	VC FYHA1HA474J	C715 0.47 50V Mylar
	AD100131	VCEA0A1HW106M	C716 1 50V EL.
	AD100148	VC FYHA1HA684J	C717 0.68 50V Mylar
	AD100171	VCQYTA1HM471J	C718 470p 50V Mylar
	AD100120	VCEA0A1CW107M	C719 100 16V EL.
	AD100141	VCEAGA1JW476M	C720 4.7 63V EL.
	AD100146	VC FYHA1HA394J	C721 0.39 50V Mylar
	AD100159	VCKYPA1HB272K	C722 2700p 50V Ceramic
	AD100161	VCKYPA2HB102K	C723 1000p 500V Ceramic
	AD100130	VCEA0A1HW105M	C724 1.0 50V EL.
	AD100173	VCQYTA1HM563J	C725 0.056 50V Mylar
△	AD100055	RC-KZ0311CEZZ	C730 0.0033 AC250V Ceramic
△	AD100143	VCEAGH2CW107M	C751 100 160V EL.
	AD100056	RC-KZ0341CEZZ	C752 0.001 2kV Ceramic
	AD100161	VCKYPA2HB102K	C754 1000p 500V Ceramic
	AD100127	VCEA0A1CW477M	C755 470 16V EL.
	AD100056	RC-KZ0341CEZZ	C757 0.001 2kV Ceramic
	AD100137	VCEA0A2EW106M	C758 1 250V EL.
	AD100161	VCKYPA2HB102K	C759 1000p 500V Ceramic
	AD100125	VCEA0A1CW337M	C760 330 16V EL.
	AD100168	VCQYTA1HM104J	C761 0.1 50V Mylar
	AD100170	VCQYTA1HM223J	C801 0.022 50V Mylar
	AD100134	VCEA0A1HW474M	C802 0.47 50V EL.
	AD100109	VCCCCY1HH120J	C803 12p 50V Ceramic
	AD100129	VCEA0A1HW104M	C804 0.1 50V EL.
	AD100129	VCEA0A1HW104M	C805 0.1 50V EL.
	AD100129	VCEA0A1HW104M	C806 0.1 50V EL.
	AD100114	VCCCCY1HH820J	C807 82p 50V Ceramic
	AD100149	VCKYCY1EF104Z	C901 0.1 25V Ceramic
	AD100133	VCEA0A1HW335M	C904 3.3 50V EL. (20AR30)
	AD100133	VCEA0A1HW335M	C905 3.3 50V EL.
	AD100108	VCCCCY1HH101J	C2001 100p 50V Ceramic
	AD100108	VCCCCY1HH101J	C2002 100p 50V Ceramic
	AD100119	VCEA0A1CW106M	C2003 1 16V EL.
	AD100108	VCCCCY1HH101J	C2021 100p 50V Ceramic
	AD100108	VCCCCY1HH101J	C2022 100p 50V Ceramic
	AD100108	VCCCCY1HH101J	C2023 100p 50V Ceramic
	AD100108	VCCCCY1HH101J	C2024 100p 50V Ceramic
	AD100118	VCEA0A1AW107M	C2040 100 10V EL.
	AD100130	VCEA0A1HW105M	C2041 1.0 50V EL.
	AD100168	VCQYTA1HM104J	C2060 0.1 50V Mylar
	AD100115	VCCCPA1HH101J	C2061 100p 50V Ceramic
	AD100118	VCEA0A1AW107M	C2062 100 10V EL.
	AD100116	VCCCPA1HH560J	C2401 56p 50V Ceramic
	AD100116	VCCCPA1HH560J	C2402 56p 50V Ceramic
	AD100126	VCEA0A1CW476M	C2601 4.7 16V EL.
	AD100108	VCCCCY1HH101J	C2602 100p 50V Ceramic

