DVP721VR/00/02/05/14

Service
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Service Manual

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Version 1.2

PHILIPS

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SECTION 1

SUMMARY

CONTENTS

PRODUCT SAFETY SERVICING GUIDELINES FOR VIDEO PRODUCTS

CAUTION : DO NOT ATTEMPT TO MODIFY THIS PRODUCT IN ANY WAY, NEVER PERFORM CUSTOMIZED INSTALLATIONS WITHOUT MANUFACTURER'S APPROVAL. UNAUTHORIZED MODIFICATIONS WILL NOT ONLY VOID THE WARRANTY, BUT MAY LEAD TO YOUR BEING LIABLE FOR ANY RESULTING PROPERTY DAMAGE OR USER INJURY.

SERVICE WORK SHOULD BE PERFORMED ONLY AFTER YOU ARE THOROUGHLY FAMILIAR WITH ALL OF THE FOLLOWING SAFETY CHECKS AND SERVICING GUIDELINES. TO DO OTHERWISE, INCREASES THE RISK OF POTENTIAL HAZARDS AND INJURY TO THE USER.

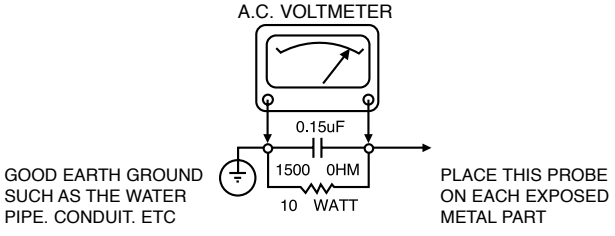
WHILE SERVICING, USE AN ISOLATION TRANSFORMER FOR PROTECTION FROM A.C. LINE SHOCK.

SAFETY CHECKS

AFTER THE ORIGINAL SERVICE PROBLEM HAS BEEN CORRECTED. A CHECK SHOULD BE MADE OF THE FOLLOWING.

SUBJECT : FIRE & SHOCK HAZARD

1. BE SURE THAT ALL COMPONENTS ARE POSITIONED IN SUCH A WAY AS TO AVOID POSSIBILITY OF ADJACENT COMPONENT SHORTS. THIS IS ESPECIALLY IMPORTANT ON THOSE MODULES WHICH ARE TRANSPORTED TO AND FROM THE REPAIR SHOP.
2. NEVER RELEASE A REPAIR UNLESS ALL PROTECTIVE DEVICES SUCH AS INSULATORS, BARRIERS, COVERS, SHIELDS, STRAIN RELIEFS, POWER SUPPLY CORDS, AND OTHER HARDWARE HAVE BEEN REINSTALLED PER ORIGINAL DESIGN. BE SURE THAT THE SAFETY PURPOSE OF THE POLARIZED LINE PLUG HAS NOT BEEN DEFEATED.
3. SOLDERING MUST BE INSPECTED TO DISCOVER POSSIBLE COLD SOLDER JOINTS, SOLDER SPLASHES OR SHARP SOLDER POINTS. BE CERTAIN TO REMOVE ALL LOOSE FOREIGN PARTICLES.
4. CHECK FOR PHYSICAL EVIDENCE OF DAMAGE OR DETERIORATION TO PARTS AND COMPONENTS. FOR FRAYED LEADS, DAMAGED INSULATION (INCLUDING A.C. CORD). AND REPLACE IF NECESSARY FOLLOW ORIGINAL LAYOUT, LEAD LENGTH AND DRESS.
5. NO LEAD OR COMPONENT SHOULD TOUCH A RECIVING TUBE OR A RESISTOR RATED AT 1 WATT OR MORE. LEAD TENSION AROUND PROTRUNING METAL SURFACES MUST BE AVOIDED.
6. ALL CRITICAL COMPONENTS SUCH AS FUSES, FLAMEPROOF RESISTORS, CAPACITORS, ETC. MUST BE REPLACED WITH EXACT FACTORY TYPES, DO NOT USE REPLACEMENT COMPONENTS OTHER THAN THOSE SPECIFIED OR MAKE UNRECOMMENDED CIRCUIT MODIFICATIONS.
7. AFTER RE-ASSEMBLY OF THE SET ALWAYS PERFORM AN A.C. LEAKAGE TEST ON ALL EXPOSED METALLIC PARTS OF THE CABINET, (THE CHANNEL SELECTOR KNOB, ANTENNA TERMINALS. HANDLE AND SCREWS) TO BE SURE THE SET IS SAFE TO OPERATE WITHOUT DANGER OF ELECTRICAL SHOCK. DO NOT USE A LINE ISOLATION TRANSFORMER DURING THIS TEST USE AN A.C. VOLTMETER, HAVING 5000 OHMS PER VOLT OR MORE SENSITIVITY, IN THE FOLLOWING MANNER; CONNECT A 1500 OHM 10 WATT RESISTOR, PARALLELED BY A .15 MFD. 150.V A.C TYPE CAPACITOR BETWEEN A KNOWN GOOD EARTH GROUND (WATER PIPE, CONDUIT, ETC.) AND THE EXPOSED METALLIC PARTS, ONE AT A TIME. MEASURE THE A.C. VOLTAGE ACROSS THE COMBINATION OF 1500 OHM RESISTOR AND .15 MFD CAPACITOR. REVERSE THE A.C. PLUG AND REPEAT A.C. VOLTAGE MEASUREMENTS FOR EACH EXPOSED METALLIC PART. VOLTAGE MEASURED MUST NOT EXCEED 75 VOLTS R.M.S. THIS CORRESPONDS TO 0.5 MILLIAMP A.C ANY VALUE EXCEEDING THIS LIMIT CONSTITUTES A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED IMMEDIATELY.



SUBJECT: GRAPHIC SYMBOLS

THE LIGHTNING FLASH WITH APROWHEAD SYMBOL. WITHIN AN EQUILATERAL TRIANGLE, IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF UNINSULATED "DANGEROUS VOLTAGE" THAT MAY BE OF SUFFICIENT MAGNITUDE TO CONSTITUTE A RISK OF ELECTRIC SHOCK.

THE EXCLAMATION POINT WITHIN AN EQUILATERAL TRIANGLE IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF IMPORTANT SAFETY INFORMATION IN SERVICE LITERATURE.

SUBJECT : X-RADIATION

1. BE SURE PROCEDURES AND INSTRUCTIONS TO ALL SERVICE PERSONNEL COVER THE SUBJECT OF X-RADIATION. THE ONLY POTENTIAL SOURCE OF X-RAYS IN CURRENT T.V. RECEIVERS IS THE PICTURE TUBE. HOWEVER, THIS TUBE DOES NOT EMIT X-RAYS WHEN THE HIGH VOLTAGE IS AT THE FACTORY SPECIFIED LEVEL. THE PROPER VALUE IS GIVEN IN THE APPLICABLE SCHEMATIC. OPERATION AT HIGHER VOLTAGES MAY CAUSE A FAILURE OF THE PICTURE TUBE OR HIGH VOLTAGE SUPPLY AND, UNDER CERTAIN CIRCUMSTANCES, MAY PRODUCE RADIATION IN EXCESS OF DESIRABLE LEVELS.
2. ONLY FACTORY SPECIFIED C.R.T. ANODE CONNECTORS MUST BE USED. DEGAUSSING SHIELDS ALSO SERVE AS X-RAY SHIELD IN COLOR SETS, ALWAYS RE-INSTALL THEM.
3. IT IS ESSNTIAL THAT SERVICE PERSONNEL HAVE AVAILABLE AN ACCURATE AND RELIABLE HIGH VOLTAGE METER. THE CALIBRA TION OF THE METER SHOULD BE CHECKED PERIODICALLY AGAINST A REFERENCE STANDARD, SUCH AS THE ONE AVAILABLE AT YOUR DISTRIBUTOR.
4. WHEN THE HIGH VOLTAGE CIRCUITRY IS OPERATING PROPERLY THERE IS NO POSSIBILITY OF AN X-RADIATION PROBLEM. EVERY TIME A COLOR CHASSIS IS SERVICED. THE BRIGHTNESS SHOULD BE RUN UP AND DOWN WHILE MONITORING THE HIGH VOLTAGE WITH A METER TO BE CERTAIN THAT THE HIGH VOLTAGE DOES NOT EXCEED THE SPECIFIED VALUE AND THAT IT IS REGULATING CORRECTLY, WE SUGGEST THAT YOU AND YOUR SERVICE ORGANIZATION REVIEW TEST PROCEDURES SO THAT VOLTAGE REGULATION IS ALWAYS CHECKED AS A STANDARD SERVICING PROCEDURE. AND THAT THE HIGH VOLTAGE READING BE RECORDER ON EACH CUSTOMER'S INVOICE.
5. WHEN TROUBLESHOOTING AND MAKING TEST MEASUREMENTS IN A PRODUCT WITH A PROBLEM OF EXCESSIVE HIGH VOLTAGE, AVOID BEING UNNECESSARILY CLOSE TO THE PICTURE TUBE AND THE HIGH VOLTAGE SUPPLY. DO NOT OPERATE THE PRODUCT LONGER THAN IS NECESSARY TO LOCATE THE CAUSE OF EXCES SIVE VOLTAGE.
6. REFER TO HV. B+ AND SHUTDOWN ADJUSTMENT PROCEDURES DESCRIBED IN THE APPROPRIATE SCHEMATIC AND DIAGRAMS (WHERE USED).

SUBJECT: IMPLOSION

1. ALL DIRECT VIEWED PICTURE TUBES ARE EQUIPPED WITH AN INTE GRAL IMPLOSION PROTECTION SYSTEM, BUT CARE SHOULD BE TAKEN TO AVOID DAMAGE DURING INSTALLATION, AVOID SCRATCHING THE TUBE. IF SCRATCHED REPLACE IT.
2. USE ONLY RECOMMENDED FACTORY REPLACEMENT TUBES.

SUBJECT : TIPS ON PROPER INSTALLATION

1. NEVER INSTALL ANY PRODUCT IN A CLOSED-IN RECESS, CUBBYHOLE OR CLOSELY FITTING SHELF SPACE. OVER OR CLOSE TO HEAT DUCT, OR IN THE PATH OF HEATED AIR FLOW.
2. AVOID CONDITIONS OF HIGH HUMIDITY SUCH AS: OUTDOOR PATIO INSTALLATIONS WHERE DEW IS A FACTOR, NEAR STEAM RADIATORS WHERE STEAM LEAKAGE IS A FACTOR, ETC.
3. AVOID PALCEMENT WHERE DRAPERIES MAY OBSTRUCT REAR VENTING. THE CUSTOMER SHOULD ALSO AVOID THE USE OF DECORATIVE SCARVES OR OTHER COVERINGS WHICH MIGHT OBSTRUCT VENTILATION.
4. WALL AND SHELF MOUNTED INSTALLATIONS USING A COMMERCIAL MOUNTING KIT. MUST FOLLOW THE FACTORY APPROVED MOUNTING INSTRUCTIONS A PRODUCT MOUNTED TO A SHELF OR PLATFORM MUST RETAIN ITS ORIGINAL FEET (OR THE EQUIVALENT THICKNESS IN SPACERS) TO PROVIDE ADEQUATE AIR FLOW ACROSS THE BOTTOM, BOLTS OR SCREWS USED FOR FASTENERS MUST NOT TOUCH ANY PARTS OR WIRING. PERFORM LEAKAGE TEST ON CUSTOMIZED INSTALLATIONS.
5. CAUTION CUSTOMERS AGAINST THE MOUNTING OF A PRODUCT ON SLOPING SHELF OR A TILTED POSITION, UNLESS THE PRODUCT IS PROPERLY SECURED.
6. A PRODUCT ON A ROLL-ABOUT CART SHOULD BE STABLE ON ITS MOUNTING TO THE CART. CAUTION THE CUSTOMER ON THE HAZARDS OF TRYING TO ROLL A CART WITH SMALL CASTERS ACROSS THRESHOLDS OR DEEP PILE CARPETS.
7. CAUTION CUSTOMERS AGAINST THE USE OF A CART OR STAND WHICH HAS NOT BEEN LISTED BY UNDERWRITERS LABORATORIES, INC. FOR USE WITH THEIR SPECIFIC MODEL OF TELEVISION RECEIVER OR GENERICALLY APPROVED FOR USE WITH T.V.'S OF THE SAME OR LARGER SCREEN SIZE.
8. CAUTION CUSTOMERS AGAINST THE USE OF EXTENSION CORDS, EXPLAIN THAT A FOREST OF EXTENSIONS SPROUTING FROM A SINGLE OUTLET CAN LEAD TO DISASTROUS CONSEQUENCES TO HOME AND FAMILY.

SERVICING PRECAUTIONS

CAUTION : Before servicing the VCR+DVD covered by this service data and its supplements and addends, read and follow the SAFETY PRECAUTIONS. NOTE : if unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions in this publications, always follow the safety precautions.
Remembers Safety First:

General Servicing Precautions

1. Always unplug the VCR+DVD AC power cord from the AC power source before:
   (1) Removing or reinstalling any component, circuit board, module, or any other assembly.
   (2) Disconnection or reconnecting any internal electrical plug or other electrical connection.
   (3) Connecting a test substitute in parallel with an electrolytic capacitor.
   Caution : A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

2. Do not spray chemicals on or near this VCR+DVD or any of its assemblies.

3. Unless specified otherwise in this service data, clean electrical contacts by applying an appropriate contact cleaning solution to the contacts with a pipe cleaner, cotton-tipped swab, or comparable soft applicator.
   Unless specified otherwise in this service data, lubrication of contacts is not required.

4. Do not defeat any plug/socket B+ voltage interlocks with whitch instruments covered by this service manual might be equipped.

5. Do not apply AC power to this VCR+DVD and/or any of its electrical assemblies unless all solid-state device heat sinks are cerrectly installed.

6. Always connect test instrument ground lead to the appropriate ground before connection the test instrument positive lead. Always remove the test instrument ground lead last.

Insulation Checking Procedure

Disconnect the attachment plug from the AC outlet and turn the power on. Connect an insulation resistance meter(500V) to the blades of the attachment plug. The insulation resistance between each blade of the attachment plug and accessible conductive parts (Note 1) should be more than 1M-ohm.

Note 1 : Accessible Conductive Parts including Metal panels, Input terminals, Earphone jacks, etc.

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field effect transistors and semiconductor chip components.
The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.

2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.

3. Use only a grouned-tip soldering iron to solder or unsolder ES devices.

4. Use only an anti-static solder removal device. Some solder removal devices not classified a “anti-static” can generate electrical charges sufficient to damage ES devices.

5. Do not use freon-propelled chemicals. These can generate electrical charge sufficient to damage ES devices.

6. Do not remove a replacement ES device from its protec tive package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil, or comparable conductive material).

7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

   Caution : Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Normally harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

SERVICE INFORMATION FOR EEPROM IC SETTING

EEPROM option code No. setting

NAME	HEX	BINARY
OPT1	00	00000000
OPT2	00	00000000
OPT3	00	00000000
OPT4	00	00000000
OPT5	00	00000000

WR : OK I : EXIT MOVE : ◄ ►
EDIT : ▲▼

MASKROM : R00
EEPROM : R01 LG CODE

MODEL	NAME	HEX	BINARY
DVP721VR/00	OPT1	FC	00000000
	OPT2	C3	00000000
	OPT3	5B	00000000
	OPT4	01	00000000
	OPT5	00	00000000
DVP721VR/02	OPT1	FC	00000000
	OPT2	D6	00000000
	OPT3	7B	00000000
	OPT4	00	00000000
	OPT5	00	00000000
DVP721VR/05	OPT1	FE	00000000
	OPT2	CD	00000000
	OPT3	4B	00000000
	OPT4	02	00000000
	OPT5	00	00000000
DVP721VR/14	OPT1	BC	00000000
	OPT2	DD	00000000
	OPT3	5B	00000000
	OPT4	04	00000000
	OPT5	00	00000000

WR : OK I : EXIT MOVE : ◄ ►
EDIT : ▲▼

EEPROM option code No. setting procedure

1. DETECT NEW EEPROM (OPTION EDIT SCREEN)
   - Eeprom EDIT screen automatically appears if replacing Eeprom.
   - Setup option data using the cursor Up/Down key of a remote control.
     (Setup upon BOM depending on OPT1~OPT5 model)
   - Since an initial remote control is set to LG for LG model, appropriately set optiona data using the cursor Up/Down key.

2. EEPROM WRITED COMPLETE SCREEN
   - Writes data on EEPROM by using REMOCON "OK".
   - If completing the option data screen with a menu key, Powering Off is automatically done and the option edit screen is arranged.

3. PG ADJUST
   1) Payback the SP standard tape
   2) Press the “1” key on the Remote controller and the “PLAY” key on the Front Panel the same time, then it goes in to Tracking initial mode.
   3) Repeat the above step(No.2), then it finishes the PG adjusting automatically.
   4) Stop the playback, then it goes out to PG adjusting mode after mony the PG data.

4. EEPROM INITIAL
   - SETUP is displayed in the field if pressing the FRONT REC KEY with the remocon number "CLEAR" key pressed in the status of powering Off.
   - AUTO SEARCH is done since the initial screen of ACMS is serviced if powering On.
   - Check basic operation (PLAY/RECORD...)

SPECIFICATIONS

General

Power requirements	AC 220-230V, 50Hz
Power consumption	19W
Dimensions (approx.)	430 X 78.5 X 265 mm (w/h/d)
Mass (approx.)	4.06 kg
Operating temperature	5°C to 35°C (41°F to 95°F)
Operating humidity	5 % to 90 %
Timer	24 hours display type
RF Modulator	UHF 22-68 (Adjustable)

System

Laser	Semiconductor laser, wavelength 650 nm
Video Head system	Double azimuth 6 heads, helical scanning.
Signal system	PAL
Frequency response	DVD (PCM 96 kHz): 8 Hz to 44 kHz
	DVD (PCM 48 kHz): 8 Hz to 22 kHz
	CD: 8 Hz to 20 kHz
Signal-to-noise ratio	More than 100dB (ANALOG OUT connectors only)
Harmonic distortion	Less than 0.008%
Dynamic range	More than 100 dB (DVD)
	More than 95 dB (CD)

INPUTS (VCR)

Audio	-6.0dBm, more than 10 kohms (SCART)
	-6.0dBm, more than 47 kohms (RCA)
Video	1.0 Vp-p, 75 ohms, unbalanced (SCART/RCA)

OUTPUTS (DVD)

VIDEO OUT	1 Vp-p 75 ohms, sync. negative
S-VIDEO OUT	(Y) 1 Vp-p 75 ohms, negative sync., Mini Din 4-pin x 1
	(C) 0.3 Vp-p 75 ohms
COMPONENT VIDEO OUT	(Y) 1 Vp-p 75 ohms, negative sync., RCA jack x 1
	(Progressive Scan) (Pb)/(Pr) 0.7 Vp-p 75 ohms, RCA jack x 2
RGB output	0.7 Vp-p 75 ohms
Audio output (digital audio)	0.5 V (p-p), 75 ohms, RCA jack x 1
Audio output (optical audio)	3 V (p-p), 75 ohms, Optical connector x 1
Audio output (analog audio)	2.0 Vrms (1 kHz, 0 dB), 600 ohms,
	RCA jack (L, R) x 2/SCART (TO TV)

OUTPUTS (VCR)

Audio	-6.0dBm, less than 1 kohms (SCART)
Video	1.0Vp-p, 75 ohms, unbalanced (SCART)
RGB output	0.7 Vp-p 75 ohms

*Design and specifications are subject to change without notice.

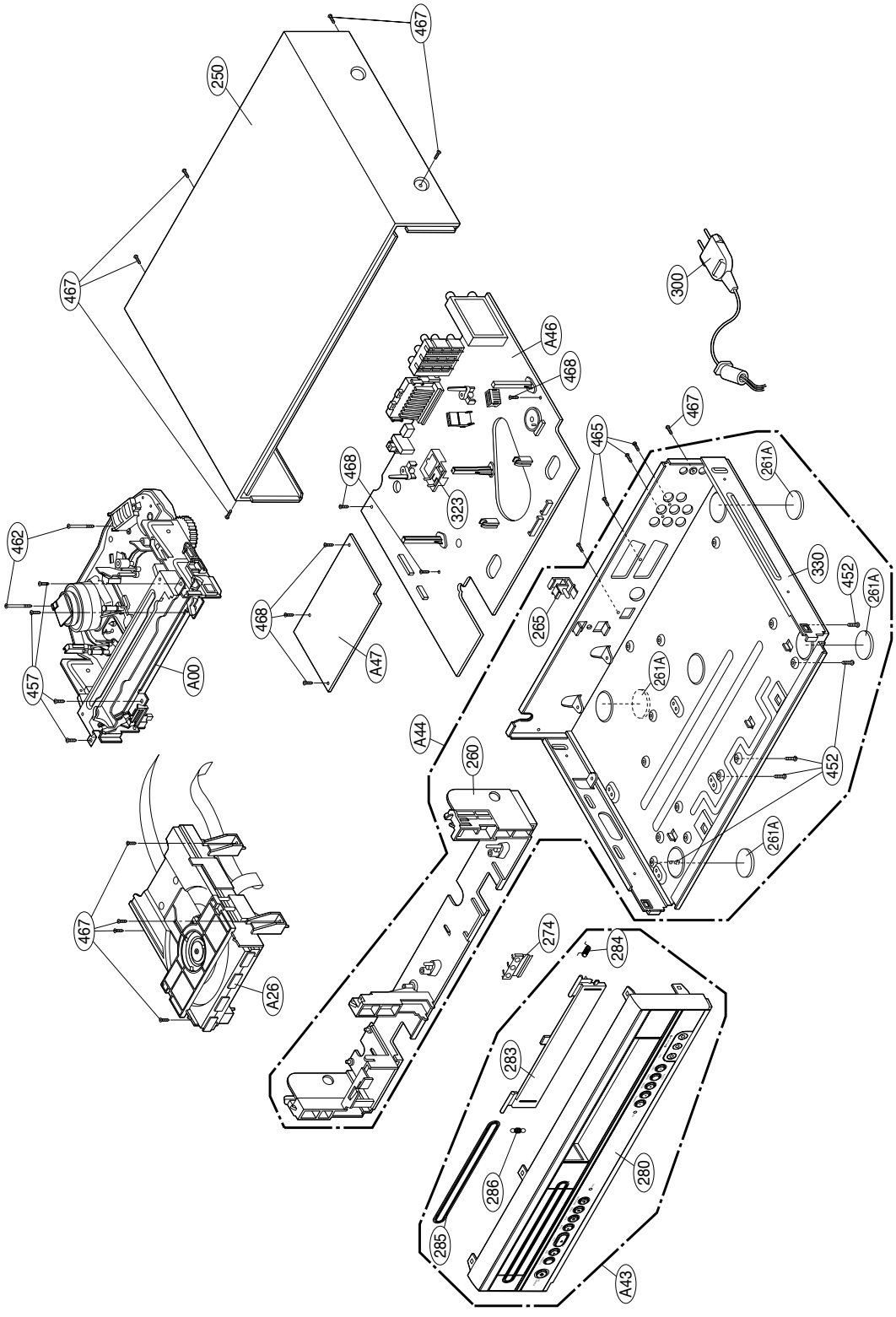
SECTION 2

CABINET & MAIN CHASSIS

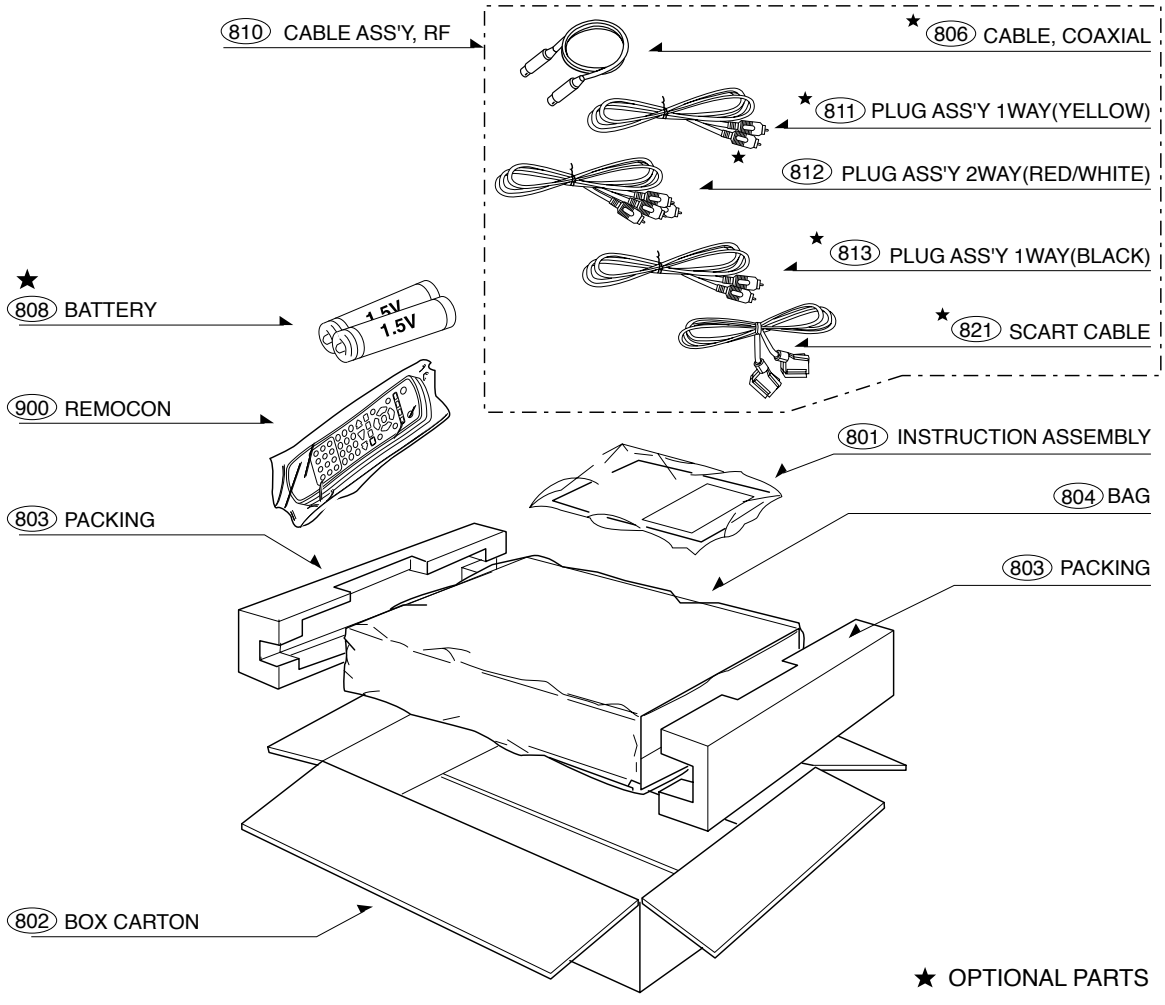
CONTENTS

EXPLODED VIEWS

1. Cabinet and Main Frame Section



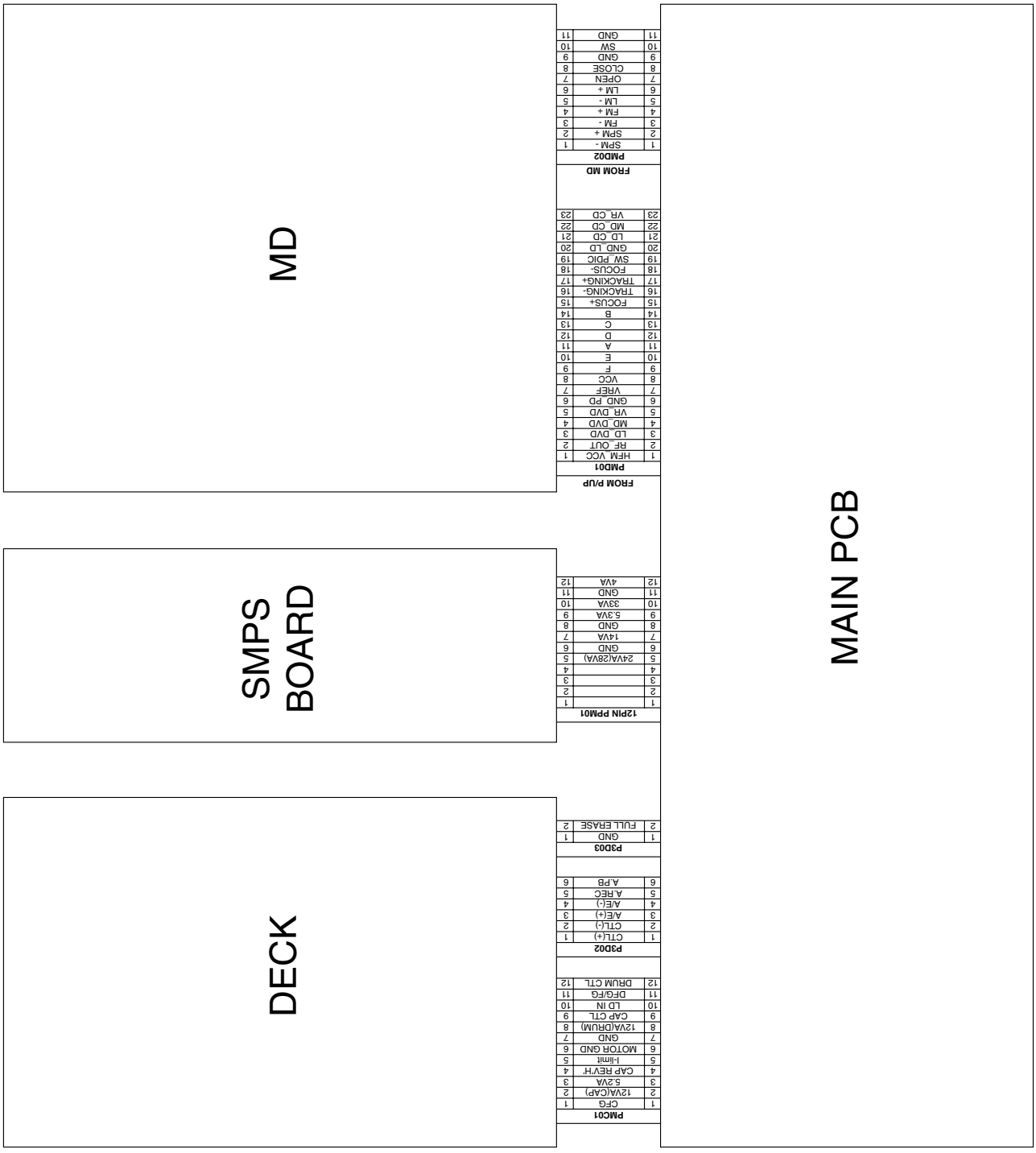
2. Packing Accessory Section



SECTION 3
ELECTRICAL

CONTENTS

OVERALL WIRING DIAGRAM



VCR PART
ELECTRICAL ADJUSTMENT PROCEDURES

1. Servo Adjustment

1) PG Adjustment

• Test Equipment

a) OSCILLOSCOPE	C) PAL MODEL : PAL SP TEST TAPE
b) NTSC MODEL : NTSC SP TEST TAPE	

• Adjustment And Specification

MODE	MEASUREMENT POINT	ADJUSTMENT POINT	SPECIFICATION
PLAY	V.Out H/SW(TP)	R/C TRK JIG KEY	6.5 ± 0.5H

• **Adjustment Procedure**

a) Insert the SP Test Tape and play.
Note - Adjust the distance of X, pressing the Tracking(+) or Tracking(-) when the “ATR” is blink after the SP Test Tape is inserted.

b) Connect the CH1 of the oscilloscope to the H/SW(TP) and CH2 to the Video Out for the VCR.

c) Trigger the mixed Combo Video Signal of CH2 to the CH1 H/SW(TP), and then check the distance (time difference), which is from the selected A(B) Head point of the H/SW(TP) signal to the starting point of the vertical synchronized signal, to 6.5H ± 0.5H (412μs, 1H=63μs).

• **PG Adjustment Method**

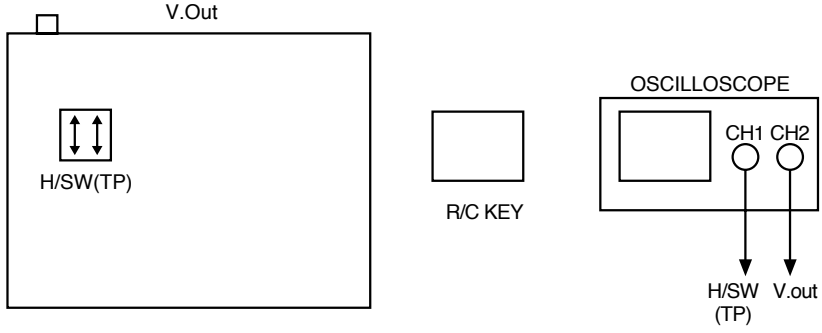
a-1) Payback the SP standard tape

b-2) Press the “1” key on the Remote controller and the “PLAY” key on the Front Panel the same time, then it goes in to Tracking initial mode.

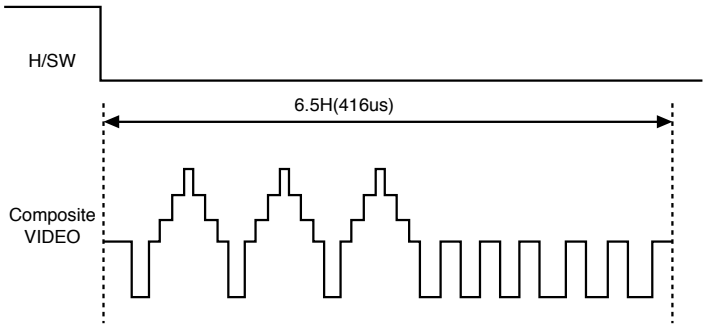
c-3) Repeat the above step(No.b-2), then it finishes the PG adjusting automatically.

d-4) Stop the playback, then it goes out to PG adjusting mode after mony the PG data.

• **CONNECTION**

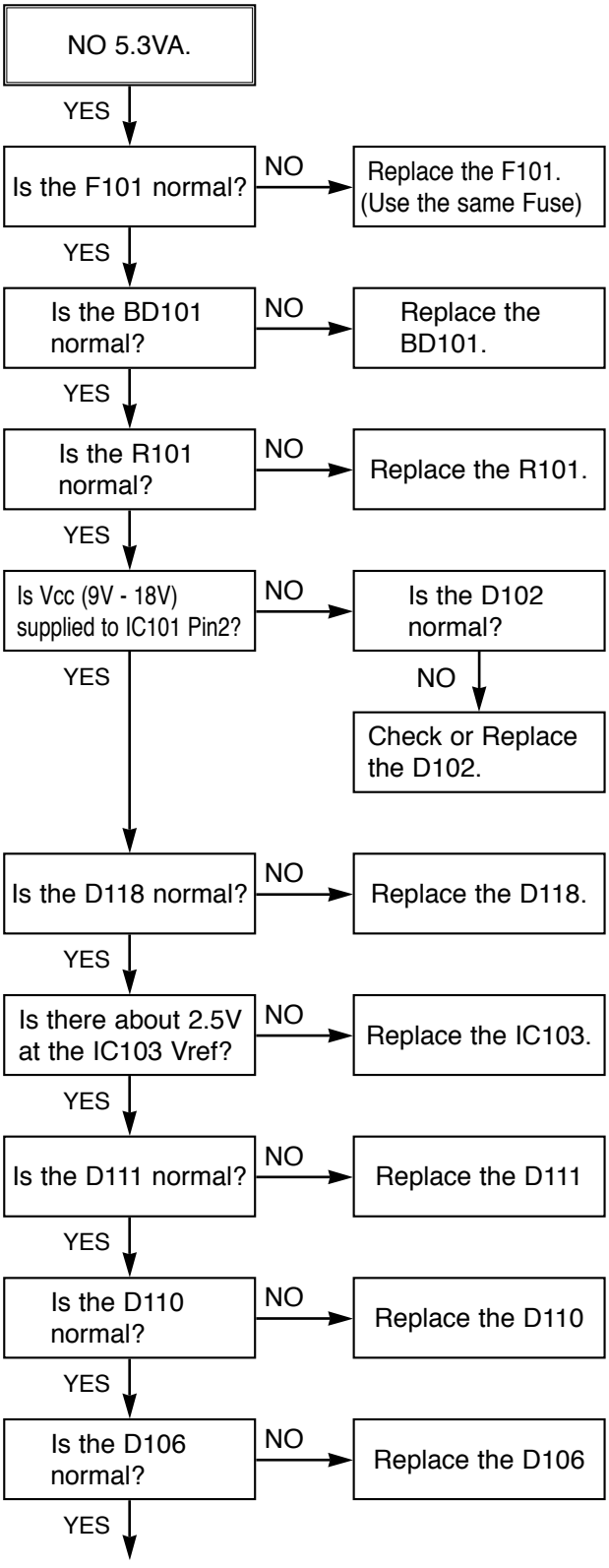


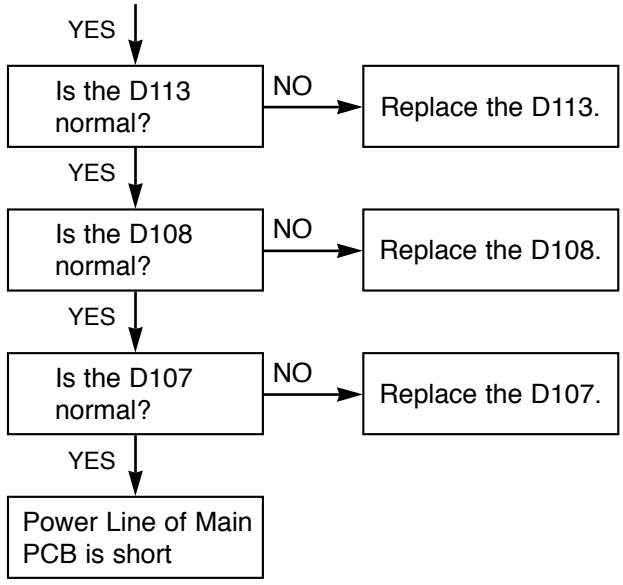
• **WAVEFORM**

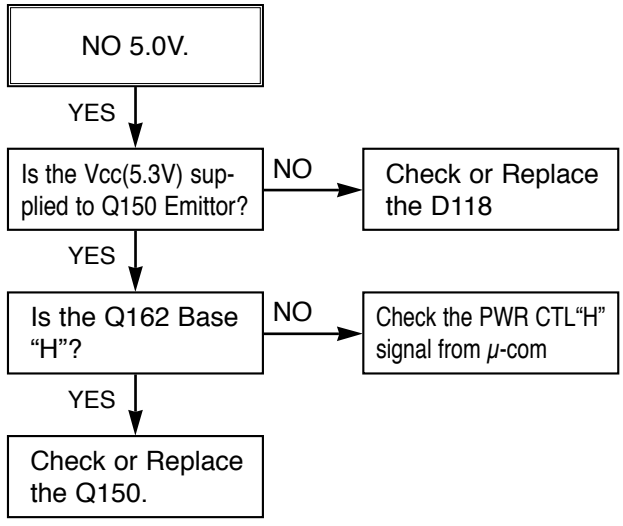


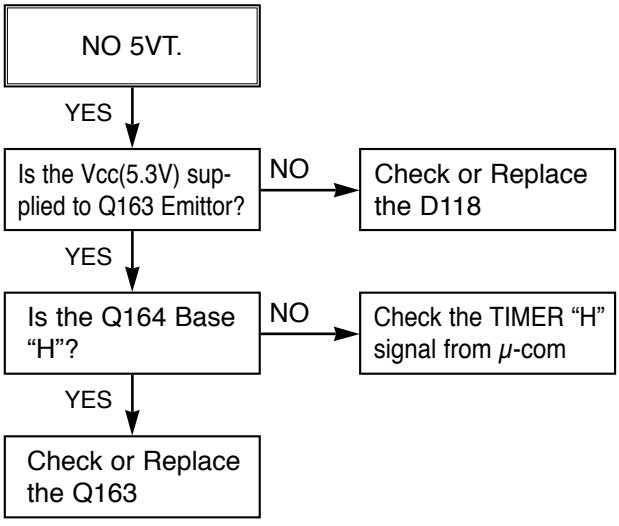
ELECTRICAL TROUBLESHOOTING GUIDE

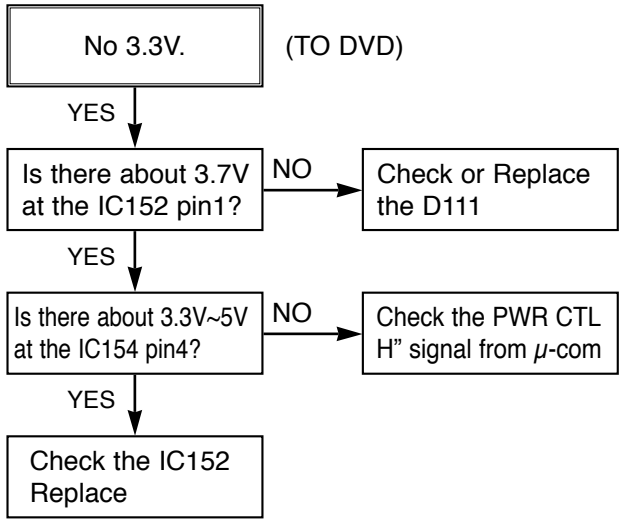
1. Power(SMPS) CIRCUIT

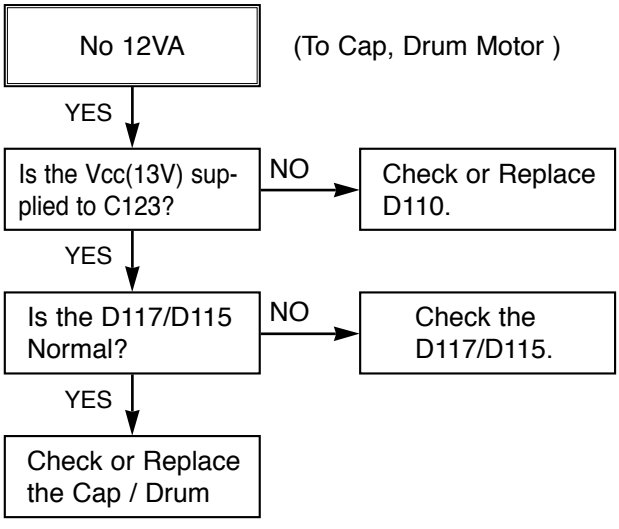


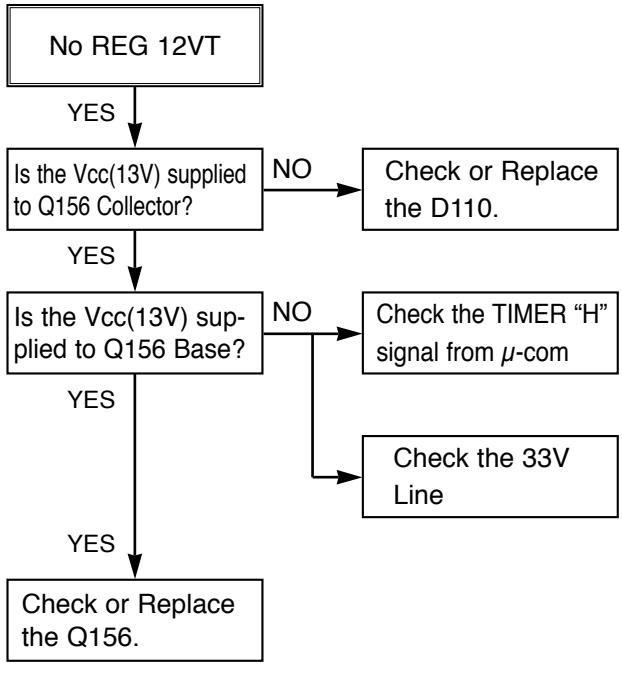


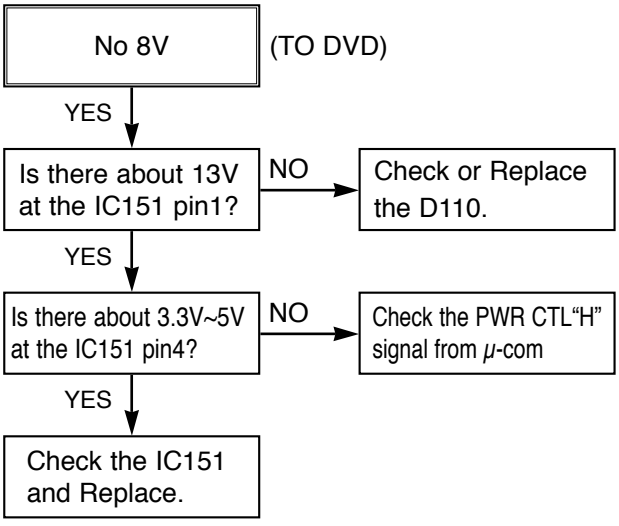


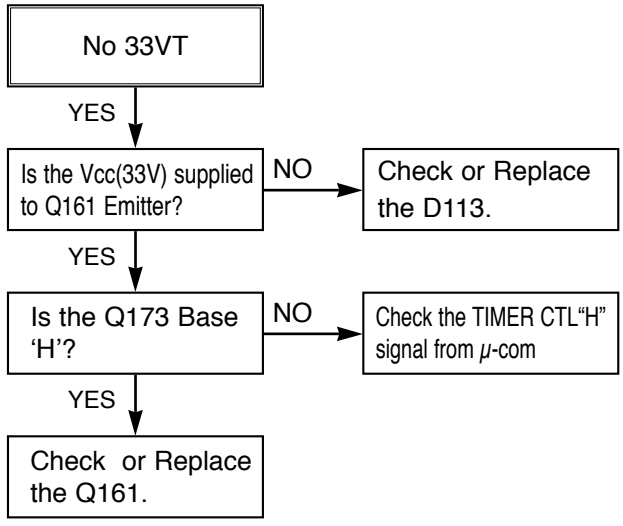

NO 5VT.
YES
Is the Vcc(5.3V) supplied to Q163 Emittor?
NO
Check or Replace the D118
YES
Is the Q164 Base "H"?
NO
Check the TIMER "H" signal from μ-com
YES
Check or Replace the Q163

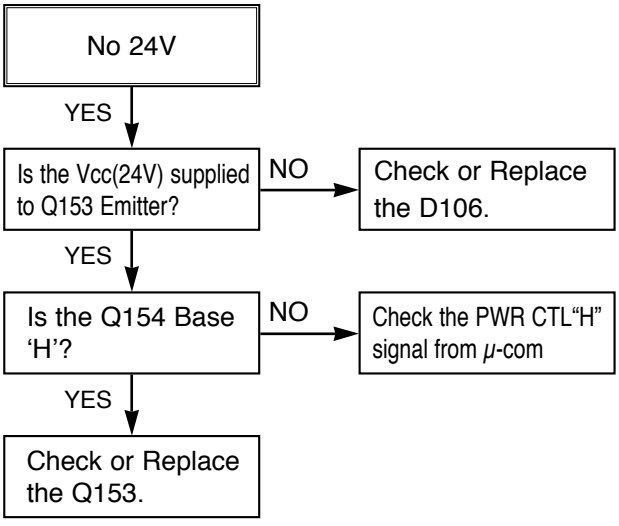

No 3.3V.
(TO DVD)
YES
Is there about 3.7V at the IC152 pin1?
NO
Check or Replace the D111
YES
Is there about 3.3V~5V at the IC154 pin4?
NO
Check the PWR CTL H" signal from μ-com
YES
Check the IC152 Replace


No 12VA
(To Cap, Drum Motor)
YES
Is the Vcc(13V) supplied to C123?
NO
Check or Replace D110.
YES
Is the D117/D115 Normal?
NO
Check the D117/D115.
YES
Check or Replace the Cap / Drum


No REG 12VT
YES
Is the Vcc(13V) supplied to Q156 Collector?
NO
Check or Replace the D110.
YES
Is the Vcc(13V) supplied to Q156 Base?
NO
Check the TIMER "H" signal from μ-com
YES
Check the 33V Line
YES
Check or Replace the Q156.

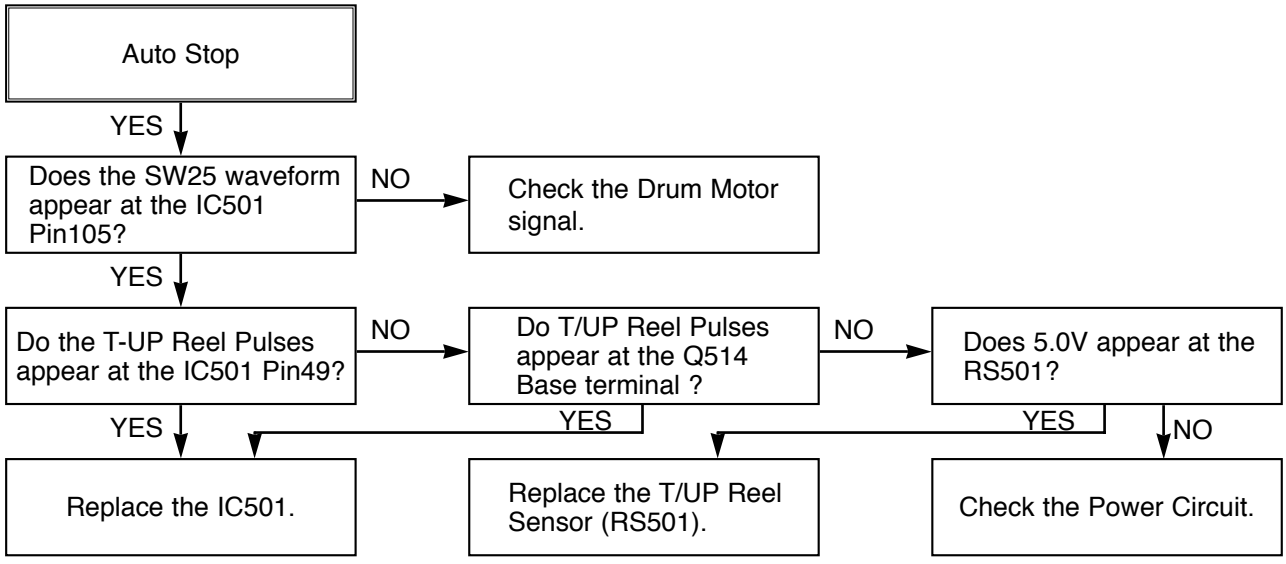

No 8V
(TO DVD)
YES
Is there about 13V at the IC151 pin1?
NO
Check or Replace the D110.
YES
Is there about 3.3V~5V at the IC151 pin4?
NO
Check the PWR CTL"H" signal from μ-com
YES
Check the IC151 and Replace.


No 33VT
YES
Is the Vcc(33V) supplied to Q161 Emitter?
NO
Check or Replace the D113.
YES
Is the Q173 Base 'H'?
NO
Check the TIMER CTL"H" signal from μ-com
YES
Check or Replace the Q161.

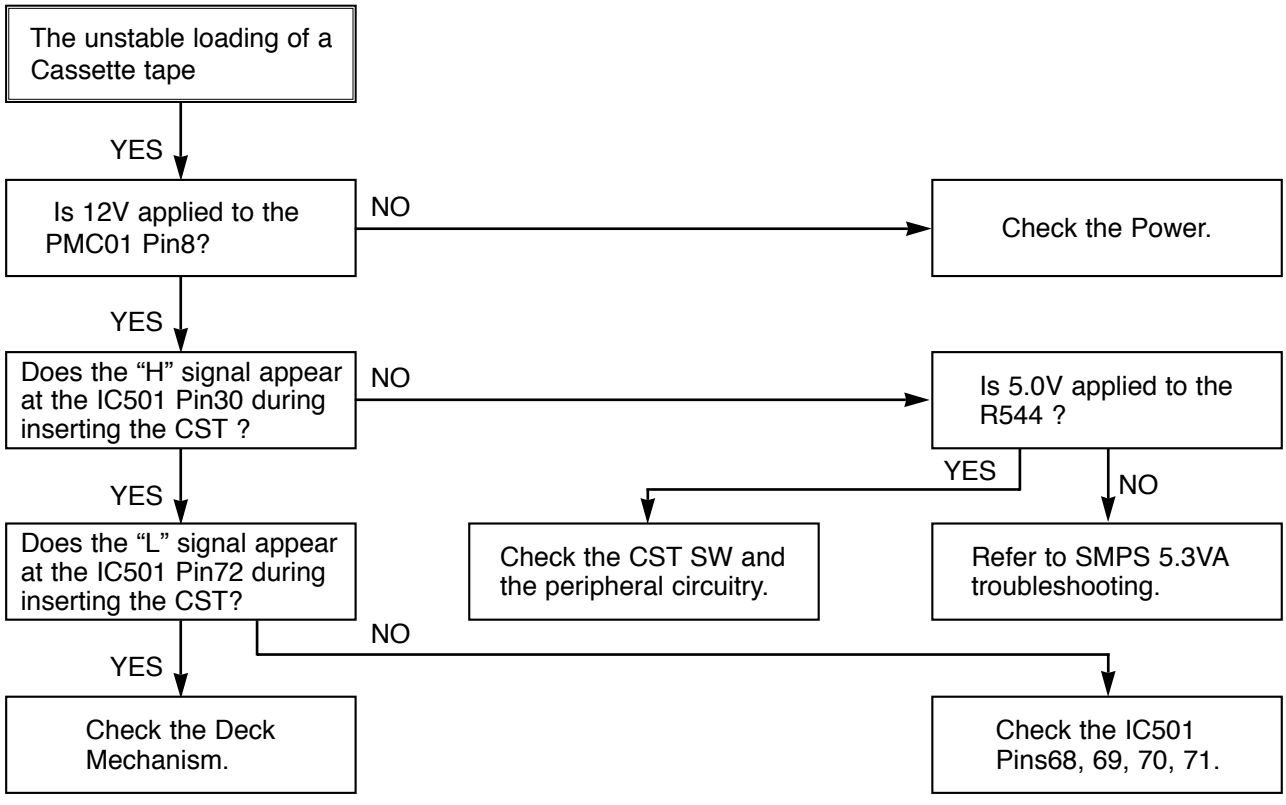

No 24V
YES
Is the Vcc(24V) supplied to Q153 Emitter?
NO
Check or Replace the D106.
YES
Is the Q154 Base 'H'?
NO
Check the PWR CTL"H" signal from μ-com
YES
Check or Replace the Q153.

2. SYSTEM/KEY CIRCUIT

(1) AUTO STOP



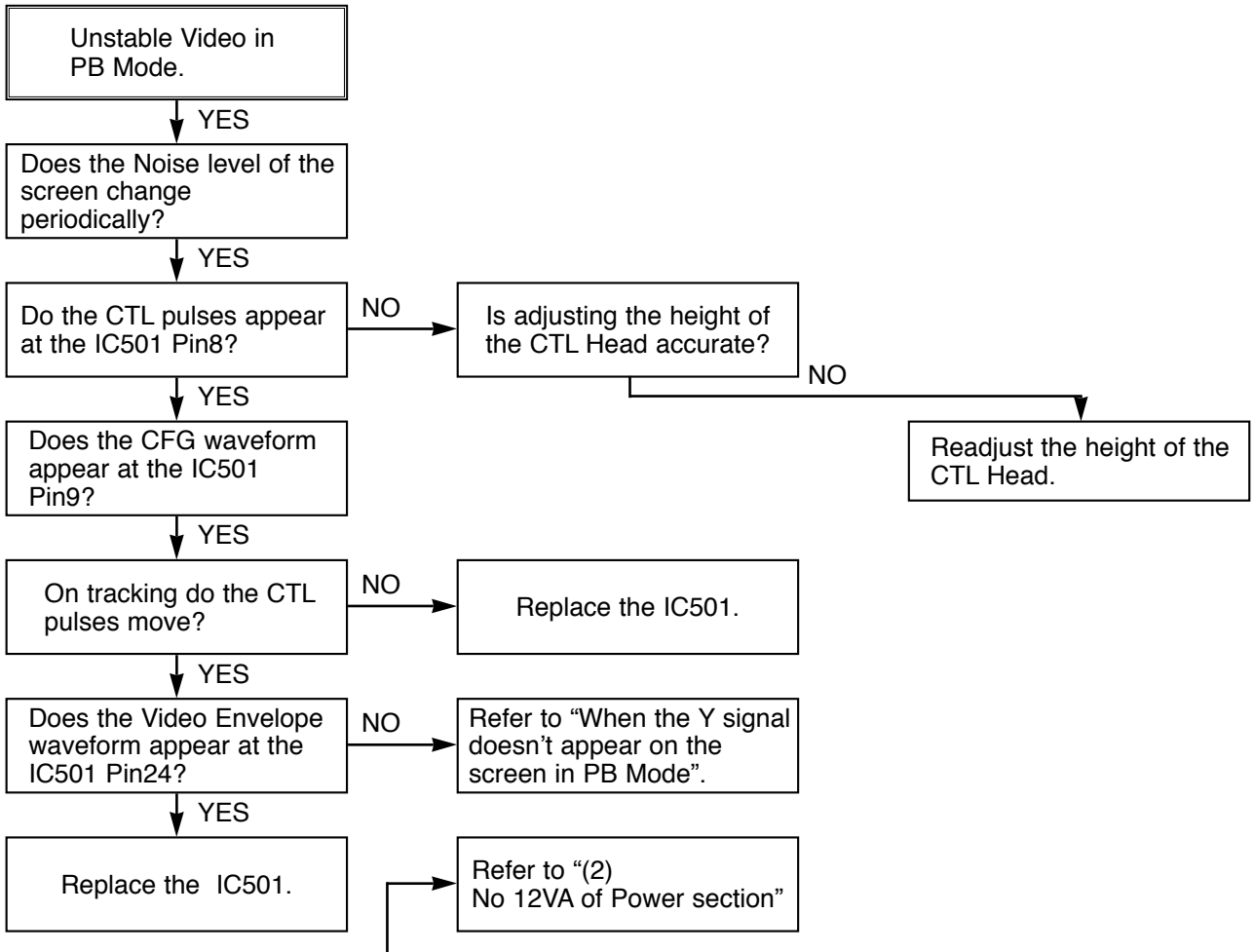
(2) The unstable loading of a Cassette tape



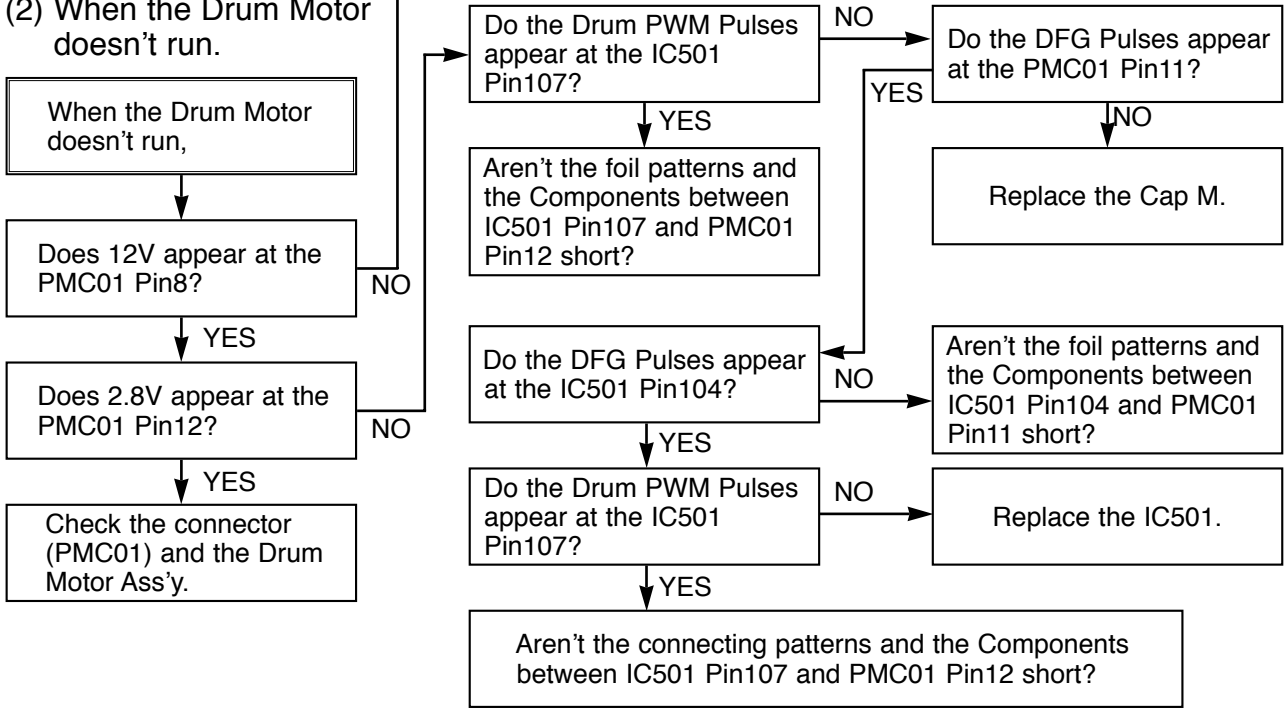
Caution : Auto stop can occur because Grease or Oil is dried up

3. SERVO CIRCUIT

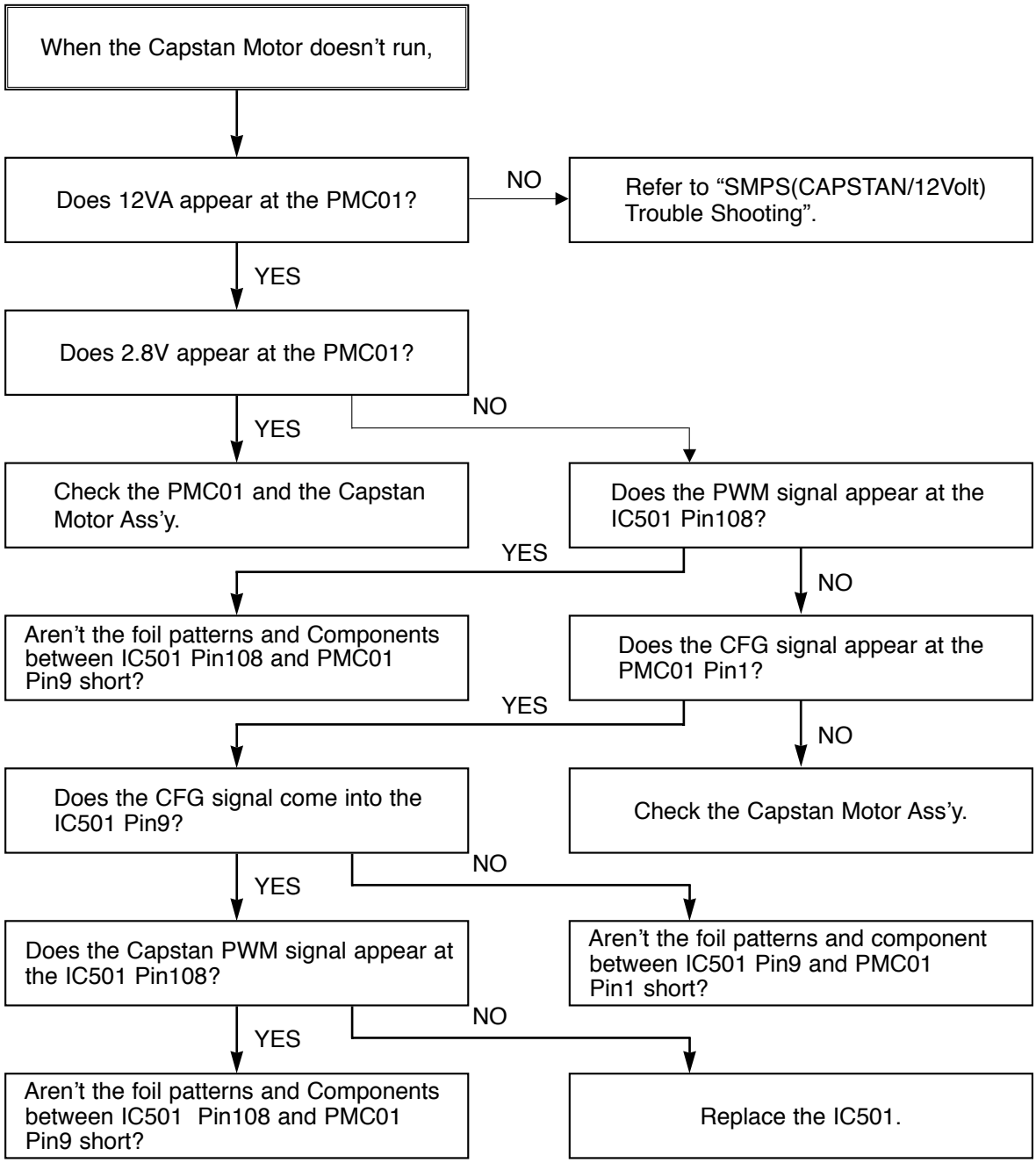
(1) Unstable Video in PB MODE



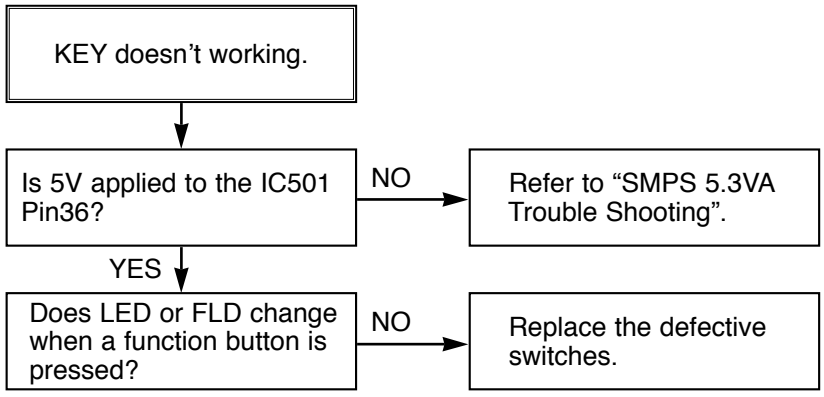
(2) When the Drum Motor doesn't run.



