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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.

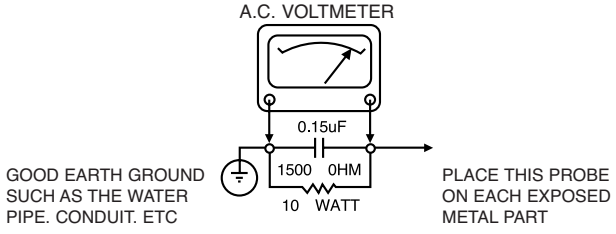
WHILE SERVICING, USE AN ISOLATION TRANSFORMER FOR PROTECTION FROM A.C. LINE SHOCK.

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.

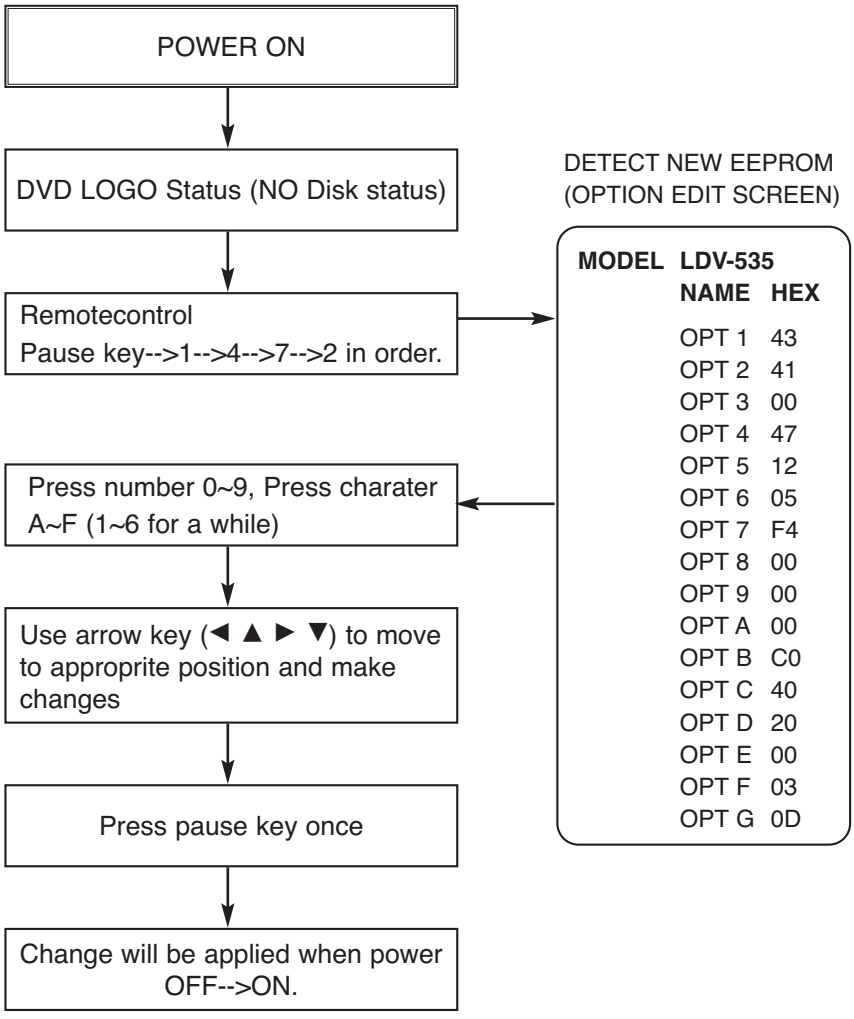
6. Do not remove a replacement ES device from its protec tive package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil, or comparable conductive material).

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



*** OPTION**

- NTSC model doesn't have VCR option and use DVD option B~F as VCR option. (only DVD exist)
- PAL model has another separate VCR option. (Both VCR and DVD exist)

SPECIFICATIONS

• GENERAL

Power requirements	120V, 60 Hz
Power consumption	16 W
Dimensions (approx.)	16.9" X 3.1" X 10.4" (430 X 78.5 X 265 mm) (w x h x d)
Weight (approx.)	9.24 lbs (4.2 kg)
Operating temperature	5˚C to 40˚C (41˚F to 104˚F)
Operating humidity	5 % to 90 %
Signal system	NTSC

• INPUTS

ANTENNA IN	75 ohms (VHF/UHF/CATV)
VHS VIDEO IN(LINE1, 2)	1 V (p-p) 75 ohms, sync negative, RCA jack x 2
VHS AUDIO IN(LINE1, 2)	-6.0 dBm more than 47 ohms, RCA jack (L, R) x 2

• OUTPUTS

VIDEO OUT	1 V (p-p) 75 ohms, sync negative
S-VIDEO OUT	(Y) 1.0 V (p-p), 75 ohms, negative sync, Mini DIN 4-pin x 1
	(C) 0.286 V (p-p) 75 ohms
COMPONENT VIDEO OUT	(Y) 1.0 V (p-p), 75 ohms, negative sync, RCA jack x 1
(Progressive scan)	(Pb)/(Pr) 0.7 V (p-p), 75 ohms, RCA jack x 2
Audio output (digital audio)	0.5 V (p-p), 75 ohms, RCA jack x 1
Audio output (analog audio)	2.0 Vrms (1 KHz, 0 dB), 600 ohms, RCA jack (L, R) x 1
RF OUT	Channel 3 or 4 (Adjustable)

• VCR SPECIFICATIONS

Head system	Four head helical scan azimuth system
Timer	12-hour display type with AM, PM
Tape speed	SP: 33.35 mm/sec, LP: 16.67 mm/sec, SLP: 11.12 mm/sec
Tape width	12.7 mm
Maximum recording time	SP: 2 HOURS (T-120), SLP: 6 HOURS (T-120)/8 HOURS (T-160)
Rewind time	About 3 minutes (T-120)
Channel coverage	VHF: 2-13, UHF: 14-69, CATV: 1-125 (4A, A-W, W+1 - W+84, A-5 - A-1)
Frequency range	20 Hz to 20 kHz
Signal-to-noise ratio	More than 43 dB
Dynamic range	More than 88 dB
Channel separation	More than 60 dB

• DVD SPECIFICATIONS

Laser system	Semiconductor laser, wavelength 650 nm
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 100 dB (ANALOG OUT jacks only)
Harmonic distortion	Less than 0.008%
Dynamic range	More than 95 dB (DVD/CD)

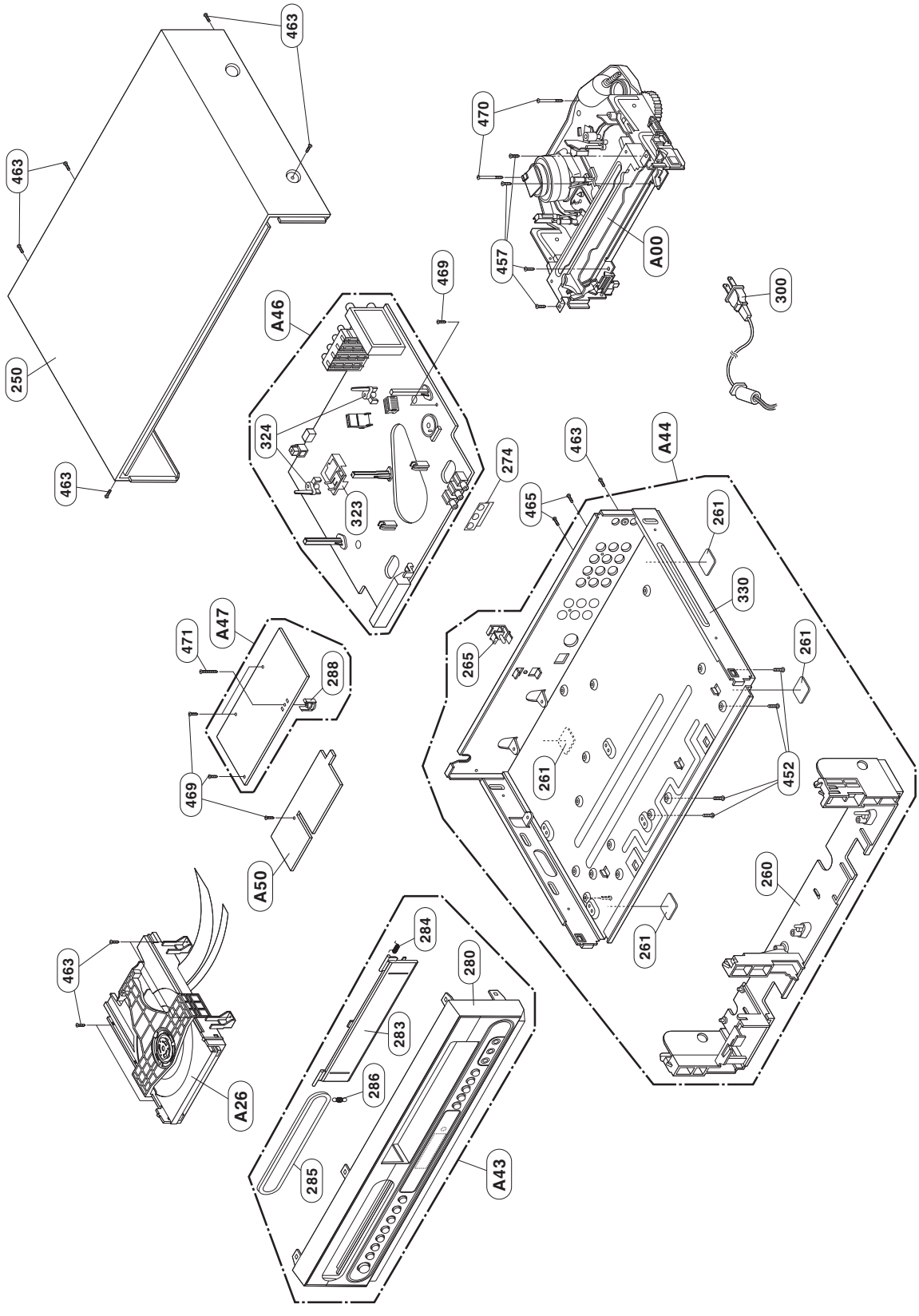
SECTION 2

CABINET & MAIN CHASSIS

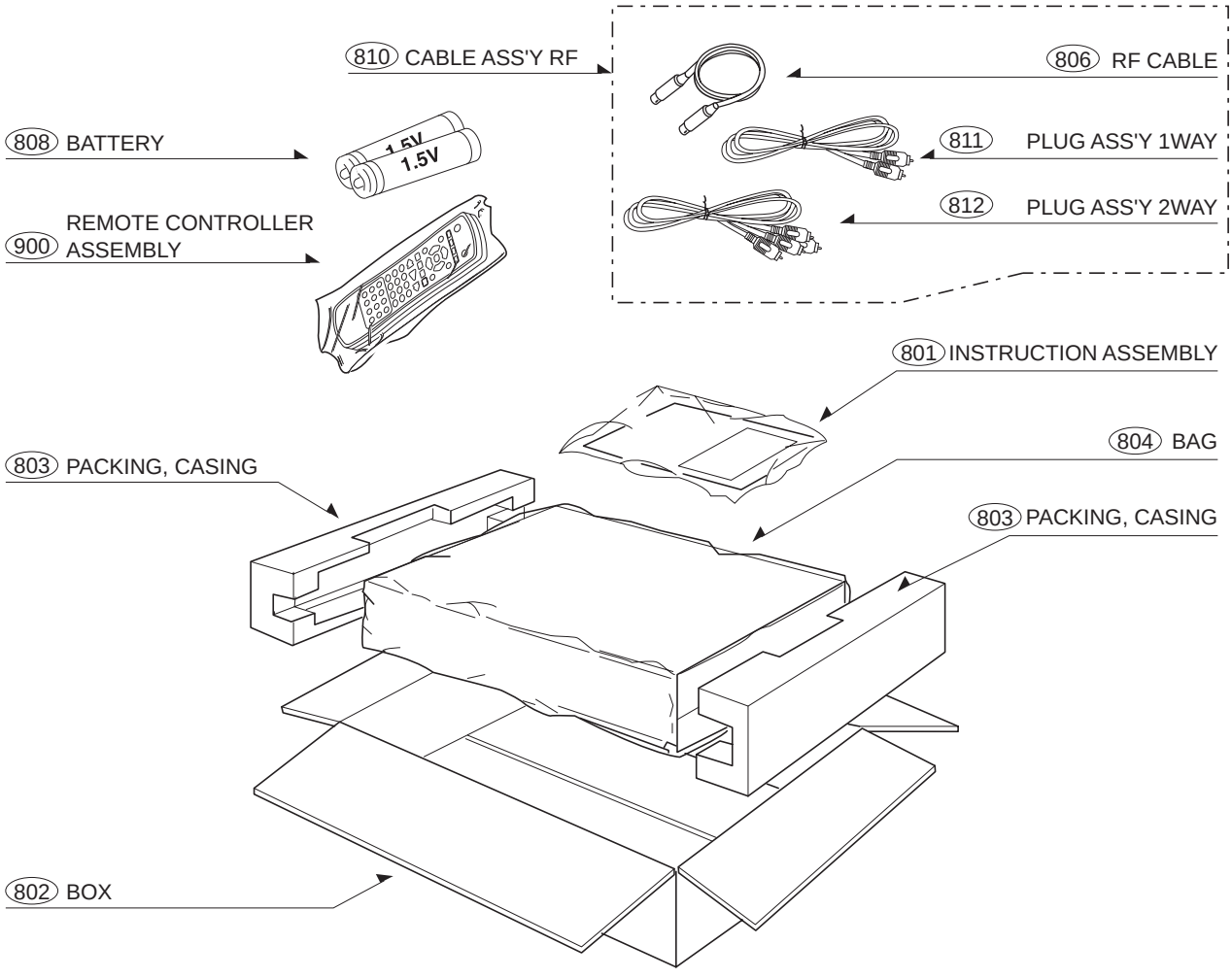
CONTENTS

EXPLODED VIEWS

1. Cabinet and Main Frame Section



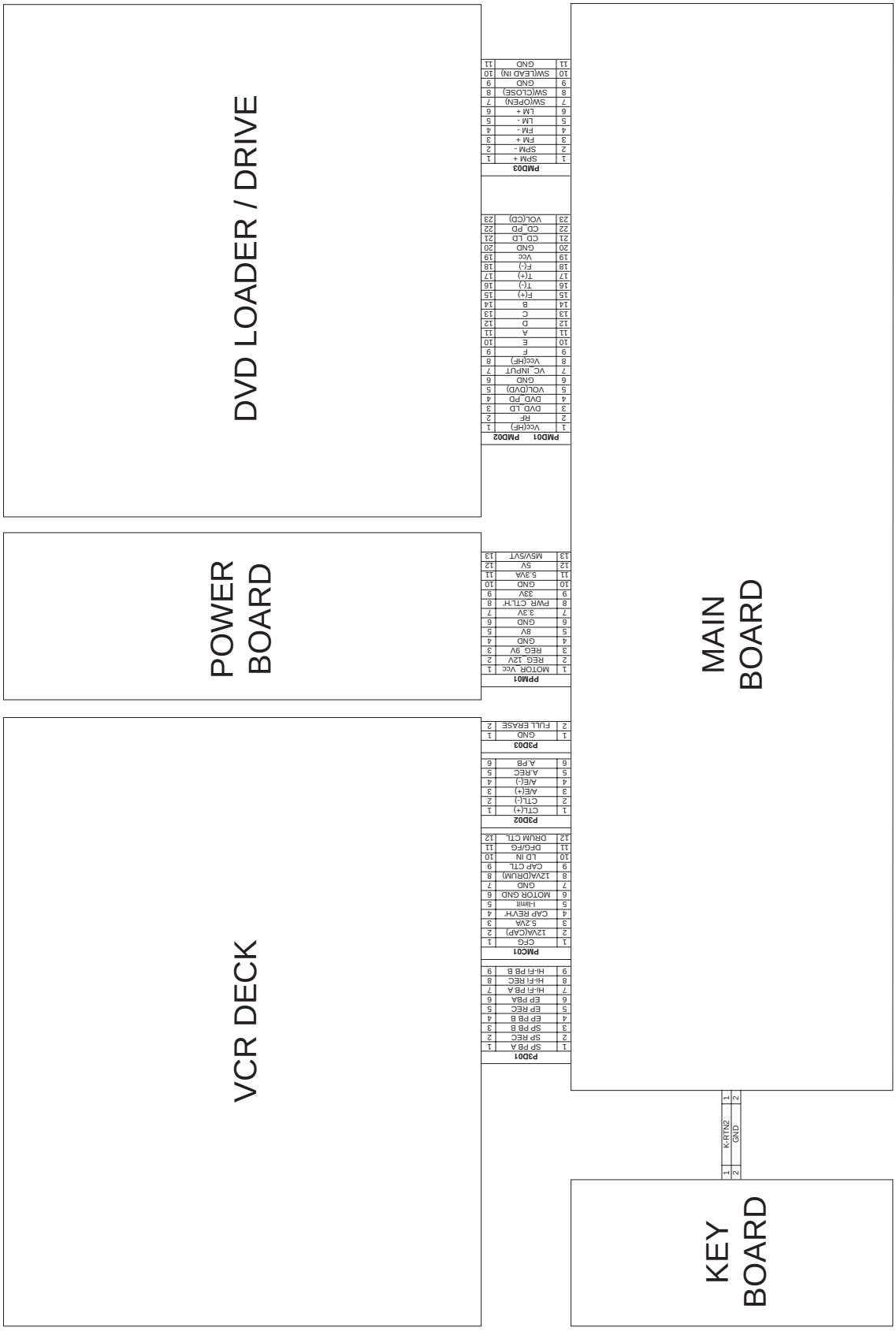
2. Packing Accessory Section



SECTION 3
ELECTRICAL

CONTENTS

OVERALL WIRING DIAGRAM



VCR PART
ELECTRICAL ADJUSTMENT PROCEDURES

1. Servo Adjustment

1) PG Adjustment

• Test Equipment

a) OSCILLOSCOPE	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**

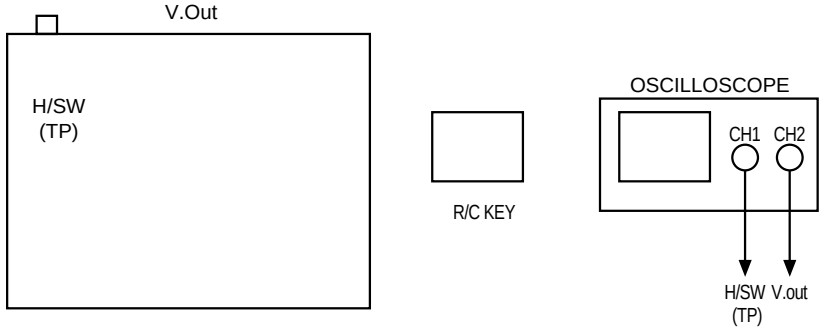
a-1) Payback the SP standard tape

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

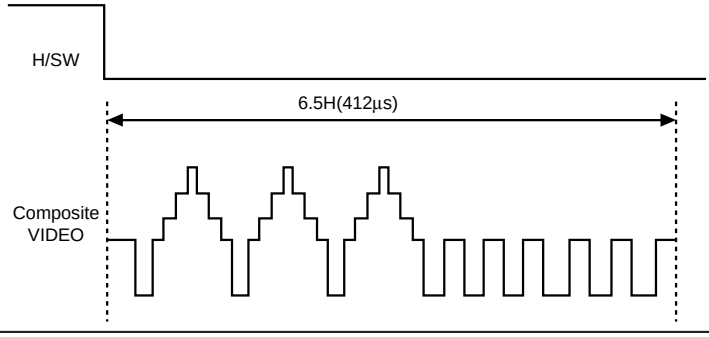
c-3) Repeat the above step(No.b-2), then it finishes the PG adjusting automatically.