Loc. No.	Part No.	Ref. No.	Description
	AD100117	VCE9GA1HW475M	C3001 4.7 50V EL.(N.P) (20AR30)
	AD100154	VCKYCY1HB562K	C3002 5600p 50V Ceramic (20AR30)
	AD100169	VCQYTA1HM123J	C3003 0.012 50V Mylar (20AR30)
	AD100130	VCEA0A1HW105M	C3004 1.0 50V EL. (20AR30)
	AD100135	VCEA0A1HW475M	C3005 4.7 50V EL. (20AR30)
	AD100131	VCEA0A1HW106M	C3006 1 50V EL. (20AR30)
	0135	VCEA0A1HW475M	C3007 4.7 50V EL. (20AR30)
	AD100155	VCKYCY1HF103Z	C3008 0.01 50V Ceramic (20AR30)
	AD100123	VCEA0A1CW227M	C3009 220 16V EL. (20AR30)
	AD100117	VCE9GA1HW475M	C3010 4.7 50V EL.(N.P) (20AR30)
	AD100135	VCEA0A1HW475M	C3011 4.7 50V EL. (20AR30)
	AD100117	VCE9GA1HW475M	C3012 4.7 50V EL.(N.P) (20AR30)
	AD100159	VCKYCY1HB272K	C3013 2700p 50V Ceramic (20AR30)
	AD100167	VCQYTA1HM103J	C3014 0.01 50V Mylar (20AR30)
	AD100178	VCSATA1CE335K	C3015 3.3 16V Tantalum (20AR30)
	AD100117	VCE9GA1HW475M	C3016 4.7 50V EL.(N.P) (20AR30)
	AD100175	VCSATA1CE106K	C3017 1 16V Tantalum (20AR30)
	AD100130	VCEA0A1HW105M	C3018 1.0 50V EL. (20AR30)
	AD100135	VCEA0A1HW475M	C3019 4.7 50V EL. (20AR30)
	AD100135	VCEA0A1HW475M	C3020 4.7 50V EL. (20AR30)

RESISTORS*[M-Ox... Metal Oxide, M-Film... Metal Film]*

AD100249	VRS-CY1JF000J	RJ1	0	1/16W	M-Ox.
AD100249	VRS-CY1JF000J	RJ2	0	1/16W	M-Ox.
AD100249	VRS-CY1JF000J	RJ4	0	1/16W	M-Ox. (20AR30)
AD100249	VRS-CY1JF000J	RJ5	0	1/16W	M-Ox.
AD100249	VRS-CY1JF000J	RJ6	0	1/16W	M-Ox.
AD100249	VRS-CY1JF000J	RJ7	0	1/16W	M-Ox.
AD100249	VRS-CY1JF000J	RJ8	0	1/16W	M-Ox. (20AR20)
AD100249	VRS-CY1JF000J	RJ11	0	1/16W	M-Ox. (20AR30)
AD100249	VRS-CY1JF000J	RJ12	0	1/16W	M-Ox. (20AR30)
AD100249	VRS-CY1JF000J	RJ13	0	1/16W	M-Ox. (20AR30)
AD100249	VRS-CY1JF000J	RJ15	0	1/16W	M-Ox.
AD100249	VRS-CY1JF000J	RJ16	0	1/16W	M-Ox. (20AR30)
AD100249	VRS-CY1JF000J	RJ17	0	1/16W	M-Ox. (20AR30)
△	AD100292	VRS-VV3AB331J	R51	330	2W M-Ox.
	AD100295	VRS-VV3DB470J	R52	47	2W Carbon
△	AD100296	VRS-VV3LB223J	R53	22k	3.0W M-Ox.
	AD100250	VRS-CY1JF101J	R54	100	1/16W M-Ox.
	AD100250	VRS-CY1JF101J	R55	100	1/16W M-Ox.
	AD100283	VRS-CY1JF823J	R56	82k	1/16W M-Ox.
	AD100272	VRS-CY1JF392J	R57	3.9k	1/16W M-Ox.
	AD100260	VRS-CY1JF221J	R201	220	1/16W M-Ox.
	AD100255	VRS-CY1JF122J	R202	1.2k	1/16W M-Ox.
	AD100280	VRS-CY1JF682J	R203	6.8k	1/16W M-Ox.
	AD100263	VRS-CY1JF270J	R204	2.7	1/16W M-Ox.
	AD100271	VRS-CY1JF391J	R205	390	1/16W M-Ox.
	AD100230	VRD-RA2EE151J	R206	150	1/4W Carbon
	AD100271	VRS-CY1JF391J	R208	390	1/16W M-Ox.
	AD100213	VRD-RA2BE222J	R301	2.2k	1/8W Carbon
	AD100251	VRS-CY1JF102J	R302	1.0k	1/16W M-Ox.
	AD100252	VRS-CY1JF103J	R303	10k	1/16W M-Ox.
	AD100270	VRS-CY1JF333J	R304	33k	1/16W M-Ox. (20AR30)
	AD100251	VRS-CY1JF102J	R305	1.0k	1/16W M-Ox. (20AR30)