(3) When the Capstan Motor doesn't run,

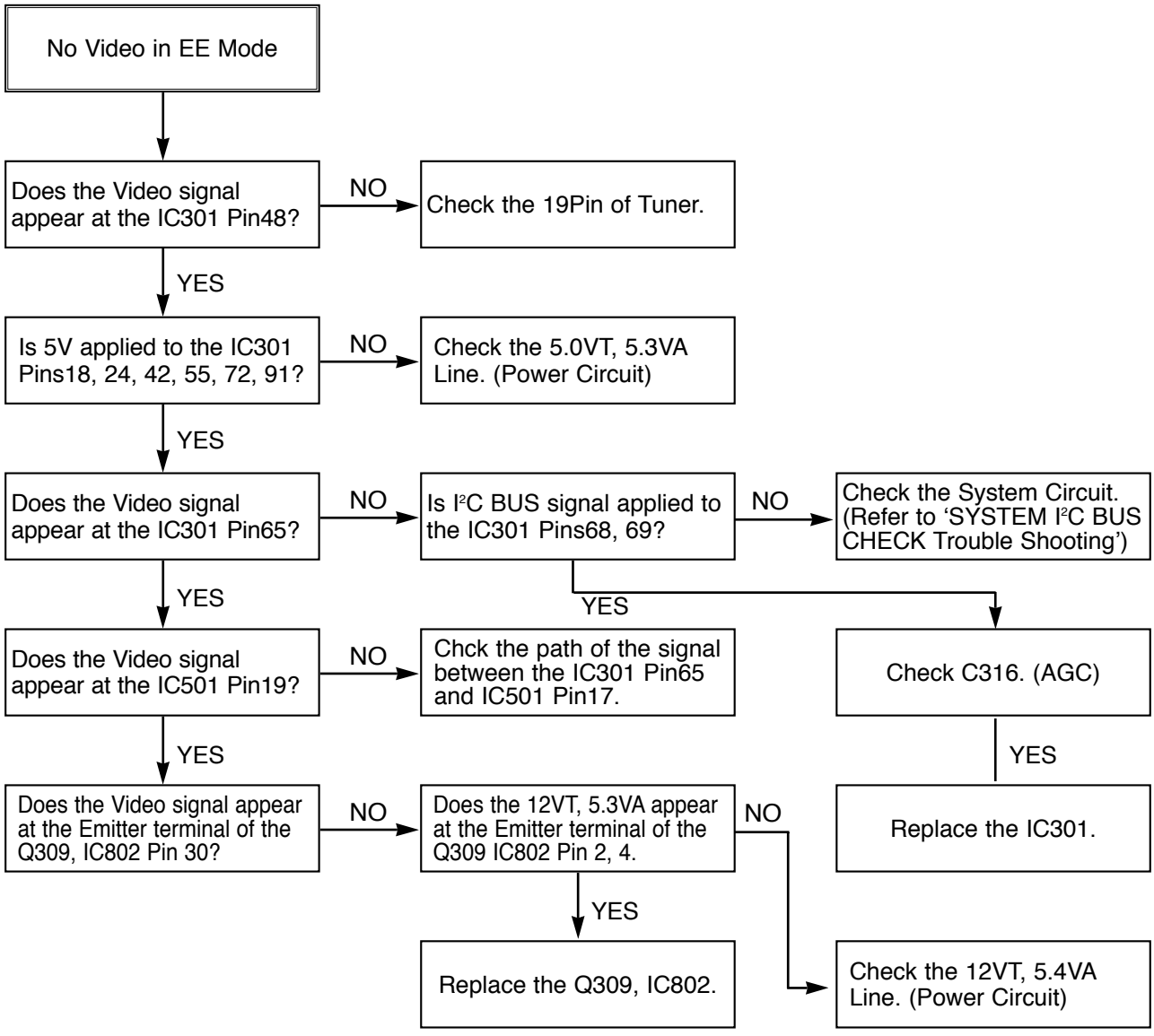


(4) KEY doesn't working

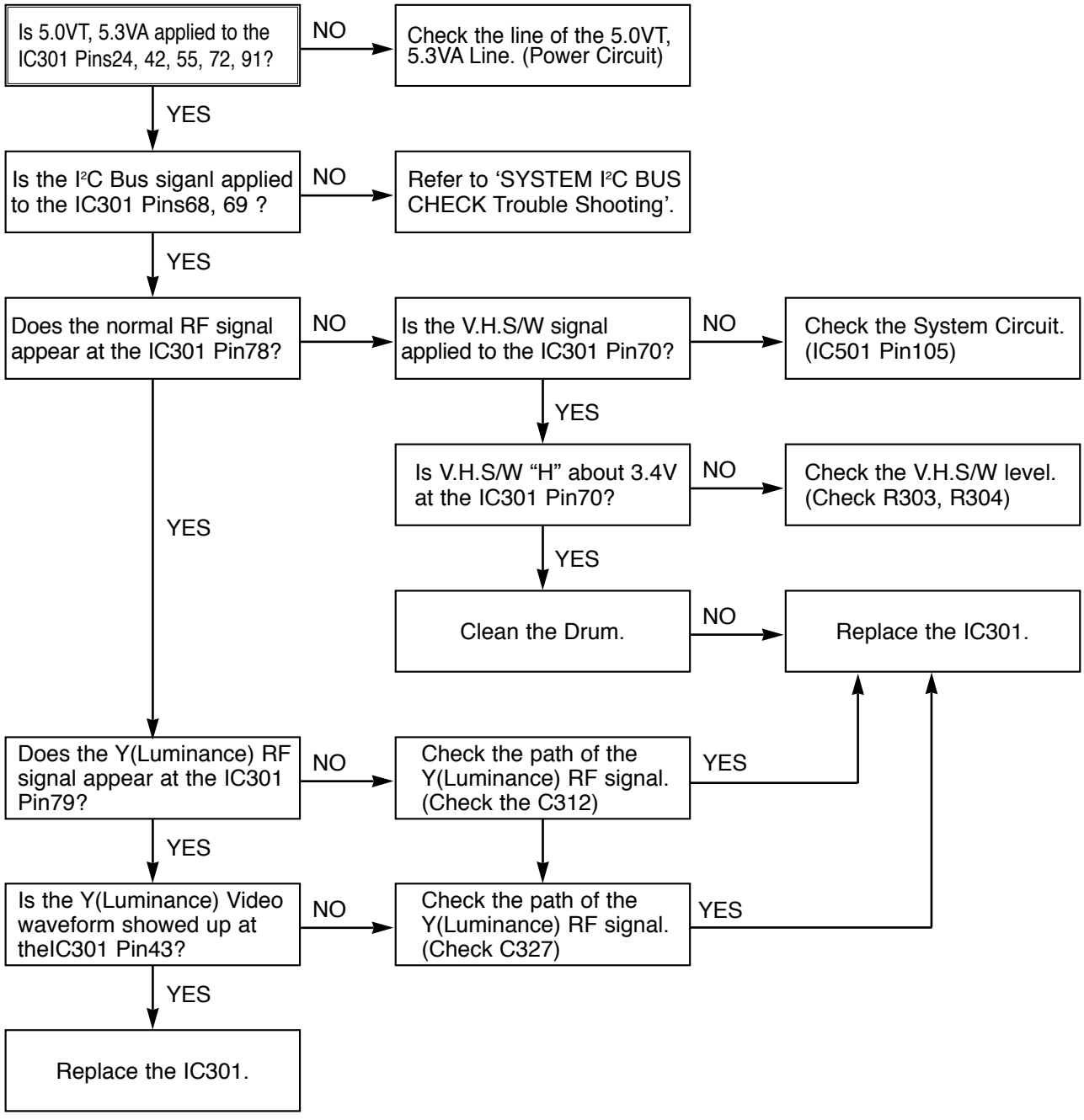


4. Y/C CIRCUIT

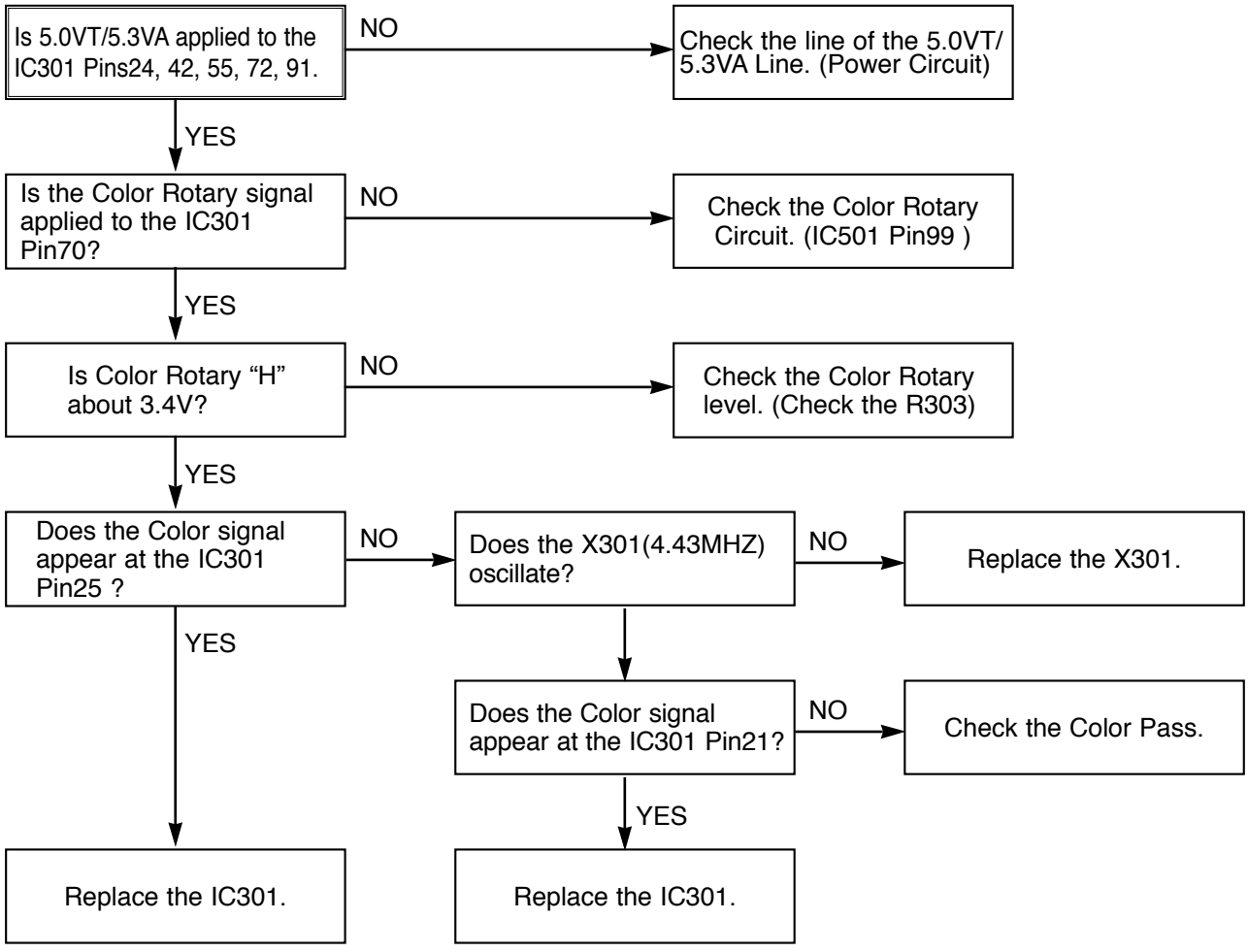
(1) No Video in EE Mode,



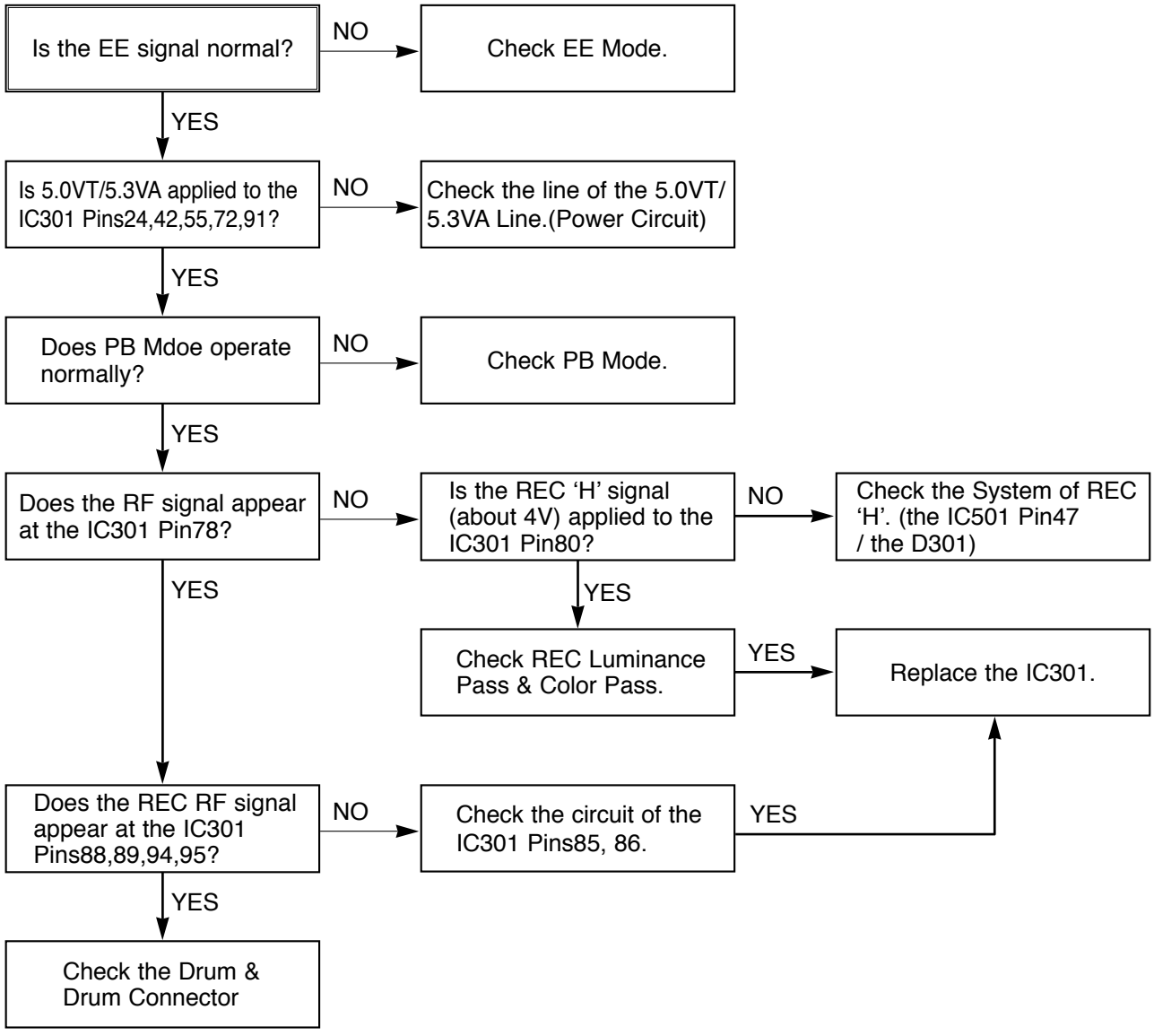
(2) When the Y(Luminance) signal doesn't appear on the screen in PB Mode,



(3) When the C(Color) signal doesn't appear on the screen in PB Mode,

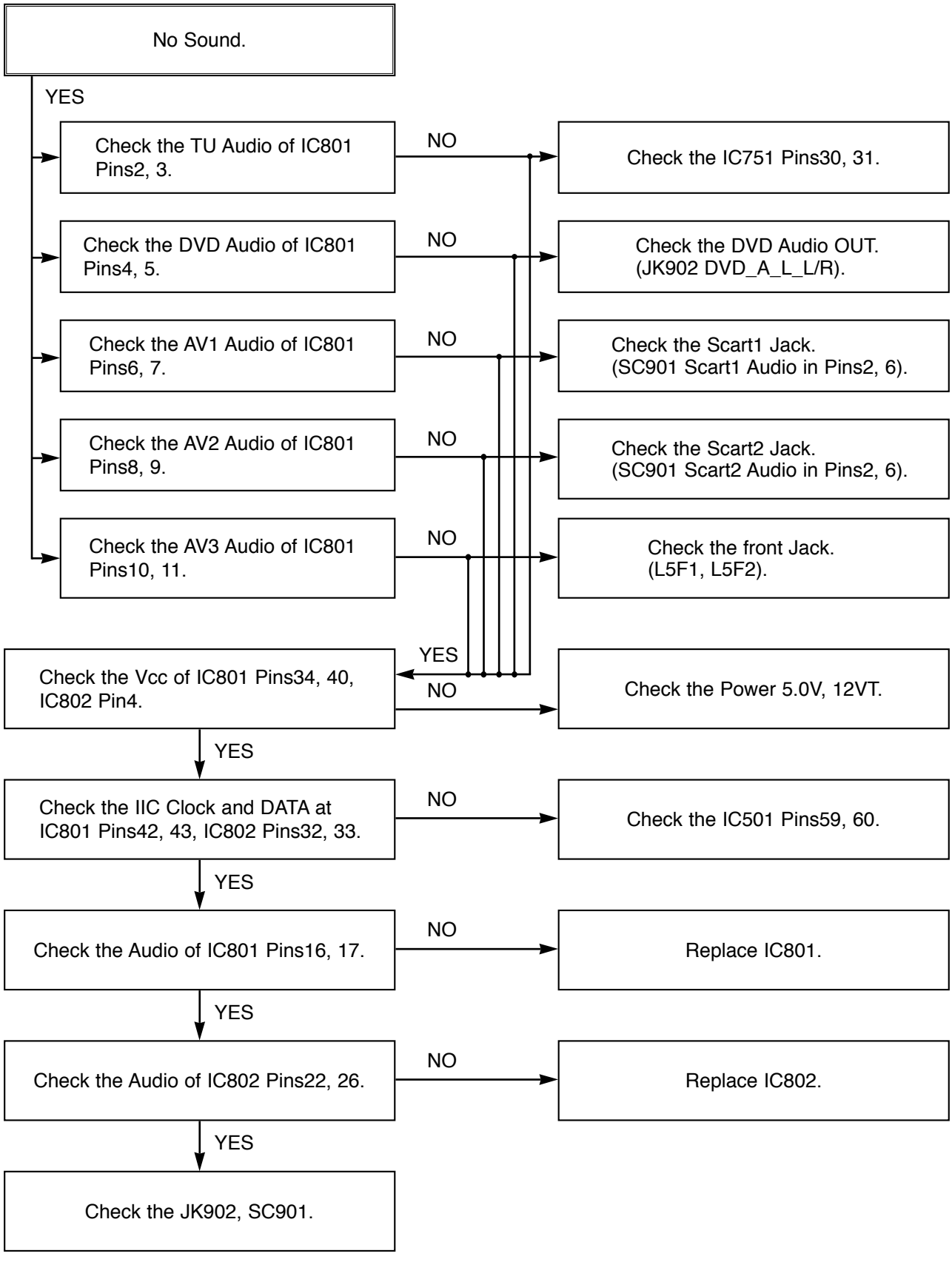


(4) When the Video signal doesn't appear on the screen in REC Mode,

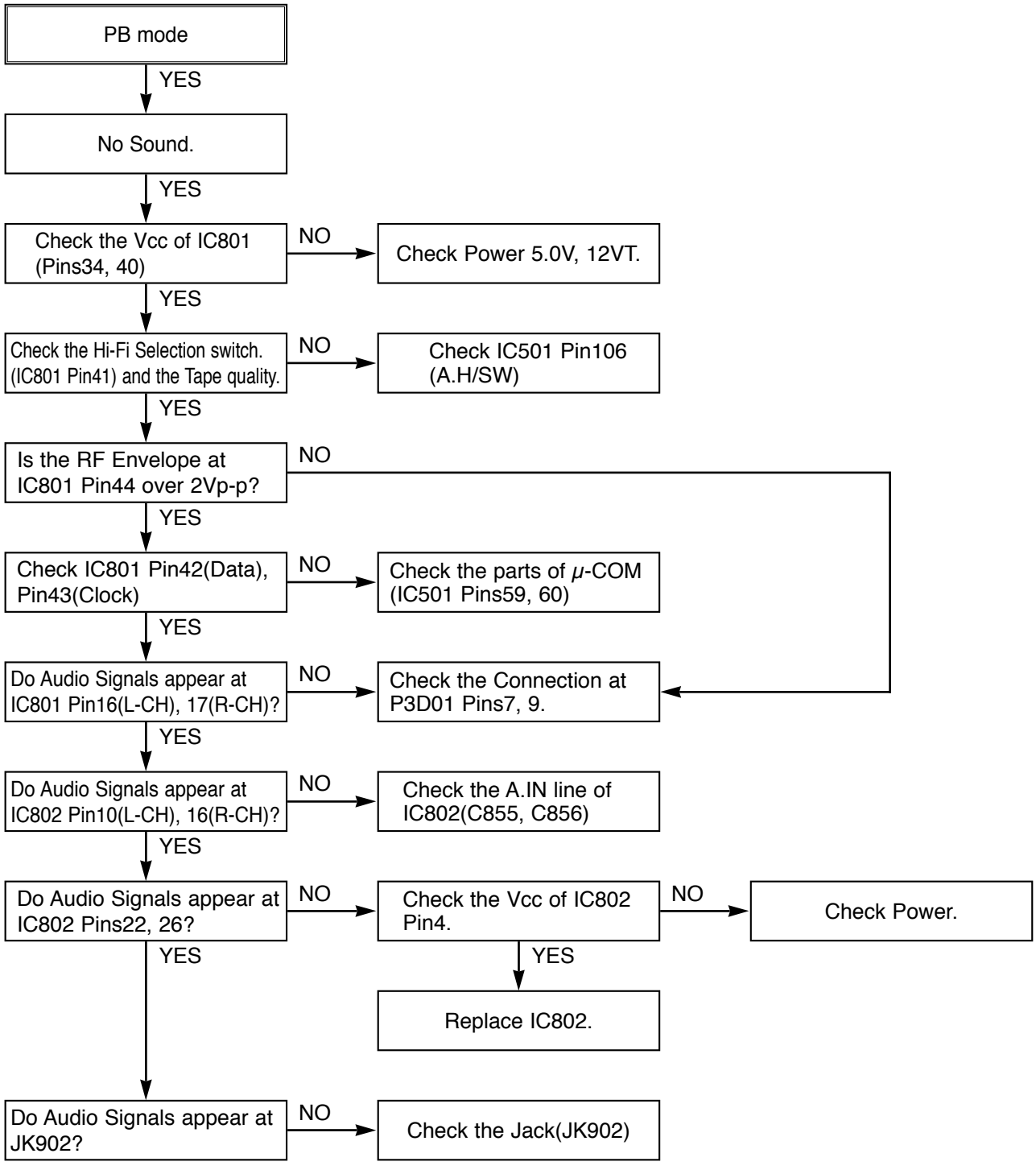


5. Hi-Fi CIRCUIT

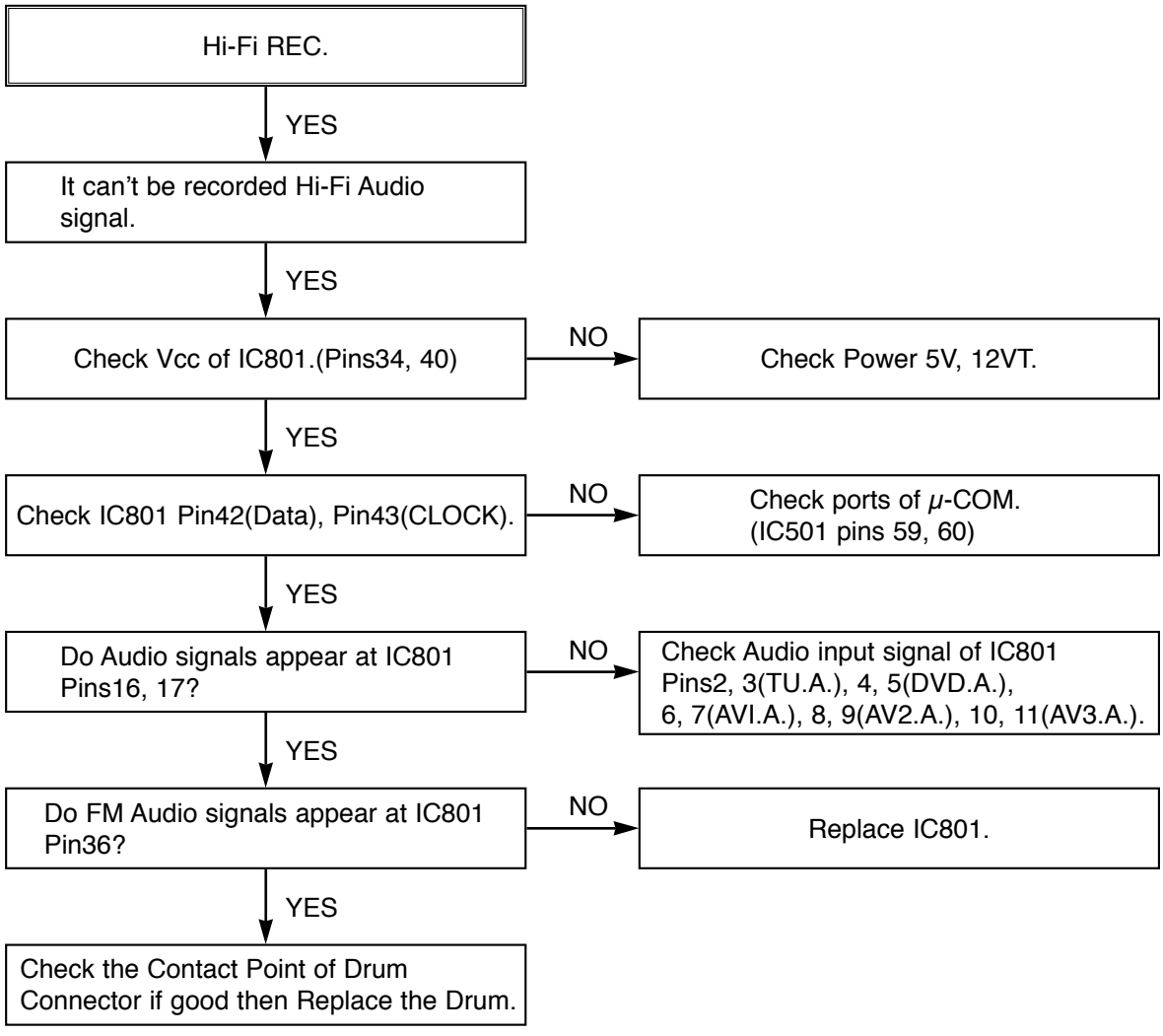
(A) No Sound(EE Mode)



(B) Hi-Fi Playback

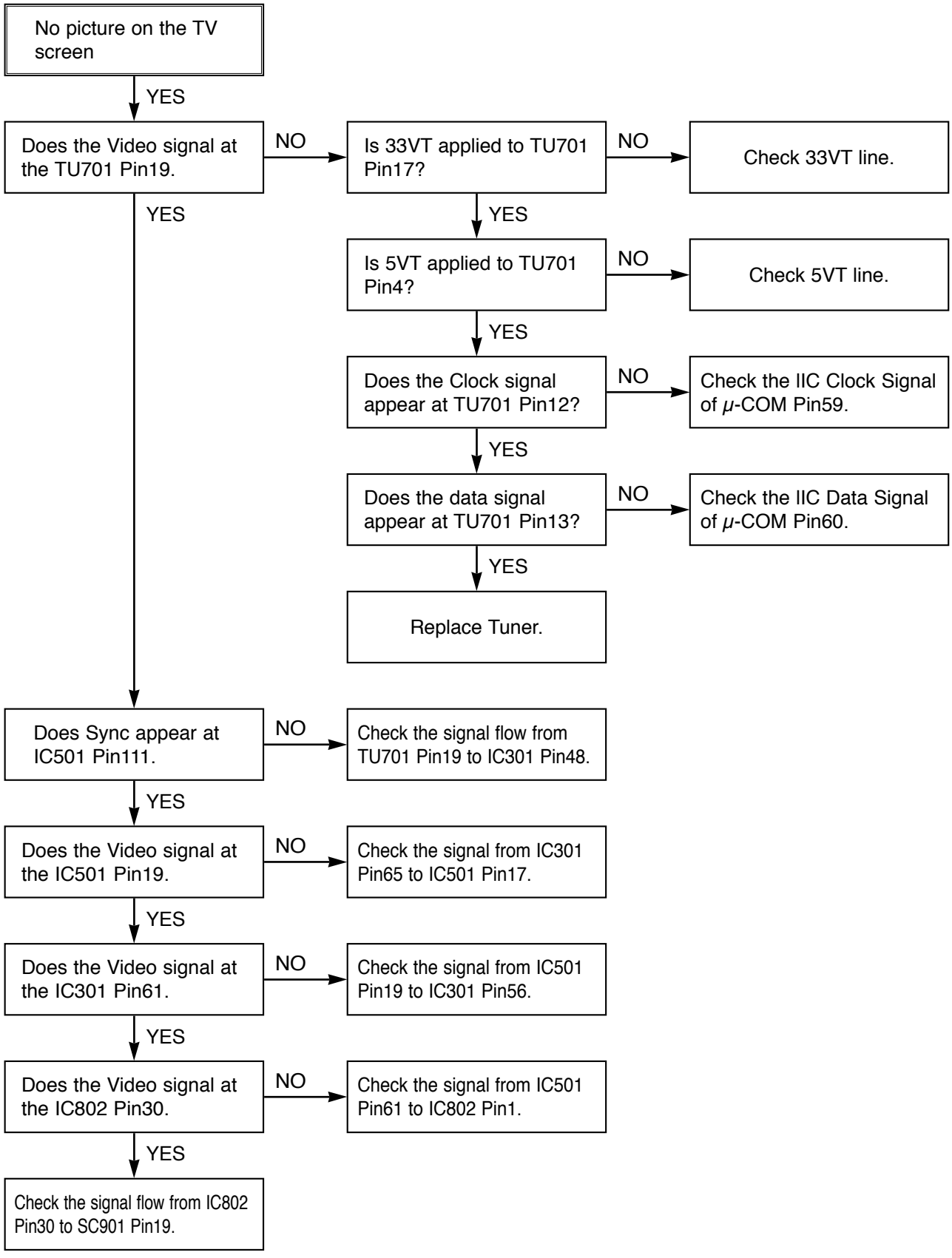


(C)

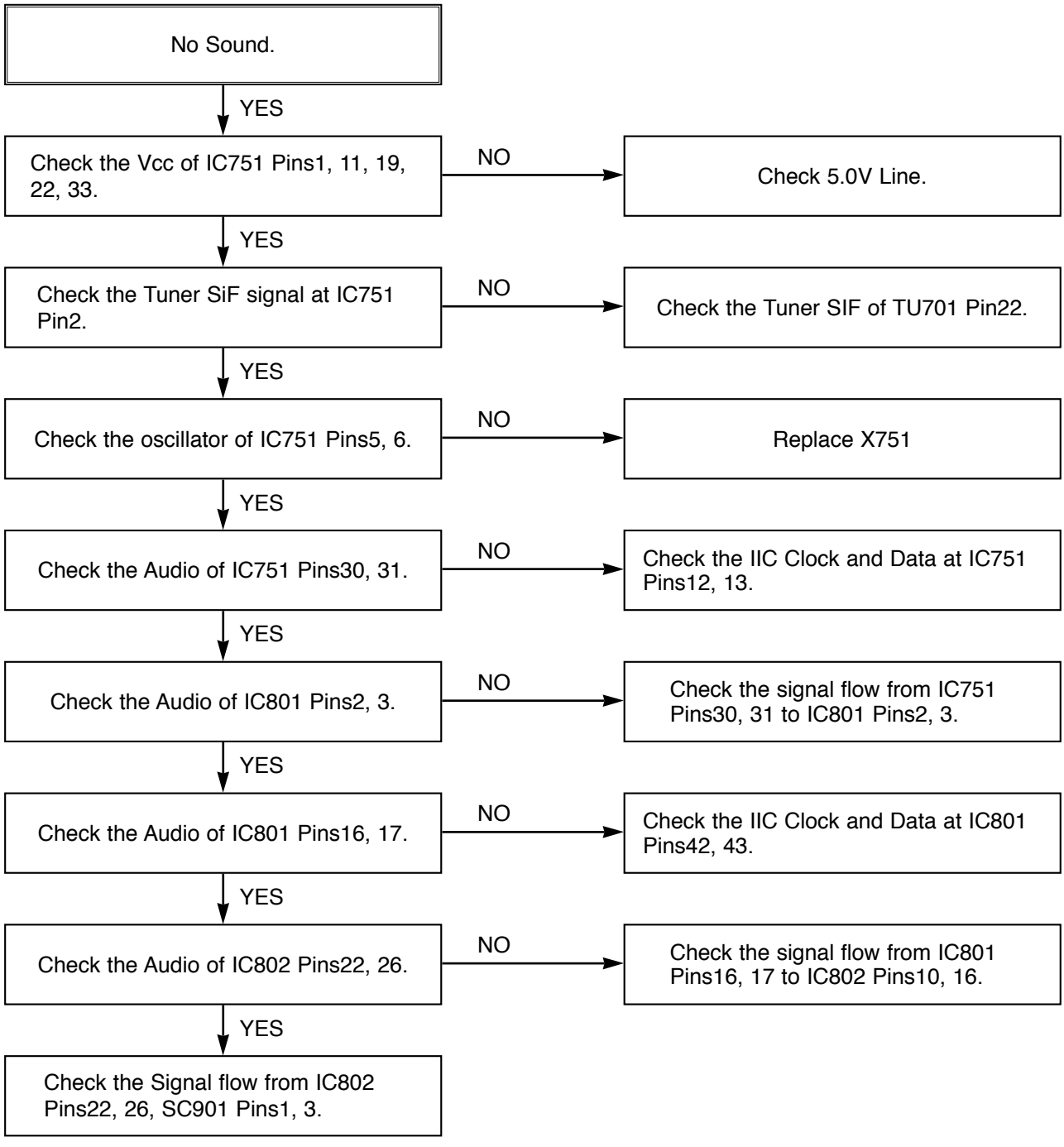

Hi-Fi REC.
YES
It can't be recorded Hi-Fi Audio signal.
YES
Check Vcc of IC801.(Pins34, 40)
NO
Check Power 5V, 12VT.
YES
Check IC801 Pin42(Data), Pin43(CLOCK).
NO
Check ports of μ-COM. (IC501 pins 59, 60)
YES
Do Audio signals appear at IC801 Pins16, 17?
NO
Check Audio input signal of IC801 Pins2, 3(TU.A.), 4, 5(DVD.A.), 6, 7(AVI.A.), 8, 9(AV2.A.), 10, 11(AV3.A.).
YES
Do FM Audio signals appear at IC801 Pin36?
NO
Replace IC801.
YES
Check the Contact Point of Drum Connector if good then Replace the Drum.

6. Tuner/IF CIRCUIT

(A) No Picture on the TV screen

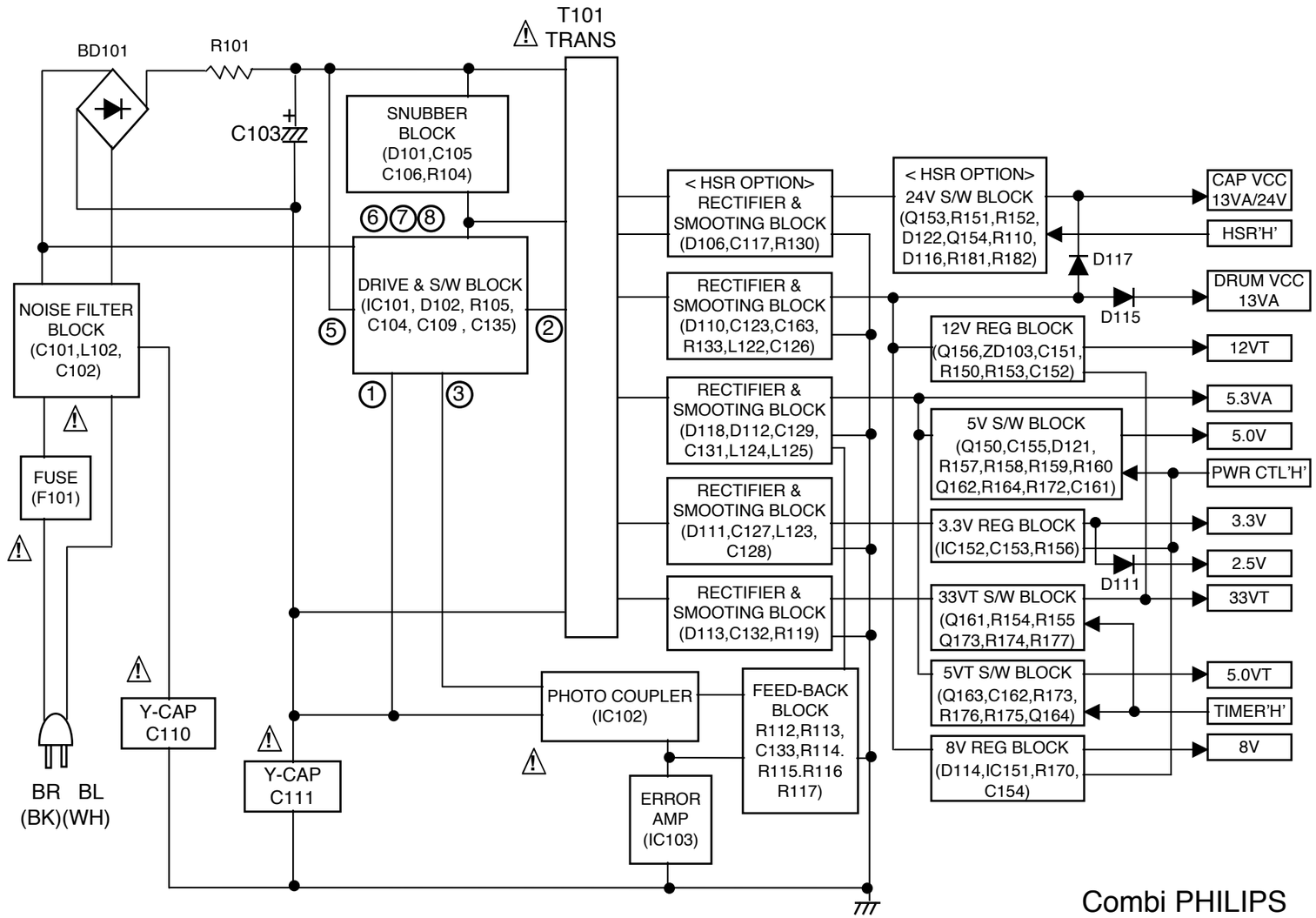


(B) No Sound


No Sound.
YES
Check the Vcc of IC751 Pins1, 11, 19, 22, 33.
NO
Check 5.0V Line.
YES
Check the Tuner SiF signal at IC751 Pin2.
NO
Check the Tuner SIF of TU701 Pin22.
YES
Check the oscillator of IC751 Pins5, 6.
NO
Replace X751
YES
Check the Audio of IC751 Pins30, 31.
NO
Check the IIC Clock and Data at IC751 Pins12, 13.
YES
Check the Audio of IC801 Pins2, 3.
NO
Check the signal flow from IC751 Pins30, 31 to IC801 Pins2, 3.
YES
Check the Audio of IC801 Pins16, 17.
NO
Check the IIC Clock and Data at IC801 Pins42, 43.
YES
Check the Audio of IC802 Pins22, 26.
NO
Check the signal flow from IC801 Pins16, 17 to IC802 Pins10, 16.
YES
Check the Signal flow from IC802 Pins22, 26, SC901 Pins1, 3.

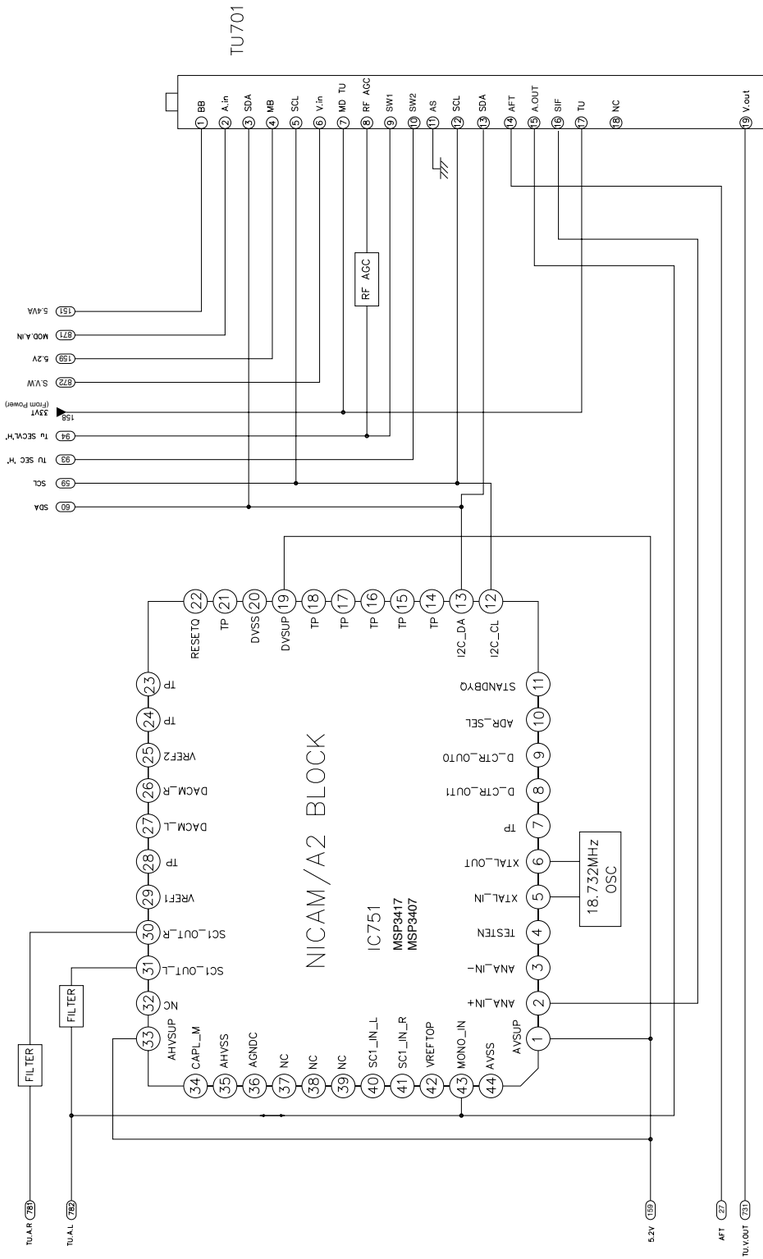
BLOCK DIAGRAMS

1. POWER(SMPS) BLOCK DIAGRAM

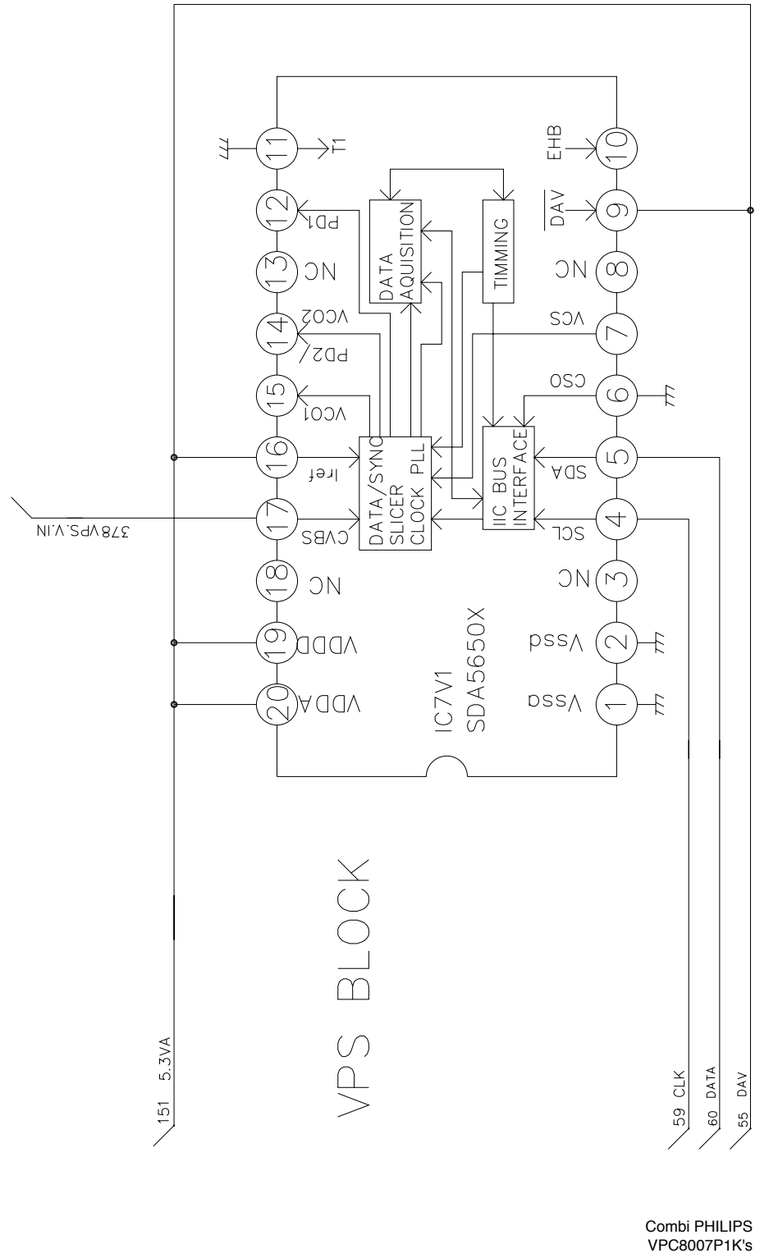


Combi PHILIPS
VPC8007P1K's

2. Tu/IF, NICAM & A2 BLOCK DIAGRAM



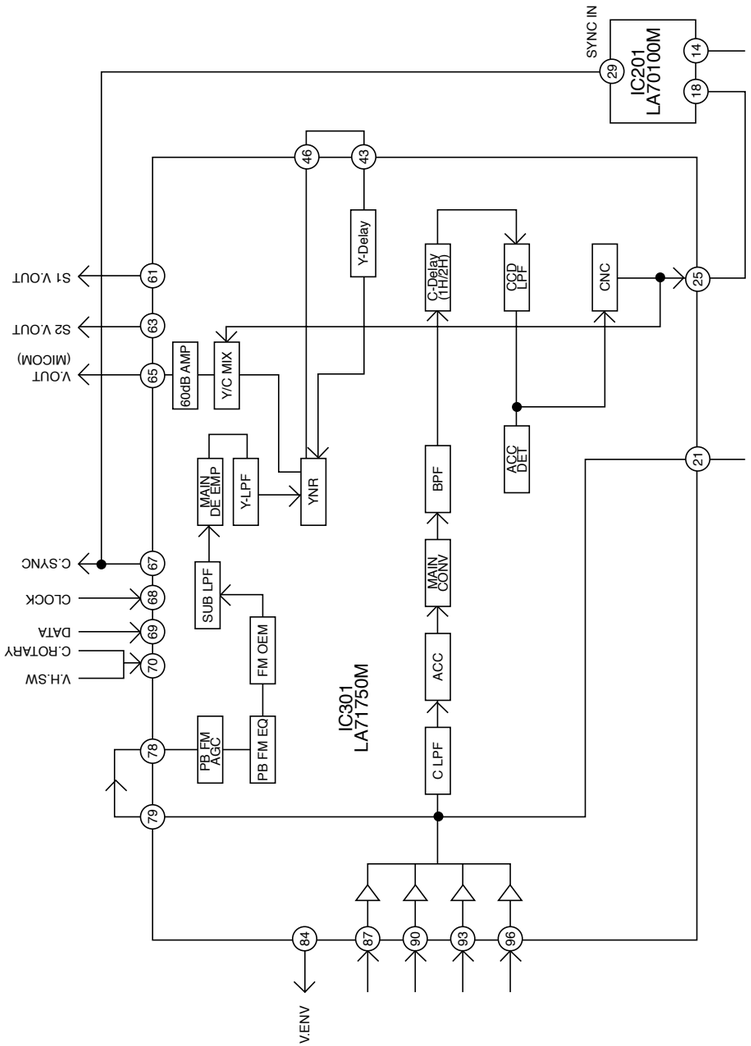
3. VPS BLOCK DIAGRAM



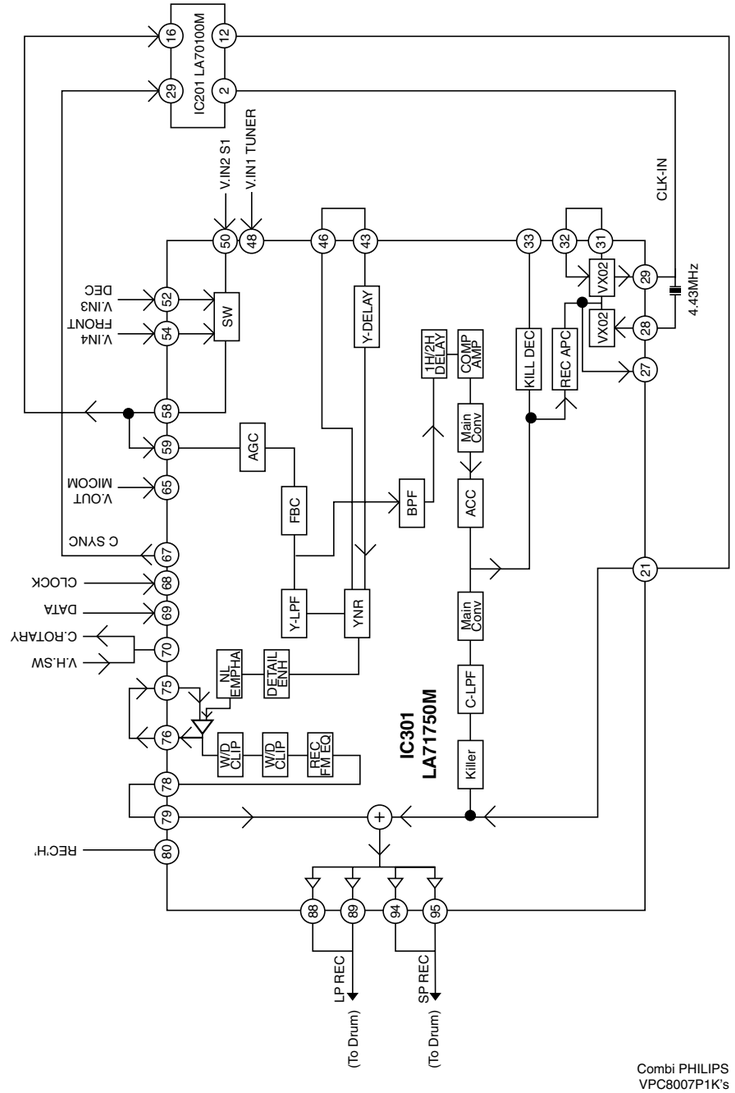
Combi PHILIPS
VPC8007P1K's

4. Y/C BLOCK DIAGRAM

(PB MODE)

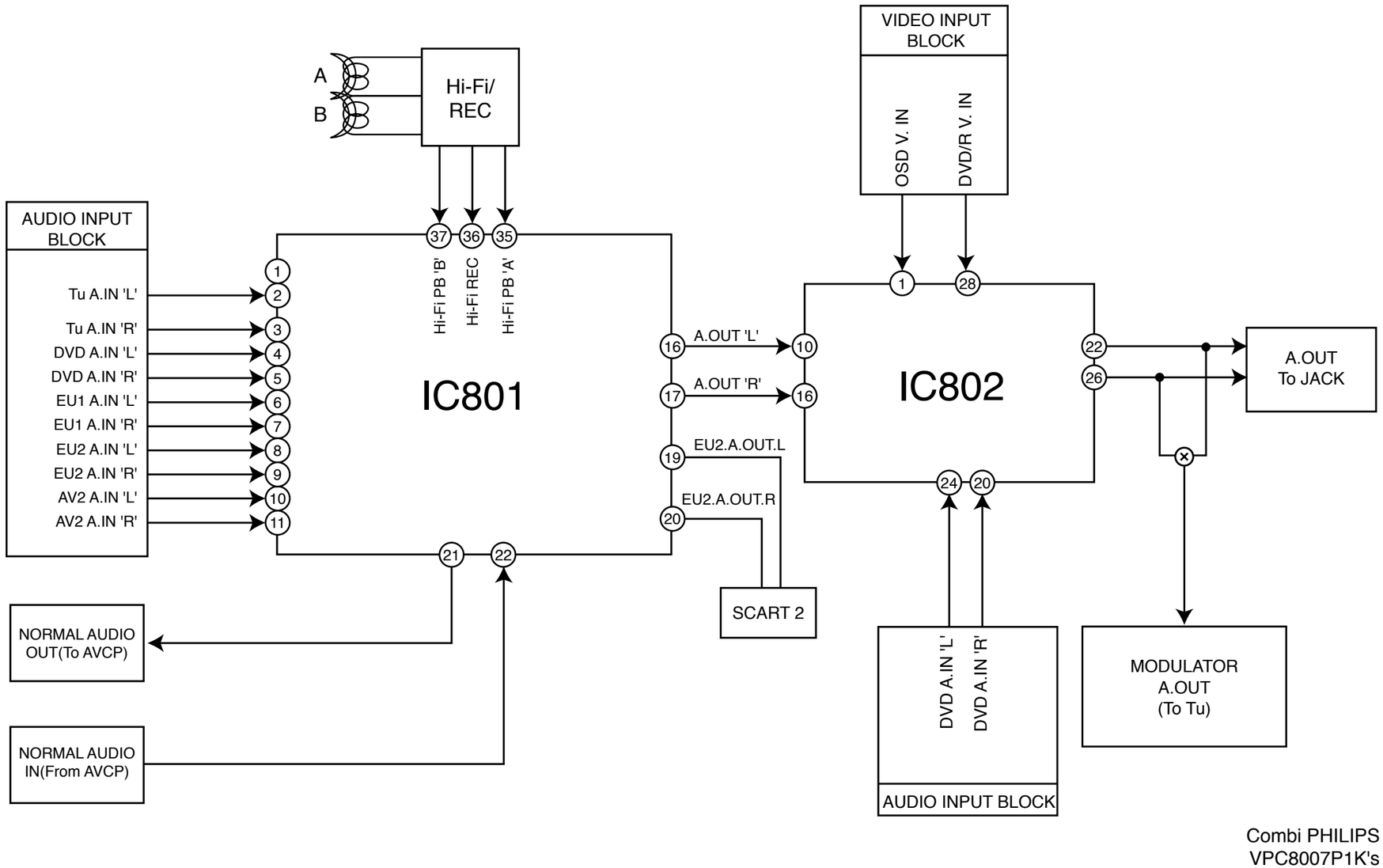


(REC MODE)



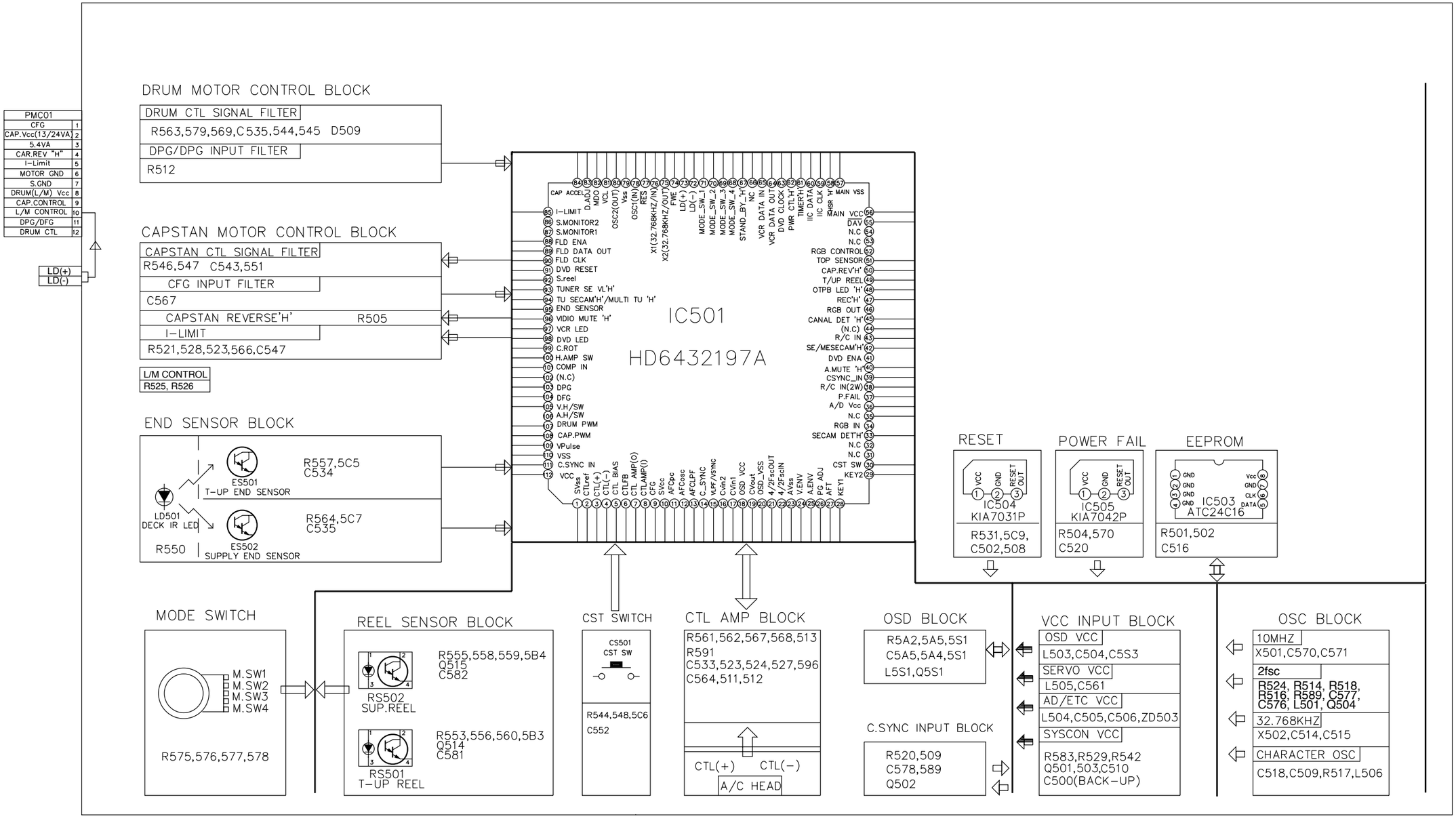
Combi PHILIPS
VPC8007P1K's

5. Hi-Fi BLOCK DIAGRAM



Combi PHILIPS
VPC8007P1K's

6. SYSTEM BLOCK DIAGRAM



Combi PHILIPS
VPC8007P1K's

CIRCUIT DIAGRAMS

1. POWER(SMPS) CIRCUIT DIAGRAM 1

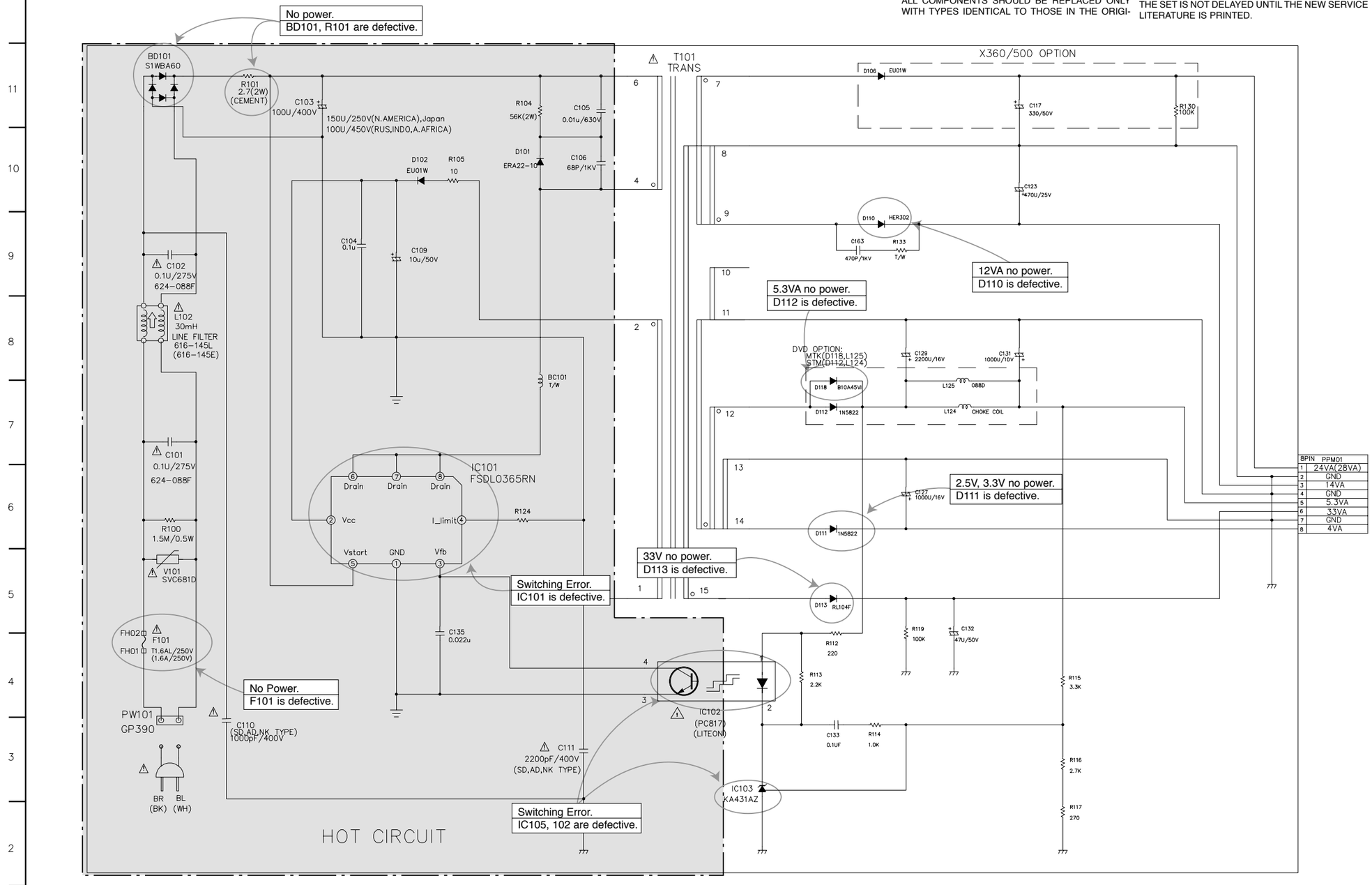
IMPORTANT SAFETY NOTICE

WHEN SERVICING THIS CHASSIS, UNDER NO CIRCUMSTANCES SHOULD THE ORIGINAL DESIGN BE MODIFIED OR ALTERED WITHOUT PERMISSION FROM THE PHILIPS ELECTRONICS CORPORATION. ALL COMPONENTS SHOULD BE REPLACED ONLY WITH TYPES IDENTICAL TO THOSE IN THE ORIGINAL CIRCUIT. SPECIAL COMPONENTS ARE SHADED ON THE SCHEMATIC FOR EASY IDENTIFICATION.

