CITIZEN®

SERVICE MANUAL

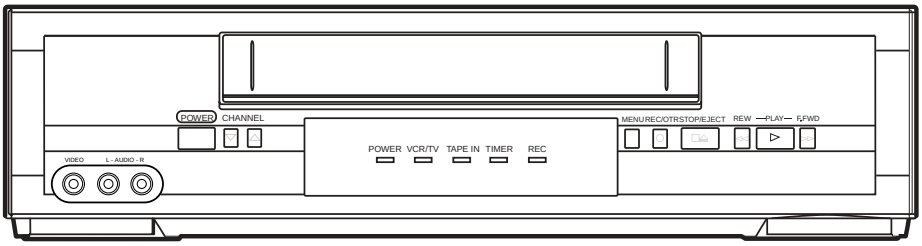
Sec. 1: Main Section
- **Specifications**
- **Preparation for Servicing**
- **Adjustment Procedures**
- **Schematic Diagrams**
- **CBA's**
- **Exploded Views**
- **Parts List**

When servicing the deck mechanism, refer to MK14 Deck Mechanism Section.

Deck Mechanism Part No.: N246UFL

VIDEO CASSETTE RECORDER

CVCR401H



VHS

IMPORTANT SAFETY NOTICE

Proper service and repair is important to the safe, reliable operation of all Funai Equipment. The service procedures recommended by Funai and described in this service manual are effective methods of performing service operations. Some of these service special tools should be used when and as recommended.

It is important to note that this service manual contains various CAUTIONS and NOTICES which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It also is important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. Funai could not possibly know, evaluate and advice the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Funai has not undertaken any such broad evaluation. Accordingly, a servicer who uses a service procedure or tool which is not recommended by Funai must first use all precautions thoroughly so that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.

MAIN SECTION

VIDEO CASSETTE RECORDER

CVCR401H

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- **Specifications**
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SPECIFICATIONS

Description	Unit	Minimum	Nominal	Maximum	Remark
1. Video					
1-1. Video Output (PB)	Vp-p	0.8	1.0	1.2	SP Mode
1-2. Video Output (R/P)	Vp-p	0.8	1.0	1.2	
1-3. Video S/N Y (R/P)	dB	40	45		SP Mode, W/O Burst
1-4. Video Color S/N AM (R/P)	dB	35	41		SP Mode
1-5. Video Color S/N PM (R/P)	dB	33	36		SP Mode
1-6. Resolution (PB)	Line	230	245		SP Mode
2. Servo					
2-1. Jitter Low	µsec		0.07	0.12	SP Mode
2-2. Wow & Flutter	%		0.3	0.5	SP Mode
3. Normal Audio					
3-1. Output (PB)	dBV	-9	-6	-3	SP Mode
3-2. Output (R/P)	dBV	-9	-6	-1.5	SP Mode
3-3. S/N (R/P)	dB	36	41		SP Mode
3-4. Distortion (R/P)	%		1.0	4.0	SP Mode
3-5. Freq. resp (R/P) at 200 Hz	dB	-11	-4		SP Mode
(-20 dB ref. 1 kHz) at 8 kHz	dB	-14	-4		SP Mode
4. Tuner					
4-1. Video output	Vp-p	0.8	1.0	1.2	E-E Mode
4-2. Video S/N	dB	39	42		E-E Mode
4-3. Audio output	dB	-10	-6	-2	E-E Mode
4-4. Audio S/N	dB	40	46		E-E Mode
5. Hi-Fi Audio					
5-1. Output	dBV	-12	-8	-4	SP Mode
5-2. Dynamic Range	dB	70	80		SP Mode
5-3. Freq. resp (6 dB B.W)	Hz		20 ~ 20 k		SP Mode

Note: Nominal specs represent the design specs. All units should be able to approximate these – some will exceed and some may drop slightly below these specs. Limit specs represent the absolute worst condition that still might be considered acceptable; In no case should a unit fail to meet limit specs.

IMPORTANT SAFETY PRECAUTIONS

Product Safety Notice

Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by a ⚠ on schematics and in parts lists. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire, and/or other hazards. The Product's Safety is under review continuously and new instructions are issued whenever appropriate. Prior to shipment from the factory, our products are carefully inspected to confirm with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

Precautions during Servicing

A. Parts identified by the ⚠ symbol are critical for safety. Replace only with part number specified.

B. In addition to safety, other parts and assemblies are specified for conformance with regulations applying to spurious radiation. These must also be replaced only with specified replacements. Examples: RF converters, RF cables, noise blocking capacitors, and noise blocking filters, etc.

C. Use specified internal wiring. Note especially:
1) Wires covered with PVC tubing
2) Double insulated wires
3) High voltage leads

D. Use specified insulating materials for hazardous live parts. Note especially:
1) Insulation tape
2) PVC tubing
3) Spacers
4) Insulators for transistors

E. When replacing AC primary side components (transformers, power cord, etc.), wrap ends of wires securely about the terminals before soldering.

F. Observe that the wires do not contact heat producing parts (heat sinks, oxide metal film resistors, fusible resistors, etc.).

G. Check that replaced wires do not contact sharp edges or pointed parts.

H. When a power cord has been replaced, check that 5 - 6 kg of force in any direction will not loosen it.

I. Also check areas surrounding repaired locations.

J. Be careful that foreign objects (screws, solder droplets, etc.) do not remain inside the set.

K. Crimp type wire connector
The power transformer uses crimp type connectors which connect the power cord and the primary side of the transformer. When replacing the transformer, follow these steps carefully and precisely to prevent shock hazards.
Replacement procedure
1) Remove the old connector by cutting the wires at a point close to the connector.
Important: Do not re-use a connector. (Discard it.)
2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.
3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.
4) Use a crimping tool to crimp the metal sleeve at its center. Be sure to crimp fully to the complete closure of the tool.

L. When connecting or disconnecting the internal connectors, first, disconnect the AC plug from the AC outlet.

Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts, and wires have been returned to their original positions. Afterwards, do the following tests and confirm the specified values to verify compliance with safety standards.

1. Clearance Distance

When replacing primary circuit components, confirm specified clearance distance (d) and (d') between soldered terminals, and between terminals and surrounding metallic parts. (See Fig. 1)

Table 1: Ratings for selected area

AC Line Voltage	Clearance Distance (d), (d')
120 V	≥ 3.0 mm (0.118 inches)

Note: This table is unofficial and for reference only. Be sure to confirm the precise values.

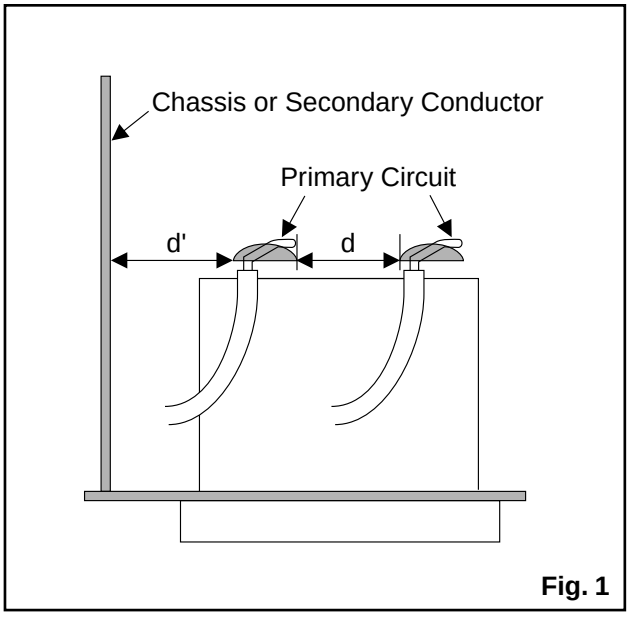


Fig. 1

2. Leakage Current Test

Confirm the specified (or lower) leakage current between B (earth ground, power cord plug prongs) and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.) is lower than or equal to the specified value in the table below.

Measuring Method (Power ON):

Insert load Z between B (earth ground, power cord plug prongs) and exposed accessible parts. Use an AC voltmeter to measure across the terminals of load Z. See Fig. 2 and the following table.

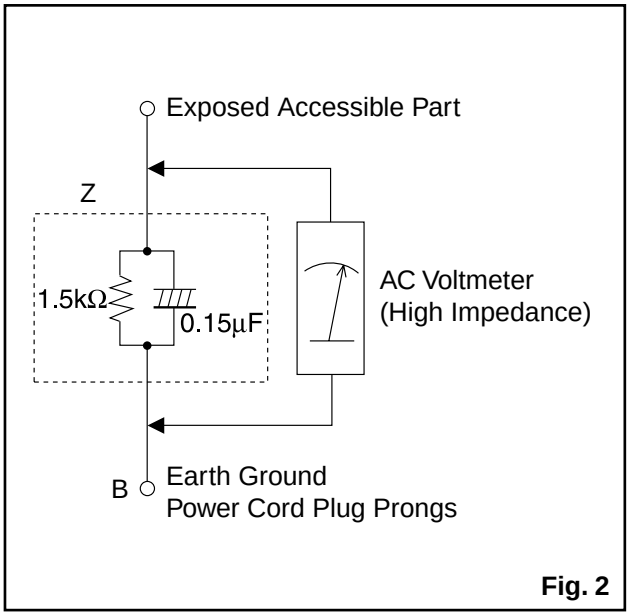


Fig. 2

Table 2: Leakage current ratings for selected areas

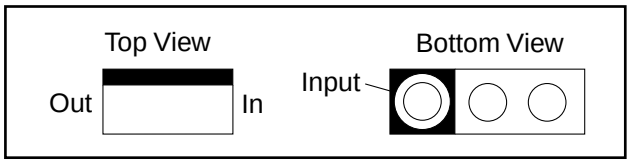
AC Line Voltage	Load Z	Leakage Current (i)	Earth Ground (B) to:
120 V	0.15 μF CAP. & 1.5 kΩ RES. Connected in parallel	i ≤ 0.5 mA Peak	Exposed accessible parts

Note: This table is unofficial and for reference only. Be sure to confirm the precise values.

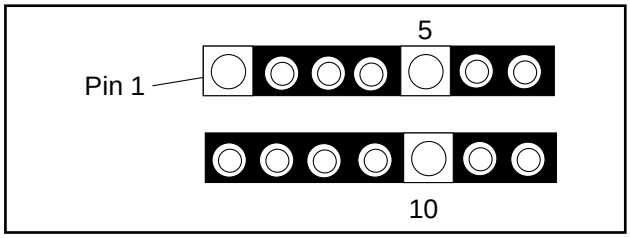
STANDARD NOTES FOR SERVICING

Circuit Board Indications

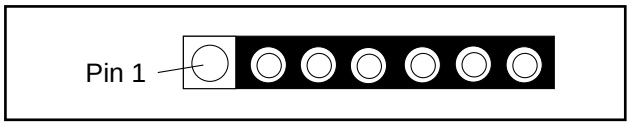
1. The output pin of the 3 pin Regulator ICs is indicated as shown.



2. For other ICs, pin 1 and every fifth pin are indicated as shown.



3. The 1st pin of every male connector is indicated as shown.



Pb (Lead) Free Solder

When soldering, be sure to use the Pb free solder.

How to Remove / Install Flat Pack-IC

1. Removal

With Hot-Air Flat Pack-IC Desoldering Machine:

1. Prepare the hot-air flat pack-IC desoldering machine, then apply hot air to the Flat Pack-IC (about 5 to 6 seconds). (Fig. S-1-1)

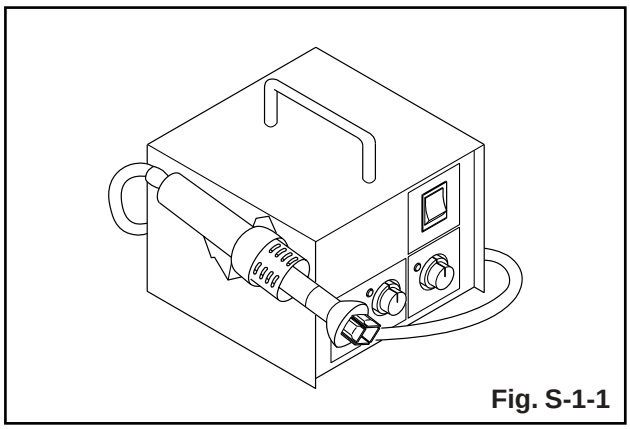


Fig. S-1-1

2. Remove the flat pack-IC with tweezers while applying the hot air.
3. Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)
4. Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

CAUTION:

1. The Flat Pack-IC shape may differ by models. Use an appropriate hot-air flat pack-IC desoldering machine, whose shape matches that of the Flat Pack-IC.
2. Do not supply hot air to the chip parts around the flat pack-IC for over 6 seconds because damage to the chip parts may occur. Put masking tape around the flat pack-IC to protect other parts from damage. (Fig. S-1-2)
3. The flat pack-IC on the CBA is affixed with glue, so be careful not to break or damage the foil of each pin or the solder lands under the IC when removing it.

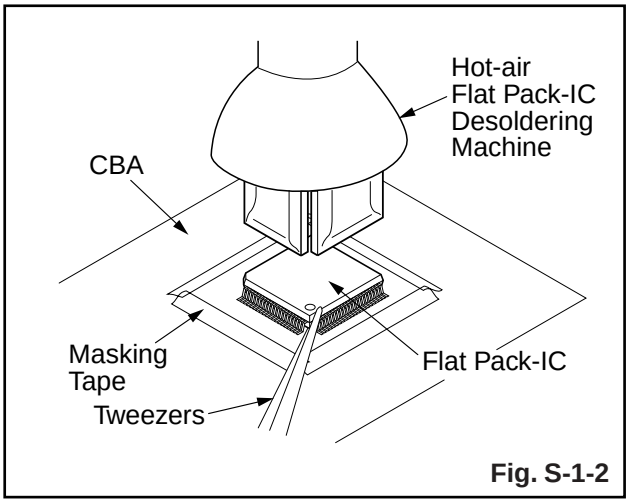


Fig. S-1-2

With Soldering Iron:

1. Using desoldering braid, remove the solder from all pins of the flat pack-IC. When you use solder flux which is applied to all pins of the flat pack-IC, you can remove it easily. (Fig. S-1-3)

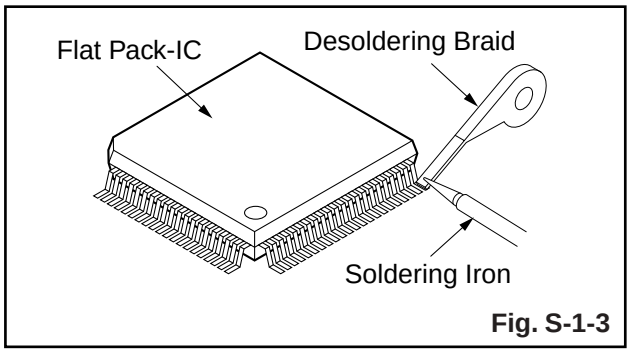


Fig. S-1-3

2. Lift each lead of the flat pack-IC upward one by one, using a sharp pin or wire to which solder will not adhere (iron wire). When heating the pins, use a fine tip soldering iron or a hot air desoldering machine. (Fig. S-1-4)

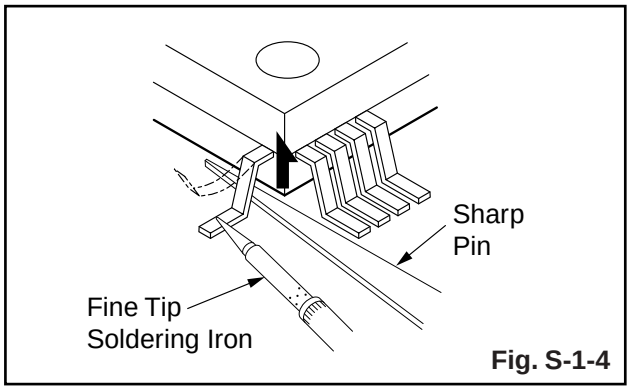


Fig. S-1-4

3. Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)
4. Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

With Iron Wire:

1. Using desoldering braid, remove the solder from all pins of the flat pack-IC. When you use solder flux which is applied to all pins of the flat pack-IC, you can remove it easily. (Fig. S-1-3)
2. Affix the wire to a workbench or solid mounting point, as shown in Fig. S-1-5.
3. While heating the pins using a fine tip soldering iron or hot air blower, pull up the wire as the solder melts so as to lift the IC leads from the CBA contact pads as shown in Fig. S-1-5.
4. Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)
5. Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

Note: When using a soldering iron, care must be taken to ensure that the flat pack-IC is not being held by glue. When the flat pack-IC is removed from the CBA, handle it gently because it may be damaged if force is applied.

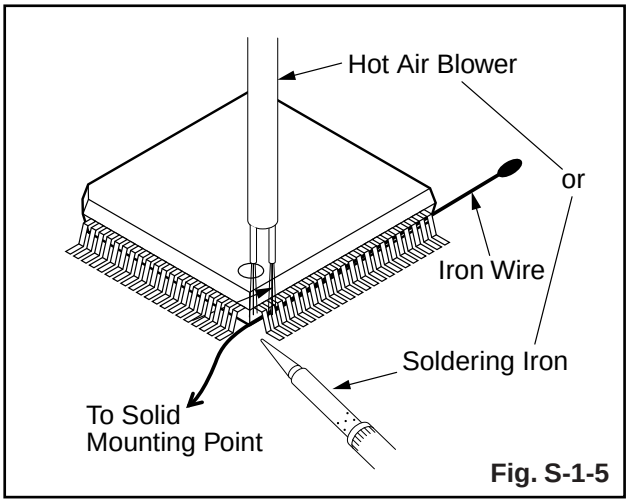


Fig. S-1-5

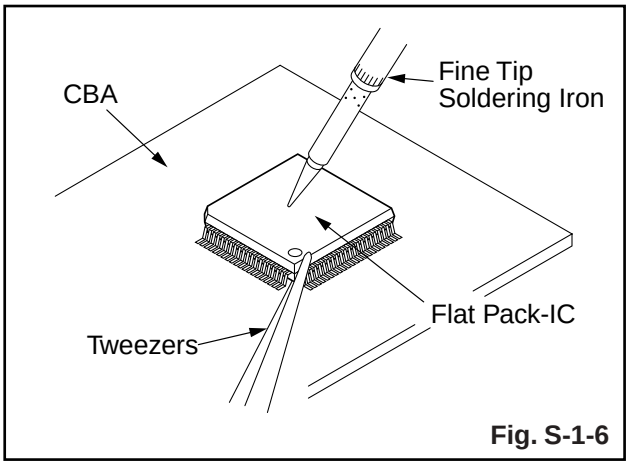


Fig. S-1-6

2. Installation

1. Using desoldering braid, remove the solder from the foil of each pin of the flat pack-IC on the CBA so you can install a replacement flat pack-IC more easily.
2. The "•" mark on the flat pack-IC indicates pin 1. (See Fig. S-1-7.) Be sure this mark matches the 1 on the PCB when positioning for installation. Then presolder the four corners of the flat pack-IC. (See Fig. S-1-8.)
3. Solder all pins of the flat pack-IC. Be sure that none of the pins have solder bridges.

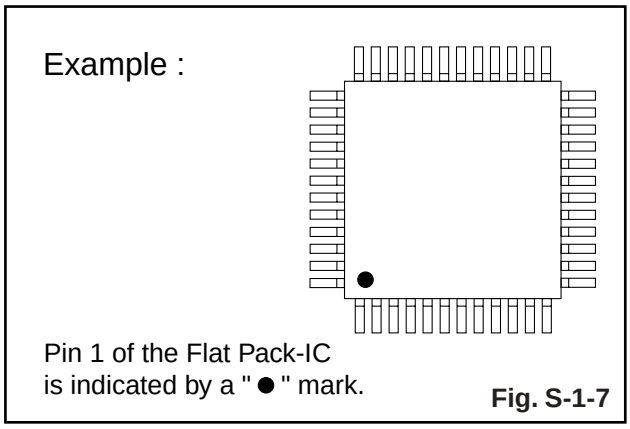


Fig. S-1-7

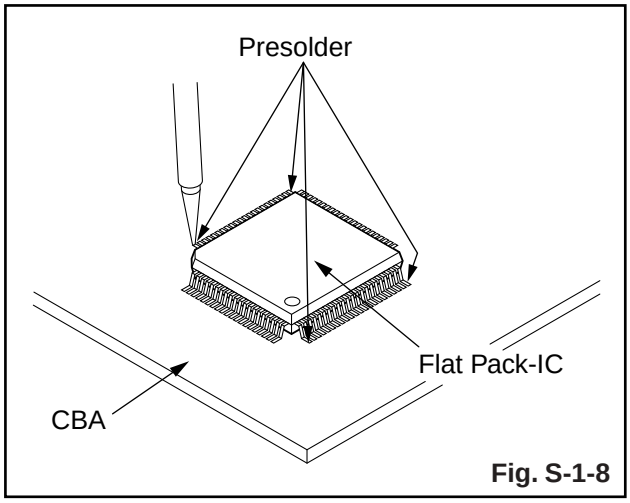


Fig. S-1-8

Instructions for Handling Semi-conductors

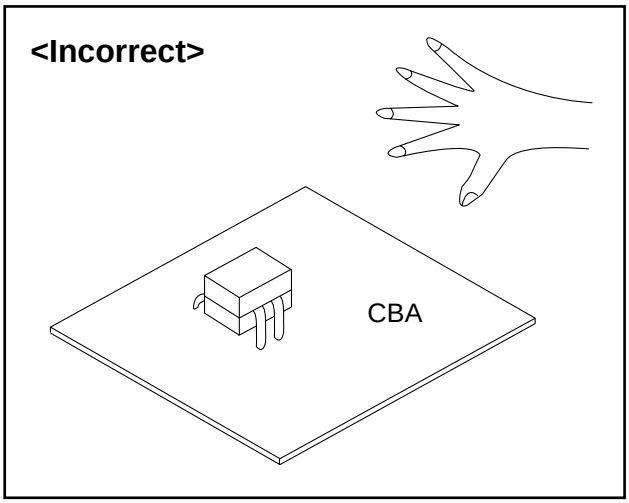
Electrostatic breakdown of the semi-conductors may occur due to a potential difference caused by electrostatic charge during unpacking or repair work.

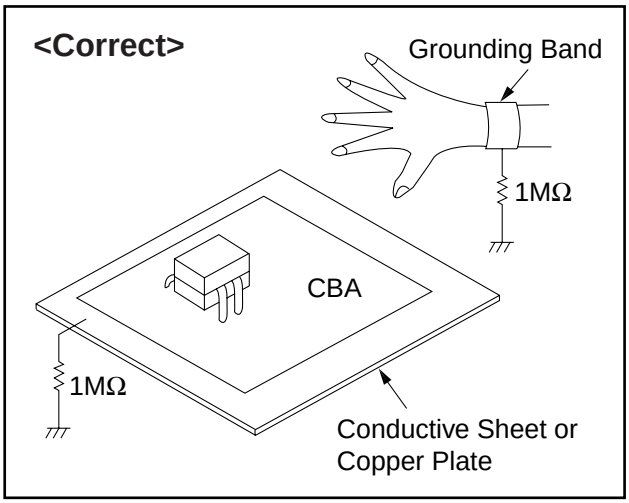
1. Ground for Human Body

Be sure to wear a grounding band (1 MΩ) that is properly grounded to remove any static electricity that may be charged on the body.

2. Ground for Workbench

Be sure to place a conductive sheet or copper plate with proper grounding (1 MΩ) on the workbench or other surface, where the semi-conductors are to be placed. Because the static electricity charge on clothing will not escape through the body grounding band, be careful to avoid contacting semi-conductors with your clothing.