Loc. No.	Part No.	Ref. No.	Description
PWB-A: DUNTK9731WEV3(20AR20)			
PWB-A: DUNTK9731WEV4(20AR30)			
MAIN UNIT (Continued)			
AD100257	VRS-CY1JF152J	R306	1.5k 1/16W M-Ox.
			(20AR30)
AD100208	VRD-RA2BE153J	R351	15k 1/8W Carbon
AD100224	VRD-RA2BE4R7J	R352	4.7 1/8W Carbon
AD100208	VRD-RA2BE153J	R353	15k 1/8W Carbon
			(20AR30)
AD100224	VRD-RA2BE4R7J	R354	4.7 1/8W Carbon
			(20AR30)
AD100217	VRD-RA2BE333J	R355	33k 1/8W Carbon
AD100280	VRS-CY1JF682J	R401	6.8k 1/16W M-Ox.
AD100268	VRS-CY1JF331J	R403	330 1/16W M-Ox.
AD100271	VRS-CY1JF391J	R404	390 1/16W M-Ox.
AD100200	VRD-RA2BE102J	R405	1.0k 1/8W Carbon
AD100273	VRS-CY1JF470J	R406	47 1/16W M-Ox.
AD100279	VRS-CY1JF680J	R407	68 1/16W M-Ox.
AD100251	VRS-CY1JF102J	R408	1.0k 1/16W M-Ox.
AD100274	VRS-CY1JF471J	R409	470 1/16W M-Ox.
AD100227	VRD-RA2BE563J	R410	56k 1/8W Carbon
AD100252	VRS-CY1JF103J	R411	10k 1/16W M-Ox.
AD100232	VRD-RA2EE561J	R412	560 1/4W Carbon
AD100220	VRD-RA2BE470J	R413	47 1/8W Carbon
AD100220	VRD-RA2BE470J	R414	47 1/8W Carbon
AD100220	VRD-RA2BE470J	R415	47 1/8W Carbon
AD100251	VRS-CY1JF102J	R416	1.0k 1/16W M-Ox.
AD100199	VRD-RA2BE101J	R417	100 1/8W Carbon
AD100257	VRS-CY1JF152J	R418	1.5k 1/16W M-Ox.
AD100275	VRS-CY1JF472J	R419	4.7k 1/16W M-Ox.
AD100261	VRS-CY1JF222J	R423	2.2k 1/16W M-Ox.
AD100264	VRS-CY1JF271J	R426	270 1/16W M-Ox.
AD100282	VRS-CY1JF821J	R440	820 1/16W M-Ox.
△ AD100290	VRS-VV3AB103J	R451	10k 1W M-Ox.
AD100207	VRD-RA2BE152J	R452	1.5k 1/8W Carbon
AD100211	VRD-RA2BE184J	R454	180k 1/8W Carbon
AD100219	VRD-RA2BE392J	R455	3.9k 1/8W Carbon
AD100262	VRS-CY1JF223J	R456	22k 1/16W M-Ox.
AD100200	VRD-RA2BE102J	R457	1.0k 1/8W Carbon
AD100205	VRD-RA2BE123J	R459	12k 1/8W Carbon
AD100221	VRD-RA2BE471J	R504	470 1/8W Carbon
AD100199	VRD-RA2BE101J	R505	100 1/8W Carbon
AD100228	VRD-RA2BE683G	R506	68k 1/8W Carbon
AD100203	VRD-RA2BE104G	R507	100k 1/8W Carbon
AD100223	VRD-RA2BE473J	R508	47k 1/8W Carbon
AD100235	VRD-RM2HD1R5J	R510	1.5 1/2W Carbon
△ AD100241	VRN-SV2HB1R5J	R511	1.5 1/2W M-Film
AD100237	VRD-RM2HD331J	R512	330 1/2W Carbon
AD100228	VRD-RA2BE683G	R516	68k 1/8W Carbon
AD100201	VRD-RA2BE103G	R517	10k 1/8W Carbon
AD100209	VRD-RA2BE154J	R518	150k 1/8W Carbon
AD100269	VRS-CY1JF332J	R524	3.3k 1/16W M-Ox.
AD100223	VRD-RA2BE473J	R525	47k 1/8W Carbon
AD100200	VRD-RA2BE102J	R552	1.0k 1/8W Carbon
AD100266	VRS-CY1JF273J	R553	27k 1/16W M-Ox.
AD100275	VRS-CY1JF472J	R554	4.7k 1/16W M-Ox.
AD100239	VRD-RM2HD472J	R602	4.7k 1/2W Carbon
△ AD100289	VRS-SV3LB182J	R603	1.8k 3.0W M-Ox
AD100221	VRD-RA2BE471J	R608	470 1/8W Carbon
AD100216	VRD-RA2BE331J	R609	330 1/8W Carbon
△ AD100294	VRS-VV3DB391J	R610	390 2W M-Ox.
AD100252	VRS-CY1JF103J	R620	10k 1/16W M-Ox.
AD100280	VRS-CY1JF682J	R621	6.8k 1/16W M-Ox.
AD100271	VRS-CY1JF391J	R631	390 1/16W M-Ox.
AD100207	VRD-RA2BE152J	R632	1.5k 1/8W Carbon
AD100275	VRS-CY1JF472J	R633	4.7k 1/16W M-Ox.
0316	VRD-RM2HD101J	R634	100 1/2W Carbon
△ AD100293	VRS-VV3AB682J	R641	6.8k 1W M-Ox.
AD100229	VRD-RA2BE821J	R642	820 1/8W Carbon
△ AD100234	VRD-RM2HD1R0J	R651	1.0 1/2W Carbon
△ AD100200	VRD-RA2BE102J	R653	1.0k 1/8W Carbon
△ AD100223	VRD-RA2BE473J	R654	47k 1/8W Carbon
△ AD100253	VRS-CY1JF104J	R655	100k 1/16W M-Ox.