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

• **CONNECTION**



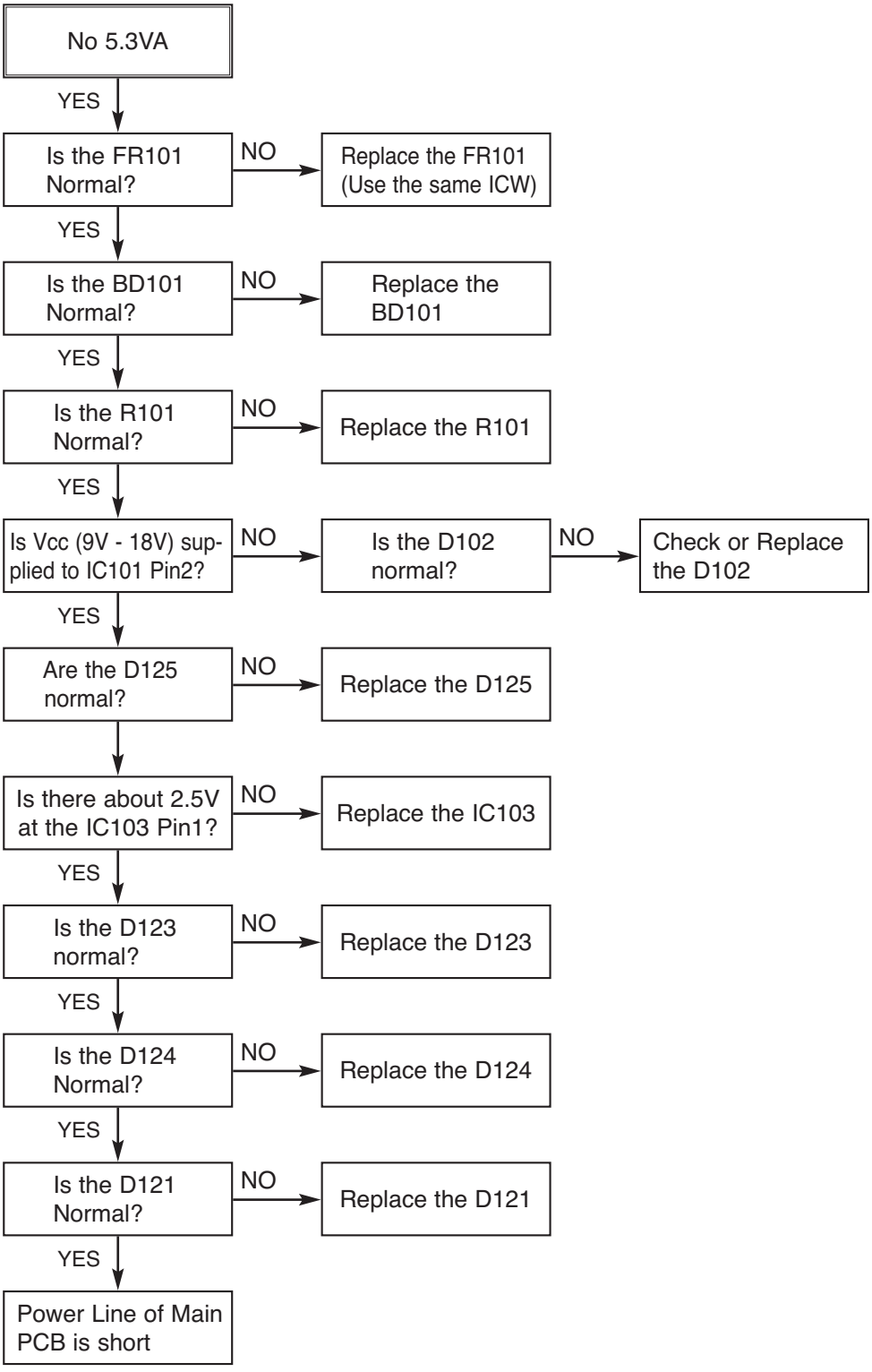
• **WAVEFORM**



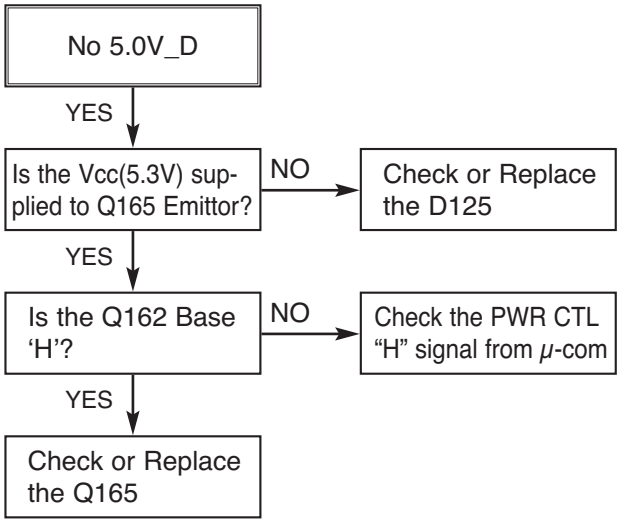
ELECTRICAL TROUBLESHOOTING GUIDE

1. Power(SMPS) CIRCUIT

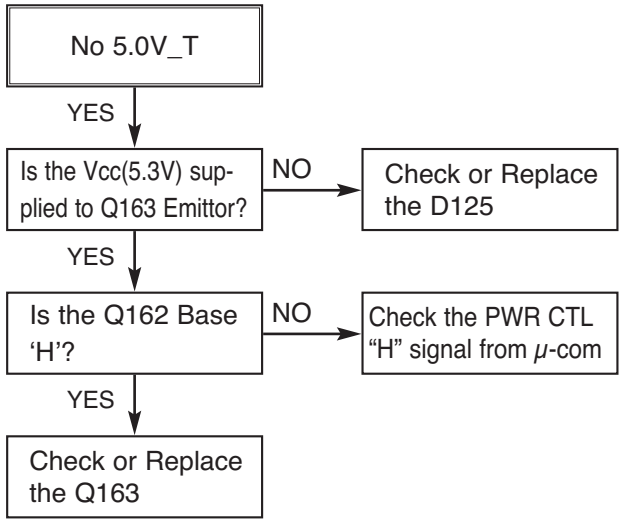
(1) NNo 5.3VA



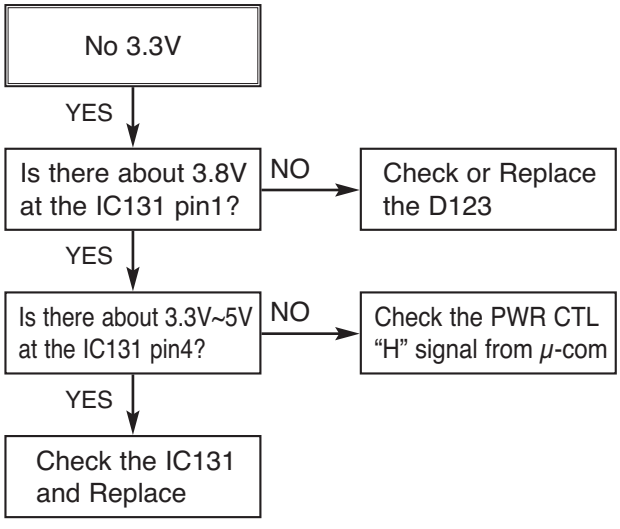
(2) No 5.0V_D



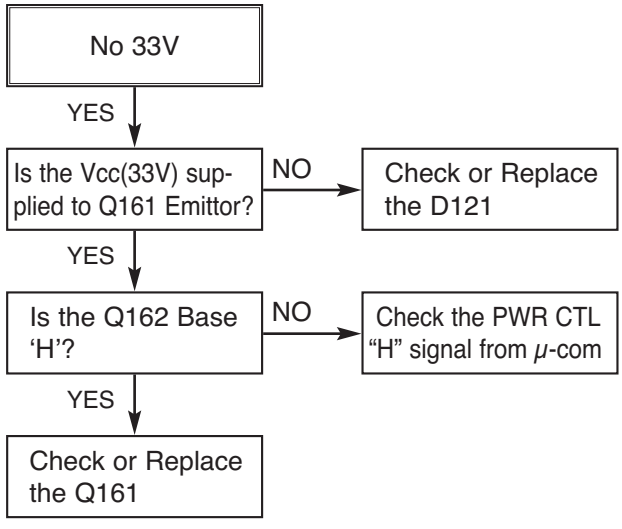
(3) No 5.0V_T



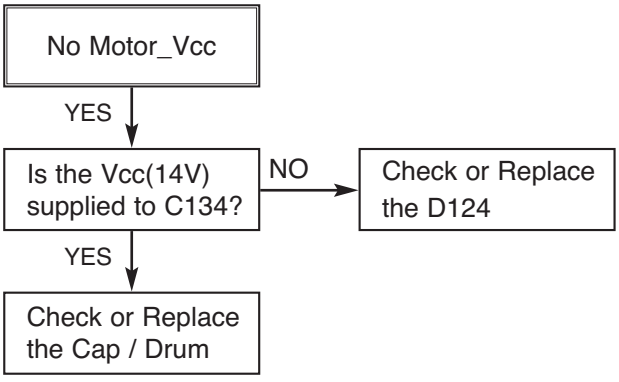
(4) No 3.3V



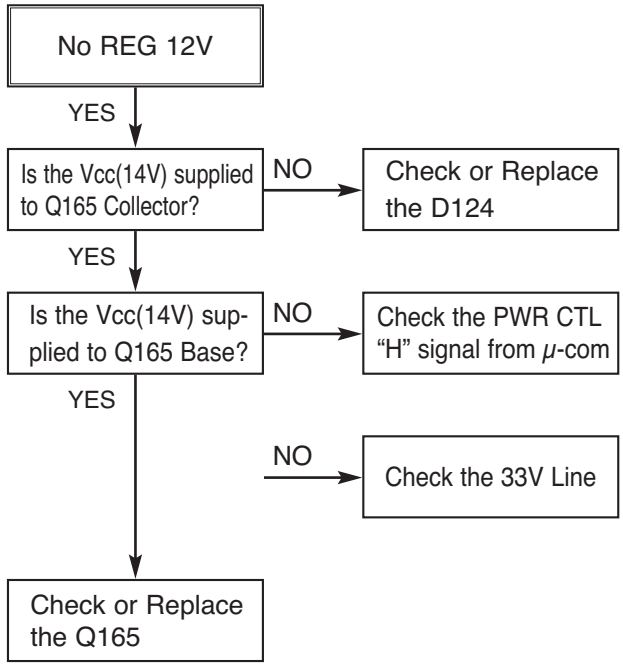
(5) No 33V



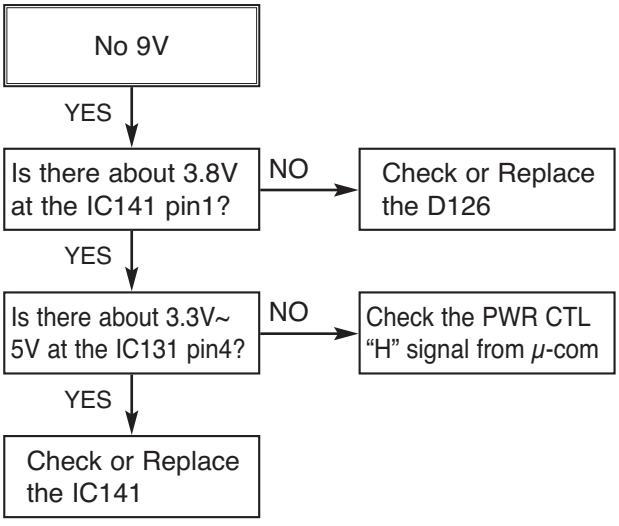
(6) No Motor_Vcc (To Cap, Drum Motor)



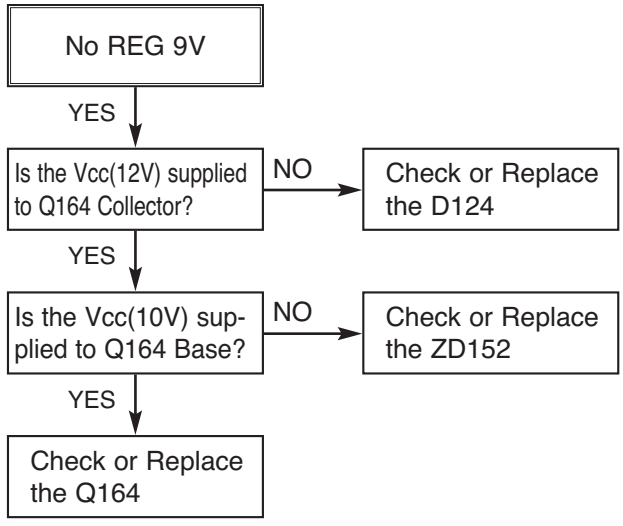
(7) No REG 12V



(8) No 9V

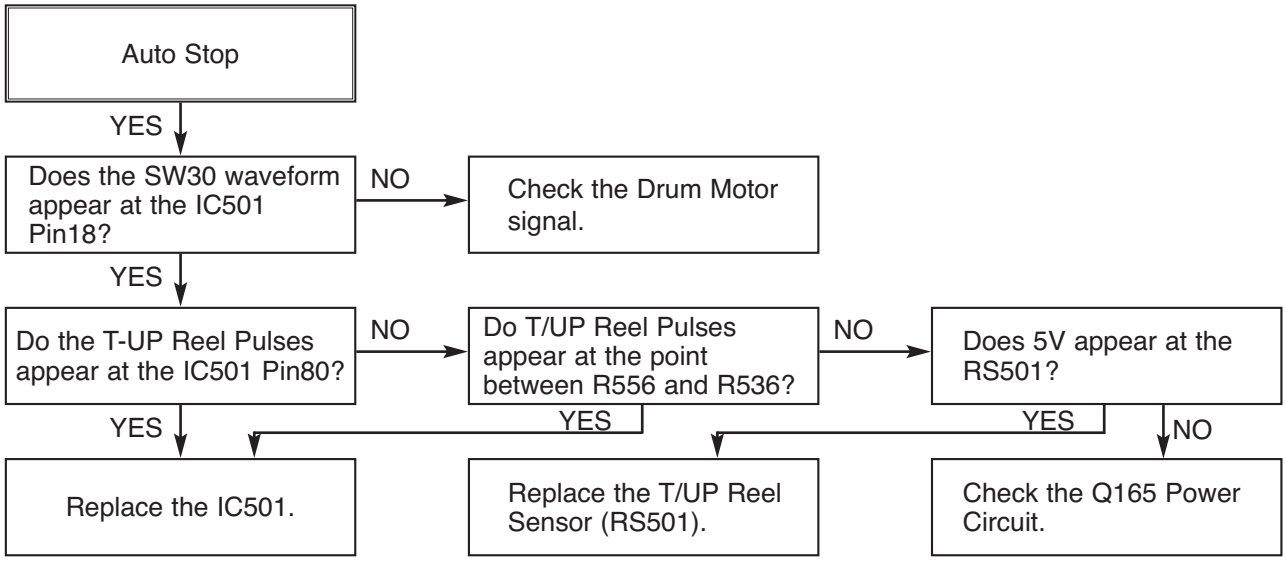


(9) No REG 9V

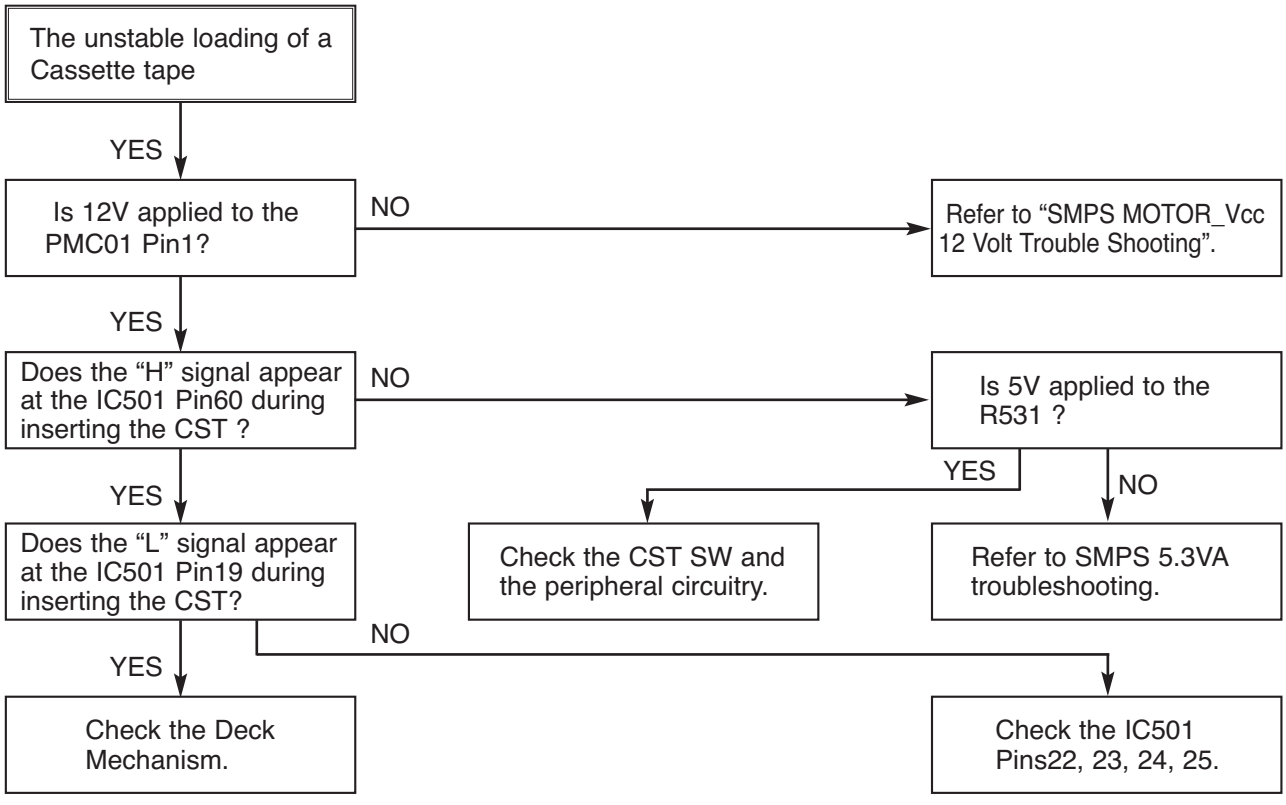


2. SYSTEM/KEY CIRCUIT

(1) AUTO STOP



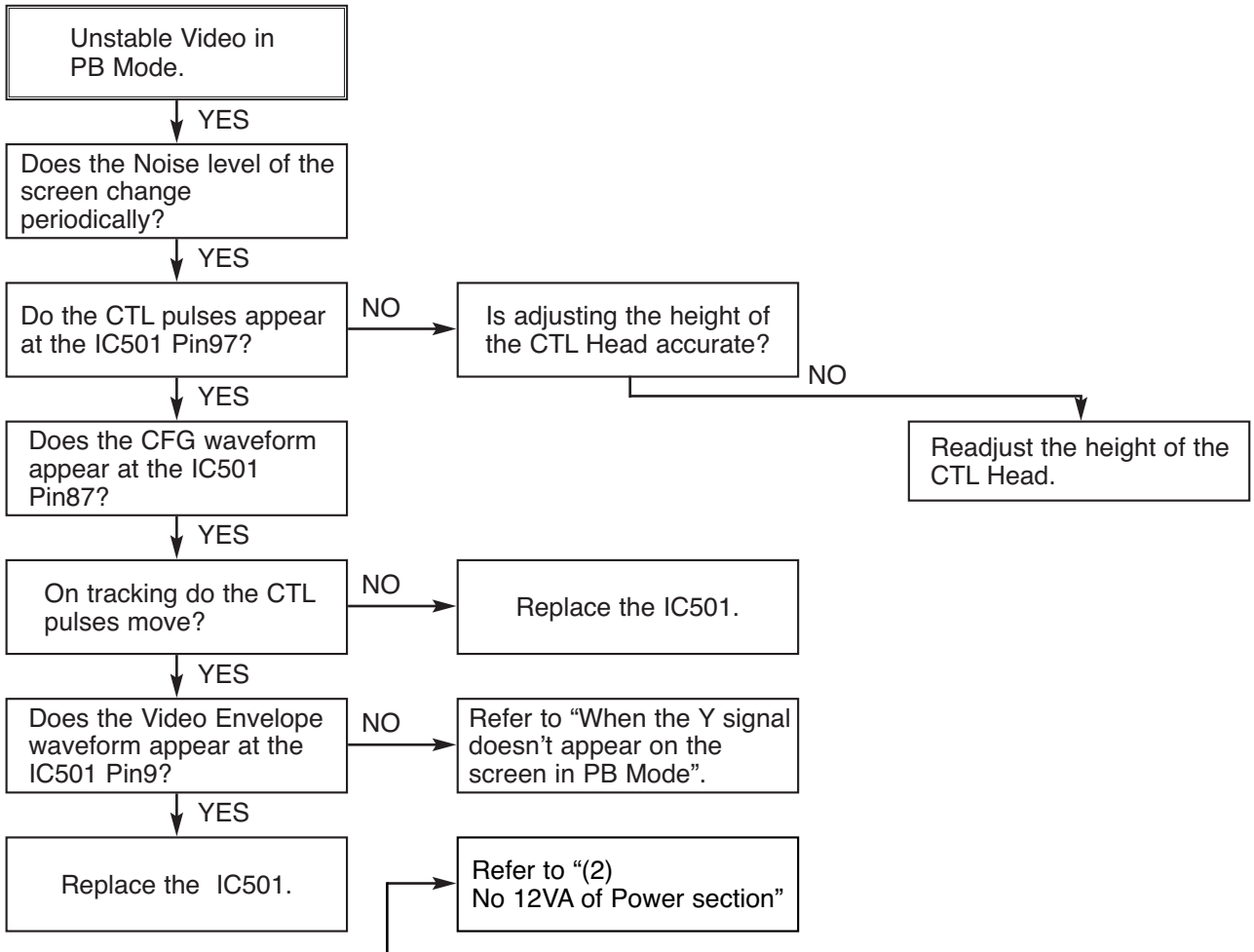
(2) The unstable loading of a Cassette tape



