HITACHI

SERVICE MANUAL

NTSC | PA2 CHASSIS

PA | No. 0103

27MMV30B

R/C: CLU-433PC
CLU-433MC

Models 27MM20BA and 27MMV30B are in the same Solid State Color Television family. The difference between the 27MM20BA and the 27MMV30B is the DDC2B and Instruction Book. Please refer to Model 27MM20B and 27MM20BA schematics, assembly, wiring, test, and troubleshooting information when servicing Model 27MMV30B. Refer to Service Manual PA No. 0092 issued in March 1998. Refer to Service Manual PA No. 0092 for the technical information regarding the "Description of Circuit" and "IC's and Transistors Functions" issued in March 1998.

REPLACEMENT PARTS LIST

This parts list only gives parts which are different from the Service Manual PA No. 0092. PRODUCT SAFETY NOTE: Components marked with a ⚠ have special characteristics important to safety. Before replacing any of these components, read carefully, the PRODUCT SAFETY NOTICE of this Service Manual. Do not degrade the safety of the receiver through improper servicing.

For 27MMV30B (Same as 27MM20BA except below parts)

SYMBOL NO.	PART NO.	DESCRIPTION
N201	QR26891	Instruction Book English
B	JK03655(H)	PA2 DDC2B P.W.B.

Above parts list of 27MMV30B plus attached replacement parts list are parts which are different from the Service Manual PA No. 0092.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

SOLID STATE COLOR TELEVISION

JULY 1998 **HHEA-MANUFACTURING DIVISION**

SAFETY PRECAUTIONS

NOTICE: Comply with all cautions and safety-related notes located on or inside the cabinet and on the chassis or picture tube.

WARNING: Since the chassis of this receiver is connected to one side of the AC power supply during operation, whenever the receiver is plugged in, service should not be attempted by anyone unfamiliar with the precautions necessary when working on this type of receiver.

The following precautions should be observed:

1. Do not install, remove, or handle the picture tube in any manner unless shatterproof goggles are worn. People not so equipped should be kept away from the picture tube while handling.

2. When service is required, an isolation transformer should be inserted between power line and the receiver before any service is performed on a "HOT" chassis receiver.

3. When replacing a chassis in the receiver, all the protective devices must be put back in place, such as barriers, nonmetallic knobs, adjustment and compartment cover-shields, isolation resistors, capacitors, etc.

4. When service is required, observe the original lead dress in the high voltage circuitry area.

5. Always use the manufacturer's replacement components. Critical components as indicated on the circuit diagram should not be replaced by another manufacturer's. Furthermore, where a short circuit has occurred, replace those components that indicate evidence of overheating.

6. Before returning a serviced receiver to the customer, the service technician must thoroughly test the unit to be certain that it is completely safe to operate without danger of electrical shock, and be sure that no protective device built into the receiver by the manufacturer has become defective, or inadvertently defeated during servicing.

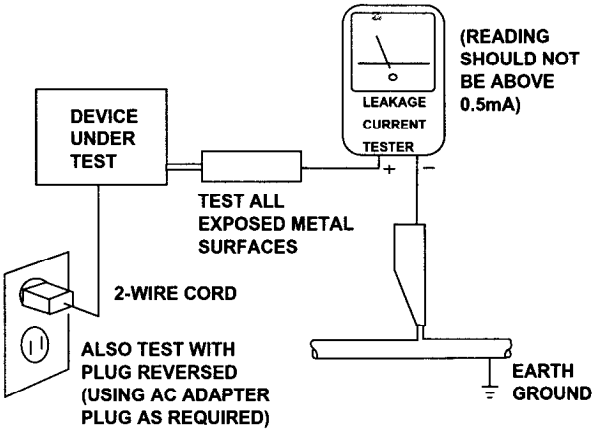
Therefore, the following checks should be performed for the continued protection of the customer and service technician.

Leakage Current Cold Check

With the AC plug removed from the 120V AC 60Hz source, place a jumper across the two plug prongs. Using an insulation tester (DC500V), connect one lead to the jumpered AC plug and touch the other lead to each exposed metal part (antennas, screwheads, metal overlays, control shafts, etc.), particularly any exposed metal part having a return path to the chassis should have a minimum resistor reading of 0.24MΩ and a maximum resistor reading of 12MΩ . Any resistance value below or above this range indicates an abnormality which requires corrective action. An exposed metal part having a return path to the chassis will indicate an open circuit.

Leakage Current Hot Check

Plug the AC line cord directly into a 120V AC 60Hz outlet (do not use an isolation transformer for this check). Turn the AC power ON. Using a Leakage Current Tester (Simpson's Model 229 or equivalent), measure for current from all exposed metal parts of the cabinet (antennas, screwheads, overlays, control shafts, etc.) particularly any exposed metal part having a return path to the chassis or to a known earth ground (water pipe, conduit, etc.). Any current measured must not exceed 0.5 milliamps.



AC LEAKAGE TEST

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE RECEIVER TO THE CUSTOMER.

High Voltage

This receiver is provided with a hold down circuit for clearly indicating that voltage has increased in excess of a predetermined value. Comply with all notes described in this service manual regarding this hold down circuit when servicing, so that this hold down circuit is operated correctly.

Serviceman Warning

With minimum BRIGHTNESS and CONTRAST, the operating high voltage in this receiver is lower than 34.0kV. In case any component having influence on the high voltage is replaced, confirm that high voltage with minimum BRIGHTNESS and CONTRAST is lower than 34.0kV. To measure high voltage use a High Impedance High Voltage meter. Connect (-) to chassis earth and (+) to the CRT Anode button. (See the following connection diagram).

NOTE: Turn power switch OFF without fail before the connection to the Anode button is made.

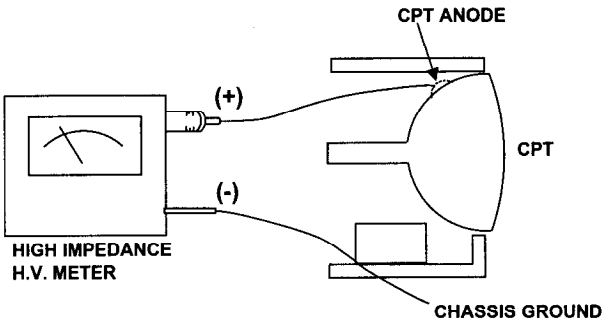
PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in HITACHI television receivers have special safety-related characteristics. These are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified with an ⚠ mark in the schematics and parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the HITACHI-recommended replacement component, shown in the parts list in this Service Manual, may create shock, fire, X-Radiation, or other hazards.