Loc. No.	Part No.	Ref. No.	Description
△ AD100244	VRN-VV3AB2R2J	R659	2.2 1W M-Film
△ AD100247	VRN-VV3ABR47J	R661	0.47 1W M-Film
△ AD100299	VRW-KQ4AC2R7K	R701	2.7 10W Cement
△ AD100298	VRW-KQ3HC1R5K	R702	1.5 5W Cement
AD100233	VRD-RM2HD184J	R703	180k 1/2W Carbon
AD100233	VRD-RM2HD184J	R704	180k 1/2W Carbon
△ AD100297	VRS-VV3LB272J	R705	2.7k 3.0W M-Ox.
△ AD100245	VRN-VV3AB3R3J	R706	3.3 1W M-Film
△ AD100286	VRS-KT3LB562J	R707	5.6k 3.0W M-Ox.
△ AD100286	VRS-KT3LB562J	R708	5.6k 3.0W M-Ox.
△ AD100240	VRN-RV3DB4R7J	R709	4.7 2W M-Film
AD100206	VRD-RA2BE124J	R710	120k 1/8W Carbon
△ AD100246	VRN-VV3ABR22J	R711	0.22 1W M-Film
AD100234	VRD-RM2HD1R0J	R712	1.0 1/2W Carbon
△ AD100243	VRN-SV2HBR68J	R713	0.68 1/2W M-Film
AD100210	VRD-RA2BE180J	R714	18 1/8W Carbon
AD100199	VRD-RA2BE101J	R715	100 1/8W Carbon
AD100200	VRD-RA2BE102J	R716	1.0k 1/8W Carbon
AD100214	VRD-RA2BE270J	R717	27 1/8W Carbon
AD100219	VRD-RA2BE392J	R718	3.9k 1/8W Carbon
AD100208	VRD-RA2BE153J	R719	15k 1/8W Carbon
AD100229	VRD-RA2BE821J	R720	820 1/8W Carbon
△ AD100092	RR-DZ0053CEZZ	R725	8.2M 1/2W Solid
△ AD100092	RR-DZ0053CEZZ	R726	8.2M 1/2W Solid
AD100288	VRS-SV3LB100J	R730	10 3.0W M-Ox.
	(20AR30)	(20AR30)	
AD100231	VRD-RA2EE330J	R731	33 1/4W Carbon
			(20AR30)
AD100285	VRS-KA3NG330J	R732	33 7.0W M-Ox.
			(20AR30)
AD100242	VRN-SV2HBR22J	R751	0.22 1/2W M-Film
AD100225	VRD-RA2BE561J	R752	560 1/8W Carbon
△ AD100284	VRS-KA3HG3R3K	R753	3.3 5W M-Ox.
△ AD100295	VRS-VV3DB470J	R755	47 2W M-Ox.
AD100226	VRD-RA2BE562J	R756	5.6k 1/8W Carbon
△ AD100248	VRN-VV3LBR47J	R757	0.47 3.0W M-Film
△ AD100287	VRS-SV2HC180J	R758	18 1/2W M-Ox.
AD100269	VRS-CY1JF332J	R801	3.3k 1/16W M-Ox.
AD100269	VRS-CY1JF332J	R802	3.3k 1/16W M-Ox.
AD100261	VRS-CY1JF222J	R803	2.2k 1/16W M-Ox.
AD100261	VRS-CY1JF222J	R804	2.2k 1/16W M-Ox.
AD100261	VRS-CY1JF222J	R805	2.2k 1/16W M-Ox.
AD100270	VRS-CY1JF333J	R806	33k 1/16W M-Ox.
AD100281	VRS-CY1JF750J	R902	75 1/16W M-Ox.
AD100251	VRS-CY1JF102J	R905	1.0k 1/16W M-Ox.
			(20AR30)
AD100251	VRS-CY1JF102J	R906	1.0k 1/16W M-Ox.
AD100253	VRS-CY1JF104J	R924	100k 1/16W M-Ox.
			(20AR30)
AD100253	VRS-CY1JF104J	R925	100k 1/16W M-Ox.
AD100199	VRD-RA2BE101J	R961	100 1/8W Carbon
AD100199	VRD-RA2BE101J	R962	100 1/8W Carbon
AD100252	VRS-CY1JF103J	R2002	10k 1/16W M-Ox.
AD100252	VRS-CY1JF103J	R2006	10k 1/16W M-Ox.
AD100217	VRD-RA2BE333J	R2008	33k 1/8W Carbon
AD100251	VRS-CY1JF102J	R2009	1.0k 1/16W M-Ox.
AD100200	VRD-RA2BE102J	R2010	1.0k 1/8W Carbon
AD100282	VRS-CY1JF821J	R2011	820 1/16W M-Ox.
AD100274	VRS-CY1JF471J	R2012	470 1/16W M-Ox.
AD100236	VRD-RM2HD223J	R2020	22k 1/2W Carbon
AD100217	VRD-RA2BE333J	R2022	33k 1/8W Carbon
AD100280	VRS-CY1JF682J	R2024	6.8k 1/16W M-Ox.
AD100280	VRS-CY1JF682J	R2025	6.8k 1/16W M-Ox.
AD100280	VRS-CY1JF682J	R2026	6.8k 1/16W M-Ox.
AD100280	VRS-CY1JF682J	R2027	6.8k 1/16W M-Ox.
AD100200	VRD-RA2BE102J	R2028	1.0k 1/8W Carbon
AD100251	VRS-CY1JF102J	R2029	1.0k 1/16W M-Ox.
AD100252	VRS-CY1JF103J	R2031	10k 1/16W M-Ox.
AD100221	VRD-RA2BE471J	R2032	470 1/8W Carbon
AD100251	VRS-CY1JF102J	R2040	1.0k 1/16W M-Ox.
AD100217	VRD-RA2BE333J	R2041	33k 1/8W Carbon
AD100250	VRS-CY1JF101J	R2042	100 1/16W M-Ox.
AD100250	VRS-CY1JF101J	R2043	100 1/16W M-Ox.
AD100280	VRS-CY1JF682J	R2044	6.8k 1/16W M-Ox.
AD100250	VRS-CY1JF101J	R2045	100 1/16W M-Ox.
AD100260	VRS-CY1JF221J	R2047	220 1/16W M-Ox.