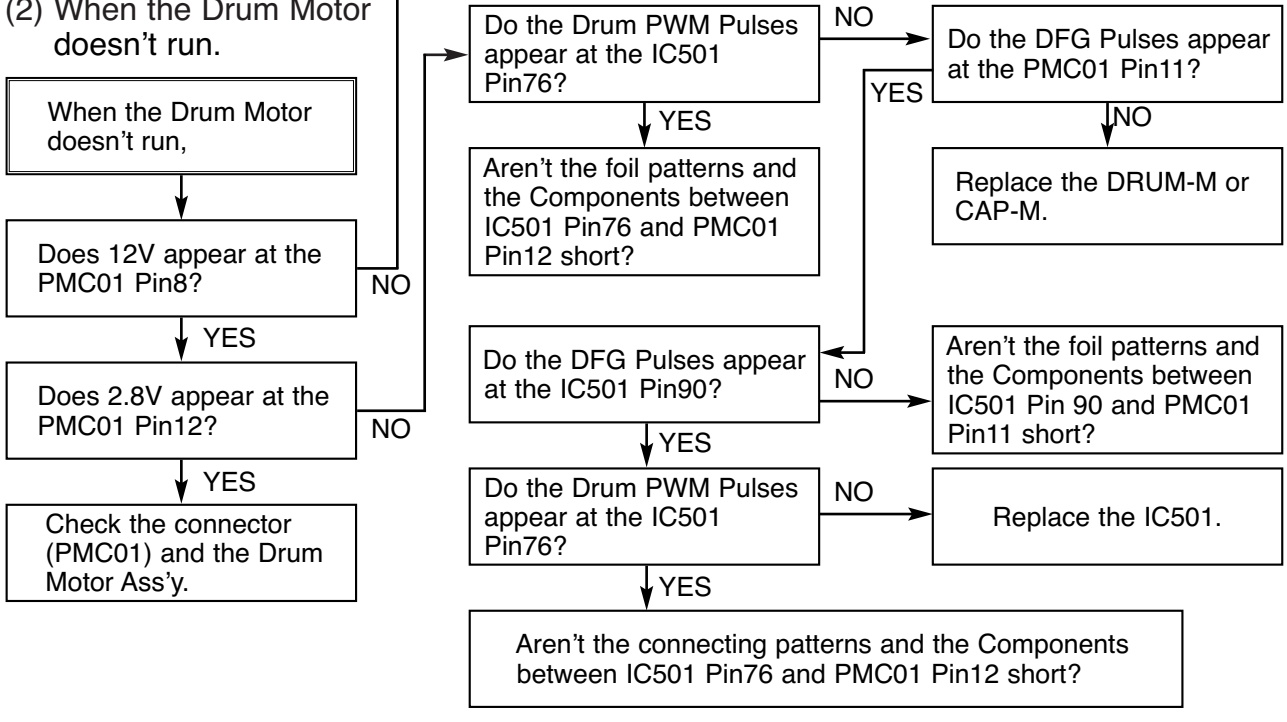
Caution : Auto stop can occur because Grease or Oil is dried up

3. SERVO CIRCUIT

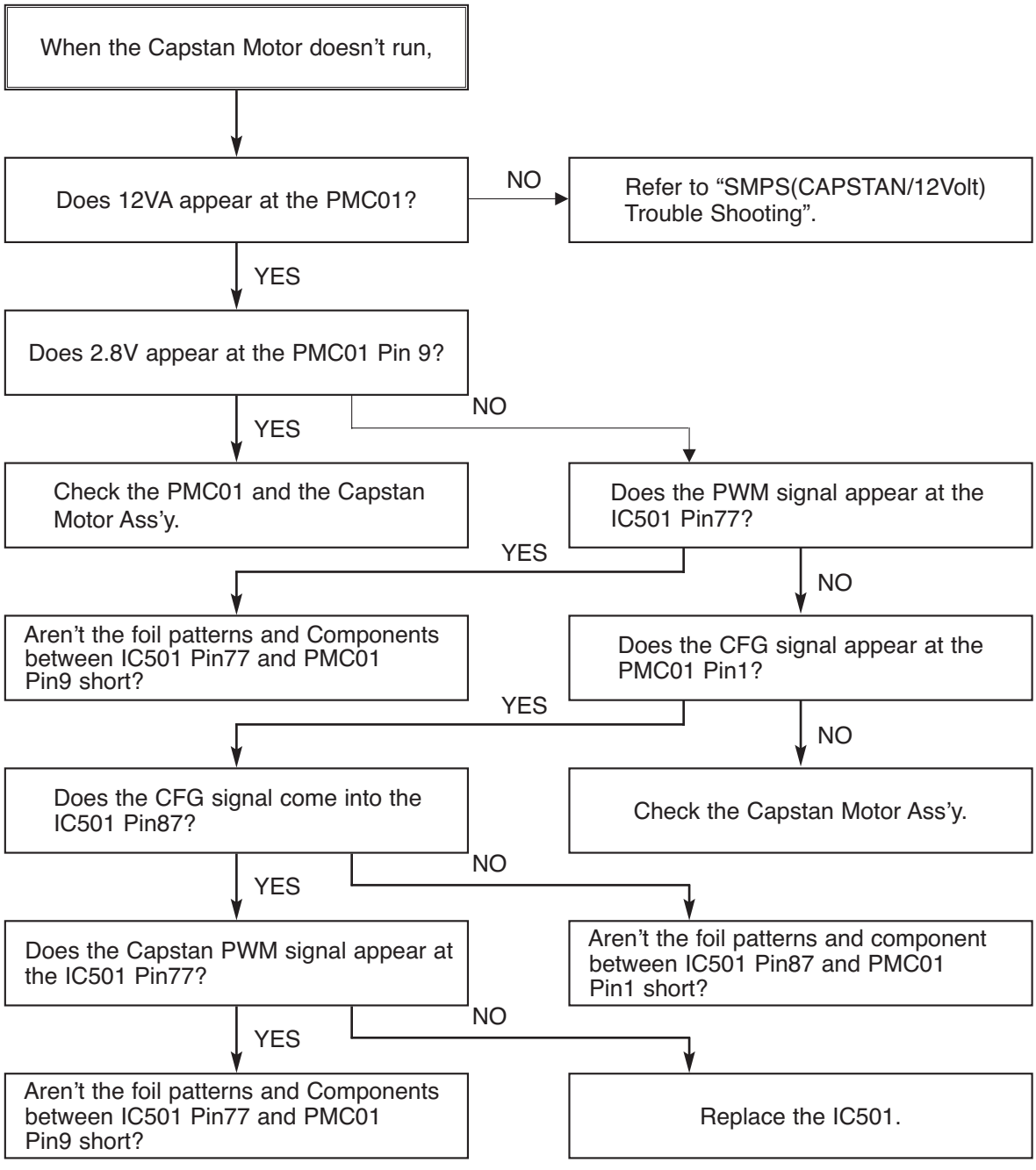
(1) Unstable Video in PB MODE



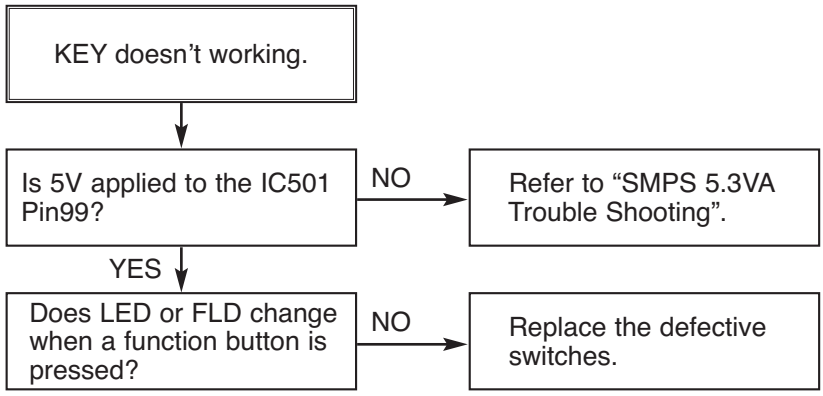
(2) When the Drum Motor doesn't run.



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

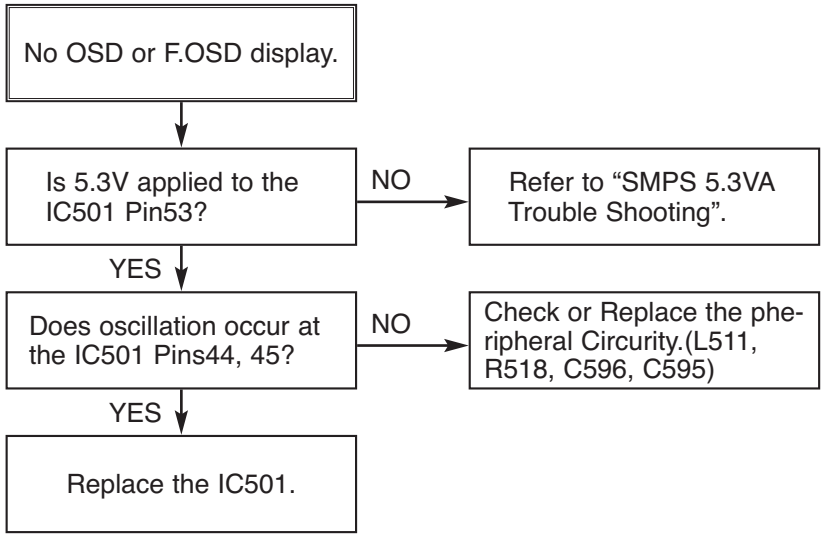


(4) KEY doesn't working

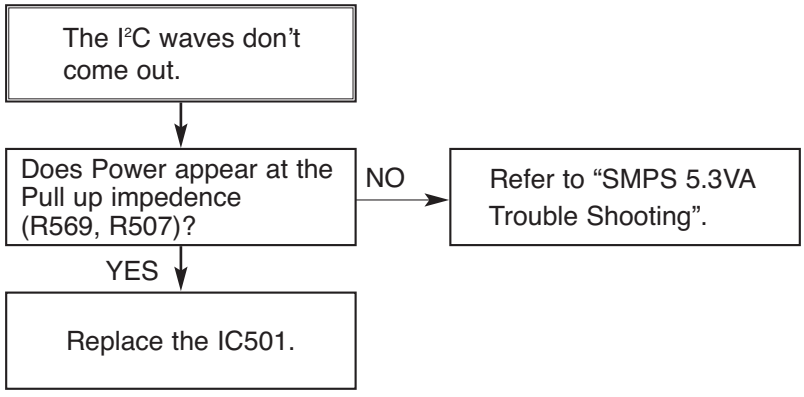


4. OSD CIRCUIT

(1) No OSD display.

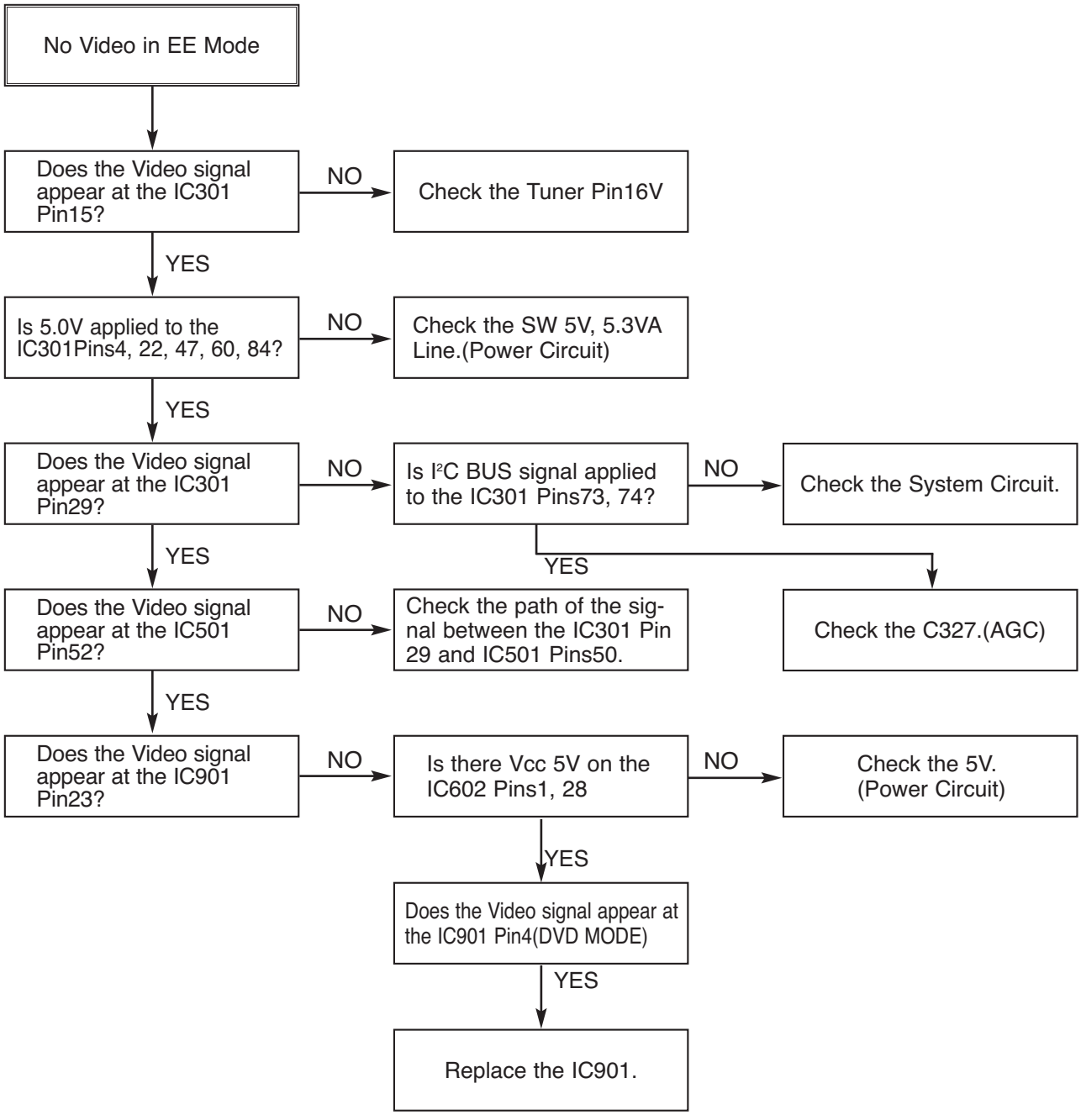


(2) I^2C BUS CHECK

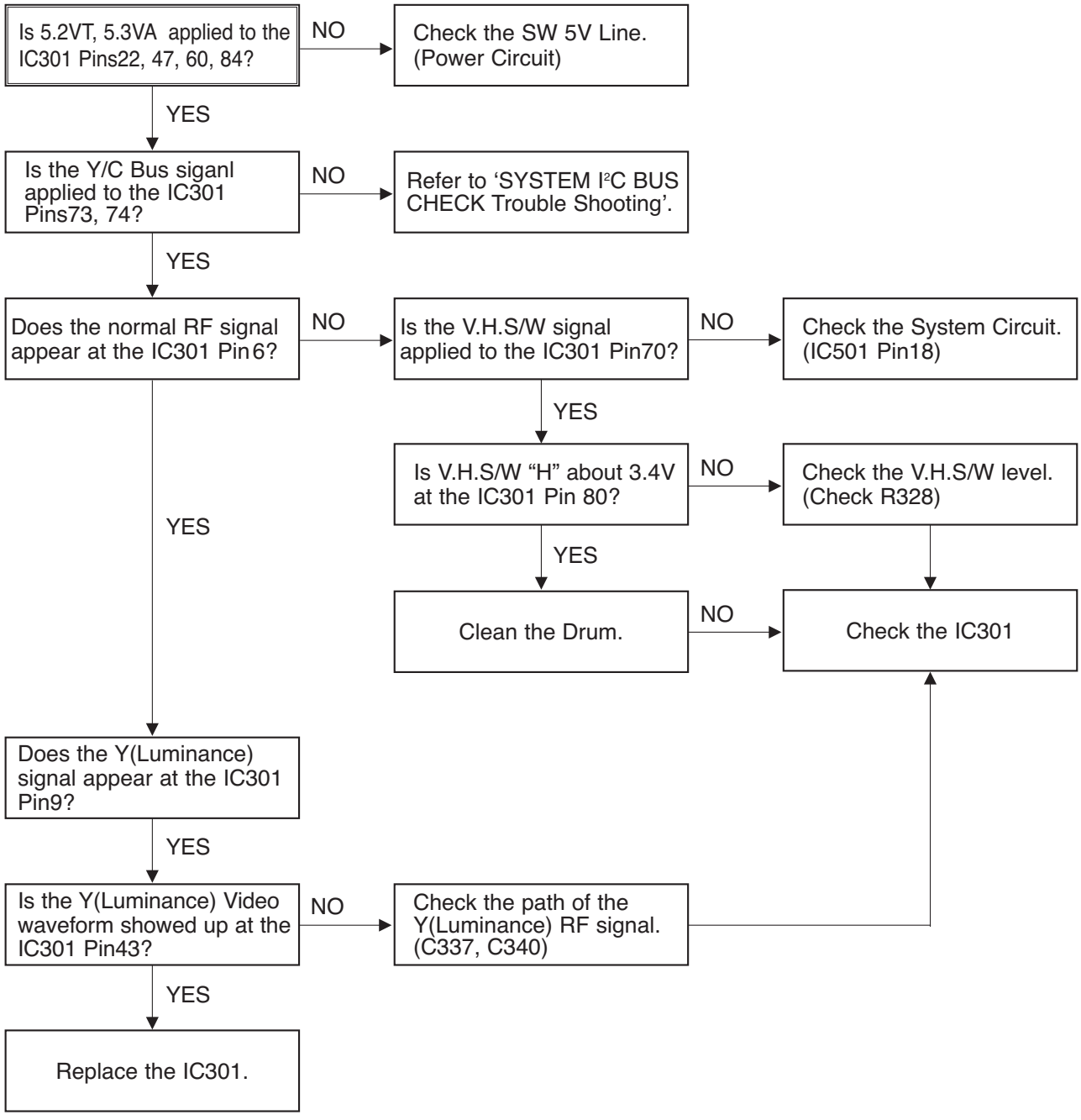


5. Y/C CIRCUIT

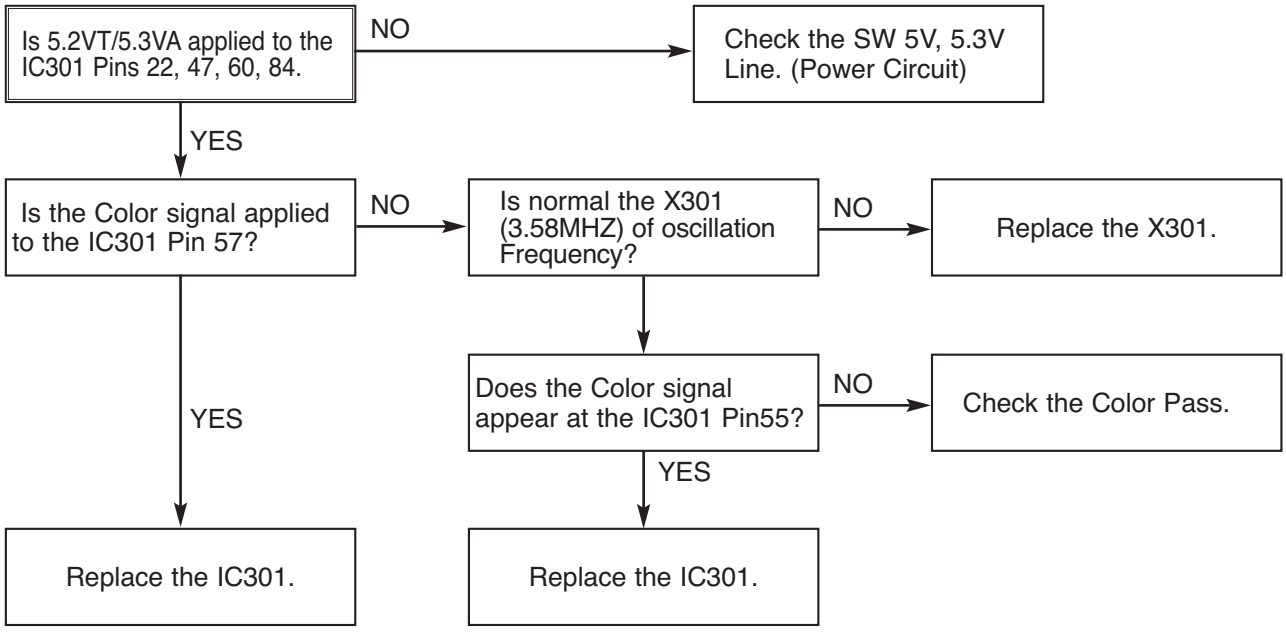
(1) No Video in EE Mode,



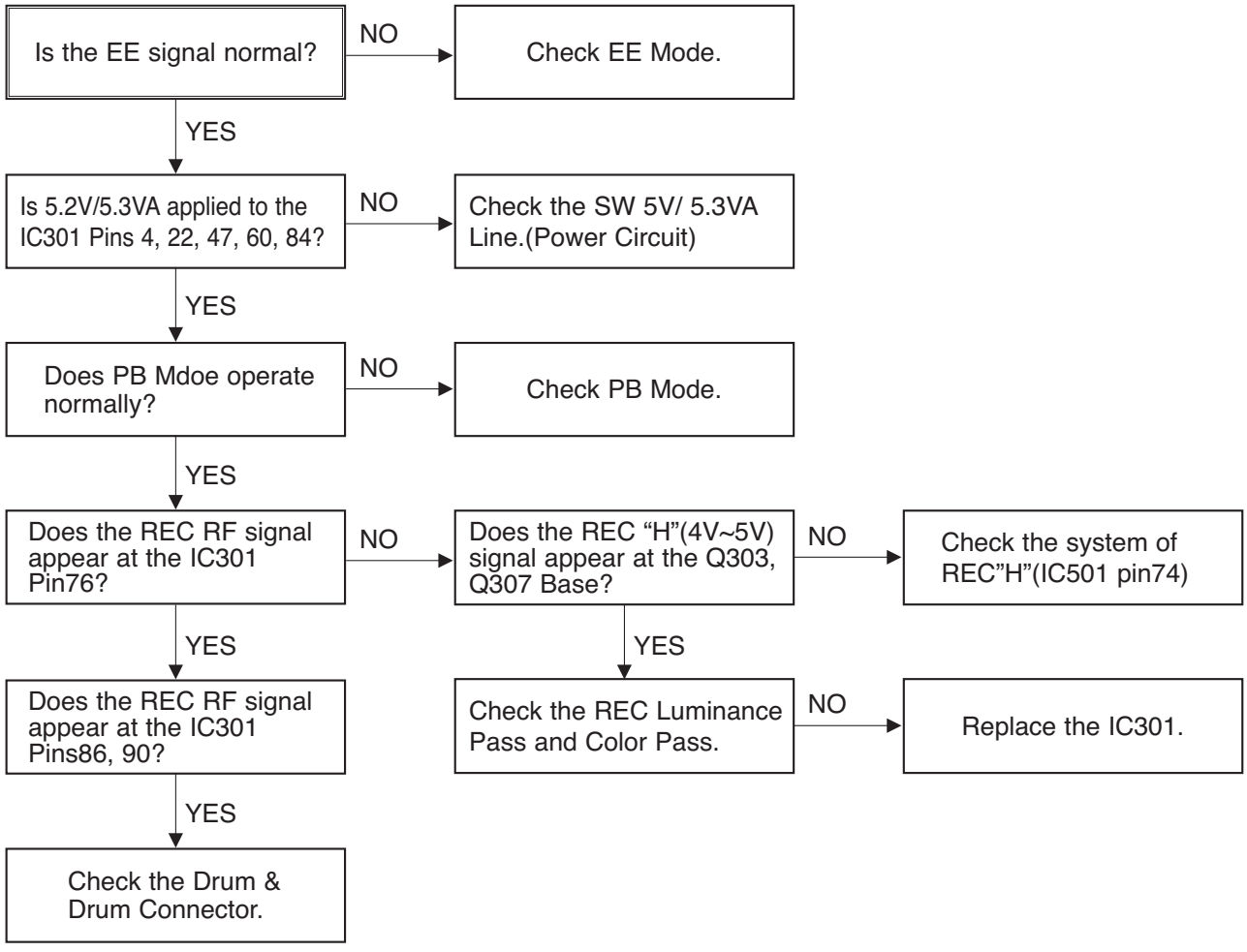
(2) When the Y(Luminance) signal doesn't appear on the screen in PB Mode,