PREPARATION FOR SERVICING

How to Enter the Service Mode

About Optical Sensors

Caution:

An optical sensor system is used for the Tape Start and End Sensors on this equipment. Carefully read and follow the instructions below. Otherwise the unit may operate erratically.

What to do for preparation

Insert a tape into the Deck Mechanism Assembly and press the [PLAY] button. The tape will be loaded into the Deck Mechanism Assembly. Make sure the power is on, connect TP502 (S-INH) to GND. This will stop the function of Tape Start Sensor, Tape End Sensor and Reel Sensors. (If these TPs are connected before plugging in the unit, the function of the sensors will stay valid.) See Fig. 1.

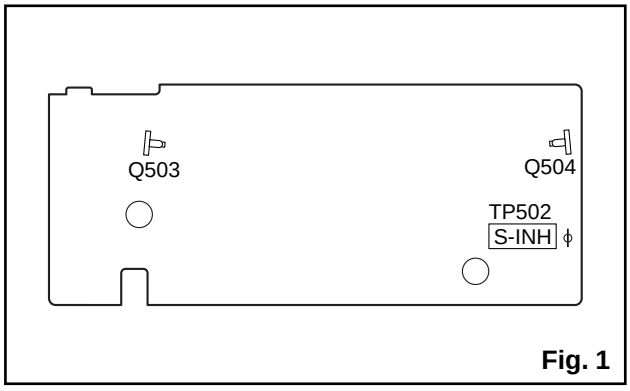


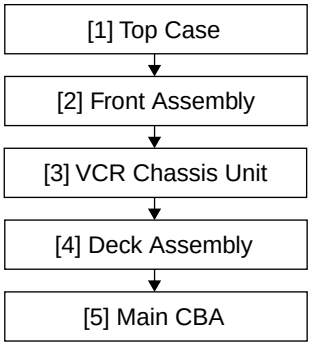
Fig. 1

Note: Because the Tape End Sensors are inactive, do not run a tape all the way to the start or the end of the tape to avoid tape damage.

CABINET DISASSEMBLY INSTRUCTIONS

1. Disassembly Flowchart

This flowchart indicates the disassembly steps to gain access to item(s) to be serviced. When reassembling, follow the steps in reverse order. Bend, route, and dress the cables as they were originally.



2. Disassembly Method

ID/ Loc. No.	Part	Removal		
		Fig. No.	Remove/*Unhook/ Unlock/Release/ Unplug/Desolder	Note
[1]	Top Case	D1	4(S-1)	---
[2]	Front Assembly	D2	*3(L-1), *4(L-2)	1
[3]	VCR Chassis Unit	D3	5(S-2)	2
[4]	Deck Assembly	D4 D5	3(S-3), *Desolder	3 4
[5]	Main CBA	D4 D5	----------	---
↓ (1)	↓ (2)	↓ (3)	↓ (4)	↓ (5)

Note:

(1) Identification (location) No. of parts in the figures

(2) Name of the part

(3) Figure Number for reference

(4) Identification of parts to be removed, unhooked, unlocked, released, unplugged, unclamped, or desoldered.
P = Spring, L = Locking Tab, S = Screw,
CN = Connector
* = Unhook, Unlock, Release, Unplug, or Desolder
e.g. 2(S-2) = two Screws (S-2),
2(L-2) = two Locking Tabs (L-2)

(5) Refer to “Reference Notes.”

Reference Notes

1. **CAUTION:** Locking Tabs (L-1) and (L-2) are fragile. Be careful not to break them.
2. Remove five Screws (S-2). Then slowly lift the VCR Chassis Unit (Deck Assembly and Main CBA) up.
3. When reassembling, solder wire jumpers as shown in Fig. D4.
4. Before installing the Deck Assembly, be sure to place the pin of LD-SW on Main CBA as shown in Fig. D5. Then, install the Deck Assembly while aligning the hole of Cam Gear with the pin of LD-SW, the shaft of Cam Gear with the hole of LD-SW as shown in Fig. D5.

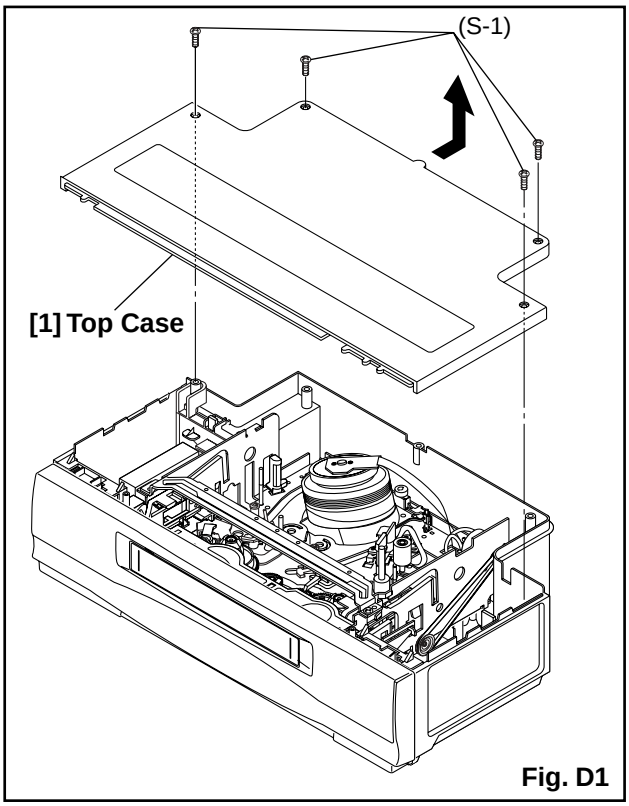


Fig. D1

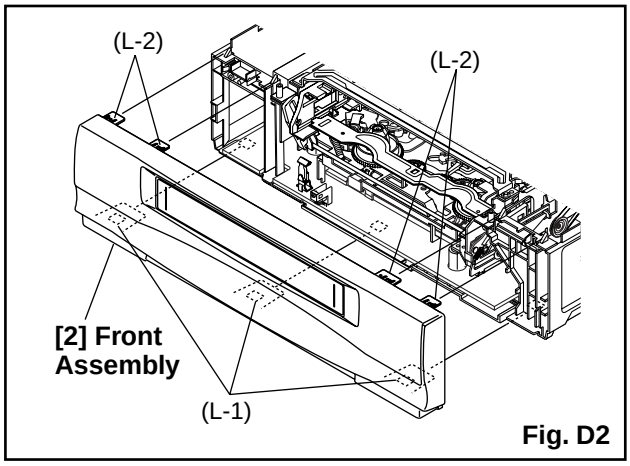


Fig. D2

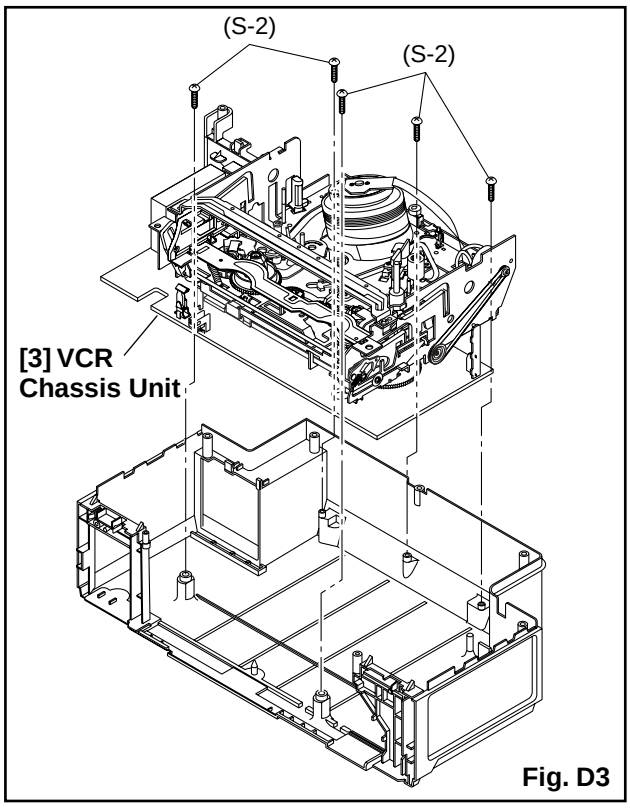
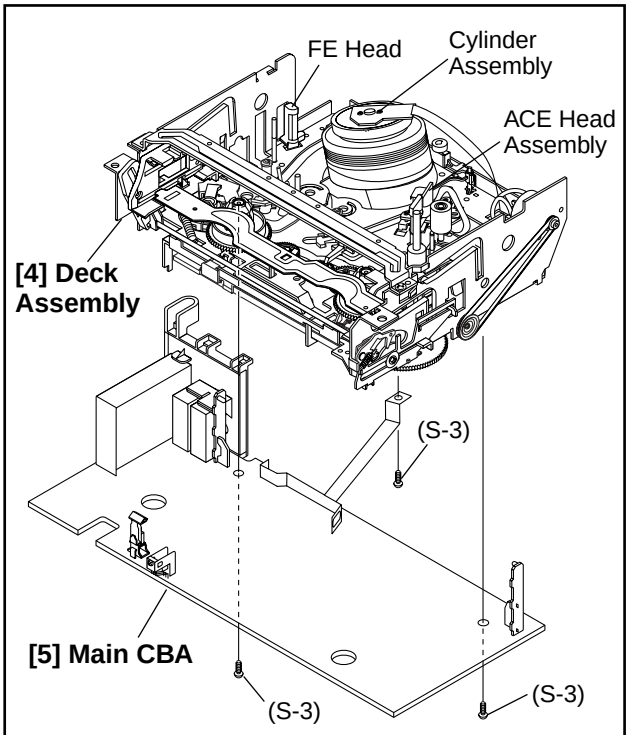
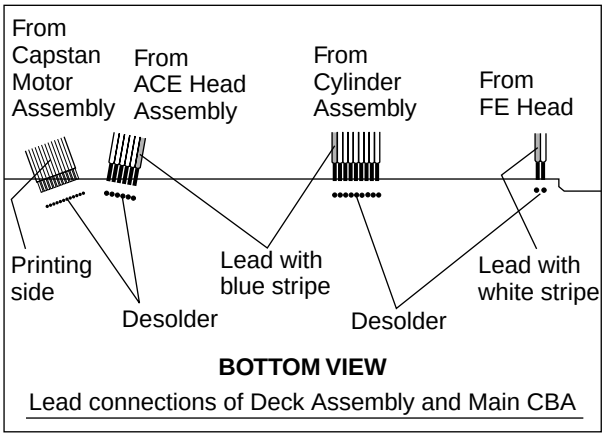


Fig. D3





BOTTOM VIEW

Lead connections of Deck Assembly and Main CBA

Fig. D4

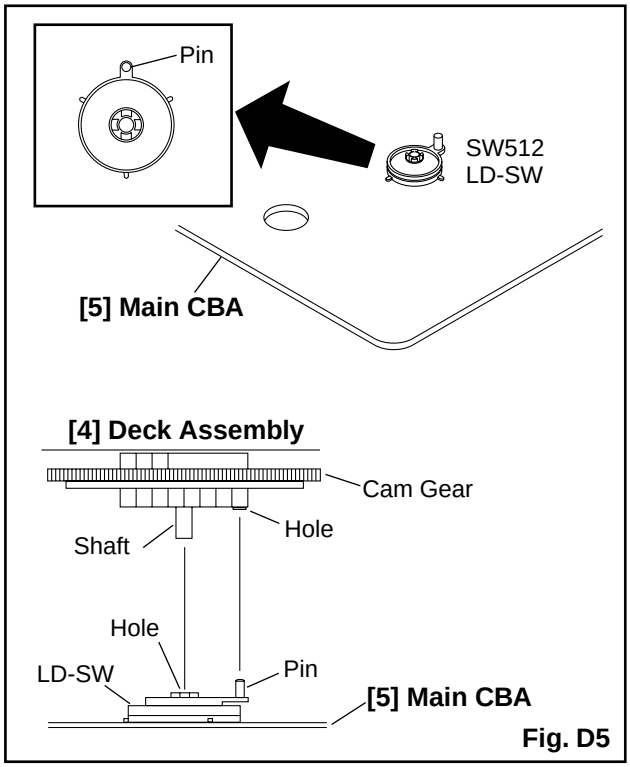

Pin
SW512
LD-SW
[5] Main CBA
[4] Deck Assembly
Cam Gear
Hole
Shaft
Hole
LD-SW
Pin
[5] Main CBA

Fig. D5

ELECTRICAL ADJUSTMENT INSTRUCTIONS

General Note: "CBA" is abbreviation for "Circuit Board Assembly."

NOTE:

1. Electrical adjustments are required after replacing circuit components and certain mechanical parts. It is important to do these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.
2. To perform these alignment / confirmation procedures, make sure that the tracking control is set in the center position: Press either [CHANNEL ▼] or [CHANNEL ▲] button on the front panel first, then the [PLAY] button on the front panel.

Test Equipment Required

1. Oscilloscope: Dual-trace with 10:1 probe,
   V-Range: 0.001~50 V/Div.,
   F-Range: DC~AC-20 MHz
2. Alignment Tape (FL8A)

How to Reset Software

To reset software, unplug the AC cord from the AC outlet. Then, insert the AC cord again 30 seconds later.

Head Switching Position Adjustment

Purpose: To determine the Head Switching position during playback.

Symptom of Misadjustment: May cause Head Switching noise or vertical jitter in the picture.

Test point	Adj. Point	Mode	Input
TP751(V-OUT) TP302(RF-SW) GND	VR501 (Switching Point)	PLAY (SP)	-----
Tape	**Measurement Equipment**	**Spec.**	
FL8A	Oscilloscope	6.5H ± 1H (412.7µs±63.5µs)	

Connections of Measurement Equipment

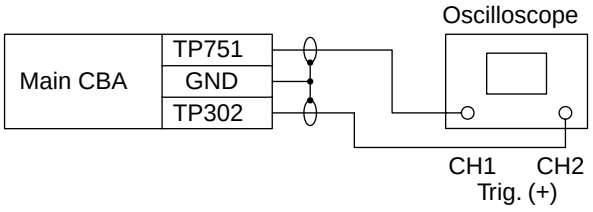
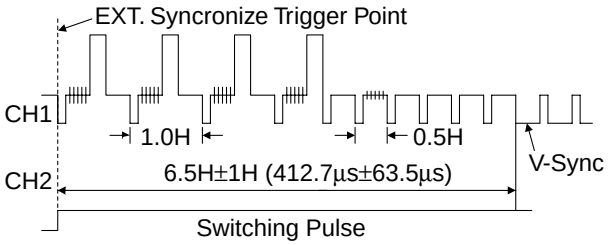


Figure 1



Note: TP751(V-OUT), TP302(RF-SW), VR501(Switching Point) --- Main CBA

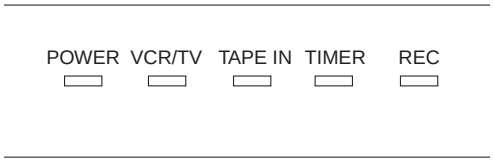
Reference Notes:

Playback the Alignment tape and adjust VR501 so that the V-sync front edge of the CH1 video output waveform is at the 6.5H ± 1H (412.7 µs ± 63.5 µs) delayed position from the rising edge of the CH2 head switching pulse waveform.

FUNCTION INDICATOR SYMBOLS

Note: The following symbols will appear on the indicator panel to indicate the current mode or operation of the VCR. On-screen modes will also be momentarily displayed on the tv screen when you press the operation buttons.

Display panel



"H" = LED Light on, "L" = LED Light off

LED Mode	Indicator Active
POWER	Power on = "H" Power off = "L"
VCR/TV	VCR mode = "H" TV mode = "L"
TAPE IN	Cassette in = "H" Cassette out = "L"
TIMER	Timer stand by = "H" One touch recording = "H" Timer recording = "H" General mode = "L"
REC	REC mode = "H" REC pause Blinks at 0.8Hz interval General mode = "L"

TV screen

Note: OSD for mechanical error will be displayed for 5 sec. after the mechanical error occurs.

Cause	Indicator Active
When reel or capstan mechanism is not functioning correctly	"EJECT ⏏ R" is displayed on a TV screen. (Refer to Fig. 1.)
When tape loading mechanism is not functioning correctly	"EJECT ⏏ T" is displayed on a TV screen. (Refer to Fig. 2.)
When cassette loading mechanism is not functioning correctly	"EJECT ⏏ C" is displayed on a TV screen. (Refer to Fig. 3.)
When the drum is not working properly	"EJECT ⏏ D" is displayed on a TV screen. (Refer to Fig. 4.)

When reel or capstan mechanism is not functioning correctly

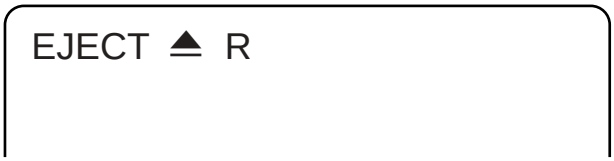


Fig. 1

When tape loading mechanism is not functioning correctly

Fig. 2

When cassette loading mechanism is not functioning correctly

Fig. 3

When the drum is not working properly

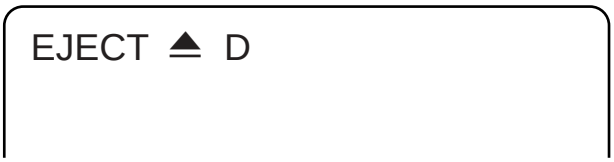
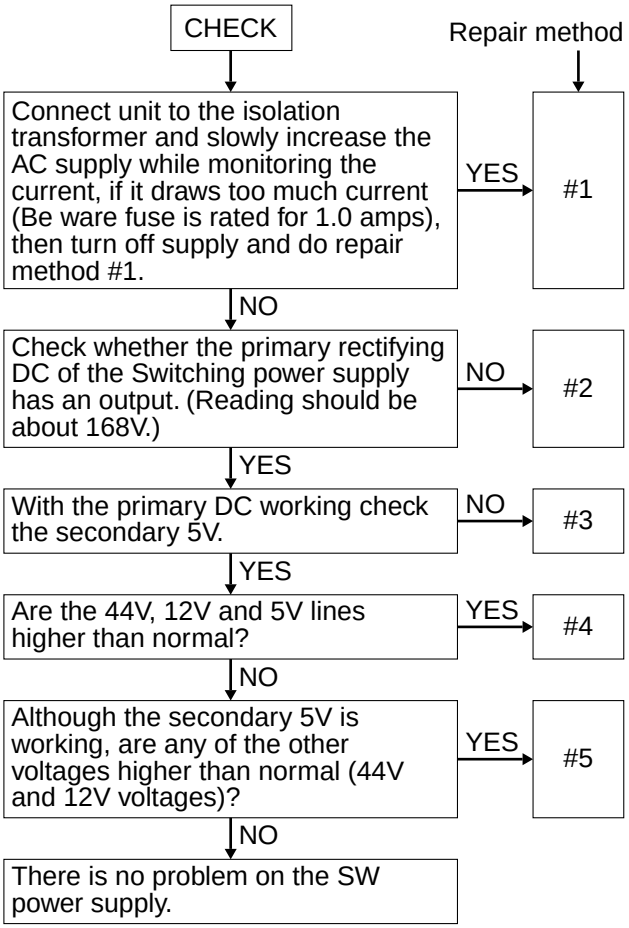


Fig. 4

POWER SUPPLY TROUBLESHOOTING GUIDE

It is highly recommended that a variable isolation transformer which can monitor current be used. (Alternatively a variable AC source which monitors current will do). Read directions below before power is added!



Repair method #1

(Power must be off)

1] Short circuit in the secondary side. Check diode D021, D015, D016, and D020, switching FET (Q001), control transistor (Q002), diode (D006), and resistor (R014) replace as necessary.
Disconnect 44V diode (D021), 12V diode (D015), 5V diode (D016), and 12V diode (D020). Check the load continuity of 44V line, 12V line, and 5V line through a tester (resistance range).
If the tester indicates a lower resistance value around 0 ohm, the line is short-circuited.
Before repairing the switching power supply, find out the short-circuited area of such line and repair it.
If the tester does not indicate any low resistance value (around 0 ohm), no load is short-circuited and there is no problem.

2] Check for any defective parts while the secondary rectifying diodes are disconnected D021, D015, D016, and D020 perform a diode check in both forward and reverse directions through a tester.

3] Remove the following components and check for defects: snubber diode (D051), switching FET (Q001), source resistor (R014), and control transistor (Q002).

Repair method #2

Check the fuse 1.0A (F001), primary rectifying diodes (D001-D004) as possible problems. Remove the above mentioned parts and check them. The circuit which turns on switching FET (Q001) may be regarded as a possible cause, even if the load at the secondary side is shorted, it can't be detected because switching FET (Q001) isn't operating. Perform check according to the steps 1] and 2] of repair method #1 and check the following parts:

(Remove the part from PCB)

Switching FET (Q001), source resistor (R014), gate resistor (R008), and start resistor (R004 and R005).

Repair method #3

A circuit to turn on switching FET (Q001) may not work and this may be regarded as a cause of trouble. Even if the load at the secondary side is short-circuited, it cannot be detected because switching FET (Q001) does not turn on. Therefore, perform check according to the steps 1] and 2] of the repair method #1 and execute the under-mentioned parts breakage check.

(Remove the part from PCB.)

switching FET (Q001), source resistor (R014), control shunt regulator (Q031), gate resistor (R008), and start resistor (R004 and R005).

Repair method #4

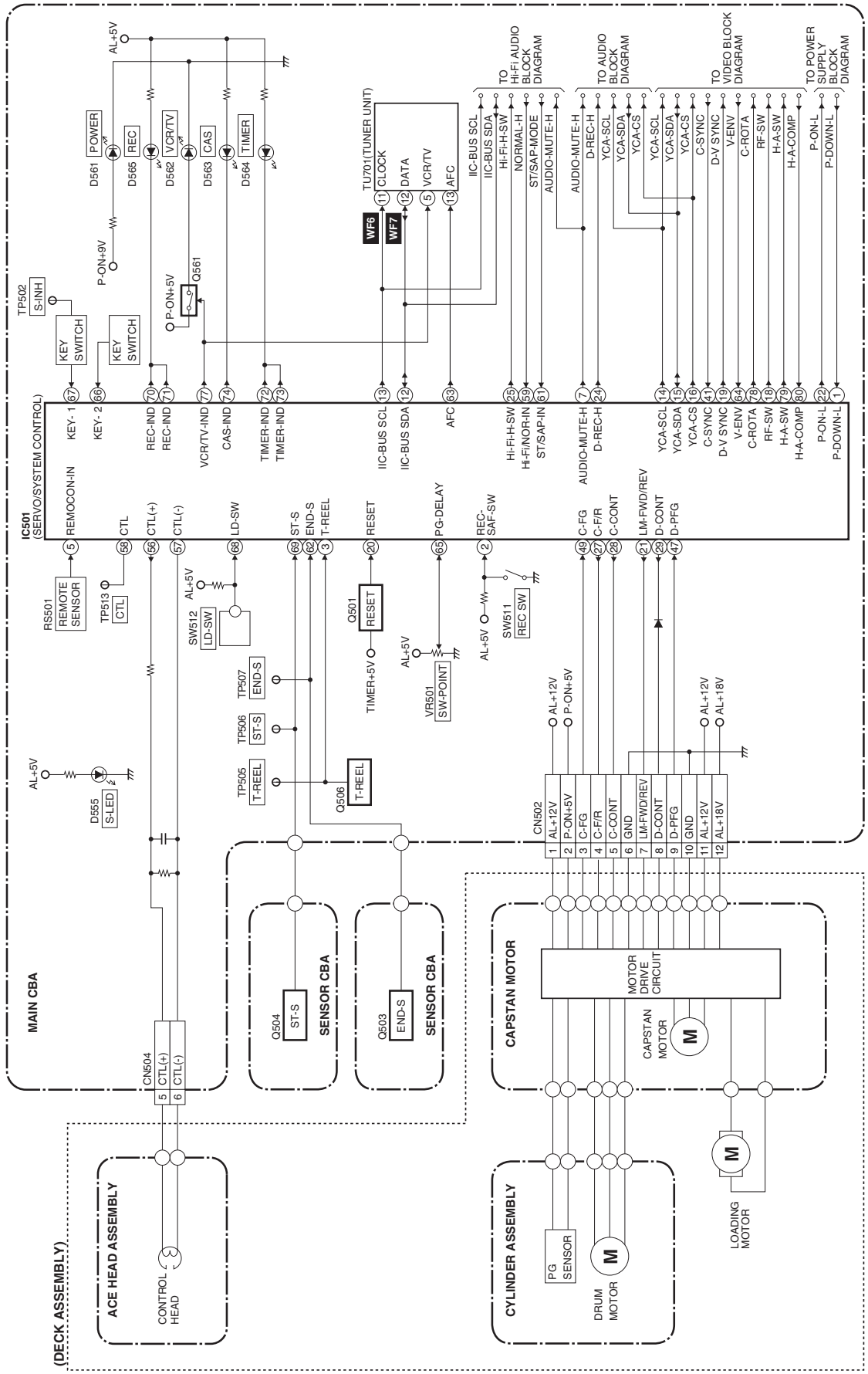
The feedback circuit which is monitored by the output of voltage may not work and this may be regarded as a possible cause, remove control transistor Q002 and check for defects. More over, a photo coupler (IC001) and transistor (Q031) may be defective, replace any defective parts with factory originals.