Loc.No.	Part No.	Ref. No.	Description	Loc.No.	Part No.	Ref. No.	Description
PWB-A: DUNTK9731WEV3(20AR20)							
PWB-A: DUNTK9731WEV4(20AR30)							
MAIN UNIT (Continued)							
AD100276	VRS-CY1JF562J	R2048	5.6k 1/16W M-Ox.	AD100034	QPLGN0260CEZZ	P702	Plug, 2-pin(M)
AD100270	VRS-CY1JF333J	R2049	33k 1/16W M-Ox.	AD100037	QPLGN0461CEZZ	P751	Plug, 4-pin(YBN)
AD100252	VRS-CY1JF103J	R2054	10k 1/16W M-Ox.	AD100038	QPLGN0561CEZZ	P901	Plug, 5-pin(E)
AD100202	VRD-RA2BE103J	R2055	10k 1/8W Carbon	AD100038	QPLGN0561CEZZ	P2001	Plug, TP2001-5
AD100260	VRS-CY1JF221J	R2060	220 1/16W M-Ox.	095	RRMCU0222CEZZ	RMC2601	R/C Receiver
AD100276	VRS-CY1JF562J	R2061	5.6k 1/16W M-Ox.	AD100017	PRDAR0102GJFW	RDA351	Heat Sink, for IC351
AD100259	VRS-CY1JF183J	R2062	18k 1/16W M-Ox.	AD100017	PRDAR0102GJFW	RDA352	Heat Sink, for IC352
AD100213	VRD-RA2BE222J	R2063	2.2k 1/8W Carbon	(20AR30)	(20AR30)		
AD100269	VRS-CY1JF332J	R2064	3.3k 1/16W M-Ox.	AD100018	PRDAR0103GJFW	RDA501	Heat Sink, IC501
AD100252	VRS-CY1JF103J	R2066	10k 1/16W M-Ox.	AD100019	PRDAR0216PEFW	RDA601	Heat Sink, for Q602
AD100252	VRS-CY1JF103J	R2067	10k 1/16W M-Ox.	AD100020	PRDAR0222PEFW	RDA701	Heat Sink, for Q701
AD100252	VRS-CY1JF103J	R2068	10k 1/16W M-Ox.	AD100011	LHLDW1002PEZZ		Holder
AD100252	VRS-CY1JF103J	R2070	10k 1/16W M-Ox.	AD100012	LX-BZ3100CEFD		Screw M3x8mm for Heatsink
AD100250	VRS-CY1JF101J	R2101	100 1/16W M-Ox.	AD100012	LX-BZ3100CEFD		Screw M3x8mm for Heatsink
AD100250	VRS-CY1JF101J	R2102	100 1/16W M-Ox.	AD100012	LX-BZ3100CEFD		Screw M3x8mm for Heatsink
AD100256	VRS-CY1JF123J	R2501	12k 1/16W M-Ox.	AD100012	LX-BZ3100CEFD		Screw M3x8mm for Heatsink
AD100266	VRS-CY1JF273J	R2503	27k 1/16W M-Ox.	(20AR30)	(20AR30)		
AD100256	VRS-CY1JF123J	R2504	12k 1/16W M-Ox.	AD100015	LX-TZ3004CEFD		Screw M3x8mm for Heatsink
AD100277	VRS-CY1JF563J	R2505	56k 1/16W M-Ox.	AD100024	QCNW-2047PEZZ		Connecting Cord