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

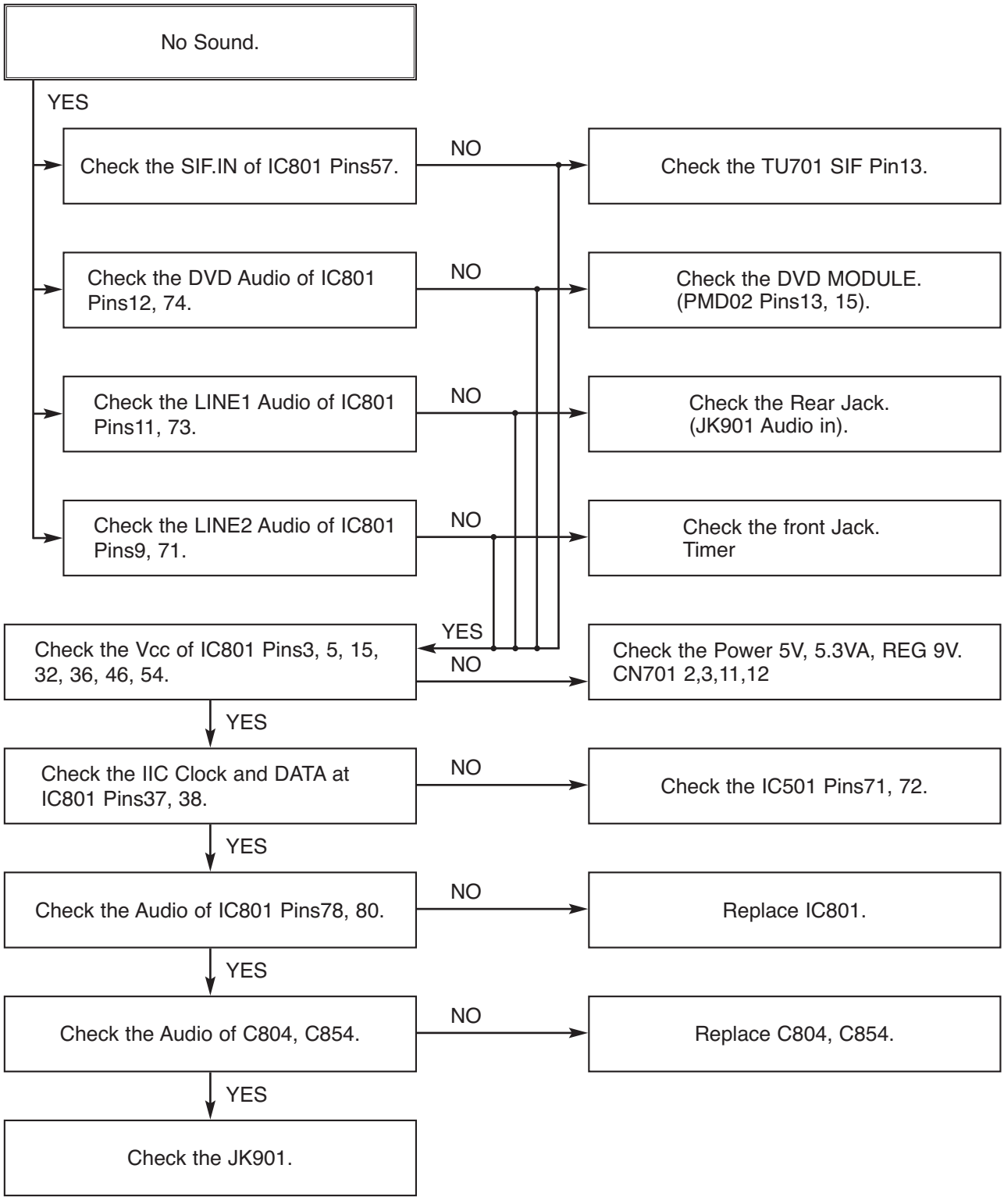


(4) When the Video signal doesn't appear on the screen in REC Mode,

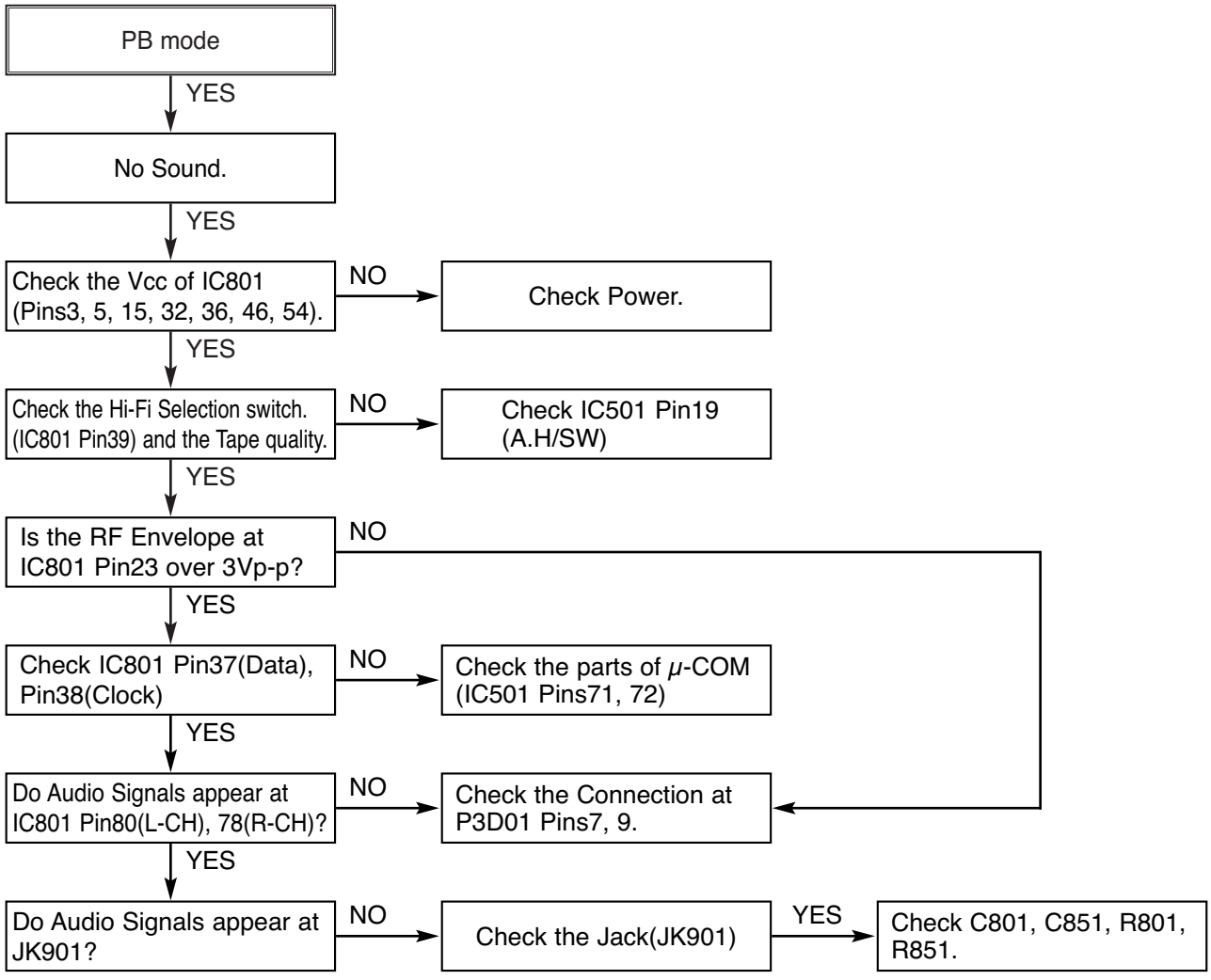


6. Hi-Fi CIRCUIT

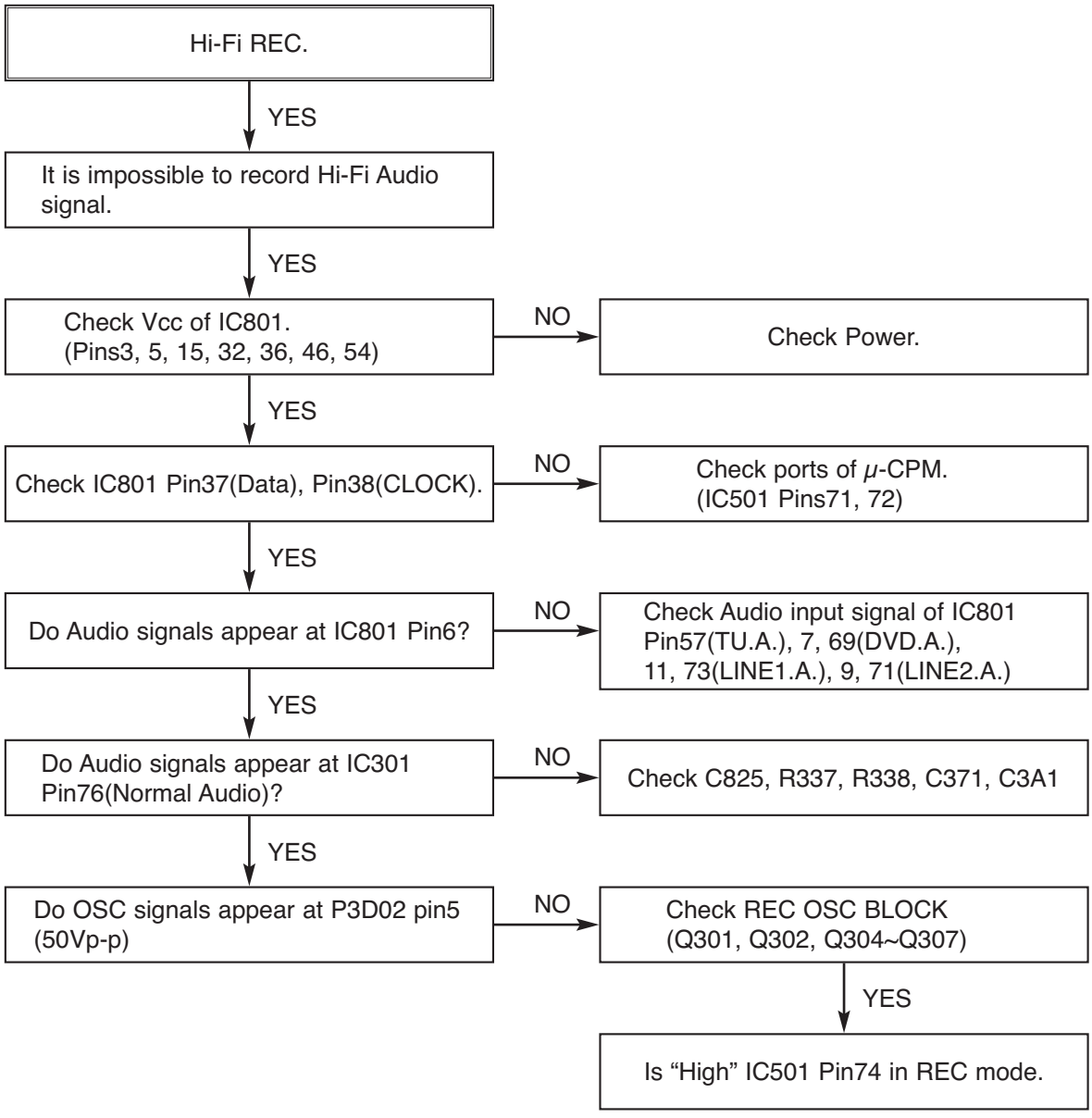
(1) No Sound(EE Mode)



(2) Hi-Fi Playback

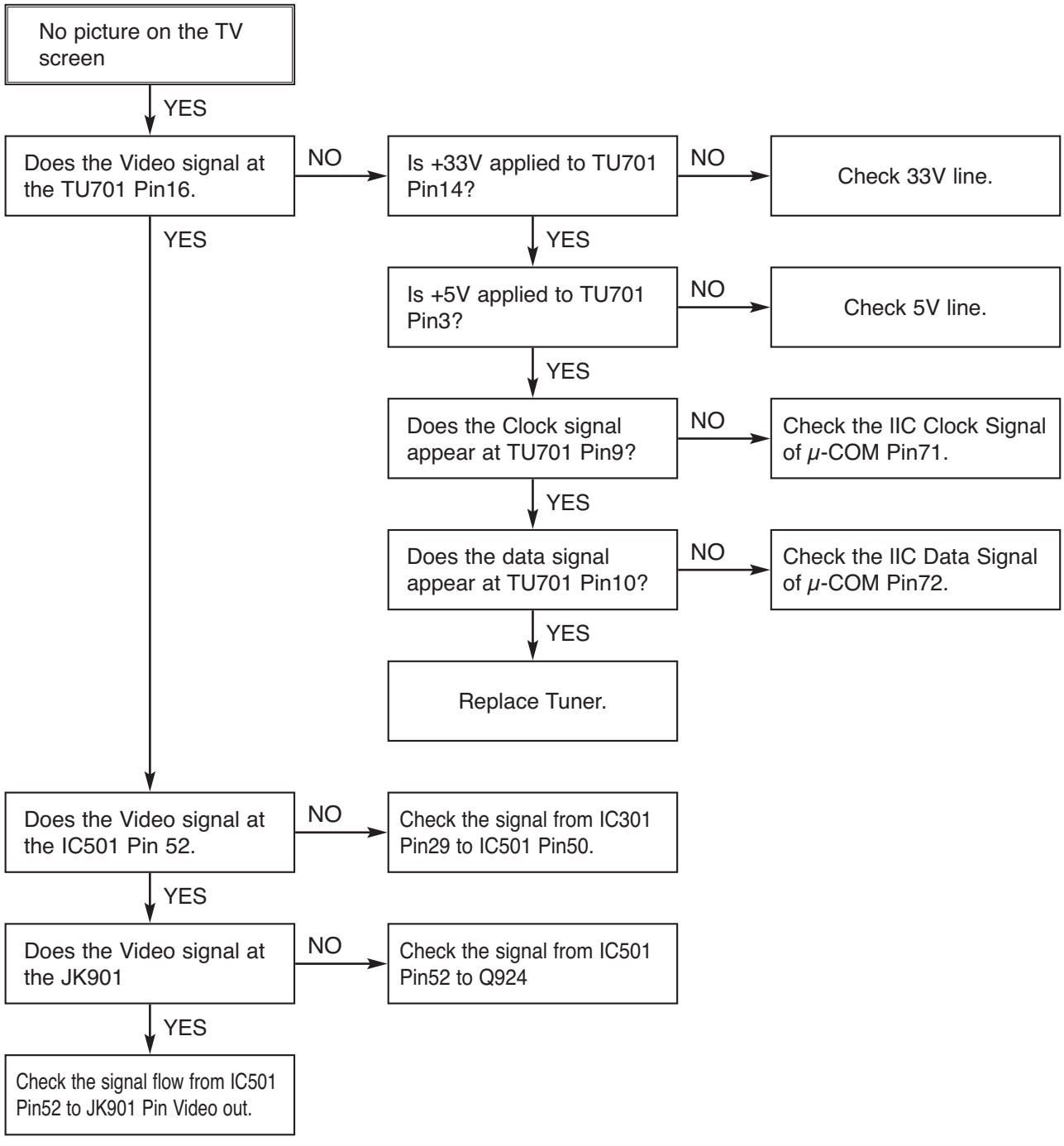


(3) Hi-Fi REC

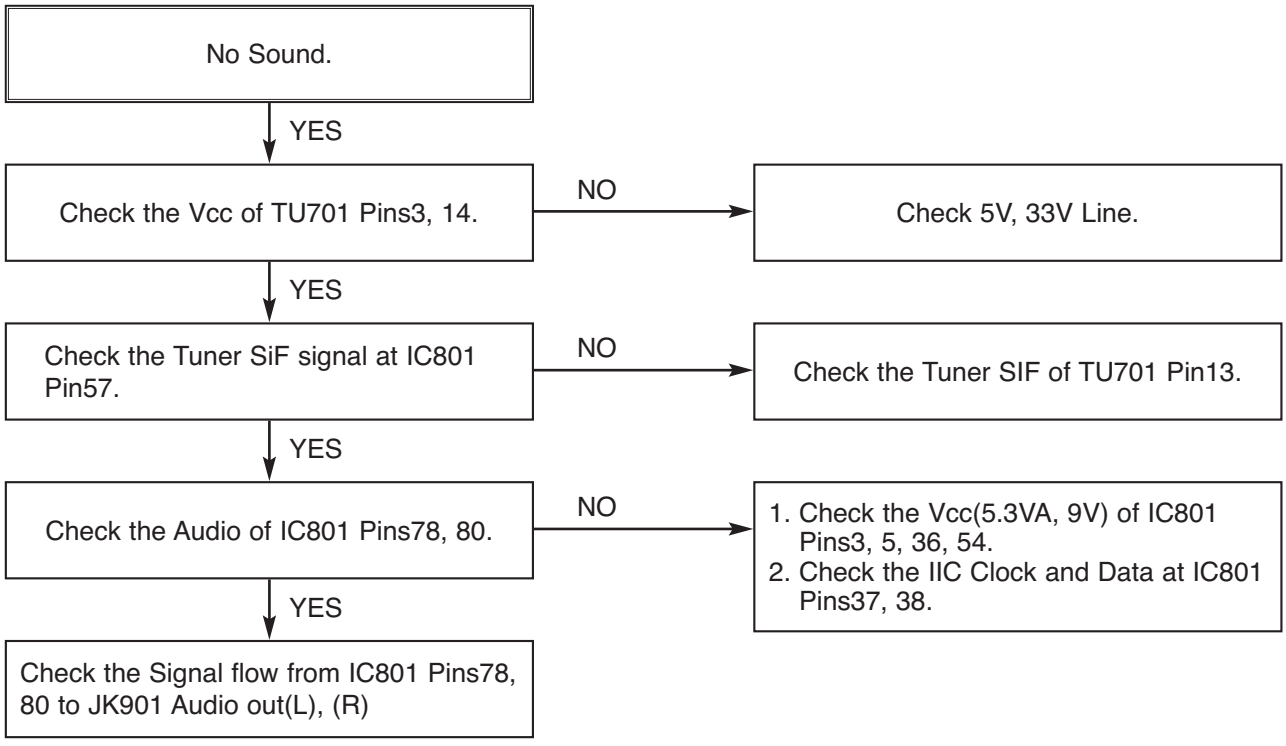

Hi-Fi REC.
YES
It is impossible to record Hi-Fi Audio signal.
YES
Check Vcc of IC801. (Pins3, 5, 15, 32, 36, 46, 54)
NO
Check Power.
YES
Check IC801 Pin37(Data), Pin38(CLOCK).
NO
Check ports of μ-CPM. (IC501 Pins71, 72)
YES
Do Audio signals appear at IC801 Pin6?
NO
Check Audio input signal of IC801 Pin57(TU.A.), 7, 69(DVD.A.), 11, 73(LINE1.A.), 9, 71(LINE2.A.)
YES
Do Audio signals appear at IC301 Pin76(Normal Audio)?
NO
Check C825, R337, R338, C371, C3A1
YES
Do OSC signals appear at P3D02 pin5 (50Vp-p)
NO
Check REC OSC BLOCK (Q301, Q302, Q304~Q307)
YES
Is “High” IC501 Pin74 in REC mode.