Repair method #5

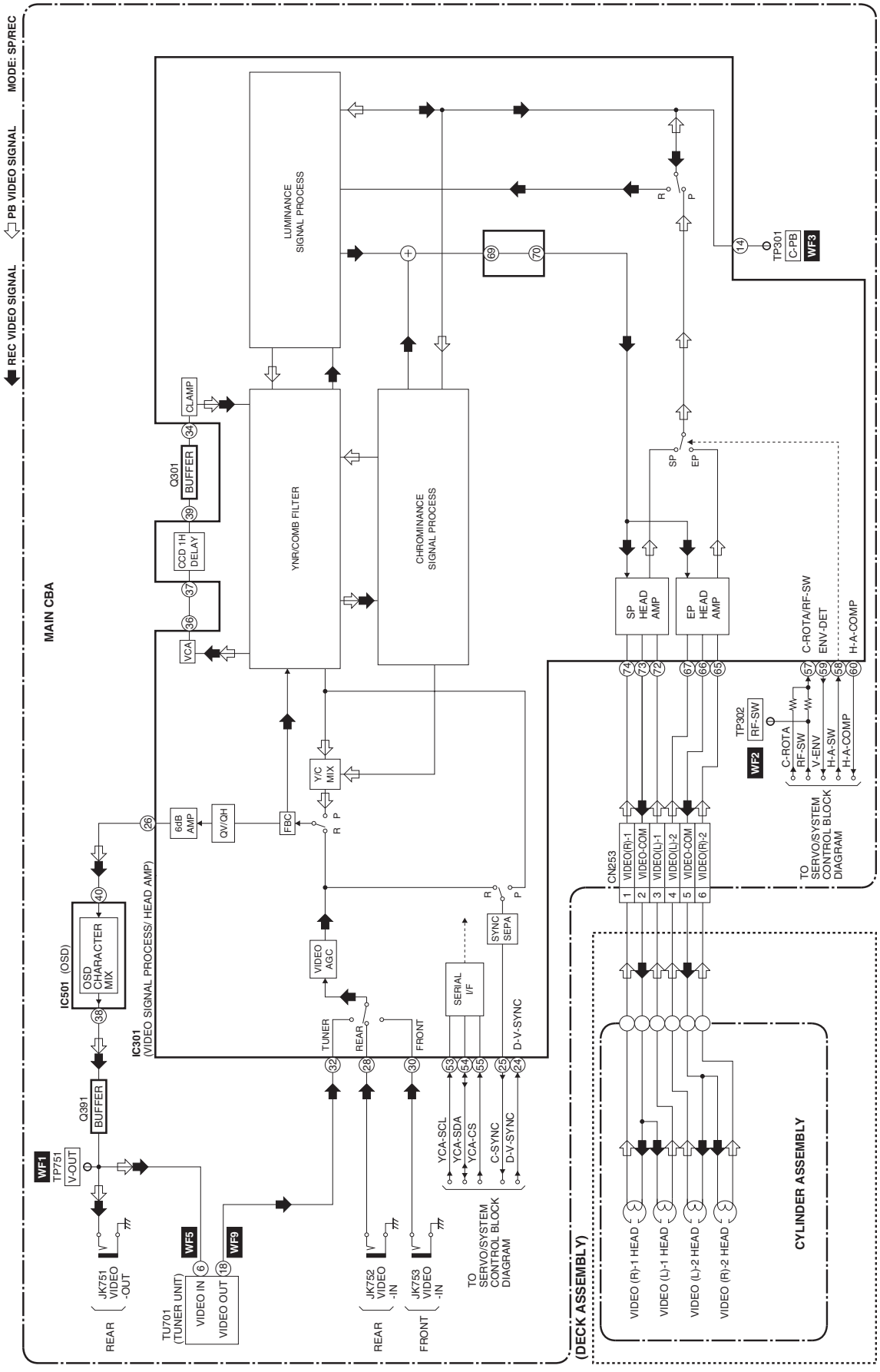
If the output voltage of the secondary side is slightly high, the line load may be in the “OPEN” state and this may be regarded as a cause of trouble. If there is no output voltage on the secondary side, the rectifying diodes (D021), (D015), and (D020) may be defective.

BLOCK DIAGRAMS

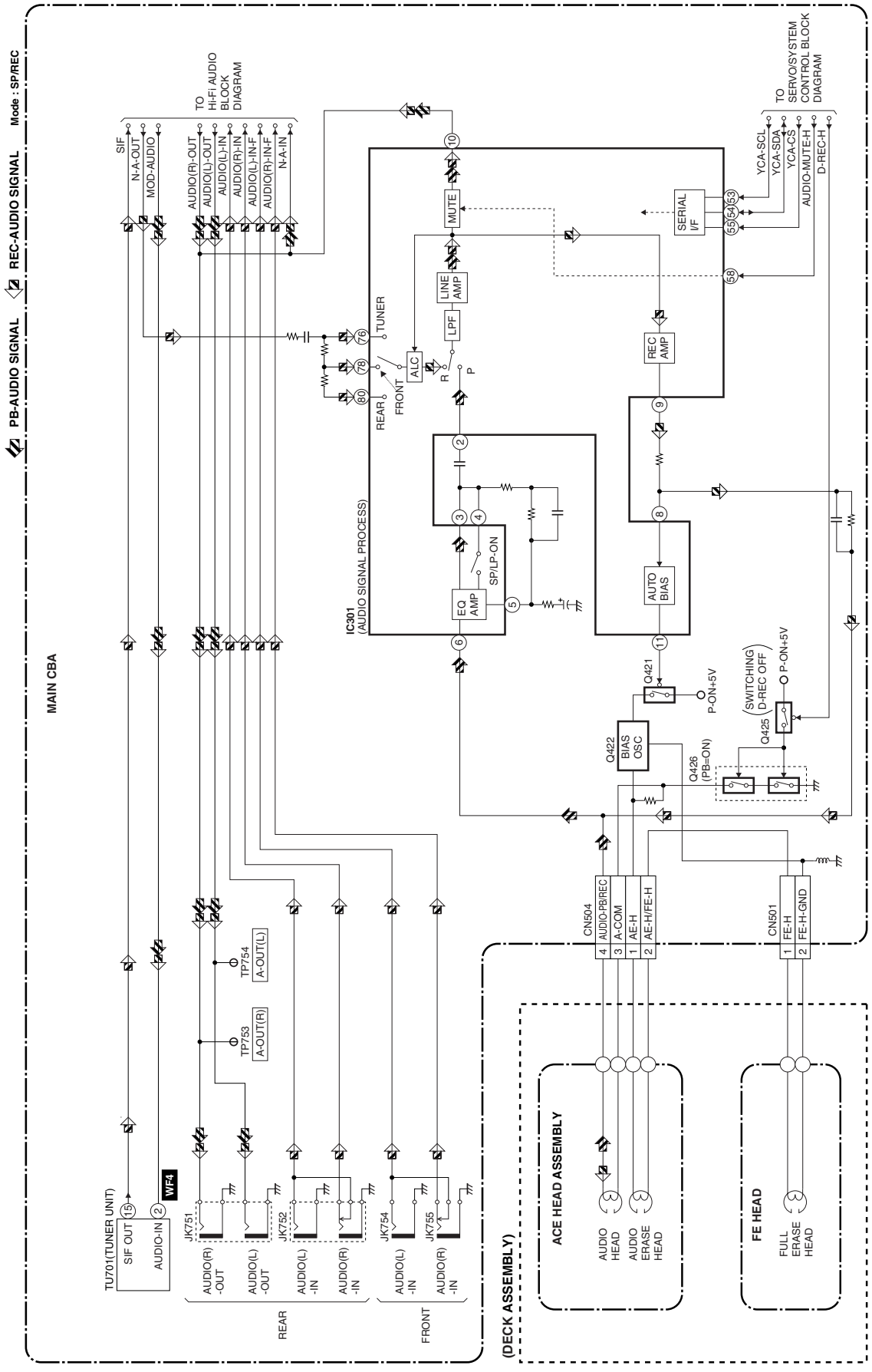
Servo/System Control Block Diagram



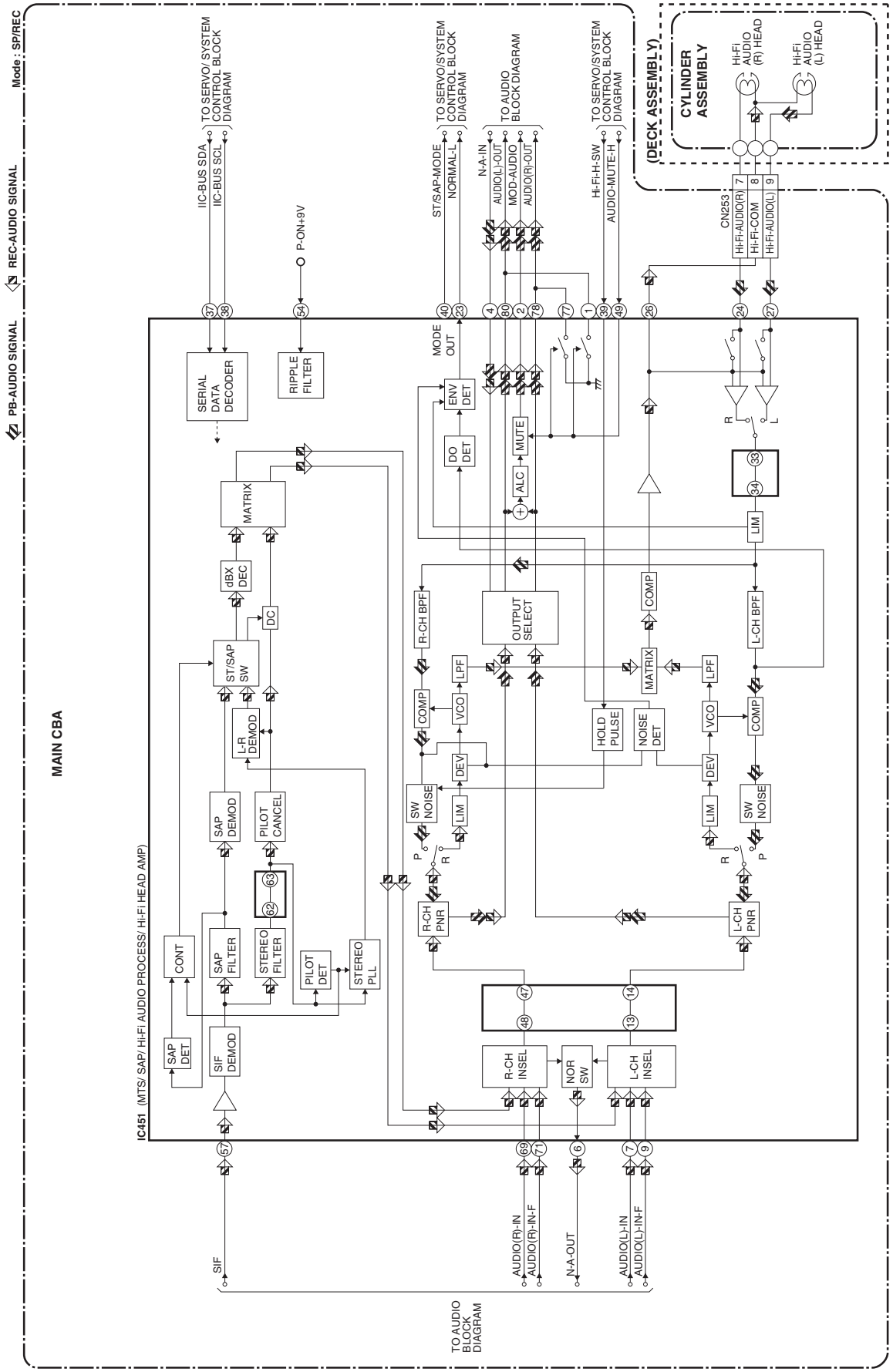
Video Block Diagram



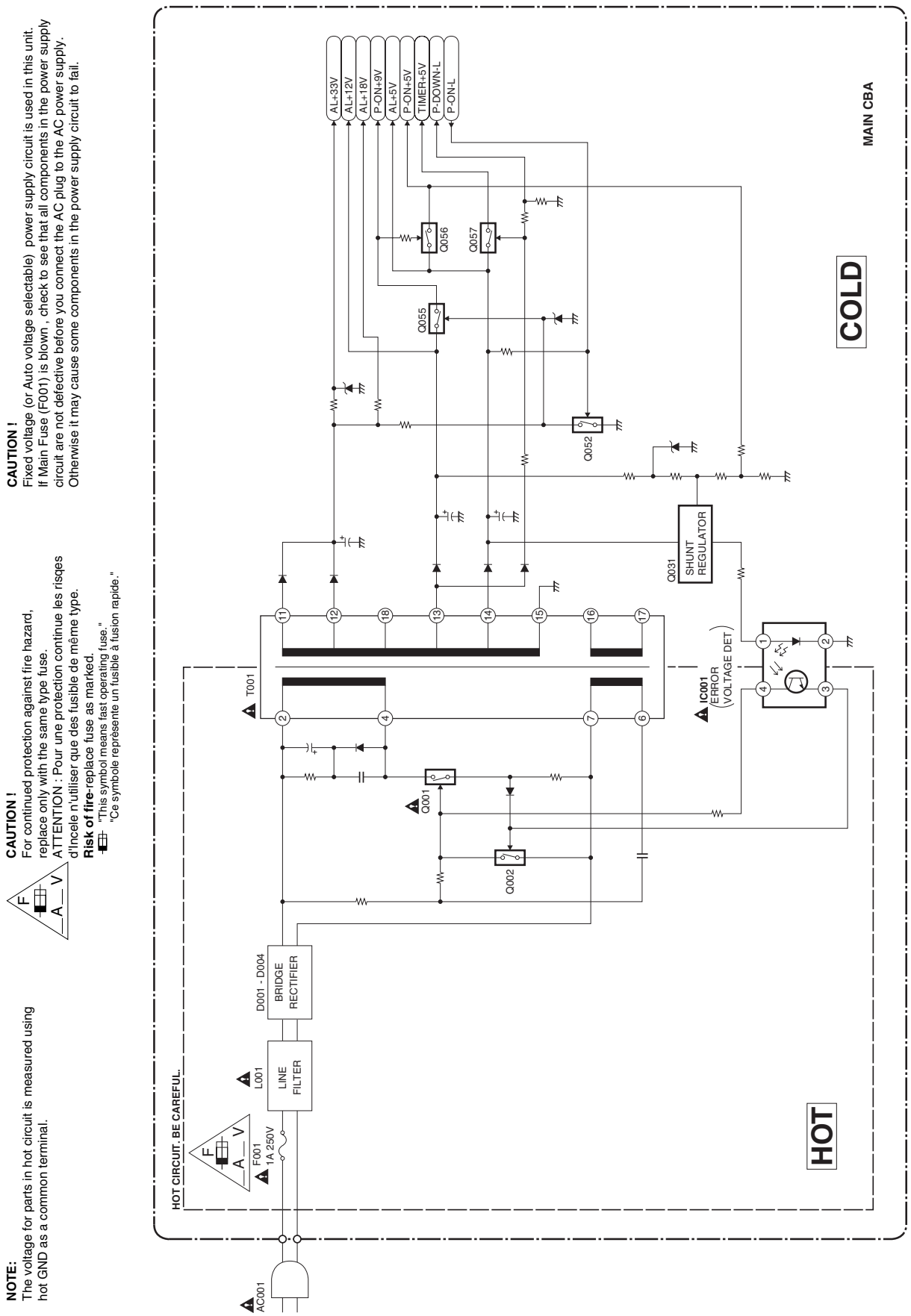
Audio Block Diagram



Hi-Fi Audio Block Diagram



Power Supply Block Diagram



SCHEMATIC DIAGRAMS / CBA'S AND TEST POINTS

Standard Notes

WARNING

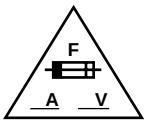
Many electrical and mechanical parts in this chassis have special characteristics. These characteristics often pass unnoticed and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts that have these special safety characteristics are identified in this manual and its supplements; electrical components having such features are identified by the mark "⚠" in the schematic diagram and the parts list. Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts that do not have the same safety characteristics as specified in the parts list may create shock, fire, or other hazards.

Notes:

1. Do not use the part number shown on these drawings for ordering. The correct part number is shown in the parts list, and may be slightly different or amended since these drawings were prepared.
2. All resistance values are indicated in ohms ($K = 10^3$, $M = 10^6$).
3. Resistor wattages are 1/4W or 1/6W unless otherwise specified.
4. All capacitance values are indicated in μF ($P = 10^{-6}$ μF).
5. All voltages are DC voltages unless otherwise specified.

LIST OF CAUTION, NOTES, AND SYMBOLS USED IN THE SCHEMATIC DIAGRAMS ON THE FOLLOWING PAGES:

1. CAUTION:



FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE FUSE.
ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQES D'INCELE N'UTILISER QUE DES FUSIBLE DE MÊME TYPE.
RISK OF FIRE-REPLACE FUSE AS MARKED.

This symbol means fast operating fuse.
Ce symbole reprèsente un fusible à fusion rapide.

2. CAUTION:

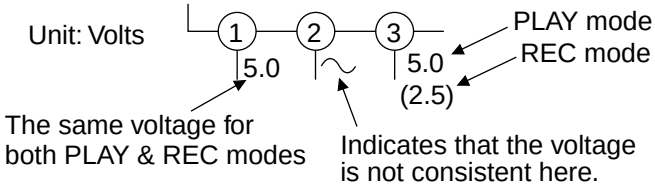
Fixed Voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F001) is blown, first check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

3. Note:

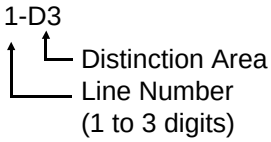
1. Do not use the part number shown on the drawings for ordering. The correct part number is shown in the parts list, and may be slightly different or amended since the drawings were prepared.
2. To maintain original function and reliability of repaired units, use only original replacement parts which are listed with their part numbers in the parts list section of the service manual.

4. Mode: SP/REC

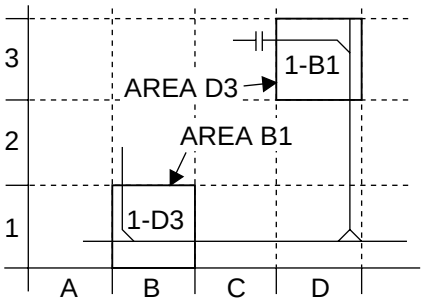
5. Voltage indications for PLAY and REC modes on the schematics are as shown below:



6. How to read converged lines



Examples:
1. "1-D3" means that line number "1" goes to the line number "1" of the area "D3".
2. "1-B1" means that line number "1" goes to the line number "1" of the area "B1".



7. Test Point Information

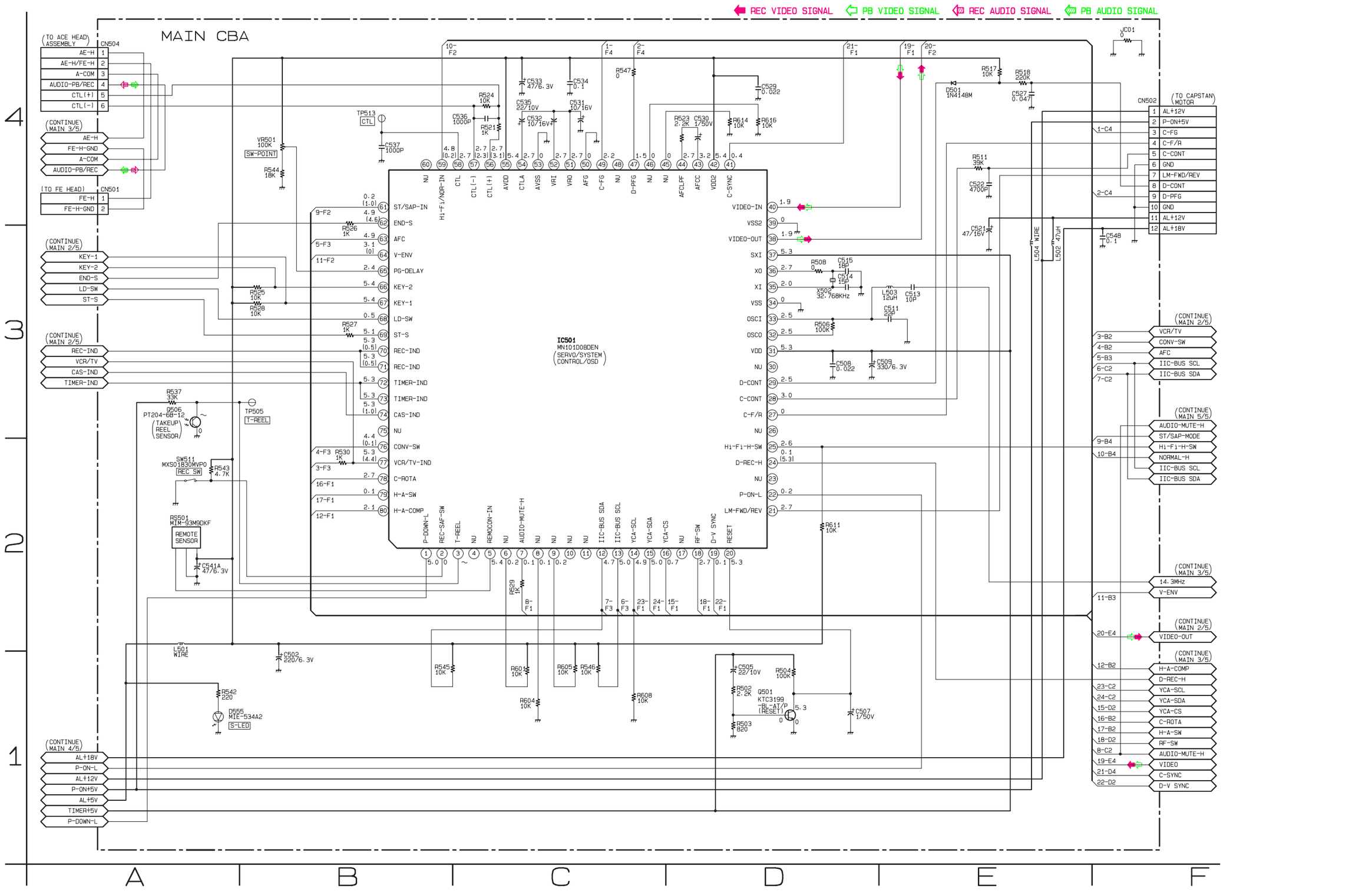
 : Indicates a test point with a jumper wire across a hole in the PCB.