AD100277	VRS-CY1JF563J	R2506	56k 1/16W M-Ox.	0317	XTASD40P20000		Screw M4x20mm for Cabinet
AD100283	VRS-CY1JF823J	R2507	82k 1/16W M-Ox.	013	LX-TZ0104GJFD		Screw M6x35mm for CRT
AD100258	VRS-CY1JF153J	R2508	15k 1/16W M-Ox.	014	LX-TZ0106GJFD		Screw M4x16mm for Speakers
AD100265	VRS-CY1JF272J	R2509	2.7k 1/16W M-Ox.				
0220	VRD-RA2BE470J	R2601	47 1/8W Carbon				
0212	VRD-RA2BE221J	R3001	220 1/8W Carbon				
AD100212	VRD-RA2BE221J	R3002	220 1/8W Carbon				
AD100254	VRS-CY1JF105J	R3003	1.0M 1/16W M-Ox.				
AD100253	VRS-CY1JF104J	R3004	100k 1/16W M-Ox.				
AD100278	VRS-CY1JF623J	R3005	62k 1/16W M-Ox.				
AD100269	VRS-CY1JF332J	R3007	3.3k 1/16W M-Ox.				
AD100267	VRS-CY1JF302J	R3008	3.0k 1/16W M-Ox.				
AD100272	VRS-CY1JF392J	R3010	3.9k 1/16W M-Ox.				
AD100251	VRS-CY1JF102J	R3011	1.0k 1/16W M-Ox.				
AD100251	VRS-CY1JF102J	R3012	1.0k 1/16W M-Ox.				
AD100215	VRD-RA2BE2R2J	R3013	2.2 1/8W Carbon				
SWITCHES							
AD10041	QSW-K0079GEZZ	S2501	Power				
AD10041	QSW-K0079GEZZ	S2502	Vol-Down				
AD10041	QSW-K0079GEZZ	S2503	Vol-Up				
AD10041	QSW-K0079GEZZ	S2504	Ch-Down				
AD10041	QSW-K0079GEZZ	S2505	Ch-Up				
MISCELLANEOUS PARTS							
△ AD100093	RRLYU0036CEZZ	RY701	Relay				
△ AD100093	RRLYU0036CEZZ	RY751	Relay				
△ AD100027	QFS-C3229CEZZ	F701	Fuse, 3.15A				
AD100042	RBLN-0037CEZZ	FB602	Ferrite Bead				
AD100042	RBLN-0037CEZZ	FB603	Ferrite Bead				
AD100042	RBLN-0037CEZZ	FB701	Ferrite Bead				
AD100042	RBLN-0037CEZZ	FB702	Ferrite Bead				
AD100042	RBLN-0037CEZZ	FB751	Ferrite Bead				
AD100042	RBLN-0037CEZZ	FB752	Ferrite Bead				
AD100028	QFSDH1013CEZZ	FH701	Fuse Holder				
AD100029	QFSDH1014CEZZ	FH702	Fuse Holder				
AD100037	QPLGN0461CEZZ	P302	Plug, 4-pin(S)				
AD100038	QPLGN0561CEZZ	P401	Plug, 5-pin(GNB)				
AD100039	QPLGN0660CEZZ	P601	Plug, 6-pin(K)				
AD100036	QPLGN0361CEZZ	P651	Plug, TP651-3				
AD100035	QPLGN0269GEZZ	P701	Plug, 2-pin(P)				