Production safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current HITACHI Service Manual. A subscription to, or additional copies of HITACHI Service Manuals may be obtained at a nominal charge from HITACHI Sales Corporation.



X-Radiation

TUBE: The primary source of X-Radiation in this receiver is the picture tube. The tube utilized in this chassis is specially constructed to limit X-Radiation emissions. For continued X-Radiation protection, the replacement tube must be the same type as the original HITACHI-approved type.

When troubleshooting and making test measurements in a receiver with an excessive high voltage problem, avoid being unnecessarily close to the picture tube and the high voltage component.

Do not operate the chassis longer than is necessary to locate the cause of excessive voltage.

This Service Manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual. Improperly performed repairs can adversely affect the safety and reliability of the product and may void warranty. Consumers should not risk trying to do the necessary repairs and should refer to a qualified service technician.

WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health and Safety Code, Section 25249.5).

When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with solder. Also, when soldering do not inhale any smoke or fumes produced.

SAFETY NOTICE
USE ISOLATION TRANSFORMER
WHEN SERVICING

Components having special safety characteristics identified by ⚠ on the parts list in this Model service manual and its supplements and bulletins. Before servicing this, it is important that the service technician read and follow the "Safety Precautions" and the "Product Safety Notices" in this Service Manual.

For continued X-Radiation protection, replace picture tube with original type or HITACHI equivalent type.

POWER SOURCE

This television receiver is designed to operate on 120 Volts/ 60Hz, AC house current. Insert the power cord into a 120 Volts/60Hz outlet.

NEVER CONNECT THE TV TO OTHER THAN THE SPECIFIED VOLTAGE OR TO DIRECT CURRENT.

TECHNICAL SPECIFICATIONS

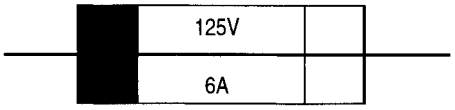
PICTURE TUBE

27MMV30B/PA2 . . . . . .A68KSA30X(D)

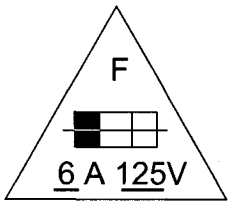
CAUTION

The following symbol near the fuse indicates fast operating fuse (to be replaced). Fuse ratings appear within the symbol. **"RISK OF FIRE - REPLACE FUSE AS MARKED"**

Example:



F901



The rating of fuse F901 is 6.0A-125V.
Replace with the same type fuse for continued protection against fire.

Inputs:

- Power Input . . . . . AC 120V, 60Hz
- Power Consumption (operating) . . . . . 188 W
- Power Consumption (maximum) . . . . . 188 W

- Antenna input impedance . . . . . 75 Ohm
- Channel coverage . . . . . 181 ch.
- VHF-Band . . . . . 2 ~ 13
- UHF-Band . . . . . 14 ~ 69
- CATV Mid Band . . . . . A-5 ~ A-1

- Super Band . . . . . J-W
- Hyper Band . . . . . W+1 - W+28
- Ultra Band . . . . . W+29 - W+84

- Video input . . . . . 1.0Vp-p, 75 Ohm
- S-Video input
  Luminance (Y) . . . . . 1.0Vp-p, 75 Ohm
  Chrominance (C) . . . . . 0.286Vp-p, 75 Ohm
- Audio input level (average) . . 400mVrms, 47K Ohm

Outputs:

- Audio Output (variable) . . . . . 400mVrms, 1K Ohm

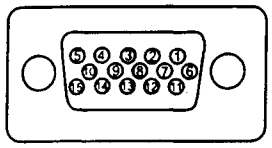
Dimensions:

- Height (in.) 23 $^{1}/_{32}$
- Width (in.) 27 $^{9}/_{32}$
- Depth (in.) 20 $^{13}/_{64}$
- Weight (lbs.) 88

VGA SPECIFICATIONS

TYPE		PS2-1	PS2-2	PS2-3
MODE		640X350	640X400	640X480
HORIZONTAL FREQUENCY		31.469Khz	31.469Khz	31.469Khz
VERTICAL FREQUENCY		70.08Hz	70.08Hz	59.94Hz
SYNC TYPE		H/V separate	H/V separate	H/V separate
SYNC POLARITY	H	TTL: positive	TTL: negative	TTL: negative
	V	TTL: negative	TTL: positive	TTL: negative

D-Sub Mini 15-Pin Connector Pin Assignments



PIN NO.	SIGNAL	PIN NO.	SIGNAL
1	Red Video	9	No Connection
2	Green Video	10	Ground
3	Blue Video	11	No Connection
4	Ground	12	No Connection
5	Ground	13	H-Sync (or H/V sync)
6	Red Ground	14	V-Sync
7	Green Ground	15	Ground
8	Blue Ground		

NOTE: Due to improvements, specifications in this operating guide are subject to change without notice.

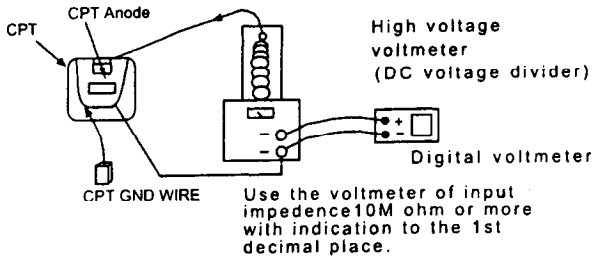
TECHNICAL CAUTIONS

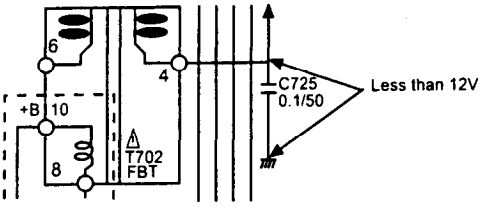
HV Protection circuit operation checking.

High voltage limiter circuit operation check and over voltage protection circuit operation check.

Adjustment Preparation

(1) Connect a high voltage voltmeter between CPT anode terminal (Anode cap side) and the ground as below.
(2) Set AC input voltage to 120±3V.
(3) Receive Hitachi circle pattern and set "Bright" and "CONTRAST" to max. Adjust Screen VR so that Beam Current is 1B 1.15±0. 1mA. (The voltage of ABL terminal-C725 both ends should be 12V or less)

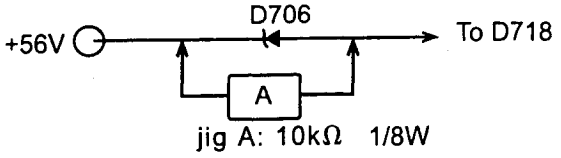




Adjustment Procedure

(1) Check that the normal High Voltage is 27.0±1.5KV and +B Voltage is 130±1.5V.