THIS CIRCUIT DIAGRAM MAY OCCASIONALLY DIFFER FROM THE ACTUAL CIRCUIT USED. THIS WAY, IMPLEMENTATION OF THE LATEST SAFETY AND PERFORMANCE IMPROVEMENT CHANGES INTO THE SET IS NOT DELAYED UNTIL THE NEW SERVICE LITERATURE IS PRINTED.

NOTE :

1. Shaded(■) parts are critical for safety. Replace only with specified part number.
2. Voltages are DC-measured with a digital voltmeter during Play mode.

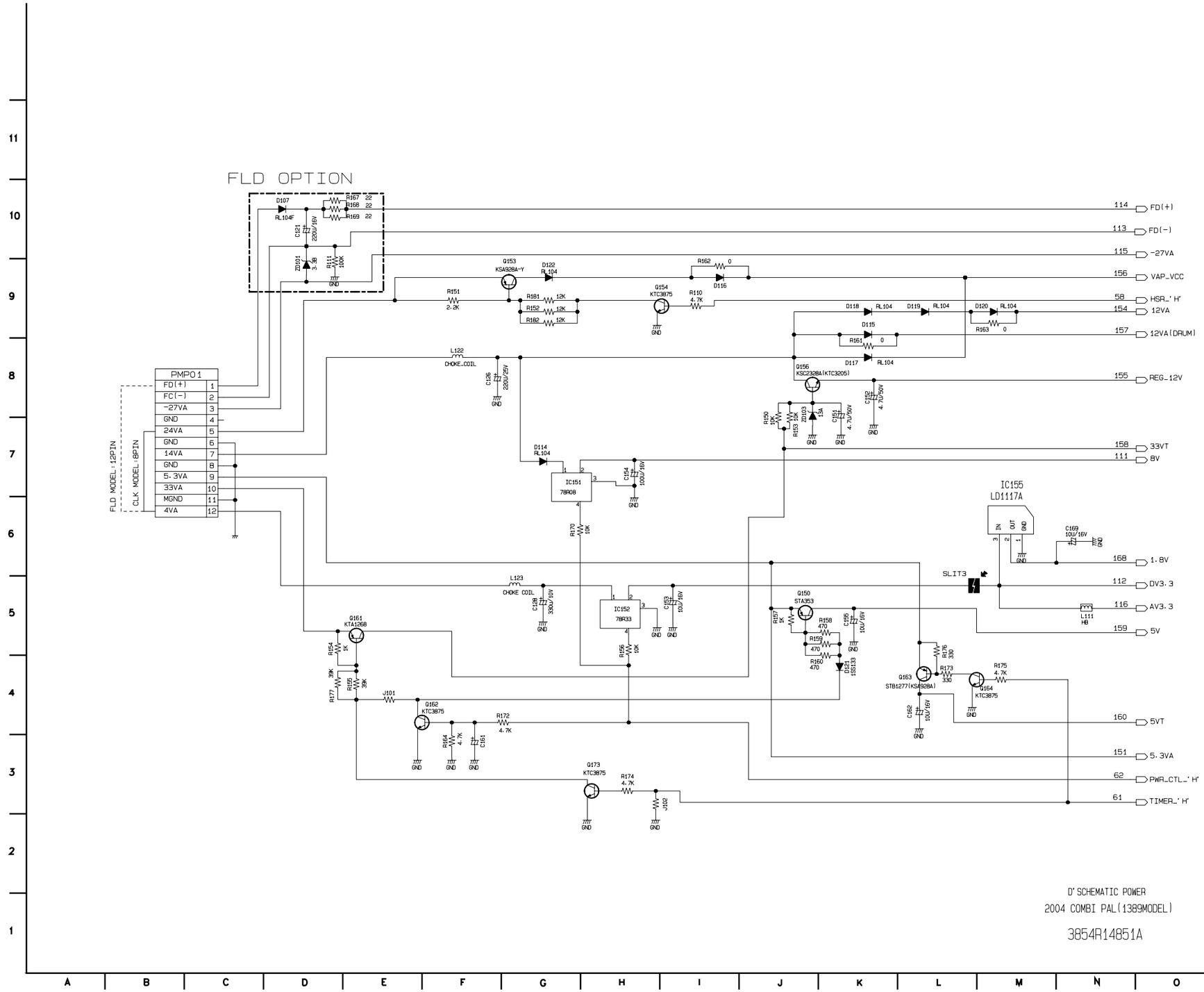


NOTES) ⏚ Symbol denotes AC ground.
⏚ Symbol denotes DC chassis ground.

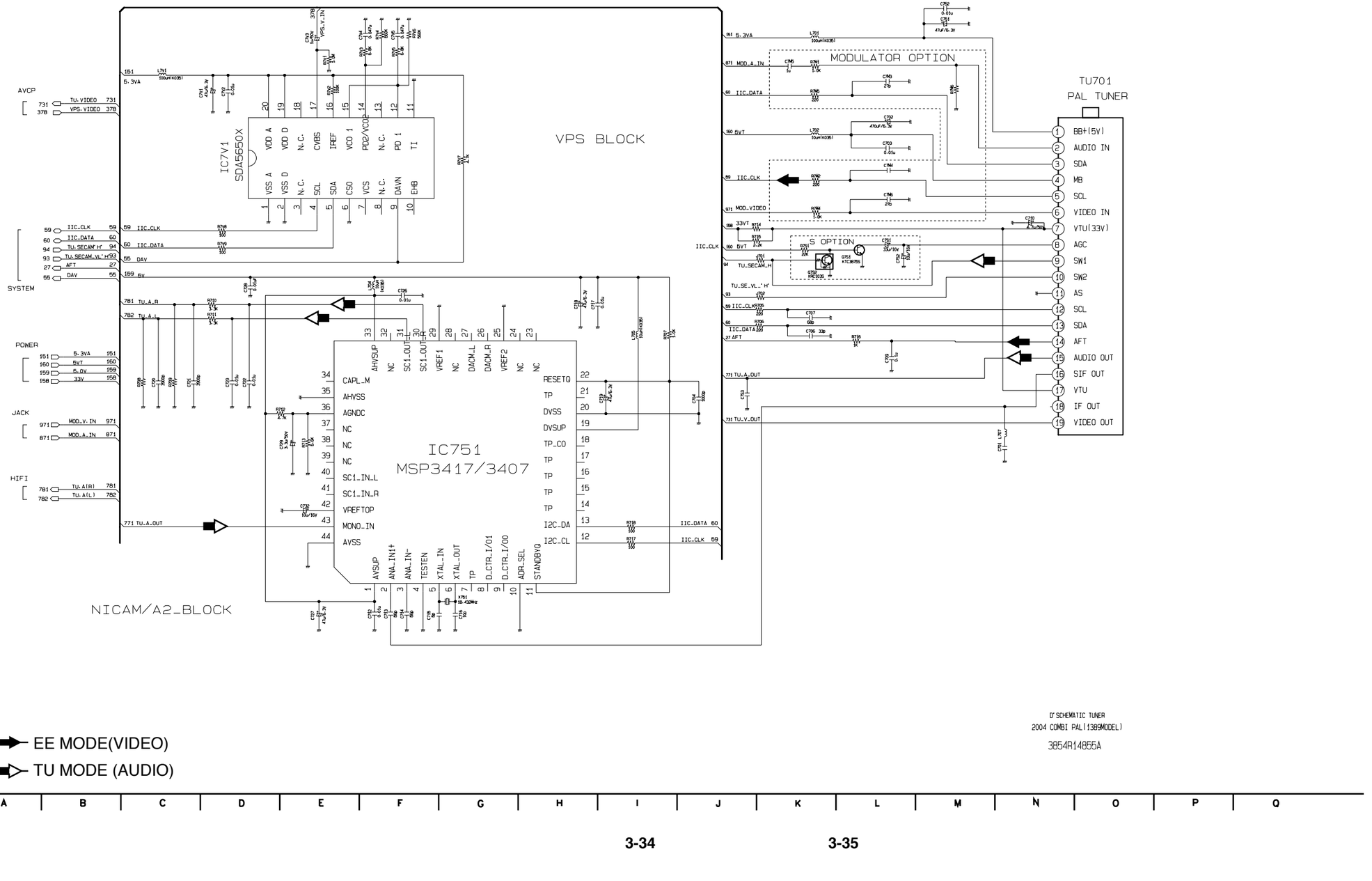
NOTE) ⚠ Warning
Parts that are shaded are critical
With respect to risk of fire or
electricial shock.

VC8806P1K's
3854R14370A

2. POWER(SMPS) CIRCUIT DIAGRAM 2



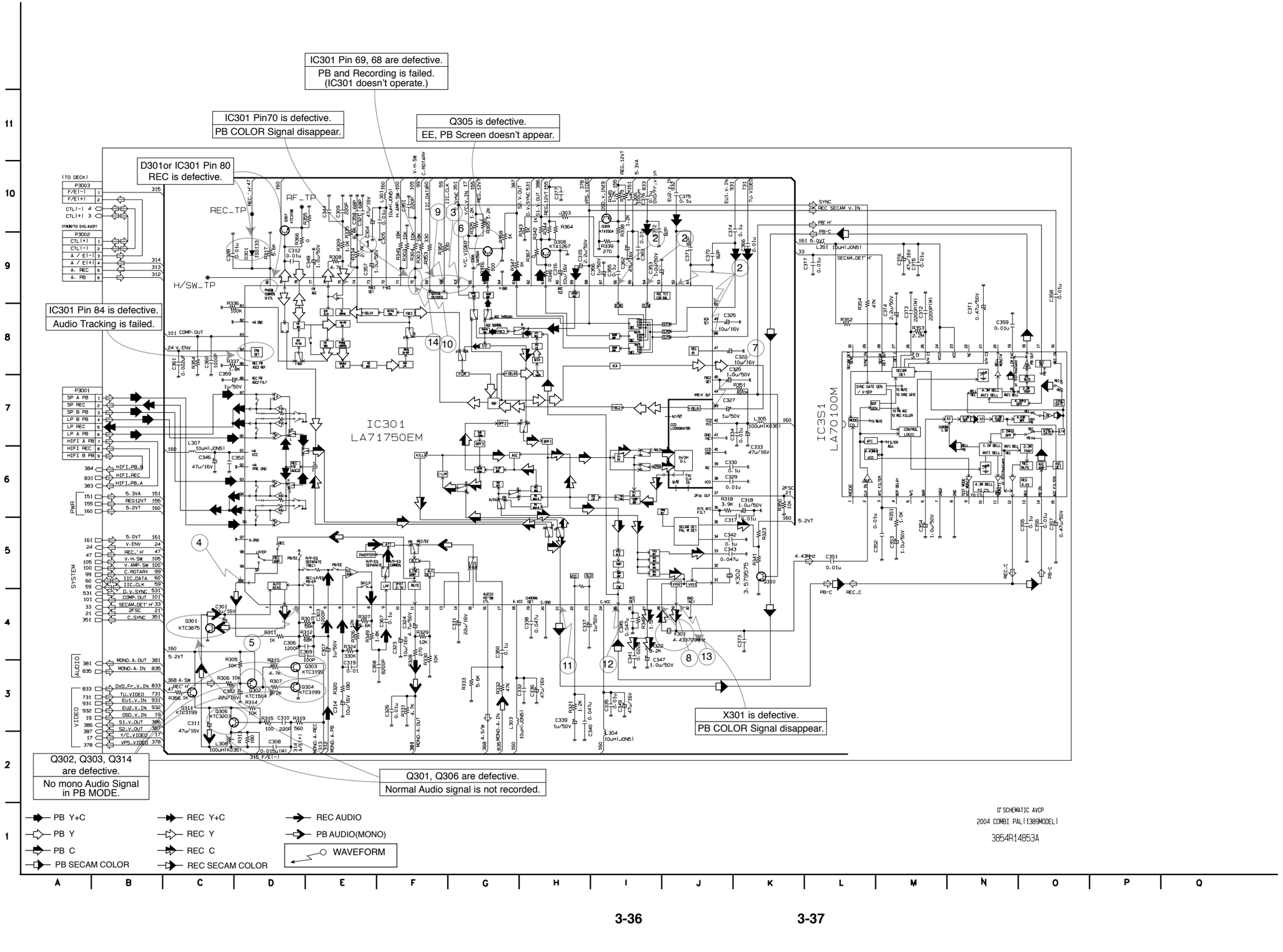
3. TU/IF, NICAM & A2 CIRCUIT DIAGRAM



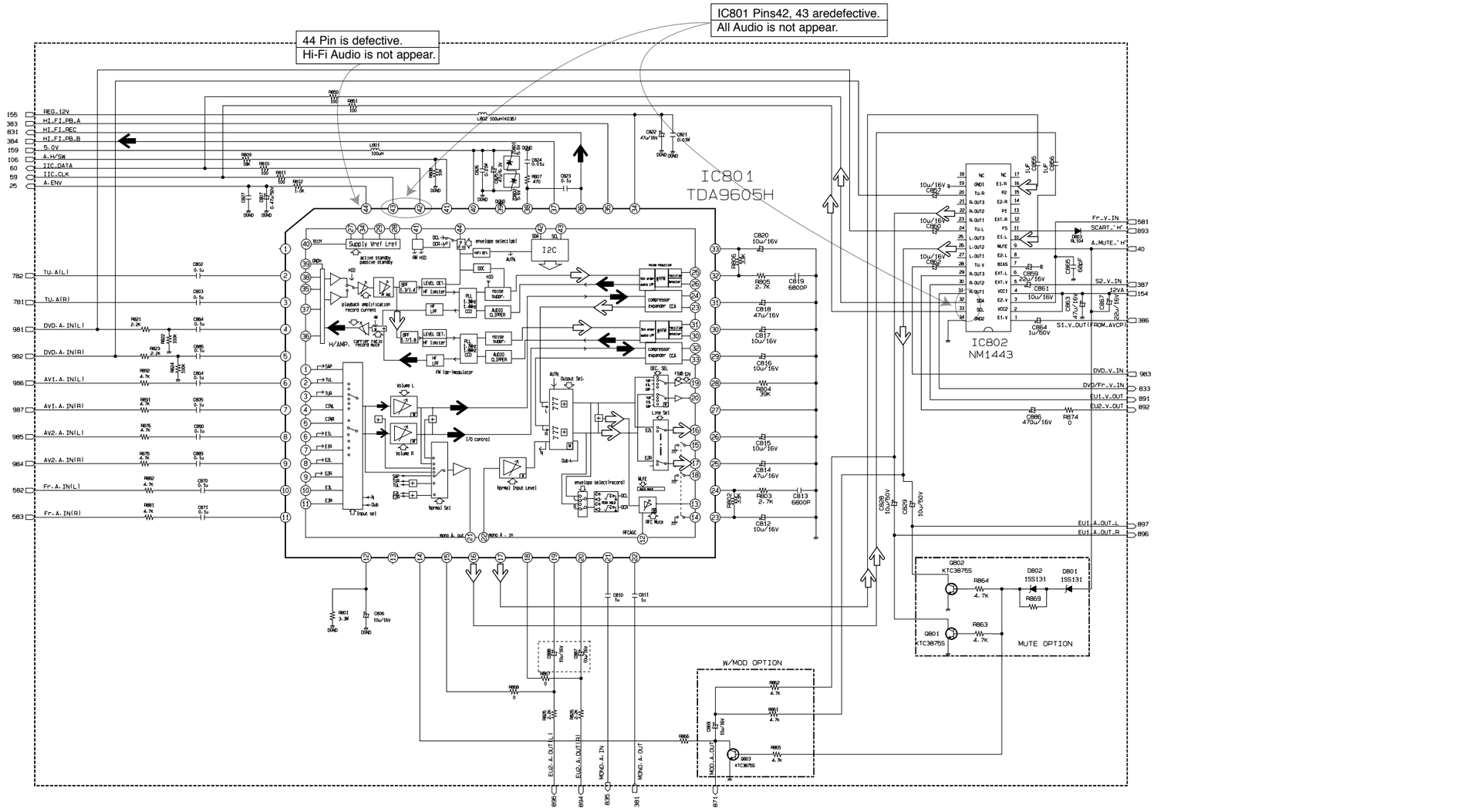
D'SCHEMATIC TUNER
2004 COMBI PAL(1389MODEL)

3854R14855A

4. A/V CIRCUIT DIAGRAM

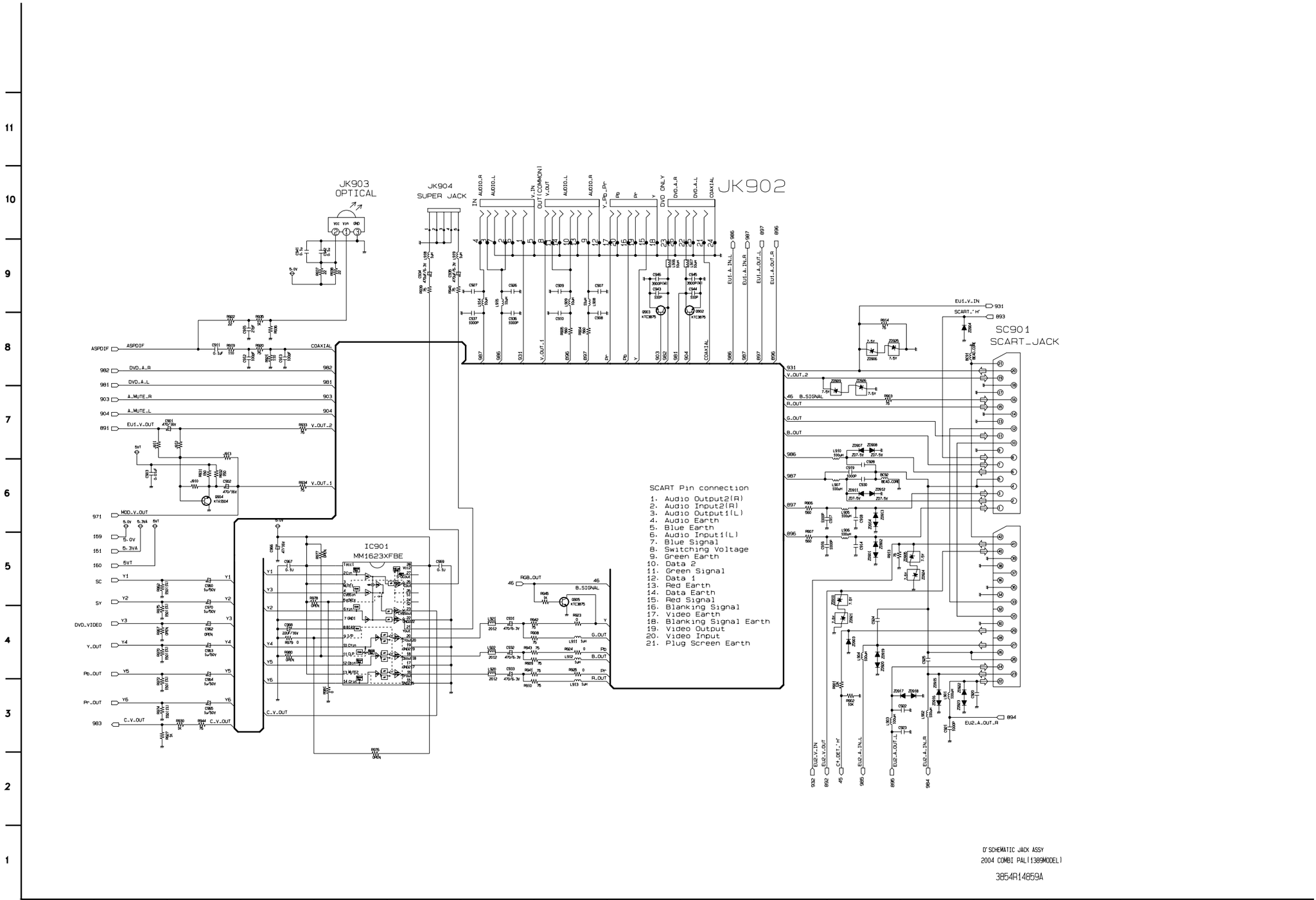


5. Hi-Fi CIRCUIT DIAGRAM

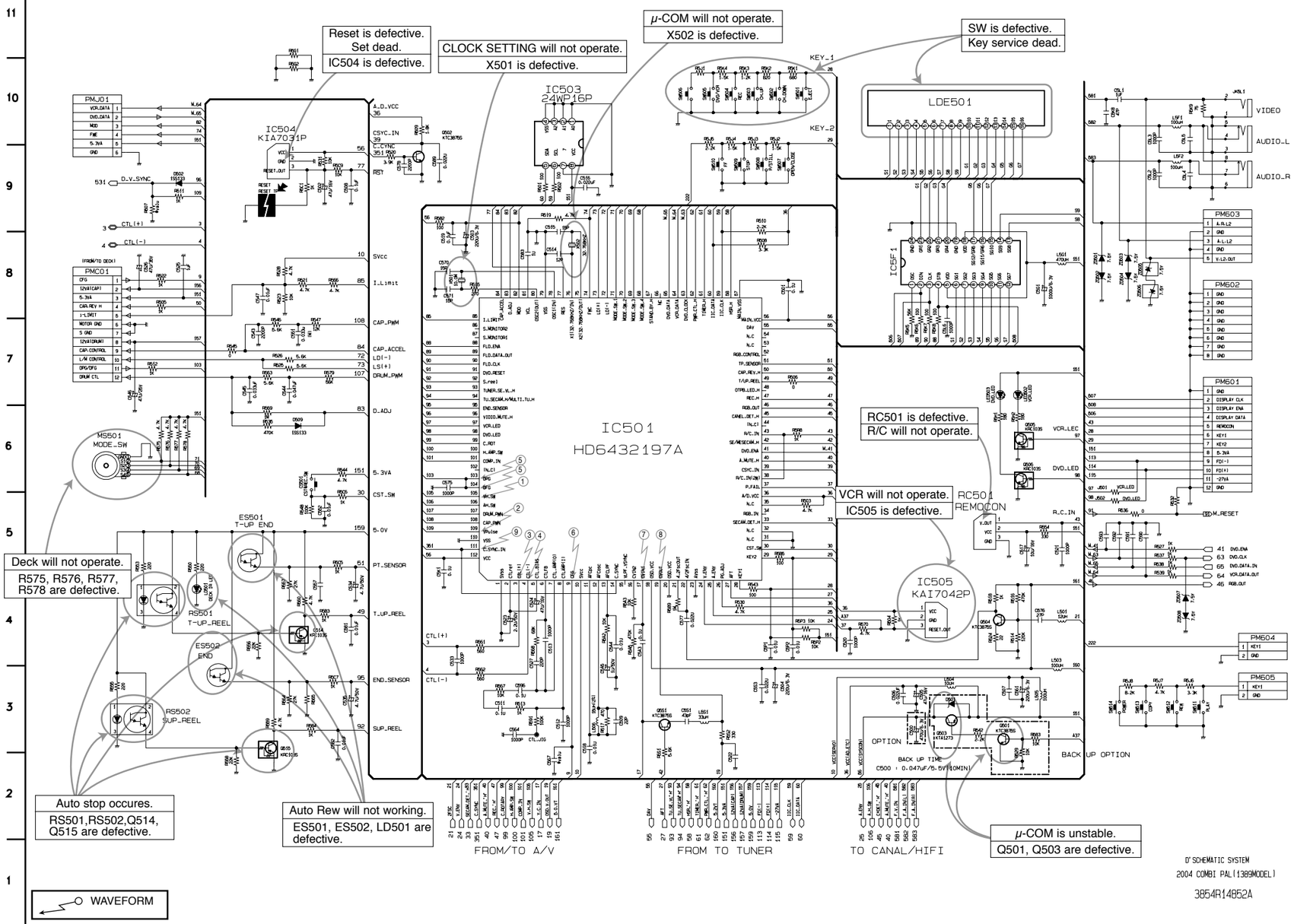


D'SCHEMATIC HI-FI
2004 COMBI PAL(1389MODEL)
3854R14854A

6. SCART(JACK) CIRCUIT DIAGRAM

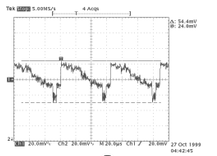


7. SYSTEM CIRCUIT DIAGRAM

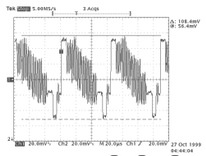


WAVEFORM & VOLTAGE SHEET

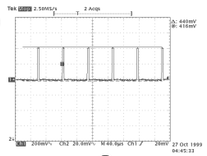
★ IC301 Oscilloscope Waveform

① 

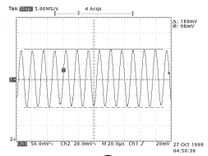
IC301 Pin ㉕
PB mode
500mvp-p

② 

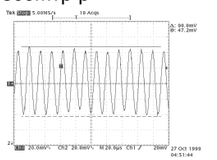
IC301 Pins ㊽ ,㊿ , ㊿
㊿ , ㊿
Video in 1Vp-p

③ 

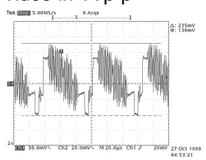
IC301 Pin ㊼
PB/REC mode
4.0Vp-p

④ 

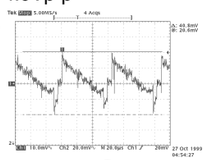
IC301 Pin ㊿
REC mode
1.1Vp-p

⑤ 

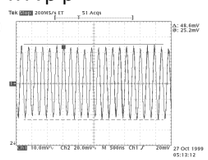
IC301 Pin ③
REC mode
2.0Vp-p

⑥ 

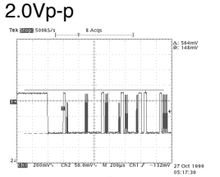
IC301 Pin ㊺
PB mode
2.02Vp-p

⑦ 

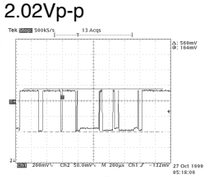
IC301 Pin ㊸
PB mode
400mVp-p

⑧ 

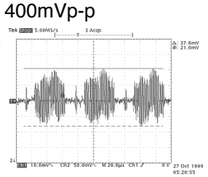
IC301 Pin ㉘
PB mode
400mVp-p

⑨ 

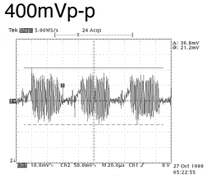
IC301 Pin ㊽
PB/REC mode
5Vp-p

⑩ 

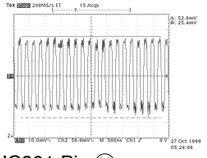
IC301 Pin ㊾
PB/REC mode
5Vp-p

⑪ 

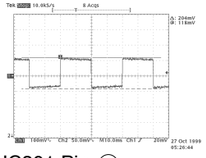
IC301 Pins ㉑
REC mode
340mVp-p

⑫ 

IC301 Pins ㉕
PB mode
300mVp-p

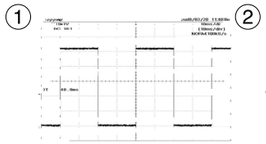
⑬ 

IC301 Pin ㉙
PB mode
400mVp-p

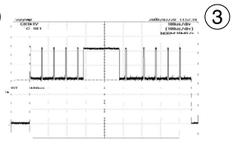
⑭ 

IC301 Pin ㊿
PB mode
3.6Vp-p

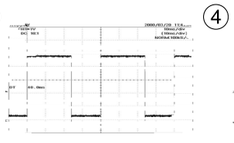
★ IC501 Waveform Photographs

① 

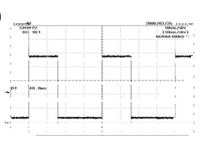
V.HSW
(IC501 Pin 105)
1V/10mS
REC/PB MODE

② 

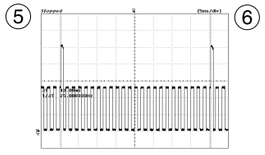
DV.SYNC
(IC501 PIN 109)
1V/100uS
QUE/REV MODE

③ 

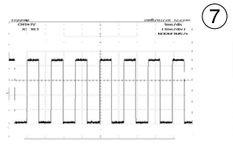
CTL(+)
(IC501 Pin 3)
1V/10mS

④ 

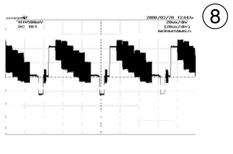
CTL(-)
(IC501 Pin4)
1V/10mS

⑤ 

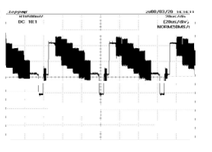
DFG/DFG
(IC501 PIN 103,104)
1V/10mS
REC/PB MODE

⑥ 

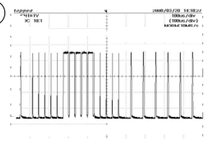
CFG
(IC501 Pin9)
1V/10mS

⑦ 

V.IN
(IC501 Pin 17)
500mV/20uS

⑧ 

V.OUT
(IC501 Pin 19)
500mV/20uS
EE/PB MODE

⑨ 

C.SYNC
(IC501 Pin 111)
1.0V/100uS
EE/PB MODE

• CIRCUIT VOLTAGE CHART

MODE / PIN NO.	EE	PB	REC
IC201			
1	2.36 V	2.35 V	2.32 V
2	2.4 V	2.35 V	2.4 V
3	3.5 V	3.49 V	3.5 V
4	2.43 V	2.41 V	2.38 V
5	0.002 V	0.005 V	0.006 V
6	0.4 V	3.7 V	0.39 V
7	0.003 V	0.003 V	0.003 V
8	0.003 V	0.003 V	0.003 V
9	2.87 V	2.85 V	2.81 V
10	2.36 V	2.35V	2.32 V
11	3.16 V	3.13 V	3 V
12	3 V	1.7 V	3.03 V
13	4 V	4 V	4 V
14	2.3 V	2.3 V	2.25 V
15	2.98 V	1.78 V	2.93 V
16	3.2 V	3.2 V	3.2 V
17	0.15 V	3.86 V	0.017 V
18	0.124 V	3.38 V	0.127 V
19	2.23 V	2.23 V	2.23 V
20	3 V	3.3 V	3.3 V
21	1.84 V	2.34 V	2.35 V
22	4.71 V	0.002 V	0.007 V
23	4.72 V	4.69 V	4.64 V
24	4.72 V	4.69 V	4.63 V
25	2.37 V	2.26 V	2.37 V
26	2.37 V	2.25 V	2.36 V
27	3 V	2.86 V	3 V
28	0.182 V	0.187 V	0.182 V
29	0.46 V	0.62 V	0.85 V
30	1.95 V	1.94 V	1.91 V
IC301			
1	4.8 V	4.84 V	0.99 V
2	0.11 V	0.014 V	0.81 V
3	2.16 V	2.16 V	2.03 V
4	0.69 V	0.63 V	1.73 V
5	2.15 V	2.15 V	2.26 V
6	2.16 V	2.15 V	2.06 V
7	2.15 V	2.15 V	2.1 V
8	2.15 V	2.15 V	2.1 V
9	2.14 V	2.14 V	2.73 V
10	2.16 V	2.16 V	2.66 V
11	2.23 V	2.27 V	2.8 V
12	1.56 V	0.002 V	2.0 V
13	2.14 V	2.14 V	0.095 V
14	0.022 V	0.022 V	2.05 V
15	2.14 V	2.14 V	2.08 V
16	4.85 V	0.146 V	4.68 V
17	2.14 V	2.14 V	2.09 V
18	4.8 V	4.86 V	4.73 V
19	3.88 V	3.92 V	2.72 V
20	2.31 V	0.003 V	0.006 V
21	3 V	1.68 V	3.02 V
22	3.2 V	2.62 V	3.2 V
23	3.2 V	2.55 V	3.2 V

MODE / PIN NO.	EE	PB	REC
24	4.85 V	4.85 V	4.75 V
25	0.121 V	3.4 V	0.19 V
26	1.65 V	1.25 V	1.6 V
27	2.16 V	2.1 V	2.14 V
28	3.75 V	3.7 V	3.66 V
29	2.43 V	2.46 V	2.34 V
30	0.002 V	0.002 V	0.005 V
31	4.76 V	4.58 V	4.72 V
32	4.68 V	4.58 V	4.71 V
33	2.88 V	2.86 V	2.8 V
34	0.061 V	0.06 V	0.061 V
35	3.02 V	2.34 V	2.99 V
36	3.5 V	2.84 V	3.4 V
37	1.7 V	1.76V	1.61 V
38	2 V	2.05 V	1.94 V
39	8.65 V	8.6 V	8.38 V
40	0.002 V	0.003 V	0.006 V
41	0.002 V	0.003 V	0.006 V
42	4.8 V	4.8 V	4.68 V
43	2.4 V	2.67 V	2.17 V
44	13.8 mV	3.86 V	0.03 V
45	2.5 V	2.52 V	2.55 V
46	2.6 V	2.78 V	2.64 V
47	4.14 V	4.14 V	4.14 V
48	3.3 V	3.09 V	3.30 V
49	2.97 V	2.93 V	3.69 V
50	1.93 V	1.92 V	1.92 V
51	0.002 V	0.003 V	0.005 V
52	1.93 V	1.93 V	1.92 V
53	2.33 V	2.33 V	2.34 V
54	1.93 V	1.92 V	1.92 V
55	5.14 V	5.14 V	5.13 V
56	2.24 V	2.57 V	2.22 V
57	1.95 V	2.28 V	0.006 V
58	3 V	2.55 V	3.01 V
59	2.9 V	2.93 V	2.92 V
60	1.47 V	1.54 V	1.48 V
61	1.8 V	2.44 V	1.79 V
62	0.087 V	0.09 V	0.088 V
63	1.8 V	2.55 V	1.78 V
64	0.002 V	0.003 V	0.006 V
65	1.71 V	0.002 V	1.69 V
66	0.002 V	0.003 V	0.006 V
67	0.005 V	0.07 V	0.44 V
68	4.8 V	4.8 V	4.78 V
69	4.7 V	4.7 V	4.7 V
70	7.75 V	2.55 V	5.55 V
71	5.55 V	0.008 V	0.008 V
72	4.84 V	4.8 V	4.72 V
73	2.21 V	2.2 V	2.24 V
74	2.45 V	2.6 V	2.43 V
75	2.38 V	0.72 V	2.38 V
76	2.4 V	0.81 V	2.39 V
77	1.58 V	1.6 V	1.48 V
78	2.44 V	3.35 V	2.33 V

MODE / PIN NO.	EE	PB	REC
79	1.73 V	1.67 V	2.51 V
80	0.98 V	0.98 V	4.46 V
81	1.1 V	1.13 V	1.15 V
82	0.003 V	0.004 V	0.006 V
83	1.65 V	1.03 V	1.41 V
84	0.258 V	2.5 V	0.014 V
85	0.002 V	0.003 V	1.38 V
86	0.251 V	0.014 V	1.98 V
87	0.77 V	0.78 V	0.78 V
88	0.77 V	0.78 V	0.77 V
89	0.77 V	0.78 V	0.77 V
90	0.77 V	0.78 V	0.77 V
91	4.85 V	4.83 V	4.74 V
92	2.1 mV	0.004 V	0.006 V
93	1.7 V	1.72 V	3.94 V
94	1.7 V	1.71 V	3.93 V
95	1.7 V	1.71 V	3.92 V
96	1.7 V	1.71 V	3.94 V
97	0.002 V	0.005 V	0.006 V
98	2.16 V	2.16 V	2.21 V
99	2.16V	2.16 V	2.25 V
100	2.16 V	2.16 V	2.31 V
IC5F1			
1	2.33 V	2.31 V	2.3 V
2	4.98 V	4.9 V	4.9 V
3	5 V	5 V	5 V
4	4.96 V	4.9 V	4.9 V
5	4.89 V	4.85 V	4.8 V
6	0.64 V	0.59 V	0.6 V
7	0.64 V	0.59 V	0.6 V
8	0.64 V	0.61 V	0.6 V
9	0.73 V	0.93 V	0.96 V
10	1 V	0.92 V	0.91 V
11	0.72 V	0.63 V	0.92 V
12	1.83 V	1.84 V	1.8 V
13	0.73 V	0.75 V	0.72 V
14	1.26 V	1.22 V	1.2 V
15	1.26 V	1.23 V	1.1 V
16	1.65 V	1.63 V	1.54 V
17	1.58 V	1.58 V	1.42 V
18	4.89 V	4.8 V	4.8 V
19	0.002 V	0.003 V	0.003 V
20	1.75 V	1.63 V	1.5 V
21	1.7 V	1.7 V	1.5 V
22	1.78 V	1.71 V	1.5 V
23	1.73 V	1.6 V	1.41 V
24	0.002 V	0.003 V	0.003 V
IC751			
1	5.1 V	5.1 V	5.08 V
2	1.5 V	1.5 V	1.51 V
3	1.5 V	1.5 V	1.5 V
4	0.002 V	0.003 V	0.003 V
5	2.5 V	2.46 V	2.46 V
6	2.44 V	2. 44 V	2.43 V
7	1.84 V	1.89 V	2.06 V

MODE / PIN NO.	EE	PB	REC
8	1.86 V	0.004 V	0.004 V
9	1.86 V	0.004 V	0.004 V
10	0.002 V	0.003 V	0.003 V
11	5.12 V	5.12 V	5.11 V
12	4.8 V	4.8 V	4.8 V
13	4.7 V	4.75 V	4.7 V
14	1.75V	2.6 V	2.59 V
15	1.77 V	2.6 V	2.6 V
16	1.77 V	5 V	5 V
17	1.75 V	1.5 V	2.06 V
18	1.75 V	1.5 V	2 V
19	5 V	5 V	5 V
20	0.003 V	0.003 V	0.003 V
21	1.88 V	1.58 V	2 V
22	5.1 V	5.1 V	5.11 V
23	0.002 V	0.005 V	0.004 V
24	0.002 V	0.005 V	0.005 V
25	0.002 V	0.003 V	0.003 V
26	0.05 V	0.051 V	0.051 V
27	0.05 V	0.05 V	0.05 V
28	0.002 V	0.003 V	0.005 V
29	0.002 V	0.003 V	0.003 V
30	2.78 V	2.77 V	2.76 V
31	2.78 V	1.9 V	2.76 V
32	0.002 V	0.003 V	0.005 V
33	5.1 V	5.09 V	5.08 V
34	4.06 V	4.08 V	4.06 V
35	0.003 V	0.003 V	0.003 V
36	2.77 V	2.76 V	2.76 V
37	0.002 V	0.002 V	0.002 V
38	0.002 V	0.003 V	0.002 V
39	0.002 V	0.003 V	0.002 V
40	2.76 V	2.75 V	2.75 V
41	2.76 V	2.75 V	2.75 V
42	2.59 V	2.59 V	2.6 V
43	2.35 V	2.35 V	2.35 V
44	0.003 V	0.003 V	0.003 V
IC501			
1	0.002 V	0.002 V	0.002 V
2	2.56 V	2.55 V	2.55 V
3	2.56 V	2.55 V	2.9 V
4	2.56 V	2.55 V	2 V
5	2.56 V	2.55 V	2.55 V
6	2.56 V	2.56 V	2.55 V
7	2.64 V	2.63 V	2.6 V
8	2.54 V	2.53 V	2.52 V
9	0.064 V	2.27 V	2.26 V
10	5.13 V	5.12 V	5.11 V
11	1.69 V	1.68 V	1.66 V
12	1.7 V	1.7 V	1.67 V
13	2.32 V	2 V	2.3 V
14	0.48 V	0.08 V	0.53 V
15	1.28 V	1.29 V	1.36 V
16	1.84 V	1.83 V	1,8 V
17	2.32 V	3 V	2.26 V

MODE / PIN NO.	EE	PB	REC
18	4.7 V	4,7 V	4.6 V
19	2.19 V	3 V	2.13 V
20	0.01 V	0.009 V	0.01 V
21	2.2 V	2.2 V	2.16 V
22	2.32 V	2.3 V	2.26 V
23	0.01 V	0.009 V	0.01 V
24	0.3 V	2.84 V	0.012 V
25	0.08 V	3.4 V	0.068 V
26	5.14 V	5.13 V	5.12 V
27	4.2 V	4.16 v	3.93 V
28	5.13 V	5.13 V	5.11 V
29	5.13 V	5.13 V	5.11 V
30	0.004 V	0.002 V	0.003 V
31	0.002 V	0.002 V	0.002 V
32	0.002 V	0.002 V	0.002 V
33	0.18 V	0.18 V	0.18 V
34	1.37 V	1.3 V	1.42 V
35	5.14 V	5.13 V	5.1 V
36	5.14 V	5.13 V	5.1 V
37	4.74 V	4.73 V	4.7 V
38	4.74 V	4.75 V	4.7 V
39	2.45 V	4.9 V	2.33V
40	5 V	0.003 V	4.96 V
41	2.28 V	1.55 V	1.42 V
42	0.003 V	0.003 V	0.004 V
43	4.76 V	4.75 V	4.73 V
44	0.003 V	0.003 V	0.004 V
45	(-)0.001 V	(-)0.001 V	(-)0.001 V
46	0.003 V	0.003 V	0.004 V
47	0.003 V	0.003 V	5 V
48	0.003 V	0.003 V	0.004 V
49	5.14 V	0~5 V	0.005~5 V
50	5.1 V	0.003 V	0.004 V
51	4.38 V	0.03 V	0.035 V
52	0.031 V	5.06 V	0.038 V
53	0.003 V	0.003 V	0.004 V
54	5.1 V	5 V	5 V
55	5.1 V	5.13 V	5.11 V
56	5.1 V	5,1 V	5.1 V
57	0.002 V	0.002 V	0.002 V
58	0.003 V	0.004 V	0.004 V
59	4.8 V	4.8 V	4.8 V
60	4.7 V	4.7 V	4.9 V
61	4.7 V	5 V	5 V
62	5 V	5 V	5 V
63	1.8 V	1.3 V	1.68 V
64	5.1 V	5 V	5 V
65	1.78 V	5.1 V	1.66 V
66	5.1 V	5.1 V	5.08 V
67	0.004 V	4.4 V	5.08 V
68	0.001 V	5.1 V	0.005 V
69	0.001 V	5.1 V	5.12 V
70	5.14 V	5.1 V	5.12 V
71	5.14 V	0.001 V	0.001 V
72	0.028 V	0.028 V	0.029 V

MODE / PIN NO.	EE	PB	REC
73	5 V	5.1 V	5.04 V
74	0.001 V	0.001 V	0.002 V
75	1.5 V	1.93 V	1.48 V
76	1.7 V	2.02 V	1.44 V
77	5.1 V	5.1 V	5.08 V
78	2.5 V	2.51 V	2.52 V
79	0.001 V	0.002 V	0.002 V
80	2.53 V	2.5 V	2.5 V
81	3.2 V	3.2 V	3.19 V
82	5.12 V	5.1 V	5.1 V
83	0.172 V	2.68 V	2.55 V
84	0.004 V	2.4 V	2.69 V
85	0.019 V	3.4 V	3.44 V
86	2.55 V	2.55 V	2.56 V
87	5.11 V	3.1 V	2.29 V
88	5.11 V	4.95 V	4.9 V
89	5.11 V	4.97 V	4.9 V
90	5.11 V	5 V	4.98 V
91	5.11 V	5.1 V	5.09 V
92	5.12 V	0.008~0.05 V	0.006 V
93	0.005 V	0.005 V	0.006 V
94	0.005 V	0.005 V	0.013 V
95	4.38 V	0.05 V	0.012 V
96	0.005 V	0.005 V	0.006 V
97	5.11 V	5.1 V	5.09 V
98	0.005 V	5.3 V	0.006 V
99	5.11 V	2.55 V	2.52 V
100	0.005 V	0.005 V	0.006 V
101	1.51 V	2.6 V	1.31 V
102	0.005 V	0.006 V	0.006 V
103	0.099 V	1.36 V	1.38 V
104	0.099 V	1.36 V	1.36 V
105	5.11 V	2.55 V	2.53 V
106	0.005 V	2.54 V	2.53 V
107	0.005 V	2.75 V	2.75 V
108	0.005 V	2.81 V	2.79 V
109	0.049 V	50.6 V	0.05 V
110	0.002 V	0.002 V	0.002 V
111	0.48 V	0.6 V	0.55 V
112	5.12 V	5.11 V	5.1 V
IC801			
1	3.8 V	3.81 V	3.82 V
2	3.8 V	3.82 V	3.82 V
3	3.8 V	3.82 V	3.82 V
4	3.8 V	3.82 V	3.82 V
5	3.8 V	3.82 V	3.82 V
6	3.8 V	3.82 V	3.82 V
7	3.8 V	3.82 V	3.82 V
8	3.8 V	3.82 V	3.82 V
9	3.8 V	3.82 V	3.82 V
10	3.8 V	3.82 V	3.82 V
11	3.8 V	3.82 V	3.82 V
12	0.054 V	~	0.048 V
13	3.87 V	3.8 V	3.99 V
14	0.008 V	0.003 V	0.011 V

MODE / PIN NO.	EE	PB	REC
15	0.008 V	0.006 V	0.01 V
16	6 V	6.07 V	6.07 V
17	6 V	6.07 V	6.08 V
18	7 V	6.07 V	0.11 V
19	6 V	6.06 V	0.028V
20	6 V	6.07 V	6.07 V
21	4.58 V	4.57 V	5.9 V
22	3.82 V	3.82 V	3.82 V
23	3.86 V	3.84 V	3.86 V
24	3.87 V	3.84 V	3.87 V
25	3.87 V	3.9 V	3.87 V
26	0.76 V	0.003 V	0.76 V
27	0.001 V	0.003 V	0.005 V
28	3.84 V	3.83 V	3.83 V
29	3.86 V	3.86 V	3.86 V
30	0.77 V	0.76V	0.76 V
31	3.87 V	3.87 V	3.86 V
32	3.86 V	3.87 V	3.87 V
33	3.86 V	3.86 V	3.86 V
34	11.84 V	11.76 V	11.77 V
35	0.64 V	0.44 V	4.3 V
36	0.64 V	0.62 V	4.3 V
37	0.64 V	0.63 V	4.28 V
38	0.005 V	0.008 V	4.32 V
39	0.002 V	0.005 V	0.006 V
40	5 V	5.07 V	5.05 V
41	0.005 V	0.92 V	0.92 V
42	4.7 V	4.7 V	4.7 V
43	4.8 V	4.8 V	4.8 V
44	0.078 V	3.3 V	0.068 V
IC802			
1	3 V	2.93 V	3.05 V
2	11.8 V	11.76 V	11.76 V
3	2.74 V	2.74 V	2.74 V
4	11.8 V	11.75 V	11.76 V
5	2.74 V	2.75 V	2.75 V
6	5.5V	5.5 V	5.5 V
7	5.6 V	5.56 V	5.57 V
8	5.5 V	5.5 V	5.49 V
9	5 V	0.006 V	4.97 V
10	5.5 V	5.5 V	5.5 V
11	11.23 V	11.15 V	11.16 V
12	5.5 V	5.5 V	5.5 V
13	0.008 V	0.01 V	0.009 V
14	5.54 V	5.5 V	5.5 V
15	0.008 V	0.009 V	0.009 V
16	5.5 V	5.5 V	5.51 V
17	0.002 V	0.003 V	0.005 V
18	0.002 V	0.005 V	0.004 V
19	(-)0.001 V	0.001 V	0.001 V
20	5.5 V	5.5 V	5.51 V
21	5.6 V	5.59 V	5.59 V
22	5.6 V	5.59 V	5.59 V
23	5.6 V	5.51 V	5.52 V
24	5.54 V	5.5 V	5.5 V

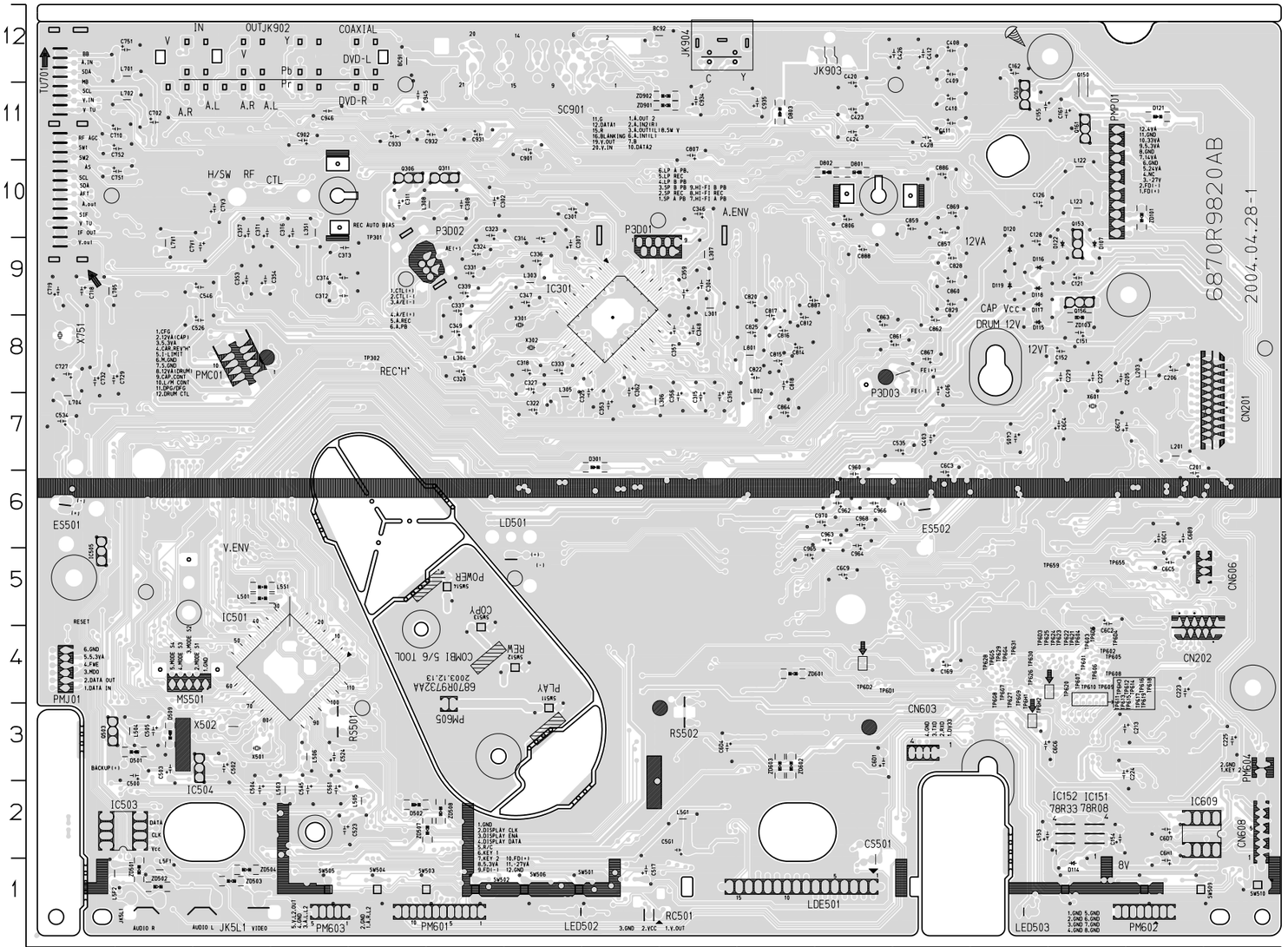
MODE / PIN NO.	EE	PB	REC
25	5.6 V	5.58 V	5.59 V
26	5.6 V	5.58 V	5.59 V
27	5.54 V	5.5 V	5.5 V
28	4.16 V	4.32 V	4.51 V
29	1.46 V	1.46 V	1.46 V
30	2.1 V	1.99 V	2.07 V
31	1.35 V	1.35 V	1.35 V
32	4.7 V	4.7 V	4.7 V
33	4.8 V	4.8 V	4.8 V
34	(-) 0.002 V	0.001 V	0.000 V

PIN	EE	PB	REC
Q301			
BASE	0.01 V	0.013 V	0.79 V
EMITER	0.003 V	0.004 V	0.005 V
COLECTOR	4.83 V	4.82 V	1.02 V
Q302			
BASE	4.85 V	4.18 V	4.75 V
EMITER	0.002 V	4.85 V	4.75 V
COLECTOR	(-)2.79 V	4.8 V	(-)25.5 V
Q303			
BASE	(-)2.76 V	0.7 V	(-)25.6 V
EMITER	(-)0.8 V	0.007 V	(-)19.13 V
COLECTOR	0.002 V	0.012 V	0.004 V
Q304			
BASE	(-)2.62 V	0.72 V	(-)25.4 V
EMITER	0.002 V	0.002 V	(-)19.4 V
COLECTOR	0.002 V	0.004 V	0.004 V
Q305			
BASE	1.71 V	1.41 V	1.7 V
EMITER	2.41 V	2.1 V	2.39 V
COLECTOR	0.003 V	0.004 V	0.005 V
Q309			
BASE	2.18 V	2.01 V	2.33 V
EMITER	2.87 V	2.7 V	3 V
COLECTOR	0.012 V	0.005 V	0.012 V
Q501			
BASE	0.69 V	0.69 V	0.69 V
EMITER	0.002 V	0.003 V	0.003 V
COLECTOR	0.02 V	0.012 V	0.023 V
Q502			
BASE	0.31 V	0.38 V	0.33 V
EMITER	0.004 V	0.004 V	0.004 V
COLECTOR	2.65 V	1.93 V	2.4 V
Q504			
BASE	0.59 V	0.51 V	0.50 V
EMITER	0.03 V	0.03 V	0.03 V
COLECTOR	3.78 V	3.75 V	3.71 V
Q5S1			
BASE	0.006 V	0.005 V	0.003 V
EMITER	1.77 V	1.8 V	1.89 V
COLECTOR	2.41 V	2.1 V	2.4 V
Q515			
BASE	4.94 V	0.5~4.3 V	0.4~4.9 V
EMITER	0.002 V	0.003 V	0.005 V
COLECTOR	0.02 V	0.2~3.5 V	0.4~4.9 V
Q514			
BASE	4.96 V	0.8~4.2 V	0.2~4.3 V
EMITER	0.002 V	0.002 V	0.003 V
COLECTOR	0.02 V	0.01~4.8V	0.011 V
Q7S1			
BASE	0.007 V	0.007 V	0.008 V
EMITER	0.001 V	0.001 V	0.001 V
COLECTOR	3.7 V	3.5 V	0.057 V
Q801			
BASE	0.7 V	(-)0.1 V	0.01 V
EMITER	0.001 V	0.003 V	0.001 V

PIN	EE	PB	REC
COLECTOR	0.004 V	~	0.006 V
Q802			
BASE	0.7 V	(-)0.12 V	0.7 V
EMITER	0.001 V	0.001 V	0.001 V
COLECTOR	0.004 V	0.02 V	0.005 V
Q804			
BASE	1.81 V	2.5 V	1.79 V
EMITER	2.5 V	3.20V	2.48 V
COLECTOR	0.002 V	0 V	0 V
Q901			
BASE	0.005 V	0.005 V	0.006 V
EMITER	0.003 V	2.04 V	1.9 V
COLECTOR	0.003 V	0.004 V	0.005 V
Q902			
BASE	(-)1.64 V	(-)1.69 V	(-)1.79 V
EMITER	0.003 V	0.004 V	0.004 V
COLECTOR	0.004 V	0.004 V	0.005 V
Q903			
BASE	(-)1.74 V	(-)1.63 V	(-)1.8 V
EMITER	0.003 V	0.003 V	0.005 V
COLECTOR	0.003 V	0.004 V	0.005 V