Loc. No.	Part No.	Ref. No.	Description
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PWB-B: DUNTK9432WEV4
CRT UNIT

TRANSISTORS

AD100304	VS2SC2229O/1E	Q852	2SC2229
AD100304	VS2SC2229O/1E	Q854	2SC2229
AD100304	VS2SC2229O/1E	Q856	2SC2229
0300	VS2SA1266-Y-1	Q881	2SA1266(Y)

DIODES

You can substitute "RH-DX0045GEZZ" and "RH-DX0446CEZZ" for "VHD1SS119//-1".

AD100179	VHD1SS119//-1	D881	Diode
AD100179	VHD1SS119//-1	D882	Diode
AD100179	VHD1SS119//-1	D885	Diode

COIL

AD100190	VP-DF151K0000	L851	Peaking 150μH
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CAPACITORS

[EL...Electrolytic]

AD100158	VCKYPA1HB271K	C851	270p 50V Ceramic
AD100158	VCKYPA1HB271K	C852	270p 50V Ceramic
AD100158	VCKYPA1HB271K	C853	270p 50V Ceramic
AD100053	RC-KZ0016CEZZ	C854	0.01 1.4kV Ceramic
AD100119	VCEA0A1CW106M	C881	10 16V EL.
AD100124	VCEA0A1CW336M	C883	3.3 16V EL.

RESISTORS

[M-Ox... Metal Oxide]

AD100220	VRD-RA2BE470J	R854	4.7 1/8W Carbon
AD100212	VRD-RA2BE221J	R852	220 1/8W Carbon
AD100204	VRD-RA2BE121J	R853	120 1/8W Carbon
AD100220	VRD-RA2BE470J	R855	4.7 1/8W Carbon
△ AD100291	VRS-VV3AB123J	R857	12k 1W M-Ox.
AD100238	VRD-RM2HD332J	R858	3.3k 1/2W Carbon
AD100220	VRD-RA2BE470J	R859	4.7 1/8W Carbon
AD100212	VRD-RA2BE221J	R860	220 1/8W Carbon
AD100204	VRD-RA2BE121J	R861	120 1/8W Carbon
△ AD100291	VRS-VV3AB123J	R865	12k 1W M-Ox.
AD100238	VRD-RM2HD332J	R866	3.3k 1/2W Carbon
AD100212	VRD-RA2BE221J	R868	220 1/8W Carbon
AD100204	VRD-RA2BE121J	R869	120 1/8W Carbon
△ AD100291	VRS-VV3AB123J	R873	12k 1W M-Ox.
AD100238	VRD-RM2HD332J	R874	3.3k 1/2W Carbon
AD100200	VRD-RA2BE102J	R881	1.0k 1/8W Carbon
AD100218	VRD-RA2BE391J	R882	390 1/8W Carbon
AD100225	VRD-RA2BE561J	R883	560 1/8W Carbon
AD100207	VRD-RA2BE152J	R884	1.5k 1/8W Carbon
AD100220	VRD-RA2BE470J	R885	4.7 1/8W Carbon

MISCELLANEOUS PARTS

AD100038	QPLGN0561CEZZ	P851	Plug, 5-pin(GBN)
AD100037	QPLGN0461CEZZ	P852	Plug, 4-pin(YBN)
AD100040	QSOCV0840CEZZ	SC851	C R T Socket

PWB-C: DUNTK9732WEV3(20AR20)
PWB-C: DUNTK9732WEV4(20AR30)
FRONT AV UNIT

MISCELLANEOUS PARTS

AD100030	QJAKE0150CEZZ	J1001	Jack, V ideo IN
AD100032	QJAKE0185CEZZ	J1002	Jack, Audio IN
AD100031	QJAKE0184CEZZ (20AR30)	J1003	Jack, Audio IN
AD100038	QPLGN0561CEZZ	P1001	Plug, 5-pin(E)

Loc. No.	Part No.	Ref. No.	Description
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MISCELLANEOUS PARTS

△ AD100021	QACCZ3008PEZZ	AC Cord
AD100022	QCNW-1964PEZZ	Connecting Cord
AD100023	QCNW-2011PEZZ	Connecting Cord
AD100025	QCNW-2110PEZZ	Connecting Cord
AD100311	VSP9050PB218A	Speaker (20AR20)
AD100312	VSP9050PB2 5WA	Speaker (20AR30)

SUPPLIED ACCESSORIES

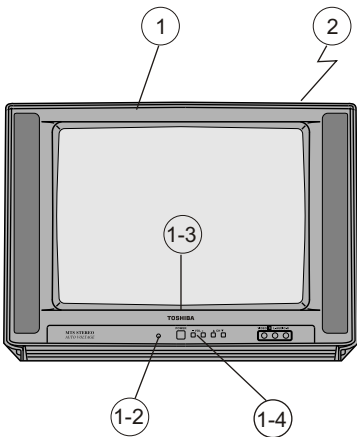
AD100104	TINS-7104GJZZ	Operation Manual(20AR20/30)
AD100094	RRMCG1589CESA	Infrared R/C Unit
AD100033	QPLGA0017CEZZ	Plug
AD100105	UBATU0001AJZZ	Battery Box Unit

PACKING PARTS
(NOT REPLACEMENT ITEM)