(2) Connect jig A to the Both end of R706 and check that the power is turned off.



(3) Disconnect the AC plug and remove jig A.

AGENCY REGULATORY INFORMATION

Federal Communications Commission Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Hitachi Home Electronics (America), Inc. may void the user's authority to operate the equipment.

Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods to maintain compliance with FCC Rules and Regulations.

Any cables that are supplied with the system must be replaced with identical cables in order to assure compliance with FCC rules. Order Hitachi spares as replacement cables.

Declaration of Conformity

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any cables that are supplied with the system must be replaced with identical cables in order to assure compliance with FCC rules. Order Hitachi spares as replacement cables.

For questions regarding this declaration, contact:

Hitachi Home Electronics (America), Inc.
1855 Dornoch Court
San Diego, CA 92173
1-800-448-2244 (1-800-HITACHI)
Attn: Customer Relations

REPLACEMENT PARTS LIST

PRODUCT SAFETY NOTE: Components marked with a ⚠ have special characters important to safety.
Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this service manual.
Don't degrade the safety of the receiver through improper servicing.

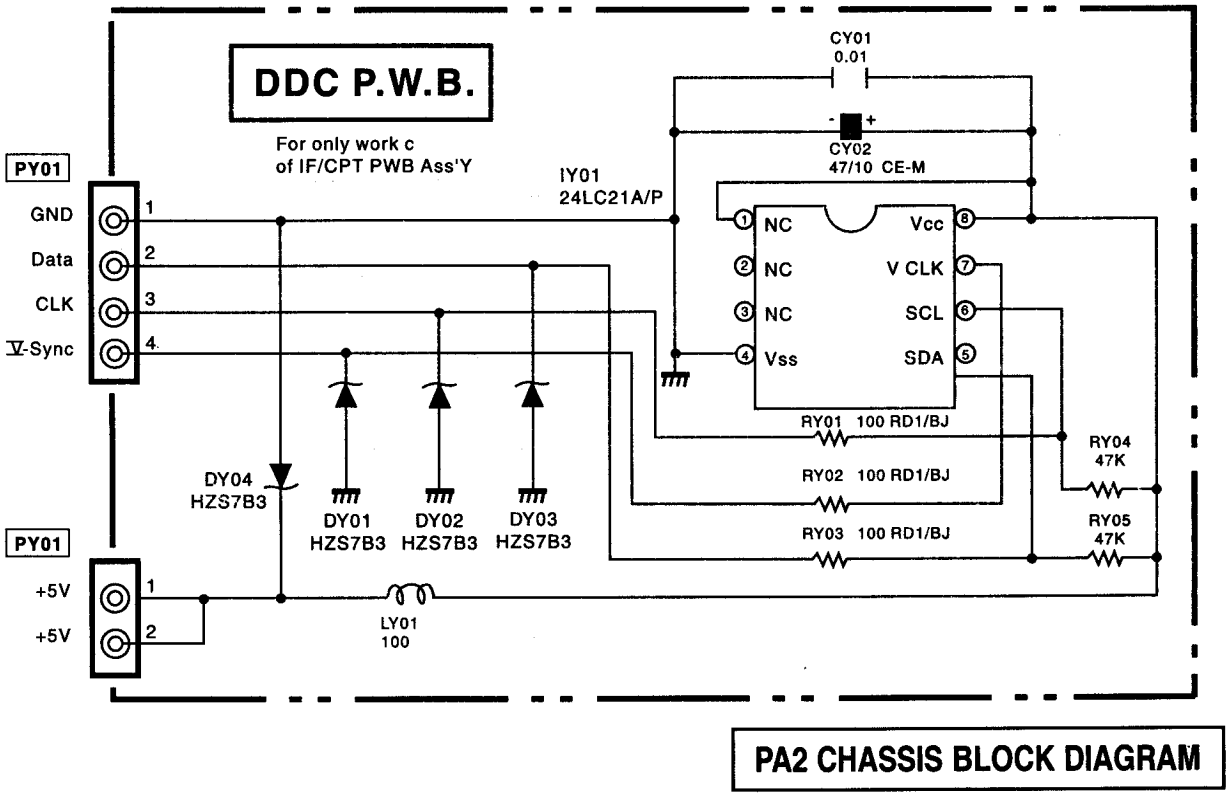
ABBREVIATIONS

Capacitors:		Resistor:		Semiconductors:	
CD:	Ceramic Disc	CF:	Carbon Film	TR:	Transistor
PF:	Polyester Film	CC:	Carbon Composition	DI:	Diode
EL:	Electrolytic	MF:	Metal Oxide Film	ZD:	Zener Diode
PP:	Polypropylene	VR:	Variable Resistor	VA:	Varistor
PR:	Paper	WW:	Wire Wound	TH:	Thermistor
TA:	Tantalum	FR:	Fuse Resistor	IC:	Integrated Circuit
TM:	Trimmer	MG:	Metal Glaze		
MC:	Mylar				

SYMBOL NO.	PART NO.	PART DESCRIPTION
		DDC2B P.W.B.
LJT0660		
CY01	0880009R	CAP.-POLYESTER 0.01UF-K 50V
CY02	0800039R	CAP.-ELECTRO. 47UF-M 10V
DY01	2339856M	ZENER HZS7B3 TA
DYO2	2339856M	ZENER HZS7B3 TA
DY03	2339856M	ZENER HZS7B3 TA
IY01	CP01042U	DIGITAL MONOLITHIC IC (24LC21A-/P)
KY51	2974432M	JUMPER WIRE (0.5 L=52MM)
KY52	2974432M	JUMPER WIRE (0.5 L=52MM)
LY01	BH00697R	COIL 100UH
PY01	2959053	5P POST PIN 4P TYPE PH
PY02	2959051	PIN POST (PH 2P)
RY01	0100041M	RES.-CARBON FLM 1/8W 100-JB
RY02	0100041M	RES.-CARBON FLM 1/8W 100-JB
RY03	0100041M	RES.-CARBON FLM 1/8W 100-JB
RY04	0700063M	RES.-CARBON FLM 1/16W 47K-JB
RY05	0700063M	RES.-CARBON FLM 1/16W 47K-JB

BASIC CIRCUIT DIAGRAM

DDC2B Circuit Schematic



PA2 CHASSIS BLOCK DIAGRAM

PRODUCT SAFETY NOTE: Components marked with a ⚠ and shaded have special characteristics important to safety. Before replacing any of these components, read carrefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