7. Tuner/IF CIRCUIT

(1) No Picture on the TV screen



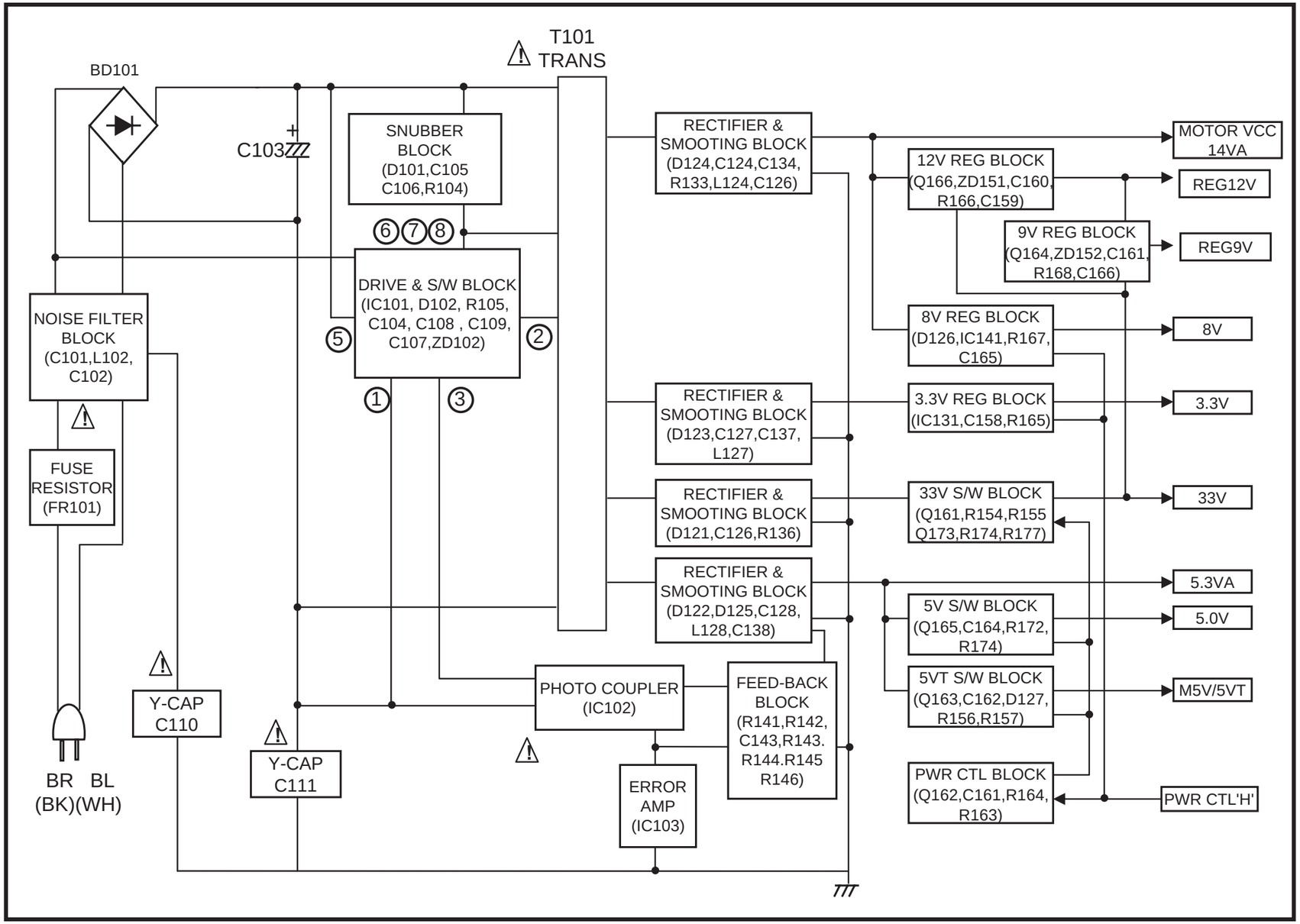
(2) No Sound


No Sound.
YES
Check the Vcc of TU701 Pins3, 14.
NO
Check 5V, 33V Line.
YES
Check the Tuner SiF signal at IC801 Pin57.
NO
Check the Tuner SIF of TU701 Pin13.
YES
Check the Audio of IC801 Pins78, 80.
NO
1. Check the Vcc(5.3VA, 9V) of IC801 Pins3, 5, 36, 54.
2. Check the IIC Clock and Data at IC801 Pins37, 38.
YES
Check the Signal flow from IC801 Pins78, 80 to JK901 Audio out(L), (R)

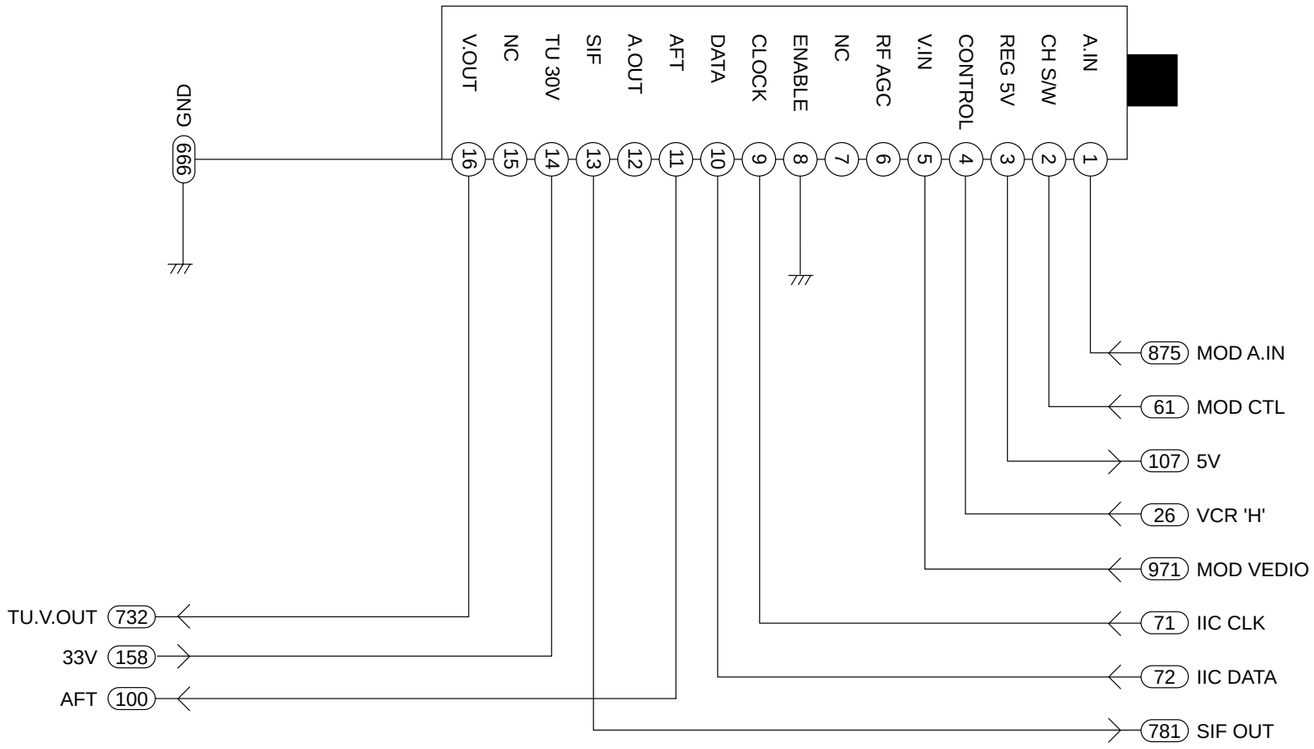
MEMO

BLOCK DIAGRAMS

1. POWER(SMPS) BLOCK DIAGRAM



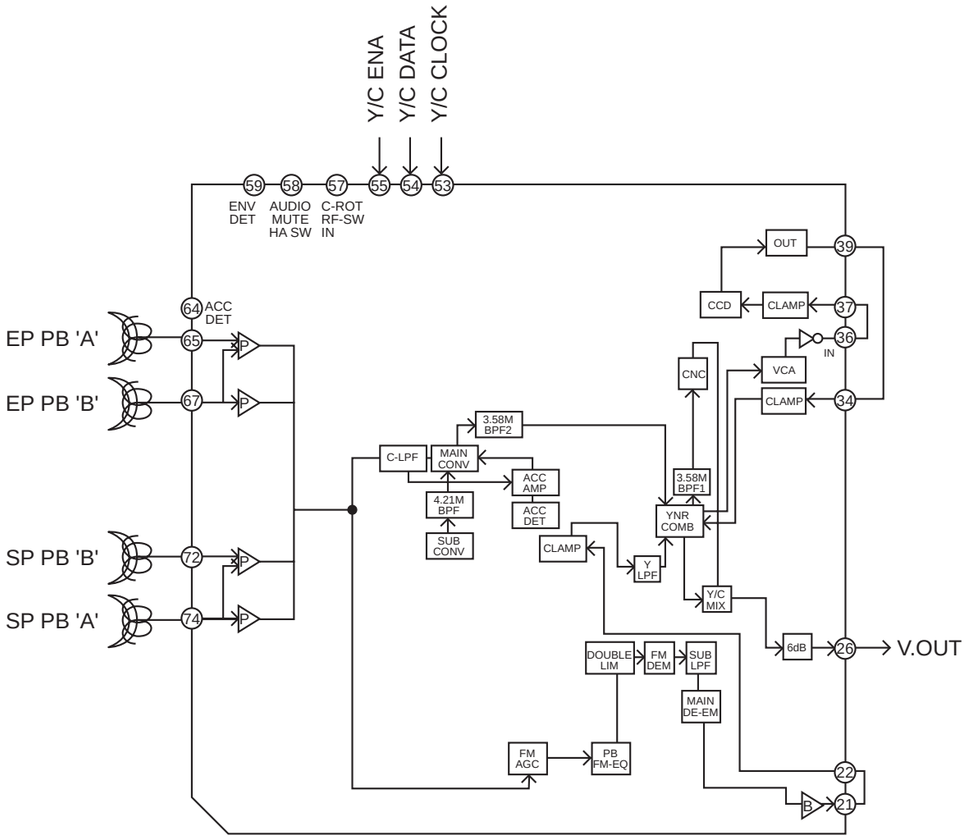
2. TU/IF BLOCK DIAGRAM



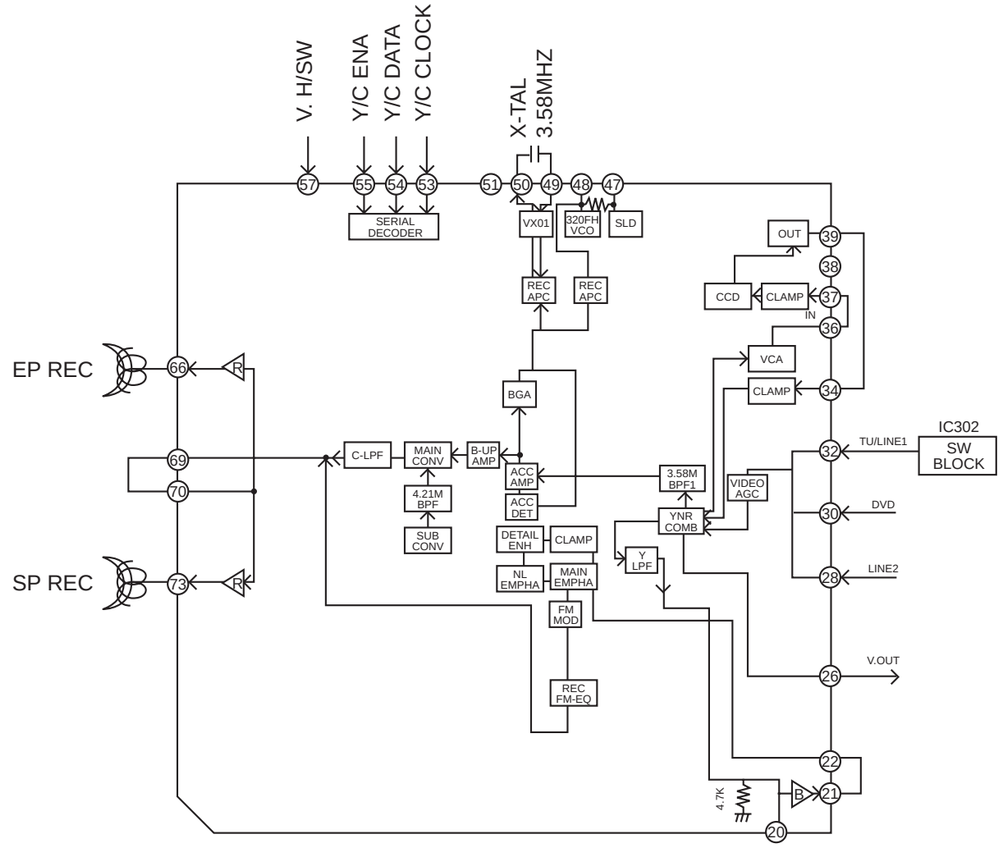
COMBI NTSC

3. Y/C BLOCK DIAGRAM

(PB Mode)

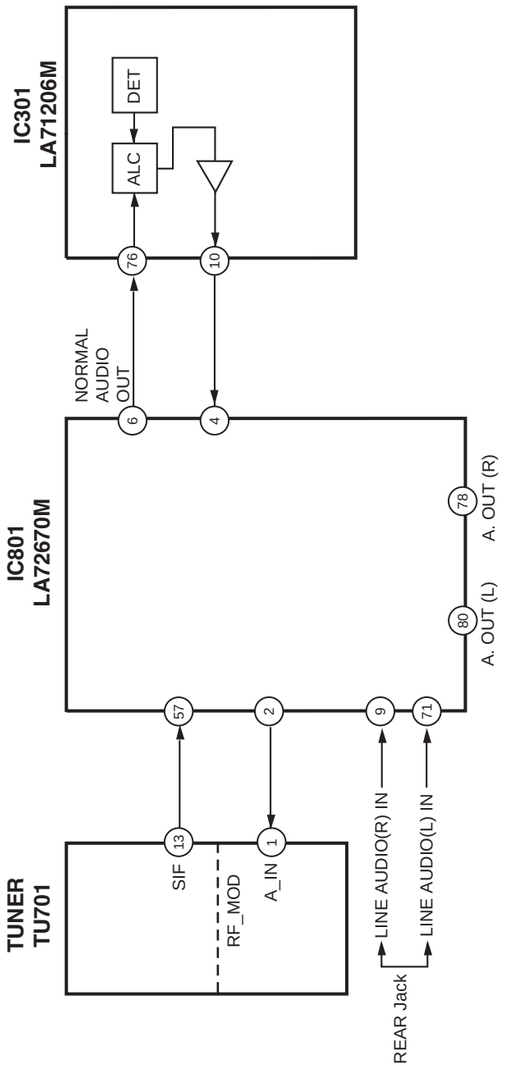


(REC Mode)

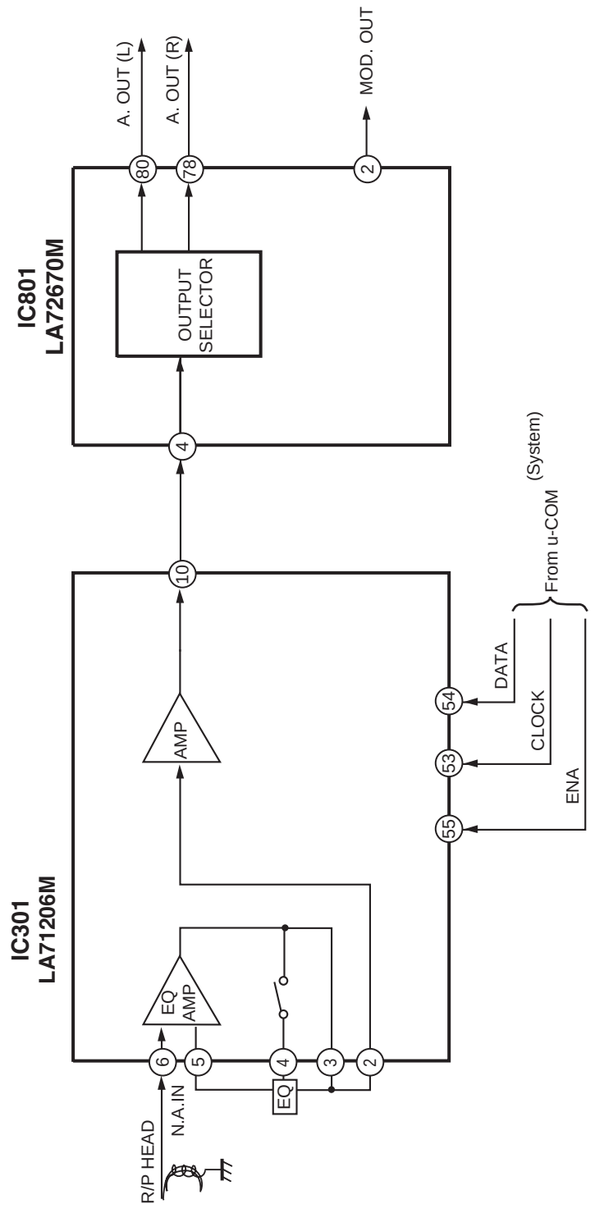


4. NORMAL AUDIO BLOCK DIAGRAM

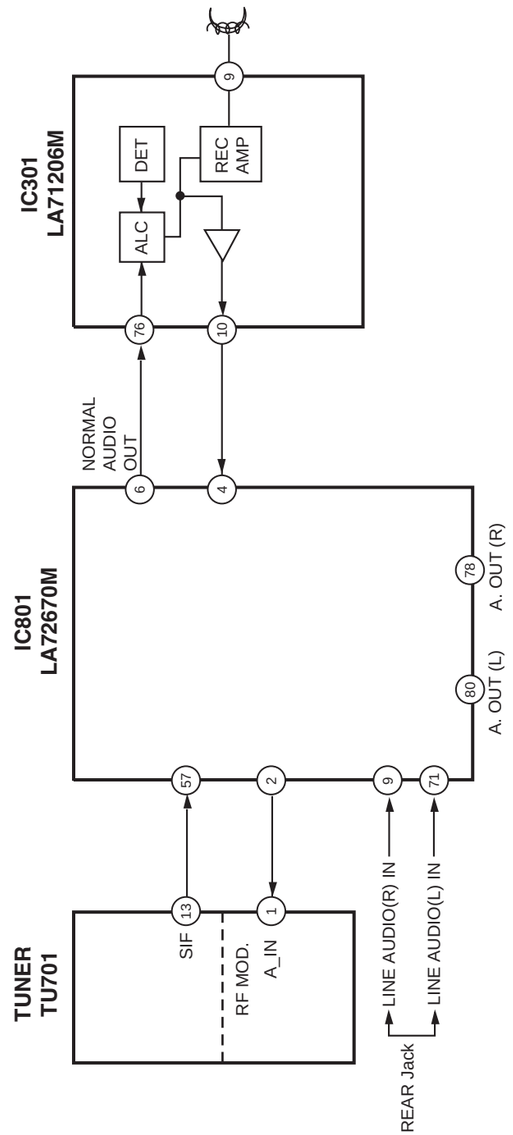
(EE Mode)



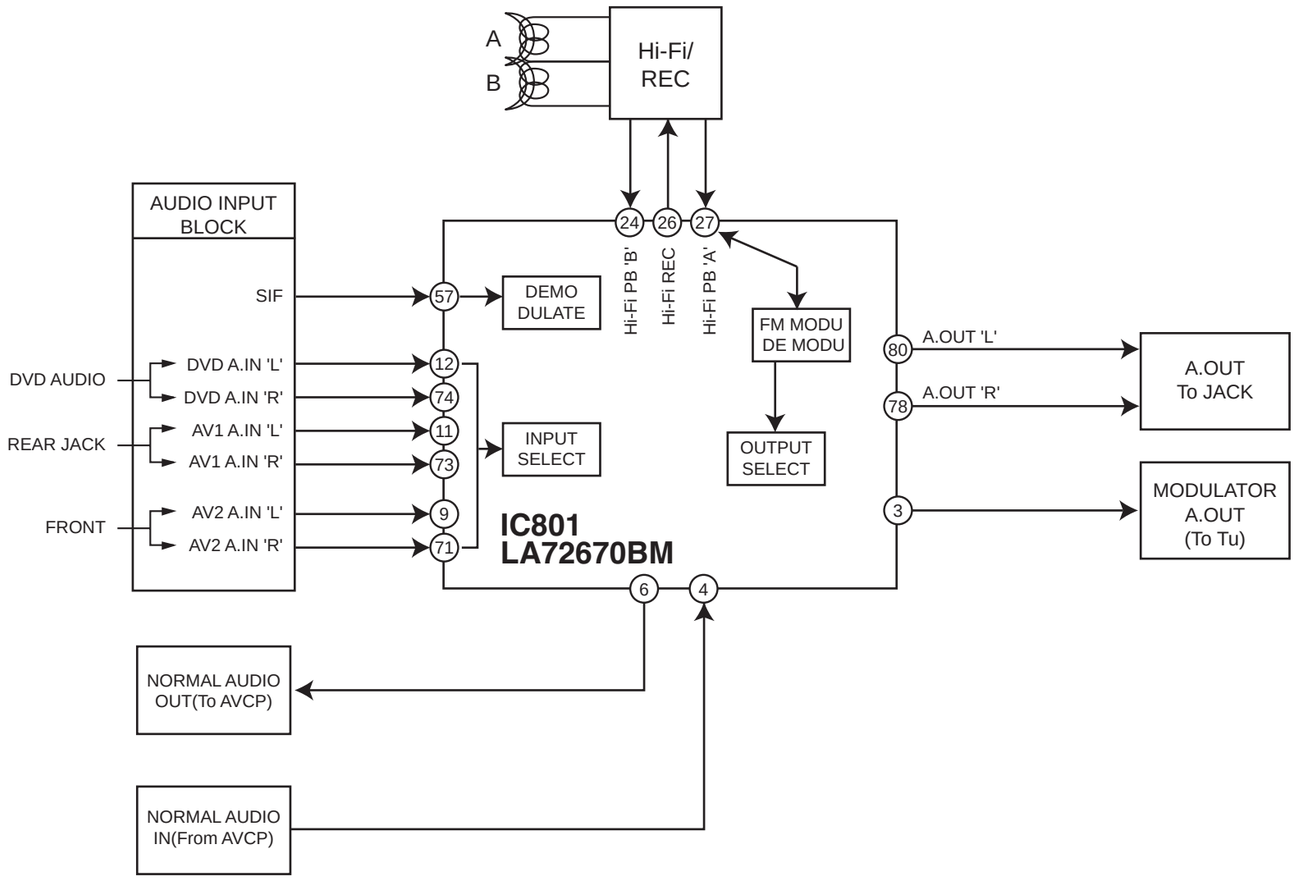
(PB Mode)