PRINTED CIRCUIT DIAGRAMS

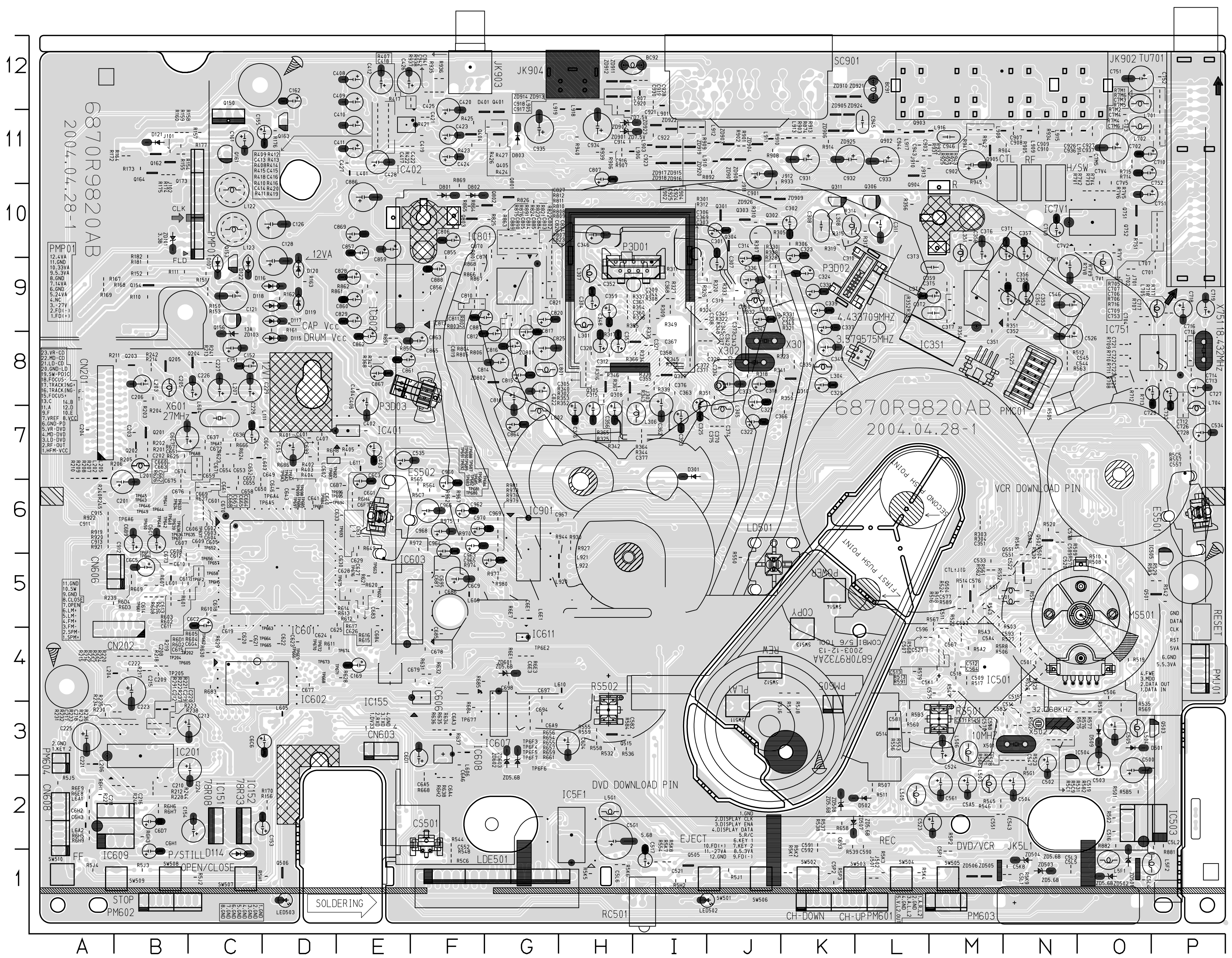
1. MAIN P.C.BOARD (VCR+DVD)_SOLDER SIDE



LOCATION GUIDE

H/SW±TP	C10
IC301	H8
IC501	D4
PIN0098	D4
REC±TP	C6
RF±TP	C10
SLIT1	K4
SLIT2	N4
SLIT3	M3
TP203	O4
TP601	N4
TP602	N4
TP603	N4
TP604	N4
TP605	N4
TP606	N4
TP607	N4
TP608	N4
TP609	N4
TP610	N4
TP611	N3
TP612	N4
TP613	N3
TP614	N4
TP615	N3
TP616	N4
TP617	N3
TP618	N4
TP619	N3
TP620	N4
TP621	N4
TP622	N4
TP623	N4
TP624	N4
TP625	N4
TP626	M4
TP627	M4
TP628	M4
TP629	M4
TP630	M4
TP631	M4
TP653	O6
TP654	O5
TP655	O5
TP659	N5
TP6D1	K4
TP6D2	K4
TP6D3	M4
TP6D4	N4
TP6D5	N4
TP6G4	M4
TP6G5	M4
TP6G7	M4
TP6G8	M4
TP6G9	M4
TP6H1	M4
TP6H2	M4
TP6H3	N4

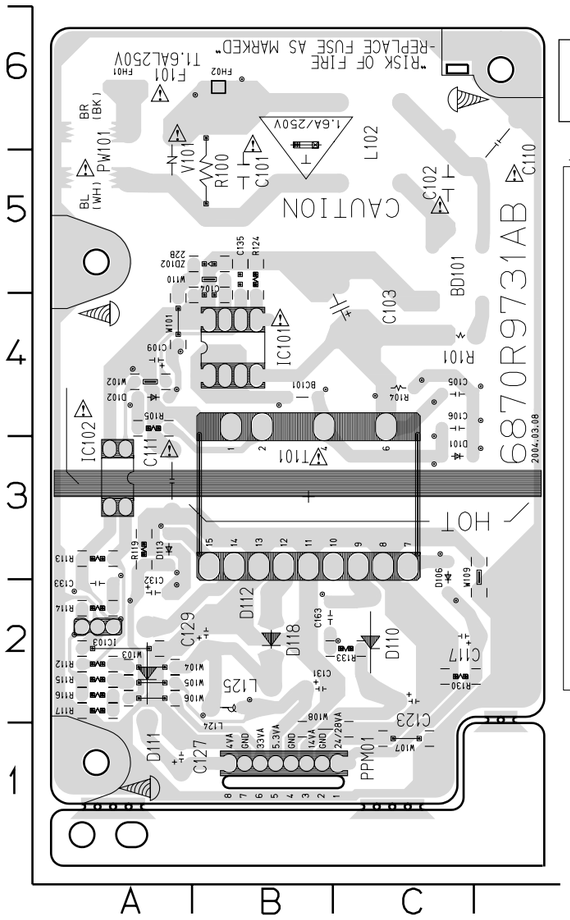
2. MAIN P.C.BOARD (VCR+DVD)_COMPONENT SIDE



LOCATION GUIDE

BC91	L12	C343	J8	C505	O3	C615	C5	C6E1	G5	C864	G7	D501	O3	L610	H4	PIN0073	I7	PIN0374	M4	Q309	I8	R230	A3	R3S2	M9	R560	L3	R628	E4	R810	G9	SW502	K1	TP6A1	D6
BC92	I12	C344	I9	C506	O4	C617	B5	C6E3	G4	C865	F8	D502	L2	L611	E7	PIN0076	E12	PIN0375	L4	Q310	K8	R231	A3	R3S3	M9	R561	M5	R629	C4	R811	G9	SW503	K1	TP6A2	D6
C121	C9	C345	I9	C507	L4	C618	C5	C6F7	E6	C867	E8	D509	O3	L6A1	A2	PIN0077	E12	PIN0502	P9	Q311	K10	R232	A3	R3S4	M8	R562	M5	R630	C4	R812	G10	SW504	L1	TP6A3	D6
C126	D10	C346	H10	C508	N3	C619	C5	C6G1	E6	C869	E10	D801	F10	L6A2	A2	PIN0078	E11	PIN0503	P9	Q401	G11	R233	B3	R401	D7	R563	N8	R631	F4	R821	G10	SW505	M1	TP6A4	D6
C128	D9	C347	J9	C509	M4	C620	C4	C6G4	C5	C870	G10	D802	F10	L6E1	G5	PIN0079	E11	PIN0526	F9	Q404	F11	R234	B3	R402	D7	R564	F6	R632	F4	R822	G10	SW506	J1	TP6A5	D6
C151	C8	C348	H8	C511	M4	C621	C4	C6H1	B1	C871	G10	D803	G11	L701	O12	PIN0080	E11	PIN0527	G9	Q405	G11	R235	B3	R403	D7	R565	F6	R634	F3	R823	G10	SW507	C1	TP6A6	B6
C152	C8	C349	K8	C512	M4	C622	D4	C6H2	A2	C884	G10	ES501	P7	L702	O11	PIN0081	E11	PIN0528	G9	Q501	P5	R236	B3	R404	D7	R566	M3	R635	F3	R824	G10	SW508	B1	TP6A7	C7
C153	D2	C350	J9	C513	M4	C623	D4	C6H3	A2	C885	G10	ES502	E5	L704	P7	PIN0082	E11	PIN0529	G9	Q502	N6	R237	B3	R405	E7	R567	M5	R636	F3	R825	G10	SW509	B1	TP6A8	C7
C154	C2	C351	M6	C514	N3	C624	D4	C701	P9	C886	E10	IC151	C2	L705	P9	PIN0083	E11	PIN0533	G10	Q503	P3	R238	B3	R407	F12	R568	M4	R637	F3	R826	G10	SW510	A1	TP6B1	D6
C155	D11	C352	H9	C515	N3	C625	E5	C702	O11	C887	G9	IC152	C2	L707	P9	PIN0084	E12	PIN0546	E8	Q504	M5	R239	A5	R408	E11	R569	O3	R638	F2	R850	E8	SW511	J3	TP6B2	E6
C161	C11	C353	I7	C516	O2	C626	E5	C703	O11	C888	F9	IC155	E4	L7V1	O9	PIN0085	E12	PIN0547	E8	Q505	I1	R240	A6	R409	E12	R570	N5	R649	E6	R851	E8	SW512	J4	TP6B3	D6
C162	D12	C355	I8	C517	I1	C627	E5	C704	O9	C889	G10	IC201	B3	L801	G8	PIN0087	M4	PIN0548	B11	Q506	D1	R241	C8	R410	E11	R575	N3	R654	G3	R861	E9	SW513	K4	TP6B4	D6
C169	E4	C356	H7	C518	M4	C628	E5	C706	P10	C890	G10	IC3S1	M9	L802	G7	PIN0090	M4	PIN0552	I11	Q514	L3	R242	B8	R411	E11	R576	O3	R655	G3	R862	E9	SW514	K5	TP6B5	D6
C201	B6	C357	H8	C519	N3	C629	E5	C707	P10	C901	J11	IC401	E7	L901	I12	PIN0091	M4	PIN0553	I11	Q515	H3	R243	B3	R412	E12	R577	O3	R656	G4	R863	G10	TP202	B4	TP6B6	D6
C202	B7	C358	I8	C520	N5	C630	E6	C709	P10	C902	M11	IC402	E11	L902	I11	PIN0092	N5	PIN0556	J11	Q5S1	N5	R244	B2	R413	E11	R578	O3	R657	G3	R864	F10	TP204	B4	TP6E2	G4
C203	B7	C359	H9	C521	I1	C631	E6	C710	O11	C903	M11	IC503	P2	L903	I11	PIN0094	M3	PIN0560	N5	Q7S1	O10	R245	A6	R414	E11	R579	L4	R658	K2	R865	F10	TP205	B4	TP6E9	D4
C204	A7	C360	H9	C522	N5	C633	E6	C712	P8	C907	N11	IC504	N3	L904	I11	PIN0095	N8	PIN0561	O10	Q7S2	O10	R246	B2	R415	E11	R582	N3	R659	G3	R866	F9	TP301	L9	TP6F1	B5
C205	C8	C361	H9	C523	M2	C636	C7	C713	P8	C908	N11	IC505	P5	L905	H11	PIN0096	M2	PIN0562	B9	Q801	G10	R291	B3	R416	E11	R583	P5	R661	G3	R867	F9	TP302	L8	TP6F2	C5
C206	B8	C362	I8	C524	M3	C637	C7	C714	P8	C909	N11	IC5F1	H2	L906	H11	PIN0097	M4	PIN0563	B9	Q802	G10	R301	I9	R417	E12	R589	M5	R666	C7	R868	F9	TP633	C6	TP6F3	G3
C208	B4	C363	I8	C525	N8	C640	D6	C715	P8	C910	N11	IC601	D5	L907	I12	PIN0099	M5	PIN0564	B11	Q803	F10	R302	H8	R418	E11	R591	M4	R668	F2	R869	F10	TP634	B6	TP6F4	G3
C209	B4	C366	K7	C526	N8	C641	D6	C716	P8	C911	A6	IC602	C4	L908	N11	PIN0101	M5	PIN0565	B11	Q902	L11	R303	M6	R419	E11	R5A2	M4	R671	C7	R874	K11	TP635	C6	TP6F5	G3
C210	B2	C367	I9	C527	M4	C643	D6	C717	O9	C912	B6	IC603	E5	L909	N11	PIN0102	N6	PIN0566	B11	Q903	L11	R304	M6	R420	E11	R5A3	M4	R683	C4	R875	G10	TP636	B6	TP6F6	G3
C211	B2	C368	I9	C533	M5	C646	D6	C718	P9	C913	A6	IC606	F4	L910	J11	PIN0103	L3	PIN0573	J10	Q904	L11	R305	J10	R421	F11	R5A5	N5	R684	F3	R876	G10	TP637	C6	TP6F7	G3
C212	B3	C369	I9	C534	P7	C649	C6	C719	P9	C914	H11	IC607	G3	L911	J11	PIN0106	N6	PIN0574	J10	Q905	M11	R306	K10	R422	E11	R5B3	L3	R685	F4	R881	P2	TP638	B6	TP6G2	E5
C213	C3	C370	J7	C535	E7	C650	C6	C720	O8	C915	A6	IC608	F3	L912	J11	PIN0123	K2	PIN0575	J10	R110	B9	R307	J10	R423	F11	R5B4	H3	R686	D7	R882	O2	TP639	B6	TP6G3	E5
C215	B4	C371	I8	C543	N2	C651	C7	C721	O8	C916	H11	IC609	A2	L913	K11	PIN0133	O9	PIN0576	J10	R111	B9	R308	I9	R424	G11	R5B5	O2	R6D1	C5	R891	G10	TP640	B6	TP6H4	B5
C216	B2	C372	I8	C544	N8	C652	C7	C722	O8	C917	H11	IC611	G4	L914	O11	PIN0134	P8	PIN0579	H8	R150	C9	R309	I9	R425	F11	R5C1	N3	R6D2	C5	R892	J11	TP641	B6	TP6H5	C5
C217	B3	C373	J9	C545	N8	C653	C7	C723	O8	C918	H12	IC751	P8	L915	N11	PIN0135	P8	PIN0580	I8	R151	C9	R310	J10	R426	G11	R5C5	P7	R6D3	B5	R901	J11	TP642	B6	TU701	P12
C218	B3	C374	J7	C546	N9	C654	C7	C726	P8	C919	I12	IC7V1	O10	L916	M11	PIN0136	O8	PIN0581	K8	R152	B9	R311	I9	R427	G11	R5C6	F1	R6D4	B5	R902	J11	TP643	B6	X301	J8
C219	B3	C375	J7	C547	N3	C655	C6	C727	P8	C920	I12	IC801	G9	L917	L11	PIN0137	O7	PIN0582	G11	R153	C9	R312	I9	R501	O2	R5C7	F6	R6E1	G4	R903	K11	TP644	B6	X302	J8
C220	B3	C376	I8	C551	M2	C657	C7	C728	P7	C921	I12	IC802	E9	L918	H11	PIN0140	G10	PIN0583	L11	R154	B11	R313	L10	R502	O2	R5C9	N3	R6E3	G4	R904	N11	TP645	B6	X501	N3
C221	A3	C377	I7	C552	F1	C658	C6	C729	P8	C922	I11	IC901	G6	L919	H11	PIN0142	G10	PIN0584	L11	R155	B11	R314	L10	R503	M5	R5G1	N3	R6E7	G5	R905	N11	TP646	B6	X502	N3
C222	B4	C3S1	M8	C557	P7	C659	C7	C732	P8	C923	I11	J101	B11	L920	H5	PIN0144	G10	PIN0586	G11	R156	D2	R315	K10	R504	N5	R5G2	N3	R6E8	A2	R906	H11	TP647	A6	X601	C7
C223	B4	C3S2	N9	C561	M2	C660	C7	C751	O12	C924	I11	J102	B11	L921	H5	PIN0145	G10	PIN0587	P5	R157	C11	R316	H8	R505	N8	R5H1	D1	R6E9	A2	R907	H11	TP648	B6	X751	P8
C224	C3	C3S3	N9	C564	M4	C661	C6	C752	P12	C925	I11	J303	I8	L922	H5	PIN0146	F9	PIN0588	O5	R158	B11	R317	H9	R506	N4	R5H2	I1	R6H1	A2	R908	J11	TP649	B6	ZD101	B10
C225	A3	C3S4	N9	C567	M4	C662	C7	C7M3	P12	C926	N11	J501	L1	LC602	D7	PIN0147	F9	PIN0590	I1	R159	B11	R318	J8	R507	L2	R5J1	J1	R6H2	F2	R909	J11	TP650	B6	ZD103	C8
C226	C8	C3S5	N9	C570	N3	C663	C7	C7M4	P11	C927	O11	J502	L1	LD501	J5	PIN0149	F9	PIN0591	D1	R160	B11	R319	K10	R508	O5	R5J2	C1	R6H3	B2	R910	K11	TP651	B6	ZD501	O1
C227	C8	C3S6	N9	C571	M3	C664	C6	C7M5	O11	C928	I12	J701	O9	LDE501	F1	PIN0150	G9	PIN0592	L3	R161	D9	R320	J9	R509	N6	R5J3	B1	R6H4	E6	R913	K11	TP652	C6	ZD502	O1
C228	C7	C3S7	N10	C575	M4	C665	C6	C7M6	P11	C930	I12	J702	O9	LED502	J1	PIN0151	H9	PIN0595	G10	R162	D9	R321	J9	R510	O5	R5J4	A1	R6H5	A2	R914	K11	TP656	C5	ZD503	N1
C229	C8	C3S8	M10	C576	M5	C667	C6	C7S1	O10	C931	K11	J910	L11	LED503	D1	PIN0152	H9	PIN0596	F10	R163	D9	R322	J9	R511	L2	R5J5	A2	R6H6	B2	R919	A6	TP657	C5	ZD504	N1
C301	J10	C3S9	M9	C577	M5	C668	C6	C7S2	O11	C932	K11	J911	J11	MS501	O4	PIN0153	F9	PIN0597	F10	R164	B11	R323	K8	R512	N8	R5J6	K4	R6H7	B2	R920	A6	TP658	C5	ZD505	M1
C302	K10	C3T1	N10	C578	N6	C669	C6	C7S3	P10	C933	L11	J912	J11	P3D01	I9	PIN0154	F9	PIN0598	K10	R167	A9	R324	J9	R513	M4	R5J7	K4	R6H8	D7	R921	A6	TP660	B5	ZD506	M1
C303	J9	C3T2	M9	C581	L3	C670	C6	C7V1	N9	C934	H11	J913	M11	P3D02	K9	PIN0155	E9	PIN0604	N3	R168	A9	R325	H8	R514	M5	R5J8	K4	R6H9	A2	R922	A6	TP661	B5	ZD507	K2
C304	H9	C3T3	M9	C582	H3	C671	C7	C7V2	N10	C935	G11	JK5L1	N1	P3D03	E8	PIN0156	E9	PIN0617	G8	R169	A9	R326	I9	R515	N3	R5K1	K1	R705	P10	R923	M11	TP662	C4	ZD508	K2
C305	H8	C3T4	M9	C583	N3	C672	C7	C7V3	N10	C936	N11	JK902	M12	PIN0001	M8	PIN0157	E9	PIN0625	J11	R170	D2	R327	I9	R516	M5	R5K2	K1	R706	P10	R924	M11	TP663	D4	ZD601	G4
C306	I9	C3T5	M9	C589	N6	C673	B5	C7V4	O11	C937	O11	JK903	F12	PIN0002	M9	PIN0158	E9	PIN0632	H12	R172	B11	R328	J9	R517	M4	R5K3	L1	R707	O9	R925	M11	TP664	D4	ZD602	G3
C307	J9	C3T6	M10	C590	L2	C674	B7	C7V5	O11	C941	F12	JK904	H12	PIN0003	M9	PIN0166	G10	PIN0635	H12	R173	B11	R329	J9	R518	M5	R5K4	L1	R708	O8	R927	H6	TP665	D4	ZD603	G3
C308	K10	C3T7	M9	C591	K2	C675	B6	C802	G10	C942	F12	L111	C7	PIN0004	M9	PIN0169	N11	PIN0638	I11	R174	B11	R330	J9	R519	O4	R5K5	H1	R709	O8	R930	H6	TP666	D4	ZD801	G8
C309	I9	C401	D7	C592	K1	C676	B6	C803	G10	C943	L11	L122	C10	PIN0005	N9	PIN0170	N11	PIN0641	I11	R175	B11	R331	J9	R520	N6	R5K6	H1	R710	O8	R931	L11	TP667	F4	ZD802	G8
C310	K10	C402	E7	C593	N4	C677	D4	C804	G10	C944	L11	L123	C10	PIN0006	M9	PIN0171	I12	PIN0644	I11	R176	D11	R332	J9	R521	N3	R5K7	I1	R711	O8	R932	M11	TP668	D4	ZD901	H11
C311	L10	C403	E7	C596	M4	C678	F4	C805	G10	C945	L11	L201	B7	PIN0007	M9	PIN0172	H11	PIN0648	I11	R177	B11	R333	J9	R522	M4	R5K8	I1	R712	O8	R933	J10	TP669	I4	ZD902	H11
C312	H8	C404	E8	C5A3	N5	C679	F4	C806	F10	C946	M11	L202	A7	PIN0008	M9	PIN0173	H11	PM601	K1	R181	B9	R334	I8	R523	N3	R5K9	N1	R713	O8	R934	N11	TP670	D4	ZD903	J11
C314	J9	C405	D7	C5A4	M4	C683	E5	C807	H11	C960	F6	L203	B8	PIN0009	M8	PIN0174	I10	PM602	B1	R182	B10	R335	I8	R524	M5	R5P2	M1	R714	O11	R935	F12	TP671	E4	ZD904	J11
C315	H7	C406	E8	C5A5	M2	C684	E5	C810	F9	C962	F6	L204	B4	PIN0011	N6	PIN0175	I11	PM603	M1	R201	B7	R336	H9	R525	N4	R5P3	K1	R715	O11	R936	F12	TP672	D4	ZD905	K11
C316	H7	C407	D7	C5G1	H2	C685	F4	C811	F9	C963	F6	L205	A7	PIN0013	N1	PIN0176	N11	PM604	A3	R202	B7	R337	H9	R526	N4	R5R8	N4	R716	P10	R937	F12	TP673	D4	ZD906	K11
C317	I8	C408	E12	C5K1	M4	C686	F5	C812	G8	C964	F6	L206	A3	PIN0015	M6	PIN0178	F11	PM605	K3	R203	B8	R338	I8	R527	N4	R5S1	N5	R717	P9	R938	F12	TP674	D4	ZD907	J11
C318	J8	C409	E12	C5K8	N1	C687	F5	C813	F9	C965	G5	L207	C8	PIN0016	O11	PIN0179	G12	PMC01	N8	R204	B8	R339	I8	R528	N3	R5S2	N5	R718	P9	R939	H11	TP675	E5	ZD908	J11
C319	J9	C410	E11	C5L1	N1	C693	K2	C814	G8	C966	F6	L301	H9	PIN0017	O11	PIN0180	F11	PMJ01	P4	R205	B7	R340	H8	R529	P5	R601	B5	R7M1	P12	R940	H11	TP676	E5	ZD909	J10
C320	K8	C411	E11	C5L2	P2	C694	G3	C815	G8	C967	G6	L303	J9	PIN0044	I9	PIN0191	M9	PMP01	C10	R206	A7	R341	K8	R530	N5	R602	B5	R7M2	P11	R941	M11	TP677	F3	ZD910	K12
C321	I8	C412	E12	C5L3	N1	C695	F5	C816	G8	C968	F6	L304	K8	PIN0045	L10	PIN0193	H1	Q150	C11	R207	A7	R342	H8	R531	N3	R603	B5	R7M4	P11	R942	M11	TP678	F3	ZD911	H12
C322	J7	C413	E11	C5L4	O1	C697	G4	C817	G8	C969	G6	L305	J7	PIN0046	H8	PIN0218	O10	Q153	C9	R208	A7	R343	I8	R532	H3	R604	C5	R7M5	P11	R943	M11	TP679	G5	ZD912	H12
C323	K10	C414	E11	C5L5	N1	C698	G4	C818	G8	C970	F6	L306	I7	PIN0047	H8	PIN0219	O10	Q154	B9	R209	A7	R344	I7	R535	O3	R605	C5	R7M6	P12	R944	H6	TP680	E5	ZD913	H12
C324	K9	C415	E11	C5L6	H1	C699	D7	C819	G9	CN201	A7	L307	H9	PIN0048	I8	PIN0222	O10	Q156	C9	R210	A7	R345	I8	R536	H3	R606	B5	R7S1	O10	R945	M11	TP681	E6	ZD914	H12
C325	I7	C416	E11	C5P1	M1	C6A3	F3	C820	G9	CN202	B4	L308	K10	PIN0049	J9	PIN0224	O10	Q161	C11	R211	B8	R346	H8	R537	K2	R607	B5	R7V1	O10	R962	F6	TP682	E6	ZD915	I11
C326	J9	C417	E11	C5P2	K1	C6A4	F2	C821	G9	CN603	E3	L3S1	M10	PIN0050	I9	PIN0226	O10	Q162	B11	R212	B2	R347	E8	R538	K2	R608	B5	R7V2	O10	R967	F6	TP683	E6	ZD916	I11
C327	J8	C418	F12	C5S1	N5	C6A5	F3	C822	G8	CN606	A5	L401	E11	PIN0051	I8	PIN0227	O10	Q163	D11	R213	C8	R348	I9	R539	K2	R609	B5	R7V3	O10	R970	F6	TP684	E6	ZD917	I11
C328	H8	C419	F11	C5S3	M4	C6A6	F3	C823	G9	CN608	A1	L501	N5	PIN0052	J9	PIN0297	I9	Q164	B11	R214	B8	R349	I9	R542	P5	R610	C5	R7V4	O10	R972	F6	TP685	E6	ZD918	I11
C329	J8	C420	F11	C601	C6	C6A9	G3	C824	G9	CS501	F2	L503	M2	PIN0053	I8	PIN0298	I9	Q173	B11	R215	B4	R350	K8	R543	M5	R611	D4	R7V5	O10	R974	F5	TP686	E6	ZD919	I11
C330	J8	C421	F11	C602	C6	C6B7	E6	C825	G8	CTL±JIG	M5	L504	O3	PIN0055	I9	PIN0305	I8	Q201	B7	R216	B4	R351	J8	R544	F2	R612	E5	R7V6	O10	R975	F6	TP687	E6	ZD920	I11
C331	K9	C422	F11	C603	C6	C6B9	B6	C826	G9	D107	C9	L505	L2	PIN0056	J9	PIN0308	I7	Q202	B7	R217	B4	R352	H8	R545	M2	R613	E5	R7V7	O10	R976	G6	TP688	E6	ZD921	L12
C332	J9	C423	F11	C604	C6	C6C1	B6	C827	G10	D114	C1	L506	M3	PIN0057	J9	PIN0313	I9	Q203	B8	R218	B4	R353	H8	R546	M2	R614	E5	R7V8	O10	R977	G5	TP689	E6	ZD922	I11
C333	J8	C424	F11	C605	C6	C6C2	C5	C828	E9	D115	D8	L5F1	O1	PIN0058	J8	PIN0314	I9	Q204	C8	R219	B4	R354	H9	R547	M4	R615	E5	R7V9	O10	R978	G6	TP690	E6	ZD923	I11
C334	J8	C425	F12	C606	C6	C6C3	E6	C829	E9	D116	D9	L5F2	P1	PIN0059	J8	PIN0330	M4	Q205	B8	R220	B4	R355	I9	R548	F1	R616	E5	R801	F9	R979	G6	TP691	E6	ZD924	K11
C335	K8	C426	E12	C607	B6	C6C4	C7	C855	F9	D117	D9	L5G1	H2	PIN0060	J9	PIN0331	M5	Q301	J10	R221	B3	R356	L10	R550	J5	R617	E5	R802	F9	R980	G5	TP692	E6	ZD925	K11
C336	J9	C427	E11	C608	B5	C6C5	B5	C856	F9	D118	D9	L5S1	N5	PIN0061	J9	PIN0334	M5	Q302	J10	R222	B3	R364	I7	R553	L3	R620	E5	R803	F9	R981	G6	TP693	E6	ZD926	J10
C337	K9	C428	E11	C609	C6	C6C6	D3	C857	E10	D119	D9	L601	B5	PIN0063	M6	PIN0338	M5	Q303	J10	R223	B3	R365	H8	R554	I1	R621	E5	R804	G9	RC501	I1	TP694	E6		
C338	I9	C500	O3	C610	C5	C6C7	B7	C859	E10	D120	D9	L603	C7	PIN0065	I8	PIN0339	N4	Q304	J10	R224	B4	R366	I8	R555	H3	R623	C7	R805	G9	RESET	P5	TP695	E6		
C339	K9	C501	N4	C611	B5	C6C9	F5	C860	E9	D121	B11	L604	C7	PIN0067	J7	PIN0345	N4	Q305	H8	R225	B4	R367	H8	R556	L3	R624	C7	R806	G9	RS501	M3	TP696	E6		
C340	J9	C502	N3	C612	B5	C6D1	F3	C861	E8	D122	C9	L605	D3	PIN0068	I9	PIN0357	N4	Q306	L10	R226	B4	R368	E8	R557	P7	R625	B7	R807	G9	RS502	H3	TP697	D6		
C341	J9	C503	O3	C613	B5	C6D4	H3	C862	E8	D301	I7	L606	F3	PIN0069	I9	PIN0358	N3	Q307	I8	R227	A2	R375	I8	R558	H3	R626	C7	R808	G9	SC901	K12	TP698	D6		
C342	I8	C504	N2	C614	B5	C6D7	B2	C863	F8	D401	G11	L609	F5	PIN0070	J7	PIN0373	L4	Q308	H8	R228	B2	R3S1	N9	R559	H3	R627	C6	R809	G9	SW501	J1	TP699	D6		

3. SMPS P.C.BOARD



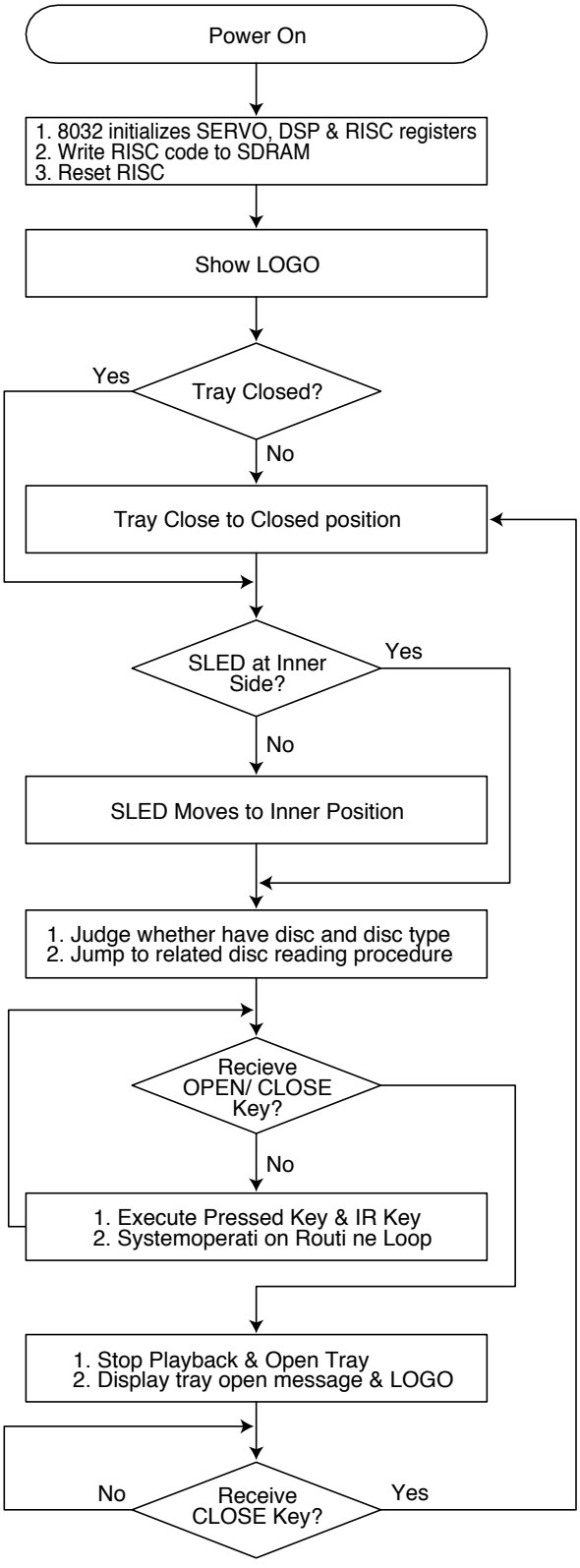
NOTES) ⚠ Warning
Parts that are shaded are critical
With respect to risk of fire or
electricial shock.

LOCATION GUIDE

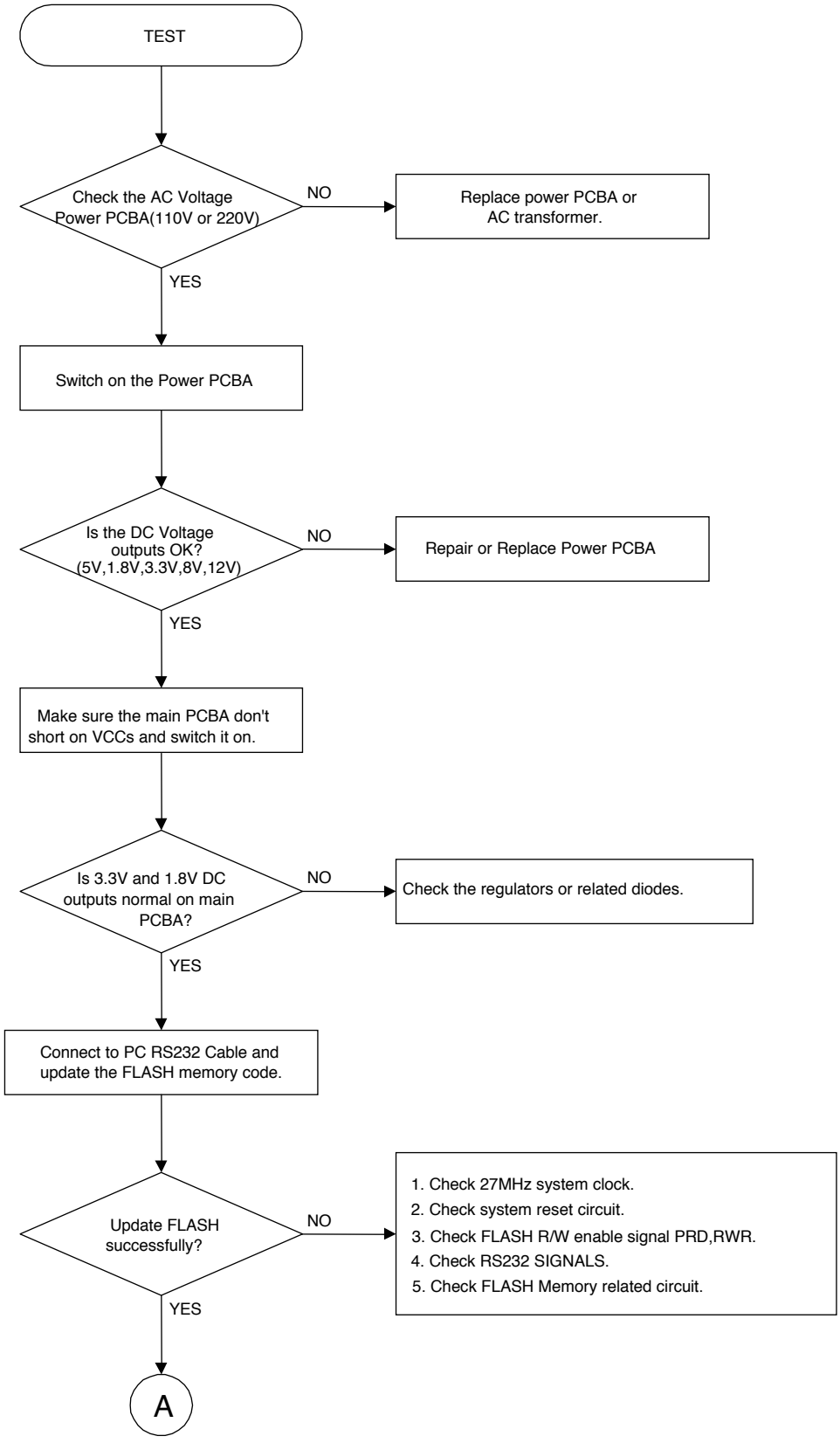
BC101	B4	FH01	A6
BD101	C5	FH02	B6
C101	B5	IC101	B4
C102	C5	IC102	A3
C103	C4	IC103	A2
C104	B4	L102	C6
C105	C4	L124	B2
C106	C4	L125	B2
C109	A4	PPM01	C1
C110	D6	PW101	A5
C111	A3	R100	B5
C117	C2	R101	C4
C123	C2	R104	C4
C127	A1	R105	A4
C129	B2	R112	A2
C131	B2	R113	A3
C132	A2	R114	A2
C133	A2	R115	A2
C135	B5	R116	A2
C163	B2	R117	A2
D101	C3	R119	A3
D102	A4	R124	B5
D106	C3	R130	C2
D110	C2	R133	C2
D111	A2	T101	B3
D112	B2	V101	A5
D113	A3	ZD102	B5
D118	B2		

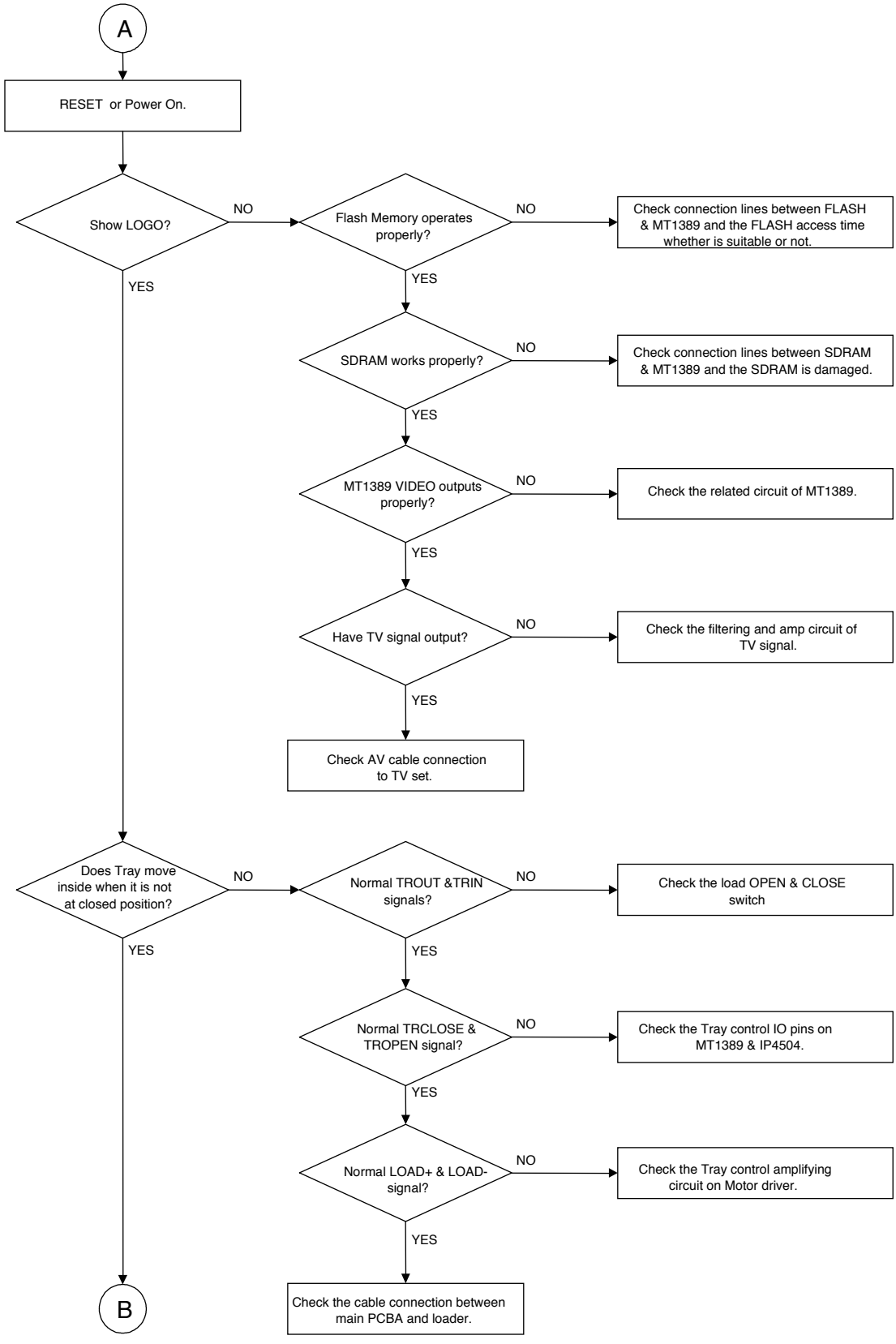
DVD PART
ELECTRICAL TROUBLESHOOTING GUIDE

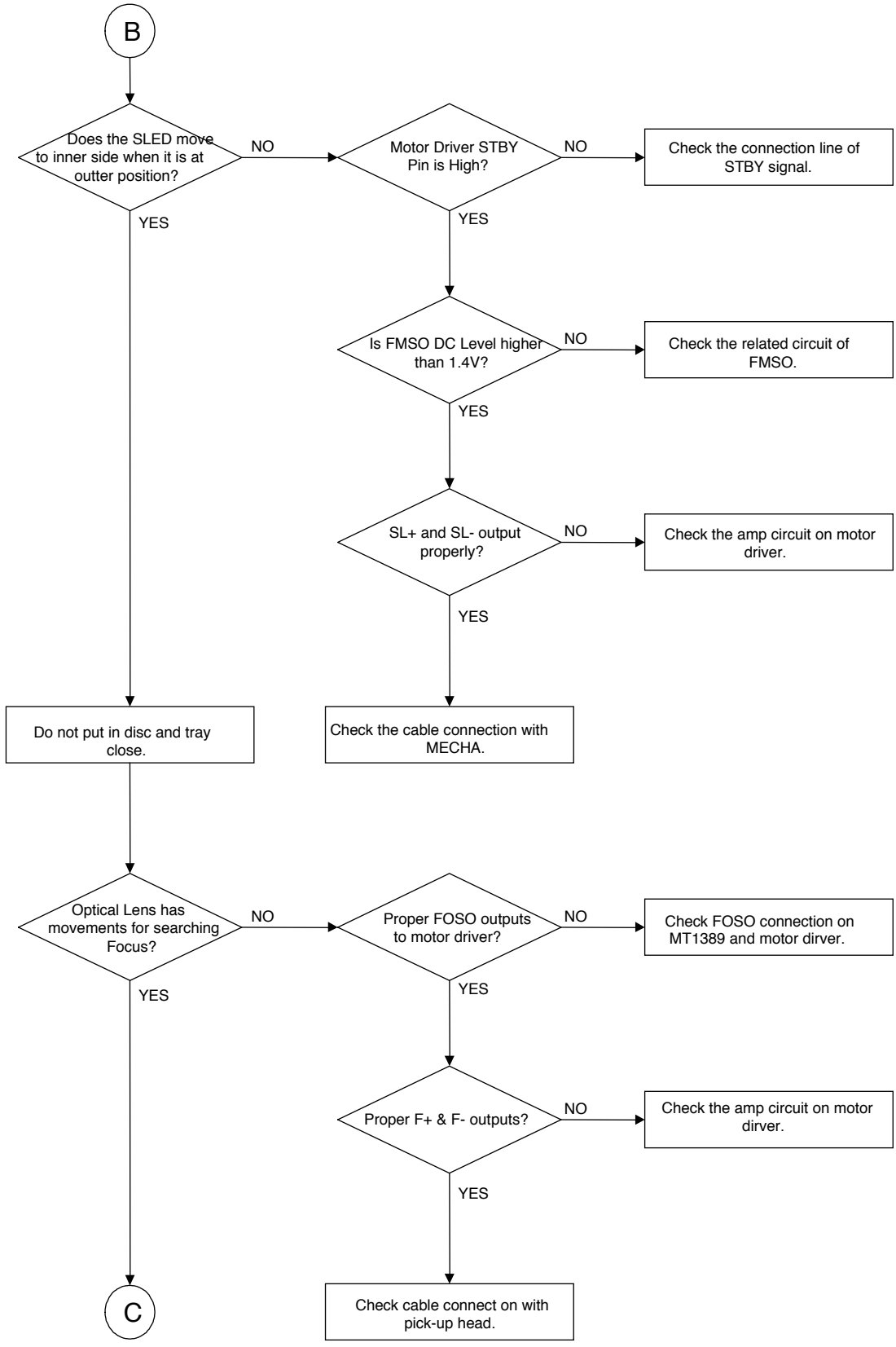
1. System operation flow

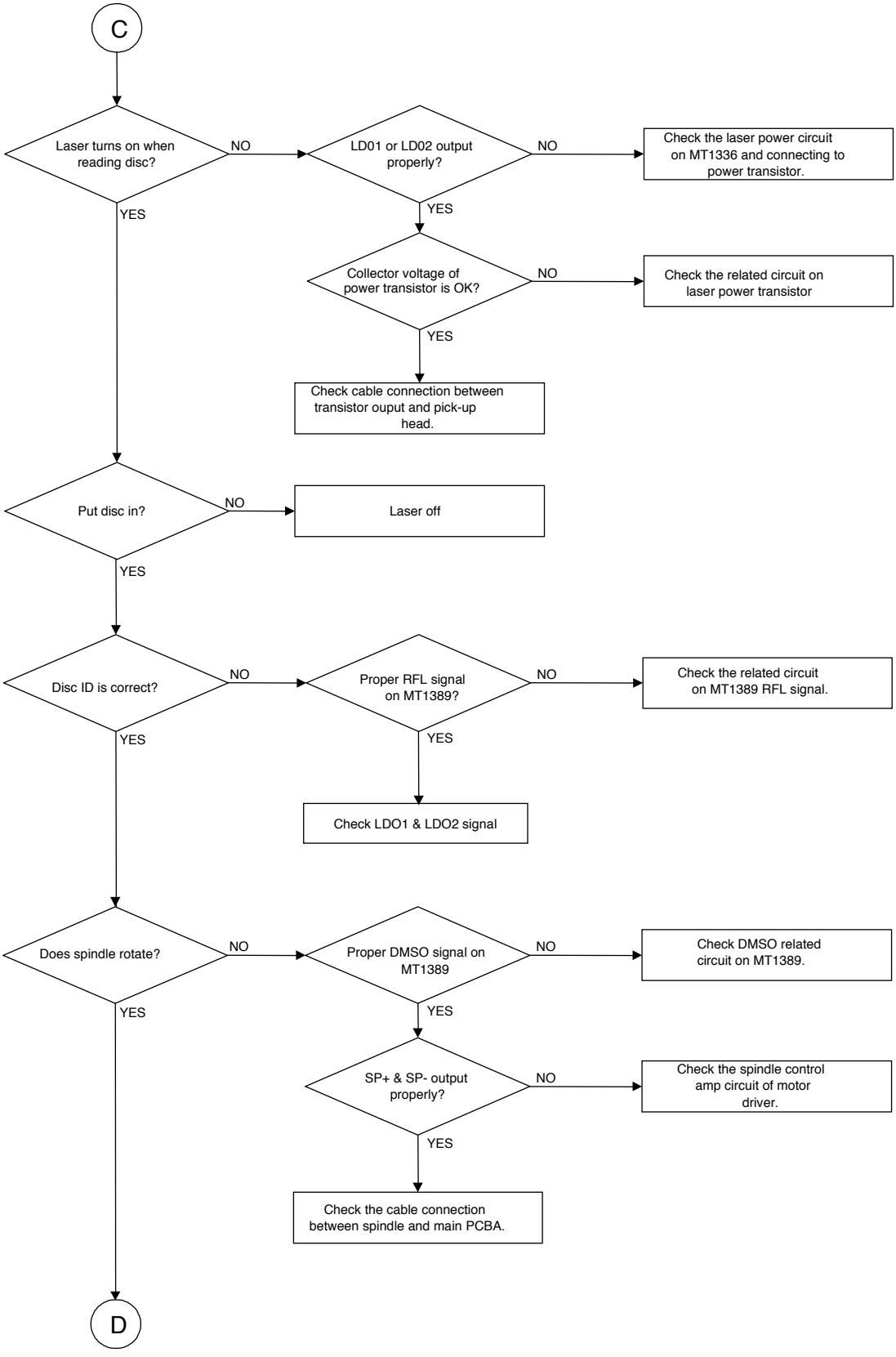


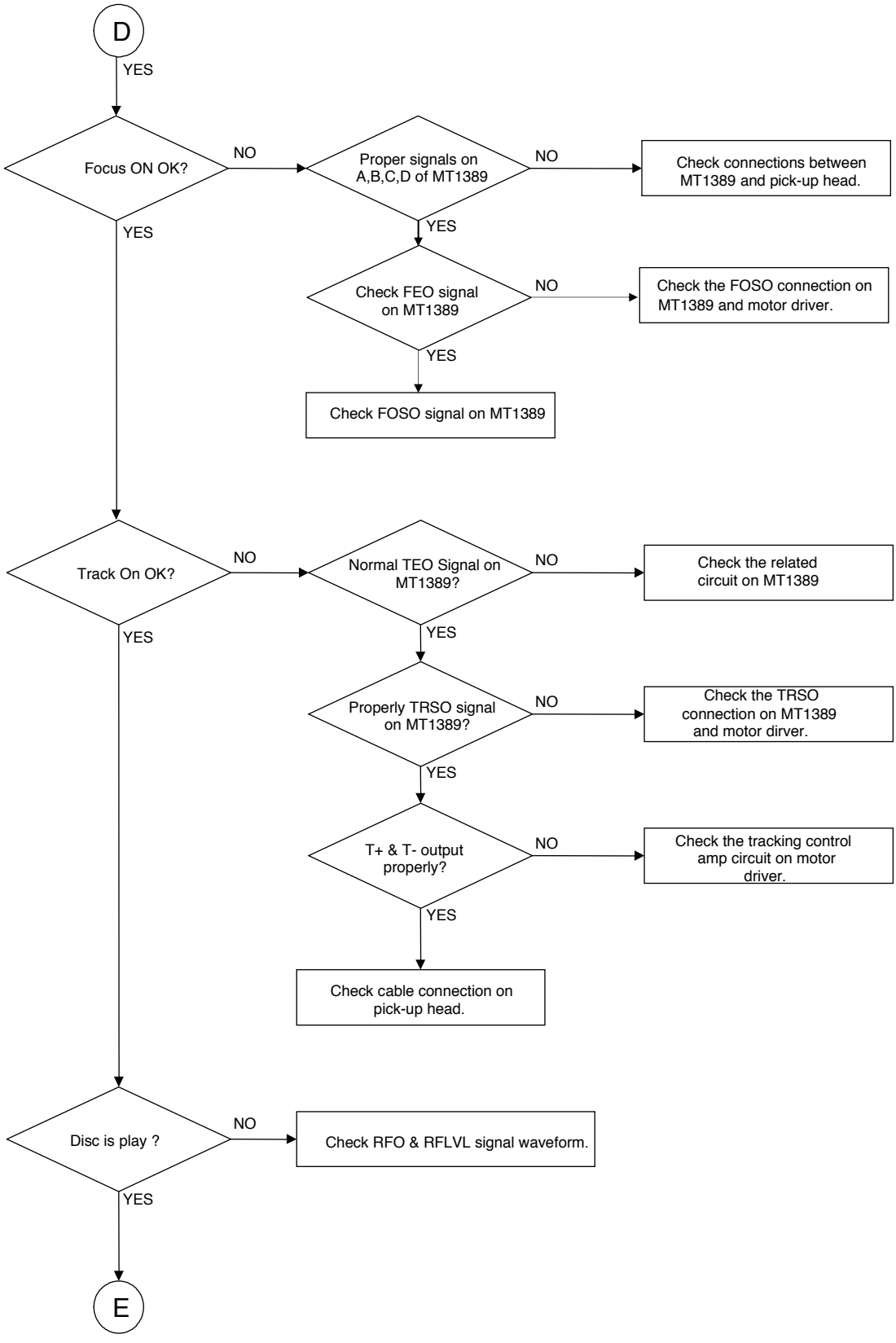
2. SYSTEM Test flow

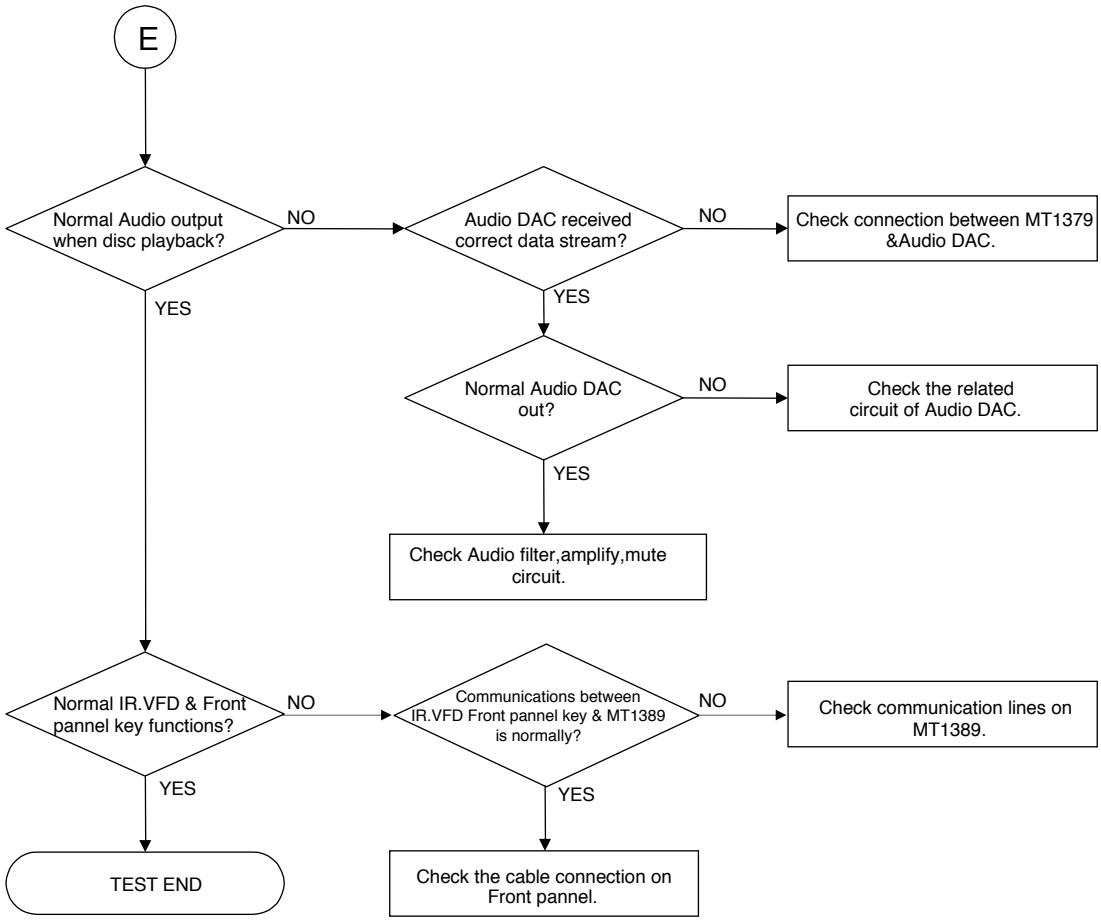



A
RESET or Power On.
Show LOGO?
NO
Flash Memory operates properly?
NO
Check connection lines between FLASH & MT1389 and the FLASH access time whether is suitable or not.
YES
YES
SDRAM works properly?
NO
Check connection lines between SDRAM & MT1389 and the SDRAM is damaged.
YES
MT1389 VIDEO outputs properly?
NO
Check the related circuit of MT1389.
YES
Have TV signal output?
NO
Check the filtering and amp circuit of TV signal.
YES
Check AV cable connection to TV set.
Does Tray move inside when it is not at closed position?
NO
Normal TROUT &TRIN signals?
NO
Check the load OPEN & CLOSE switch
YES
YES
Normal TRCLOSE & TROPEN signal?
NO
Check the Tray control IO pins on MT1389 & IP4504.
YES
Normal LOAD+ & LOAD- signal?
NO
Check the Tray control amplifying circuit on Motor driver.
YES
B
Check the cable connection between main PCBA and loader.


B
Does the SLED move to inner side when it is at outter position?
NO
Motor Driver STBY Pin is High?
NO
Check the connection line of STBY signal.
YES
YES
Is FMSO DC Level higher than 1.4V?
NO
Check the related circuit of FMSO.
YES
SL+ and SL- output properly?
NO
Check the amp circuit on motor driver.
YES
Do not put in disc and tray close.
Check the cable connection with MECHA.
Optical Lens has movements for searching Focus?
NO
Proper FOSO outputs to motor driver?
NO
Check FOSO connection on MT1389 and motor dirver.
YES
YES
Proper F+ & F- outputs?
NO
Check the amp circuit on motor dirver.
YES
C
Check cable connect on with pick-up head.


C
Laser turns on when reading disc?
NO
LD01 or LD02 output properly?
NO
Check the laser power circuit on MT1336 and connecting to power transistor.
YES
YES
Collector voltage of power transistor is OK?
NO
Check the related circuit on laser power transistor
YES
Check cable connection between transistor ouput and pick-up head.
Put disc in?
NO
Laser off
YES
Disc ID is correct?
NO
Proper RFL signal on MT1389?
NO
Check the related circuit on MT1389 RFL signal.
YES
YES
Check LDO1 & LDO2 signal
Does spindle rotate?
NO
Proper DMSO signal on MT1389
NO
Check DMSO related circuit on MT1389.
YES
YES
SP+ & SP- output properly?
NO
Check the spindle control amp circuit of motor driver.
YES
Check the cable connection between spindle and main PCBA.
D

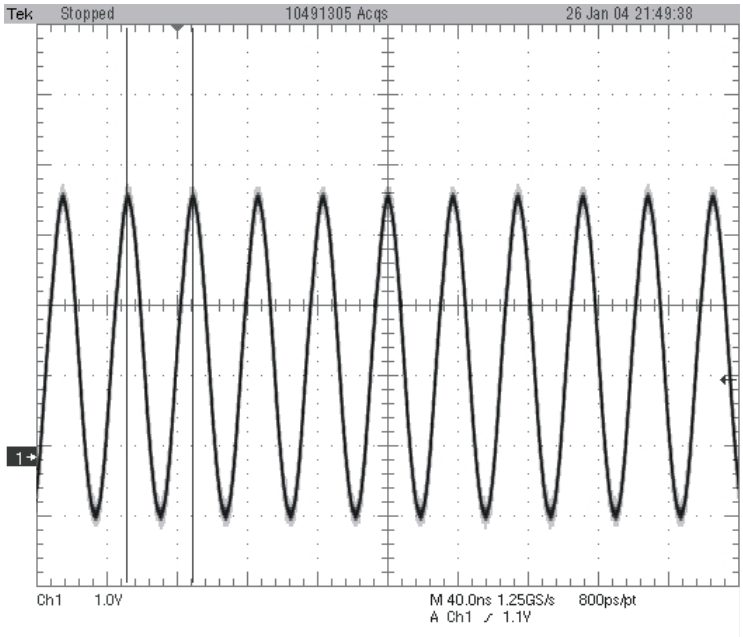

D
YES
Focus ON OK?
NO
Proper signals on A,B,C,D of MT1389
NO
Check connections between MT1389 and pick-up head.
YES
YES
Check FEO signal on MT1389
NO
Check the FOSO connection on MT1389 and motor driver.
YES
Check FOSO signal on MT1389
Track On OK?
NO
Normal TEO Signal on MT1389?
NO
Check the related circuit on MT1389
YES
YES
Properly TRSO signal on MT1389?
NO
Check the TRSO connection on MT1389 and motor dirver.
YES
T+ & T- output properly?
NO
Check the tracking control amp circuit on motor driver.
YES
Check cable connection on pick-up head.
Disc is play ?
NO
Check RFO & RFLVL signal waveform.
YES
E


E
Normal Audio output when disc playback?
NO
Audio DAC received correct data stream?
NO
Check connection between MT1379 &Audio DAC.
YES
YES
Normal Audio DAC out?
NO
Check the related circuit of Audio DAC.
YES
Check Audio filter,amplify,mute circuit.
Normal IR.VFD & Front pannel key functions?
NO
Communications between IR.VFD Front pannel key & MT1389 is normally?
NO
Check communication lines on MT1389.
YES
YES
TEST END
Check the cable connection on Front pannel.