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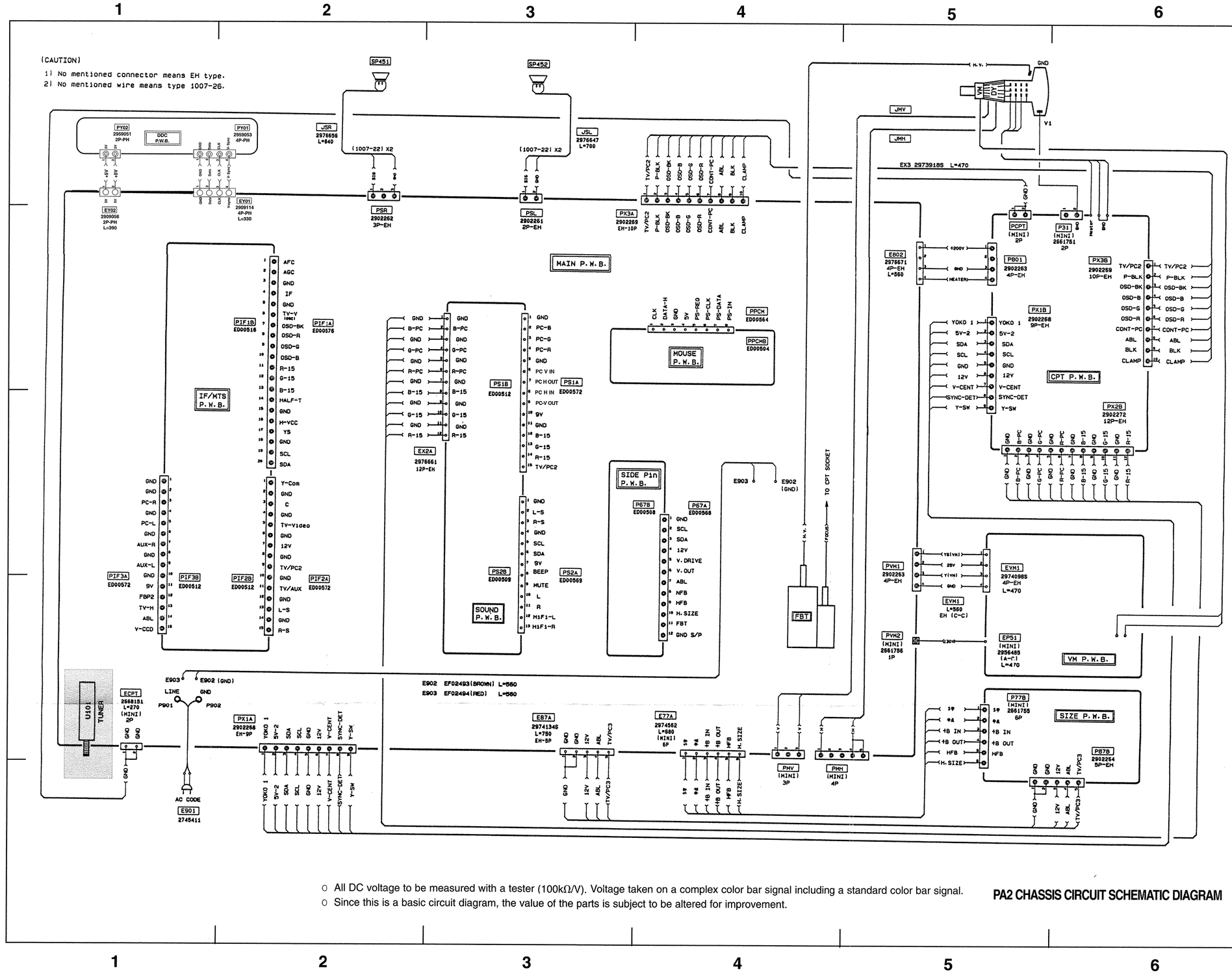
BASIC CIRCUIT DIAGRAM



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PA2 CHASSIS CIRCUIT SCHEMATIC DIAGRAM

BASIC CIRCUIT DIAGRAM

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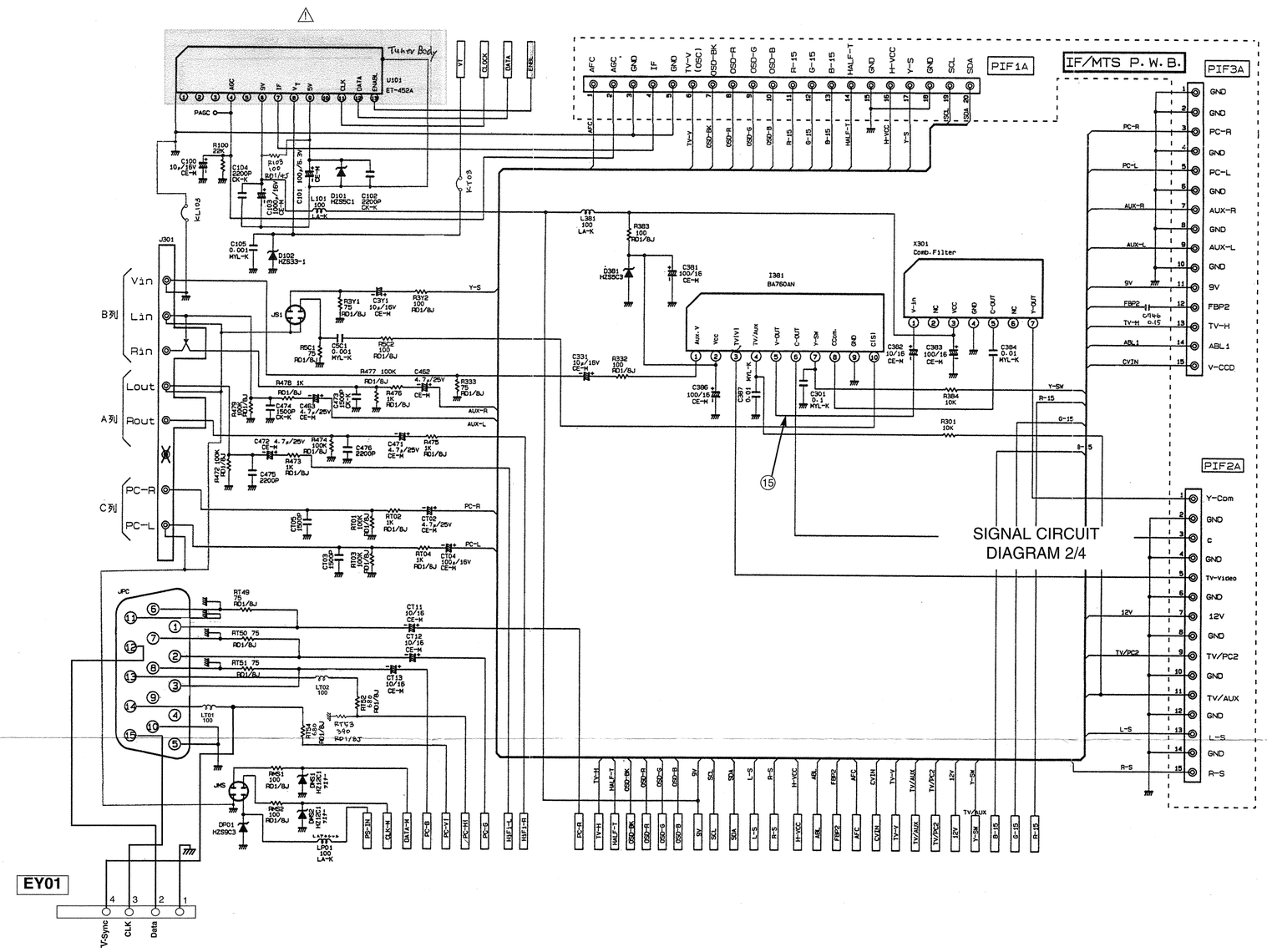
circuit no.	pin no.	DC voltage
I381	1	2.59v
	2	5.35v
	3	2.56v
	4	0.90v
	5	1.83v
	6	1.83v
	7	0.95v
	8	2.55v
	9	0v
	10	2.59v