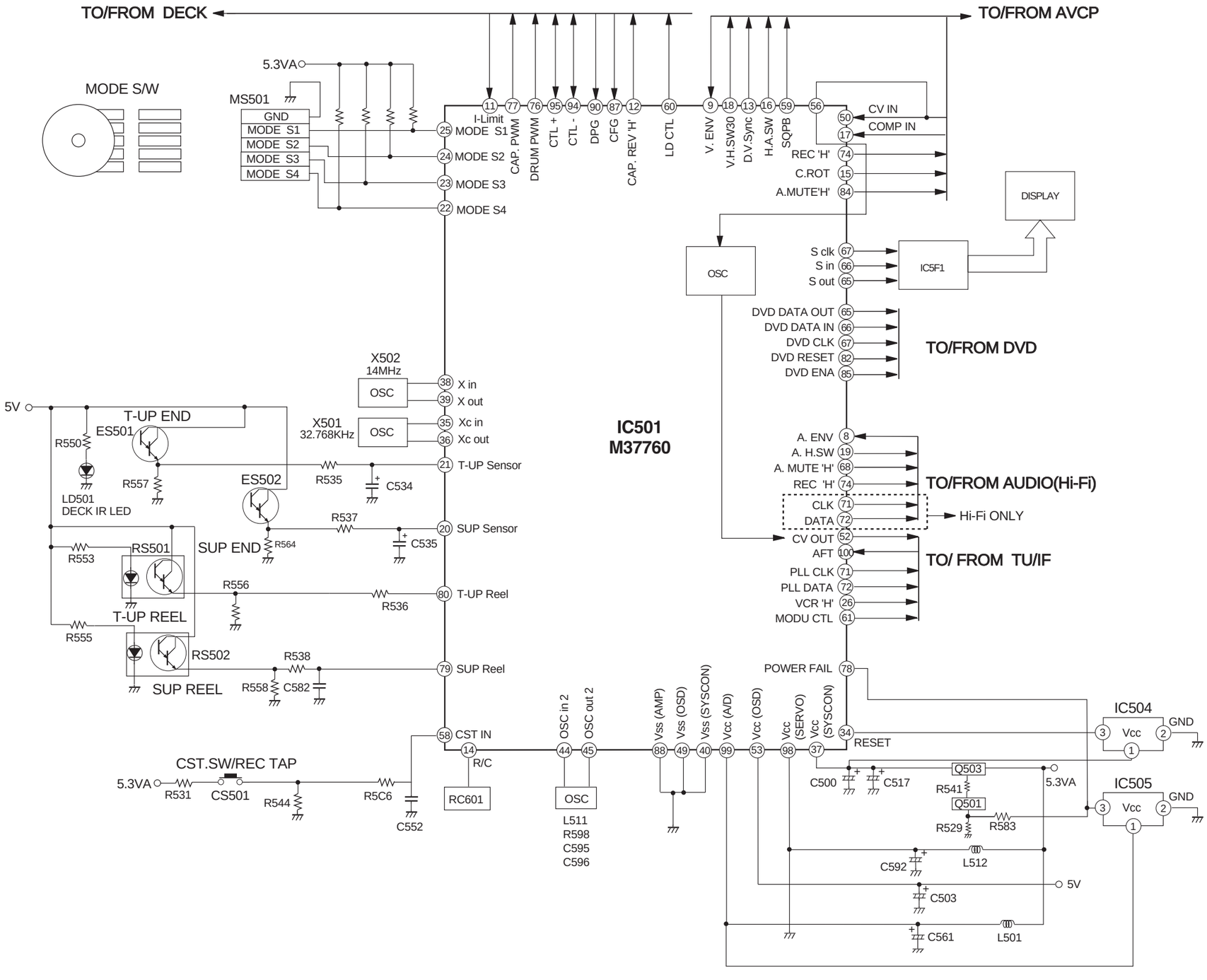
(REC Mode)



5. Hi-Fi BLOCK DIAGRAM



6. SYSTEM BLOCK DIAGRAM



CIRCUIT DIAGRAMS

1. POWER(SMPS) CIRCUIT DIAGRAM

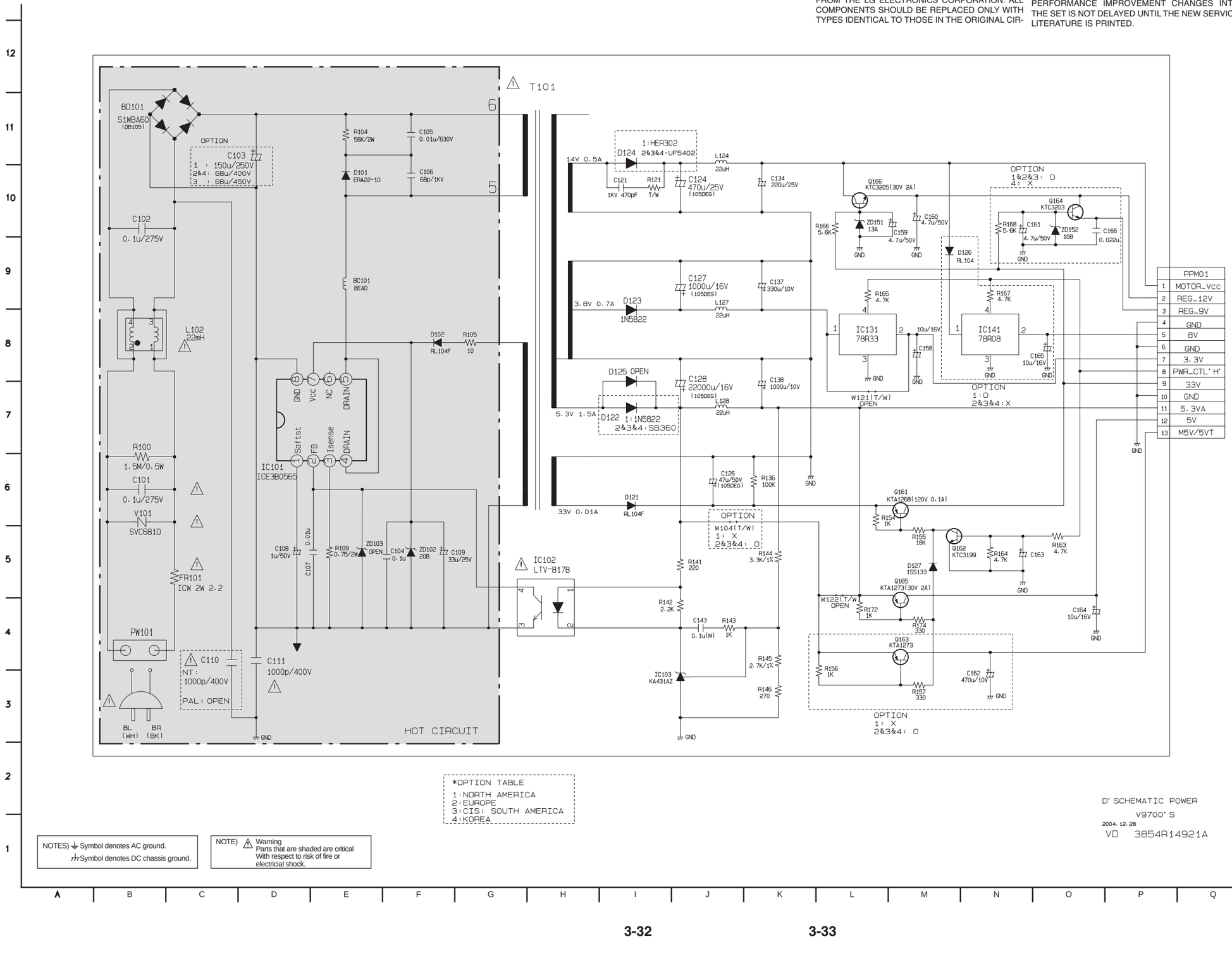
IMPORTANT SAFETY NOTICE

WHEN SERVICING THIS CHASSIS, UNDER NO CIRCUMSTANCES SHOULD THE ORIGINAL DESIGN BE MODIFIED OR ALTERED WITHOUT PERMISSION FROM THE LG 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.

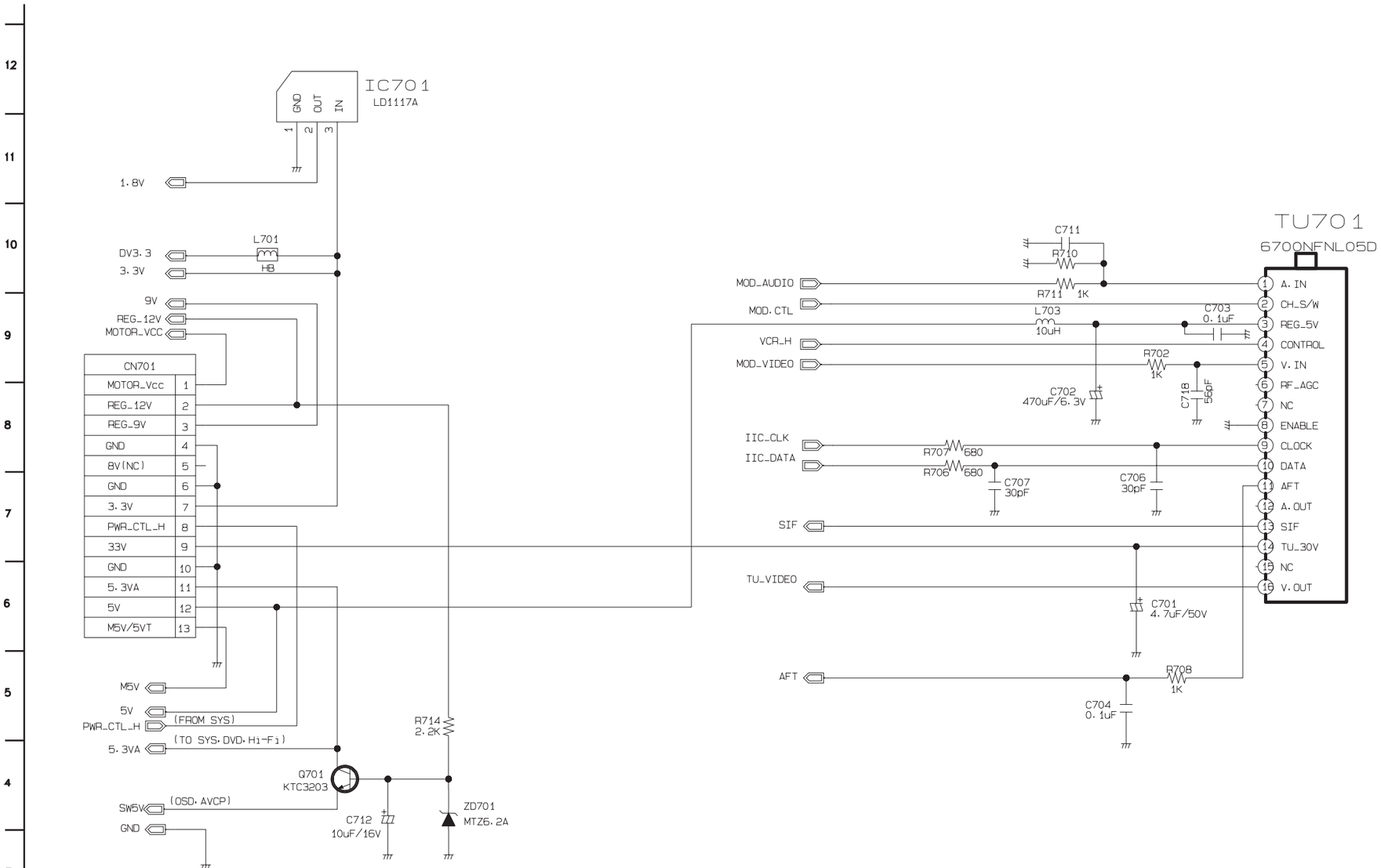
THIS CIRCUIT DIAGRAM MAY OCCASIONALLY DIFFER FROM THE ACTUAL CIRCUIT USED. THIS WAY, IMPLEMENTATION OF THE LATEST SAFETY AND PERFORMANCE IMPROVEMENT CHANGES INTO THE SET IS NOT DELAYED UNTIL THE NEW SERVICE LITERATURE IS PRINTED.

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.



2. TU/IF CIRCUIT DIAGRAM

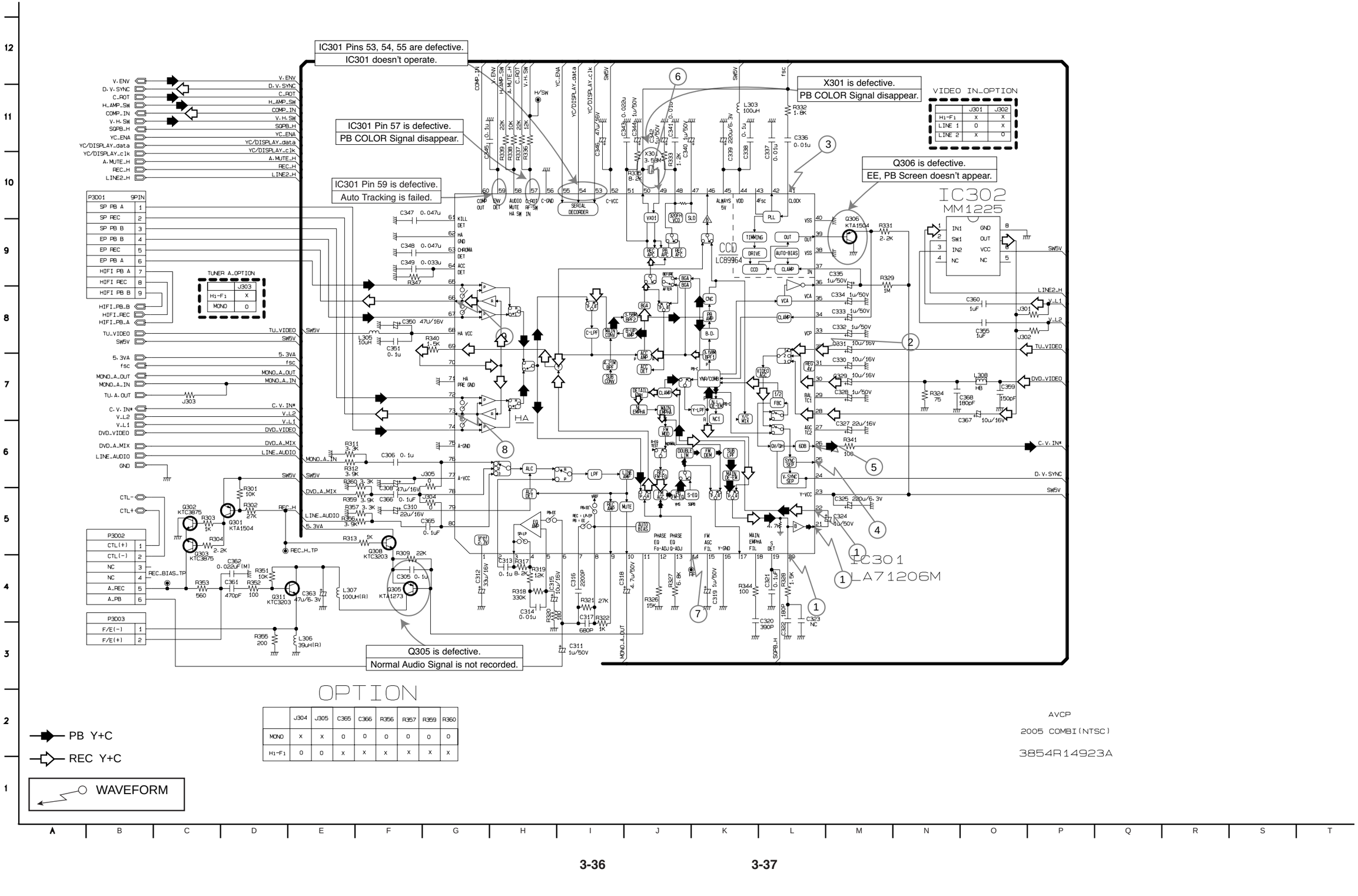


D. SCHEMATIC

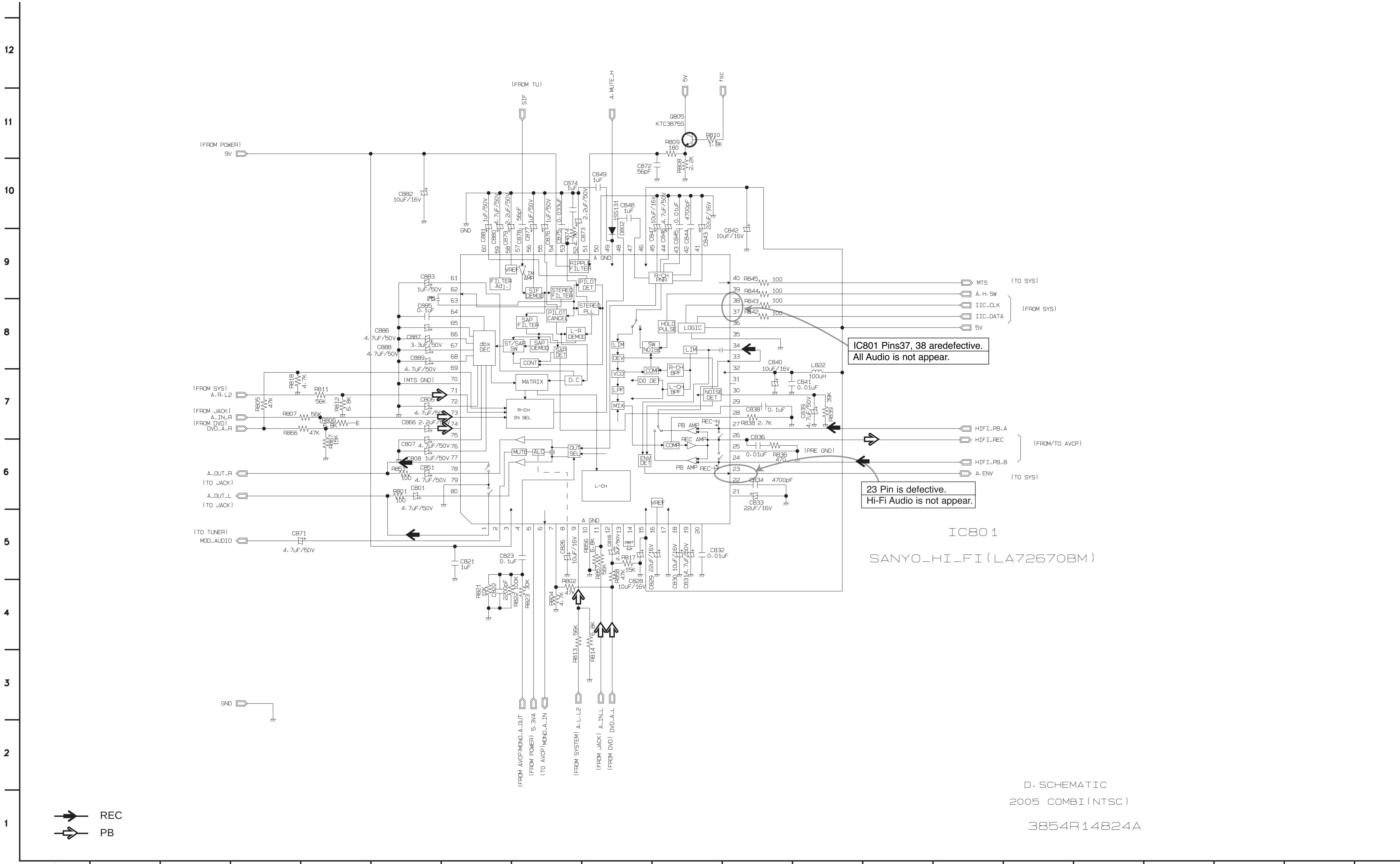
2005 COMBI(NTSC)