 : Used to indicate a test point with a component lead on foil side.

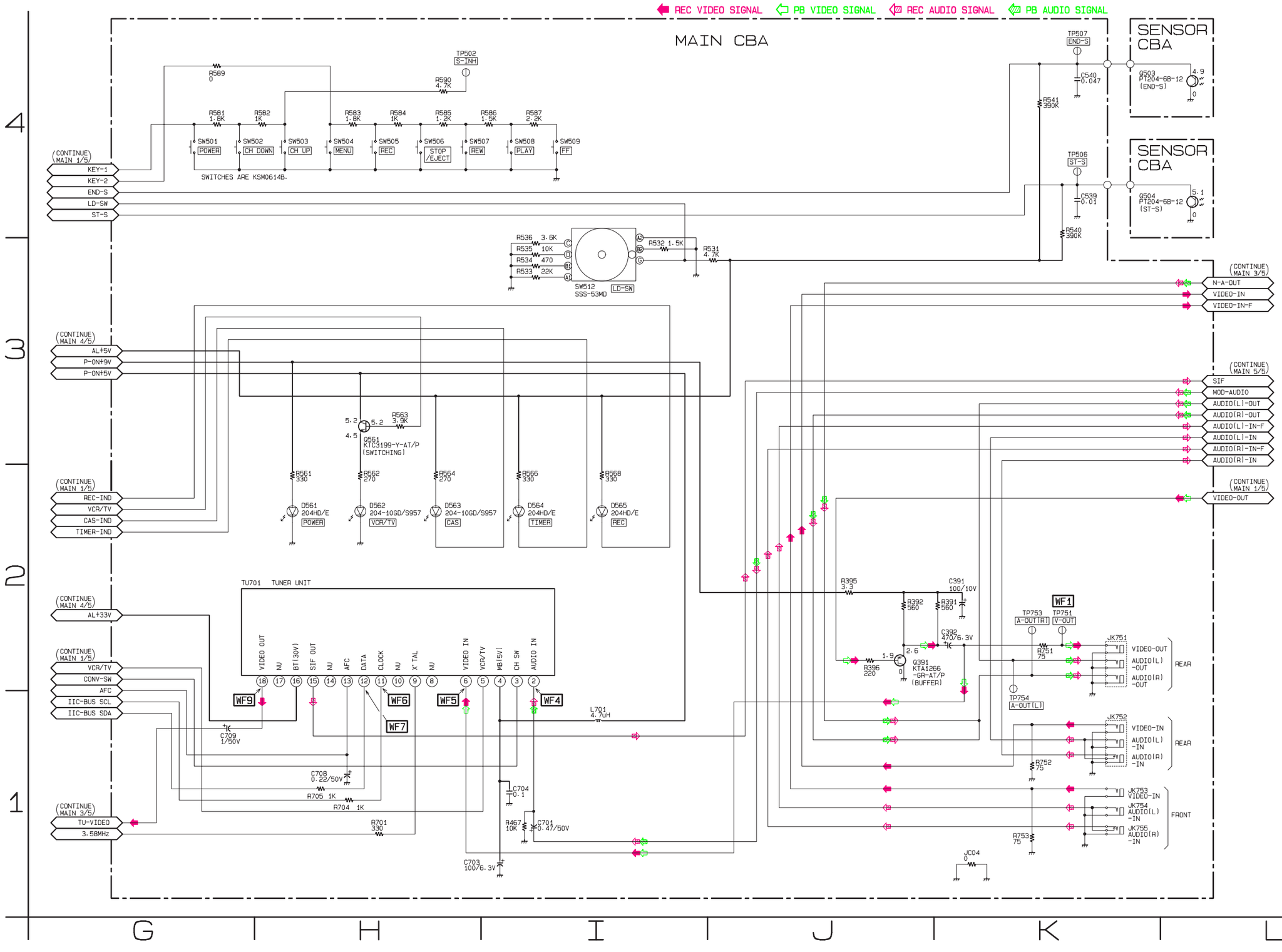
 : Used to indicate a test point with no test pin.

 : Used to indicate a test point with a test pin.

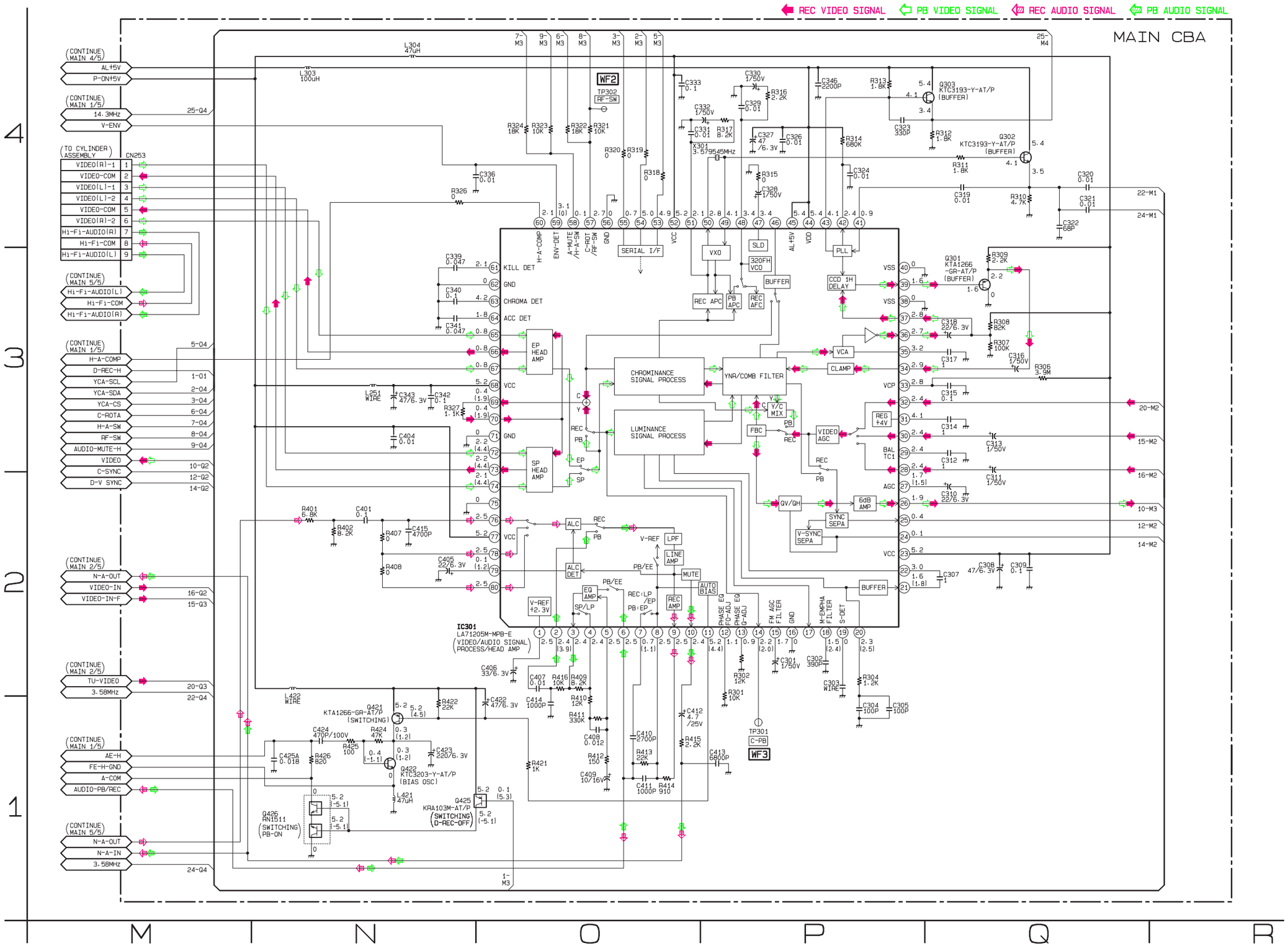
Main 1/5 Schematic Diagram



Main 2/5 & Sensor Schematic Diagram



Main 3/5 Schematic Diagram

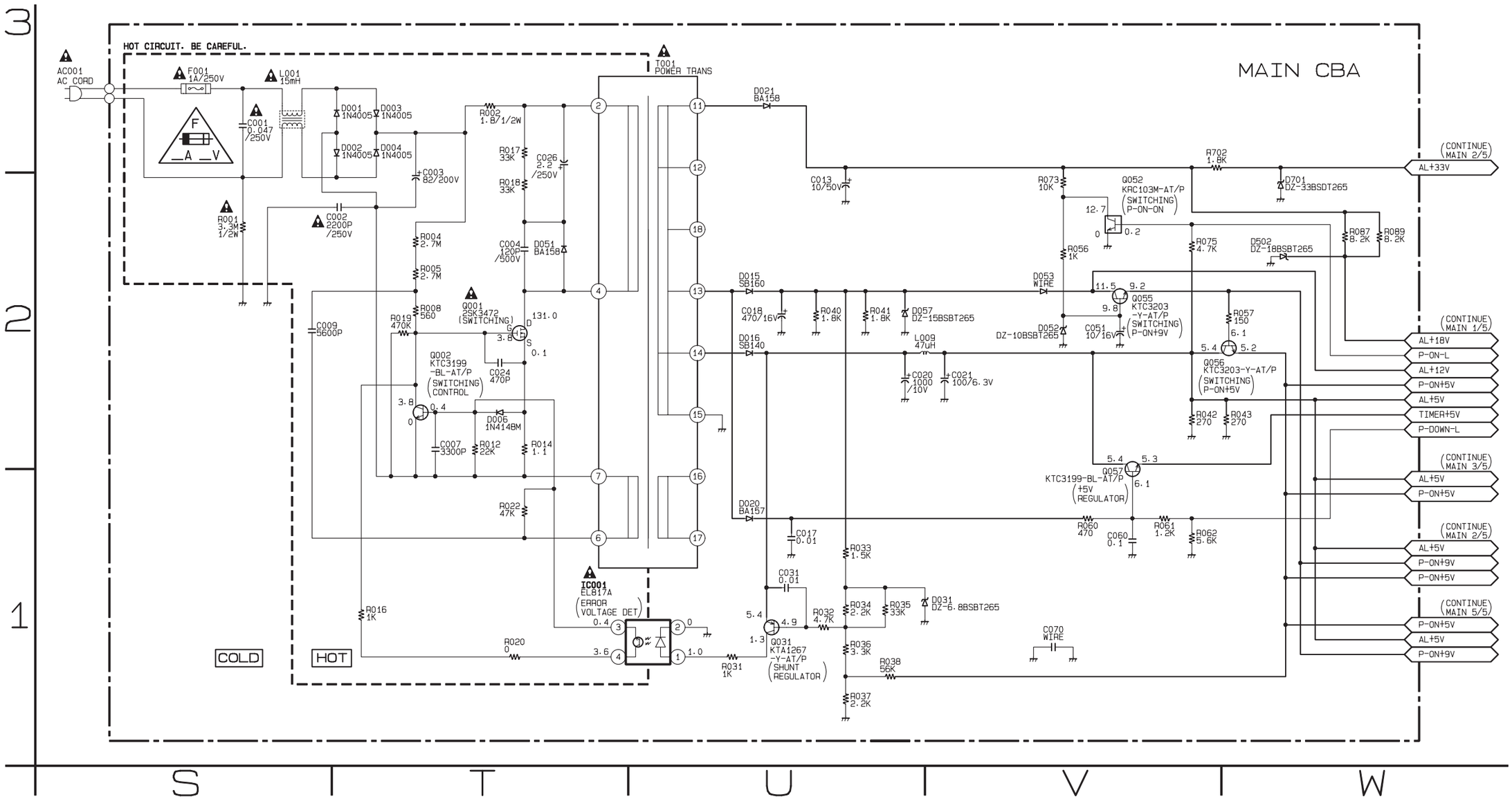


Main 4/5 Schematic Diagram

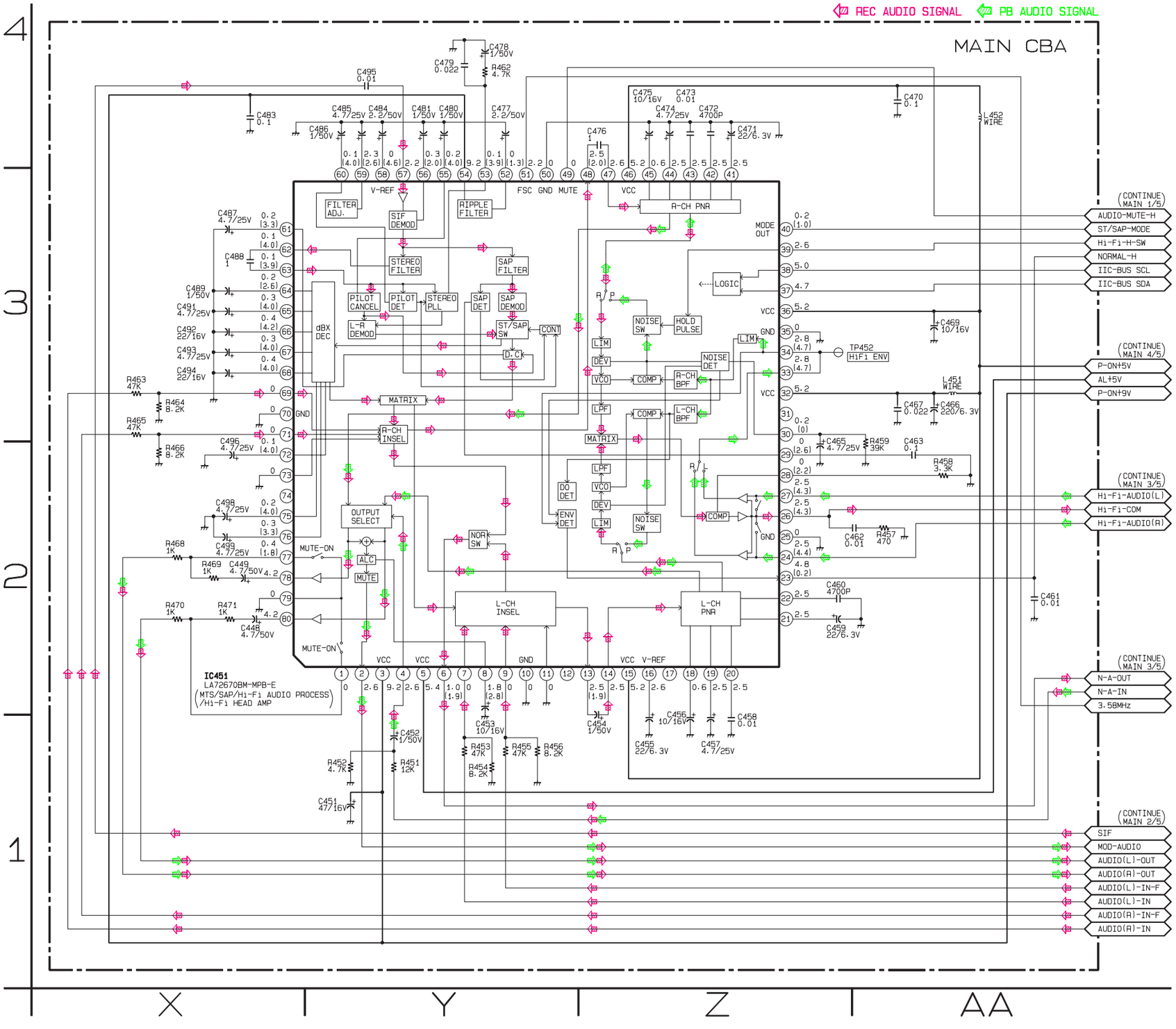
CAUTION !
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit. If Main Fuse (F001) is blown , check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

CAUTION !
For continued protection against fire hazard, replace only with the same type fuse.
ATTENTION : Pour une protection continue les risqes d'Incele n'utiliser que des fusible de même type.
Risk of fire-replace fuse as marked.
"This symbol means fast operating fuse."
"Ce symbole reprèsente un fusible à fusion rapide."

NOTE:
The voltage for parts in hot circuit is measured using hot GND as a common terminal.



Main 5/5 Schematic Diagram



Main CBA Top View

CAUTION !
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit. If Main Fuse (F001) is blown , check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

NOTE:
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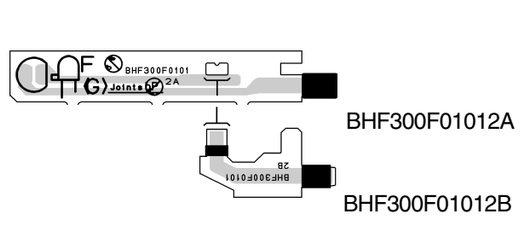
"Ce symbole reprèsente un fusible à fusion rapide."

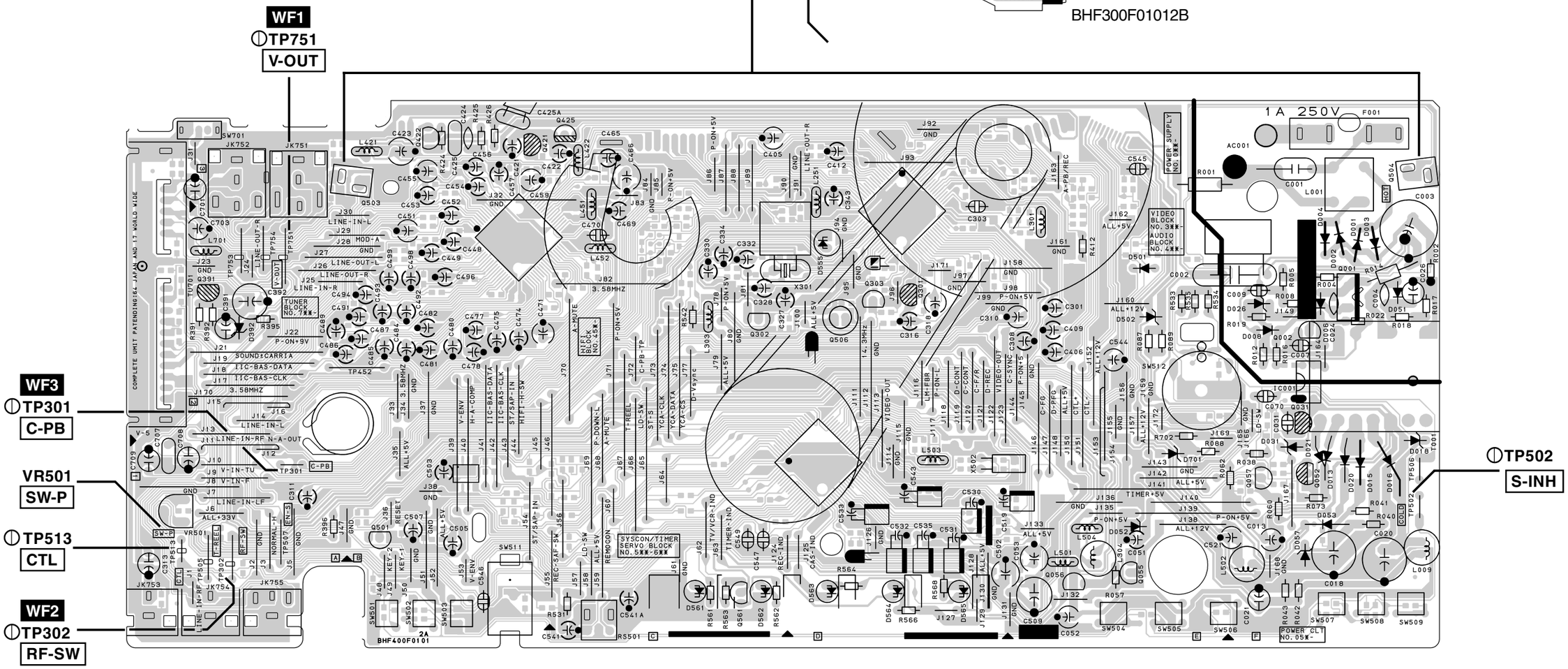
Because a hot chassis ground is present in the power supply circut, an isolation transformer must be used. Also, in order to have the ability to increase the input slowly, when troubleshooting this type power supply circuit, a variable isolation transformer is required.

NOTE:
Two Types of Main CBA (BHF400F01012,BHF400F01013) are described in this S/M.
When servicing , see the corresponding circuit board Layout (BHF400F01012,BHF400F01013).

Sensor CBA Top View



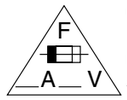
< BHF400F01012 >



Main CBA Bottom View

CAUTION !
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F001) is blown , check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply.
Otherwise it may cause some components in the power supply circuit to fail.

NOTE:
The voltage for parts in hot circuit is measured using hot GND as a common terminal.