○ All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
○ Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

PA2 CHASSIS CIRCUIT SCHEMATIC DIAGRAM

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BASIC CIRCUIT DIAGRAM

SIGNAL CIRCUIT DIAGRAM 4/4

circuit no.	pin no.	DC voltage	
		TV mode	PC mode
I001	1	4.18v	4.05
	2	4.72v	4.72v
	3	2.54v	2.54v
	4	4.94v	4.9v
	5	3.72v	1.85v
	6	4.97v	0.38v
	7	0v	0v
	8	4.89v	4.73v
	9	4.99v	4.95v
	10	0v	4.86v
	11	0v	1.74v
	12	0v	0v
	13	0v	0v
	14	0v	0v
	15	4.97v	4.93v
	16	4.97v	4.94v
	17	4.98v	4.94v
	18	4.98v	4.94v
	19	2.11v	2.81v
	20	2.11v	2.79v
	21	0.16v	0.1v
	22	2.17v	1.52v
	23	0v	0v
	24	2.21v	2.4v
	25	1.8v	1.81v

circuit no.	pin no.	DC voltage	
		TV mode	PC mode
I001	26	0v	0v
	27	4.98v	4.94v
	28	4.98v	3.17v
	29	4.98v	3.12v
	30	4.96v	4.92v
	31	4.96v	4.92v
	32	0v	0v
	33	4.91v	0v
	34	0v	0v
	35	0v	4.93v
	36	1.21v	1.2v
	37	4.54v	4.3v
	38	0v	0.1v
	39	4.16v	4.3v
	40	0v	0v
	41	0v	0v
	42	4.98v	4.94v
	43	4.98v	1.27v
	44	4.98v	1.28v
	45	0.86v	0.87v
	46	0v	0v
	47	0v	0v
	48	0v	0v
	49	0v	0v
	50	0v	0v
	51	0v	0v
	52	0v	0v

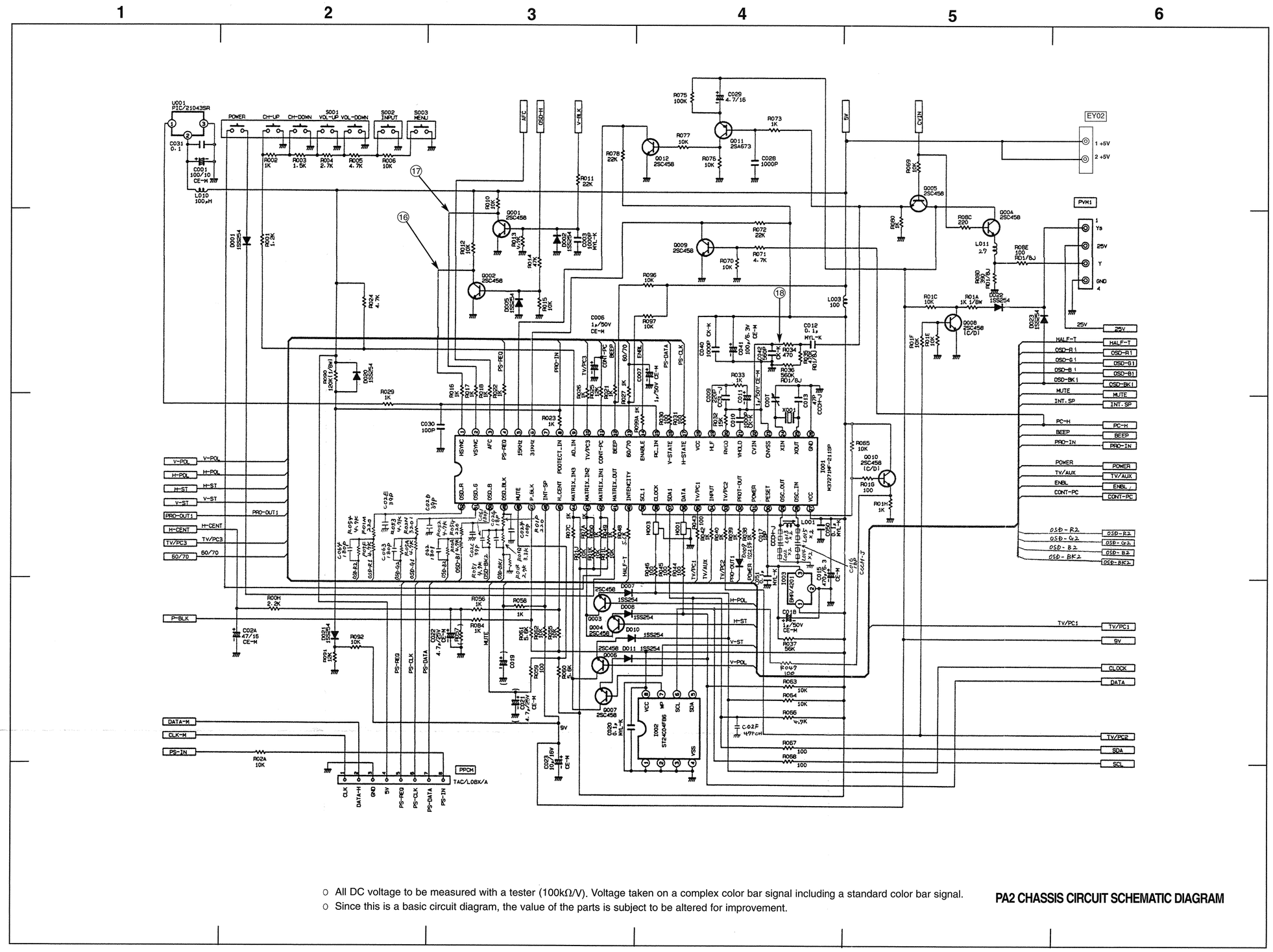
circuit no.	pin.no.	DC voltage
I 002	1	0v
	2	0v
	3	0v
	4	0v
	5	4.5v
	6	3.6v
	7	0v
	8	4.98v