DETAILS AND WAVEFORMS ON SYSTEM TEST AND DEBUGGING

1. SYSTEM 27MHz CLOCK, RESET, FLASH R/W SIGNAL

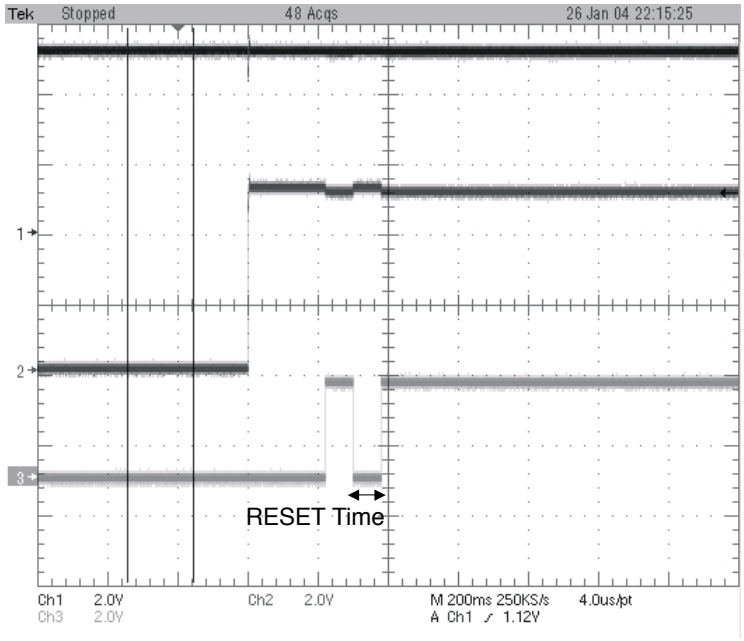
1) MT1389 main clock is at 27MHz(X501)



1.0V, 27MHz

FIG 1-1

2) MT1389 reset is low active



5.2VA

PWR_CTL

M_RESET(FRONT)

FIG 1-2

3) RS232 waveform during procedure(Downloading)

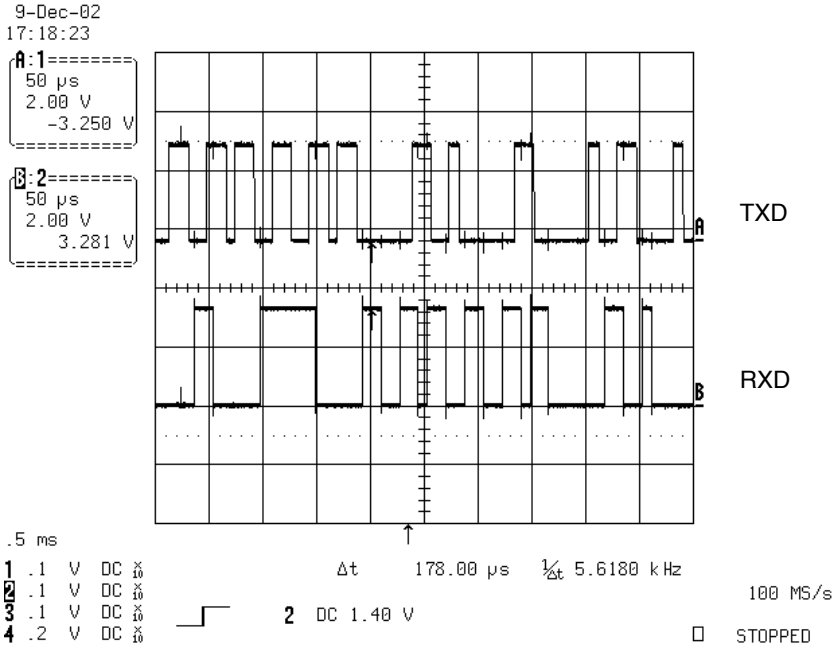


FIG 1-3

4) Flash R/W enable signal during download(Downloading)

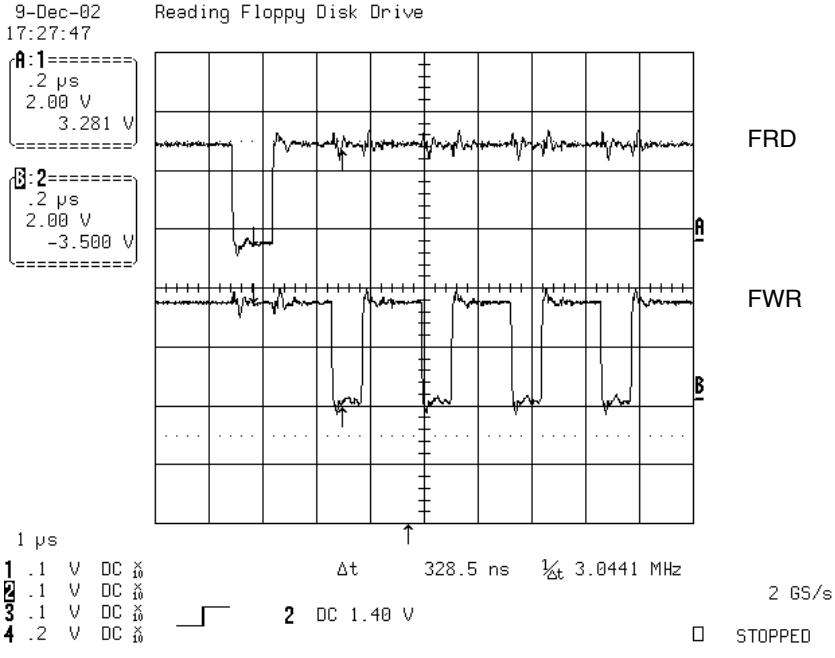


FIG 1-4

2. SDRAM CLOCK

DCLK = 128MHz, Vp-p=2.2, Vmax=2.7V

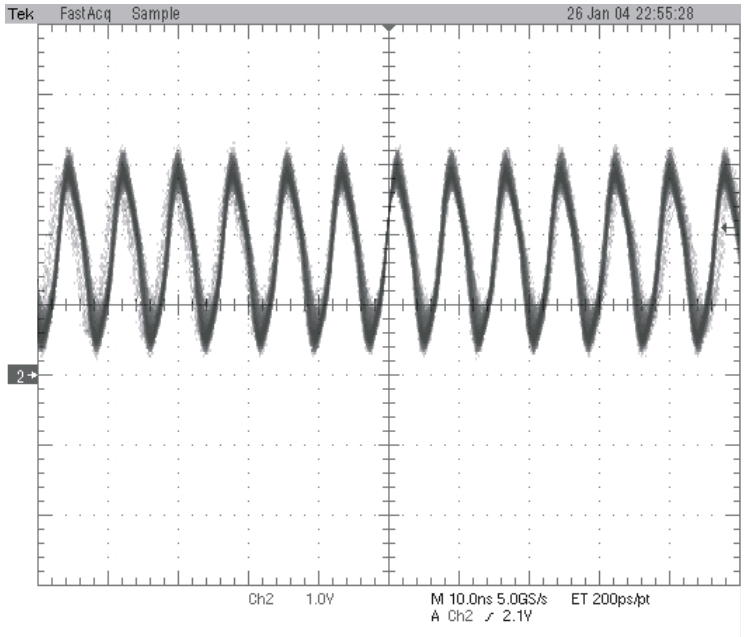


FIG 2-1

3. TRAY OPEN/CLOSE SIGNAL

1) Tray open/close waveform

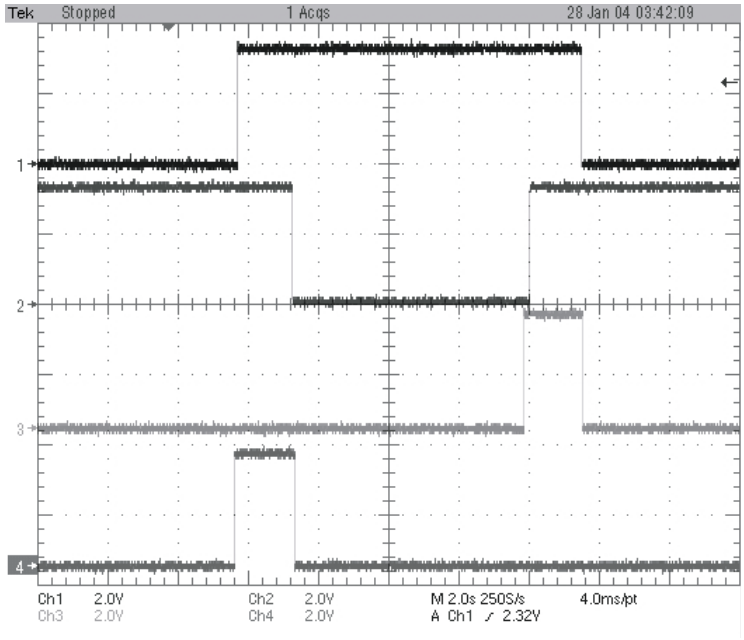
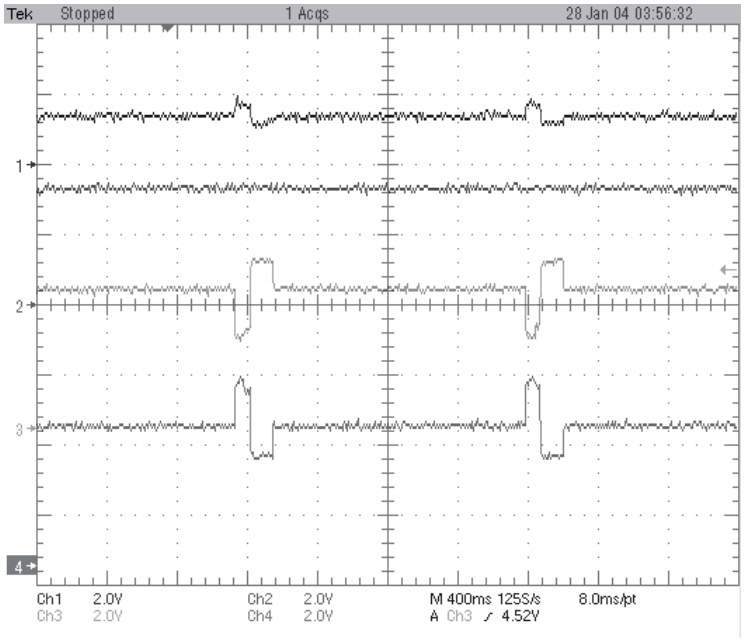


FIG 3-1

4. SLED CONTROL RELATED SIGNAL (NO DISC CONDITION)



FMSO(2.0V/1.4V/1.0V)

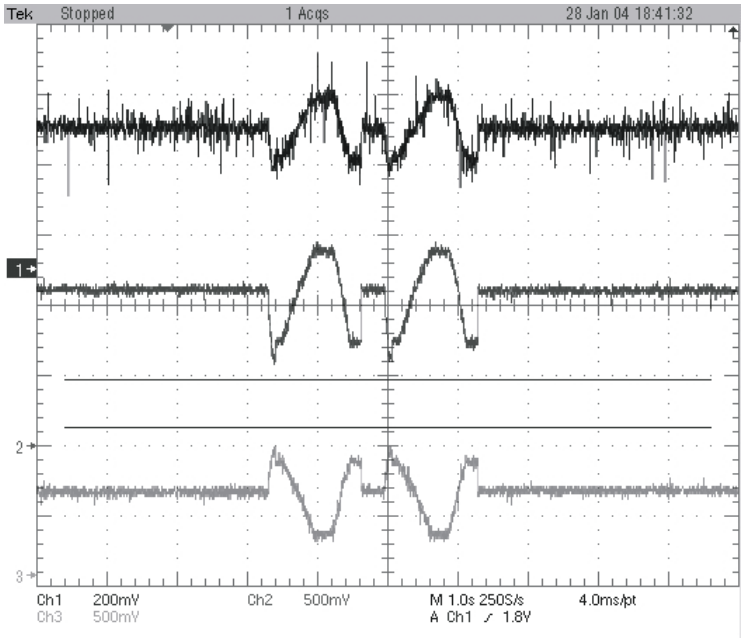
STBY(3.3V)

SL+(4.7V/4.0V/2.6V)

SL-(5.3V/4.0V/3.0V)

FIG 4-1

5. LENS CONTROL RELATED SIGNAL(NO DISC CONDITION)



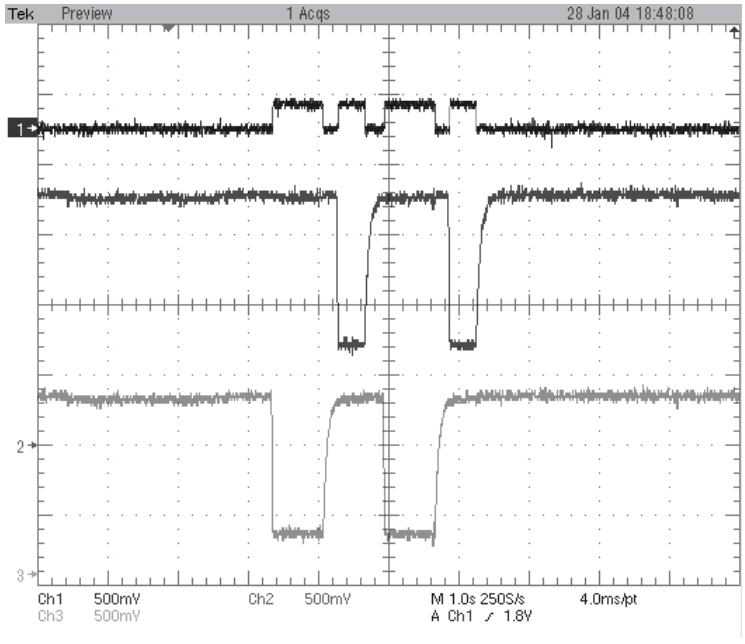
FOSO(1.5V/1.4V/1.3V)

F+(4.0V/3.6V/3.2V)

F-(4.0V/3.6V/3.2V)

FIG 5-1

6. LASER POWER CONTROL RELATED SIGNAL(NO DISC CONDITION)



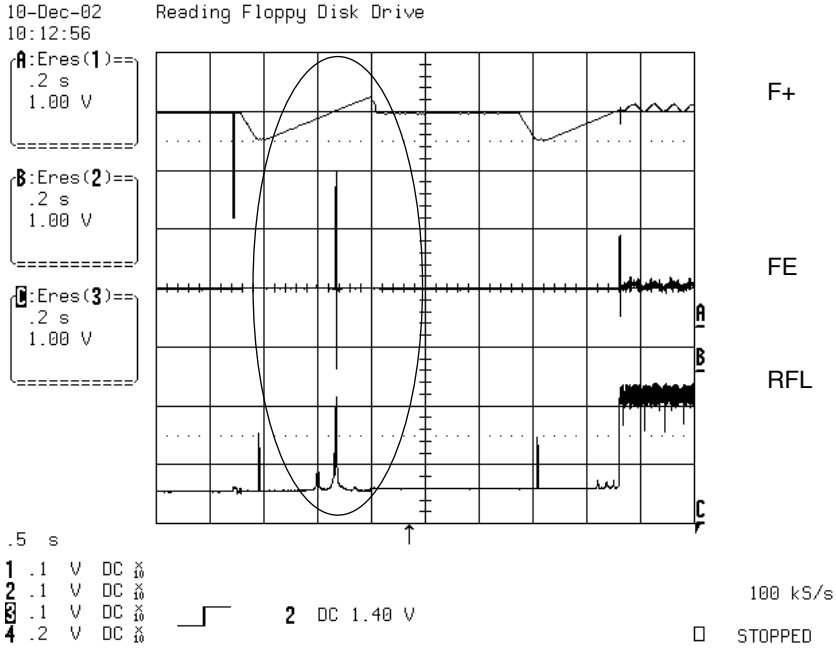
MDI1(0V/180mV)

LD01(5.0V//3.5V)

LD02(5.0V/3.6V)

FIG 6-1

7. DISC TYPE JUDGEMENT WAVEFORM



F+

FE

RFL

FIG 7-1 (DVD)

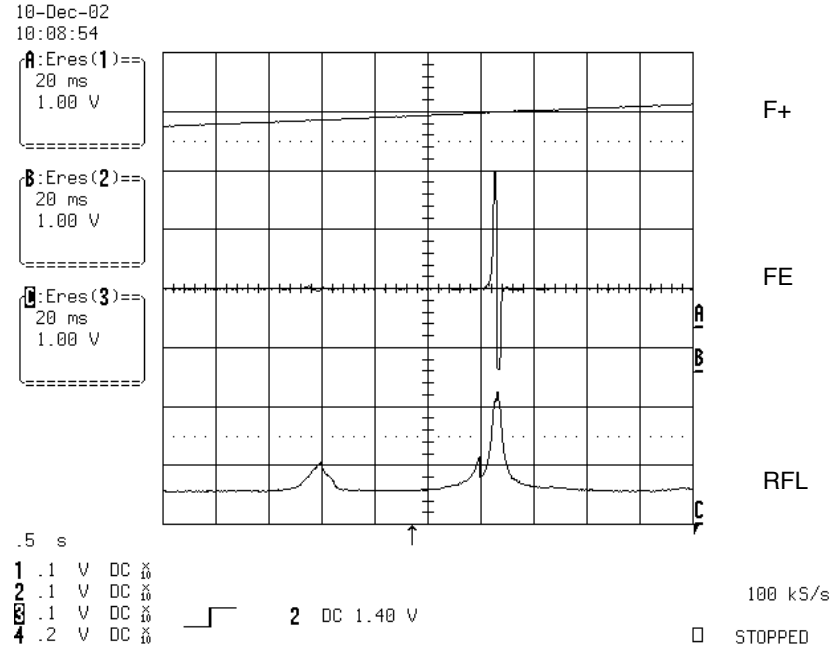


FIG 7-2 (DVD)

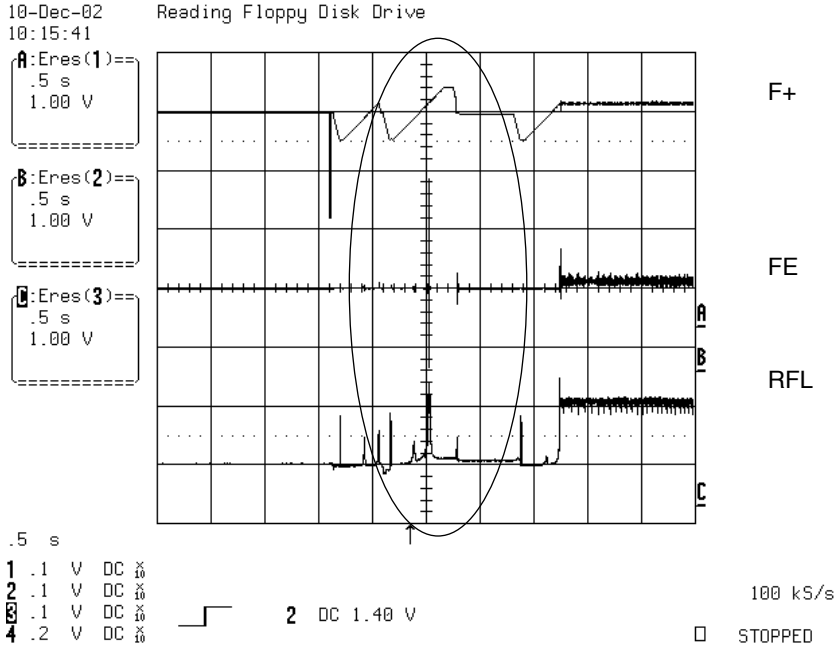


FIG 7-3 (CD)

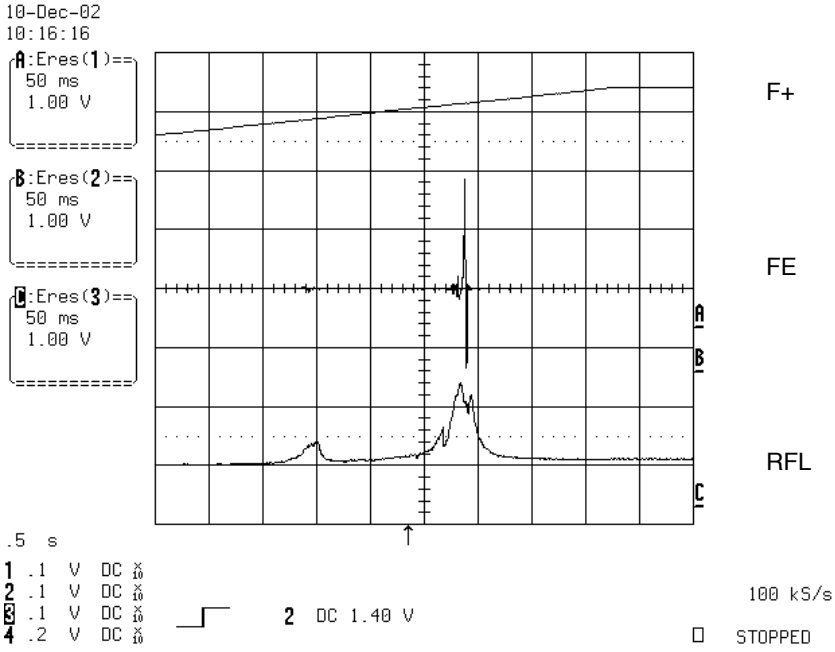


FIG 7-4 (CD)

8. FOCUS ON WAVEFORM

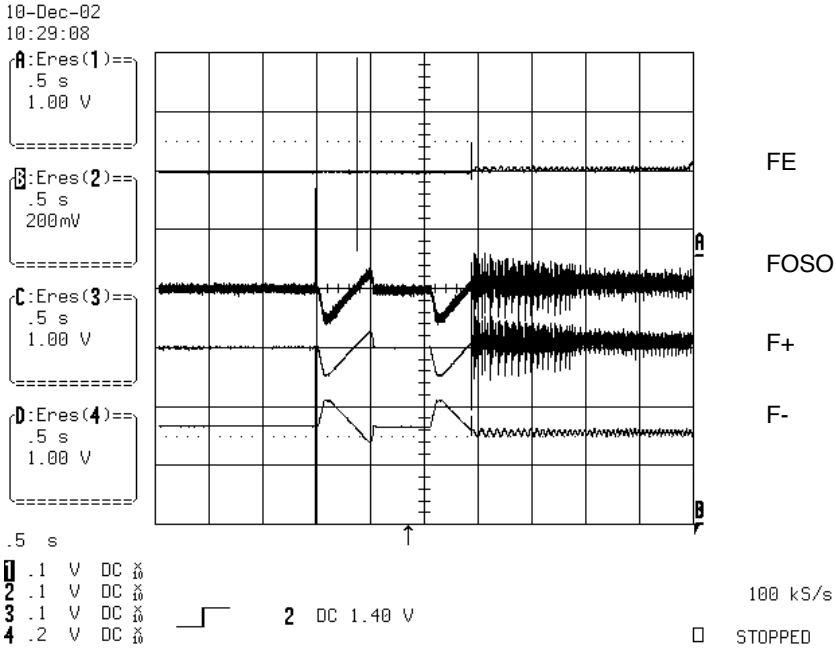


FIG 8-1 (DVD)

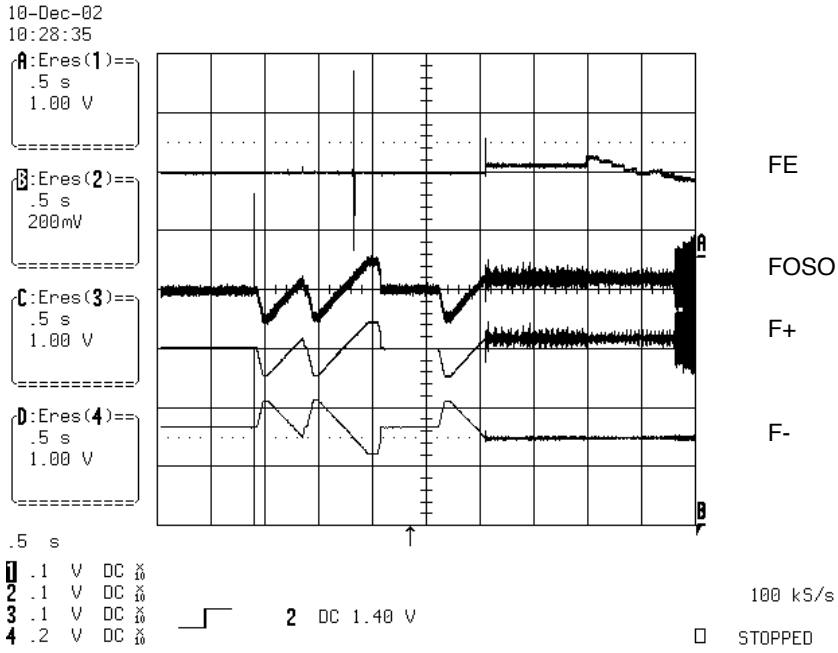


FIG 8-2 (CD)

9. SPINDLE CONTROL WAVEFORM (NO DISC CONDITION)

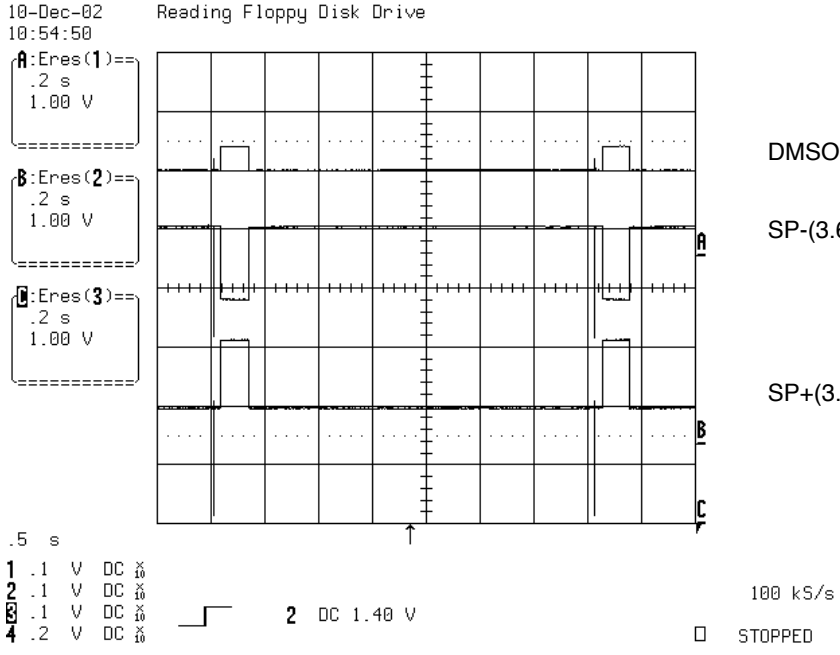


FIG 9-1

10. TRACKING CONTROL RELATED SIGNAL(System checking)

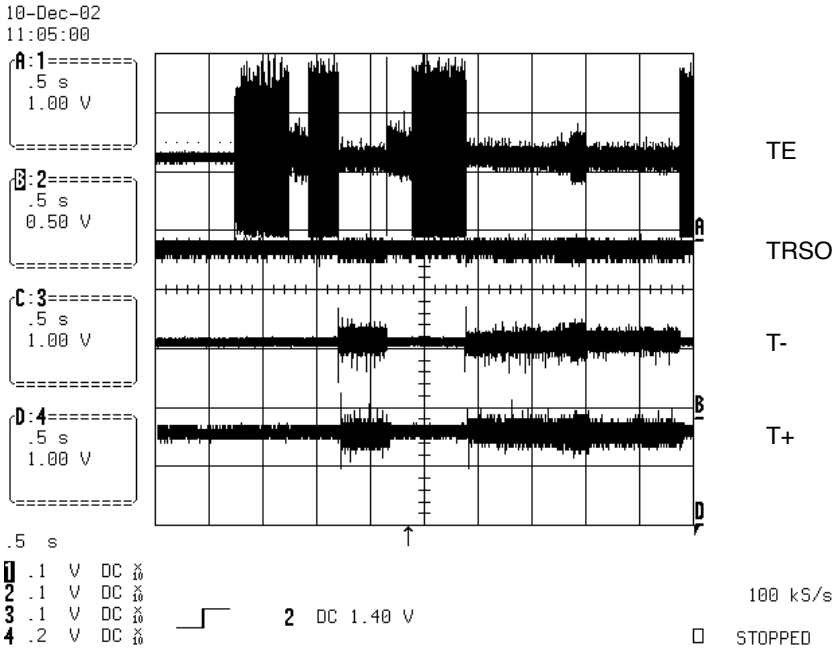


FIG 10-1(DVD)

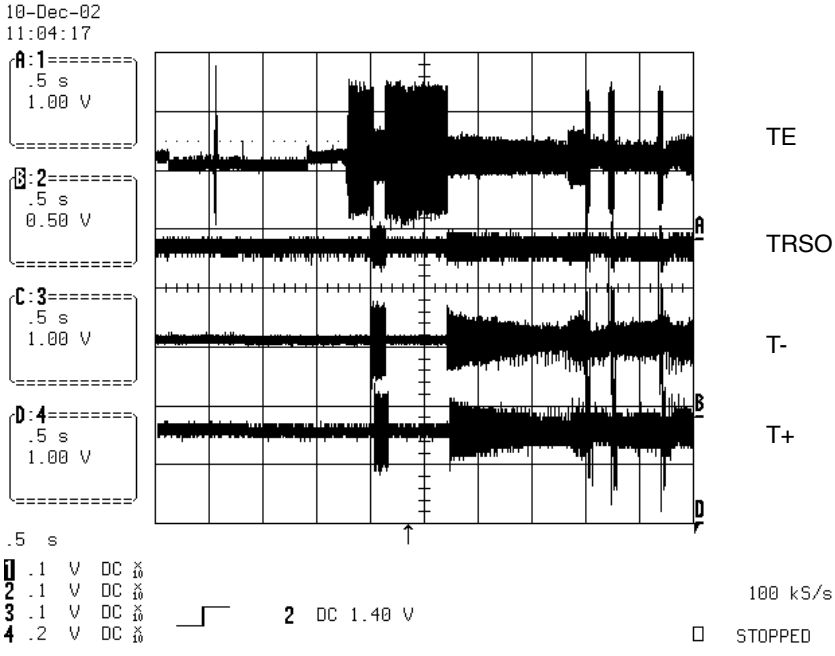


FIG 10-2(CD)

11. MT1389 AUDIO OPTICAL AND COAXIAL OUTPUT(SPDIF)

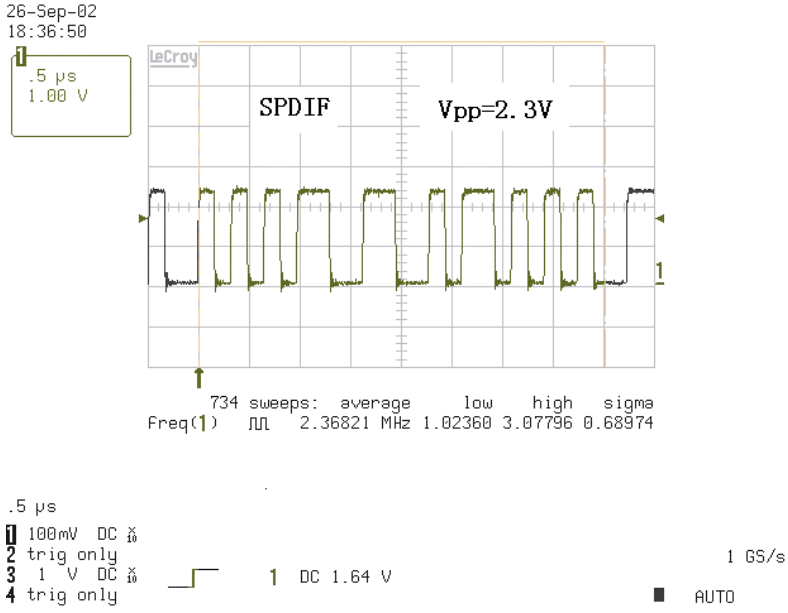


FIG 11-1

12. MT1389 VIDEO OUTPUT WAVEFORM

1) 100%

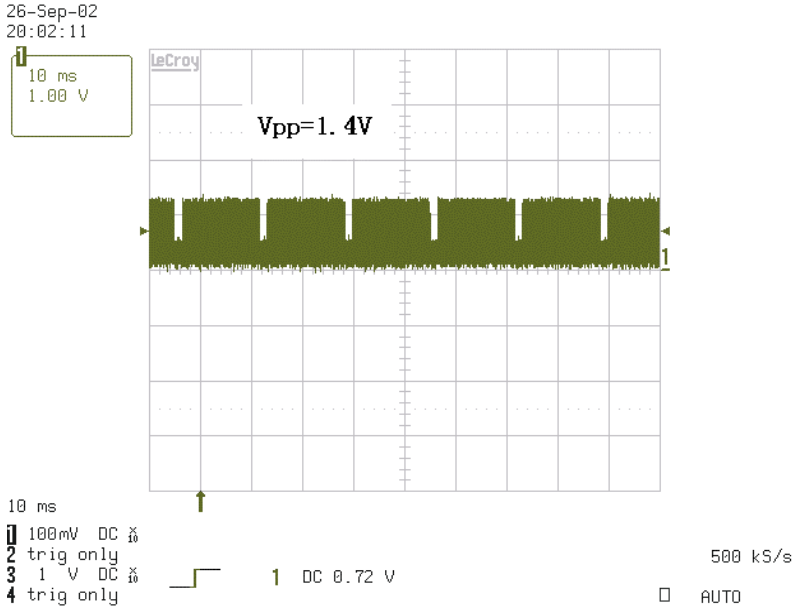


FIG 12-1

2) COMPOSITE VIDEO SIGNAL

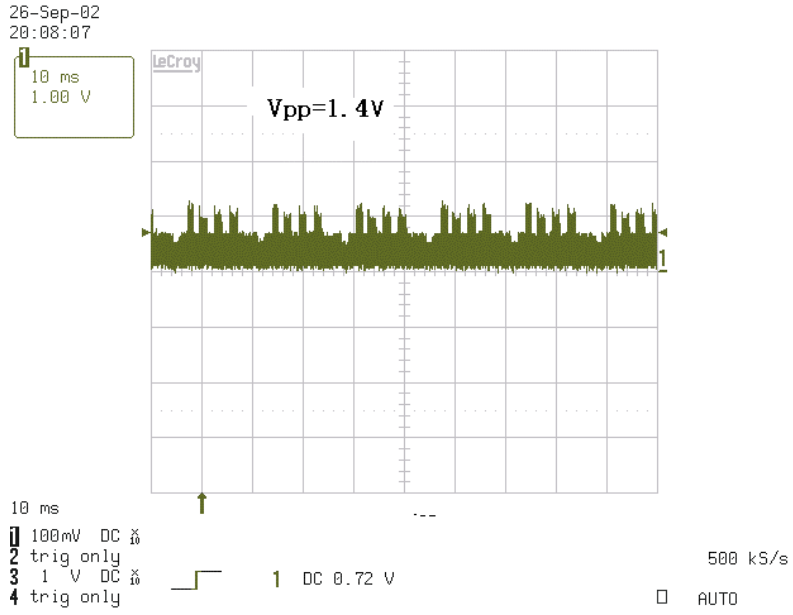


FIG 12-2

13. MT1389 AUDIO OUTPUT TO AUDIO DAC

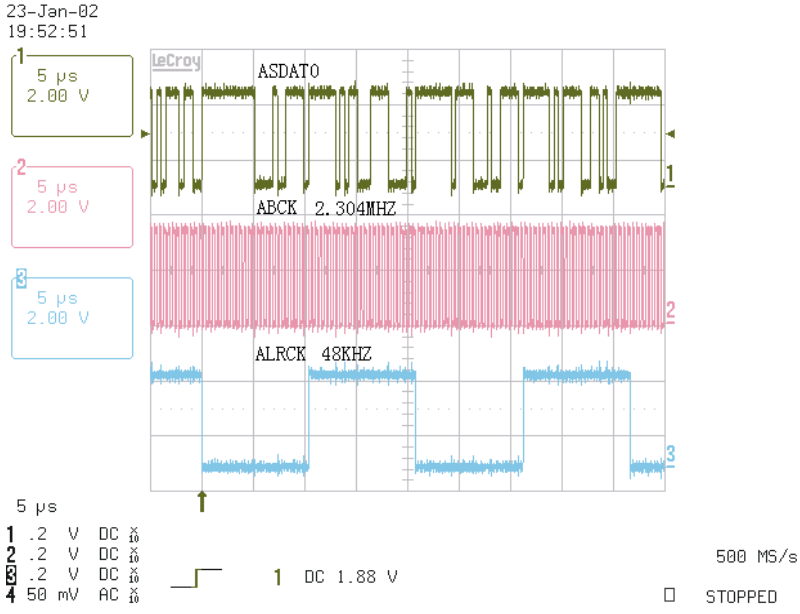


FIG 13-1

14. AUDIO OUTPUT FROM AUDIO DAC

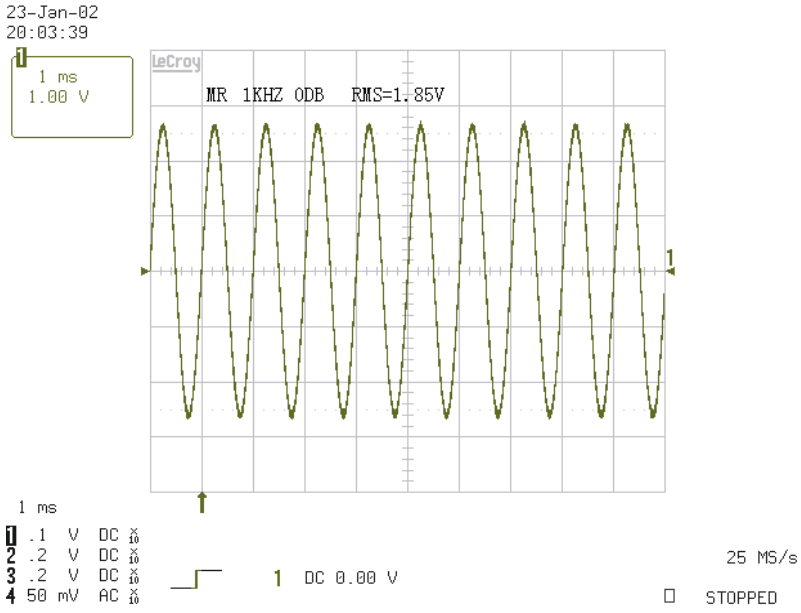
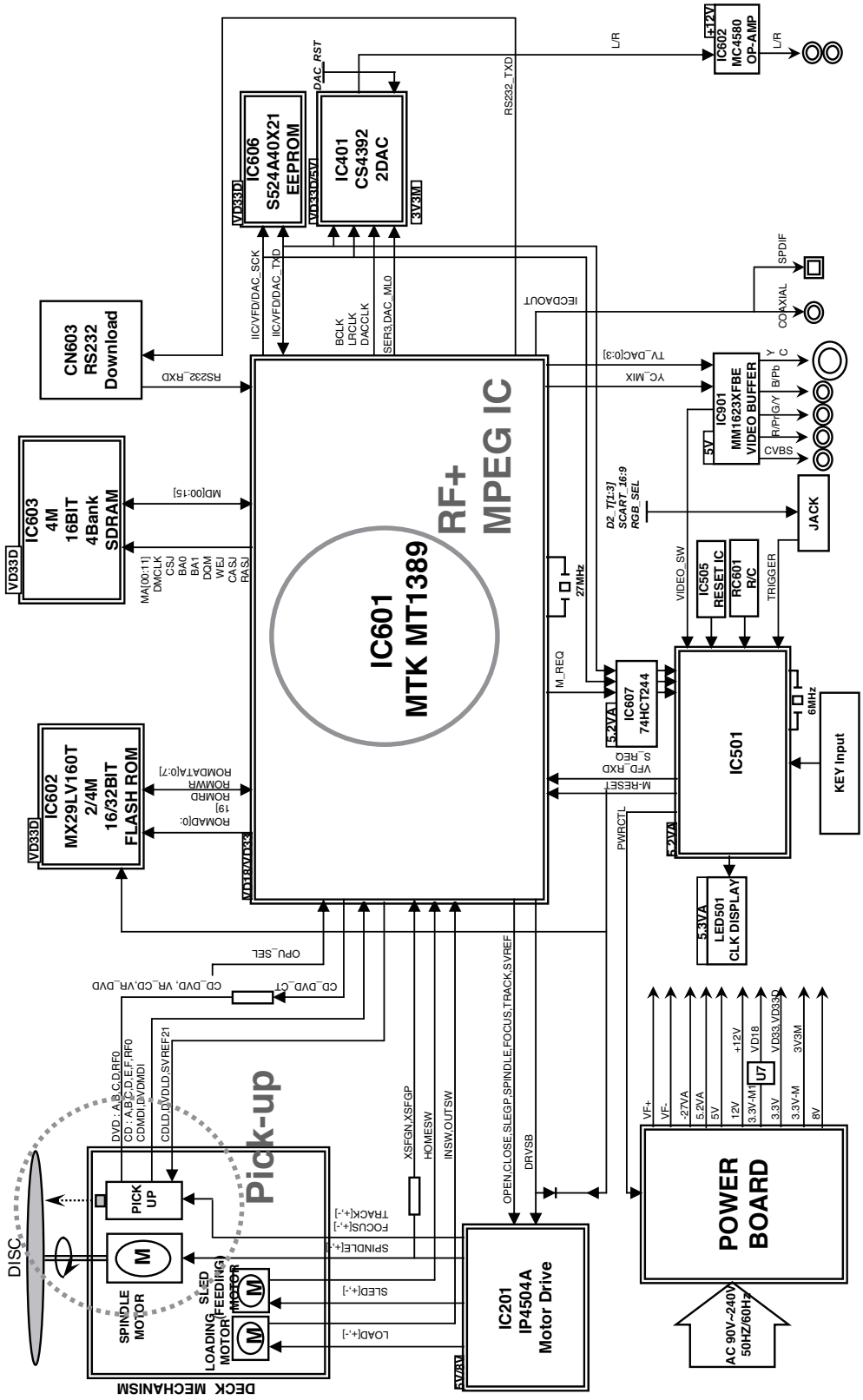