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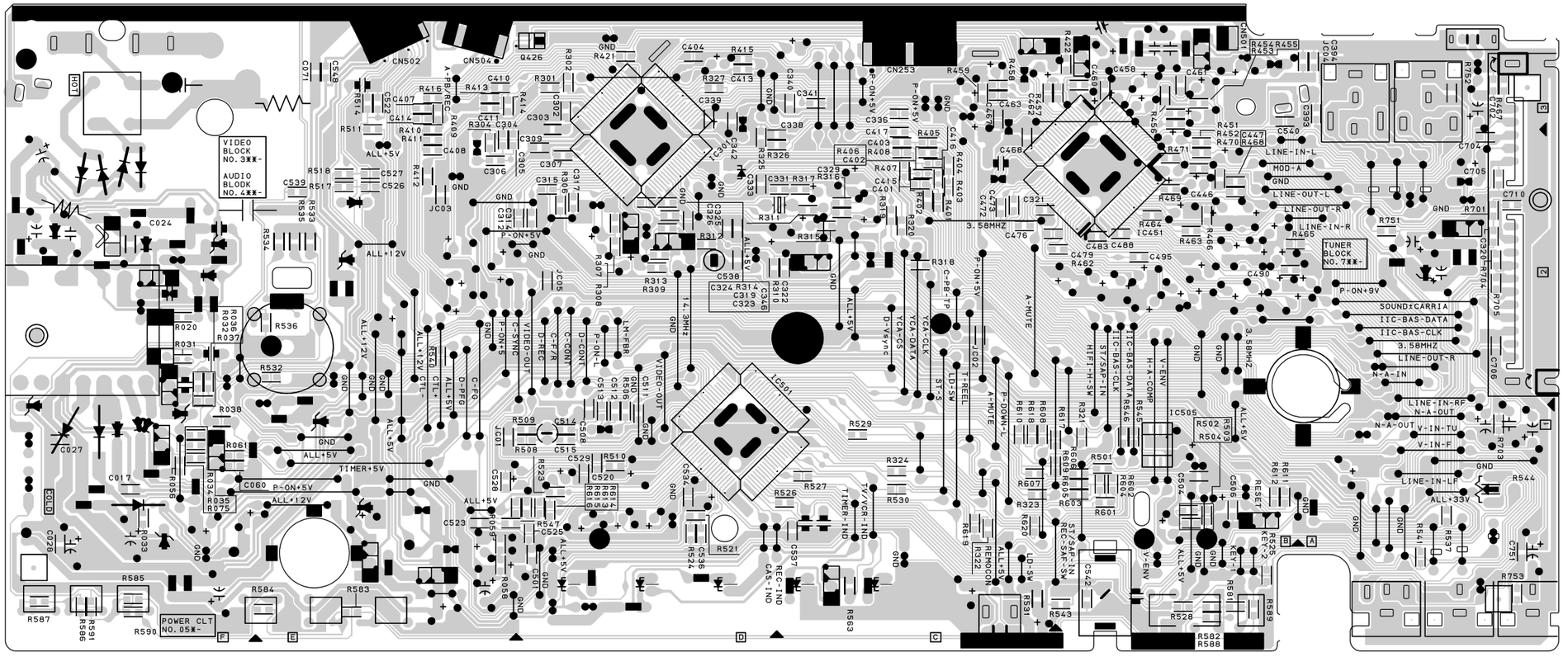
< BHF400F01012 >



Main CBA Top View

CAUTION !
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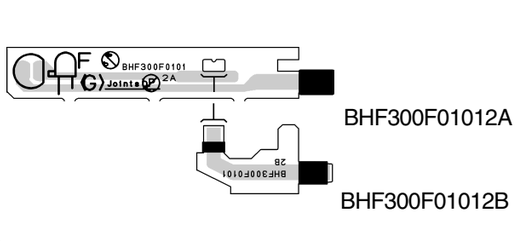
When servicing , see the corresponding circuit board Layout (BHF400F01012,BHF400F01013).

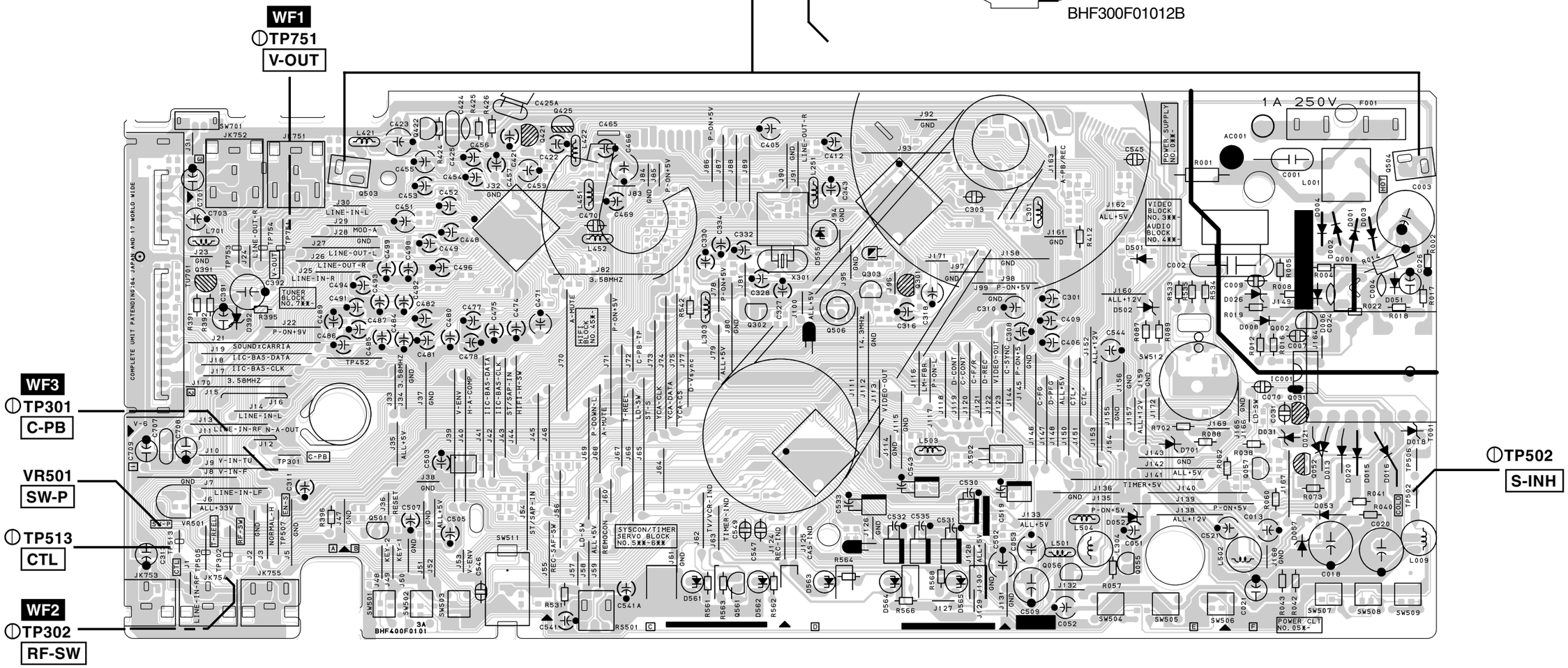
Sensor CBA Top View



BHF300F01012A

BHF300F01012B

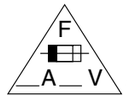
< BHF400F01013 >



Main CBA Bottom View

CAUTION !
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F001) is blown , check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply.
Otherwise it may cause some components in the power supply circuit to fail.

NOTE:
The voltage for parts in hot circuit is measured using hot GND as a common terminal.



CAUTION !
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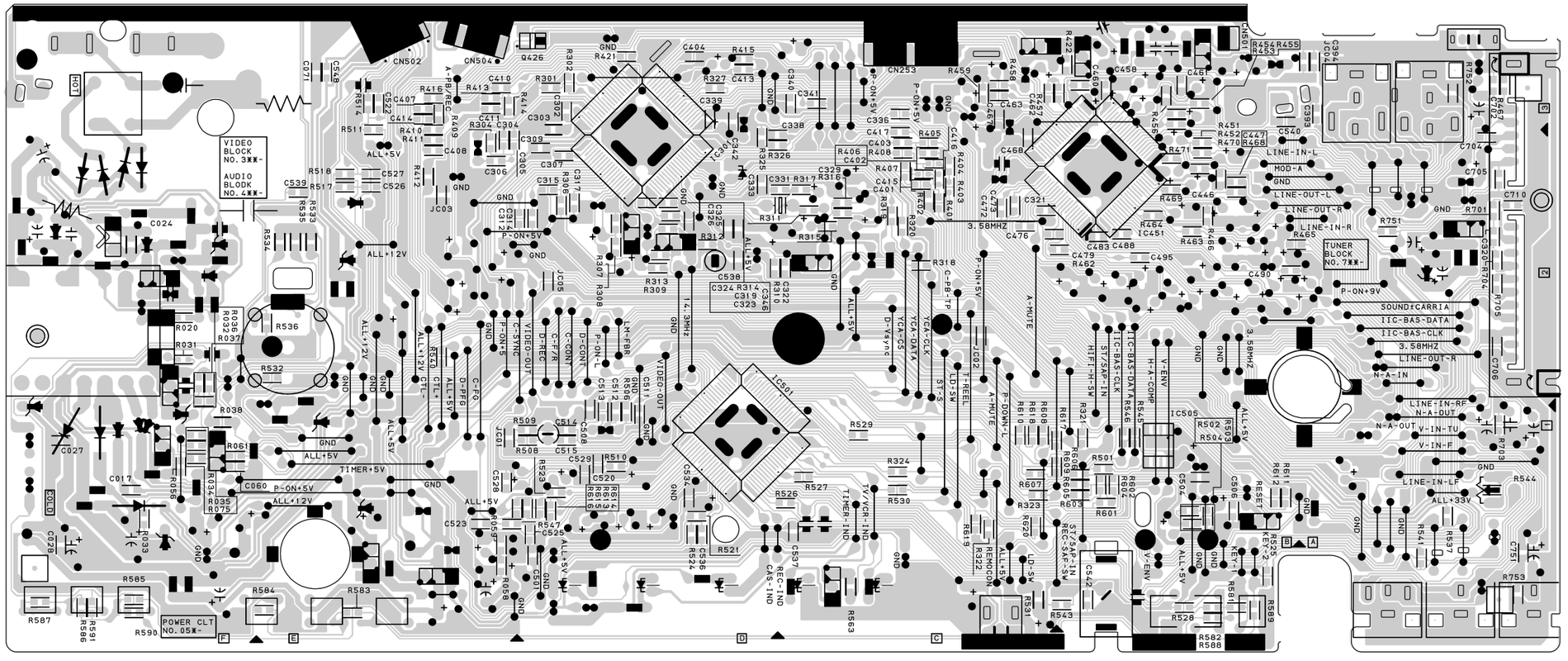
ATTENTION : Pour une protection continue les risqes d'Incele n'utiliser que des fusible de même type.
Risk of fire-replace fuse as marked.
"This symbol means fast operating fuse."
"Ce symbole représente un fusible à fusion rapide."

Because a hot chassis ground is present in the power supply circut, an isolation transformer must be used. Also, in order to have the ability to increase the input slowly, when troubleshooting this type power supply circuit, a variable isolation transformer is required.

NOTE:
Two Types of Main CBA (BHF400F01012,BHF400F01013) are described in this S/M.
When servicing , see the corresponding circuit board Layout (BHF400F01012,BHF400F01013).

< BHF400F01013>



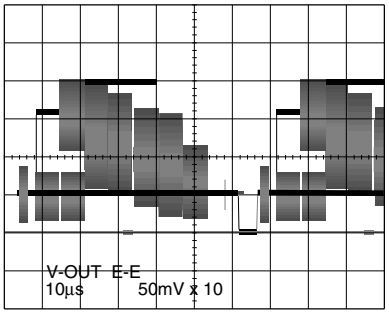
WAVEFORMS

NOTE:

Input

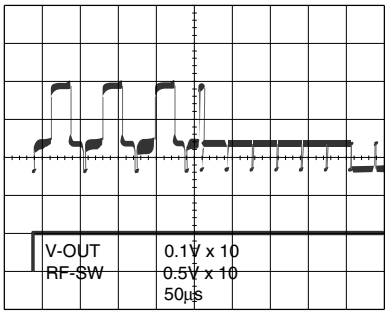
VCR: COLOR BAR SIGNAL (WITH 1KHz AUDIO SIGNAL)
(WF1~WF7,WF9)

WF1 TP751



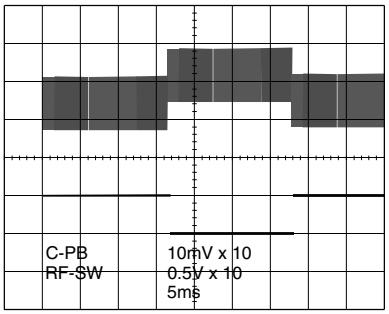
WF1 UPPER TP751

WF2 LOWER TP302

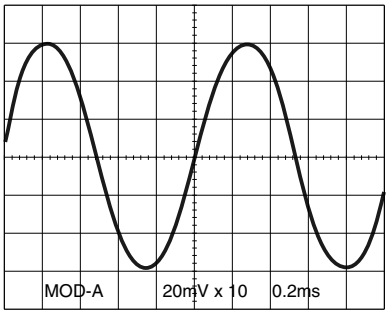


WF3 UPPER TP301

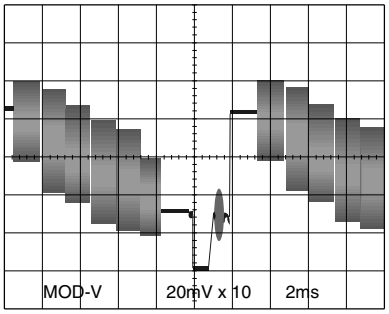
WF2 LOWER TP302



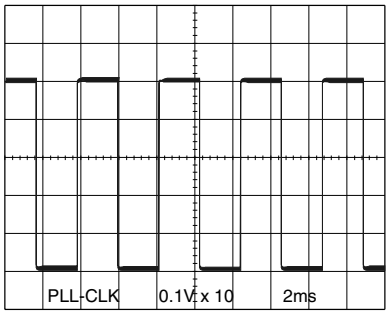
WF4 Pin 2 of TU701



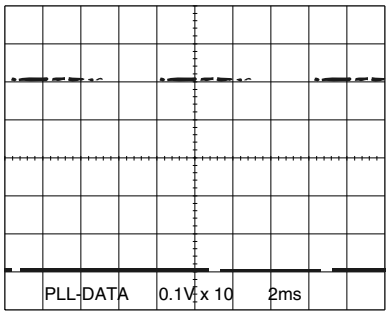
WF5 Pin 6 of TU701



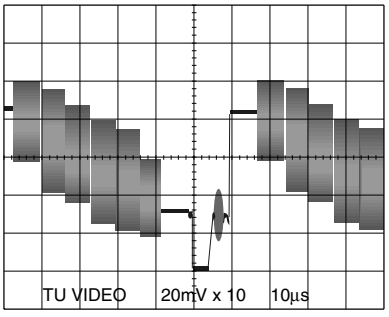
WF6 Pin 11 of TU701



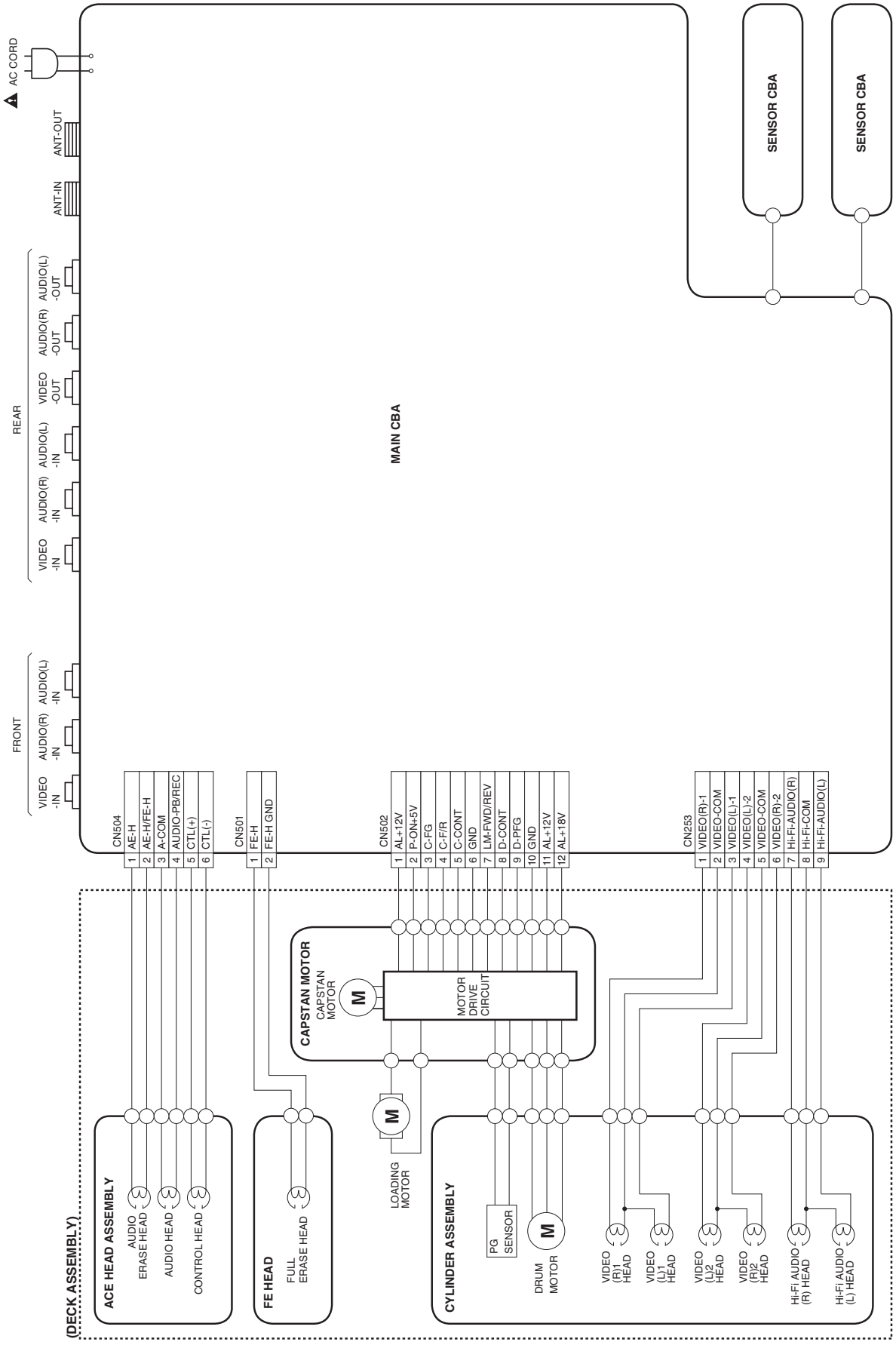
WF7 Pin 12 of TU701



WF9 Pin 18 of TU701



WIRING DIAGRAM



SYSTEM CONTROL TIMING CHARTS

Mode SW: LD-SW

LD-SW Position detection A/D Input voltage Limit (Calculated voltage)	Symbol
3.76 V ~ 4.50 V (4.12 V)	EJ
4.51 V ~ 5.00 V (5.00 V)	CL
0.00 V ~ 0.25 V (0.00 V)	SB
1.06 V ~ 1.50 V (1.21 V)	TL
0.66 V ~ 1.05 V (0.91 V)	FB
1.99 V ~ 2.60 V (2.17 V)	SF
1.51 V ~ 1.98 V (1.80 V)	SM
3.20 V ~ 3.75 V (3.40 V)	AU
0.26 V ~ 0.65 V (0.44 V)	AL
4.51 V ~ 5.00 V (5.00 V)	SS
2.61 V ~ 3.19 V (2.97 V)	RS

Note:

Note: EJ ⟶ RS: Loading FWD (LM-FWD / REV “H”)
RS ⟶ EJ: Loading REV (LM-FWD / REV “L”)
Stop (A) = Loading
Stop (B) = Unloading

Note:

Symbol	Loading Status
EJ	Eject
CL	Eject ~ REW Reel
SB	REW Reel ~ Stop (B)
TL	Stop (B) ~ Brake Cancel
FB	Brake Cancel ~ FF / REW
SF	FF / REW ~ Stop (M), (FF / REW)
SM	Stop (M), (FF / REW) ~ Stop (A)
AU	Stop (A) ~ Play / REC
AL	Play / REC ~ Still / Slow
SS	Still / Slow ~ RS (REW Search)
RS	RS (REW Search)

Still/Slow Control Frame Advance Timing Chart

1) SP Mode

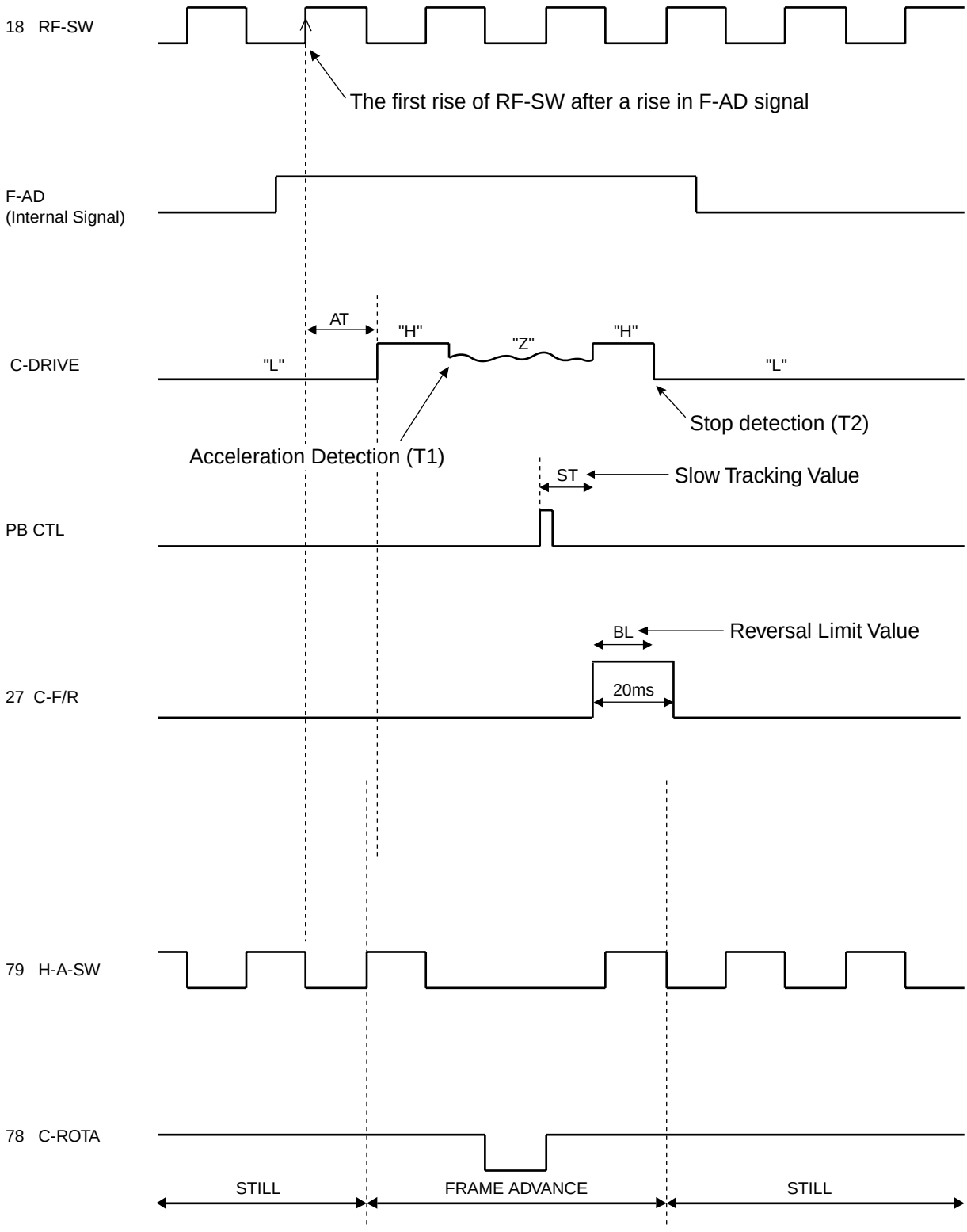


Fig. 1

2) LP/SLP Mode

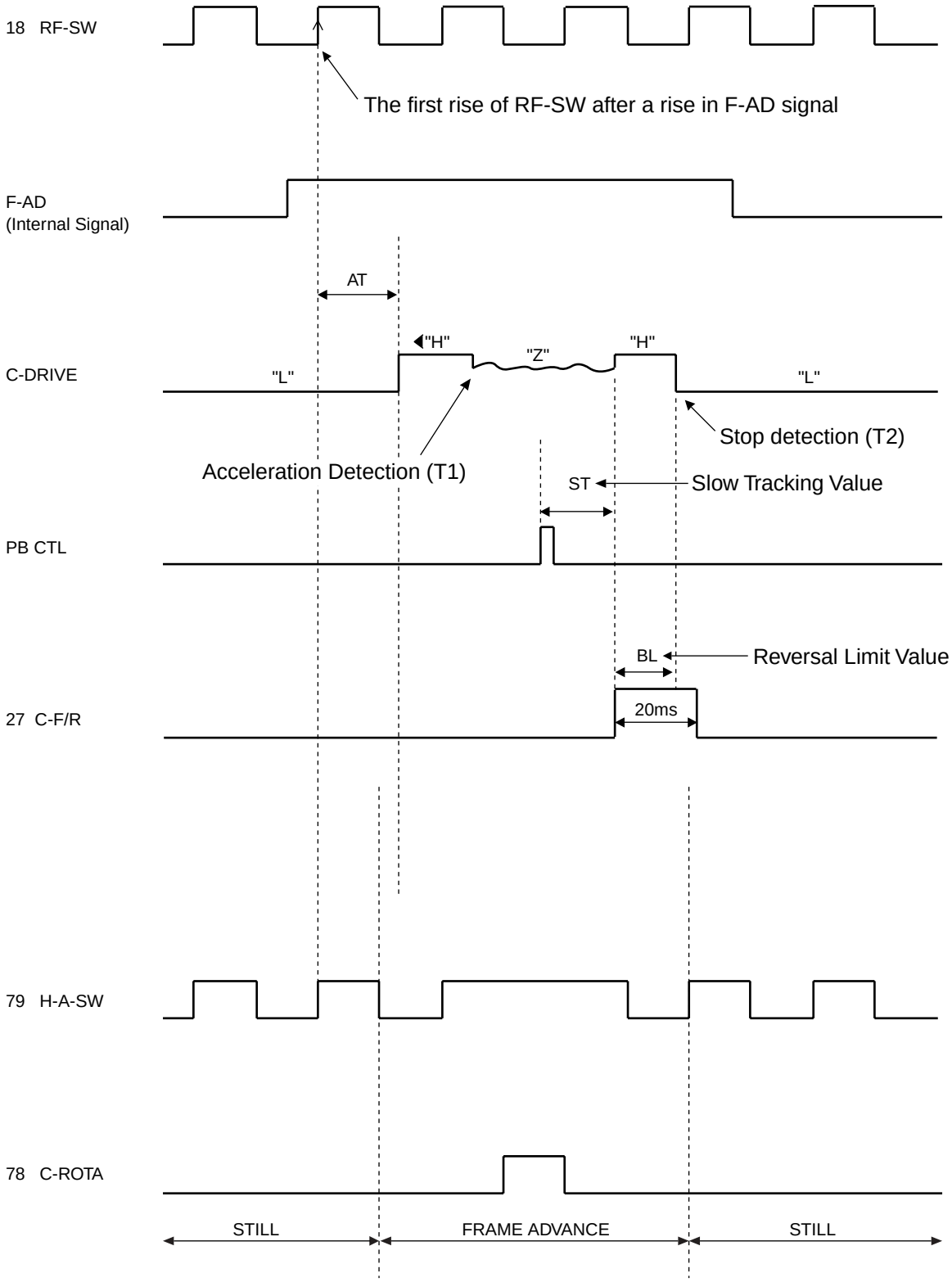


Fig. 2

1. EJECT (POWER OFF) -> CASSETTE IN (POWER ON) -> STOP(B) -> STOP(A) -> PLAY -> RS -> FS -> PLAY -> STILL -> PLAY -> STOP(A)