circuit no.	pin no.	DC voltage
I 003	1	4.98v
	2	0v
	3	4.95v

circuit no.	pin no.	DC voltage
Q001	b	0v
	c	4.72v
	e	0v

circuit no.	pin no.	DC voltage
Q002	b	0v
	c	4.18v
	e	0v

circuit no.	pin no.	DC voltage	
		TV mode	PC mode
Q003	b	0v	1.61v
	c	4.98v	0.9v
	e	0v	0.9v
Q004	b	0.1v	1.58v
	c	4.98v	0.9v
	e	0v	0.9v



- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

PA2 CHASSIS CIRCUIT SCHEMATIC DIAGRAM

circuit no.	pin no.	DC voltage
Q005	b	2.17v
	c	9.21v
	e	1.52v

circuit no.	pin no.	DC voltage	
		TV mode	PC mode
Q006	b	0v	1.61v
	c	4.98v	0.9v
	e	0v	0.9v
Q007	b	0v	1.57v
	c	4.98v	0.9v
	e	0v	0.9v

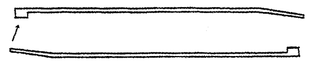
circuit no.	pin no.	DC voltage	
Q008	b	0.66v	0v
	c	0v	9.21v
	e	0v	0v
Q009	b	0.1v	0.56v
	c	4.97v	0.38v
	e	0v	0v
Q010	b	*4.2v	*4.3v
	c	4.98v	4.94v
	e	*3.5v	*3.3v
Q011	b	1.54v	1v
	c	0.3v	0.6v
	e	1.69v	1.51v
Q012	b	0.1v	0.45v
	c	3.72v	1.95v
	e	0v	0v
Q00A	b	1.8v(TV)	
	c	9.2v(TV)	
	e	1.6v(TV)	

WIRING DRAWING OF 27MMV30B FINAL ASSEMBLY

Instruction

A) Please prepare two sets of binders attach as it shows on the next drawing.

INSERT THE TIP ON
THE OTHER BINDER

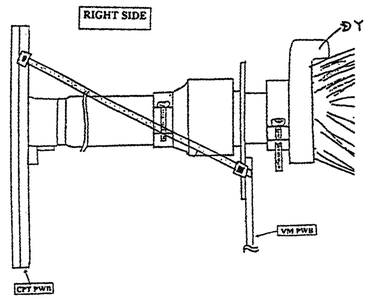


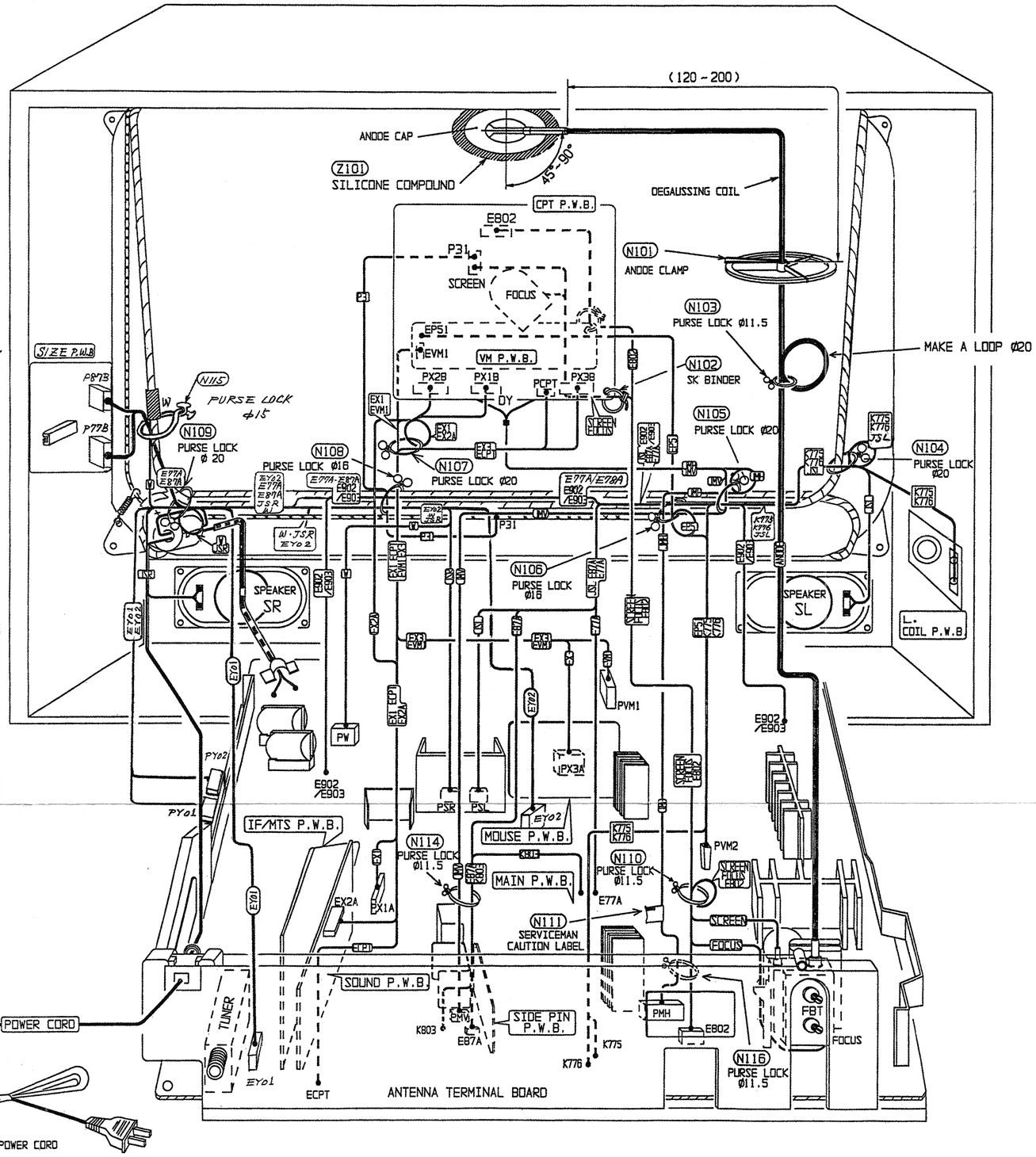
B) Using a set of binders insert one tip of the set in the left top side of the CPT PWB and the other tip insert in the left top side of the VM PWB.