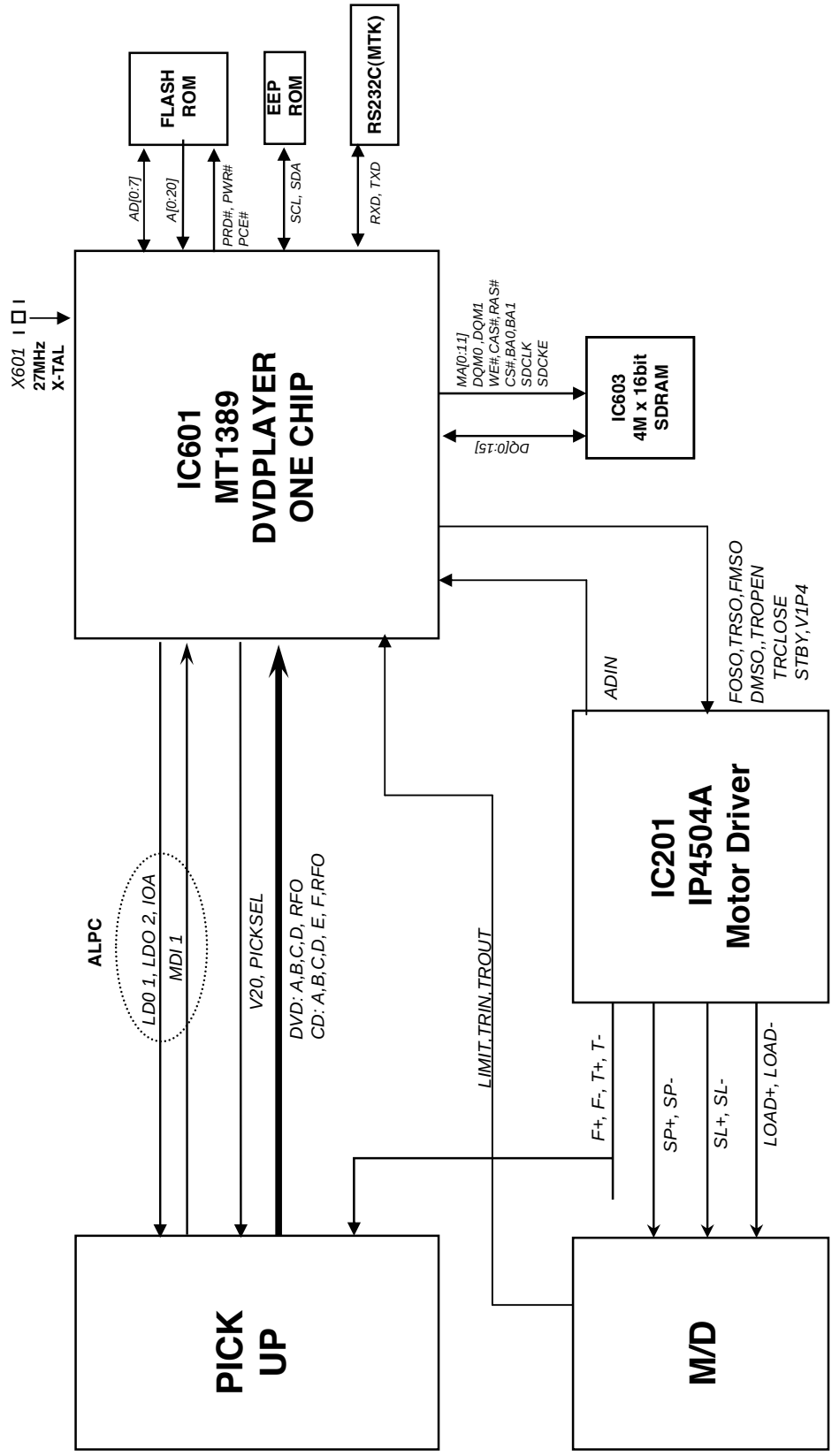
FIG 14-1

BLOCK DIAGRAMS

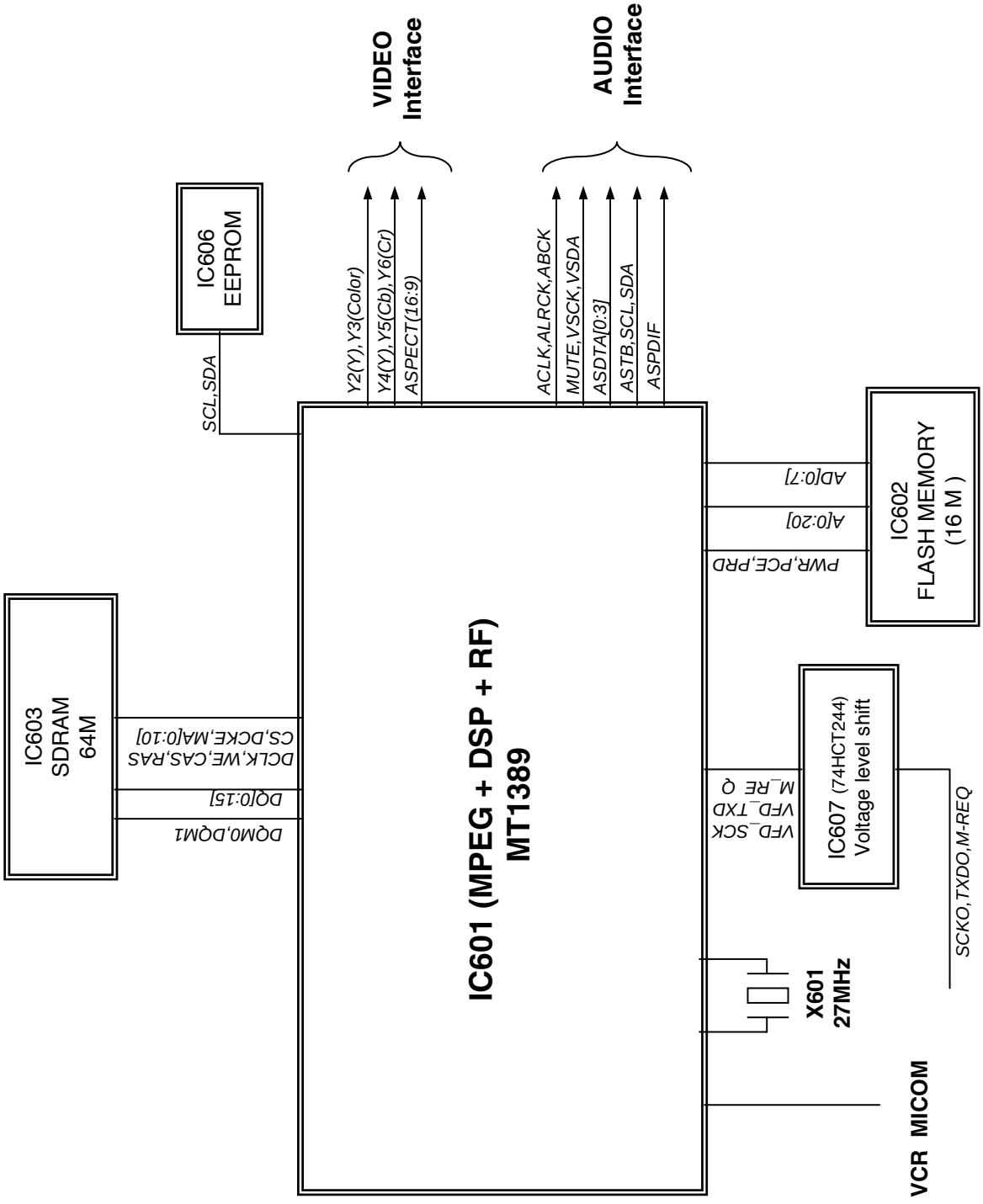
1. Overall Block Diagram



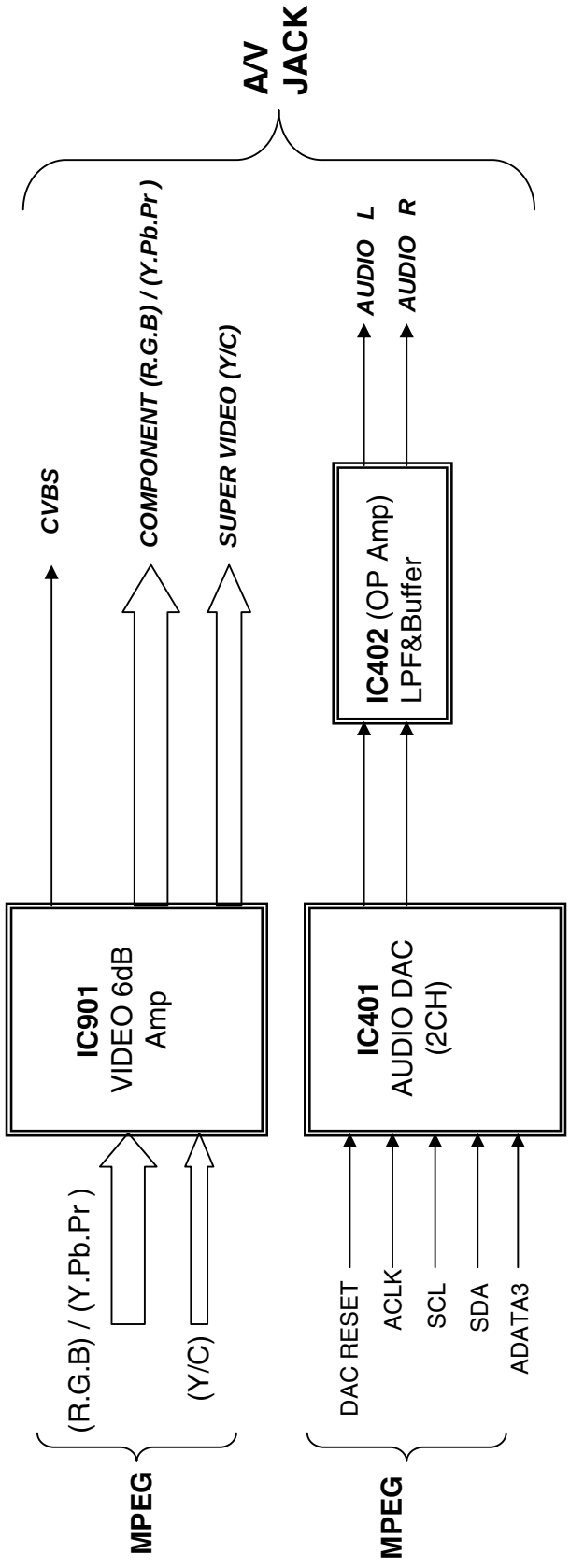
2. SERVO Block Diagram



3. MPEG & MEMORY Block Diagram



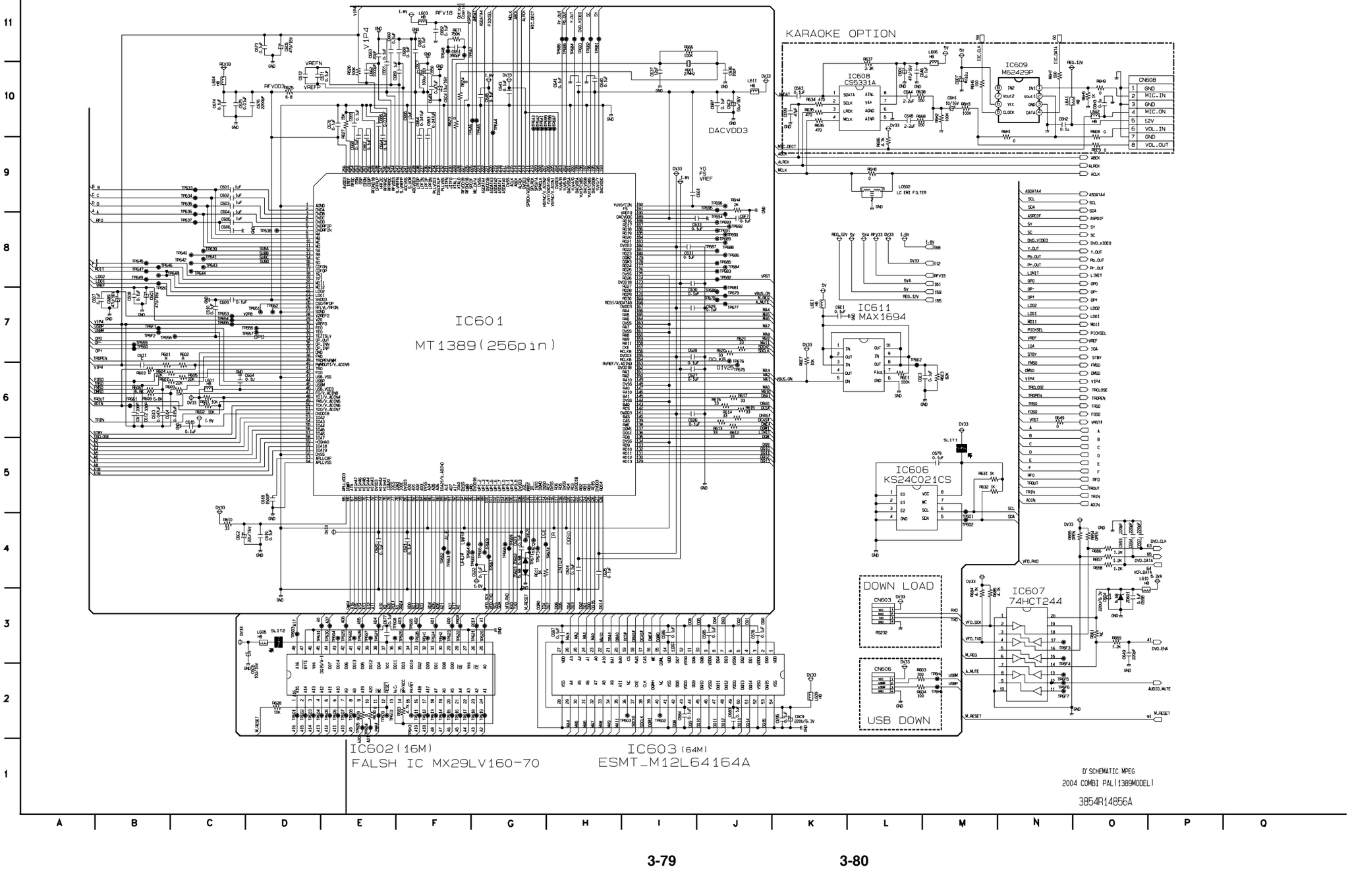
4. VIDEO & AUDIO Block Diagram



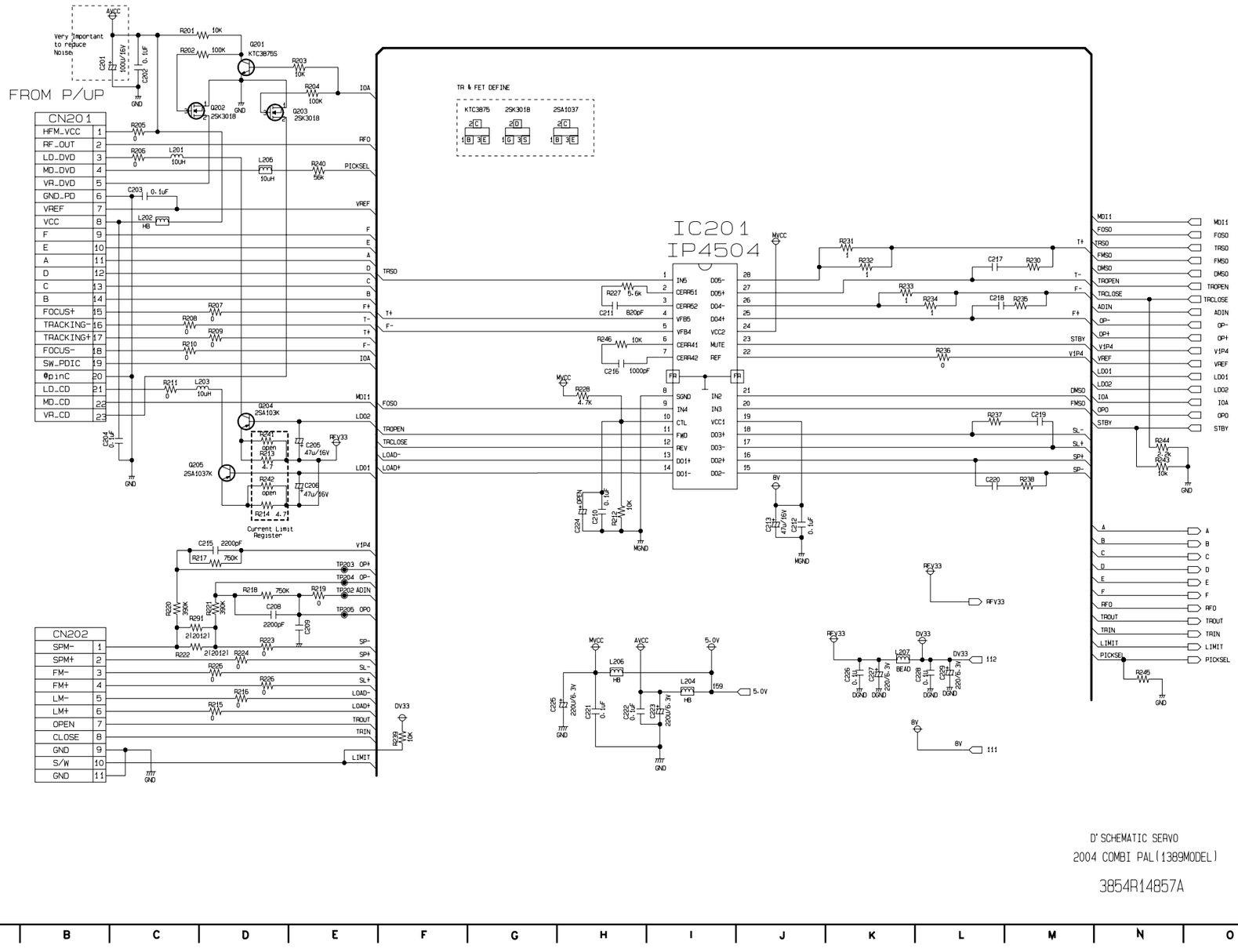
MEMO

CIRCUIT DIAGRAMS

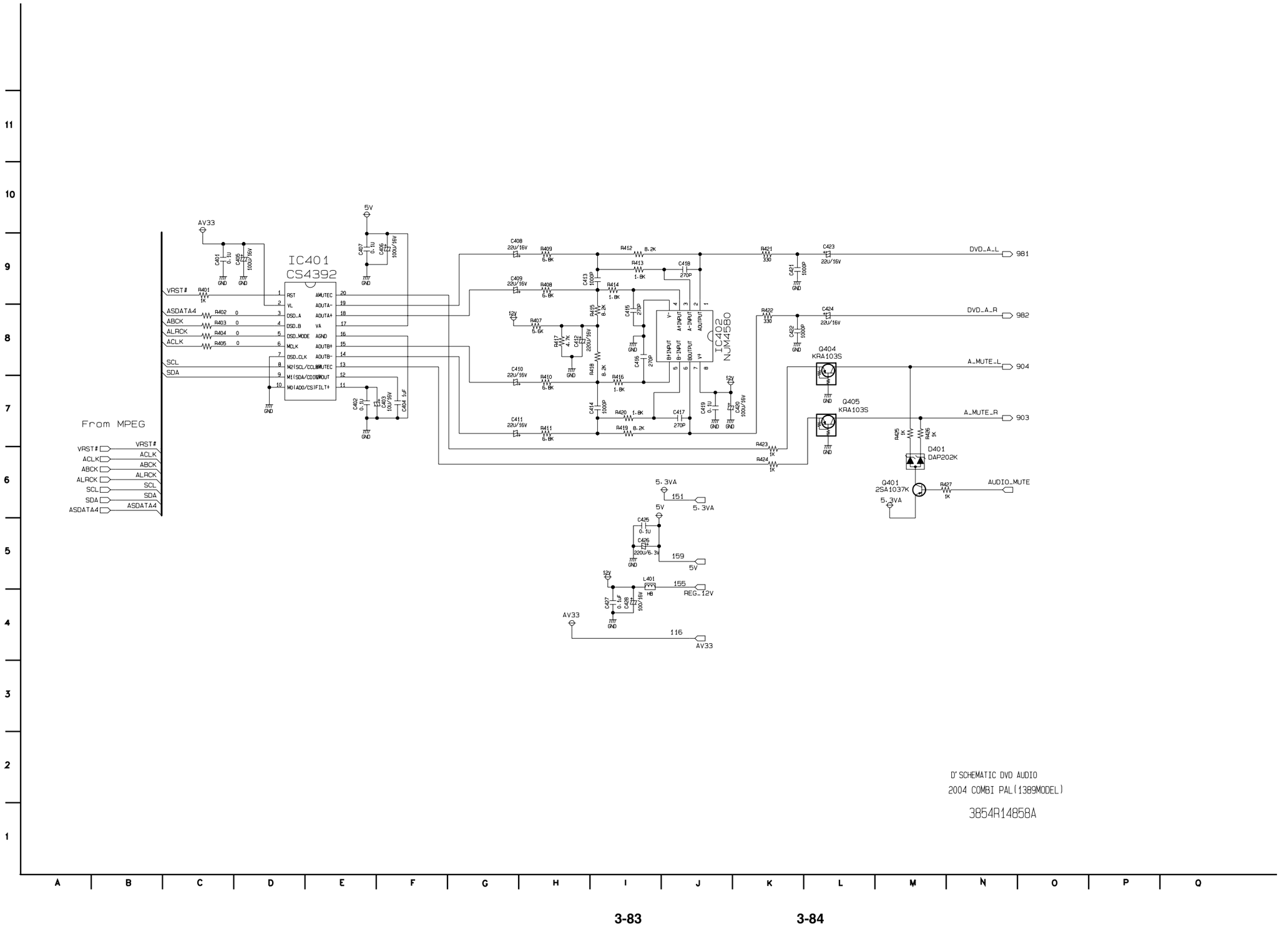
1. SYSTEM CIRCUIT DIAGRAM



2. RF & DSP SERVO CIRCUIT DIAGRAM



3. AV/JACK CIRCUIT DIAGRAM



• CIRCUIT VOLTAGE CHART

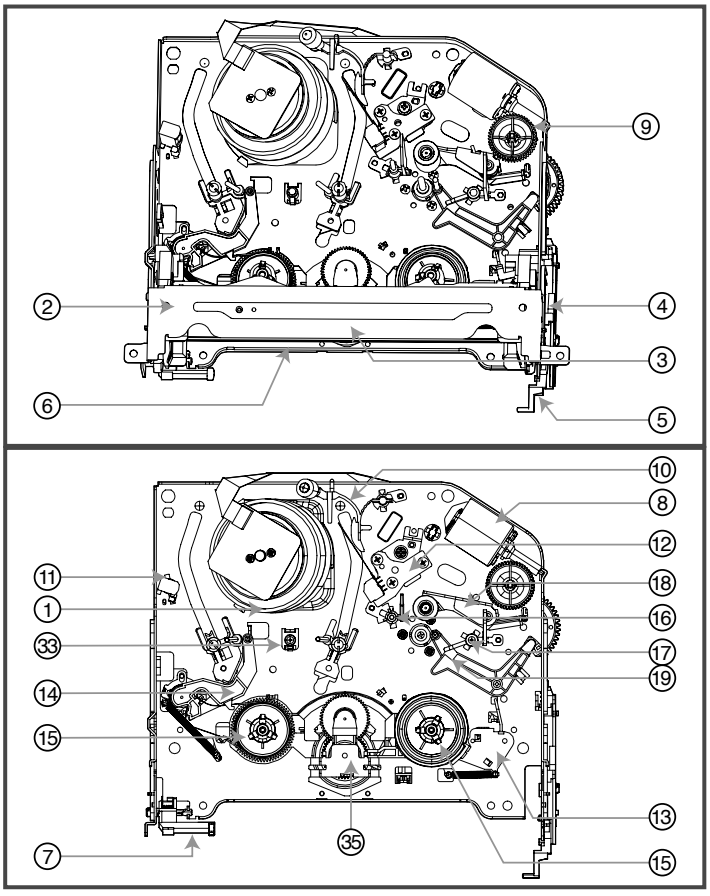
MODE / PIN NO.	STOP	PLAY
IC201		
2	2.54	2.3
3	2.55	2.3
4	2.53	2.3
5	2.56	2.35
6	2.54	2.43
7	2.56	2.42
8	0.001	0.001
9	1.39	1.38
10	3.5	3.37
11	0.004	0.004
12	0.002	
13	3.97	3.96
14	3.97	3.96
15	3.99	2.71
16	3.96	5.21
17	3.98	4.04
18	3.96	3.88
19	8	8
20	1.38	1.38
21	1.38	1.73
22	1.38	1.38
23	3.24	3.22
24	5.07	4.87
25	2.59	2.46
26	2.55	2.48
27	2.59	2.47
28	2.52	2.43
IC401		
1	3.25	3.24
2	3.25	3.23
3	0.002	1.21
4	1.62	1.61
5	1.62	1.61
6	1.57	1.56
7	0.001	0
8	3.27	3.26
9	3.27	3.26
10	0.001	0
11	5.02	4.81
12	2.38	2.3
13	4.9	0.001
14	2.4	2.36
15	2.4	2.36
16	0.001	0.001
17	5.1	4.93
18	2.4	2.35
19	2.4	2.36
20	4.9	0.001
IC402		
1	5.8	5.72
2	5.8	5.73
3	5.8	5.73
4	0	0
5	5.8	5.72
6	5.8	5.73
7	5.8	5.73
8	12.6	12.49
IC601		
1	0.001	0.002
2	1.57	1.58
3	1.57	1.58
4	1.57	1.58
5	1.58	1.58
6	1.58	1.59
7	1.58	1.59
8	1.98	2.02
9	1.98	2.02
10	1.98	2.02
11	1.99	2.03
12	1.46	1.32
13	1.46	1.33
14	1.46	1.31
15	1.46	1.32
16	1.45	1.35
17	1.45	1.35
18	1.99	2.2
19	1.99	2.1
20	0	0.1
21	0	0
22	3.2	3.1
23	3.2	3.1
24	3.2	3.1
25	1.37	1.8
26	0.8	0.07
27	0	0.003
28	2.6	2.7
29	1.9	1
30	1.38	1.2
31	1.34	1.21
32	0.8	1.3
33	0.8	1.3
34	3	2.8
35	3.28	2.8
36	1.38	2.4
37	1.38	2.6
38	1.37	1.3
39	0.003	0
40	1.37	1.3
41	1.41	1.31
42	1.39	1.3
43	0.001	0
44	0.02	0.01
45	0.02	0.01
46	3.25	3.2
47	2.99	3
48	3.25	3.2
49	0	0.001
50	3.23	3.21
51	0.002	0.001
52	1.8	1.71
53	3.25	3.19
54	3.25	3.2
55	3.25	3.2
56	3.22	3.1
57	3.21	3.13
58	3.19	3.1
59	3.25	3.1
60	3.25	3.12
61	0.001	0.002
62	0	0.002
63	1.77	1.72
64	0	0.002
65	3.24	3.1
66	3.25	3.21
67	0.001	0.002
68	0.002	0.002
69	0.001	0.003
70	0.001	0.003
71	3.25	3.24
72	3.25	3.24
73	3.25	3.24
74	0.001	0.003
75	0	0.002
76	0.001	0.001
77	0.001	0.002
78	2.44	2.41
79	0.001	0.003
80	3.2	3.1
81	3.2	3.1
82	3.27	3.24
83	3.23	3.16
84	3.2	3.1
85	0.001	0.003
86	3	2.91
87	3	2.99
88	3	2.9
89	0.007	0.008
90	0.001	0.003
91	2.99	1.2
92	0.001	0.003
93	3.27	3.24
94	0.001	0.002
95	3.2	3.2
96	3.97	3.7
97	1.8	1.8
98	4.1	3.2
99	4.1	3.2
100	3.2	3.2
101	3.2	3.16
102	3.27	3.23
103	3.2	3.23
104	4	3.9
105	2.1	2.1
106	4.1	3.99
107	3.2	3.21
108	3.25	3.21
109	0.02	0.03
110	5.1	5.15
111	4.2	3.6
112	4.2	3.68
113	2.6	2.5
114	3.2	3.1
115	1.6	1.5
116	0.001	0.003
117	0.4	0.02
118	1.8	1.7
119	0	0
120	0.9	0.8
121	1	0.8
122	1.8	1.8
123	1.38	1.31
124	1.23	1.2
125	1.3	1.25
126	0.34	0.35
127	3.25	3.2
128	1.8	1.81
129	2	1.9
130	1.04	0.8
131	1.8	1.75
132	0.002	0.003
133	0.001	0.9
134	0.002	0.001
135	1.06	0.99
136	3.24	3.2
137	3.06	3
138	3.17	3
139	3.1	3
140	3.26	3.1
141	3.26	3.1
142	3.04	3
143	1.27	1.12
144	0.002	0.003
145	1.57	1.6
146	0.04	0.04
147	1.47	1.39
148	0.002	0.003
149	1.67	1.55
150	1.59	1.6
151	1.8	1.7
152	0.02	0.01
153	0.02	0.01
154	3.25	3.14
155	1.7	3.24
156	0.4	0.04
157	0.002	0.003
158	0.003	0.003
159	0.003	0.003
160	0.02	0.04
161	0.001	0.003
162	1.47	1.61
163	0.002	0.002
164	2.25	0.04
165	2.26	2.1
166	1.36	1.45
167	3.25	3.24
168	0.003	0.003
169	0.002	0
170	0.03	0.02
171	0.03	0.01
172	1.8	1.79
173	1.8	1.78
174	3.25	3.24
175	0.001	0.003
176	4	4.1
177	3.25	3.2
178	3.26	3.2
179	4.1	3.61
180	0.03	0.02
181	0.03	0.02
182	3.25	3.2
183	0.03	0.03
184	0.03	0.03
185	0.03	0.03
186	0.03	0.03
187	0.03	0.03
188	0.03	0.01
189	3.23	3.21
190	1.23	1.24
191	1.24	1.24
192	2.22	2.08
193	0	0.001
194	0.3	0.4
195	3.23	3.21
196	0.7	0.7
197	0	0.001
198	3.2	3.21
199	3.23	3.2
200	0.002	0.4
201	0.002	0.002
202	0.2	0.4
203	0.2	0.4
204	3.25	3.23
205	2.96	2.93
206	3.7	3.61
207	2.9	2.91
208	3.7	3.54
209	4	3.5
210	4	3.5
211	3.7	3.4
212	3.7	3.2
213	1.6	1.61
214	1.6	1.61
215	1.57	1.55
216	0.003	0.02
217	0.003	0.002
218	0.003	1.2
219	0.003	0.6
220	3	3.1
221	1.8	1.81
222	0.005	1.2
223	0	0
224	0.3	0.01
225	1.6	1.61
226	0	0
227	1.8	1.8
228	0.6	0.7
229	0.6	0.7
230	1.37	1.1
231	1.34	1.12
232	0	0
233	1.8	1.8
234	3.1	3
235	1	1.7
236	1.3	1.67
237	0	0.001
238	0.9	0.4
239	3.1	3.07
240	0.1	0.1
241	0	0
242	0.01	0.1
243	0.01	0.1
244	3.1	3.01
245	1.09	1.65
246	1.35	1.36
247	0.01	0.1
248	1.5	3.07
249	0	0.001
250	0.01	0.24
251	0.01	0.24
252	1.48	1.52
253	1.47	1.51
254	1	1.04
255	0.9	0.98
256	3.2	3.18
IC602		
1	0.002	0.2
2	3.2	0.4
3	3.2	3.07
4	3.2	3.2
5	3.2	3.01
6	3.2	0.5
7	3.2	0.5
8	3.2	2
9	0.002	0.002
10	0.01	0.009
11	3.2	3.2
12	5.1	5.1
13	3.27	3.26
14	3.27	3.26
15	4.62	3.8
16	2.13	0.002
17	2.11	1.15
18	2.06	2.36
19	2.06	2.1
20	2.12	2.5
21	2.06	1.7
22	2.07	1.9
23	2.05	1.88
24	1.9	2
25	1.8	2
26	0	0.001
27	0.001	0
28	0	0
29	2.3	1.65
30	1.48	1.4
31	1.17	1.36
32	1.5	1.4
33	0.66	1.3
34	1.5	1.4
35	0.9	1
36	1.5	1.4
37	3.2	3.26
38	1.5	1.58
39	1.5	1.4
40	1.69	2
41	1.3	1.4
42	1.5	1.2
43	1.4	1.4
44	1.3	1.3
45	1.9	1.98
46	0.001	0.002
47	0.001	0.002
48	0	0.002
IC603		
1	3.27	3.25
2	1.27	1.2
3	3.27	3.25
4	1.25	1.1
5	1.38	1.14
6	0.02	0.001
7	1.06	1.14
8	0.93	1.47
9	3.27	3.26
10	1	1.57
11	0.41	1.48
12	0.001	0.001
13	1.98	0.38
14	3.27	3.26
15	2.9	2.71
16	3.23	3.19
17	3.09	3
18	3.19	3.13
19	3.03	2.89
20	1.55	1.49
21	0.71	1.2
22	0.03	0.007
23	0.16	0.22
24	1.38	1.39
25	1.36	1.37
26	1.37	1.37
27	3.27	3.26
28	0.002	0.001
29	1.36	1.95
30	2.28	1.46
31	2.25	2.25
32	1.49	1.68
33	0.01	0.01
34	0.02	0.007
35	0.004	0.05
36	0.02	0.01
37	1.03	0.72
38	1.71	1.71
39	2.59	2.7
40	0.01	0.05
41	0.002	0.01
42	1.33	1.1
43	3.27	3.26
44	1.35	1.11
45	1.33	1.02
46	0.002	0.001
47	1.36	0.92
48	1.3	0.92
49	3.27	3.26
50	1.48	1
51	1.91	0.5
52	0.002	0.001
53	0.33	1.47
54	0.002	0.001
IC606		
1	0.002	0.001
2	0.002	0.001
3	0.002	0.001
4	0.002	0.001
5	3.27	3.26
6	3.27	3.26
7	0.002	0.001
8	3.27	3.26
IC607		
1	0.002	0.002
2	3.27	3.24
3	0.002	0.002
4	0.008	3.24
5	0.002	0.001
6	2.26	0.78
7	0.002	0.001
8	2.26	3.24
9	0.002	0.001
10	0.001	0.001
11	3.12	2.56
12	2.45	5.14
13	2.94	2.55
14	2.44	1.25
15	2.82	2.65
16	0.002	5.11
17	2.96	2.65
18	0.002	5.11
19	0.001	0.001
20	5.24	5.14
IC901		
1	5.09	4.9
2	2.41	2.3
3	5.09	4.9
4	1.17	1.13
5	0.002	0.001
6	1.56	1.62
7	0.002	0.001
8	2.46	2.37
9	0.001	0.002
10	1.14	1.31
11	0.05	0.05
12	2.37	2.29
13	5.09	4.9
14	2.41	2.32
15	0.001	0.001
16	2.46	2.38
17	0.002	0.002
18	2.35	2.3
19	0.002	0.001
20	1.2	1.56
21	1.7	2.17
22	0.002	0.002
23	1.69	2.14
24	0.03	0.03
25	0.03	0.03
26	2.47	2.38
27	0.03	0.03
28	5.09	4.89
IC5F1		
1	2.26	2.1
2	5	5.04
3	5.07	5.05
4	5.02	5
5	4.6	4.25
6	1.7	2.54
7	1.35	2.49
8	1.43	2.3
9	1.81	2.47
10	1.8	2.48
11	1.75	2.44
12	1.52	0.77
13	0.8	0.83
14	1.14	1.63
15	2.1	1.79
16	2.11	1.81
17	2.17	1.78
18	4.61	4.25
19	0.002	0.002
20	2.2	1.82
21	2.2	1.79
22	2.23	1.82
23	2.23	1.9
24	0.002	0.002

SECTION 4 MECHANISM (D-37) OF VCR PART

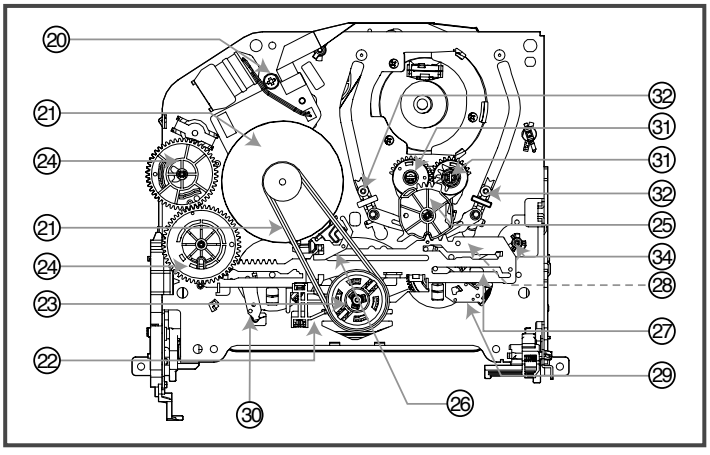
CONTENTS

POSITION DRAWING OF DECK MECHANISM PARTS

• Top View



• Bottom View



Order Of Dis-assembled / Parts firstly Disassembled		Part	Fixing Type	Ref. Drawings	Position
	1	Drum Assembly	3 screws	A-1	T
	2	Plate Top	2 hooks	A-2	T
2	3	Holder Assembly CST	6 chasses	A-2	T
2,3	4	Gear Assembly Rack F/L	1 hook	A-2	T
2,3,4	5	Opener Door	Chassis Hole	A-2	T
2,3,4,5	6	Arm Assembly F/L	Chassis Hole	A-2	T
	7	Lever Assembly S/W	Chassis Hole, 1 hook	A-2	T
	8	Motor Assembly L/D	1 screw	A-3	T
	9	Gear Wheel	2 hooks	A-3	T
	10	Arm Assembly Cleaner	Chassis Embossing	A-3	T
	11	Head F/E	Chassis Embossing	A-3	T
	12	Base Assembly A/C Head	1 screw	A-3	T
2,3	13	Brake Assembly T	1 hook	A-4	T
2,3	14	Arm Assembly Tension	1 hook	A-4	T
2,3,13,14	15	Reel S / Reel T	Shaft	A-4	T
	16	Base Assembly P4	Chassis Embossing	A-5	T
	17	Opener Lid	Chassis Embossing	A-5	T
17	18	Arm Assembly Pinch	Shaft	A-5	T
17	19	Arm T/up	1 hook	A-5	T
	20	Supporter, capstan	Chassis Hole	A-6	B
17,18	21	Belt Capstan/Motor Capstan	3 screws	A-6	B
	22	Lever F/R	Locking Tab	A-6	B
21, 22	23	Clutch Assembly D37	Washer	A-6	B
	24	Gear Drive/Gear Cam	Washer/Hook	A-7	B
	25	Gear Sector	Hook	A-7	B
21	26	Brake Assembly Capstan	Chassis Hole	A-7	B
21,22,23, 24,2526	27	Plate Slider	Chassis Guide	A-7	B
21,22,23, 24,2526,27	28	Lever Tension	1 Hook	A7	B
21,22,23, 24,2526,27	29	Lever Spring	1 Hook	A-7	B
21,22,23, 24,2526,27	30	Lever Brake	1 Hook	A-7	B
25	31	Gear Assembly P2/ Gear Assembly P3	Bass	A-8	B
2, 3, 14, 25, 31	32	Base Assembly P2 /Base Assembly P3	6 Chasses	A-8	B
25, 31	33	Base Loading	3 Hooks	A-8	B
2,3,14	34	Base Tension	Chassis Embossing	A-9	T
	35	Arm Assembly Idler Jog	Locking Tab	A-9	T

T:Top, B:Bottom

NOTE : Assembly order is a reverse of disassembly order.

(1) For assembly, check the assembly mode is accurate.
(2) Parts firstly disassembled indicate parts firstly disassembled in disassembly of related parts.

DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

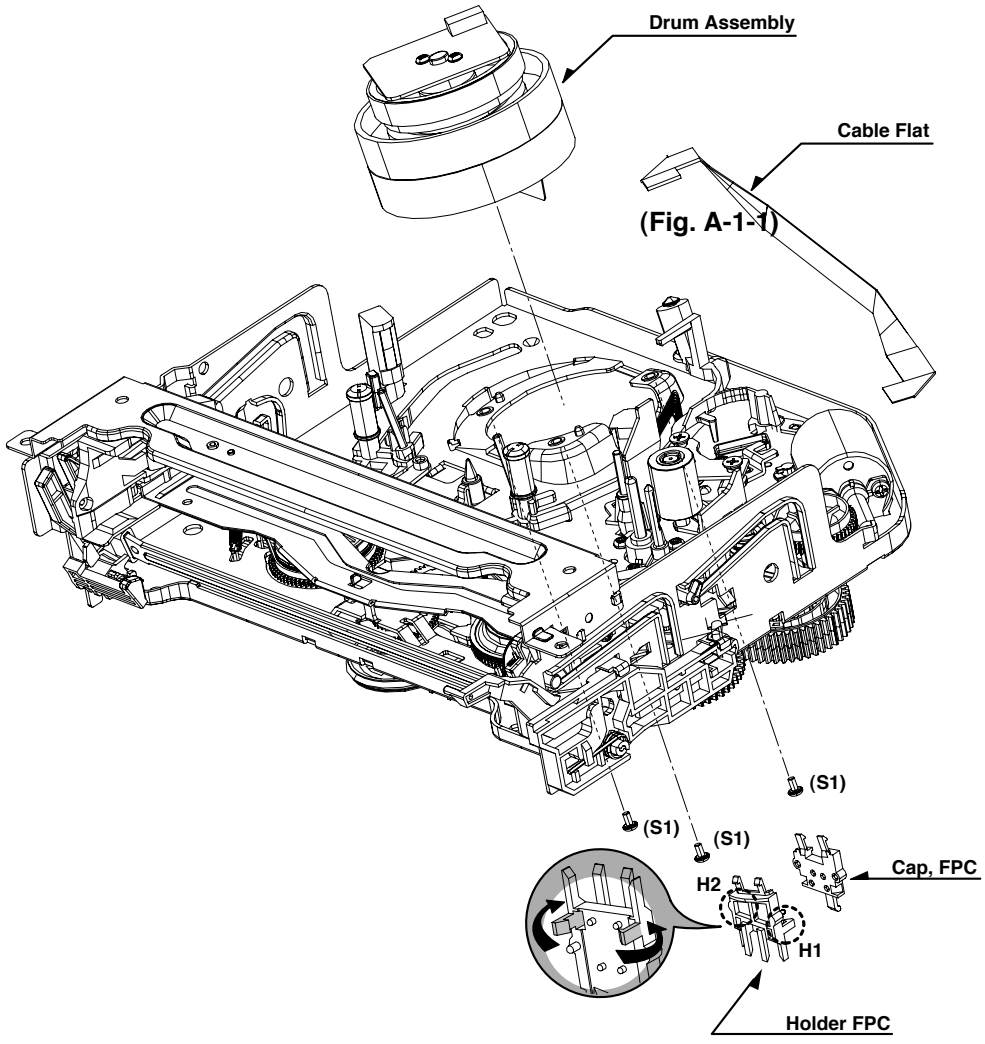
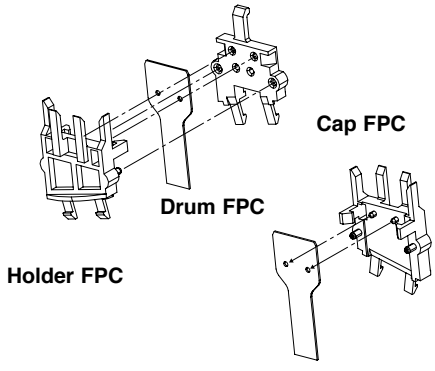


Fig. A-1

1. Disassembly of Drum Assembly (Figure A-1)

1) Separate cable flat from the Drum FPC and the Capstan Motor.
2) Release 3 screws (S1) on the bottom side of the chassis, and separate the drum assembly.
3) Release the hooks (H1, H2) and separate both the holder FPC and the Cap FPC (disassemble if necessary).

Cautions in assembly of FPC



Assembly shape seen in the reverse direction

DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

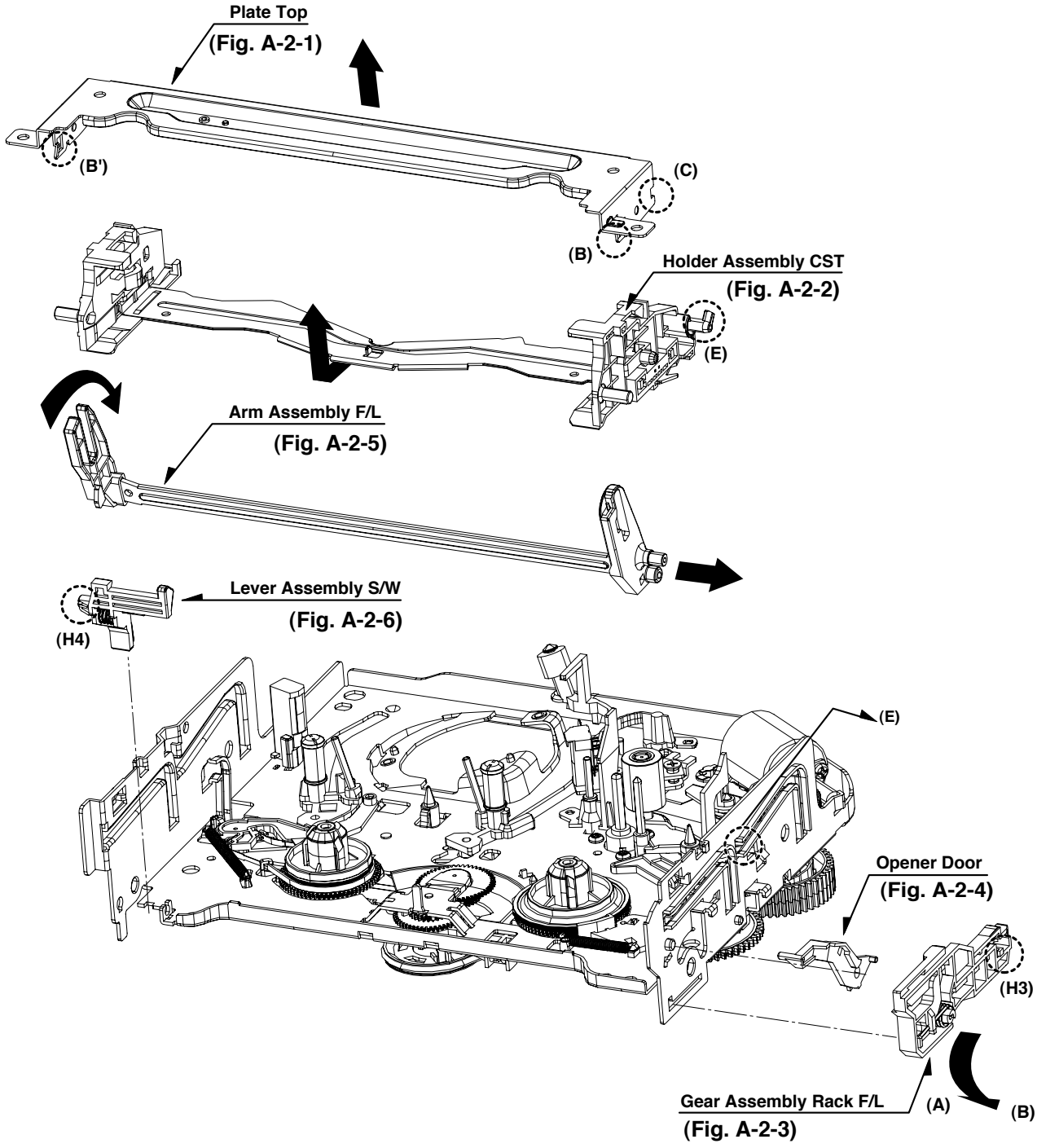


Fig. A-2

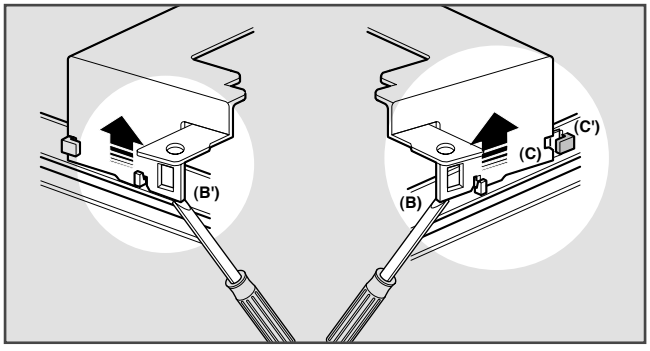
DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

2. Disassembly of Plate Top (Fig. A-2-1)

1) Separate the right part while leaning back the (B) part of the plate top toward the arrow direction.
2) Separate the left part while leaning back the (B') part of the plate top toward the arrow direction.
(Tool used: Tool such as (-) driver, auger, etc with pointed or flat end)

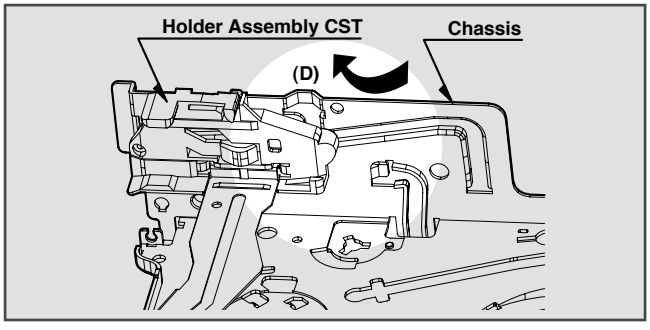
CAUTIONS

Assemble while pressing the (C), (C') part after corresponding them as in drawing.



3. Holder Assembly CST (Fig. A-2-2)

1) Firstly separate the left part from the groove on the (D) part of chassis while moving the holder assembly CST toward the arrow direction.



2) Separate the right part from each groove of chassis

CAUTIONS

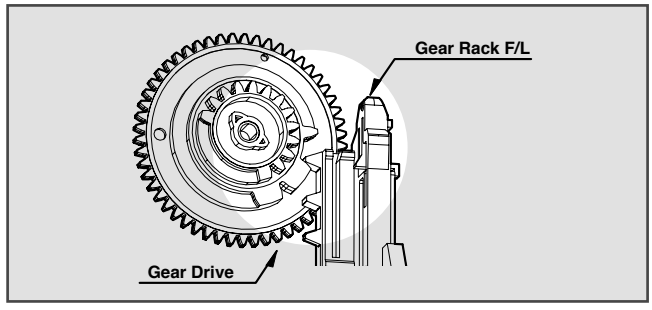
Assemble by inserting the left part after firstly inserting the (E) part of the holder assembly CST into the groove on the (E') part of chassis.

4. Disassembly of Gear Assembly Rack F/L (Fig. A-2-3)

1) Separate the hook (H3) while leaning ahead the hook (3) after moving the gear assembly rack F/L toward the arrow (A) direction.
2) Separate the gear assembly rack F/L toward the arrow (B) direction.

CAUTIONS

For the assembly, correspond the gear part of gear assembly rack F/L to the gear drive.



5. Opener Door (Fig. A-2-4)

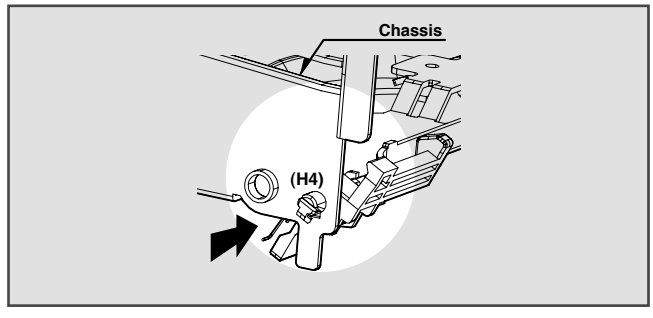
1) Separate the opener door ahead from the guide hole of chassis while turning it clockwise.

6. Arm Assembly F/L (Fig. A-2-5)

1) Firstly separate the left part of the arm assembly F/L from the groove of chassis while pushing the arm assembly F/L toward the arrow direction.
2) Separate the right part from the groove of chassis.).

7. Lever Assembly S/W (Fig. A-2-6)

1) Separate the lever assembly S/W while pushing it toward the arrow direction after removing the hook (4) on the left side of chassis.



DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

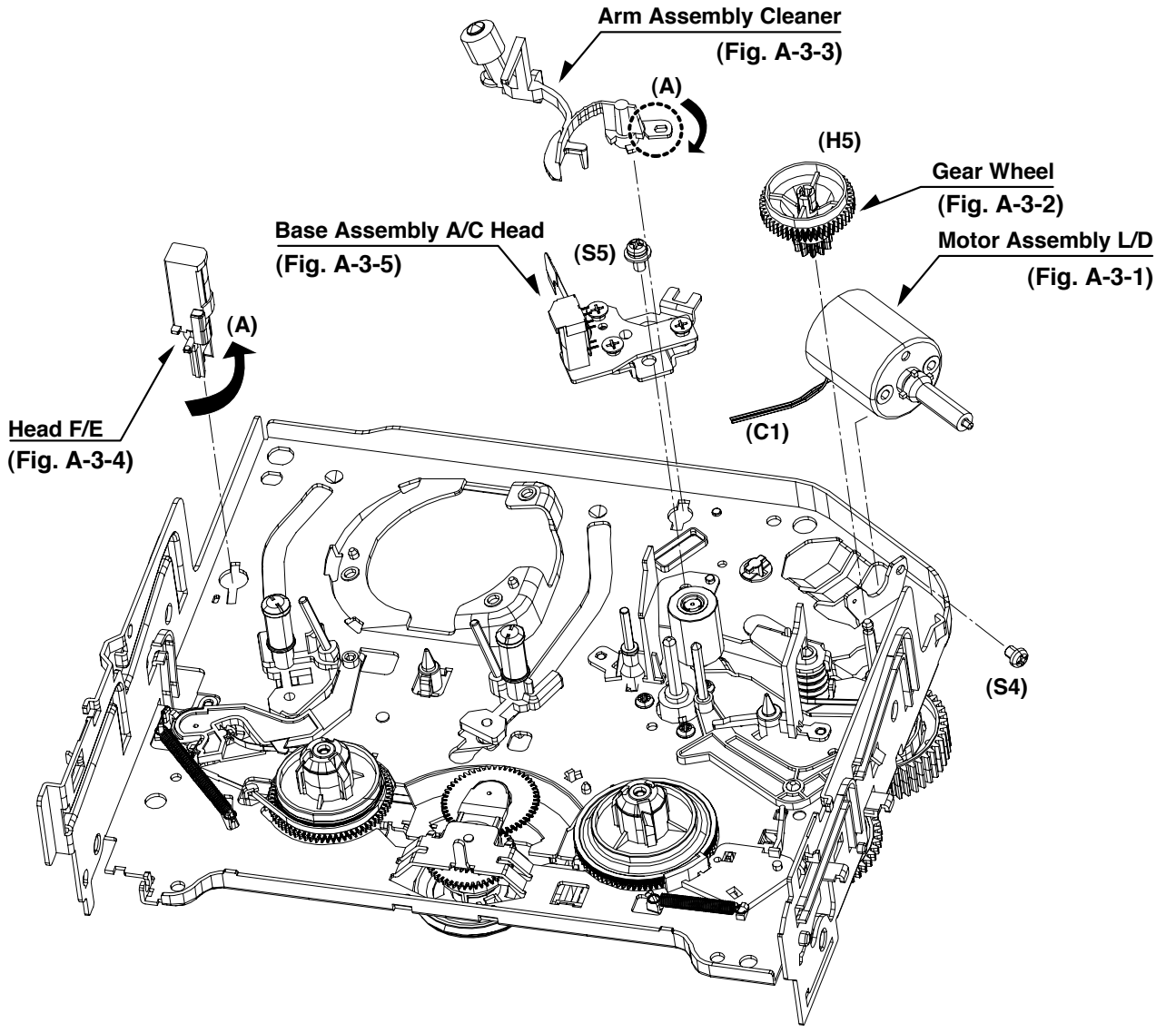


Fig. A-3

8. Motor Assembly L/D (Fig. A-3-1)

1) Take the connector (C1) connected to the Capstan motor PCB out.
2) Remove a screw (S4) of the chassis (S4) and step backward, and disassemble it while holding it up.

9. Gear Wheel (Fig. A-3-2)

1) Release the hook (H5) of the gear wheel and disassemble it upward.

10. Arm Assembly Cleaner (Fig. A-3-3)

1) Separate the (A) part of Fig. A-3-1 from the embossing of chassis, and hold it up while turning it anti-clockwise.

11. Head F/E (Fig. A-3-4)

1) Separate the (A) part of the head F/E from the embossing of chassis, and hold it up while turning it anti-clockwise.

12. Base Assembly A/C Head (Fig. A-3-5)

1) Release a screw (S5) and disassemble while holding it up.

DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

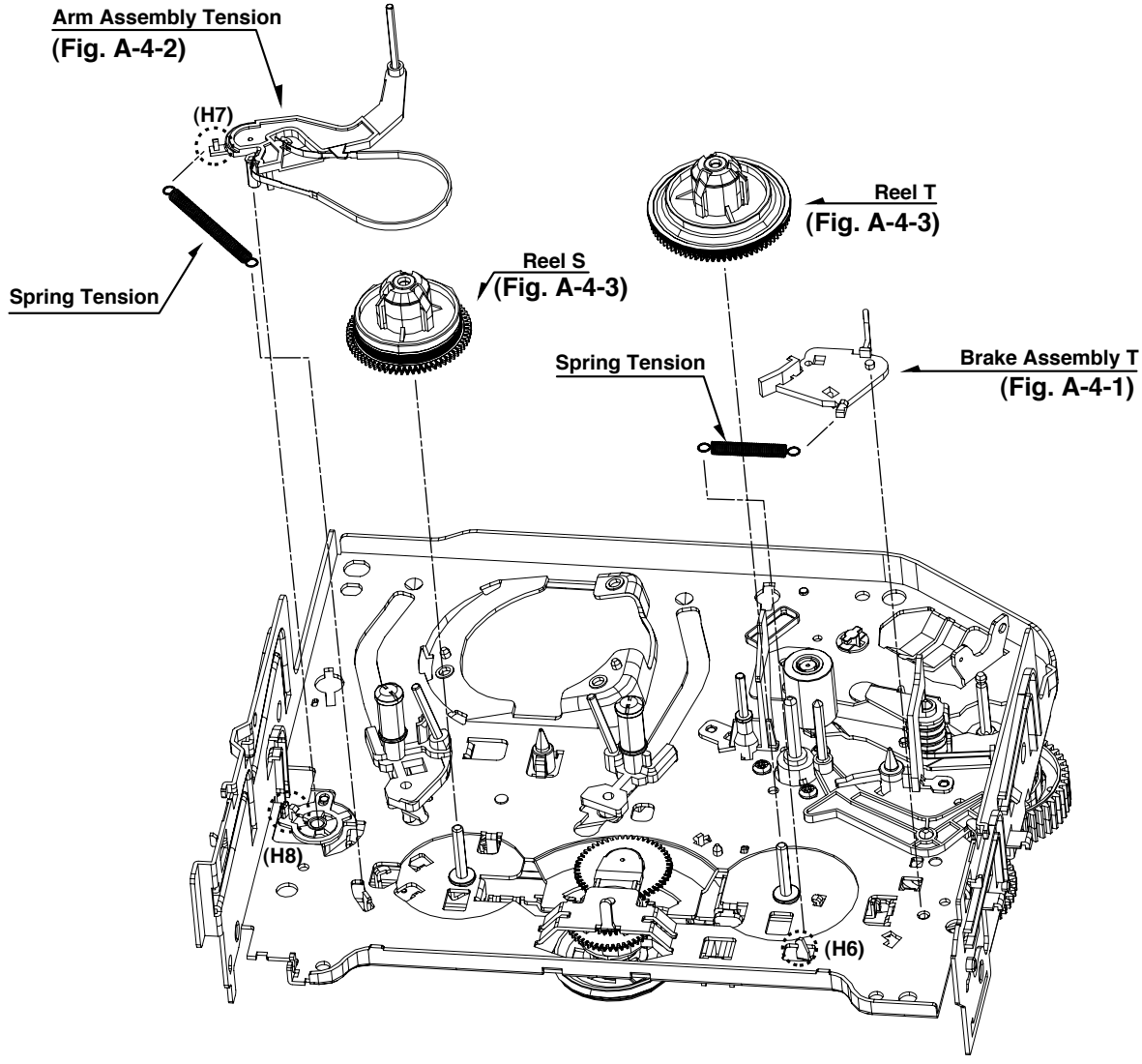


Fig. A-4

13. Brake Assembly T (Fig. A-4-1)

1) Release the spring tension from the lever spring hook (H6).
2) Disassemble the brake assembly T while holding it upward.

14. Arm Assembly Tension (Fig. A-4-2)

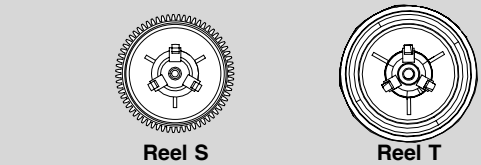
1) Release the spring tension the hook (H7) from the arm assembly tension.
2) After releasing the hook (H8) of the base tension, separate it while holding it up.

CAUTIONS

Spring used for both brake assembly T and arm assembly tension is used (2EA used).

15. Reel S/Reel T (Fig. A-4-3)

1) Disassemble the reel S/ reel T while holding it up (comparison between Reel S and Reel T)



DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

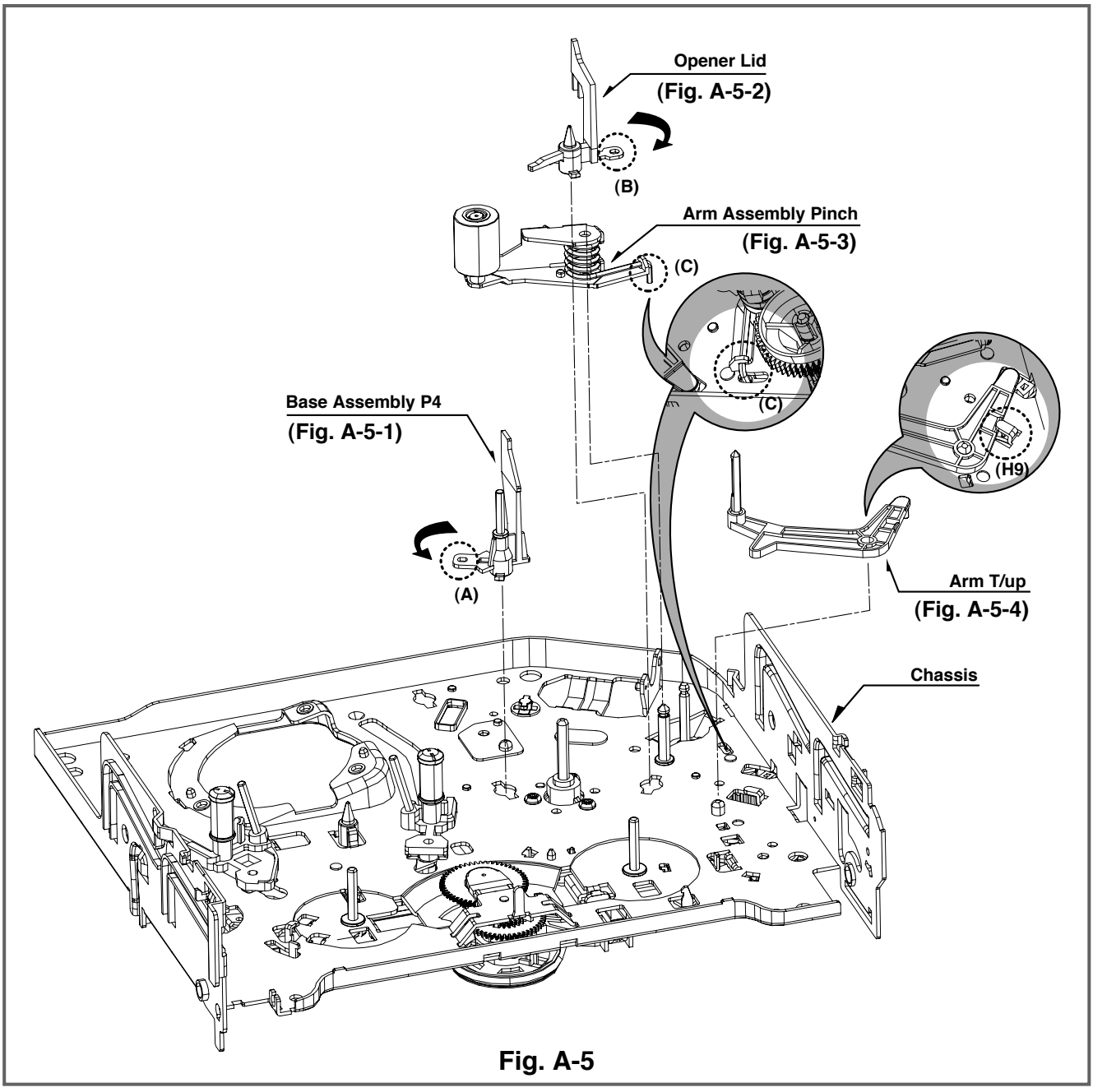


Fig. A-5

16. Base Assembly P4 (Fig. A-5-1)

1) Release the (A) part of the base assembly P4 from the embossing of chassis.
2) Hold the base assembly P4 up while turning it anti-clockwise.

17. Opener Lid (Fig. A-5-2)

1) Release the (B) part of the opener lid from the embossing of chassis.
2) Disassemble the opener lid upward while turning it anti-clockwise.

18. Arm Assembly Pinch (Fig. A-5-3))

1) Hold the arm assembly pinch up.

19. Arm T/up (Fig. A-5-4)

1) Turn the arm T/up to release the anchor jaw (H9) part of chassis and then hold it upward.

CAUTIONS

For the assembly, check the (C) part of the arm assembly pinch is assembled as in drawing.

- REVERSE THE MECHANISM.

DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

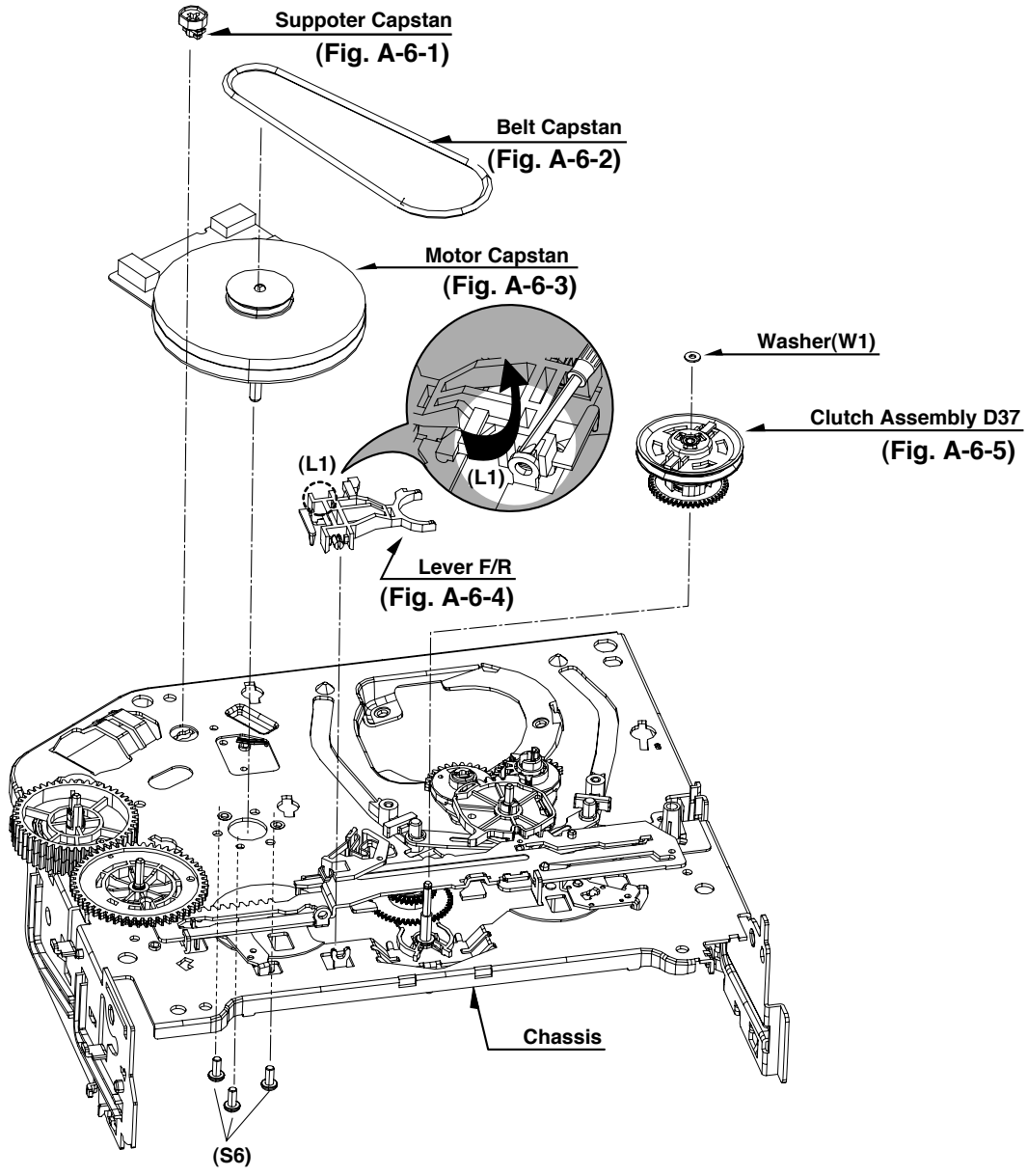


Fig. A-6

20. Supporter, Capstan (Fig. A-6-1)

1) Turn the supporter and Capstan by 90 deg. clockwise with a driver for disassembly.

21. Belt Capstan (Fig. A-6-2) / Motor Capstan (Fig. A-6-3)

1) Separate the belt Capstan.
2) Undo 3 screws (S6) on the bottom side of chassis and disassemble it upward.

22. Lever F/R (Fig. A-6-4)

1) Release the locking tab (L1) and then disassemble it upward.

23. Clutch Assembly D37 (Fig. A-6-5)

1) Remove the washer (W1) and then disassemble it upward.

DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

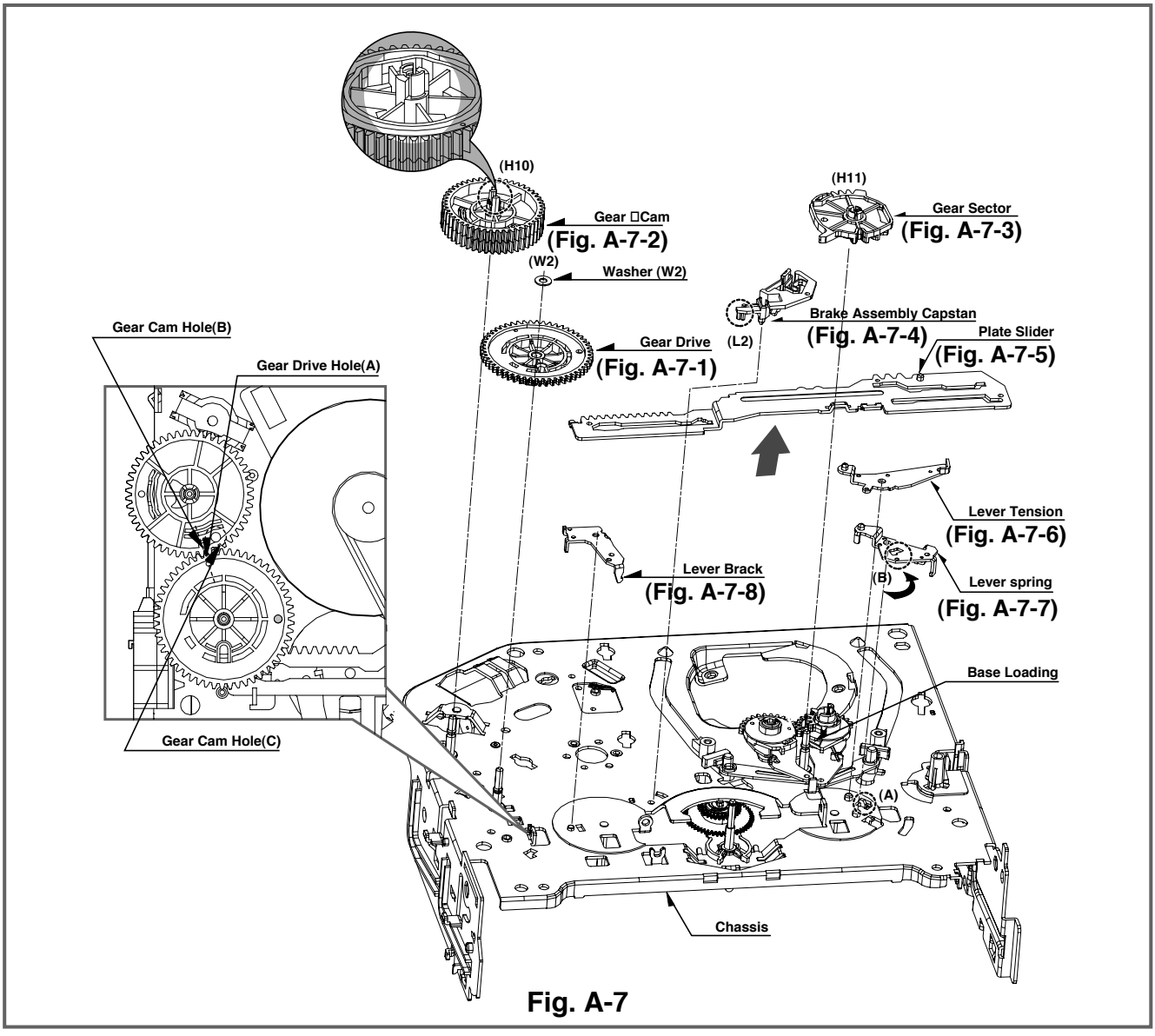


Fig. A-7

24. Gear Drive (Fig. A-7-1)/ Gear Cam (Fig. A-7-2)

1) Remove the washer (W2) and then disassemble the gear drive.
2) Release the hook (H10) of the gear cam and then disassemble it upward.

CAUTIONS

For the assembly, adjust both the gear driver hole (A) and the gear cam hole (B) straightly and then correspond the gear cam hole (C) to the chassis hole.

25. Gear Sector (Fig. A-7-3)

1) Release the hook (H11) of the gear sector and then hold the gear sector upward.

26. Brake Assembly Capstan (Fig. A-7-4)

1) Release the locking tab (L2) on the bottom side of the plate slider and then disassemble it upward.

27. Plate Slider (Fig. A-7-5)

1) Disassemble the plate slider while holding it up.

28. Lever Tension (Fig. A-7-6)

1) Release the lever tension from the guide (A) of chassis while turning it anti-clockwise.
2) Disassemble the lever tension while holding it up.

29. Lever Spring (Fig. A-7-7)

1) Release the (B) part of the lever spring from the guide (A) of chassis while turning it anti-clockwise.
2) Disassemble the lever tension while holding it up.

30. Lever Brake (Fig. A-7-8)

1) Disassemble the lever brake while holding it up.

DECK MECHANISM DISASSEMBLY

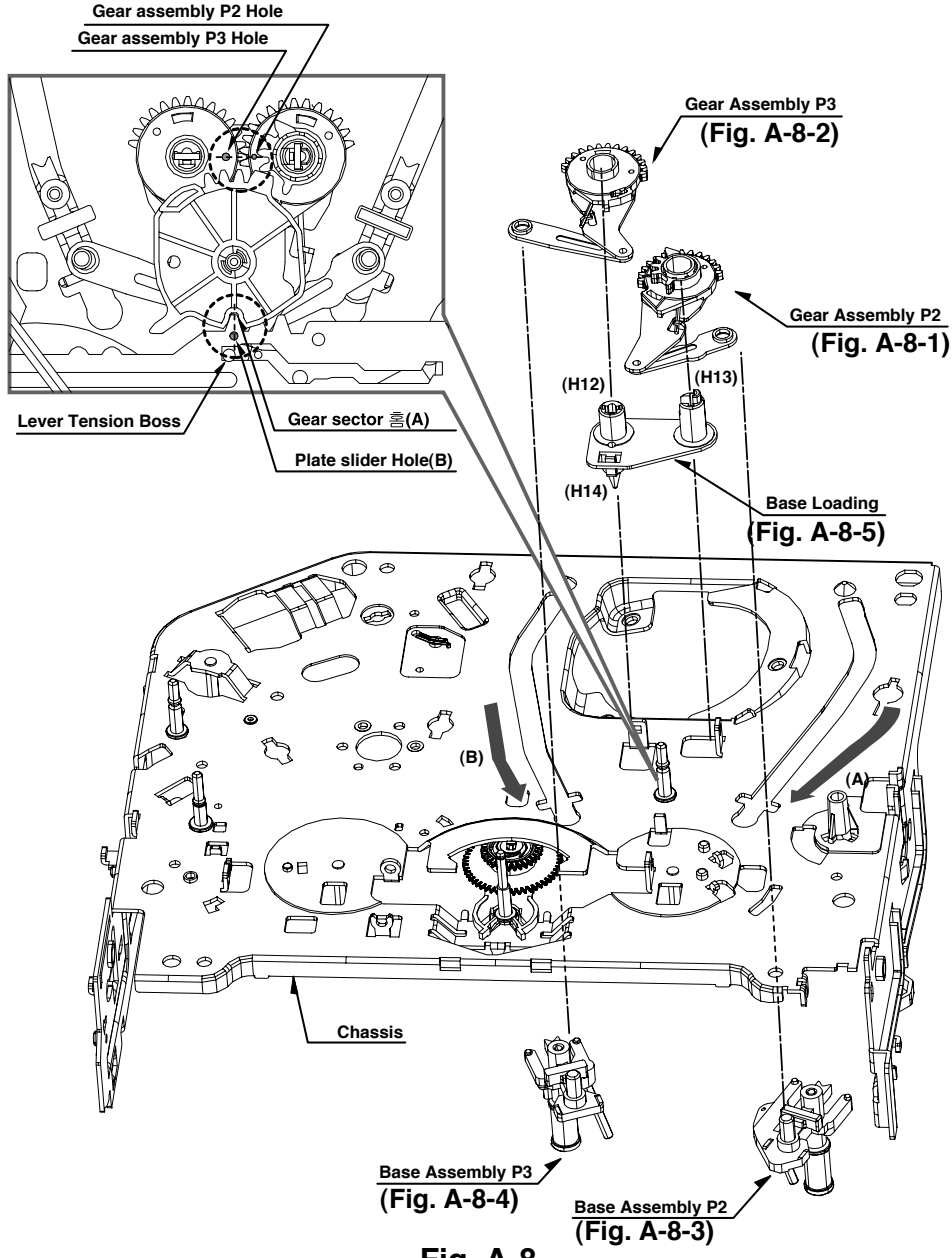


Fig. A-8

31. Gear Assembly P2 (Fig. A-8-1)/ Gear Assembly P3 (Fig. A-8-2)

1) Hold the gear assembly P2 upward.
2) Hold the gear assembly P3 upward.

CAUTIONS

For the assembly, check the holes of both the gear assembly P2 and the P3 are adjusted straightly, and then correspond the gear section groove (A) to the plate slider hole (B).

32. Base Assembly P2 (Fig. A-8-3)/ Base Assembly P3 (Fig. A-8-4)

1) Disassemble the base assembly P2 downward while moving it toward the arrow (A) direction along with the guide hole of chassis.
2) Disassemble the base assembly P2 downward while moving it toward the arrow (B) direction along with the guide hole of chassis.

33. Base Loading (Fig. A-8-5)

1) Release 3 hooks (H12, 13, 14) of the base loading, and then disassemble them upward.
   - Reverse the mechanism.

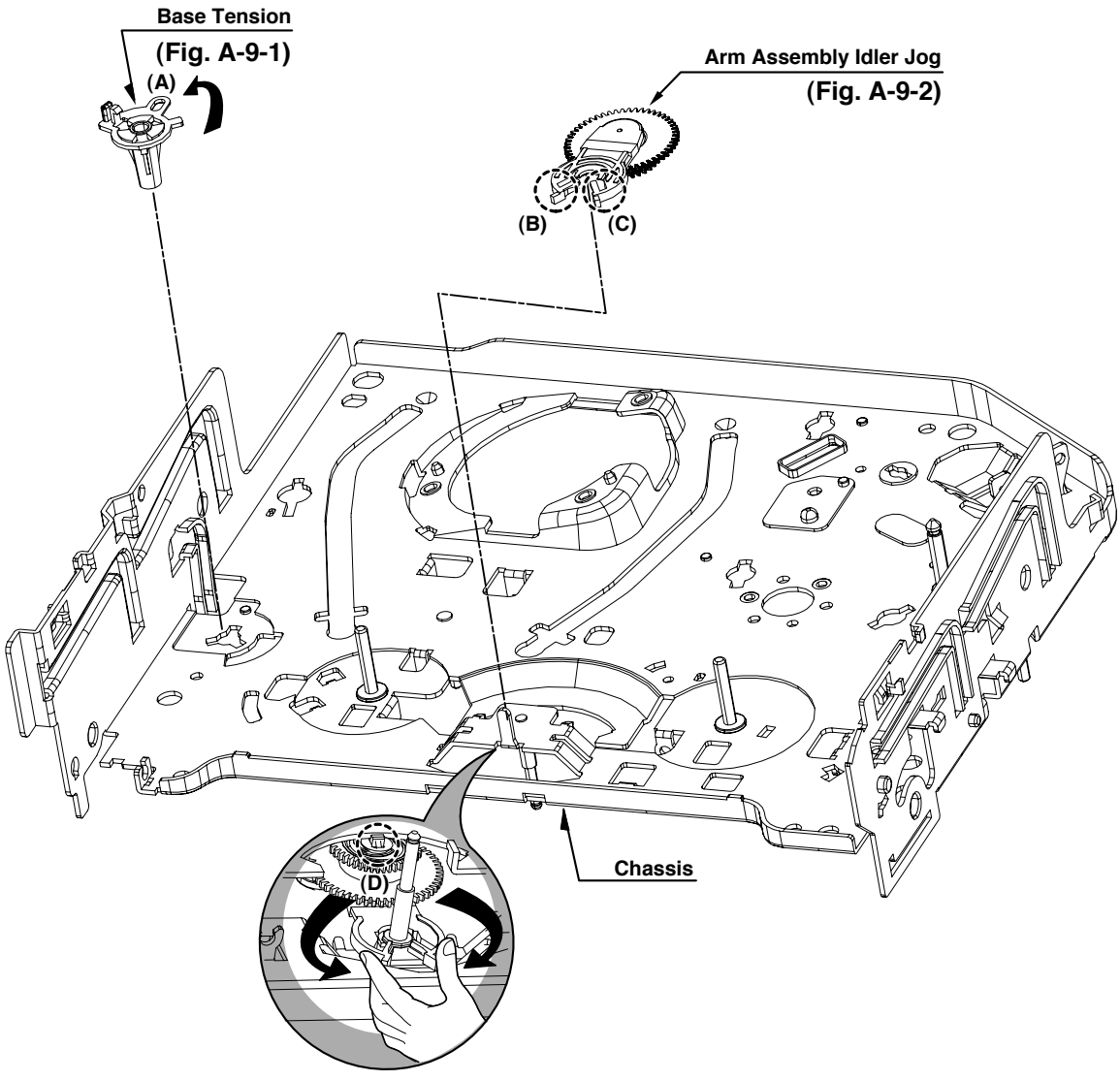


Fig. A-9

34. Base Tension (Fig. A-9-1)

1) Release the (A) part of the base tension from the embossing of chassis.
2) Hold the base tension upward while turning it anti-clockwise.

35. Arm assembly Idler Jog (Fig. A-9-2)

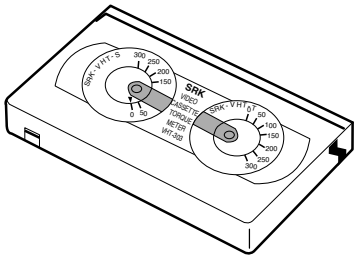
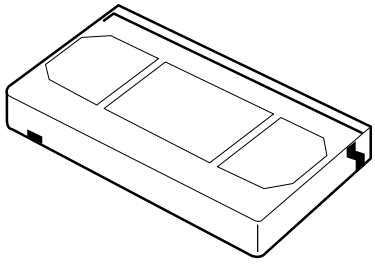
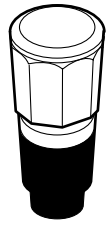
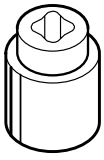
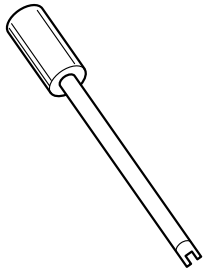
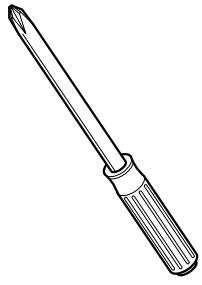
1) Push both (B), (C) parts in Fig. A-9-2 toward the arrow direction.
2) Disassemble the arm assembly idler upward.