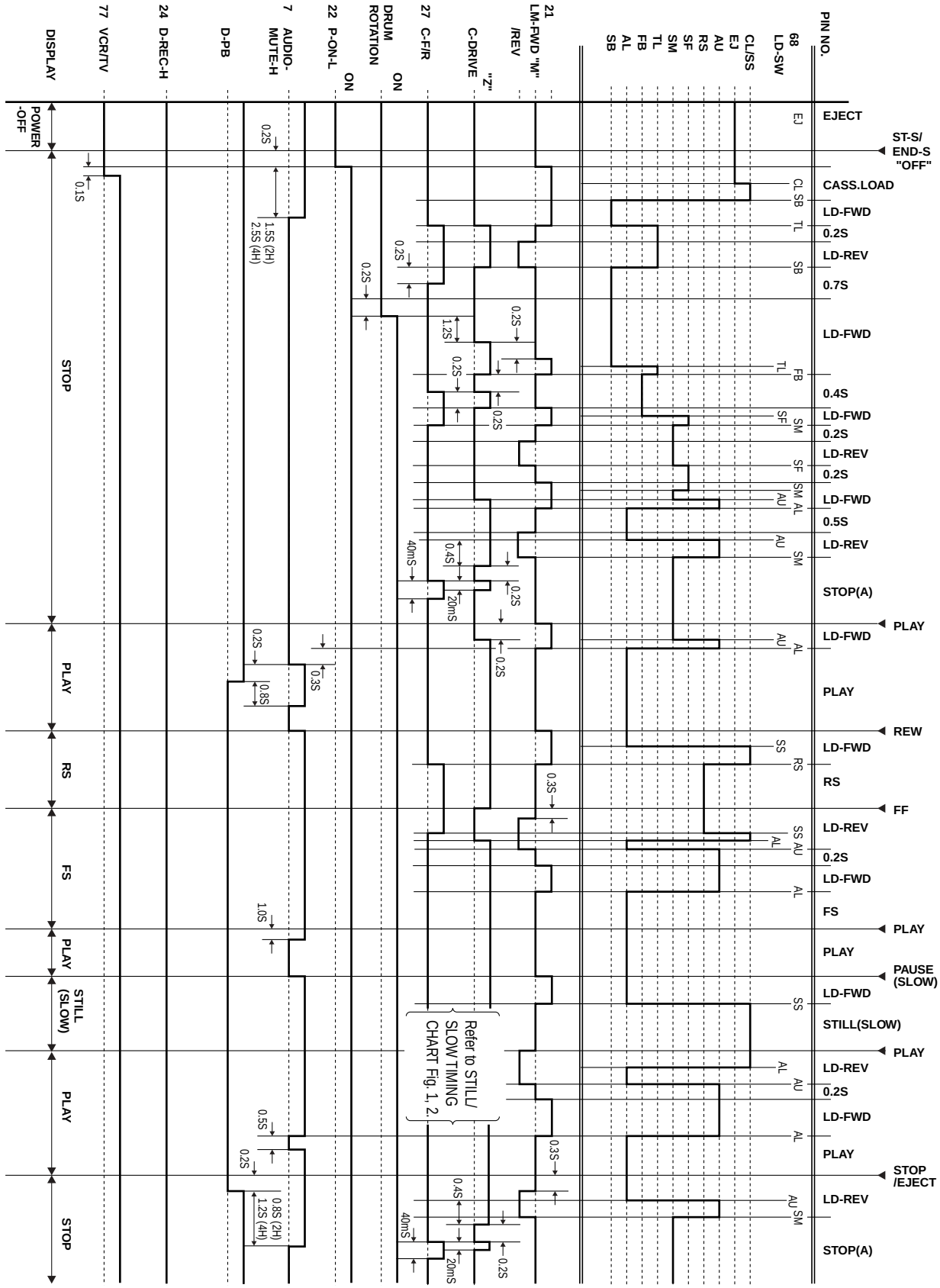


Fig. 3

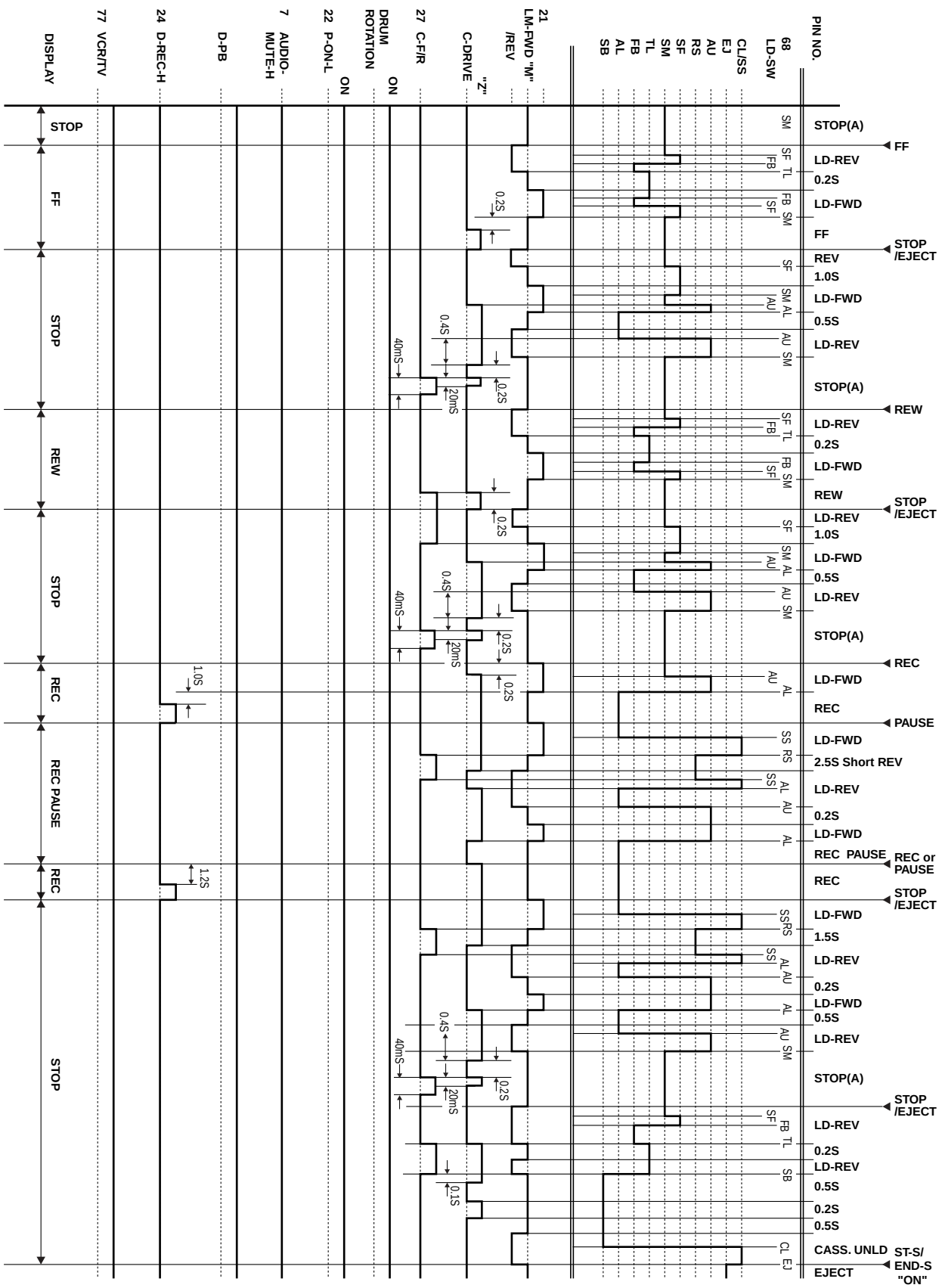

2. STOP(A) -> FF -> STOP(A) -> REW -> STOP(A) -> REC -> PAUSE -> PAUSE or REC -> STOP(A) -> EJECT
PIN NO.
68 LD-SW
CL/SS
EJ
AU
RS
SF
SM
TL
FB
AL
SB
21 LM-FWD "M" /REV
"Z" C-DRIVE
27 C-F/R
DRUM ROTATION
22 P-ON-L
7 AUDIO-MUTE-H
D-PB
24 D-REC-H
77 VCR/TV
DISPLAY
STOP(A)
FF
LD-REV
0.2S
LD-FWD
FF
STOP /EJECT
REV
1.0S
LD-FWD
0.5S
LD-REV
STOP(A)
REW
LD-REV
0.2S
LD-FWD
REW
STOP /EJECT
LD-REV
1.0S
LD-FWD
0.5S
LD-REV
STOP(A)
REC
LD-FWD
REC
PAUSE
LD-FWD
2.5S Short REV
LD-REV
0.2S
LD-FWD
REC PAUSE
REC or PAUSE
REC
STOP /EJECT
LD-FWD
1.5S
LD-REV
0.2S
LD-FWD
0.5S
LD-REV
STOP(A)
STOP /EJECT
LD-REV
0.2S
LD-REV
0.5S
0.2S
0.5S
CASS. UNLD
EJECT
ST-S/ END-S "ON"
0.2S
0.4S
40mS
20mS
1.0S
1.2S
0.1S
STOP
FF
STOP
REW
STOP
REC
REC PAUSE
REC
STOP

Fig. 4

IC PIN FUNCTION DESCRIPTIONS

IC501 (SERVO/SYSTEM CONTROL/OSD)

"H" ≥ 4.5 V, "L" ≤ 1.0 V

Pin No.	IN/ OUT	Signal Name	Function	Active Level
1	IN	P-DOWN-L	Power Voltage Down Detector Signal	L
2	IN	REC-SAF-SW	Recording Safety SW Detect (With Record tab = "L"/ With out Record tab = "H")	H/L
3	IN	T-REEL	Take Up Reel Rotation Signal	PULSE
4	-	N.U.	Not Used	-
5	IN	REMOCON-IN	Remote Control Sensor	H/L
6	-	N.U.	Not Used	-
7	OUT	AUDIO-MUTE-H	Audio Mute Control Signal (Mute = "H")	H
8	-	N.U.	Not Used	-
9	-	N.U.	Not Used	-
10	-	N.U.	Not Used	-
11	-	N.U.	Not Used	-
12	IN/ OUT	IIC-BUS-SDA	IIC BUS Control Data	H/L
13	OUT	IIC-BUS-SCL	IIC BUS Control Clock	H/L
14	OUT	YCA-SCL	YCA IC Control Clock	H/L
15	OUT	YCA-SDA	YCA IC Control Data	H/L
16	OUT	YCA-CS	YCA IC Control Chip Select	H
17	-	N.U.	Not Used	-
18	OUT	RF-SW	Video Head Switching Pulse	H/L
19	OUT	D-V SYNC	Dummy V-sync Output	H/Hi-z
20	IN	RESET	System Reset Signal (Reset = "L")	L
21	OUT	LM-FWD/ REV	Loading Motor FWD/ REV Output	H/Z/L
22	OUT	P-ON-L	Power On Signal to Low	L
23	-	N.U.	Not Used	-
24	OUT	D-REC-H	Delayed Record Signal	H
25	OUT	Hi-Fi-H-SW	Hi-Fi Audio Head Switching Pulse	-
26	-	N.U.	Not Used	-
27	OUT	C-F/R	Capstan Motor FWD/ REV Control Signal (FWD = "L"/REV = "H")	H/L
28	OUT	C-CONT	Capstan Motor Control Signal	PWM
29	OUT	D-CONT	Drum Motor Control Signal	PWM
30	-	N.U.	Not Used	-
31	-	VDD	VDD	-
32	OUT	OSCO	Main Clock Output 14.31818MHz	-
33	IN	OSCI	Main Clock Input 14.31818MHz	-
34	-	VSS	VSS	-
35	IN	XI	Sub Clock Input 32.768 MHz	-
36	OUT	XO	Sub Clock Output 32.768 MHz	-
37	IN	SXI	Operation Mode Selecting Input Signal	-
38	OUT	VIDEO-OUT	Composite Video Signal Output	-
39	-	VSS2	Vss2	-
40	IN	VIDEO-IN	Composite Video Signal Input	-
41	IN	C-SYNC	Composite Synchronized Pulse	PULSE
42	-	VDD2	VDD2	-
43	IN	AFCC	Low Path Filter Input Signal For AFC	-
44	OUT	AFCLPF	Low Path Filter Output Signal For AFC	-
45	-	N.U.	Not Used	-
46	-	N.U.	Not Used	-
47	IN	D-PFG	Drum PG/FG Input Signal	PULSE
48	-	N.U.	Not Used	-
49	IN	C-FG	Capstan Motor Rotation Detection Pulse	PULSE
50	-	AFG	GND	-
51	OUT	VRO	Servo Standard Voltage Output	-

Pin No.	IN/ OUT	Signal Name	Function	Active Level
52	IN	VRI	Servo Standard Voltage Input	-
53	-	AVSS	AVSS	-
54	IN	CTLA	CTL Amp. AC GND	-
55	-	AVDD	AVDD	-
56	IN/ OUT	CTL (+)	Playback/Record Control Signal (+)	-
57	IN/ OUT	CTL (-)	Playback/Record Control Signal (-)	-
58	OUT	CTL	Amp. Output Control Signal for Test Point	-
59	IN	Hi-Fi/ NOR-IN	Audio Mode Input Hi-Fi="L"/Normal="H"	-
60	-	N.U.	Not Used	-
61	IN	ST/SAP-IN	Tuner Stereo/Sap Detector Siginal Input	-
62	IN	END-S	Tape End Position Detect Signal	A/D
63	IN	AFC	Automatic Frequency Control Signal	A/D
64	IN	V-ENV	Video Envelope Comparator Signal	A/D
65	IN	PG-DELAY	Video Head Switching Pulse Signal Adjusted Voltage	A/D
66	IN	KEY-2	A/D Key Data Signal 2	A/D
67	IN	KEY-1	A/D Key Data Signal 1	A/D
68	IN	LD-SW	Deck Mode Position Detector Signal	A/D
69	IN	ST-S	Tape Start Position Detector Signal	A/D
70	OUT	REC-IND	"REC" LED Signal Output	L
71	OUT	REC-IND	"REC" LED Signal Output	L
72	OUT	TIMER-IND	"TIMER" LED Signal Output	L
73	OUT	TIMER-IND	"TIMER" LED Signal Output	L
74	OUT	CAS-IND	"CASSETTE" LED Signal Output	L
75	-	N.U.	Not Used	-
76	OUT	CONV-SW	RF Conv. Output Channel Switching Signal 3ch = "Hi-z", 4ch = "L"	Hi-z/L
77	OUT	VCR/TV-IND	VCR/TV Mode LED Indicate	H/L
78	OUT	C-ROTA	Color Phase Rotary Changeover SIgnal	H/L
79	OUT	H-A-SW	Video Head Amp Switching Pulse	H/L
80	IN	H-A-COMP	Head Amp Comparator Signal	H/L

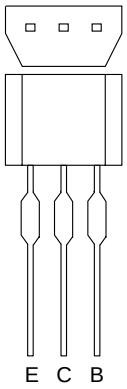
Notes:

Abbreviation for Active Level:

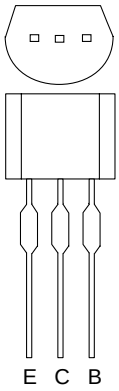
PWM ----- Pulse Wide Modulation

A/D -------- Analog - Digital Converter

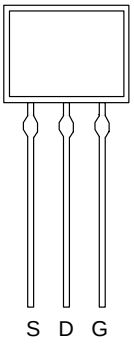
LEAD IDENTIFICATIONS



KRA103M
KRC103M
KTA1266(GR)
KTC3193(Y)
KTC3199(BL,Y)

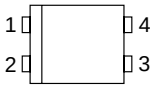


KTA1267(Y)
KTC3203(Y)



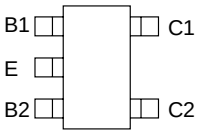
2SK3472(Q)

EL817A



1: A
2: K
3: E
4: C

RN1511(TE85R)



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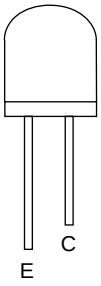
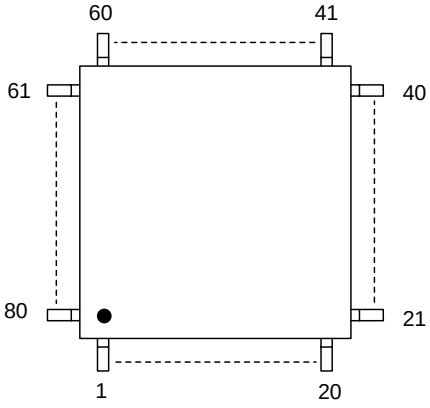


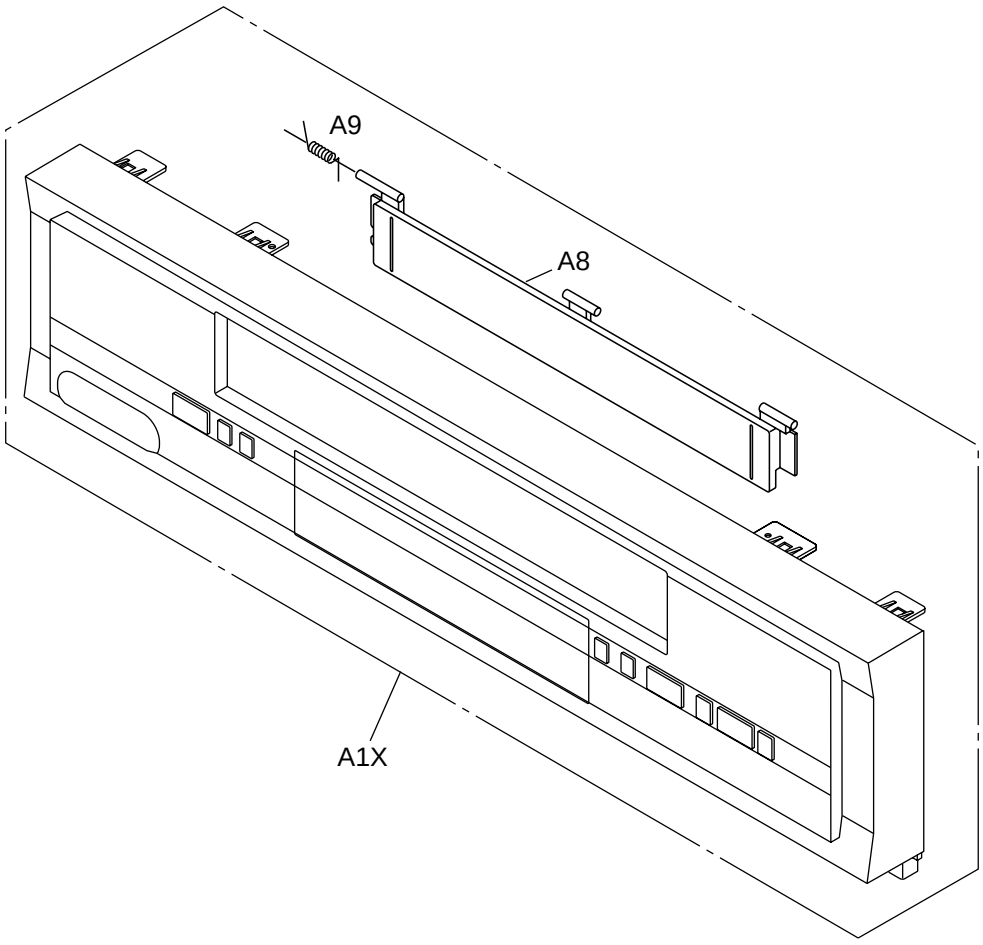
LA71205M-MPB-E
LA72670BM-MPB-E
MN101D08DEN