C) Using the other set of binders insert one tip of the set in the hole of the CPT sheild NCPT mark as Q857 (sheild marking) and the other tip insert in the right top side of the VM PWB.

D) Adjust the binders so that the PWB's (CPT & VM) are fix together: do not pull too much the binders this can crack the PWB by the tension made by the binders.

E) After fixing the CPT PWB & the VM PWB please apply silicon rubber between the CPT socket and the CPT to avoid movement.





PRODUCT SAFETY NOTE: Components marked with a ⚠ and shaded have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.

PRINTED CIRCUIT BOARD

MAIN P.W.B.
COMPONENT SIDE

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

PA2 MAIN P.W.B COMPONENT SIDE

MAIN P.W.B.
PATTERN SIDE

PRINTED CIRCUIT BOARD

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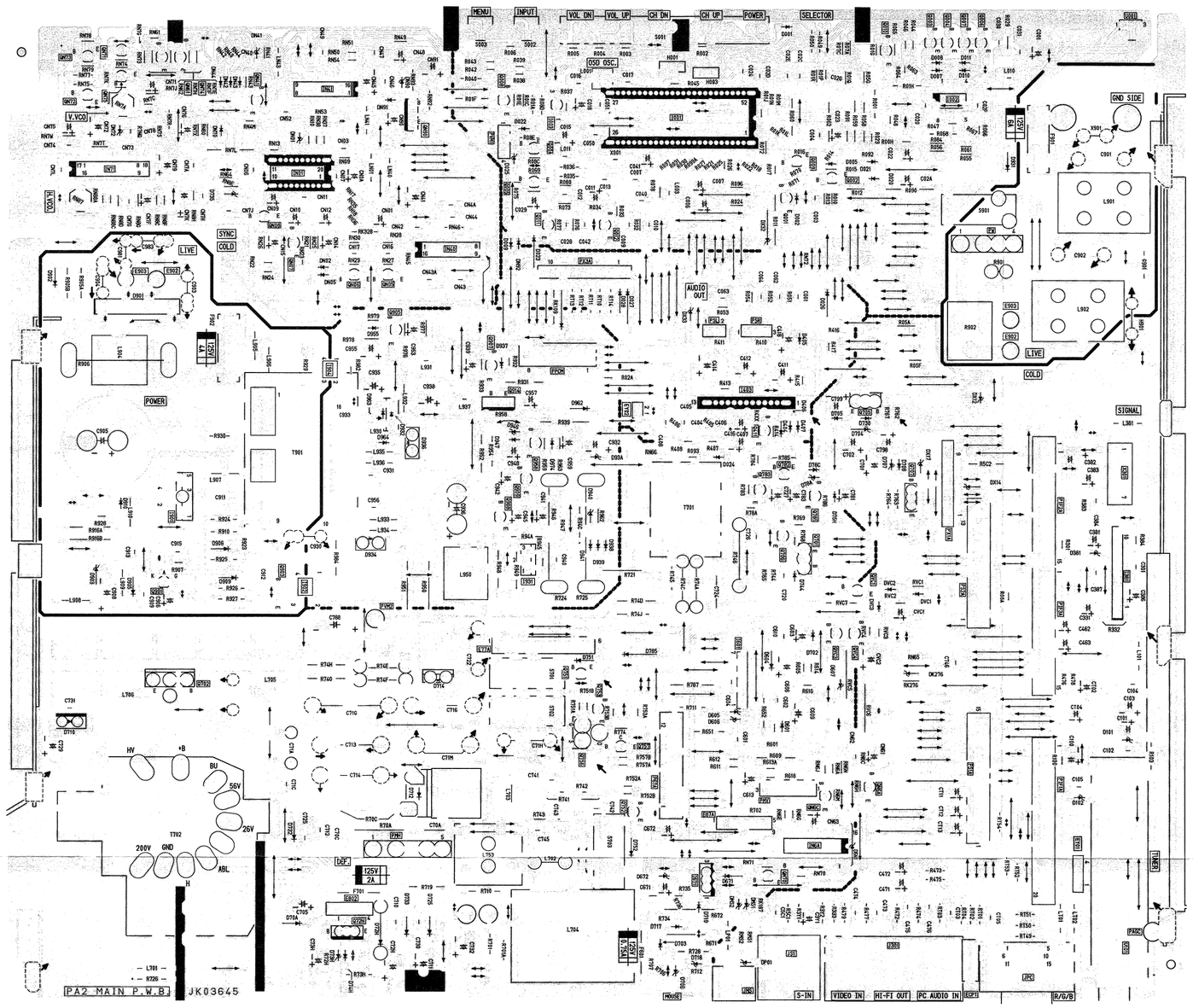