CAUTIONS

Take care to ensure that the (D) part in the drawing is not hung to chassis in disassembly.

DECK MECHANISM ADJUSTMENT

• Fixtures and Tools for Service

1. Cassette Torque Meter **SRK-VHT-303(Not SVC part)** **Part No:D00-D006** 	**2. Alignment tape** **Part No NTSC:DTN-0001** **PAL:DTN-0002** 	**3. Torque gauge** **600g.Cm ATG** **Part No:D00-D002** 
4. Torque gauge adaptor **Part No:D09-R001** 	**5. Post height adjusting driver** **Part No:DTL-0005** 	**6. + Type driver (ø5)** 

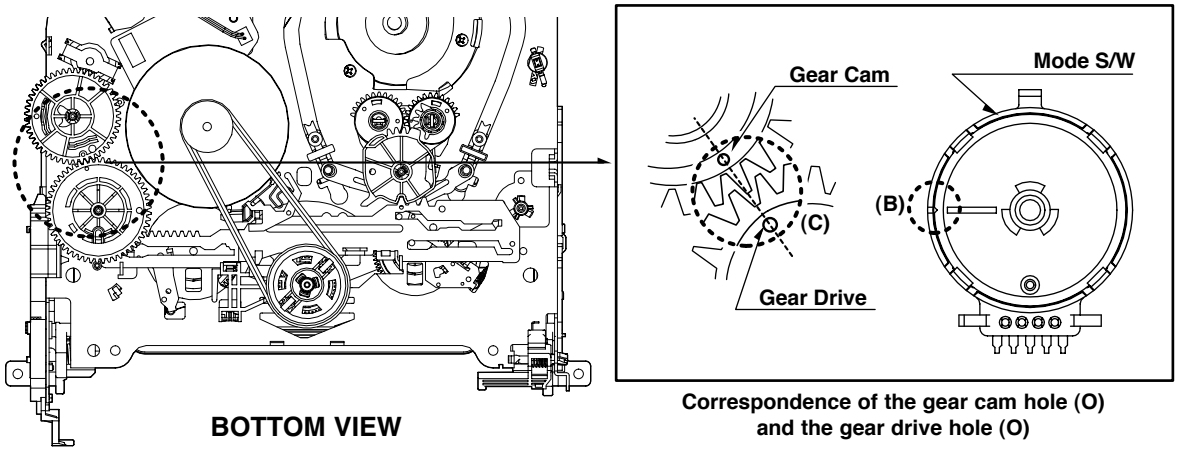
DECK MECHANISM ADJUSTMENT

1. Mechanism Assembly Mode Check

Purpose of adjustment : To make tools normally operate by positioning tools accurately.		
Fixtures and tools used	**VCR (VCP) status**	**Checking Position**
• Blank Tape (empty tape)	• Eject Mode (with cassette withdrawn)	• Mechanism and Mode Switch

1) Turn the VCR on and take the tape out by pressing the eject button.
2) Separate both top cover and plate top, and check both the hole (A) of gear cam and the hole (A') of chassis correspond (Fig. C-2).
3) If it is done as in the paragraph 2): Turn the gear cam as in No.2) after mantling the motor assembly L/D.
4) Undo the screw fixing the deck and the main frame, and separate the deck assembly. Check both the hole (A) of gear cam and the hole (A') of chassis correspond (Fig. C-1).
5) Check the mode S/W on the main P.C. board locates at a proper position as in (B) of the Fig. (C-1).
6) Connect the deck to the main P.C. board and perform all types of test.

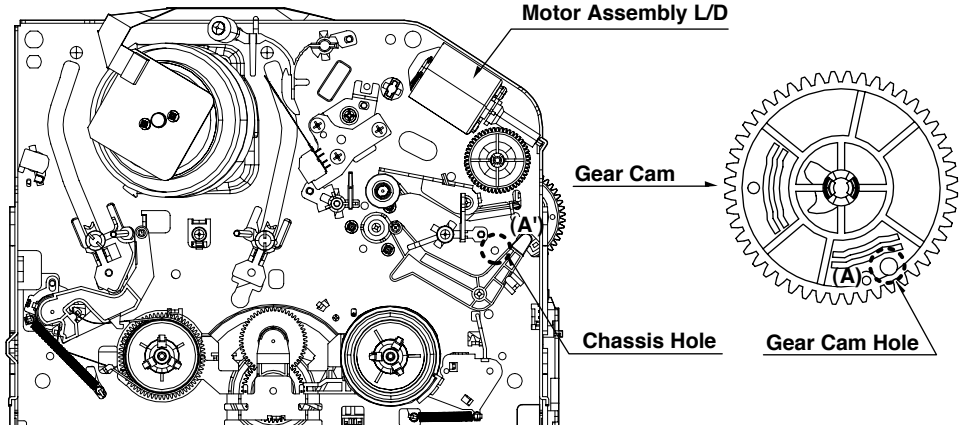
CHECK DIAGRAM



BOTTOM VIEW

Correspondence of the gear cam hole (O) and the gear drive hole (O)

Fig. C-1



TOP VIEW

Fig. C-2

DECK MECHANISM ADJUSTMENT

2. Previous Preparation for Deck Adjustment

(Preparation to load the VCR (VCP) with cassette tape not inserted)

1) Take the power cord from the consent.
2) Separate the top cover and the plate assembly top.
3) Insert the power cord into again.
4) Turn the VCR (VCP) on and load the cassette while pushing the lever stopper of the holder assembly CST backward. In this case, clog both holes on the housing rail part of chassis to prevent detection of the end sensor.

If doing so, proceeding to the stop mode is done. In this status, input signals of all modes can be received. However, operation of the Rewind and the Review is impossible since the take-up reel remains at stop status and so cannot detect the reel pulse (however, possible for several seconds).

3. Torque Measuring

Purpose of Measuring : To measure and check the reel torque on the take-up part and the supply part that performs basic operation of the VCR (VCP) for smoothly forwarding the tape.
Measure and check followings when the tape is not smoothly wound or the tape velocity is abnormally proceeded:

Fixtures and tools used	VCR (VCP) status	Measuring method
• Torque Gauge (600 g.cm ATG) • Torque Gauge Adaptor • Cassette Torque Meter SRK-VHT-303	• Play (FF) or Review (REW) Mode	• Try to operate the VCR (VCP) per mode with the tape not inserted (See '2. Prior Preparation for Deck Adjustment). • Measure after adhering and fixing the torque gauge adaptor to the torque gauge (Fig. C-3-1) • Read scale of the supply or take-up part of the cassette torque meter (Fig. C-3-2).

Item	Mode	Instruments	Reel Measured	Measuring Value
Fast forward Torque	Fast Forward	Torque Gauge	Take-Up Reel	More than 400g°cm
Rewind Torque	Rewind	Torque Gauge	Supply Reel	More than 400g°cm
Play Take-Up Torque	Play	VHT-303	Take-Up Reel	40~100g°cm
Review Torque	Review	VHT-303	Supply Reel	120~210g°cm

NOTE

Adhere the torque gauge adaptor to the torque gauge for measuring the value.

• Torque Gauge (600g.cm ATG)

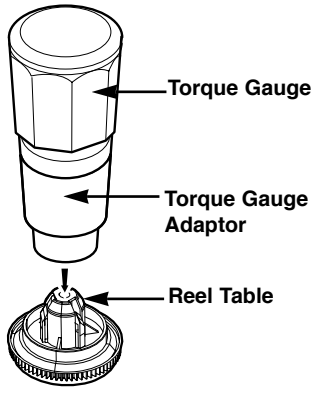


Fig. C-3-1

• Cassette Torque Meter (SRK-VHT-303)

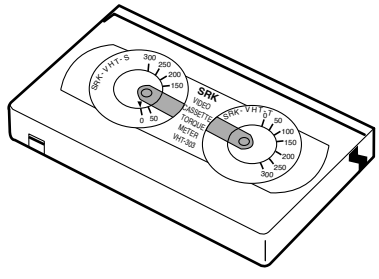


Fig. C-3-2

DECK MECHANISM ADJUSTMENT

4. Guide Roller Height Adjustment

Purpose of adjustment : To ensure that the bottom surface of the tape can travel along with the tape lead line of the lower drum by constantly and adjusting and maintaining the height of the tape.

4-1. Prior Adjustment

Fixtures and tools used	VCR (VCP) status	Adjustment position
• Post Height Adjusting Driver	• Play or Review Mode	• The guide roller height adjusting screw on the supply guide roller and the take-up guide roller

Adjustment Procedure

1) Travel the tape and check the bottom surface of the tape travels along with the guide line of the lower drum.
2) If the tape travels toward the lower part of guide line on the lower drum, turn the guide roller height adjusting screw to the left
3) If it travels to the upper part, turn it to the right.
4) Adjust the height of the guide roller to ensure that the tape is guided on the guide line of the lower drum at the inlet/outlet of the drum. (Fig. C-4-1)

ADJUSTMENT DIAGRAM

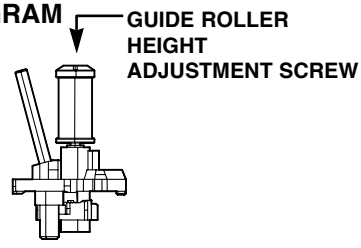


Fig. C-4-1

4-2. Fine Adjustment

Fixtures and tools used	Measuring tools and connection position	VCR (VCP) status	Adjustment position
• Oscilloscope • Standard test tape • Post height adjusting driver	• CH-1: PB RF Envelope • CH-2: NTSC : SW 30Hz PAL : SW 25Hz • Head switching output point • RF Envelope output point	• Play the standard test tape.	• Guide roller height adjusting screw

1) Play the standard test tape after connecting the probe of oscilloscope to the RF envelope output point and the head switching output point.
2) Tracking control (playback) : Locate it at the center (Set the RF output to the maximum value via the tracking control when such adjustment is completed after the drum assembly is replaced.)
3) Height adjusting screw: Flatten the RF waveform. (Fig. C-4-2)
4) Move the tracking control (playback) to the right/left. (Fig. C-4-3)
5) Check the start and the end of the RF output reduction width are constant.

CAUTIONS

There must exist no crumpling and folding of the tape due to excess adjustment or insufficient adjustment.

Waveform

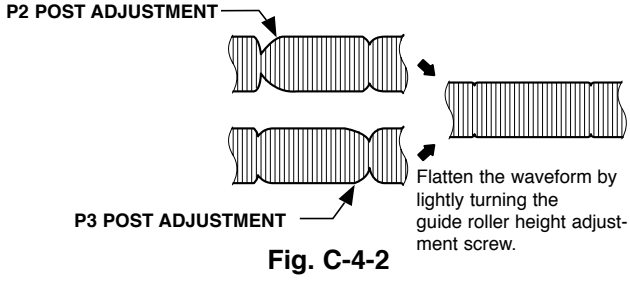


Fig. C-4-2

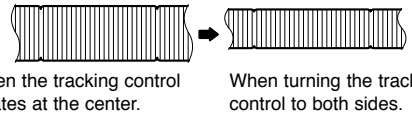
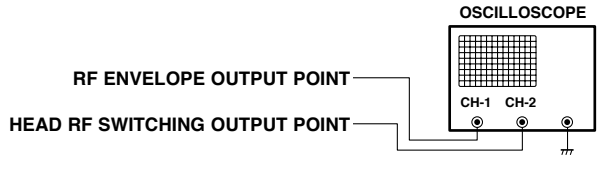


Fig. C-4-2

Connection Diagram



DECK MECHANISM ADJUSTMENT

5. Audio/Control (A/C) Head Adjustment

Purpose of adjustment : To ensure that audio and control signals can be recorded and played according to the contract tract by constantly maintaining distance between tape and head, and tape tension between the P3 post and the P4 post.

5-1. Prior Adjustment (performed only when no audio output appears in play of the standard test tape)

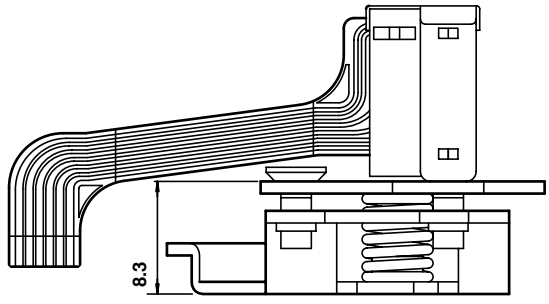
Fixtures and tools used	VCR (VCP) status	Adjustment position
• Blank Tape (Empty Tape) • Driver (+) Type ø 5	• Play the blank tape (empty tape).	• Tilt adjusting screw (C) • Height adjusting screw (B) • Azimuth adjusting screw (A)

Adjustment Procedure/Adjustment Diagrams

1) Basically use the A/C head assembly adjusted as in SPEC.
2) Check there is crumpling and folding of the tape around the A/C head. If it is, Turn and adjust the tilt adjusting screw to ensure that the tape corresponds to the bottom guide of the P4, and recheck the tape path after proceeding play for 4-5 seconds.
3) Where the tape bottom is not equal to Fig. C-5-3, Adjust the height by using the height adjusting screw (B) and then readjust it by using the tilt adjusting screw (C).

CAUTIONS

Always check the height of the A/C head since most ideal height of A/C head can be obtained when the bottom part of the tape is away 0.2 ~ 0.25mm from the bottom part of the A/C head.



A/C Head Base

Fig. C-5-1

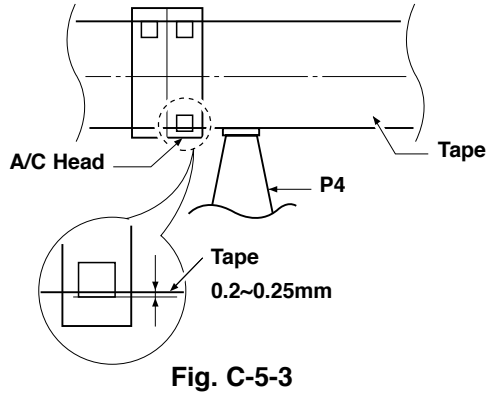
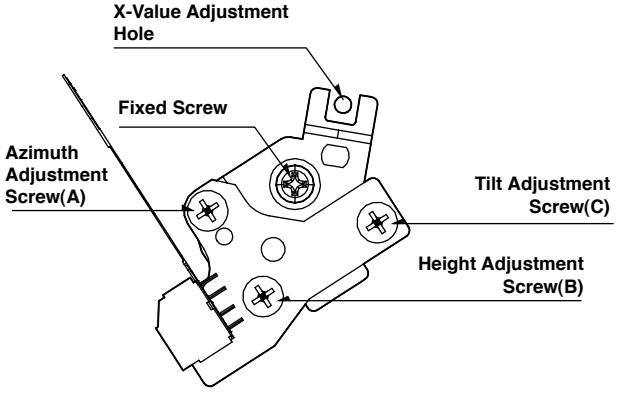


Fig. C-5-3



A/C Head Assembly

Fig. C-5-2

DECK MECHANISM ADJUSTMENT

5-2. Tape Path Check between Pinch Roller and Take up Guide (Check in the Rev Mode)

1) Check the tape pass status between the pinch roller and the take-up guide.(Check there is crumpling of the tape pass and folding of the take-up guide.)
   (1) When holding of the take-up guide bottom occurs Turn the tilt adjusting screw (C) clockwise and travel it stably to ensure there is no crumbling or folding of the tape.
   (2) When holding of the take-up guide top occurs Turn the tilt adjusting screw (C) anti-clockwise and travel it stably to ensure there is no crumbling or folding of the tape.

2) Check there is folding of the tape at the bottom or top of the take-up guide in cutting-off the REV mode

CAUTIONS

If the RF waveform is changed after adjusting the A/C head, perform fine adjustment to ensure the RF waveform is flattened.

5-3. Fine Adjustment (Azimuth Adjustment)

Fixtures and tools used	Connection position	VCR (VCP) status	Adjustment position
• Oscilloscope • Standard test tape (only for SP) • Driver (+) Type Ø 4	• Audio Output Jack	• Play the standard test • Tape, 1KHz, 7KHz.	• Azimuth Adjusting Screw (A) • Height Adjusting Screw (B)

Adjustment Procedure

1) Connect the probe of Oscilloscope to the audio output jack.
2) Ensure that Audio 1KHz, 7KHz output is flattened at the maximization point by adjusting the Azimuth adjusting screw (A).

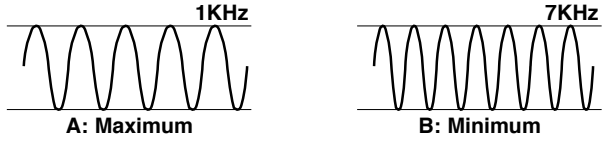
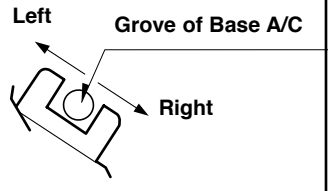


Fig. C-5-4

6. X-distance Adjustment

Purpose of adjustment : To maintain compatibility with other VCR (VCP).

Fixtures and tools used	Connection position	VCR (VCP) status	Adjustment position
• Oscilloscope • Standard test tape (only for SP) • Driver (+) Type Ø 4	• CH-1: PB RF Envelope • CH-2: NTSC ; SW 30Hz PAL:SW 25Hz • Head switching output point • RF Envelope output point	• Play the standard test tape.	

Adjustment Procedure

1) After releasing the auto tracking, lightly turn the fixing screw. Turn the (+) type driver (Ø 3 ~ Ø 4) on the X-distance adjusting hole to the right or left. Adjust the RF envelope level to the maximum point and then fix the fixing screws.
2) For the 31mm head, adjust it with the SP tape recorded in the width of 31mm since the head travels on the tape track only for SP with the width of 58mm.

Connection Diagram

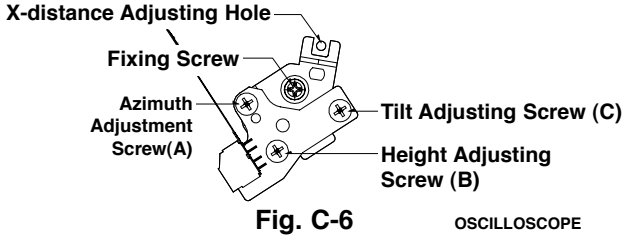
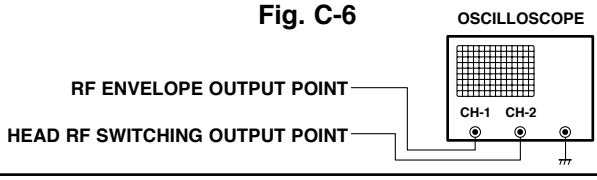


Fig. C-6



DECK MECHANISM ADJUSTMENT

7. Adjustment after Drum Assembly (Video Heads)

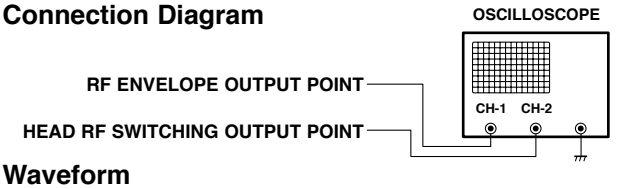
Purpose of adjustment : To adjust and stabilize the height change, X-distance change, etc depending on the guide roller after assembling the drum.

Fixtures and tools used	Connection position	VCR (VCP) status	Adjustment position
• Oscilloscope • Standard test tape (only for SP) • Post Height Adjusting Driver • Driver (+) Type Ø 5	• CH-1: PB RF Envelope • CH-2: NTSC : SW 30Hz PAL:SW 25Hz • Head switching output point • RF Envelope output point	• Play the blank tape. • Play the standard test tape.	• Fine adjustment of guide roller • Switching Point • Tracking Preset • X-distance

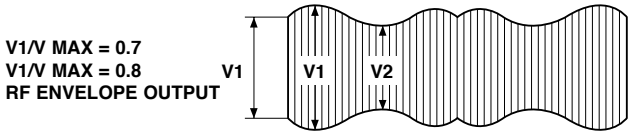
Checking/Adjustment Procedure

1) Play the blank tape (empty tape) and check whether the guide roller crumbles or wrinkles the tape and adjust it if necessary.
2) Check that the RF envelope output waveform is flat, and adjust the height of the guide roller while playing the standard test tape.
3) Adjust the switching point.
4) Check the RF envelope output is the maximum when the tracking control locates at the center. If not maximum, set up to ensure that RF envelope output becomes the maximum by turning the (+) type driver (Ø 3 ~ Ø 4) on the base A/C groove.

Connection Diagram



Waveform



8. Check of Traveling Device after Deck Assembly

8-1. Audio, RF Normalization Time (Locking Time) Check in Play after CUE or REV

Fixtures and tools used	Measuring standard	Connection position	VCR (VCP) status
• Oscilloscope • 6H 3KHz Color Bar Standard Test tape • Stop Watch	• RF Locking Time: Within 5 seconds • Audio Locking Time : Within 10 seconds	• CH-1: PB RF Envelope • CH-2: Audio output • RF Envelope output point • Audio output jack	• Play the 6H 3KHz Color Bar Standard Test tape.

Checking Procedure

1) Check that locking time of the RF and Audio waveform is fallen within the measuring standard in conversion of the play mode from the CUE or the REV mode.
2) Readjust the paragraph 5 and 6 if it deviates from the standard.

8-2. Check of Tape Curl and Jam Status

Fixtures and tools used	Fixtures and tools used	Fixtures and tools used
• T-160 Tape • T-120 Tape	• There must be no jam or curl at the first, middle and end position of tape.	• Travel the tape at the position of its first and end.

Checking Procedure

1) Check there is no abnormality of every traveling post status.
2) There must be no abnormal operation of the counter in occurrence of folding of the bottom tape. There must be not abnormality of audio signal in damage of the top tape.
3) If there is abnormality, readjust the adjustment paragraph 4 and 5.

1. Checking Points prior to Repair

Following abnormal phenomena may be repaired by removal of foreign materials and oil supply. Check oiling is required at the checking set or cleaning status is complete. Determine that necessity of checking and repair the set exists after checking the using period of the set together with the user. In this case, followings must be checked:

Phenomena	Checking Points and Cause	Replace-ment
Color beat	Pollution of Full-Erase Head	o
S/N, Color Faded	Pollution of Video Head	o
Horizontal, Vertical Jitte	Pollution of Video Head or Tape Transport System	o
Poor Sound, Low Sound	Pollution of Audio/Control Head	o
No tape wound or tape wound loosely. FF or REW impossible, or slow turning	Pollution of Pinch Roller or Belt Capstan Belt	o
Tape loosely wound in REV or Unloading	Deterioration of Clutch Assembly D37 Torque	o
	Pollution of Drum and Traveling Device	Fig. C-9-3

CAUTIONS

If operation of the position with (O) mark is abnormal even after removing cause, replace it with substitute product since it shows damage or wearing.

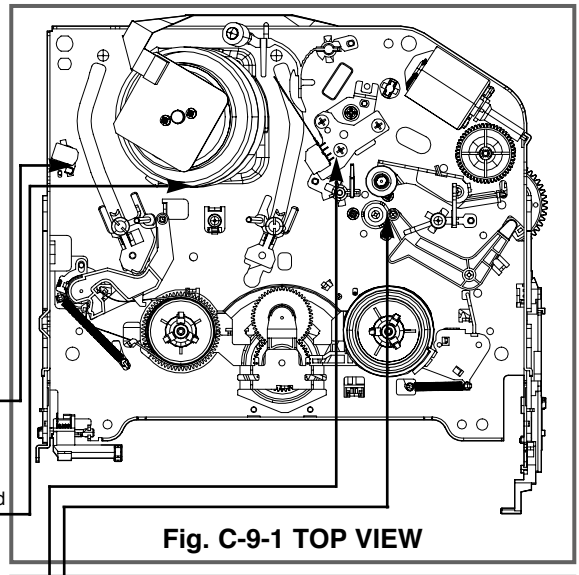


Fig. C-9-1 TOP VIEW

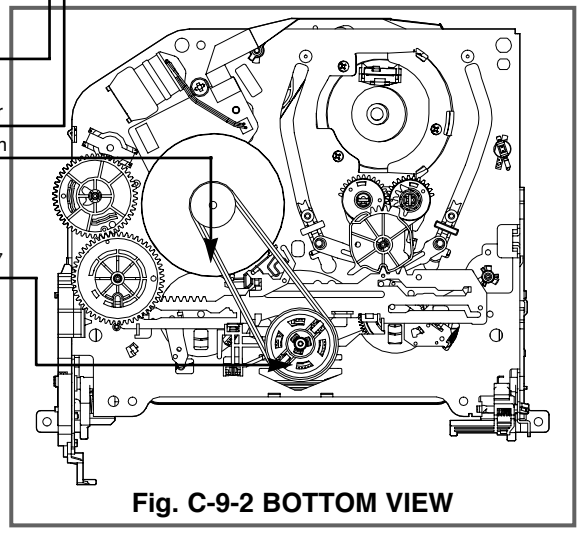


Fig. C-9-2 BOTTOM VIEW

*** No. (1) ~ (12) shows sequence that the tape moves from the supply reel to the take-up reel.)**

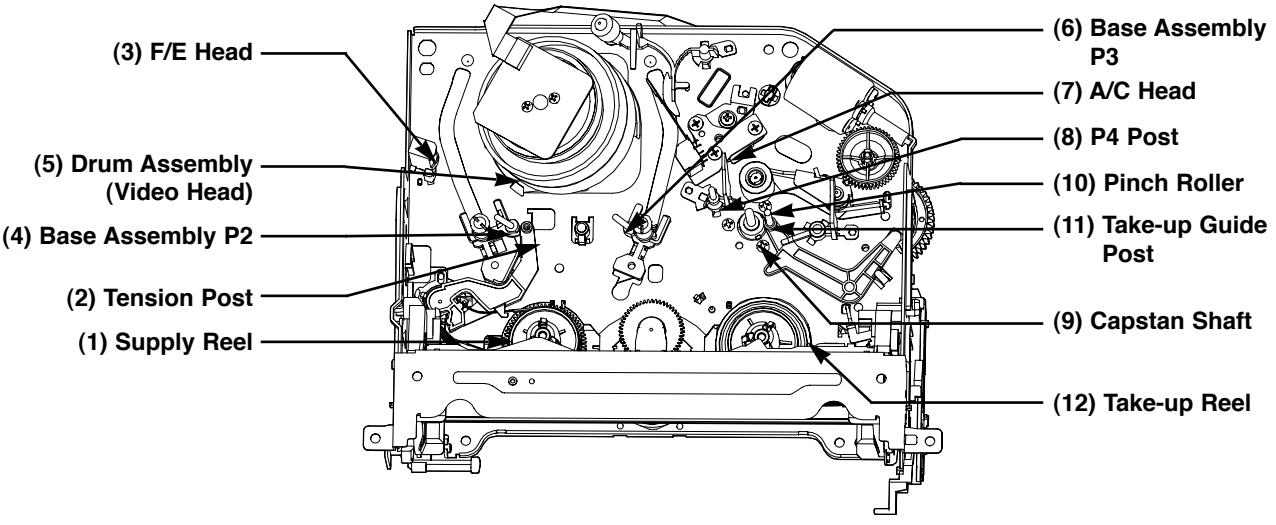


Fig. C-9-3 Tape Transport System

2. Essential Check and Repair

Recording density of the video is far higher than the audio. Therefore video parts are very precise so as to allow only error of 1/1000mm or so in order to maintain compatibility with other videos.
If one of these parts is polluted or old, same phenomena will appear as they are damaged.
To maintain clear screen, regular check, replacement of old and damaged parts and oil supply, etc are essential.

3. Regular Check and Repair

Check and repair schedule is not constant since they vary depending on method that the consumer uses video and environment where the video is installed at.
However, for the video used by common household, good screen will be maintained if regular check and repair per 1,000 hour is performed. The following chart shows relationship between using time and checking time:

Table 1

Time Requiring Checking / Average hours used per day	About 1 year	About 18 months	About 3 years
One hour	■	■	■
Two hours	■	■	
Three hours	■		

4. Tools for Check and Repair

(1) Grease: Floil G-3114 (KANTO) or equivalent grease (Green)
(2) Grease: Kanto G-754, PL-433 (Yellow)
(3) Alcohol (Isopropyl Alcohol)
(4) Cleaning Patch (cloth)

5. Maintenance Process

5-1) Removal of Foreign Material

(1) Removal of foreign material from video head (Fig. C-9-4)
Firstly try to use a cleaning tape.
Use a cleaning patch if foreign materials are not removed with the cleaning tape due to severe dirty of the head. Soak the cleaning patch in alcohol and put it to the head tip. Smoothly turn the drum (turning cylinder) to the right or left (In this case, the cleaning patch must not be moved vertically).
After completely drying the head, test the traveling status of the tape.
If alcohol (Isopropyl Alcohol) remains at the video head, the tape may be damaged when this solution touches with the head surface.

Never use a cloth bar (commercial sale)

(2) Wipe the tape transport system and the drive system with the cleaning patch soaked in alcohol (Isopropyl Alcohol) when removing foreign materials from them.
1) The part touched with the traveling tape is called as tape transport system. The drive system consists of parts to travel the tape.
2) Care must be exercised so that unreasonable force to change the pattern will be applied to the tape transport system during removal of foreign materials.

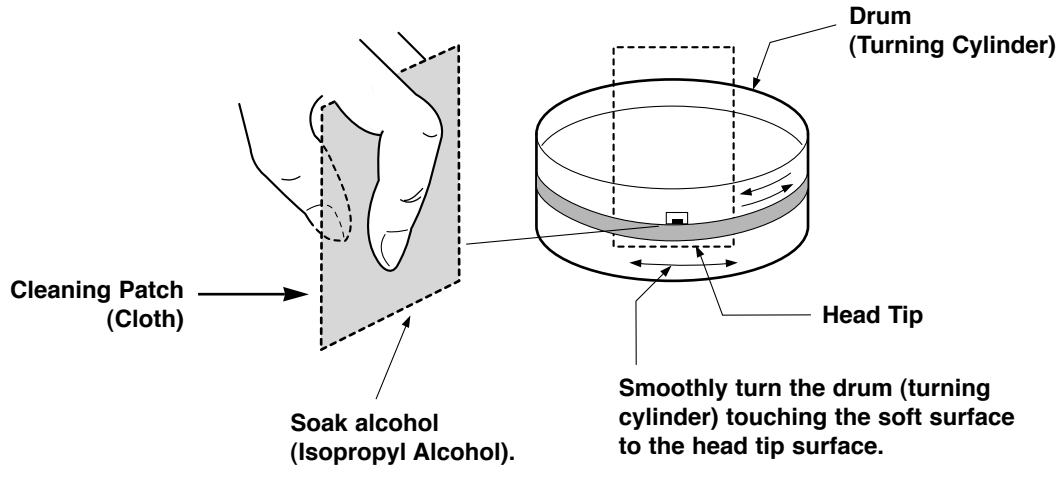


Fig. C-9-4

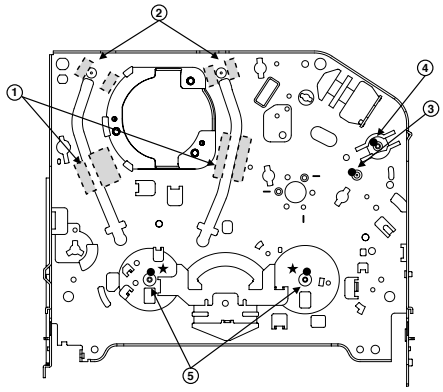
5-2) Grease Applications

(1) Grease Application Method

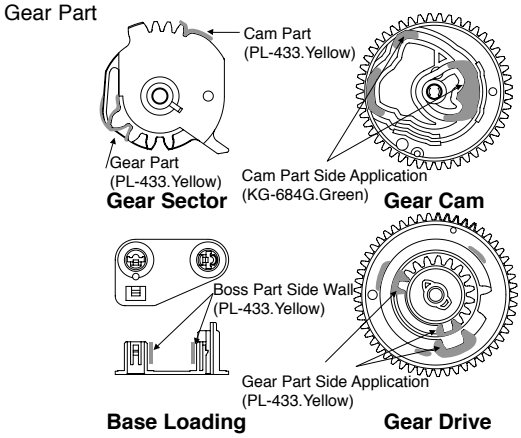
Apply grease by using a cloth swab or brush. Care must be exercised so that excess quantity should not be used. If the excessive quantity is applied, wipe it with the gauze soaked in alcohol (Isopropyl Alcohol).

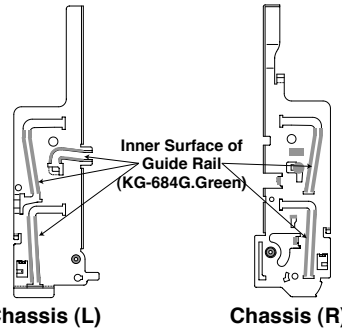
NOTE: POSITION OF GREASE APPLICATION

(1) Inner Side Surface and Top Surface of Loading Path
(2) Stable Adhesion Part of Base P2, P3
(3) Arm Pinch Shaft
(4) Gear Wheel Shaft
(5) Reel S. T. Shaft
(1) (2) (3) (4): KG-684G (Green)
(5): PL-433 (Yellow)



Chassis (TOP)

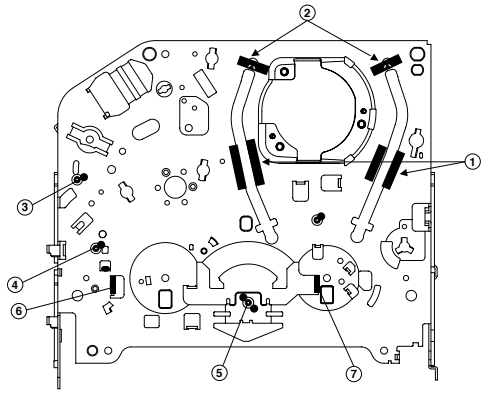




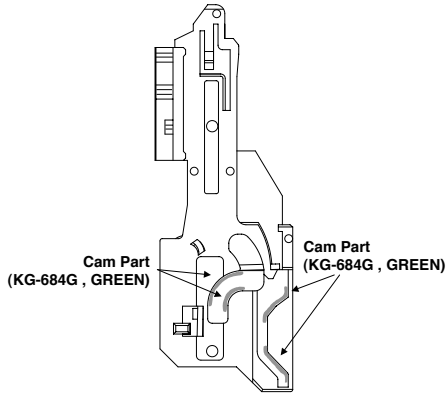
(2) Regular Grease Application

Apply grease to the designated application position every 500 hour.

(1) Inner Side Surface and Top Surface of Loading Path
(2) Stable Adhesion Part of Base P2, P3 Coil
(3) Gear Cam Shaft
(4) Gear Drive Shaft
(5) Clutch Shaft Groove
(6) Guide Part on the Plate Slider Side Wall (Left)
(7) Guide Part on the Plate Slider Side Wall (Right)
(1) (2) (3) (4) (5) (6) (7): KG-684G (Green)



Chassis (Bottom)



Gear Rack F/L

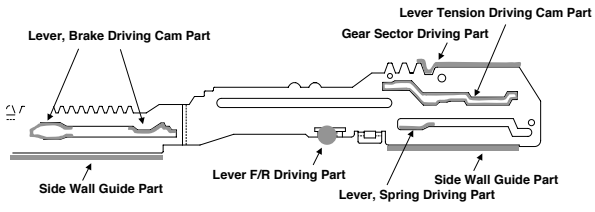
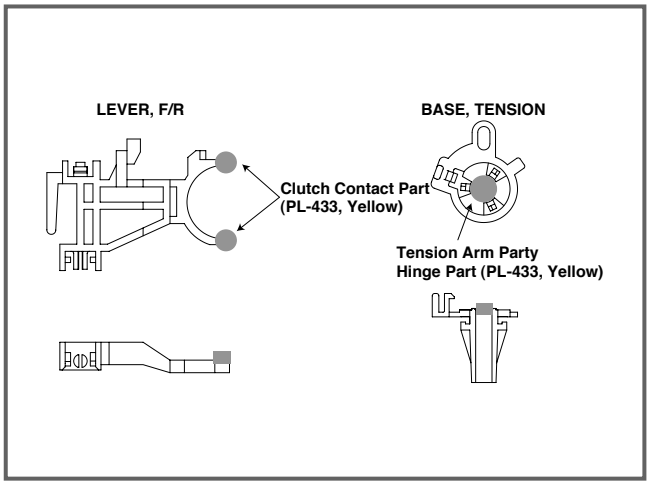
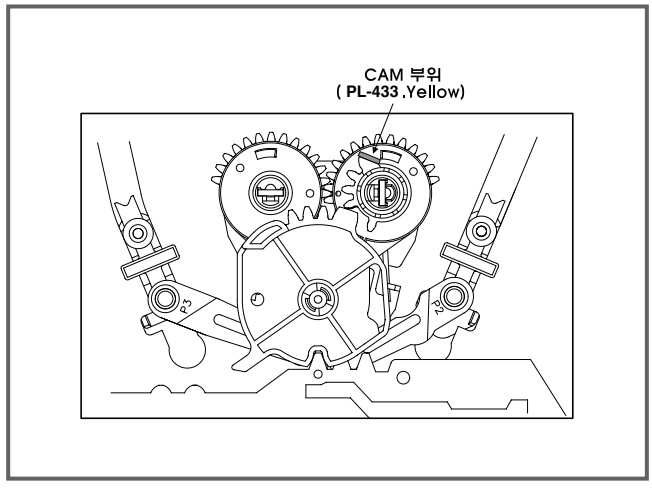


Plate Slider

Lever, F/R, Base, Tension



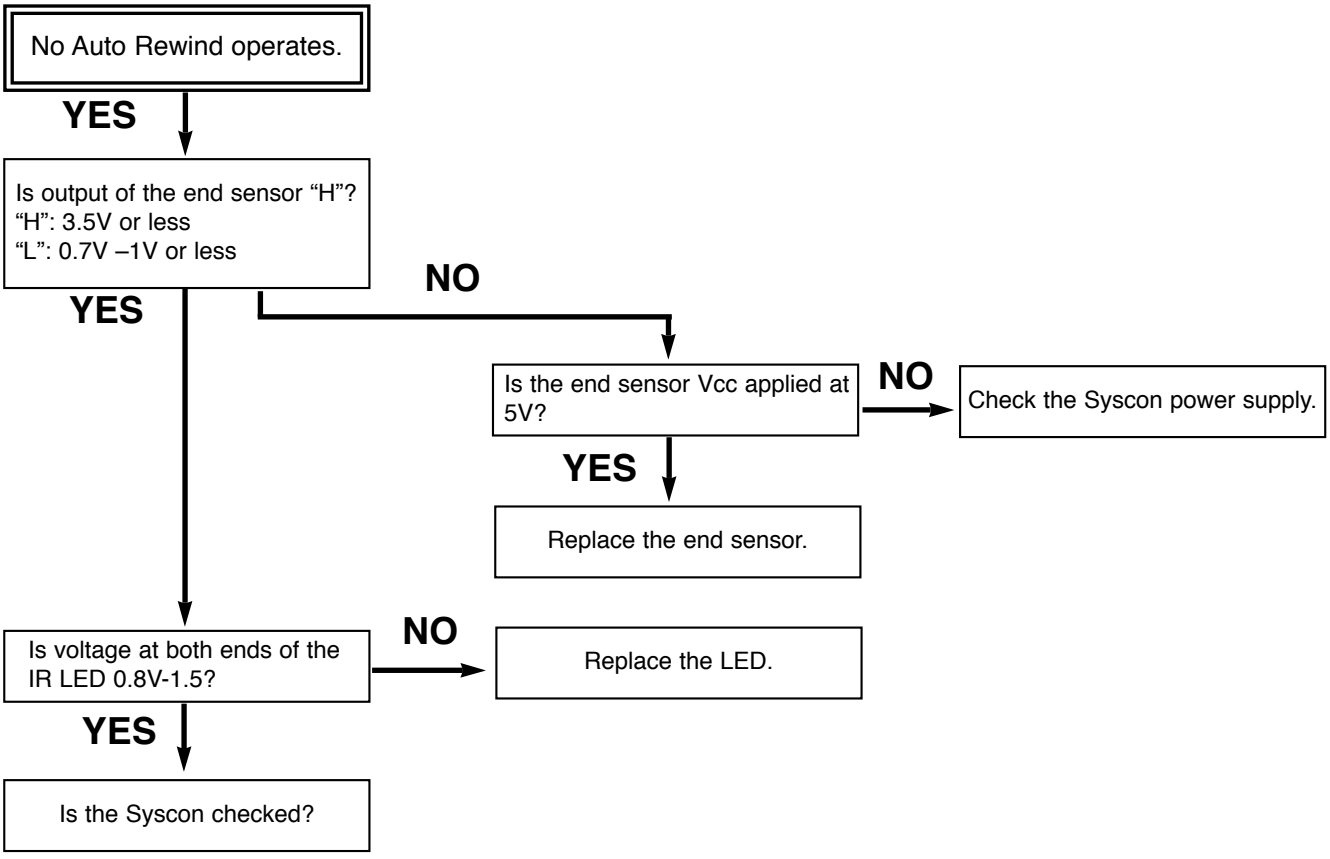
GEAR AY, P2 & P3



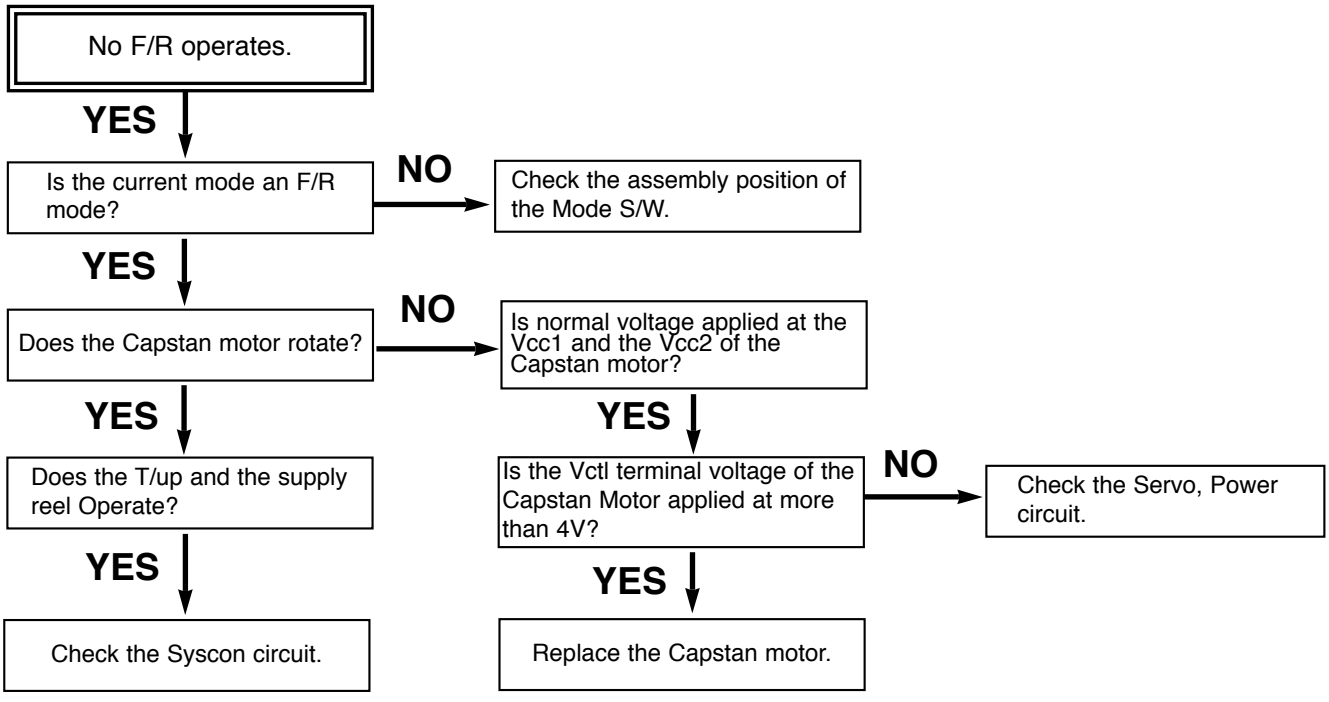
MECHANISM TROUBLESHOOTING GUIDE

1.Deck Mechanism

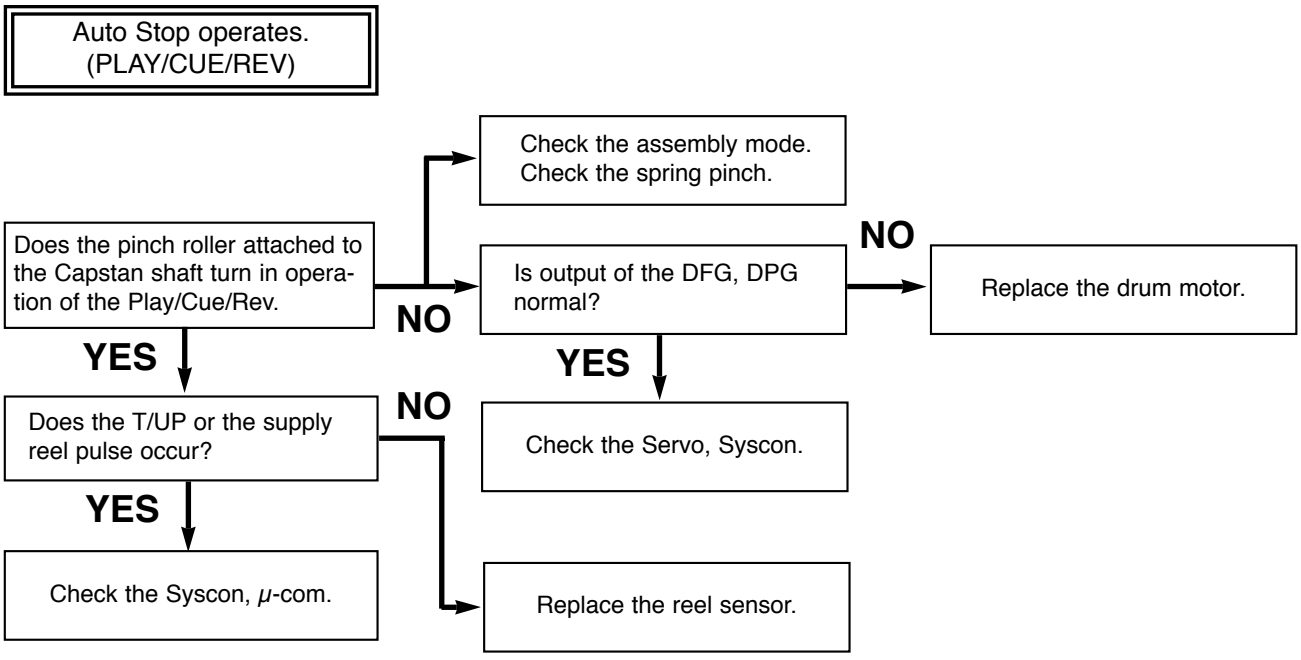
A.



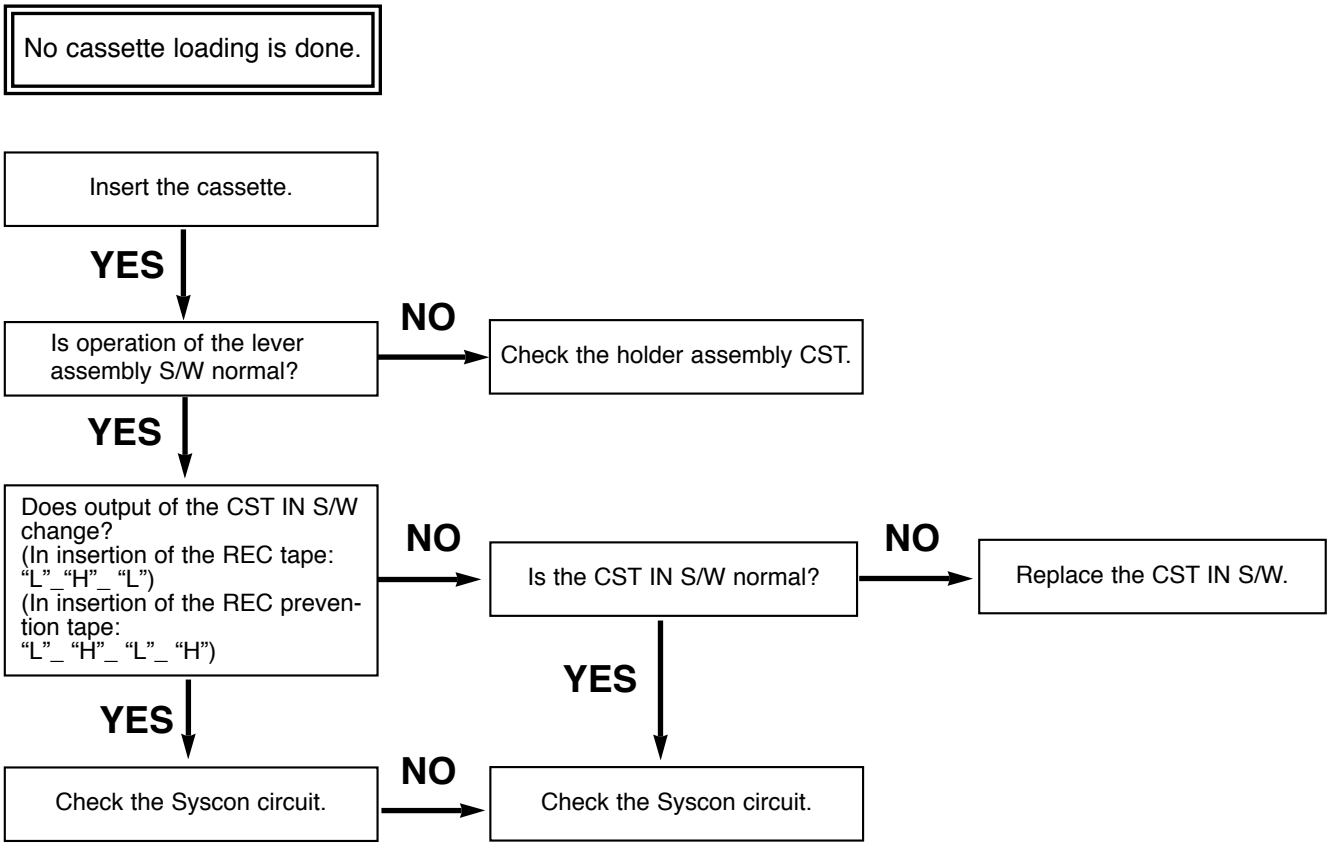
B.



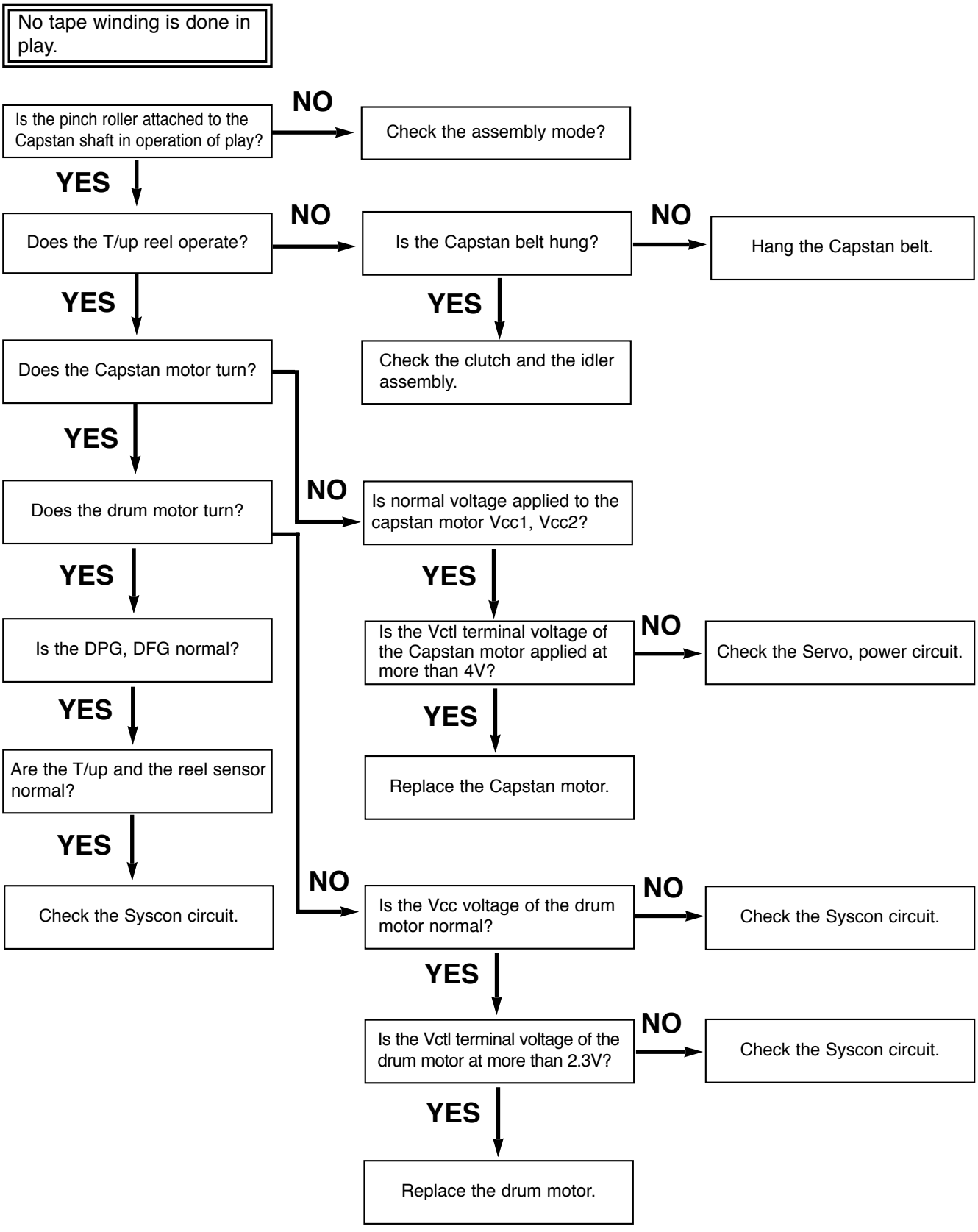
C.


Auto Stop operates.
(PLAY/CUE/REV)
Does the pinch roller attached to the Capstan shaft turn in operation of the Play/Cue/Rev.
NO
Check the assembly mode.
Check the spring pinch.
Is output of the DFG, DPG normal?
NO
Replace the drum motor.
YES
YES
Does the T/UP or the supply reel pulse occur?
NO
Check the Servo, Syscon.
YES
Check the Syscon, μ-com.
Replace the reel sensor.

D.

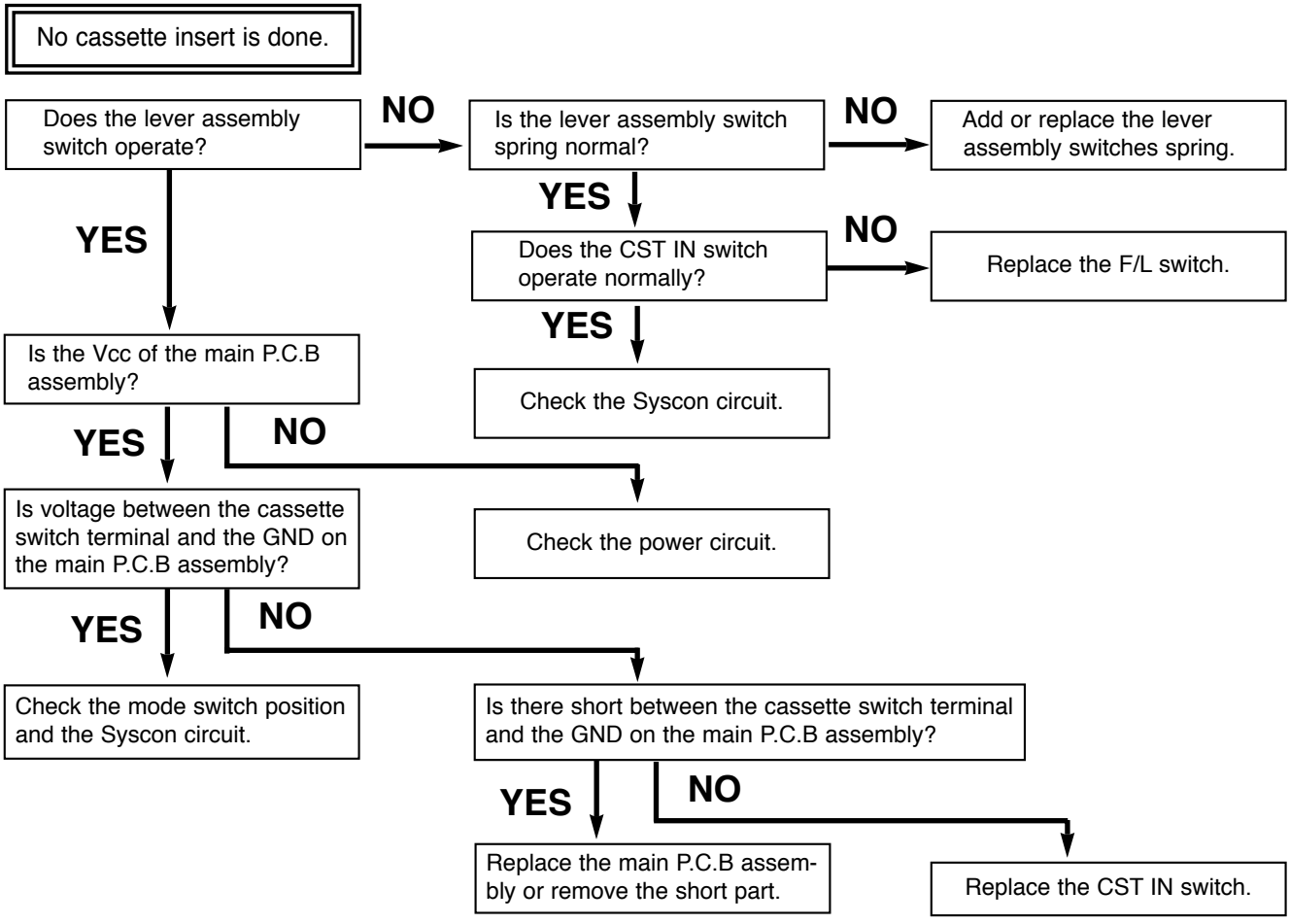

No cassette loading is done.
Insert the cassette.
YES
Is operation of the lever assembly S/W normal?
NO
Check the holder assembly CST.
YES
Does output of the CST IN S/W change?
(In insertion of the REC tape:
"L"_"H"_"L")
(In insertion of the REC prevention tape:
"L"_"H"_"L"_"H")
NO
Is the CST IN S/W normal?
NO
Replace the CST IN S/W.
YES
YES
Check the Syscon circuit.
NO
Check the Syscon circuit.

E.

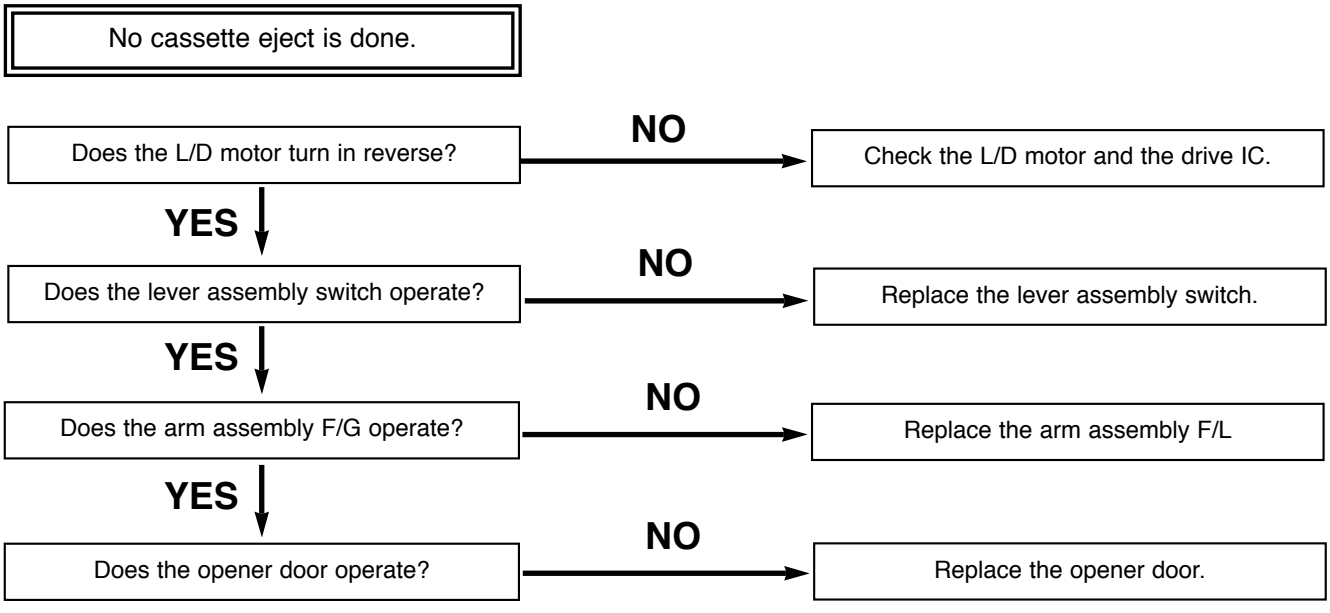

No tape winding is done in play.
Is the pinch roller attached to the Capstan shaft in operation of play?
NO
Check the assembly mode?
YES
Does the T/up reel operate?
NO
Is the Capstan belt hung?
NO
Hang the Capstan belt.
YES
YES
Check the clutch and the idler assembly.
Does the Capstan motor turn?
YES
Does the drum motor turn?
NO
Is normal voltage applied to the capstan motor Vcc1, Vcc2?
YES
YES
Is the DPG, DFG normal?
Is the Vctl terminal voltage of the Capstan motor applied at more than 4V?
NO
Check the Servo, power circuit.
YES
YES
Are the T/up and the reel sensor normal?
Replace the Capstan motor.
YES
NO
Check the Syscon circuit.
Is the Vcc voltage of the drum motor normal?
NO
Check the Syscon circuit.
YES
Is the Vctl terminal voltage of the drum motor at more than 2.3V?
NO
Check the Syscon circuit.
YES
Replace the drum motor.