3854R14825A

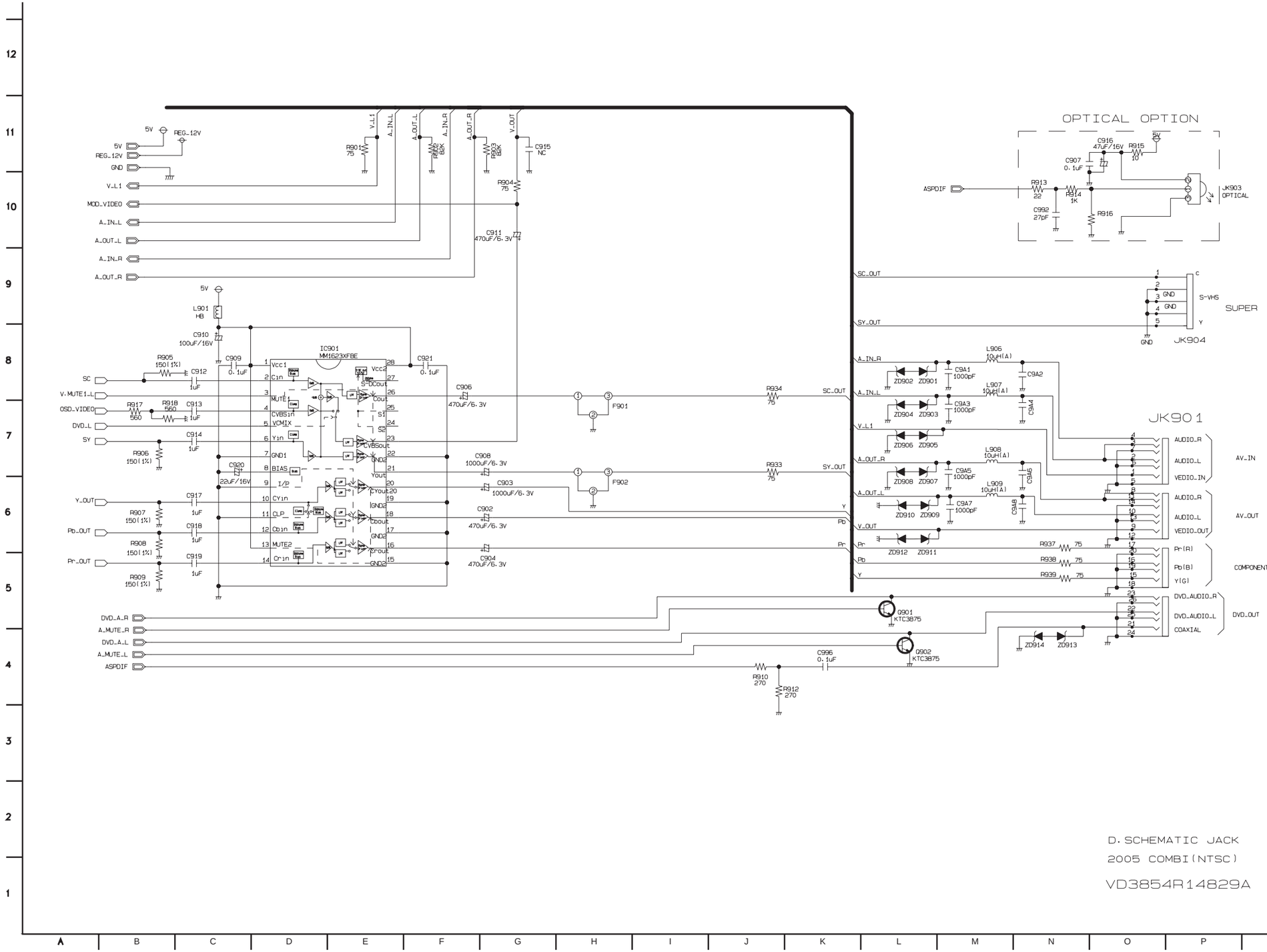
3. A/V CIRCUIT DIAGRAM



4. Hi-Fi CIRCUIT DIAGRAM

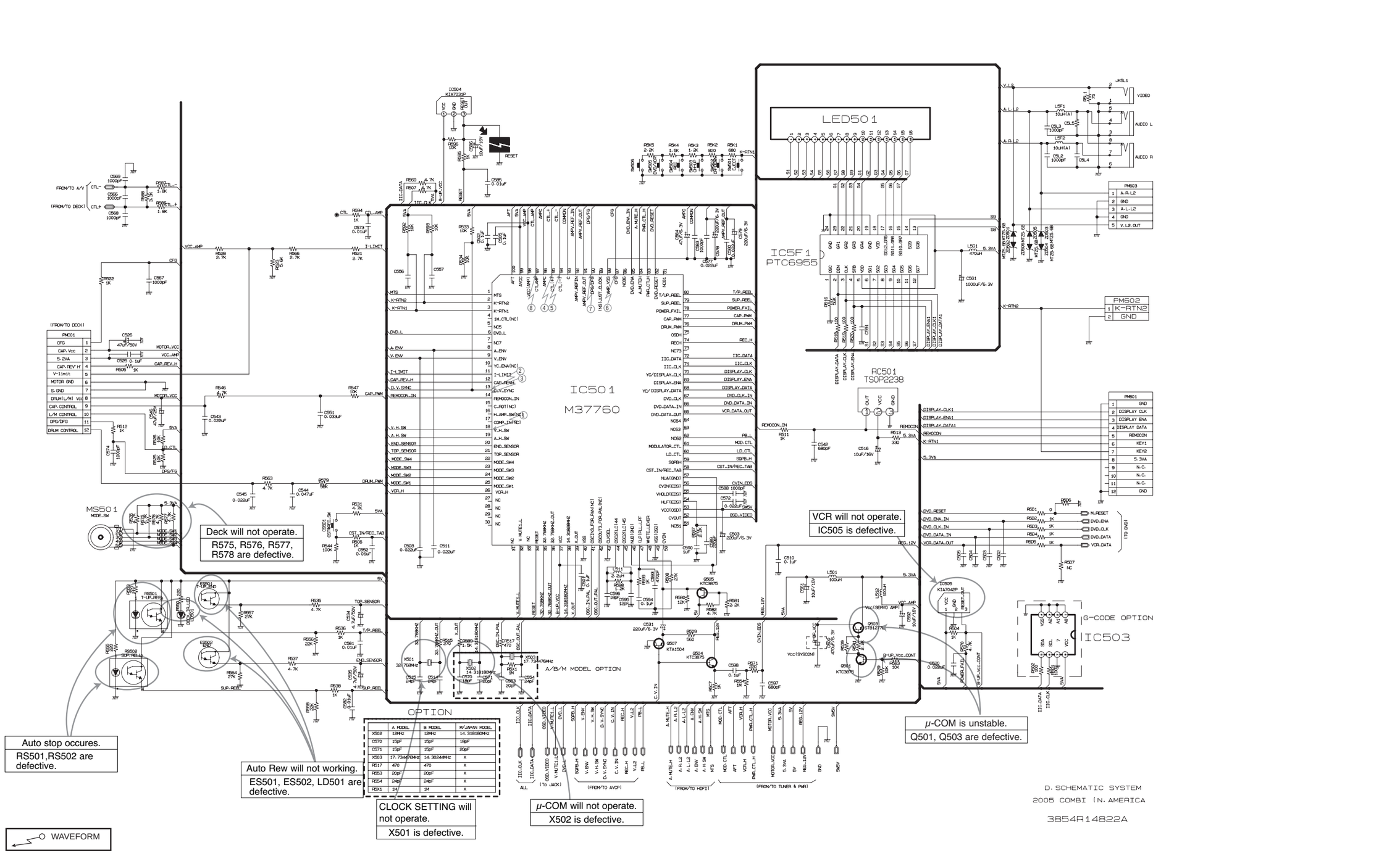


5. JACK CIRCUIT DIAGRAM



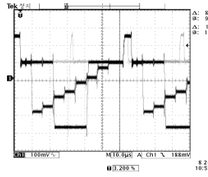
D. SCHEMATIC JACK
2005 COMBI(NTSC)
VD3854R14829A

6. SYSTEM CIRCUIT DIAGRAM

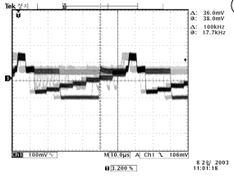


• WAVEFORMS

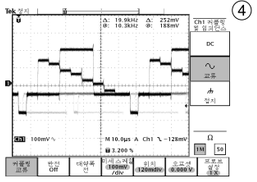
* IC301 Waveform

① 

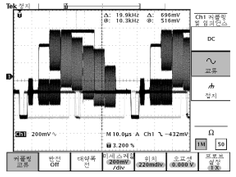
IC301 Pin 9
100mV/10msec DIV
VV/EE
(Main De-Emphasis out)

② 

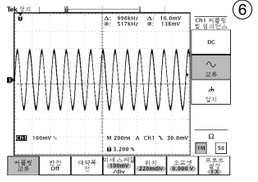
IC301 Pin 12
100mV/10msec DIV
PB
(Main De-Emphais
Peacking)

③ 

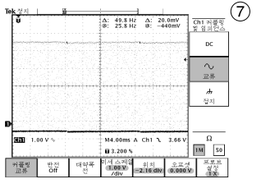
IC301 Pins 33, 36, 37
100mV/10msec DIV
VV/EE
Clamp Drive IN Pin 33
Y-out(to 1H CCD) Pin 36
Y-out(from 1H CCD) Pin 37

④ 

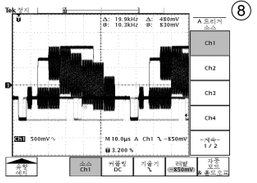
IC301 Pin 15
200mV/10msec DIV
EE
(VIDEO IN)

⑤ 

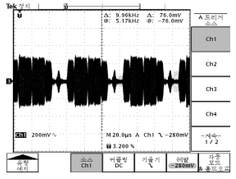
IC301 53 Pin
100mV/0.2msec DIV
REC/PB
(2fsc)

⑥ 

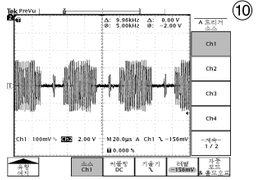
IC301 31 Pin
1.0V/20msec DIV
VV/EE
(C-SYNC OUT)

⑦ 

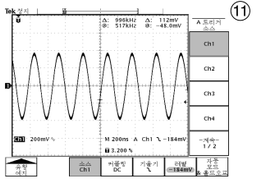
IC301 29 Pin
500mV/10msecDIV
VV/EE
(VIDEO OUT)

⑧ 

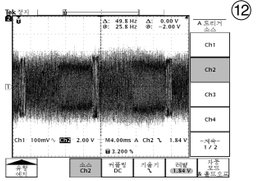
IC301 Pin 43
200mV/20msec DIV
PB
(C.OUT)

⑨ 

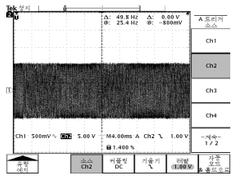
IC301 Pins 46, 57
200mV/20msec DIV
VV/EE
from 1H CCD Pin 46
to 1H CCD Pin 57

⑩ 

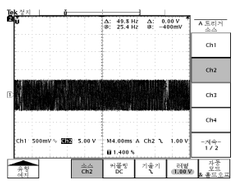
IC301 Pin 67
100mV/0.2msec DIV
PB/REC
(3.58MHz X-TAL IN)

⑪ 

IC301 Pin 77
100mV/5msec DIV
PB
(PB RF out)

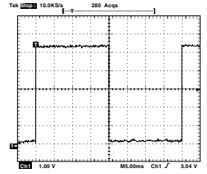
⑫ 

IC301 Pin 86
500mV/2msec DIV
SP REC
(REC RF)

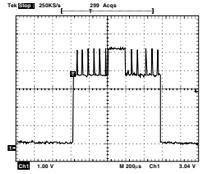
⑬ 

IC301 Pin 90
500mV/2msec DIV
EP REC
(REC RF)

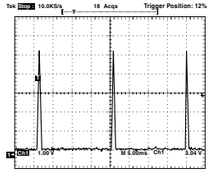
* IC501 Waveform

① 

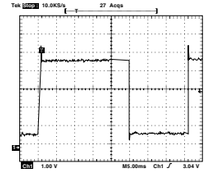
IC501 Pin 18
REC/PB

② 

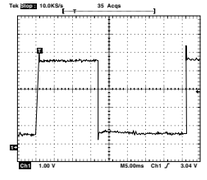
IC501 Pin 13
QUE/REV

③ 

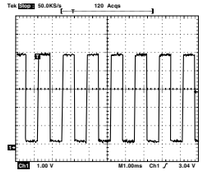
IC501 Pin 13
QUE/REV

④ 

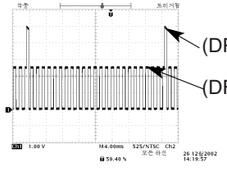
IC501 Pin 95
REC

⑤ 

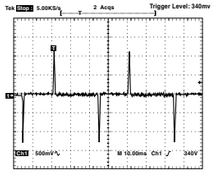
IC501 Pin 94
REC

⑥ 

IC501 Pin 87
REC/PB

⑦ 

IC501 Pin 90
REC/PB
(DPG/DFG)

⑧ 

IC501 Pin 97
PB
(CTL OUT)

• CIRCUIT VOLTAGE CHART

MODE / PIN NO.	STOP	PLAY
IC202		
1	0.02	1.28
2	0	0
3	8	0.56
4	0.03	0.62
5	0	1.73
6	2.7	2.23
7	2.93	0
8	2.7	2.23
9	2.93	3.22
10	2.72	2.11
11	2.92	1.74
12	1.64	2.24
13	8.04	1.74
14	8.04	1.75
15	2.95	3.2
16	0.01	0
17	0	3.2
18	2.79	1.74
19	0.46	0.01
20	2.77	2.13
21	2.94	2.13
22	0.46	0.01
23	0	0
24	0	0
25	0.46	0
26	0	3.22
27	0	0
28	0.46	2.58
29	0	2.75
30	2.7	1.27
31	0	0
32	0	2.75
33	0	2.77
34	0.02	2.74
35	3.2	1.74
36	0	0.28
IC203		
1	2.4	4.8
2	2.72	4.84
3	2.7	4.84
4	0	0
5	0	0.03
6	1.04	1
7	0.12	0.4
8	7.8	8
IC401		
1	1.59	1.6
2	0	1.6
3	1.58	1.6
4	0	0
5	3.12	3.17
6	4.03	4.9
7	2.5	2.5
8	2.45	2.5

MODE / PIN NO.	STOP	PLAY
9	0	0
10	2.4	2.47
11	2.94	0
12	2.94	0
13	2.121	0
14	3.18	3.2
15	3.18	3.21
16	1.58	1.58
IC402		
1	5.54	5.52
2	5.54	5.52
3	5.5	5.52
4	0	0
5	5.5	5.3
6	5.54	5.52
7	5.54	5.52
8	12.1	12.1
IC5F1		
1	2.45	2.15
2	4.9	4.9
3	4.93	4.92
4	4.88	4.88
5	5	4.5
6	0.7	2.8
7	0.71	2.57
8	0.72	2.5
9	0.72	2.7
10	1.24	2.3
11	1.74	2.77
12	2.4	0.94
13	0.9	1
14	1.37	1.93
15	0.55	2.44
16	2.08	2.27
17	1.85	2.21
18	5	4.5
19	0	0
20	2.2	2
21	0	2.16
22	2	2.2
23	1.84	2.34
24	0	0
IC602		
1	3.2	3.25
2	0	1
3	3.2	3.25
4	1.6	1
5	0	1
6	0	0
7	1.8	1
8	0	1
9	3.2	3.25
10	2.14	1
11	0.53	1
12	0	0

MODE / PIN NO.	STOP	PLAY
13	2.16	0.9
14	3.2	3.25
15	0	0.9
16	3.15	0.81
17	2.7	0.82
18	3	0.83
19	2.3	0.82
20	0.25	0.83
21	0.44	0.8
22	0	0.8
23	0	0.8
24	0.06	0.8
25	0.25	0.84
26	0.25	0.83
27	3.2	3.22
28	0	0
29	0.36	1
30	0.34	1
31	0	1.05
32	0.32	1.03
33	0.32	1
34	0.32	1
35	0.32	1
36	0	0
37	3.18	3.2
38	1.77	1.8
39	0.33	1.04
40	0	0
41	0	0
42	0	0
43	0	3.22
44	0	0
45	0	0
46	0	0
47	0	0
48	0.32	0
49	3.23	3.22
50	0.31	3.22
51	0.3	1
52	0	0
53	0.3	1
54	0	0
IC603		
1	3.2	3.22
2	3.2	3.2
3	0.01	0.01
4	3.2	3.22
5	3.18	3.22
6	0	0.01
7	3.18	3.22
8	3.17	3.22
9	3.2	3.22
10	0	0
11	3.2	3.22
12	4.08	4.1

MODE / PIN NO.	STOP	PLAY
13	3.2	3.22
14	0	0
15	0	0
16	3.2	3.22
17	3.2	3.22
18	0.01	0.01
19	0.01	0.01
20	0.03	0.01
21	3.18	3.22
22	0.01	0.01
23	3.2	3.22
24	3.18	3.22
25	3.2	3.22
26	3.2	3.22
27	0	0
28	0	3.2
29	0.8	0.93
30	0.54	0.95
31	0.53	0.8
32	0.54	0.78
33	0.56	0.74
34	0.6	0.76
35	0.77	0.8
36	0.8	0.9
37	3.16	3.2
38	0.82	3.2
39	0.77	0.8
40	0.76	0.76
41	0.7	0.8
42	0.77	0.83
43	0.74	0.82
44	0.73	0.83
45	0.75	0.8
46	0	0
47	3.16	3.2
48	3.2	3.2
IC604		
1	0	0
2	1.68	0.95
3	0	0
4	1.7	1.26
5	4.28	3.44
6	1.7	1.35
7	5.2	5.2
8	0	3.2
9	2.3	0.1
10	0	0
11	0	0
12	0.09	5.23
13	3.2	3.2
14	0	0
15	2.6	2
16	0	0
17	1.31	1.11
18	0	0

MODE / PIN NO.	STOP	PLAY
19	0	0
20	5.23	5.23
IC609		
1	4.97	4.95
2	2.31	2.26
3	0	4.95
4	1.32	1.43
5	0	0.01
6	1.08	1.45
7	0	0
8	2.4	2.3
9	0.05	0.05
10	2.31	2.25
11	4.2	4.2
12	2.3	2.265
13	4.97	4.9
14	2.34	2.26
15	0	0
16	0	2.3
17	0	0
18	2.38	2.3
19	0	0
20	2.34	2.3
21	0	1.8
22	0	0
23	1.56	1.66
24	0.03	0
25	0.03	0.03
26	2.38	2.31
27	0.03	0.03
28	4.96	4.94
IC801		
1	0	0
2	2.17	2.53
3	9.27	9.2
4	2.48	2.5
5	5.23	5.23
6	1.98	1.98
7	0	0
8	0.01	0.73
9	0	0
10	0	0
11	0	0
12	2.5	2.5
13	1.97	1.96
14	2.49	2.51
15	2.52	5
16	0	2.5
17	0.48	0
18	0.49	0.48
19	2.54	2.53
20	2.54	2.54
21	2.53	2.53
22	0	2.53
23	0	0.17

MODE / PIN NO.	STOP	PLAY
24	2.27	2.24
25	0	0
26	2.27	2.25
27	2.27	2.25
28	0	0
29	3.2	3.25
30	0	0
31	2.5	2.53
32	5.05	5
33	2.66	2.64
34	0	2.64
35	0	0
36	5.1	5
37	4.74	4.75
38	4.75	4.74
39	5.13	5.12
40	0	0.97
41	2.52	2.55
42	2.52	2.53
43	2.53	2.54
44	2.53	2.58
45	0.49	0.49
46	5.09	5.07
47	2.49	2.51
48	0	2
49	4.4	0
50	0	0
51	1.74	1.72
52	1.23	1.24
53	3.88	3.89
54	9.27	9.2
55	3.88	3.9
56	2.16	2.18
57	0	4.6
58	4.58	2.48
59	2.51	3.9
60	3.88	3.2
61	3.2	3.78
62	3.83	3.86
63	3.85	2.5
64	2.5	3.9
65	3.9	4.1
66	4.11	3.85
67	3.4	3.96
68	3.95	0
69	0	0
70	0	0
71	0	3.9
72	3.9	0
73	0	2.5
74	2.49	3.9
75	3.89	3.2
76	3.2	0
77	0.01	4.2
78	4.14	0

MODE / PIN NO.	STOP	PLAY
80	4. 13	4. 19
IC301		
1	0.06	0.06
2	0.05	0.06
3	0.06	0.06
4	5.08	5.1
5	2.17	2.1
6	2.57	2.56
7	2.83	2.83
8	1.9	2
9	1.87	1.3
10	2.36	1.42
11	2.08	1.88
12	1.65	0.58
13	0	0
14	1.38	2.31
15	2.8	2.8
16	0.18	1.9
17	0	2.8
18	0	1.96
19	2.78	2.8
20	0	4.1
21	2.8	2.8
22	5	5
23	2.3	2.32
24	0.33	0.44
25	2.11	2.13
26	0	2.77
27	0.32	0.35
28	0.03	0.03
29	1.68	2.15
30	2.22	2.85
31	0.14	0.22
32	2.25	2.2
33	2.11	2.12
34	1.85	1.86
35	3.03	3
36	2.38	2.4
37	3.03	3
38	2.14	2.17
39	1.48	1.52
40	2.1	2.11
41	2.7	2.76
42	1.97	2
43	2.1	2
44	0	0
45	3.26	3.2
46	3.26	3.23
47	5.05	5.1
48	4.92	4.95
49	3.56	3.53
50	5.05	5.08
51	2.25	2.23
52	5.05	5.1
53	2.57	2.6