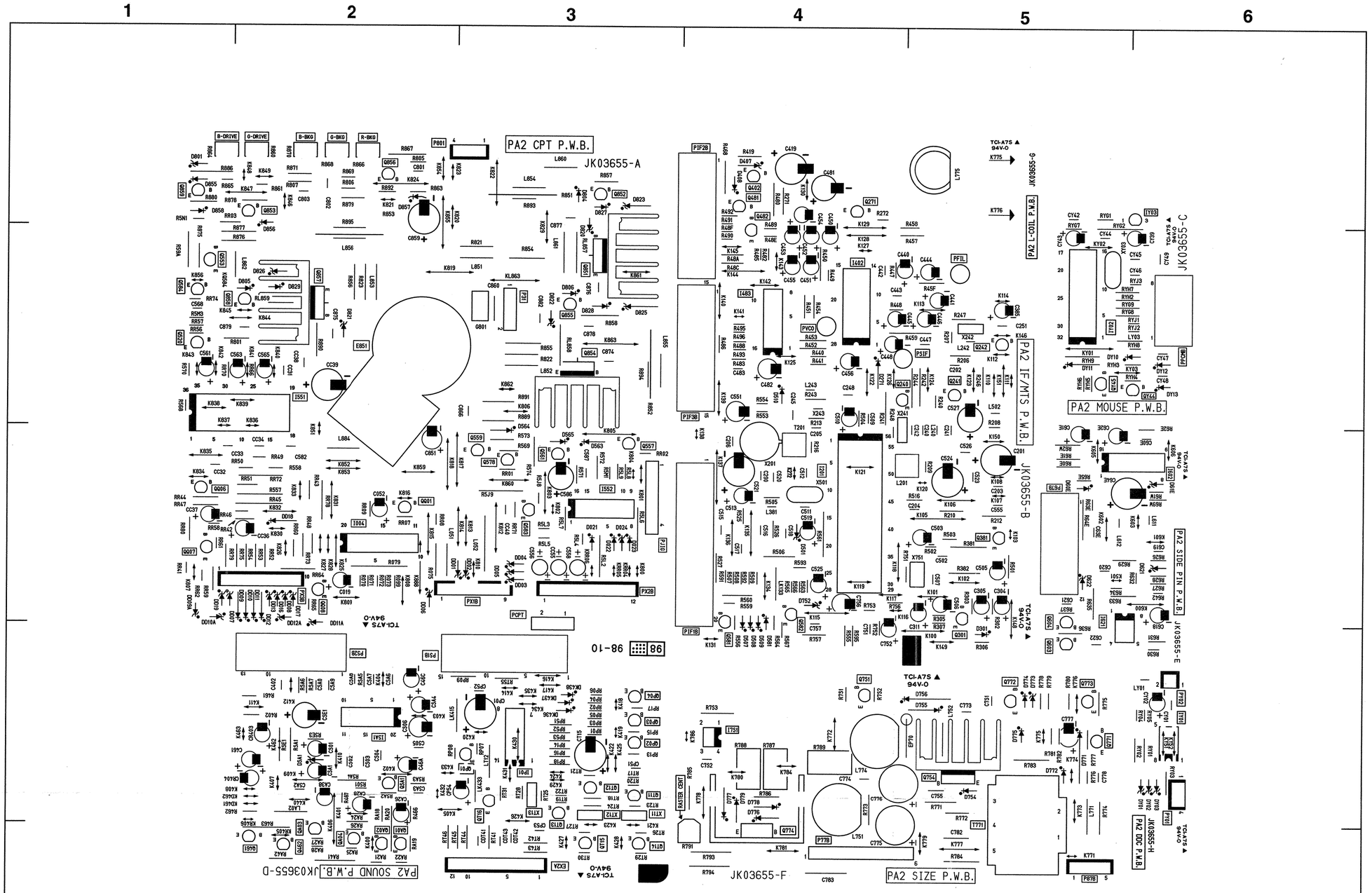
- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

PA2 MAIN P.W.B. PATTERN SIDE

PRODUCT SAFETY NOTE: Components marked with a ⚠ and shaded have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.

PRINTED CIRCUIT BOARD

SUB P.W.B.
COMPONENT SIDE



- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

PA2 SUB P.W.B. COMPONENT SIDE

SUB P.W.B.
PATTERN SIDE

PRINTED CIRCUIT BOARD

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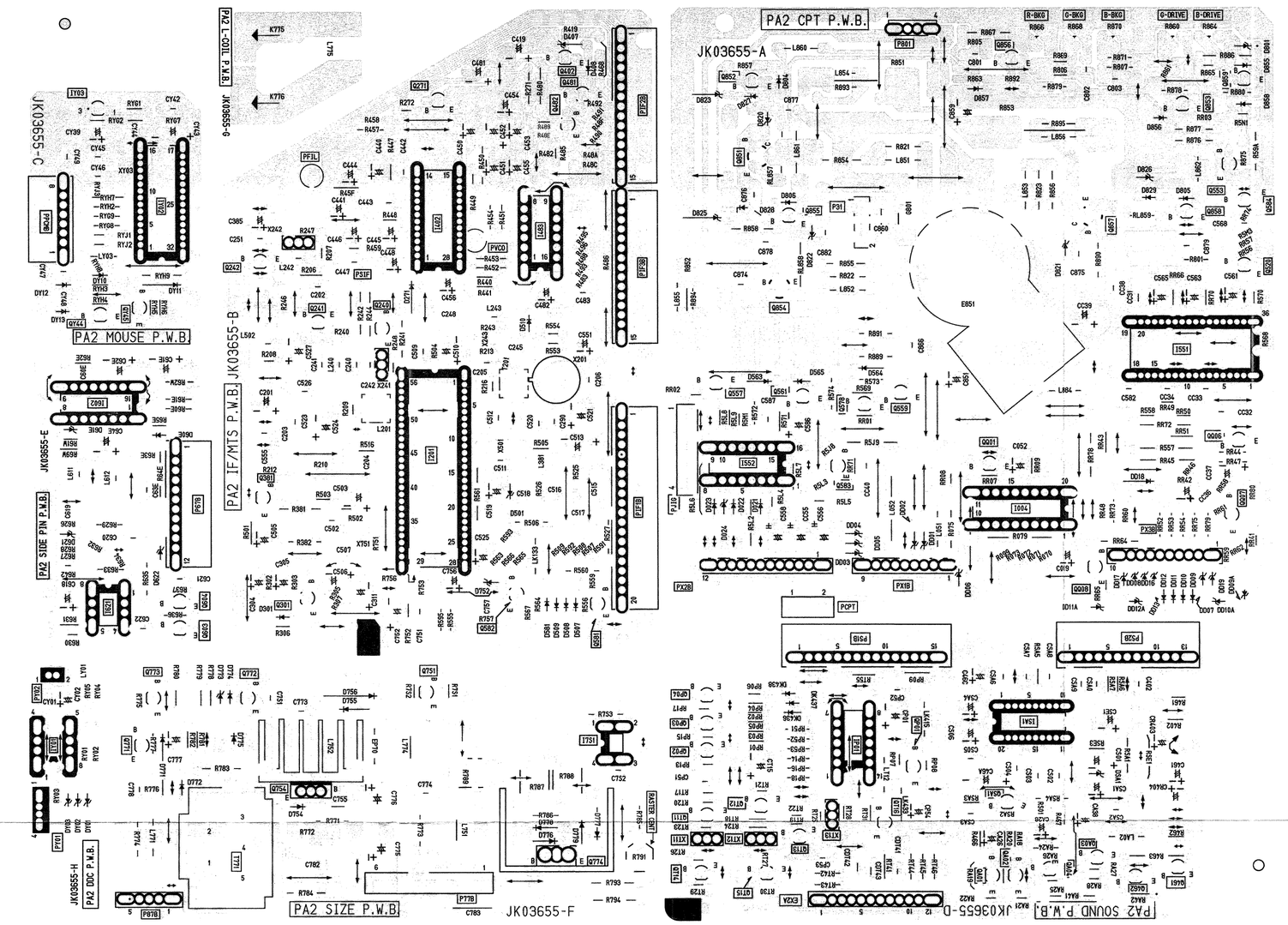

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

PA2 SUB P.W.B. PATTERN SIDE

NOTES:

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