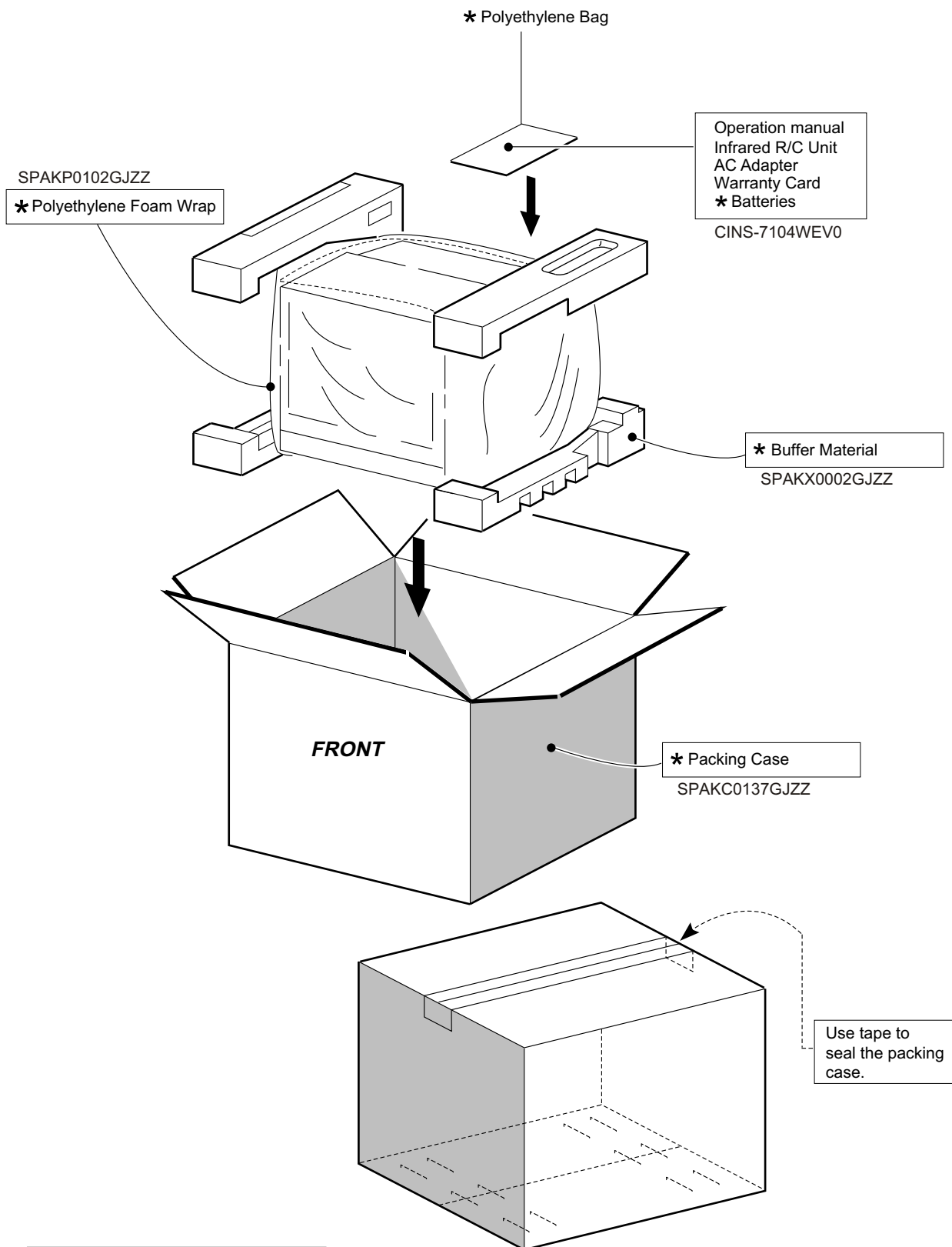
100	SPAKC0137GJZZ	— Packing Case
101	SPAKP0102GJZZ	— Polyethylene Foam Wrap
102	SPAKX0002GJZZ	— Buffer Material
103	SSAKA0101GJZZ	— Polyethylene Bag

CABINET PARTS

AD100001	CCABA0112WEH0	Front Cabinet Ass'y 1 (20AR20)
AD100002	CCABA0113WEH0	Front Cabinet Ass'y 1 (20AR30)
AD100008	GCOVA0002GJSA	R/C Cover 1-2
AD100009	HBDGB0102GJSA	Badge, "TOSHIBA" 1-3
AD100010	JBTN-0002GJSD	Button 1-4
AD100007	GCABB0002GJKA	Rear Cabinet 2



PACKING OF THE SET



*** MARK** : Not Replacement Items.

TOSHIBA CORPORATION

1-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO 105-8001, JAPAN