2. Front Loading Mechanism

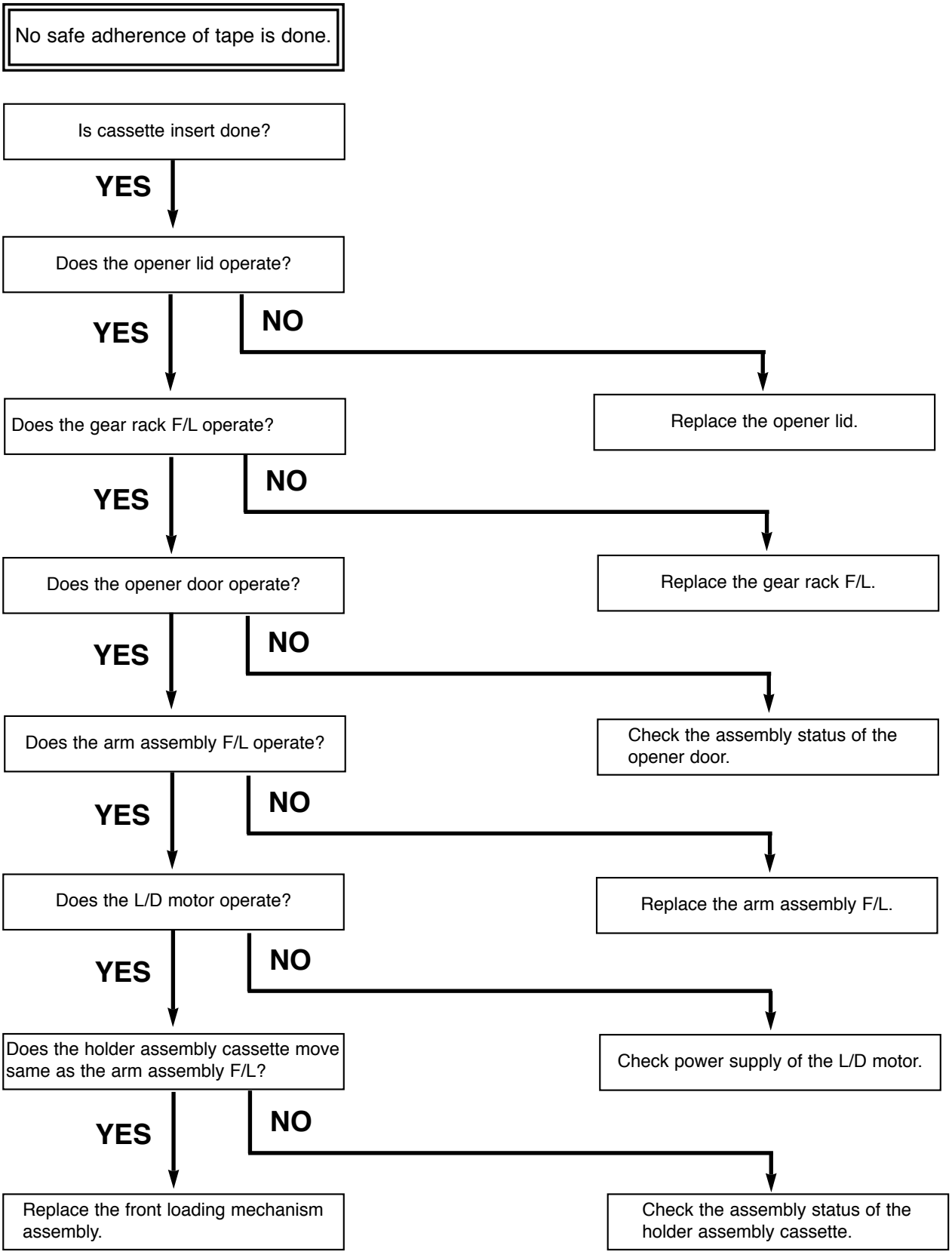
A.



B.

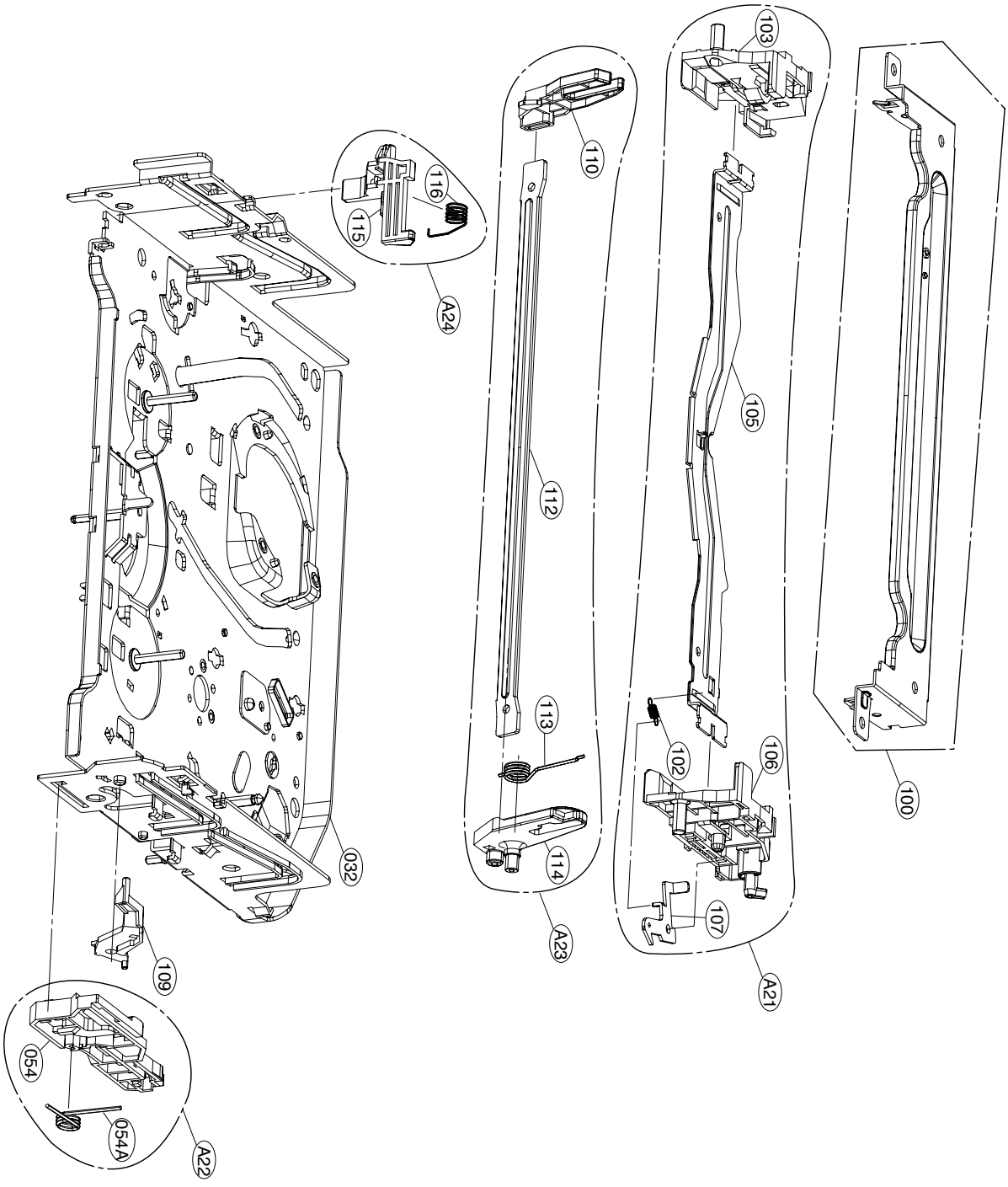


C.


No safe adherence of tape is done.
Is cassette insert done?
YES
Does the opener lid operate?
YES
NO
Replace the opener lid.
Does the gear rack F/L operate?
YES
NO
Replace the gear rack F/L.
Does the opener door operate?
YES
NO
Check the assembly status of the opener door.
Does the arm assembly F/L operate?
YES
NO
Replace the arm assembly F/L.
Does the L/D motor operate?
YES
NO
Check power supply of the L/D motor.
Does the holder assembly cassette move same as the arm assembly F/L?
YES
NO
Check the assembly status of the holder assembly cassette.
Replace the front loading mechanism assembly.

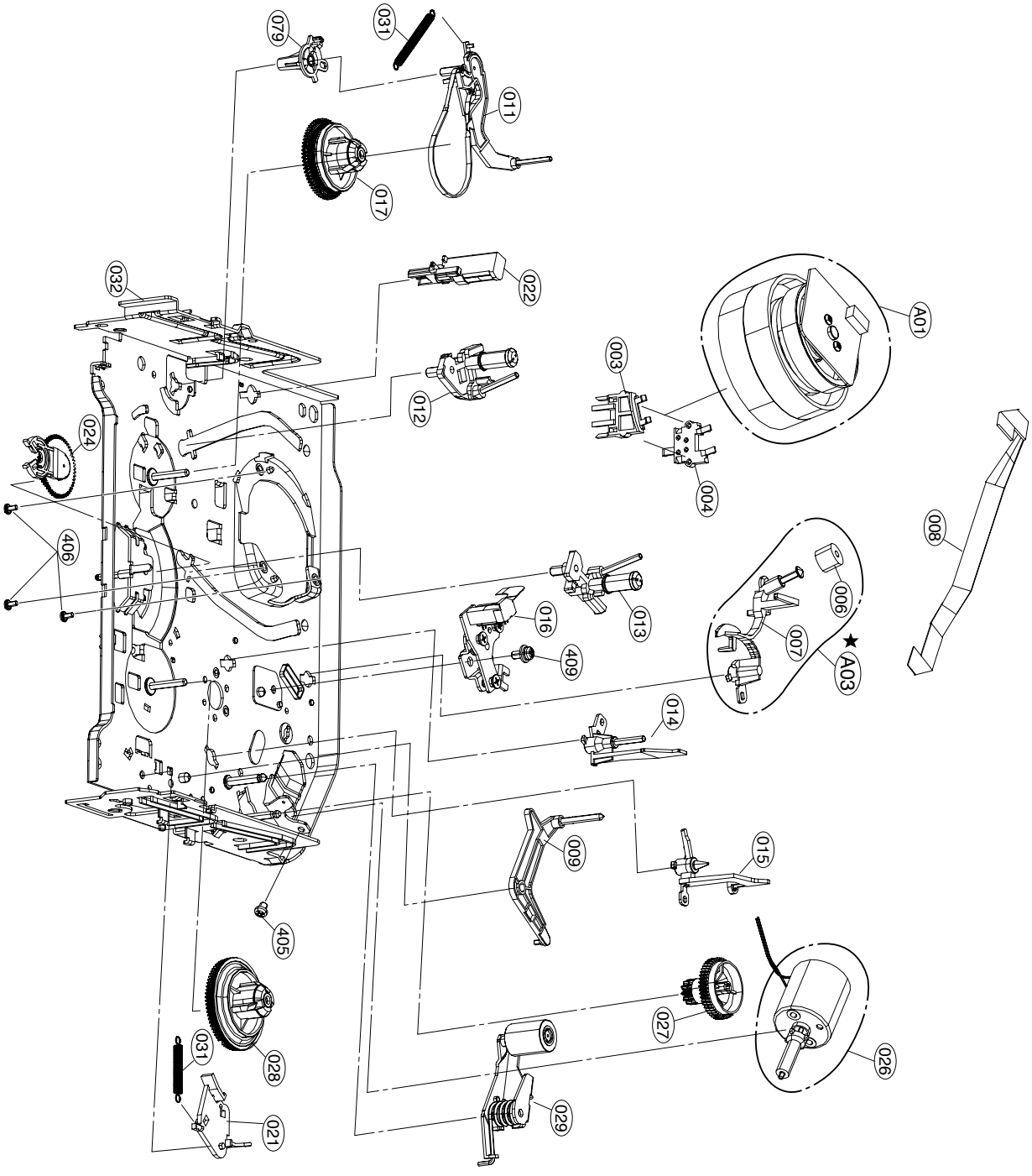
EXPLODED VIEWS

1. Front Loading Mechanism Section

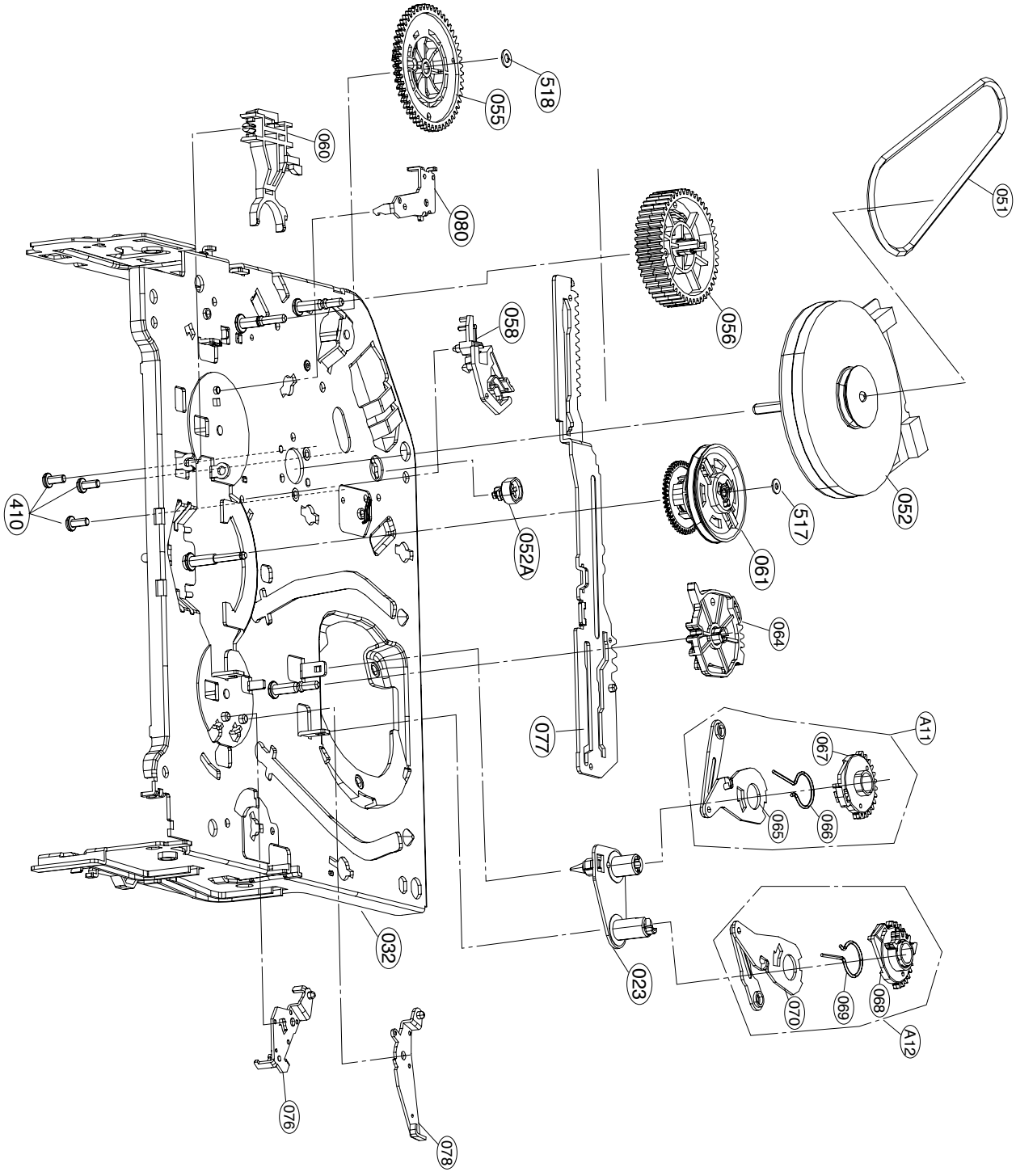


2. Moving Mechanism Section (1)

★ OPTIONAL PART



3. Moving Mechanism Section (2)



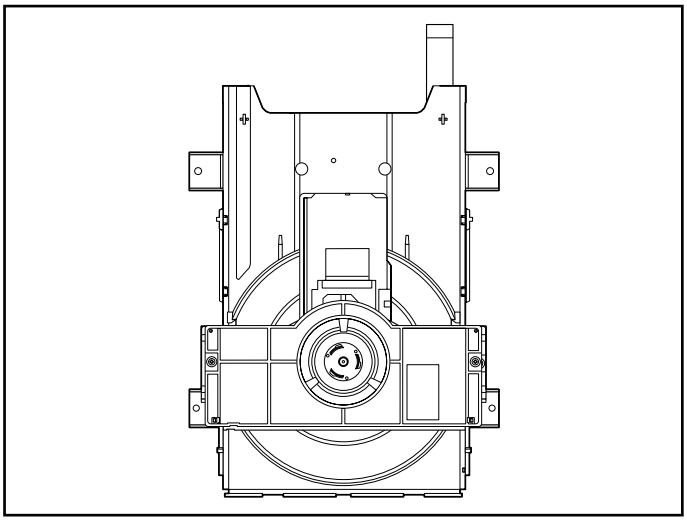
MEMO

SECTION 5 MECHANISM OF DVD PART

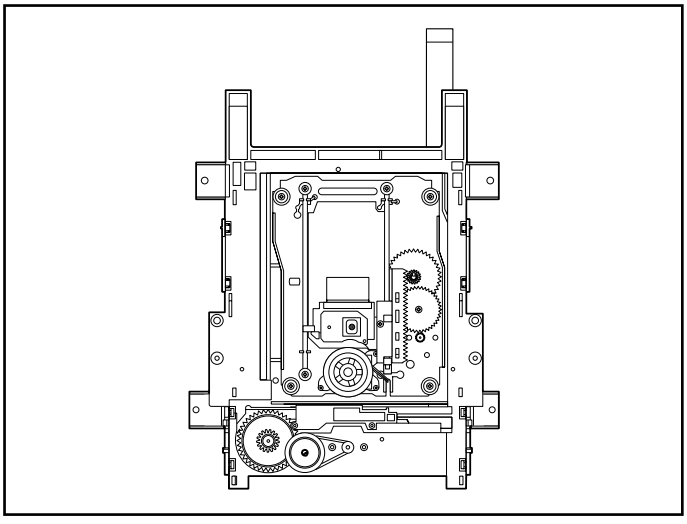
CONTENTS

DECK MECHANISM PARTS LOCATION

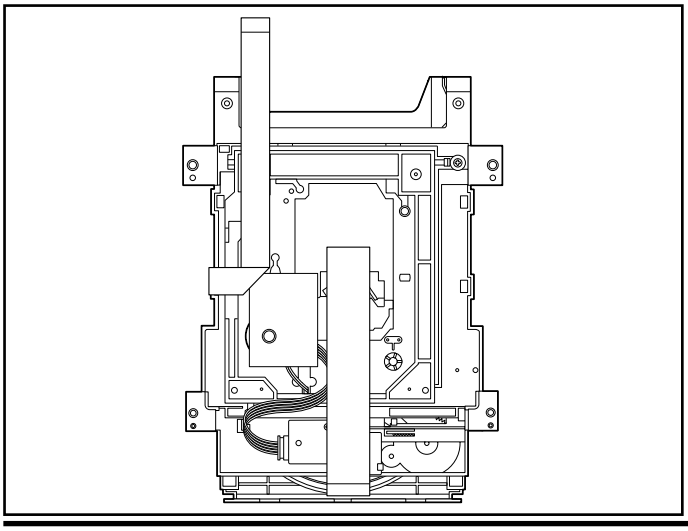
• Top View (With Tray)



• Top View (Without Tray)



• Bottom View



Procedure Starting No.		Parts	Fixing Type	Disassembly	Figure
	1	Holder Clamp	2 Screws, 2 Locking Tabs		5-1
1	2	Clamp Assembly Disc			5-1
1, 2	3	Plate Clamp			5-1
1, 2, 3	4	Magnet Clamp			5-1
1, 2, 3, 4	5	Clamp Upper			5-1
1	6	Tray Disc			5-2
1, 6	7	Base Assembly Sled	4 Screws,		5-3
1, 2, 6	8	Gear Assembly Feed			5-3
1, 2, 6, 8	9	Gear Middle			5-3
1, 2, 6, 8, 9	10	Gear Assembly Rack	1 Screw		5-3
1, 2, 7	11	Rubber Rear			5-3
1, 2, 7	12	Frame Assembly Up/Down	1 Screw	Bottom	5-4
1, 2	13	Belt Loading	1 Locking Tab		5-4
1, 2 ,13	14	Gear Pulley			5-4
1, 2, 13, 14	15	Gear Loading	1 Locking Tab		5-4
1, 2, 7, 12, 13, 14	16	Guide Up/Down			5-4
1, 2, 13	17	PWB Assembly Loading	1 Locking Tab 1 Hook 2Screw	Bottom	5-4
1, 2, 7, 12, 13, 14, 15, 16, 17	18	Base Main			5-4

Note

When reassembling, perform the procedure in reverse order.

The “Bottom” on Disassembly column of above Table indicates the part should be disassembled at the Bottom side.

DECK MECHANISM DISASSEMBLY

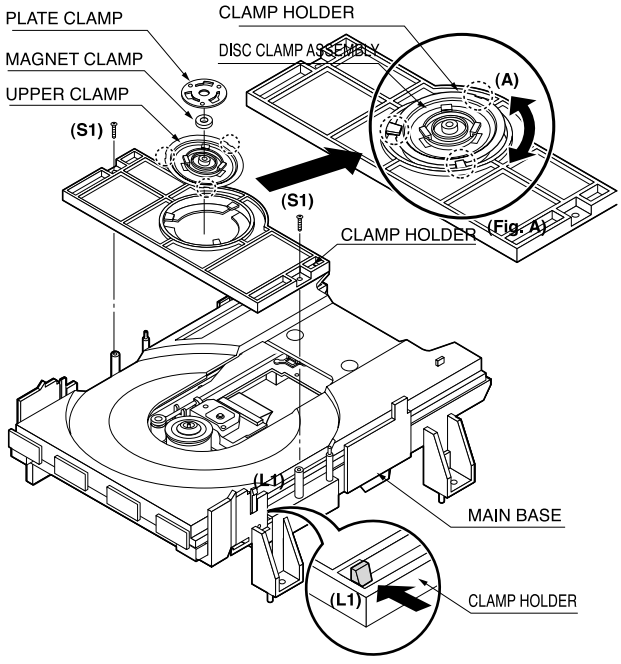


Fig. 5-1

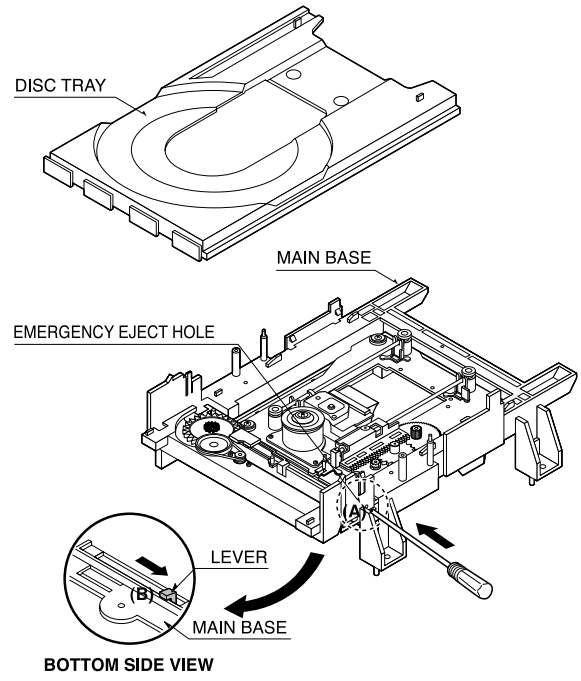


Fig. 5-2

1. Holder Clamp (Fig. 5-1)

1) Release 2 Screws(S1).
2) Unhook 2 Locking Tabs(L1).
3) Lift up the Holder Clamp and then separate it from the Base Main.

1-1. Clamp Assembly Disc

1) Place the Clamp Assembly Disc as Fig. (A)
2) Lift up the Clamp Assembly Disc in direction of arrow(A).
3) Separate the Clamp Assembly Disc from the Holder Clamp.

1-1-1. Plate Clamp

1) Turn the Plate Clamp to counterclockwise direction and then lift up the Plate Clamp.

1-1-2. Magnet Clamp

1-1-3. Clamp Upper

2. Tray Disc (Fig. 5-2)

1) Insert and push a Driver in the emergency eject hole(A) at the right side, or put the Driver on the Lever(B) of the Gear Emergency and pull the Lever(B) in direction of arrow so that the Tray Disc is ejected about 15~20mm.
2) Pull the Tray Disc until it is separated from the Base Main completely.

DECK MECHANISM DISASSEMBLY

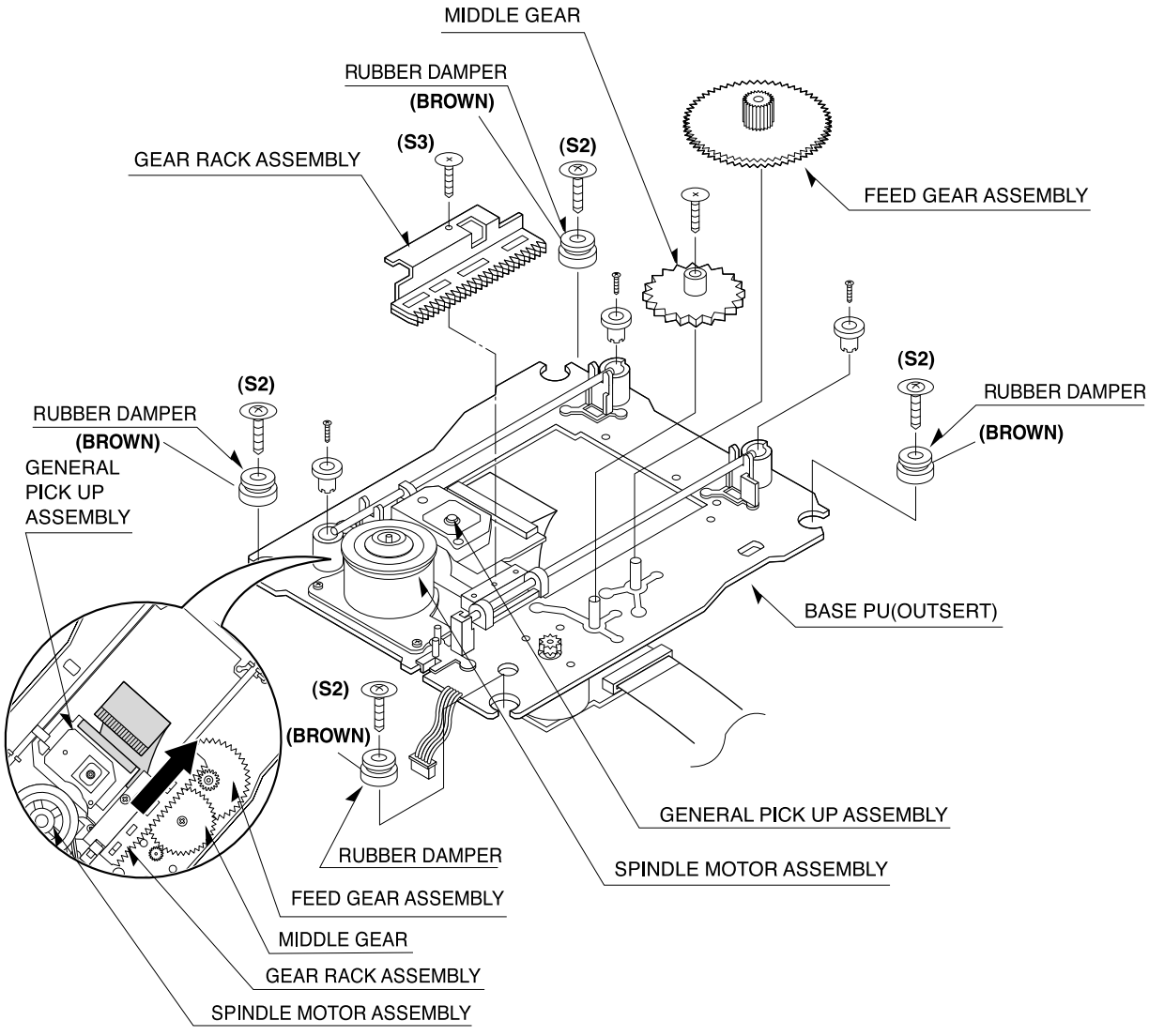


Fig. 5-3

3. Base Assembly Sled (Fig. 5-3)

1) Release 4 Screw(S2).
2) Disconnect the FFC Connector(C1)

3-1. Gear Assembly Feed

3-2. Gear Middle

3-3. Gear Assembly Rack

1) Release the Scerw(S3)

4. Rubber Rear (Fig. 5-3)

DECK MECHANISM DISASSEMBLY

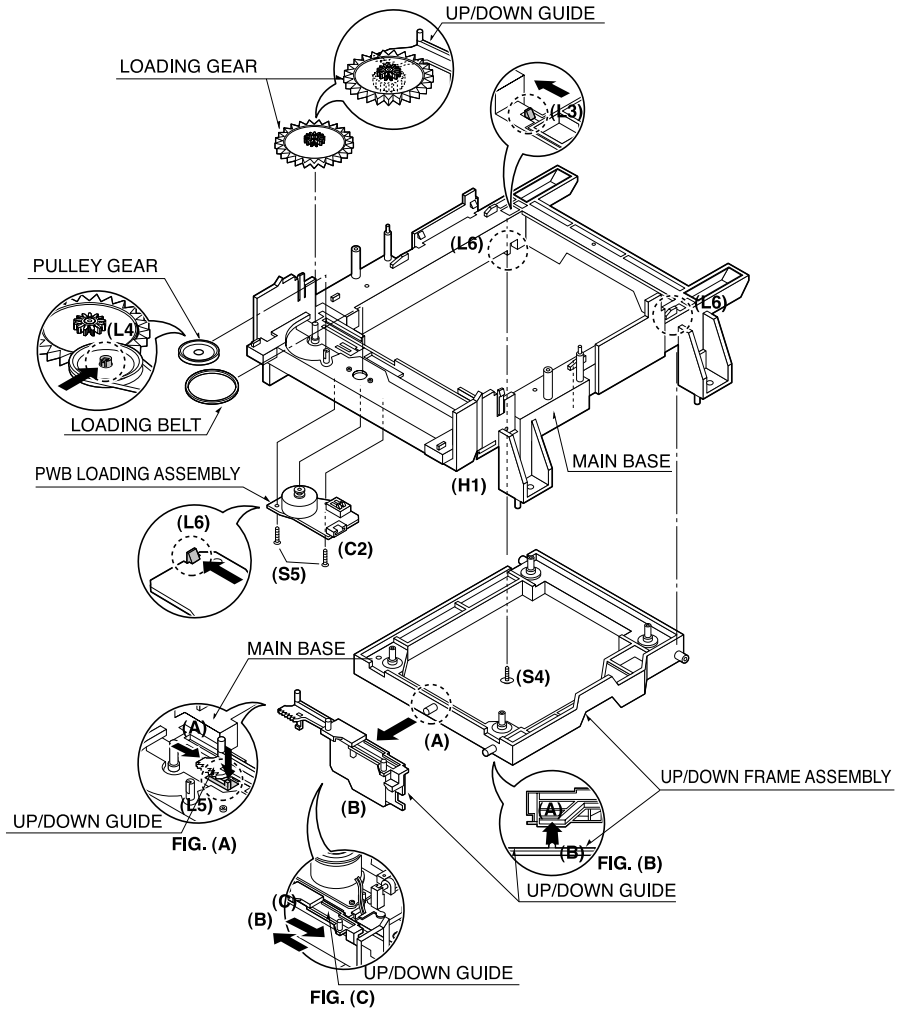


Fig. 5-4

5. Frame Assembly Up/Down (Fig. 5-4)

Note

Put the Base Main face down(Bottom Side)

1) Release the Screw(S4)
2) Unlock the Locking Tab(L3) in direction of arrow and then lift up the Frame Assembly Up/Down to separate it from the Base Main.

Note

- When reassembling move the Guide Up/Down in direction of arrow(C) until it is positioned as Fig.(C).
- When reassembling insert (A) portion of the Frame Assembly Up/Down in the (B) portion of the Guide Up/Down as Fig.(B)

6. Belt Loading(Fig. 5-4)

Note

Put the Base Main on original position(Top Side)

7. Gear pulley (Fig. 5-4)

1) Unlock the Locking Tab(L4) in direction of arrow(B) and then separate the Gear Pulley from the Base Main.

8. Gear Loading (Fig. 5-4)

9. Guide Up/Down (Fig. 5-4)

1) Move the Guide Up/Down in direction of arrow(A) as Fig.(A)
2) Push the Locking Tab(L5) down and then lift up the Guide Up/Down to separate it from the Base Main.

Note

When reassembling place the Guide Up/Down as Fig.(C) and move it in direction arrow(B) until it is locked by the Locking Tab(L5). And confirm the Guide Up/Down as Fig.(A)

10. PWB Assembly Loading (Fig. 5-4)

Note

Put the Base Main face down(Bottom Side)

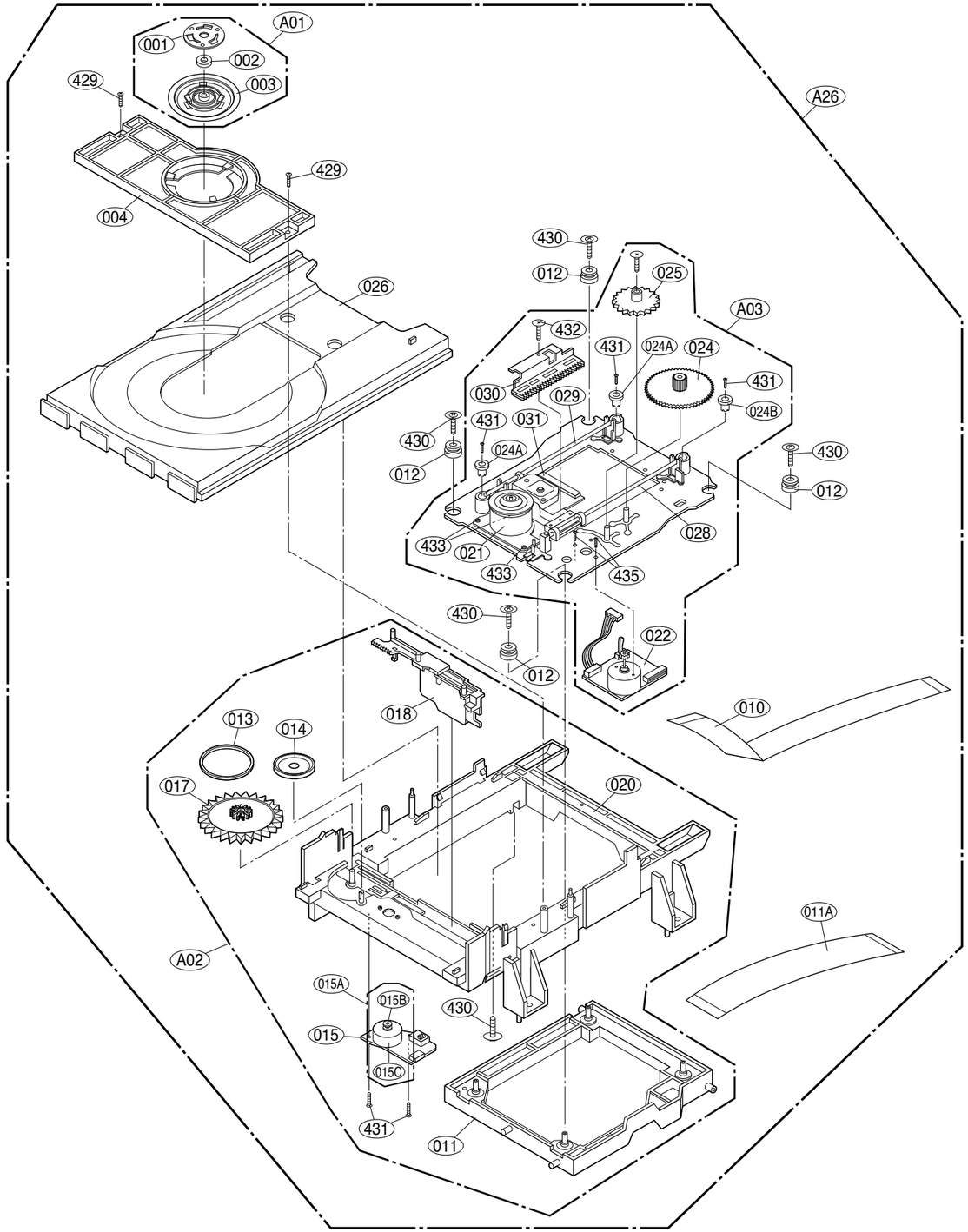
1) Release 2 Screws(S5)
2) Unlock the Loading Motor (C2) from the Hook (H1) on the Base Main.
3) Unlock 2 Locking Tabs(L6) and separate the PWB Assembly Loading from the Base Main.

11. Base Main(Fig. 5-4)

MEMO

EXPLODED VIEWS

1. Deck Mechanism Exploded View



MEMO

MEMO

MECHANICAL & ACCESSORIES PARTS LIST

SET & PACKAGING PARTS (FOR PAGES 2-2 TO 2-3)

A00	9965 000 25549	VCR MECHANISM	
A26	9965 000 25550	DVD MODULE	
A43	9965 000 25539	PANEL ASSEMBLY, FRONT	/00
A43	9965 000 25668	PANEL ASSEMBLY, FRONT	/02/14
A43	9965 000 25526	PANEL ASSEMBLY, FRONT	/05
A46	9965 000 25548	MAIN BOARD ASSEMBLY	/00
A46	9965 000 25669	MAIN BOARD ASSEMBLY	/02
A46	9965 000 25674	MAIN BOARD ASSEMBLY	/05
A46	9965 000 25675	MAIN BOARD ASSEMBLY	/14
A47	9965 000 25547	POWER SUPPLY BOARD ASSEMBLY	
323	9965 000 25560	CASE ASSEMBLY	
261A	9965 000 25545	RUBBER, FOOT	
265	9965 000 25546	HOLDER, POWER CORD	
283	9965 000 25540	DOOR, VCR	
284	4822 492 42785	SPRING DOOR	
285	9965 000 25541	DOOR, DVD	
286	9965 000 25542	SPRING, DVD	
300	9965 000 25538	⚠ POWER CORD W/CONN.	/00/02/14
300	9965 000 25525	⚠ POWER CORD W/CONN.	/05
806	9965 000 25543	RF PAL DOUBLE SHIELD	
821	9965 000 25544	SCART TO SCART 21 PIN	
900	9965 000 18509	REMOTE CONTROLLER ASSEMBLY	

VCR MECHANISM PARTS (FOR PAGES 4-28 TO 4-30)

A01	9965 000 25617	DRUM(CIRC) ASSEMBLY, D37-6CH PAL
A03	9965 000 25618	ARM ASSEMBLY, CLEANER - D37
A11	9965 000 25619	GEAR ASSEMBLY, P3 - D37
A12	9965 000 25620	GEAR ASSEMBLY, P2 - D37
A21	9965 000 25621	HOLDER ASSEMBLY, CST - D37
A22	9965 000 25622	GEAR ASSEMBLY, RACK F/L - D37
A23	9965 000 25623	ARM ASSEMBLY, F/L - D37
A24	9965 000 25624	LEVER ASSEMBLY, SWITCH(C) - D37
003	9965 000 25625	HOLDER, FPCB(6CH) - D37C MO
004	9965 000 25626	CAP, FPCB - D37C MOLD
008	9965 000 25627	CABLE, FLAT 7PIN 17CM
009	9965 000 25628	ARM, T/UP OTHER - D37
011	9965 000 25629	ARM ASSEMBLY, TENSION - D37
012	9965 000 25630	BASE ASSEMBLY, P2 -D37
013	9965 000 25631	BASE ASSEMBLY, P3 - D37
014	9965 000 25632	BASE ASSEMBLY, P4 - D37
015	9965 000 25633	OPENER, LID OTHER - D37
016	9965 000 25634	BASE ASSEMBLY, A/C HEAD (ALPS)
017	9965 000 25635	REEL, S OTHER - D37
021	9965 000 25636	BRAKE ASSEMBLY, T - D37
022	9965 000 25637	HEAD(CIRC), ST FE HEAD FOR D37
023	9965 000 25638	BASE, LOADING OTHER - D37
024	9965 000 25639	ARM ASSEMBLY, IDLER(H)
026	9965 000 25640	MOTOR ASSEMBLY, L/D - (DI) D37
027	9965 000 25641	GEAR, WHEEL OTHER - D37
028	9965 000 25642	REEL, T OTHER - D37
029	9965 000 25643	ARM ASSEMBLY, PINCH - D37
031	9965 000 25644	SPRING, COIL TENSION - D37
051	9965 000 19315	CAPSTAN
052	9965 000 25645	MOTOR, CAPSTAN F2QVB66 SANKYO
052A	9965 000 25660	SUPPORTER, CAPSTAN OTHER - D37
055	9965 000 25646	GEAR, DRIVE OTHER - D37
056	9965 000 25647	GEAR, CAM OTHER - D37
058	9965 000 25648	BRAKE ASSEMBLY, CAPSTAN -D37
060	9965 000 25649	LEVER, F/R OTHER - D37
061	9965 000 25650	CLUTCH ASSEMBLY, D37(M)
064	9965 000 25651	GEAR, SECTOR OTHER - D37
076	9965 000 25652	LEVER, SPRING OTHER - D37
077	9965 000 25653	PLATE, SLIDER OTHER - D37
078	9965 000 25654	LEVER, TENSION OTHER - D37
079	9965 000 25655	BASE, TENSION OTHER - D37
080	9965 000 25656	LEVER, BRAKE OTHER - D37
100	9965 000 25657	PLATE ASSEMBLY, TOP - D37
109	9965 000 25658	OPENER, DOOR OTHER - D37
405	9965 000 25659	SCREW, PAN HEAD M3.0 L4.0
406	4822 502 21655	SCREW, PAN HEAD M3.0 L6.0
409	9965 000 19341	D2.6 L5.0 SWRCH18A/FZY TAP
410	9965 000 19342	D2.6 L6.8 MSWR3/FZY
517	9965 000 13164	WASHER STOPPER
518	9965 000 13163	WASHER STOPPER

DVD MODULE PARTS (FOR PAGES 5-5 TO 5-6)

A01	9965 000 18546	CLAMP ASSEMBLY, DISC DP-7 (DI)
A02	9965 000 25661	LOADER ASSEMBLY
A03	9965 000 25662	DVD-M DRIVE ASSEMBLY
010	9965 000 25663	CABLE, FLAT 11PIN 12CM
011A	9965 000 25667	CABLE, FLAT 23PIN 20CM
012	9965 000 25664	RUBBER, DAMPER DP7
012	9965 000 18520	RUBBER, DAMPER DP7 (ALTERNATIVE)
013	9965 000 18521	BELT, TRAY MOTOR
015	9965 000 25665	PWB (PCB) ASSEMBLY,MOTOR TRAY
026	9965 000 25666	TRAY, DVD DISC

Note: Only the parts mentioned in this list are normal service spare parts.

ELECTRICAL PARTS LIST

POWER SUPPLY BOARD ASSEMBLY

MISCELLANEOUS

F101	4822 070 31602	⚠	FUSE 1600MA 250 V 5.2X20
T101	9965 000 25558	⚠	TRANSFORMER,SMPS[COIL]
V101	9965 000 19235	⚠	VARISTOR SVC681D-10A

CAPACITORS

C101	9965 000 18666	⚠	CAP 0.1UF 275V
C102	9965 000 18666	⚠	CAP 0.1UF 275V
C103	9965 000 18667		ELCAP 100UF 400V
C105	9965 000 18669		FILM CAP 0.01UF D 630V 10%
C106	9965 000 25551		CAP HIGH-VOL 68PF 1KV
C110	9965 000 18672	⚠	CERAMIC 1000PF 400V
C111	9965 000 18672	⚠	CERAMIC 1000PF 400V
C127	4822 124 40201		1000UF 20% 16V
C129	9965 000 25552		ELCAP 2200UF 16V 20%
C131	4822 124 40184		1000UF 20% 10V
C163	9965 000 25553		CAP HI-VOL 470P 1KVDC

RESISTORS

R100	9965 000 19226	1.5M OHM 1/2W 5.00% MF10
R101	9965 000 19227	2.7/2W CEMENT SMPS V
R104	9965 000 19228	56K OHM 2W 5.00% TR

COILS & FILTERS

L102	9965 000 25557	⚠	FILTER SHT LFSQ2215V4-04220
L102	9965 000 25556	⚠	FILTER KSE-145E KSE (ALTERNATIVE)
L125	9965 000 19213		CHOKE COIL 20UH

DIODES

BD101	9965 000 18662	S1WBA60(1A 600V)
D101	9965 000 18682	ERA22-10 KFLB,TP ,R T/P,FUJI
D102	9965 000 18683	EU01W(R-FORM) TP SANKEN
D106	9965 000 18565	RL104F TP RECTRON NON 400V 1A
D110	9965 000 25554	RU4YX BK (ALTERNATIVE)
D110	9965 000 18684	HER302 BK RECTRON DO201AD 100V
D111	9965 000 18685	1N5822 BK RECTRON DO201AD 40V
D113	9965 000 18565	RL104F TP RECTRON NON 400V 1A
D118	9965 000 18687	B10A45V1 BK KEC TO220 45V 10A
ZD102	9965 000 25559	UZ-22BSB 26MM

TRANSISTORS & INTEGRATED CIRCUITS

IC101	9965 000 25555		IC FSDL0365RN 8PIN,DIP
IC102	9965 000 18689	⚠	LTV-817B,PHOTO COUPLER(LITEON)
IC103	4822 209 12767		KIA431

Note: Only the parts mentioned in this list are normal service spare parts.

MAIN BOARD ASSEMBLY

MISCELLANEOUS

323	9965 000 25560	CASE ASSEMBLY
CS501	9965 000 25563	SWITCH MPU12970MLB0
ES501	9965 000 25564	HOLDER ASSY VCR DECK/MECHA END
ES502	9965 000 25564	HOLDER ASSY VCR DECK/MECHA END
JK5L1	9965 000 25584	FRONT A/V-IN DPAE-0385
JK902	9965 000 25585	RGB / AV CONN. RCA-910A-00-01
JK903	9965 000 25586	OPTICAL OUT PLT131/T5/12(12MBPS)
JK904	9965 000 25587	S-VIDEO OUT DIN405
LD501	9965 000 25592	HOLDER ASSY, VCR DECK/MECHA END
MS501	9965 000 25595	SWITCH MMS01080ZMBO 5VDC 1MA D37
MS501	9965 000 25594	SWSSS-51MD-3 5V 1MA (ALTERNATIVE)
RC501	9965 000 25601	IR RECEIVER TSOP2236AY1
RS501	9965 000 25602	KIT-3001A REEL SENSOR
RS502	9965 000 25602	KIT-3001A REEL SENSOR
SC901	9965 000 25603	DOUBLE - SCART DSAM-0341
SW502	9965 000 25604	TACT SWITCH THVV951BAA
SW503	9965 000 25604	TACT SWITCH THVV951BAA
SW504	9965 000 25604	TACT SWITCH THVV951BAA
SW505	9965 000 25604	TACT SWITCH THVV951BAA
SW506	9965 000 25604	TACT SWITCH THVV951BAA
SW507	9965 000 25604	TACT SWITCH THVV951BAA
SW508	9965 000 25604	TACT SWITCH THVV951BAA
SW509	9965 000 25604	TACT SWITCH THVV951BAA
SW510	9965 000 25604	TACT SWITCH THVV951BAA
SW511	9965 000 25604	TACT SWITCH THVV951BAA
SW511	9965 000 25605	TACT SW EVQ 213 09K (ALTERNATIVE)
SW511	9965 000 25606	TACT SWITCH SKHVBG3910-AA (ALT.)
SW512	9965 000 25604	TACT SWITCH THVV951BAA
SW512	9965 000 25605	TACT SW EVQ 213 09K (ALTERNATIVE)
SW512	9965 000 25606	TACT SWITCH SKHVBG3910-AA (ALT.)
SW513	9965 000 25604	TACT SWITCH THVV951BAA
SW513	9965 000 25605	TACT SW EVQ 213 09K (ALTERNATIVE)
SW513	9965 000 25606	TACT SWITCH SKHVBG3910-AA (ALT.)
SW514	9965 000 25604	TACT SWITCH THVV951BAA
SW514	9965 000 25606	TACT SWITCH SKHVBG3910-AA (ALT.)
SW514	9965 000 25605	TACT SW EVQ 213 09K (ALTERNATIVE)
TU701	9965 000 25607	TUNER UNIT TADM-M101D /00/05/14
TU701	9965 000 25672	TUNER UNIT TADM-S101D /02
TU701	9965 000 25608	TUNER UNIT TCMK0601PD20C PAL F (ALTERNATIVE)
X301	9965 000 25609	X'AL 4.433619MHZ HC-49S
X501	9965 000 18658	X'TAL 10MHZ +/- 30 PPM
X501	9965 000 25610	X'TAL 10-0000MHZ 30P (ALTERNATIVE)
X502	9965 000 25611	X'TAL 32.768KHZ
X502	9965 000 18659	X'TAL 32.768KHZ (ALTERNATIVE)
X601	9965 000 18582	X'TA27MHZ 20PPM 1
X751	9965 000 18660	X'TAL 18432000HZ 30PPM 16
X751	9965 000 25612	X'TAL 18.432MHZ +/- 3 (ALTERNATIVE)

ELECTRICAL PARTS LIST

CAPACITORS

C5G1	9965 000 25561	ELCAP 1000UF 6.3V M FM
C945	9965 000 25562	ELCAP 3900PF D 100V 5%
C946	9965 000 25562	ELCAP 3900PF D 100V 5%

COILS & FILTERS

BC91	9965 000 18585	BEAD CORE BFS3550R2FD8,R T/P
BC92	9965 000 18585	BEAD CORE BFS3550R2FD8,R T/P
L111	9965 000 18575	HB-1M2012-102JT
L122	9965 000 19212	CHOCK(22MH) 5MM TOKO TP
L122	9965 000 25588	CHOKE COIL TDK 22UH (ALTERNATIVE)
L123	9965 000 19212	CHOCK(22MH) 5MM TOKO TP
L123	9965 000 25588	CHOKE COIL TDK 22UH (ALTERNATIVE)
L201	9965 000 18574	10UH 5% 4X5 TR5
L202	9965 000 18575	HB-1M2012-102JT
L203	9965 000 18574	10UH 5% 4X5 TR5
L204	9965 000 18575	HB-1M2012-102JT
L205	9965 000 19456	10UH, CHIP2012
L206	9965 000 18575	HB-1M2012-102JT
L207	9965 000 18575	HB-1M2012-102JT
L301	9965 000 25589	INDUCTOR LF7.5N OEL 10UH 10% TP
L301	9965 000 18640	10UH 5% TP 3X5 TR5 (ALTERNATIVE)
L303	9965 000 25589	INDUCTOR LF7.5N OEL 10UH 10% TP
L303	9965 000 18640	10UH 5% TP 3X5 TR5 (ALTERNATIVE)
L304	9965 000 25589	INDUCTOR LF7.5N OEL 10UH 10% TP
L304	9965 000 18640	10UH 5% TP 3X5 TR5 (ALTERNATIVE)
L305	9965 000 18641	100M K 6X6 L5 TP
L306	9965 000 18641	100M K 6X6 L5 TP
L307	9965 000 25589	INDUCTOR LF7.5N OEL 10UH 10% TP
L307	9965 000 18640	10UH 5% TP 3X5 TR5 (ALTERNATIVE)
L308	9965 000 18641	100M K 6X6 L5 TP
L3S1	9965 000 18646	10M K 6X6 L5 TP /02/14
L401	9965 000 18575	HB-1M2012-102JT
L501	9965 000 18642	12M K 2.3X3.4 L5 TP
L503	9965 000 18643	100UH 5% TP 3X5 TR5
L504	9965 000 25589	INDUCTOR LF7.5N OEL 10UH 10% TP
L504	9965 000 18640	10UH 5% TP 3X5 TR5 (ALTERNATIVE)
L505	9965 000 18641	100M K 6X6 L5 TP
L506	9965 000 18644	EL0405RA SKI150G-3 K-TDK 15UH
L5F1	9965 000 18643	100UH 5% TP 3X5 TR5
L5F2	9965 000 18643	100UH 5% TP 3X5 TR5
L5G1	9965 000 25590	INDUCTOR 470M K 6X6 L5 TP
L5S1	9965 000 18645	33M K 2.3X3.4 L5 TP
L601	9965 000 18575	HB-1M2012-102JT
L603	9965 000 18575	HB-1M2012-102JT
L604	9965 000 18575	HB-1M2012-102JT
L605	9965 000 18575	HB-1M2012-102JT
L609	9965 000 18575	HB-1M2012-102JT
L610	9965 000 18575	HB-1M2012-102JT
L611	9965 000 18575	HB-1M2012-102JT
L701	9965 000 18641	100M K 6X6 L5 TP
L702	9965 000 18646	10M K 6X6 L5 TP
L704	9965 000 18646	10M K 6X6 L5 TP
L705	9965 000 18646	10M K 6X6 L5 TP
L7V1	9965 000 18641	100M K 6X6 L5 TP
L801	9965 000 18641	100M K 6X6 L5 TP
L802	9965 000 18641	100M K 6X6 L5 TP
L901	9965 000 19456	10UH, CHIP2012
L902	9965 000 19456	10UH, CHIP2012
L903	9965 000 19456	10UH, CHIP2012
L904	9965 000 19456	10UH, CHIP2012
L905	9965 000 19456	10UH, CHIP2012
L906	9965 000 19456	10UH, CHIP2012
L907	9965 000 19456	10UH, CHIP2012
L908	9965 000 19456	10UH, CHIP2012
L909	9965 000 19456	10UH, CHIP2012
L910	9965 000 19456	10UH, CHIP2012
L911	9965 000 25591	INDUCTOR 1UH , CHIP2012
L912	9965 000 25591	INDUCTOR 1UH , CHIP2012
L913	9965 000 25591	INDUCTOR 1UH , CHIP2012
L916	9965 000 19456	10UH, CHIP2012
L917	9965 000 19456	10UH, CHIP2012
L918	9965 000 25591	INDUCTOR 1UH , CHIP2012
L919	9965 000 25591	INDUCTOR 1UH , CHIP2012
L920	9965 000 18575	HB-1M2012-102JT
L921	9965 000 18575	HB-1M2012-102JT
L922	9965 000 18575	HB-1M2012-102JT

DIODES

D114	9965 000 18686	RL104 R
D117	9965 000 18686	RL104 R
D118	9965 000 18686	RL104 R
D119	9965 000 18686	RL104 R
D121	4822 130 32778	1SS133
D122	9965 000 18686	RL104 R
D301	4822 130 32778	1SS133
D401	4822 130 80522	DAP202U
D502	4822 130 32778	1SS133
D509	4822 130 32778	1SS133
D801	4822 130 32778	1SS133
D802	4822 130 32778	1SS133
D803	4822 130 32778	1SS133
LDE501	9965 000 25593	LED DISPLAY F3C5-2GWB
LED502	4822 130 83976	DL-11S2RNS
LED503	4822 130 83976	DL-11S2RNS
ZD103	9965 000 25613	UZ-13BSA 26MM
ZD501	9965 000 25614	UZ-5.6BSB 26MM
ZD502	9965 000 25614	UZ-5.6BSB 26MM
ZD503	9965 000 25614	UZ-5.6BSB 26MM
ZD504	9965 000 25614	UZ-5.6BSB 26MM
ZD505	9965 000 25616	Z02W7.5V
ZD506	9965 000 25616	Z02W7.5V
ZD507	9965 000 25614	UZ-5.6BSB 26MM
ZD508	9965 000 25614	UZ-5.6BSB 26MM

ELECTRICAL PARTS LIST

DIODES

ZD601	9965 000 25615	UZ-5.6BSC 26MM	
ZD602	9965 000 25615	UZ-5.6BSC 26MM	
ZD603	9965 000 25615	UZ-5.6BSC 26MM	
ZD801	9965 000 25616	Z02W7.5V	
ZD802	9965 000 25616	Z02W7.5V	

INTEGRATED CIRCUITS

IC151	9965 000 25565	NJM2396F08	
IC151	9965 000 19209	KIA78R08PI (ALTERNATIVE)	
IC151	9965 000 25570	PQ08RD1L (ALTERNATIVE)	
IC151	9965 000 25571	KA78R08TSTU (ALTERNATIVE)	
IC152	9965 000 25570	PQ08RD1L	
IC152	9965 000 25566	KA78R33TSTU (ALTERNATIVE)	
IC152	9965 000 25572	KIA78R33PI (ALTERNATIVE)	
IC155	9965 000 25573	LD1117A-1.8V	
IC201	9965 000 25567	IP4504A	
IC301	9965 000 18630	LA71750EM	
IC3S1	9965 000 25670	LA70100M	/02/14
IC401	9965 000 25575	CS4392-KZR	
IC402	9965 000 25568	MC4580 UTC	
IC402	9965 000 04714	NJM4580M (ALTERNATIVE)	
IC501	9965 000 25576	HD6432197SA42F	
IC503	9965 000 25577	AT24C16-	
IC503	9965 000 18632	CAT24W16P (ALTERNATIVE)	
IC504	9965 000 18633	KIA7031P 3P 3.1V	
IC504	9965 000 25574	KA7531Z 3.1V (ALTERNATIVE)	
IC505	9965 000 18634	KIA7042P	
IC5F1	9965 000 25569	PT6955	
IC5F1	9965 000 25578	LG5-6955 (ALTERNATIVE)	
IC601	9965 000 25579	MT1389FE/C	
IC602	9965 000 25580	HY29LV160TT-70	
IC603A	9965 000 25581	M12L64164A W/SW ESGIPS	/00/05
IC603A	9965 000 25671	M12L64164A W/SW EGFISD	/02
IC603A	9965 000 25676	M12L64164A W/SW EGPHCS	/14
IC606	9965 000 18571	S524A40X21-SCT0	
IC607	9965 000 18554	MM74HCT244SJ	
IC751	9965 000 14760	MSP3417G-QG-B8-V3	
IC7V1	9965 000 25582	SDA5650X	
IC801	9352 631 46557	TDA9605H/N2	
IC802	9965 000 25583	MM1443XJBE	
IC901	9965 000 18573	MM1623XFBE	

TRANSISTORS

Q150	9965 000 25596	STA353 AUK KOREA TP MPAK -40V	
Q153	9965 000 25597	KSA928A-Y,TO-92L	
Q153	9965 000 25598	STB1277LY-AT (ALTERNATIVE)	
Q153	4822 130 63766	KTA1273Y (ALTERNATIVE)	
Q154	4822 130 10491	KTC3875S-GR-T1	
Q156	9965 000 18651	2SC5344Y TP	
Q161	9965 000 19225	KTA1268-BL	
Q162	4822 130 10491	KTC3875S-GR-T1	
Q163	9965 000 25597	KSA928A-Y,TO-92L	
Q163	4822 130 63766	KTA1273Y (ALTERNATIVE)	
Q163	9965 000 25598	STB1277LY-AT TP	
Q164	4822 130 10491	KTC3875S-GR-T1	
Q173	4822 130 10491	KTC3875S-GR-T1	
Q201	4822 130 10491	KTC3875S-GR-T1	
Q202	3141 018 51690	2SK3018	
Q203	3141 018 51690	2SK3018	
Q204	4822 130 61269	2SA1037KQ	
Q205	4822 130 61269	2SA1037KQ	
Q301	4822 130 10491	KTC3875S-GR-T1	
Q302	9965 000 16622	KTA1504GR-RTK	
Q303	4822 130 10491	KTC3875S-GR-T1	
Q304	4822 130 10491	KTC3875S-GR-T1	
Q305	9965 000 16622	KTA1504GR-RTK	
Q306	9965 000 18651	2SC5344Y TP	
Q306	9965 000 25599	KTC3203 (ALTERNATIVE)	
Q309	9965 000 16622	KTA1504GR-RTK	
Q311	9965 000 25600	KTC3199-GR (2SC3199)	
Q401	4822 130 61269	2SA1037KQ	
Q404	9965 000 11427	KRA103S	
Q405	9965 000 11427	KRA103S	
Q501	4822 130 10491	KTC3875S-GR-T1	
Q502	4822 130 10491	KTC3875S-GR-T1	
Q503	9965 000 25597	KSA928A-Y,TO-92L	
Q503	9965 000 25598	STB1277LY-AT (ALTERNATIVE)	
Q503	4822 130 63766	KTA1273Y (ALTERNATIVE)	
Q504	4822 130 10491	KTC3875S-GR-T1	
Q505	9965 000 16624	KRC103S RTK	
Q506	9965 000 16624	KRC103S RTK	
Q514	9965 000 16624	KRC103S RTK	
Q515	9965 000 16624	KRC103S RTK	
Q5S1	4822 130 10491	KTC3875S-GR-T1	
Q7S1	4822 130 10491	KTC3875S-GR-T1	/02
Q7S2	9965 000 16624	KRC103S RTK	/02
Q801	4822 130 10491	KTC3875S-GR-T1	
Q802	4822 130 10491	KTC3875S-GR-T1	
Q803	4822 130 10491	KTC3875S-GR-T1	/02/05
Q902	4822 130 10491	KTC3875S-GR-T1	
Q903	4822 130 10491	KTC3875S-GR-T1	
Q905	4822 130 10491	KTC3875S-GR-T1	

Note: Only the parts mentioned in this list are normal service spare parts.