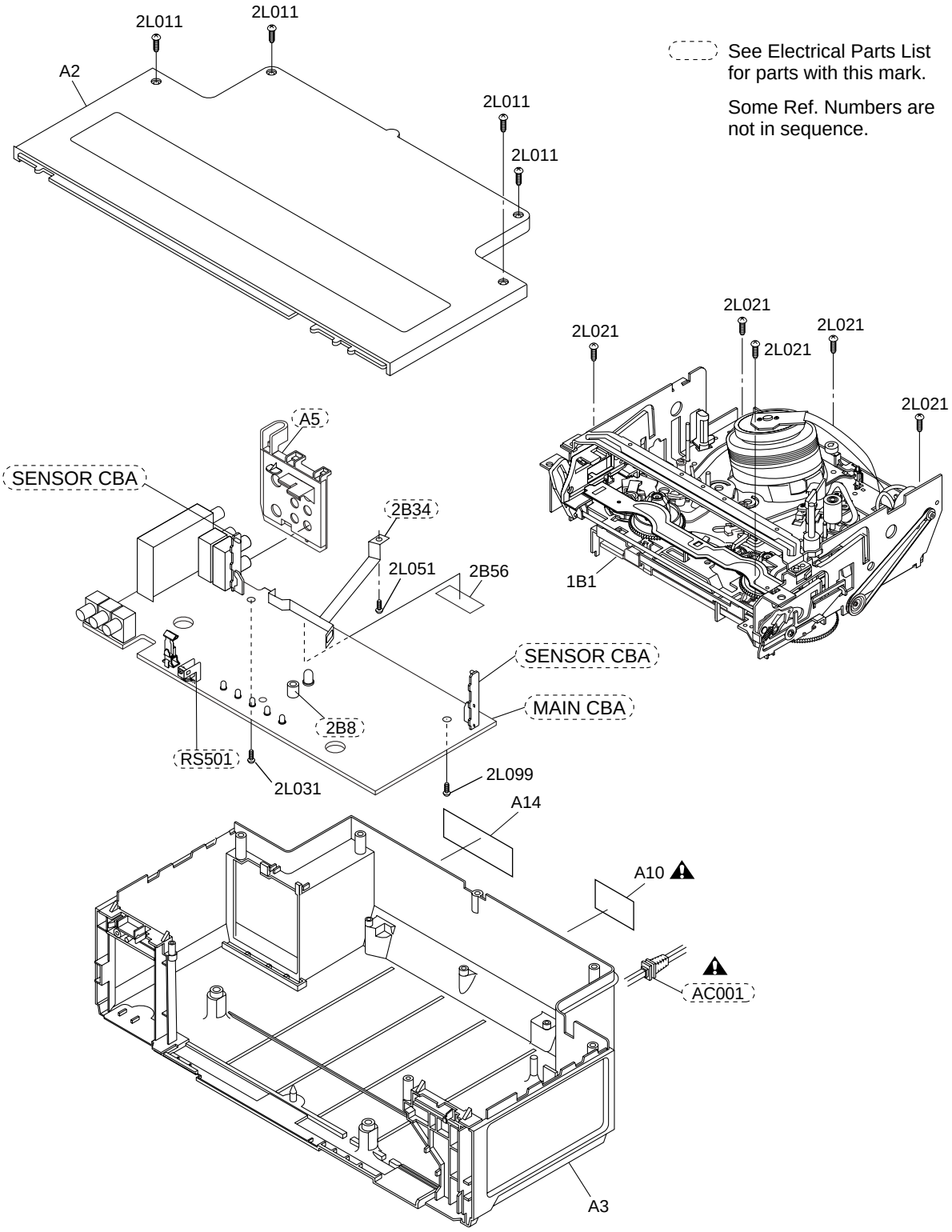
Note:
A: Anode
K: Cathode
E: Emitter
C: Collector
B: Base
R: Reference
G: Gate
D: Drain
S: Source

EXPLODED VIEWS

Front Panel

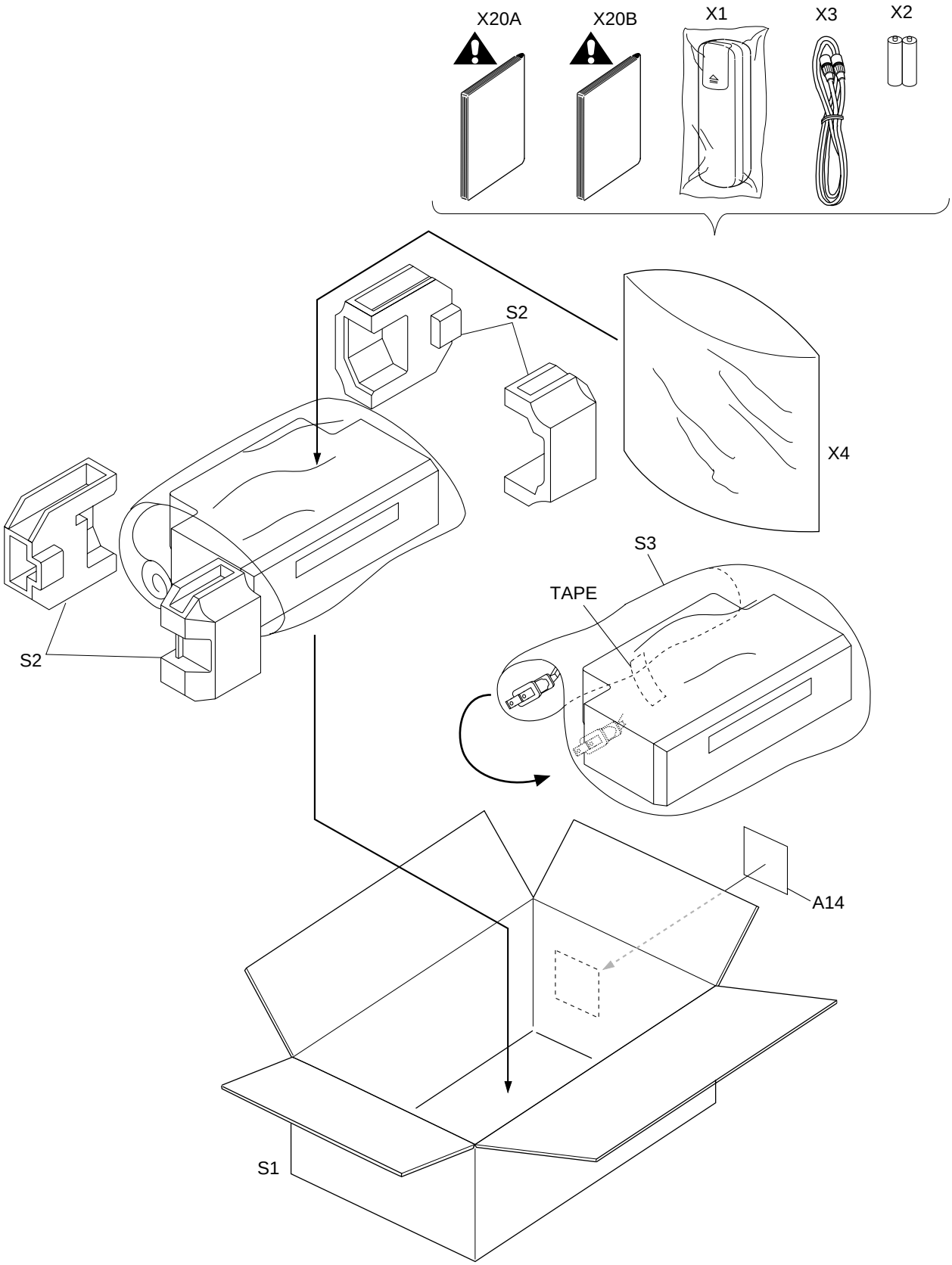


Cabinet


2L011
2L011
A2
2L011
2L011
See Electrical Parts List for parts with this mark.
Some Ref. Numbers are not in sequence.
2L021
2L021
2L021
2L021
2L021
1B1
A5
SENSOR CBA
2B34
2L051
2B56
SENSOR CBA
MAIN CBA
2B8
RS501
2L031
2L099
A14
A10
AC001
A3

Packing

Some Ref. Numbers are not in sequence.



MECHANICAL PARTS LIST

PRODUCT SAFETY NOTE: Products marked with a ⚠ have special characteristics important to safety. Before replacing any of these components, read carefully the product safety notice in this service manual. Don't degrade the safety of the product through improper servicing.

NOTE: Parts that are not assigned part numbers (---------) are not available.

Ref. No.	Description	Part No.
A1X	FRONT ASSEMBLY HJ45WCD	1VM222573
A2	TOP CASE(WAL MART CANADA) HF441CD	0VM306784
A3	CHASSIS(WAL MART CANADA) HF441CD	0VM204546
A8	DOOR CASSETTE HD450CD	0VM414613
A9	DOOR SPRING HF410UD	1VM421240
A10⚠	RATING LABEL HJ45WCD	----------
A14	LABEL BAR CODE HB400UD	----------
1B1	DECK ASSEMBLY CZD014/VM246U	N246UFL
2B56	CABLE COVER HF410UD	0VM416449
2L011	SCREW P-TIGHT 3X10 BIND HEAD+	GBHP3100
2L021	SCREW P-TIGHT M3*10 WASHERHEAD+	GCJP3100
2L031	SCREW S-TIGHT M3X6 BIND HEAD+	GBJS3060
2L051	SCREW S-TIGHT M3X6 BIND HEAD+	GBJS3060
2L099	SCREW P-TIGHT M3X8 BIND HEAD+	GBCP3080
PACKING		
S1	GIFT BOX CARTON HJ45WCD	1VM323021
S2	STYROFOAM(F/C-U27) HD400UD	0VM203814
S3	UNIT BAG V4010PA	0VM406453B
ACCESSORIES		
X1	REMOTE CONTROL UNIT NA375UD	NA375UD
X2	DRY BATTERY R6P/2S	XB0M451T0001
X3	RF CABLE 2.5C-2V	WPZ0901TM002
X4	ACCESSORY BAG E5700UD	0VM415576
X20A⚠	OWNERS MANUAL(EN) HJ45WCD	1VMN22928
X20B⚠	OWNERS MANUAL(FR) HJ45WCD	1VMN22929

ELECTRICAL PARTS LIST

PRODUCT SAFETY NOTE: Products marked with a ⚠ have special characteristics important to safety. Before replacing any of these components, read carefully the product safety notice in this service manual. Don't degrade the safety of the product through improper servicing.

NOTES:

1. Parts that are not assigned part numbers (---------) are not available.
2. Tolerance of Capacitors and Resistors are noted with the following symbols.

C.....±0.25% D.....±0.5% F.....±1%

G.....±2% J.....±5% K.....±10%

M.....±20% N.....±30% Z.....+80/-20%

MCV CBA

Ref. No.	Description	Part No.
	MCV CBA Consists of the following:	1VSA13564
	MAIN CBA (MCV-A) SENSOR CBA	---------- 1VSA13752

MAIN CBA

Ref. No.	Description	Part No.
	MAIN CBA Consists of the following:	----------
	CAPACITORS	
C001⚠	METALIZED FILM CAP. 0.047µF/250V M	CT2E473MS037
C002⚠	SAFETY CAP. 2200pF/250V	CCG2EMA0F222
C003	ELECTROLYTIC CAP. 82µF/200V M	CA2D820S6014
C004	CERAMIC CAP. B K 120pF/500V	CCD2JKP0B121
C007	CERAMIC CAP.(AX) X K 3300pF/16V	CCA1CKT0X332
C009	CERAMIC CAP.(AX) X K 5600pF/16V	CCA1CKT0X562
C013	ELECTROLYTIC CAP. 10µF/50V M H7	CE1JMAVSL100
C017	CHIP CERAMIC CAP. B K 0.01µF/50V	CHD1JKB0B103
C018	ELECTROLYTIC CAP. 470µF/16V M	CE1CMASDL471
C020	ELECTROLYTIC CAP. 1000µF/10V M	CE1AMZPDL102
C021	ELECTROLYTIC CAP. 100µF/6.3V M	CE0KMASDL101
C024	CERAMIC CAP. SL J 470pF/50V	CCD1JJSSL471
C026	ELECTROLYTIC CAP. 2.2µF/250V M	CA2E2R2S6009
C031	CERAMIC CAP.(AX) Y M 0.01µF/16V	CCA1CMT0Y103
C051	ELECTROLYTIC CAP. 10µF/16V M H7	CE1CMAVSL100
C060	CHIP CERAMIC CAP. B K 0.1µF/25V	CHD1EKB0B104
C070	PCB JUMPER D0.6-P5.0	JW5.0T
C301	ELECTROLYTIC CAP. 1µF/50V M H7	CE1JMAVSL1R0
C302	CHIP CERAMIC CAP. CH J 390pF/50V	CHD1JJBCH391
C303	PCB JUMPER D0.6-P5.0	JW5.0T
C304	CHIP CERAMIC CAP. CH J 100pF/50V	CHD1JJBCH101
C305	CHIP CERAMIC CAP. CH J 100pF/50V	CHD1JJBCH101
C307	CHIP CERAMIC CAP. F Z 1µF/10V	CHD1AZB0F105
C308	ELECTROLYTIC CAP. 47µF/6.3V M H7	CE0KMAVSL470
C309	CHIP CERAMIC CAP. F Z 0.1µF/50V	CHD1JZB0F104
C310	ELECTROLYTIC CAP. 22µF/6.3V M H7	CE0KMAVSL220
C311	ELECTROLYTIC CAP. 1µF/50V M H7	CE1JMAVSL1R0
C312	CHIP CERAMIC CAP. F Z 1µF/10V	CHD1AZB0F105
C313	ELECTROLYTIC CAP. 1µF/50V M	CE1JMASDL1R0
C314	CHIP CERAMIC CAP. F Z 1µF/10V	CHD1AZB0F105
C315	CHIP CERAMIC CAP. B K 0.1µF/25V	CHD1EKB0B104
C316	ELECTROLYTIC CAP. 1µF/50V M H7	CE1JMAVSL1R0
C317	CHIP CERAMIC CAP. F Z 1µF/10V	CHD1AZB0F105
C318	ELECTROLYTIC CAP. 22µF/6.3V M H7	CE0KMAVSL220
C319	CHIP CERAMIC CAP. B K 0.01µF/50V	CHD1JKB0B103
C320	CHIP CERAMIC CAP. B K 0.01µF/50V	CHD1JKB0B103
C321	CHIP CERAMIC CAP. B K 0.01µF/50V	CHD1JKB0B103
C322	CHIP CERAMIC CAP. CH J 68pF/50V	CHD1JJBCH680
C323	CHIP CERAMIC CAP. CH J 330pF/50V	CHD1JJBCH331
C324	CHIP CERAMIC CAP. B K 0.01µF/50V	CHD1JKB0B103
C326	CHIP CERAMIC CAP. B K 0.01µF/50V	CHD1JKB0B103
C327	ELECTROLYTIC CAP. 47µF/6.3V M H7	CE0KMAVSL470
C328	ELECTROLYTIC CAP. 1µF/50V M H7	CE1JMAVSL1R0
C329	CHIP CERAMIC CAP. B K 0.01µF/50V	CHD1JKB0B103
C330	ELECTROLYTIC CAP. 1µF/50V M H7	CE1JMAVSL1R0
C331	CHIP CERAMIC CAP. B K 0.01µF/50V	CHD1JKB0B103
C332	ELECTROLYTIC CAP. 1µF/50V M H7	CE1JMAVSL1R0
C333	CHIP CERAMIC CAP. F Z 0.1µF/50V	CHD1JZB0F104
C336	CHIP CERAMIC CAP. B K 0.01µF/50V	CHD1JKB0B103
C339	CHIP CERAMIC CAP. B K 0.047µF/50V	CHD1JKB0B473
C340	CHIP CERAMIC CAP. B K 0.1µF/25V	CHD1EKB0B104
C341	CHIP CERAMIC CAP. B K 0.047µF/50V	CHD1JKB0B473
C342	CHIP CERAMIC CAP. F Z 0.1µF/50V	CHD1JZB0F104
C343	ELECTROLYTIC CAP. 47µF/6.3V M H7	CE0KMAVSL470
C346	CHIP CERAMIC CAP. B K 2200pF/50V	CHD1JKB0B222
C391	ELECTROLYTIC CAP. 100µF/10V M	CE1AMASDL101
C392	ELECTROLYTIC CAP. 470µF/6.3V M	CE0KMASDL471
C401	CHIP CERAMIC CAP. F Z 0.1µF/50V	CHD1JZB0F104
C404	CHIP CERAMIC CAP. B K 0.01µF/50V	CHD1JKB0B103
C405	ELECTROLYTIC CAP. 22µF/6.3V M H7	CE0KMAVSL220
C406	ELECTROLYTIC CAP. 33µF/6.3V M H7	CE0KMAVSL330
C407	CHIP CERAMIC CAP. B K 0.01µF/50V	CHD1JKB0B103
C408	CHIP CERAMIC CAP. B K 0.012µF/50V	CHD1JKB0B123
C409	ELECTROLYTIC CAP. 10µF/16V M H7	CE1CMAVSL100
C410	CHIP CERAMIC CAP. B K 2700pF/50V	CHD1JKB0B272
C411	CHIP CERAMIC CAP. B K 1000pF/50V	CHD1JKB0B102
C412	ELECTROLYTIC CAP. 4.7µF/25V M H7	CE1EMAVSL4R7
C413	CHIP CERAMIC CAP. B K 6800pF/50V	CHD1JKB0B682
C414	CHIP CERAMIC CAP. B K 1000pF/50V	CHD1JKB0B102
C415	CHIP CERAMIC CAP. B K 4700pF/50V	CHD1JKB0B472
C422	ELECTROLYTIC CAP. 47µF/6.3V M H7	CE0KMAVSL470
C423	ELECTROLYTIC CAP. 220µF/6.3V M H7	CE0KMAVSL221
C424	CERAMIC CAP. B K 470pF/100V	CCD2AKS0B471
C425A	FILM CAP.(P) 0.018µF/50V J	CA1J183MS029
C448	ELECTROLYTIC CAP. 4.7µF/50V M H7	CE1JMAVSL4R7
C449	ELECTROLYTIC CAP. 4.7µF/50V M H7	CE1JMAVSL4R7
C451	ELECTROLYTIC CAP. 47µF/16V M H7	CE1CMAVSL470
C452	ELECTROLYTIC CAP. 1µF/50V M H7	CE1JMAVSL1R0
C453	ELECTROLYTIC CAP. 10µF/16V M H7	CE1CMAVSL100
C454	ELECTROLYTIC CAP. 1µF/50V M H7	CE1JMAVSL1R0
C455	ELECTROLYTIC CAP. 22µF/6.3V M H7	CE0KMAVSL220
C456	ELECTROLYTIC CAP. 10µF/16V M H7	CE1CMAVSL100
C457	ELECTROLYTIC CAP. 4.7µF/25V M H7	CE1EMAVSL4R7
C458	CHIP CERAMIC CAP. B K 0.01µF/50V	CHD1JKB0B103
C459	ELECTROLYTIC CAP. 22µF/6.3V M H7	CE0KMAVSL220
C460	CHIP CERAMIC CAP. B K 4700pF/50V	CHD1JKB0B472
C461	CHIP CERAMIC CAP. B K 0.01µF/50V	CHD1JKB0B103
C462	CHIP CERAMIC CAP. B K 0.01µF/50V	CHD1JKB0B103
C463	CHIP CERAMIC CAP. B K 0.1µF/25V	CHD1EKB0B104

Ref. No.	Description	Part No.
C465	ELECTROLYTIC CAP. 4.7µF/25V M H7	CE1EMAVSL4R7
C466	ELECTROLYTIC CAP. 220µF/6.3V M H7	CE0KMAVSL221
C467	CHIP CERAMIC CAP. B K 0.022µF/50V	CHD1JKB0B223
C469	ELECTROLYTIC CAP. 10µF/16V M H7	CE1CMAVSL100
C470	CERAMIC CAP.(AX) F Z 0.1µF/50V	CCA1JZTFZ104
C471	ELECTROLYTIC CAP. 22µF/6.3V M H7	CE0KMAVSL220
C472	CHIP CERAMIC CAP. B K 4700pF/50V	CHD1JKB0B472
C473	CHIP CERAMIC CAP. B K 0.01µF/50V	CHD1JKB0B103
C474	ELECTROLYTIC CAP. 4.7µF/25V M H7	CE1EMAVSL4R7
C475	ELECTROLYTIC CAP. 10µF/16V M H7	CE1CMAVSL100
C476	CHIP CERAMIC CAP. F Z 1µF/10V	CHD1AZB0F105
C477	ELECTROLYTIC CAP. 2.2µF/50V M H7	CE1JMAVSL2R2
C478	ELECTROLYTIC CAP. 1µF/50V M H7	CE1JMAVSL1R0
C479	CHIP CERAMIC CAP. B K 0.022µF/50V	CHD1JKB0B223
C480	ELECTROLYTIC CAP. 1µF/50V M H7	CE1JMAVSL1R0
C481	ELECTROLYTIC CAP. 1µF/50V M H7	CE1JMAVSL1R0
C483	CHIP CERAMIC CAP. F Z 0.1µF/50V	CHD1JZB0F104
C484	ELECTROLYTIC CAP. 2.2µF/50V M H7	CE1JMAVSL2R2
C485	ELECTROLYTIC CAP. 4.7µF/25V M H7	CE1EMAVSL4R7
C486	ELECTROLYTIC CAP. 1µF/50V M H7	CE1JMAVSL1R0
C487	ELECTROLYTIC CAP. 4.7µF/25V M H7	CE1EMAVSL4R7
C488	CHIP CERAMIC CAP. F Z 1µF/10V	CHD1AZB0F105
C489	ELECTROLYTIC CAP. 1µF/50V M H7	CE1JMAVSL1R0
C491	ELECTROLYTIC CAP. 4.7µF/25V M H7	CE1EMAVSL4R7
C492	ELECTROLYTIC CAP. 22µF/16V M H7	CE1CMAVSL220
C493	ELECTROLYTIC CAP. 4.7µF/25V M H7	CE1EMAVSL4R7
C494	ELECTROLYTIC CAP. 22µF/16V M H7	CE1CMAVSL220
C495	CHIP CERAMIC CAP. B K 0.01µF/50V	CHD1JKB0B103
C496	ELECTROLYTIC CAP. 4.7µF/25V M H7	CE1EMAVSL4R7
C498	ELECTROLYTIC CAP. 4.7µF/25V M H7	CE1EMAVSL4R7
C499	ELECTROLYTIC CAP. 4.7µF/25V M H7	CE1EMAVSL4R7
C502	ELECTROLYTIC CAP. 220µF/6.3V M H7	CE0KMAVSL221
C505	ELECTROLYTIC CAP. 22µF/10V M H7	CE1AMAVSL220
C507	ELECTROLYTIC CAP. 1µF/50V M H7	CE1JMAVSL1R0
C508	CHIP CERAMIC CAP. B K 0.022µF/50V	CHD1JKB0B223
C509	ELECTROLYTIC CAP. 330µF/6.3V M H7	CE0KMASSL331
C511	CHIP CERAMIC CAP. CH J 22pF/50V	CHD1JJBCH220
C513	CHIP CERAMIC CAP. CH D 10pF/50V	CHD1JDBCH100
C514	CHIP CERAMIC CAP. CH J 15pF/50V	CHD1JJBCH150
C515	CHIP CERAMIC CAP. CH J 18pF/50V	CHD1JJBCH180
C521	ELECTROLYTIC CAP. 47µF/16V M H7	CE1CMAVSL470
C522	CHIP CERAMIC CAP. B K 4700pF/50V	CHD1JKB0B472
C527	CHIP CERAMIC CAP. B K 0.047µF/50V	CHD1JKB0B473
C529	CHIP CERAMIC CAP. B K 0.022µF/50V	CHD1JKB0B223
C530	ELECTROLYTIC CAP. 1µF/50V M H7	CE1JMAVSL1R0
C531	ELECTROLYTIC CAP. 10µF/16V M H7	CE1CMAVSL100
C532	ELECTROLYTIC CAP. 10µF/16V M H7	CE1CMAVSL100
C533	ELECTROLYTIC CAP. 47µF/6.3V M H7	CE0KMAVSL470
C534	CHIP CERAMIC CAP. B K 0.1µF/25V	CHD1EKB0B104
C535	ELECTROLYTIC CAP. 22µF/10V M H7	CE1AMAVSL220
C536	CHIP CERAMIC CAP. B K 1000pF/50V	CHD1JKB0B102
C537	CHIP CERAMIC CAP. B K 1000pF/50V	CHD1JKB0B102
C539	CHIP CERAMIC CAP. B K 0.01µF/50V	CHD1JKB0B103
C540	CHIP CERAMIC CAP. B K 0.047µF/50V	CHD1JKB0B473
C541A	ELECTROLYTIC CAP. 47µF/6.3V M H7	CE0KMAVSL470
C548	CHIP CERAMIC CAP. F Z 0.1µF/50V	CHD1JZB0F104
C701	ELECTROLYTIC CAP. 0.47µF/50V M	CE1JMASDLR47
C703	ELECTROLYTIC CAP. 100µF/6.3V H7	CE0KMAVSL101
C704	CHIP CERAMIC CAP. F Z 0.1µF/50V	CHD1JZB0F104
C708	ELECTROLYTIC CAP. 0.22µF/50V M	CE1JMASDLR22
C709	ELECTROLYTIC CAP. 1µF/50V M	CE1JMASDL1R0

Ref. No.	Description	Part No.
DIODES		
D001	RECTIFIER DIODE 1N4005	NDQZ001N4005
D002	RECTIFIER DIODE 1N4005	NDQZ001N4005
D003	RECTIFIER DIODE 1N4005	NDQZ001N4005
D004	RECTIFIER DIODE 1N4005	NDQZ001N4005
D006	SWITCHING DIODE 1N4148M	NDTZ01N4148M
D015	SCHOTTKY BARRIER DIODE SB160	NDQZ000SB160
D016	SCHOTTKY BARRIER DIODE SB140	NDQZ000SB140
D020	RECTIFIER DIODE BA157	NDQZ000BA157
D021	RECTIFIER DIODE BA158	NDQZ000BA158
D031	ZENER DIODE DZ-6.8BSBT265	NDTB0DZ6R8BS
D051	RECTIFIER DIODE BA158	NDQZ000BA158
D052	ZENER DIODE DZ-10BSBT265	NDTB00DZ10BS
D053	PCB JUMPER D0.6-P10.0	JW10.0T
D057	ZENER DIODE DZ-15BSBT265	NDTB00DZ15BS
D501	SWITCHING DIODE 1N4148M	NDTZ01N4148M
D502	ZENER DIODE DZ-18BSBT265	NDTB00DZ18BS
D555	LED MIE-534A2	NPZZM1E534A2
D561	LED(RED) 204HD/E	NPQZ00204HDE
D562	LED(GREEN) 204-10GD/S957	NPQZ10GDS957
D563	LED(GREEN) 204-10GD/S957	NPQZ10GDS957
D564	LED(RED) 204HD/E	NPQZ00204HDE
D565	LED(RED) 204HD/E	NPQZ00204HDE
D701	ZENER DIODE DZ-33BSDT265	NDTD00DZ33BS
ICS		
IC001⚠	PHOTOCOUPLER EL817A	NPEA000EL817
IC301	IC Y/C/A LA71205M-MPB-E	QSZBA0RSY037
IC451	IC HIFI LA72670BM-MPB-E	QSZBA0RSY039
IC501	MICROCONTROLLER 8BIT MN101D08DEN	QSZAA0RMS036
COILS		
L001⚠	LINE FILTER 15MH 5904	LLBG00ZKT010
L009	RADIAL TYPE CHOKE COIL CW68-470K-841040NP	LLBD00PKV023
L251	PCB JUMPER D0.6-P5.0	JW5.0T
L303	INDUCTOR(100µH K) LAP02TA101K	LLAXKATTU101
L304	RADIAL TYPE CHOKE COIL CW68-470K-841040NP	LLBD00PKV023
L421	INDUCTOR 47µH-K-5FT	LLARKBSTU470
L422	PCB JUMPER D0.6-P5.0	JW5.0T
L451	PCB JUMPER D0.6-P5.0	JW5.0T
L452	PCB JUMPER D0.6-P5.0	JW5.0T
L501	PCB JUMPER D0.6-P5.0	JW5.0T
L502	RADIAL TYPE CHOKE COIL CW68-470K-841040NP	LLBD00PKV023
L503	INDUCTOR 12µH-K-26T	LLAXKATTU120
L504	PCB JUMPER D0.6-P5.0	JW5.0T
L701	INDUCTOR 4.7µH-K-26T	LLAXKATTU4R7
TRANSISTORS		
Q001⚠	FET 2SK3472(Q)	QFWZ2SK3472Q
Q002	TRANSISTOR KTC3199-BL-AT/P	NQS5KTC3199P
Q031	TRANSISTOR KTA1267-Y-AT/P	NQSYKTA1267P
Q052	NPN TRANSISTOR KRC103M-AT/P	NQSZKRC103MP
Q055	TRANSISTOR KTC3203-Y-AT/P	NQSYKTC3203P
Q056	TRANSISTOR KTC3203-Y-AT/P	NQSYKTC3203P
Q057	TRANSISTOR KTC3199-BL-AT/P	NQS5KTC3199P
Q301	TRANSISTOR KTA-1266-GR-AT/P	NQS4KTA1266P
Q302	TRANSISTOR KTC3193-Y-AT/P	NQSYKTC3193P
Q303	TRANSISTOR KTC3193-Y-AT/P	NQSYKTC3193P
Q391	TRANSISTOR KTA-1266-GR-AT/P	NQS4KTA1266P
Q421	TRANSISTOR KTA-1266-GR-AT/P	NQS4KTA1266P
Q422	TRANSISTOR KTC3203-Y-AT/P	NQSYKTC3203P
Q425	RES. BUILT-IN TRANSISTOR KRA103M-AT/P	NQSZ0KRA103M
Q426	CHIP TRANSISTOR RN1511(TE85R.F)	QQ2Z0RN1511F

Ref. No.	Description	Part No.
Q501	TRANSISTOR KTC3199-BL-AT/P	NQS5KTC3199P
Q506	PHOTO TRANSISTOR PT204-6B-12	NPWZT2046B12
Q561	TRANSISTOR KTC3199-Y-AT/P	NQSYKTC3199P
	RESISTORS	
R001⚠	GLASS GLAZE RES. 1/2W J 3.3M Ω	RXX2JZLZ0335
R002	METAL OXIDE FILM RES. 1/2W J 1.8 Ω	RNX2JZLZ01R8
R004	CARBON RES. 1/4W J 2.7M Ω	RCX4JATZ0275
R005	CARBON RES. 1/4W J 2.7M Ω	RCX4JATZ0275
R008	CARBON RES. 1/6W J 560 Ω	RCX6JATZ0561
R012	CARBON RES. 1/6W J 22k Ω	RCX6JATZ0223
R014	CARBON RES. 1/2W J 1.1 Ω	RCX21R1ZU004
R016	CARBON RES. 1/6W J 1k Ω	RCX6JATZ0102
R017	CARBON RES. 1/4W J 33k Ω	RCX4JATZ0333
R018	CARBON RES. 1/4W J 33k Ω	RCX4JATZ0333
R019	CARBON RES. 1/6W J 470k Ω	RCX6JATZ0474
R020	CHIP RES.(1608) 1/10W 0 Ω	RRXAZB5Z0000
R022	CARBON RES. 1/6W J 47k Ω	RCX6JATZ0473
R031	CHIP RES. 1/10W J 1k Ω	RRXAJB5Z0102
R032	CHIP RES. 1/10W J 4.7k Ω	RRXAJB5Z0472
R033	CHIP RES. 1/10W J 1.5k Ω	RRXAJB5Z0152
R034	CHIP RES. 1/10W F 2.2k Ω	RRXAFB5H2201
R035	CHIP RES. 1/10W J 33k Ω	RRXAJB5Z0333
R036	CHIP RES. 1/10W F 3.3k Ω	RRXAFB5H3301
R037	CHIP RES. 1/10W F 2.2k Ω	RRXAFB5H2201
R038	CARBON RES. 1/6W J 56k Ω	RCX6JATZ0563
R040	CARBON RES. 1/4W J 1.8k Ω	RCX4JATZ0182
R041	CARBON RES. 1/4W J 1.8k Ω	RCX4JATZ0182
R042	CARBON RES. 1/4W J 270 Ω	RCX4JATZ0271
R043	CARBON RES. 1/4W J 270 Ω	RCX4JATZ0271
R056	CHIP RES. 1/10W J 1k Ω	RRXAJB5Z0102
R057	CARBON RES. 1/4W J 150 Ω	RCX4JATZ0151
R060	CARBON RES. 1/4W J 470 Ω	RCX4JATZ0471
R061	CHIP RES. 1/10W J 1.2k Ω	RRXAJB5Z0122
R062	CARBON RES. 1/6W J 5.6k Ω	RCX6JATZ0562
R073	CARBON RES. 1/4W J 10k Ω	RCX4JATZ0103
R075	CHIP RES. 1/10W J 4.7k Ω	RRXAJB5Z0472
R087	CARBON RES. 1/4W J 8.2k Ω	RCX4JATZ0822
R089	CARBON RES. 1/4W J 8.2k Ω	RCX4JATZ0822
R301	CHIP RES. 1/10W J 10k Ω	RRXAJB5Z0103
R302	CHIP RES. 1/10W J 12k Ω	RRXAJB5Z0123
R304	CHIP RES. 1/10W J 1.2k Ω	RRXAJB5Z0122
R306	CHIP RES. 1/10W J 3.9M Ω	RRXAJB5Z0395
R307	CHIP RES. 1/10W J 100k Ω	RRXAJB5Z0104
R308	CHIP RES. 1/10W J 82k Ω	RRXAJB5Z0823
R309	CHIP RES. 1/10W J 2.2k Ω	RRXAJB5Z0222
R310	CHIP RES. 1/10W J 4.7k Ω	RRXAJB5Z0472
R311	CHIP RES. 1/10W J 1.8k Ω	RRXAJB5Z0182
R312	CHIP RES. 1/10W J 1.8k Ω	RRXAJB5Z0182
R313	CHIP RES. 1/10W J 1.8k Ω	RRXAJB5Z0182
R314	CHIP RES. 1/10W J 680k Ω	RRXAJB5Z0684
R315	CHIP RES.(1608) 1/10W 0 Ω	RRXAZB5Z0000
R316	CHIP RES. 1/10W J 2.2k Ω	RRXAJB5Z0222
R317	CHIP RES. 1/10W J 8.2k Ω	RRXAJB5Z0822
R318	CHIP RES.(1608) 1/10W 0 Ω	RRXAZB5Z0000
R319	CHIP RES.(1608) 1/10W 0 Ω	RRXAZB5Z0000
R320	CHIP RES.(1608) 1/10W 0 Ω	RRXAZB5Z0000
R321	CHIP RES. 1/10W J 10k Ω	RRXAJB5Z0103
R322	CHIP RES. 1/10W J 18k Ω	RRXAJB5Z0183
R323	CHIP RES. 1/10W J 10k Ω	RRXAJB5Z0103
R324	CHIP RES. 1/10W J 18k Ω	RRXAJB5Z0183
R326	CHIP RES.(1608) 1/10W 0 Ω	RRXAZB5Z0000
R327	CHIP RES. 1/10W F 1.1k Ω	RRXAFB5H1101

Ref. No.	Description	Part No.
R391	CARBON RES. 1/6W J 560 Ω	RCX6JATZ0561
R392	CARBON RES. 1/6W J 560 Ω	RCX6JATZ0561
R395	CARBON RES. 1/6W J 3.3 Ω	RCX6JATZ03R3
R396	CARBON RES. 1/4W J 220 Ω	RCX4JATZ0221
R401	CHIP RES. 1/10W J 6.8k Ω	RRXAJB5Z0682
R402	CHIP RES. 1/10W J 8.2k Ω	RRXAJB5Z0822
R407	CHIP RES.(1608) 1/10W 0 Ω	RRXAZB5Z0000
R408	CHIP RES.(1608) 1/10W 0 Ω	RRXAZB5Z0000
R409	CHIP RES. 1/10W J 8.2k Ω	RRXAJB5Z0822
R410	CHIP RES. 1/10W J 12k Ω	RRXAJB5Z0123
R411	CHIP RES. 1/10W J 330k Ω	RRXAJB5Z0334
R412	CARBON RES. 1/4W J 150 Ω	RCX4JATZ0151
R413	CHIP RES. 1/10W J 22k Ω	RRXAJB5Z0223
R414	CHIP RES. 1/10W J 910 Ω	RRXAJB5Z0911
R415	CHIP RES. 1/10W J 2.2k Ω	RRXAJB5Z0222
R416	CHIP RES. 1/10W J 10k Ω	RRXAJB5Z0103
R421	CHIP RES. 1/10W J 1k Ω	RRXAJB5Z0102
R422	CHIP RES. 1/10W J 22k Ω	RRXAJB5Z0223
R424	CARBON RES. 1/6W J 47k Ω	RCX6JATZ0473
R425	CARBON RES. 1/6W J 100 Ω	RCX6JATZ0101
R426	CARBON RES. 1/6W J 820 Ω	RCX6JATZ0821
R451	CHIP RES. 1/10W J 12k Ω	RRXAJB5Z0123
R452	CHIP RES. 1/10W J 4.7k Ω	RRXAJB5Z0472
R453	CHIP RES. 1/10W J 47k Ω	RRXAJB5Z0473
R454	CHIP RES. 1/10W J 8.2k Ω	RRXAJB5Z0822
R455	CHIP RES. 1/10W J 47k Ω	RRXAJB5Z0473
R456	CHIP RES. 1/10W J 8.2k Ω	RRXAJB5Z0822
R457	CHIP RES. 1/10W J 470 Ω	RRXAJB5Z0471
R458	CHIP RES. 1/10W J 3.3k Ω	RRXAJB5Z0332
R459	CHIP RES. 1/10W J 39k Ω	RRXAJB5Z0393
R462	CHIP RES. 1/10W J 4.7k Ω	RRXAJB5Z0472
R463	CHIP RES. 1/10W J 47k Ω	RRXAJB5Z0473
R464	CHIP RES. 1/10W J 8.2k Ω	RRXAJB5Z0822
R465	CHIP RES. 1/10W J 47k Ω	RRXAJB5Z0473
R466	CHIP RES. 1/10W J 8.2k Ω	RRXAJB5Z0822
R467	CHIP RES. 1/10W J 10k Ω	RRXAJB5Z0103
R468	CHIP RES. 1/10W J 1k Ω	RRXAJB5Z0102
R469	CHIP RES. 1/10W J 1k Ω	RRXAJB5Z0102
R470	CHIP RES. 1/10W J 1k Ω	RRXAJB5Z0102
R471	CHIP RES. 1/10W J 1k Ω	RRXAJB5Z0102
R502	CHIP RES. 1/10W J 2.2k Ω	RRXAJB5Z0222
R503	CHIP RES. 1/10W J 820 Ω	RRXAJB5Z0821
R504	CHIP RES. 1/10W J 100k Ω	RRXAJB5Z0104
R506	CHIP RES. 1/10W J 100k Ω	RRXAJB5Z0104
R508	CHIP RES.(1608) 1/10W 0 Ω	RRXAZB5Z0000
R511	CHIP RES. 1/10W J 39k Ω	RRXAJB5Z0393
R517	CHIP RES. 1/10W J 10k Ω	RRXAJB5Z0103
R518	CHIP RES. 1/10W J 220k Ω	RRXAJB5Z0224
R521	CHIP RES. 1/10W J 1k Ω	RRXAJB5Z0102
R523	CHIP RES. 1/10W J 2.2k Ω	RRXAJB5Z0222
R524	CHIP RES. 1/10W J 10k Ω	RRXAJB5Z0103
R525	CHIP RES. 1/10W J 10k Ω	RRXAJB5Z0103
R526	CHIP RES. 1/10W J 1k Ω	RRXAJB5Z0102
R527	CHIP RES. 1/10W J 1k Ω	RRXAJB5Z0102
R528	CHIP RES. 1/10W J 10k Ω	RRXAJB5Z0103
R529	CHIP RES. 1/10W J 1k Ω	RRXAJB5Z0102
R530	CHIP RES. 1/10W J 1k Ω	RRXAJB5Z0102
R531	CARBON RES. 1/6W G 4.7k Ω	RCX6GATZ0472
R532	CHIP RES. 1/10W F 1.5k Ω	RRXAFB5H1501
R533	CARBON RES. 1/6W G 22k Ω	RCX6GATZ0223
R534	CARBON RES. 1/6W G 470 Ω	RCX6GATZ0471
R535	CARBON RES. 1/6W G 10k Ω	RCX6GATZ0103
R536	CHIP RES. 1/10W F 3.6k Ω	RRXAFB5H3601

Ref. No.	Description	Part No.
R537	CHIP RES. 1/10W J 33k Ω	RRXAJB5Z0333
R540	CHIP RES. 1/10W J 390k Ω	RRXAJB5Z0394
R541	CHIP RES. 1/10W J 390k Ω	RRXAJB5Z0394
R542	CARBON RES. 1/4W J 220 Ω	RCX4JATZ0221
R543	CHIP RES. 1/10W J 4.7k Ω	RRXAJB5Z0472
R544	CHIP RES. 1/10W J 18k Ω	RRXAJB5Z0183
R545	CHIP RES. 1/10W J 10k Ω	RRXAJB5Z0103
R546	CHIP RES. 1/10W J 10k Ω	RRXAJB5Z0103
R547	CHIP RES.(1608) 1/10W 0 Ω	RRXAZB5Z0000
R561	CARBON RES. 1/6W J 330 Ω	RCX6JATZ0331
R562	CARBON RES. 1/4W J 270 Ω	RCX4JATZ0271
R563	CARBON RES. 1/6W J 3.9k Ω	RCX6JATZ0392
R564	CARBON RES. 1/4W J 270 Ω	RCX4JATZ0271
R566	CARBON RES. 1/6W J 330 Ω	RCX6JATZ0331
R568	CARBON RES. 1/6W J 330 Ω	RCX6JATZ0331
R581	CHIP RES. 1/10W J 1.8k Ω	RRXAJB5Z0182
R582	CHIP RES. 1/10W J 1k Ω	RRXAJB5Z0102
R583	CHIP RES. 1/10W J 1.8k Ω	RRXAJB5Z0182
R584	CHIP RES. 1/10W J 1k Ω	RRXAJB5Z0102
R585	CHIP RES. 1/10W J 1.2k Ω	RRXAJB5Z0122
R586	CHIP RES. 1/10W J 1.5k Ω	RRXAJB5Z0152
R587	CHIP RES. 1/10W J 2.2k Ω	RRXAJB5Z0222
R589	CHIP RES.(1608) 1/10W 0 Ω	RRXAZB5Z0000
R590	CHIP RES. 1/10W J 4.7k Ω	RRXAJB5Z0472
R601	CHIP RES. 1/10W J 10k Ω	RRXAJB5Z0103
R604	CHIP RES. 1/10W J 10k Ω	RRXAJB5Z0103
R605	CHIP RES. 1/10W J 10k Ω	RRXAJB5Z0103
R608	CHIP RES. 1/10W J 10k Ω	RRXAJB5Z0103
R611	CHIP RES. 1/10W J 10k Ω	RRXAJB5Z0103
R614	CHIP RES. 1/10W J 10k Ω	RRXAJB5Z0103
R616	CHIP RES. 1/10W J 10k Ω	RRXAJB5Z0103
R701	CHIP RES. 1/10W J 330 Ω	RRXAJB5Z0331
R702	CARBON RES. 1/4W J 1.8k Ω	RCX4JATZ0182
R704	CHIP RES. 1/10W J 1k Ω	RRXAJB5Z0102
R705	CHIP RES. 1/10W J 1k Ω	RRXAJB5Z0102
R751	CHIP RES. 1/10W J 75 Ω	RRXAJB5Z0750
R752	CHIP RES. 1/10W J 75 Ω	RRXAJB5Z0750
R753	CHIP RES. 1/10W J 75 Ω	RRXAJB5Z0750
SWITCHES		
SW501	TACT SWITCH KSM0614B	SST0101HH013
SW502	TACT SWITCH KSM0614B	SST0101HH013
SW503	TACT SWITCH KSM0614B	SST0101HH013
SW504	TACT SWITCH KSM0614B	SST0101HH013
SW505	TACT SWITCH KSM0614B	SST0101HH013
SW506	TACT SWITCH KSM0614B	SST0101HH013
SW507	TACT SWITCH KSM0614B	SST0101HH013
SW508	TACT SWITCH KSM0614B	SST0101HH013
SW509	TACT SWITCH KSM0614B	SST0101HH013
SW511	LEAF SWITCH MXS01830MVP0	SSC0101MCE03
SW512	ROTARY MODE SWITCH SSS-53MD	SSR0106KB003
MISCELLANEOUS		
2B8	BUSH LED(F) H3700UD	0VM409508
2B34	SHIELD HEAD HD400UD	0VM305875
A5	JACK BOARD(HIFI) HD400UD	0VM203804
AC001⚠	AC CORD PB8B2F9110A-057	WAC0172LW011
F001⚠	FUSE SIC 1A 250V U/C PSE	PAGG20CW3102
FH001	FUSE HOLDER MSF-015	XH01Z00LY001
FH002	FUSE HOLDER MSF-015	XH01Z00LY001
JC01	CHIP RES.(1608) 1/10W 0 Ω	RRXAZB5Z0000
JC04	CHIP RES.(1608) 1/10W 0 Ω	RRXAZB5Z0000
JK751	RCA JACK MSP-283V-B-324NILF01	JXRL040LY141
JK752	RCA JACK MSP-293V3-324NILF(B1	JYRL060LY031
JK753	RCA JACK MSP-281V42-B(B110)	JXRL010LY142
JK754	RCA JACK MSP-281V40-B(B110)	JXRL010LY138
JK755	RCA JACK 1P MSP-281V31-A(B110)	JYRL010LY027
RS501	REMOTE RECEIVER MIM-93M9DKF	USESJRSUNT03
T001⚠	POWER TRANSFOMER CSA-SW0357A-NP	LTT00CPSA180
TP301	PCB JUMPER D0.6-P5.0	JW5.0T
TP302	PCB JUMPER D0.6-P10.0	JW10.0T
TP452	PCB JUMPER D0.6-P12.5	JW12.5T
TP502	PCB JUMPER D0.6-P5.0	JW5.0T
TP505	PCB JUMPER D0.6-P10.0	JW10.0T
TP506	PCB JUMPER D0.6-P5.0	JW5.0T
TP507	PCB JUMPER D0.6-P10.0	JW10.0T
TP513	PCB JUMPER D0.6-P5.0	JW5.0T
TP751	PCB JUMPER D0.6-P12.5	JW12.5T
TP753	PCB JUMPER D0.6-P10.0	JW10.0T
TP754	PCB JUMPER D0.6-P10.0	JW10.0T
TU701	TUNER UNIT VH025AFE	UTUNNTUSP026
VR501	CARBON P.O.T. VZ067TL1 B104 PB(F)	VRCB104HH014
X301	XTAL 3.579545MHz(20PPM)	FXC355LLN004
X502	XTAL QTF38-32768K125P20L	FXC323LQUA02

SENSOR CBA

Ref. No.	Description	Part No.
	SENSOR CBA Consists of the following:	1VSA13752
TRANSISTORS		
Q503	PHOTO TRANSISTOR PT204-6B-12	NPWZT2046B12
Q504	PHOTO TRANSISTOR PT204-6B-12	NPWZT2046B12