MODE / PIN NO.	STOP	PLAY
54	0	0
55	2.06	2.005
56	0	0
57	2.15	2.11
58	2.02	1.9
59	4.95	0
60	4.1	5
61	2.37	4.15
62	2.18	1.37
63	1.97	2.2
64	2.22	2.61
65	1.93	2.24
66	2.16	2.31
67	2.45	2.18
68	2.03	2.45
69	1.8	2
70	1.9	1.8
71	0.23	0.76
72	4.92	4.95
73	4.75	5
74	4.75	0
75	2.63	2.65
76	2.2	2.12
77	2.83	2.84
78	0.03	2.15
79	0	0
80	2.83	2.54
81	0.04	0.04
82	0.01	0.01
83	0.13	0.02
84	5	5
85	2.28	1.37
86	2.28	1.4
87	2.28	1.35
88	0	0
89	2.27	1
90	2.27	1
91	2.27	1
92	5.05	5
93	0.45	0.44
94	0.01	2.5
95	2.52	2.5
96	0	2.5
97	0	0
98	2.36	2.2
99	0	0
100	2.57	2.57
IC501		
1	0.97	0.08
2	5.2	5.2
3	5.2	5.2
4	0	0
5	0	1
6	5.1	5
7	0.2	0.74

MODE / PIN NO.	STOP	PLAY
8	0.17	0.09
9	0.17	0.16
10	0.01	0.01
11	0.03	3.4
12	0.24	0.01
13	0.03	0.03
14	4.8	0
15	0.01	2.57
16	0.3	0.01
17	0.33	0.01
18	5.14	2.57
19	5.14	2.57
20	4.32	0.14
21	4.28	0.02
22	0	5.1
23	0	5.2
24	5.2	5.2
25	5.21	0.01
26	5.14	5.1
27	0	0.1
28	5.14	5.1
29	0	0.01
30	0.01	0.01
31	0.01	0.01
32	0.01	0.01
33	0.01	0
34	5.17	5
35	1.46	0
36	0	1.35
37	5.17	0
38	2.22	0
39	2.3	2.29
40	0	0
41	0.25	0.57
42	0.28	0.57
43	0	0
44	2.4	2.37
45	2	2.37
46	0	0
47	1.44	1.36
48	0	0
49	0	0
50	0.15	1.64
51	0.2	0.7
52	1.37	1.63
53	5.04	5.1
54	0	2.6
55	1.4	1.96
56	0	1.77
57	0	01.56
58	0	0
59	0.01	4.1
60	2.6	2.6
61	4.15	4.13
62	0.01	0

MODE / PIN NO.	STOP	PLAY
63	0.05	0.05
64	0.05	0.05
65	2.25	2.3
66	2.4	0.06
67	5.2	5.2
68	4.94	4.94
69	4.9	4.88
70	4.9	4.92
71	4.77	4.94
72	4.74	5.12
73	0.01	0.01
74	0.01	0.01
75	0.8	0.01
76	0.82	2.66
77	0.01	2.66
78	4.8	4.8
79	4.87	4.44
80	4.85	4.21
81	0	2.58
82	4.11	4.17
83	4.86	4.86
84	0	0.01
85	4.26	4.2
86	0.13	0
87	2.6	2.36
88	0	0
89	0.12	0.3
90	0	1.37
91	2.59	2.5
92	2.6	2.5
93	0	0.03
94	2.54	2.52
95	2.54	2.52
96	2.58	2.54
97	0.28	2.54
98	5.2	5.1
99	5.2	5.2
100	0.16	0.16
IC601		
1	1.4	0.06
2	0	1.6
3	2.45	2.52
4	3.1	3.21
5	0	0
6	0	3.2
7	3.15	3.2
8	0	3.2
9	3.15	3.2
10	3.15	3.2
11	3.15	3.2
12	3.1	3.17
13	3.1	3.21
14	1.6	1.68
15	0	0
16	0	0.65

MODE / PIN NO.	STOP	PLAY
17	1.56	0
18	0	1.35
19	0	0
20	0	0
21	0	0
22	0.05	0
23	3.2	0.05
24	0.8	0.84
25	0.05	0.66
26	0.49	0.58
27	0.63	0
28	0	0.03
29	1	1.3
30	3.19	3.22
31	0	0
32	0.5	0
33	0.7	0.7
34	0.55	0.55
35	0	0.02
36	1.28	1.3
37	1.68	1.66
38	0.05	0
39	0.4	2.5
40	0.6	2.44
41	2.45	3.21
42	2.43	2.42
43	2.46	2.46
44	0.8	0.01
45	0	0.01
46	0	0.01
47	1.77	0
48	2.9	1.67
49	0	0
50	0	0
51	0	1.6
52	0	1.6
53	0	0
54	0	0
55	1.2	0.09
56	1.28	0
57	1.56	0
58	1	1.07
59	1	1
60	1.11	0
61	1.11	0
62	1.11	0
63	1.11	0
64	0.03	1.7
65	0	0
66	1	0.64
67	0.96	0.64
68	0.93	0.64
69	0.23	0.62
70	1	3.14
71	0	0.01

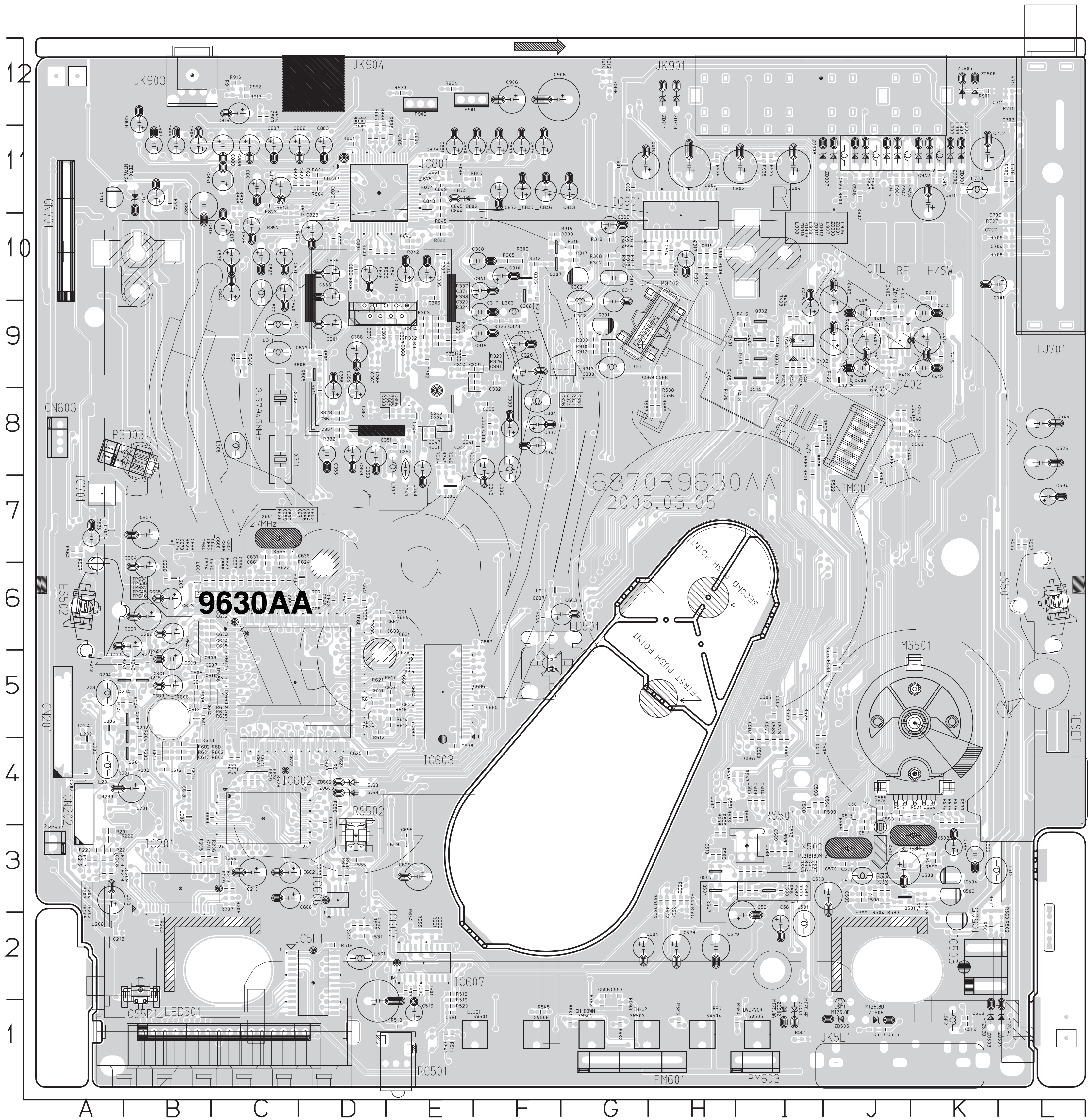
MODE / PIN NO.	STOP	PLAY
72	0	0.15
73	0.53	0.04
74	2.4	2.41
75	2.4	2.46
76	3.2	3.06
77	3.22	3.13
78	3.22	3.13
79	0	0.01
80	0	0.01
81	3.22	3.22
82	1.78	1.83
83	0	0
84	1.3	0.63
85	1.8	0.81
86	1.21	0.7
87	1.3	0.7
88	1.4	1.2
89	2.3	0.7
90	2	0.7
91	1.4	0.7
92	0.82	0.69
93	0.81	0.68
94	1.71	1.7
95	1.75	1.8
96	0	0
97	0	0.7
98	0.92	0.7
99	0.93	0.66
100	0.93	0.67
101	0.93	0.66
102	2.52	0.65
103	2.57	2.38
104	2.57	2.5
105	2.26	1.68
106	1.65	3.2
107	3.18	0.03
108	0	0
109	0	0
110	3.2	3.2
111	0.47	0.9
112	3.2	3.2
113	3.2	3.2
114	0.02	0.02
115	0.03	0.03
116	0.02	0.02
117	3.19	3.21
118	1.79	1.93
119	1.69	1.66
120	1.56	1.66
121	0	0
122	1.79	1.79
123	0	0
124	4.1	4.1
125	3.08	3.24
126	2.27	3.23

MODE / PIN NO.	STOP	PLAY
127	2.26	3.22
128	3.18	3.22
129	3.19	3.22
130	3.18	3.22
131	0	3.21
132	3.18	3.21
133	3.18	3.2
134	3.18	3.22
135	3.16	0
136	3.19	3.22
137	3.19	0
138	0	3.22
139	3.2	3.22
140	3.2	3.22
141	0.45	0
142	0.43	3.22
143	0.47	3.21
144	0.42	3.21
145	0.48	3.21
146	1.03	3.21
147	1.03	0
148	1.76	3.23
149	0	0
150	0	0
151	1.03	0.98
152	1.04	0.99
153	1.05	0.99
154	1	0.98
155	0.94	0.98
156	0.92	0.98
157	1.04	0.98
158	1.05	1
159	3.24	3.22
160	0	0
161	3.19	0.81
162	0	0.81
163	3.2	0.81
164	3.19	0.81
165	0.77	0.01
166	0	0.01
167	3.19	3.2
168	0.77	0.01
169	3.17	3.2
170	3.17	3.2
171	1.68	1.66
172	0	0
173	0	0.01
174	0	3.2
175	0	3.2
176	0	0.01
177	0	3.2
178	0	3.2
179	0	3.2
180	0	3.2
181	0	3.2

MODE / PIN NO.	STOP	PLAY
182	2.23	3.2
183	2.2	3.2
184	0	3.2
185	2.92	0
186	0	3.2
187	2.3	2.46
188	1.7	2.48
189	0	2.52
190	0	0
191	2.22	2.4
192	0	2.38
193	0	2.39
194	0	2.15
195	0	3.23
196	2.22	2.36
197	3.2	2.37
198	2.24	1.67
199	2.28	0
200	0.01	2.4
201	0	2.4
202	0	0
203	0.01	0
204	0.24	0
205	3.22	3.25
206	2.65	3.25
207	3.22	2.37
208	2.1	0.01

PRINTED CIRCUIT DIAGRAMS

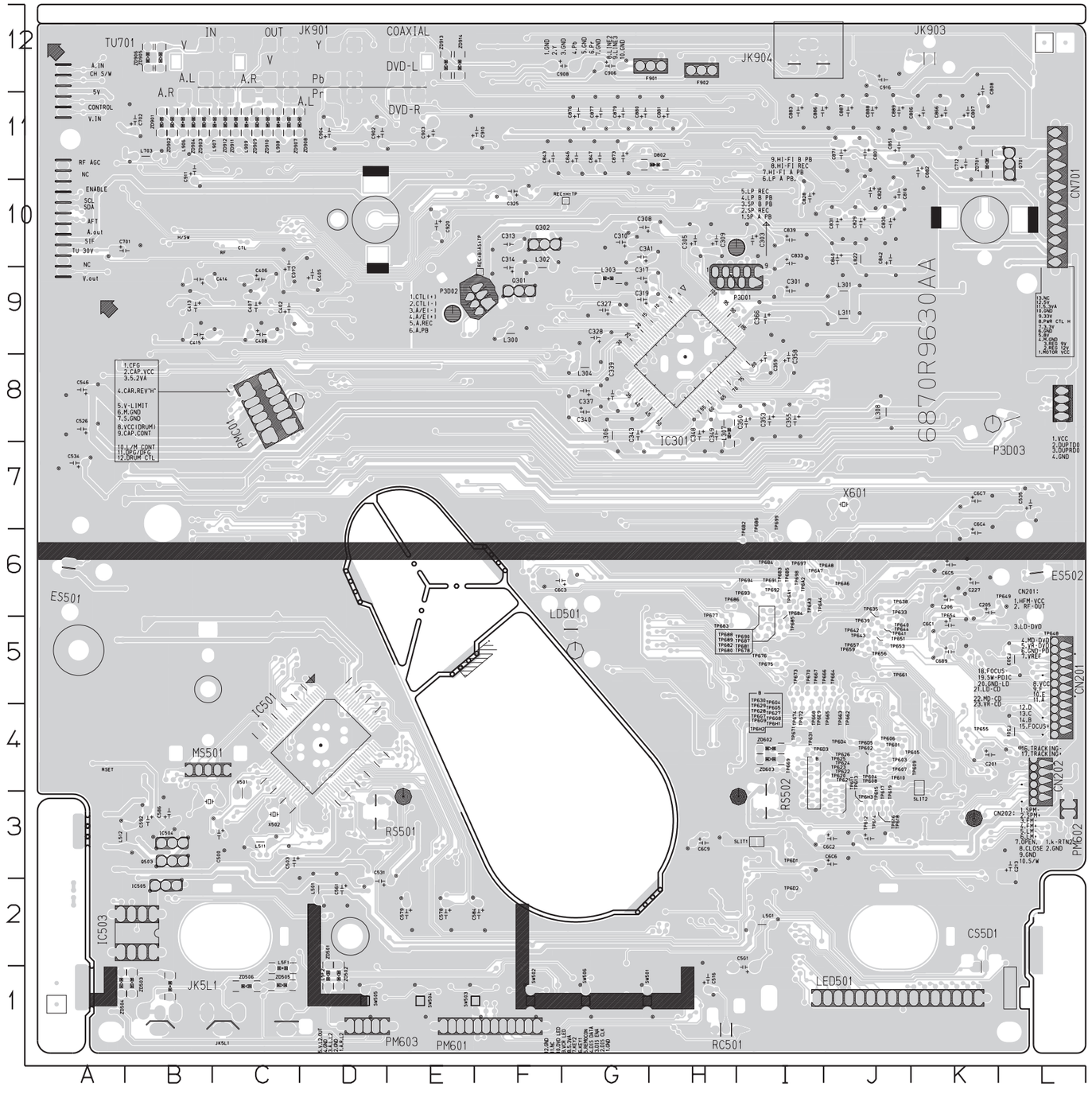
1. MAIN P.C.BOARD (TOP SIDE)



LOCATION GUIDE

C201	B4	C374	F9	C5D5	I4	C6B7	F6	C909	G10	L601	B5	R221	A3	R515	J4	R605	B5	R906	H10
C202	A4	C3A1	F10	C5G1	D1	C6B9	B5	C910	G11	L603	D6	R222	A3	R516	D2	R606	B5	R907	H10
C203	A4	C401	I9	C5L2	K1	C6C1	B5	C911	K11	L604	B6	R239	A4	R517	J4	R607	B5	R908	H10
C204	A5	C402	J9	C5L3	J1	C6C2	C3	C912	H10	L605	B4	R240	A5	R518	E2	R608	B5	R909	H10
C205	B6	C403	J10	C5L4	K1	C6C3	G6	C913	H10	L609	E3	R241	A5	R519	E1	R609	B5	R910	G12
C206	B6	C405	I9	C5L5	J1	C6C4	B6	C914	H10	L611	F6	R242	B5	R520	E1	R610	C4	R912	G12
C208	A3	C406	J9	C601	B6	C6C5	B6	C915	J11	L701	A7	R243	B2	R521	I8	R611	D4	R913	C12
C209	A3	C407	J9	C602	B6	C6C6	C3	C916	C12	L703	K11	R244	C3	R522	J7	R612	D5	R914	C12
C210	C3	C408	J9	C603	B6	C6C7	B7	C917	H10	L822	C10	R245	B5	R523	I8	R613	E5	R915	C12
C211	B3	C409	J9	C604	B6	C6C9	E3	C918	H10	L901	G11	R291	A3	R525	I5	R614	E5	R916	C12
C212	A2	C410	J9	C605	B6	C6F7	D6	C919	H10	L906	K11	R301	E9	R526	I5	R615	D5	R917	H10
C213	A3	C411	J9	C606	B5	C6G1	D6	C920	H10	L907	J11	R302	E9	R528	I8	R616	E5	R918	H10
C215	A3	C412	J9	C607	B5	C6G4	B5	C921	G11	L908	J11	R303	E9	R529	J3	R617	D5	R933	E12
C226	B6	C413	K9	C608	B5	C701	L10	C992	C12	L909	J11	R304	E10	R531	D2	R620	E5	R934	E12
C227	B6	C414	K9	C609	B5	C702	K11	C996	G12	LD501	F5	R305	F10	R533	J5	R621	D5	R937	I11
C300	G9	C415	K9	C610	B5	C703	L11	C9A1	K11	LED501	B1	R306	F10	R534	J5	R623	C6	R938	I11
C301	D9	C418	I8	C611	B4	C704	L10	C9A2	K11	MS501	K4	R307	G10	R535	L7	R624	C6	R939	H11
C302	E9	C500	J3	C612	B4	C706	L10	C9A3	J11	P3D01	E9	R308	G10	R536	H4	R625	C6	RC501	E1
C303	D10	C501	J4	C613	B5	C707	L10	C9A4	J11	P3D02	G9	R309	G9	R537	A7	R626	C6	RESET	L5
C304	E9	C502	I5	C614	B5	C711	L12	C9A5	J11	P3D03	A8	R310	G9	R538	H3	R627	C6	RF±TP	K10
C305	E10	C503	J3	C615	B4	C712	B11	C9A6	J11	PIN0020	E9	R311	F10	R539	K3	R628	C4	RS501	I3
C306	E10	C505	I5	C617	B4	C718	L11	C9A7	J11	PIN0022	E9	R312	F10	R541	K3	R629	C4	RS502	D3
C307	E10	C508	J5	C618	B4	C801	C11	C9A8	J11	PIN0032	F9	R313	G9	R544	D2	R630	C4	SW501	F1
C308	F10	C510	H3	C619	C4	C806	B11	CN201	A5	PIN0035	E8	R315	F10	R546	J8	R631	D3	SW502	G1
C309	E10	C511	I5	C620	C4	C807	B11	CN202	A4	PIN0037	F8	R316	G10	R547	I4	R632	D3	SW503	G1
C310	F10	C514	J3	C621	C4	C808	B12	CN603	A8	PIN0039	F8	R317	G10	R550	F6	R654	E2	SW504	H1
C312	G9	C515	J4	C622	C4	C816	C10	CN701	A10	PIN0040	F8	R319	G10	R553	I3	R655	E2	SW505	I1
C313	G10	C516	E1	C623	D4	C821	E11	CS5D1	B2	PIN0041	F8	R320	F9	R554	I3	R658	D4	SW506	F1
C314	G9	C520	J3	C624	D4	C822	D11	CTL	J10	PIN0054	E9	R322	E9	R555	D3	R661	E2	TP202	A3
C317	F9	C525	I8	C625	D4	C823	D11	D401	I9	PIN0055	E9	R323	E9	R556	I4	R666	C7	TP203	A3
C319	F9	C526	L8	C626	D5	C826	C10	D802	E11	PIN0056	D9	R324	E9	R557	L7	R671	D6	TP204	A3
C320	E9	C531	I2	C627	E5	C827	D11	ES501	L7	PIN0059	E9	R325	F9	R558	H3	R683	C4	TP205	A3
C321	E9	C534	L7	C628	D5	C828	D10	ES502	A5	PIN0204	E9	R326	F9	R563	J8	R6D1	B4	TP634	B6
C322	E9	C535	A7	C629	E6	C829	C10	F901	E12	PIN0393	G8	R328	D8	R564	A7	R6D2	B4	TP636	B6
C323	F9	C542	E1	C630	E5	C830	C10	F902	E12	PIN0396	F10	R331	E8	R566	I8	R6H4	D6	TP637	B6
C324	E9	C543	J8	C631	E6	C831	C10	IC201	B3	PM601	G1	R332	D8	R569	L2	R702	L11	TP645	B5
C325	G10	C544	J8	C633	D6	C832	D10	IC401	I9	PM602	A3	R333	E8	R570	J3	R706	L10	TP646	B5
C326	F9	C545	J8	C636	C7	C833	D10	IC402	J9	PM603	I1	R335	E8	R571	I3	R707	L10	TP647	B5
C327	F9	C546	L8	C637	C7	C834	D10	IC503	K2	PMC01	J8	R337	E9	R575	K4	R708	L10	TP650	B6
C328	F9	C551	J8	C640	D6	C836	D10	IC504	K3	Q201	B4	R338	E9	R576	K4	R710	L12	TP652	C5
C329	F9	C552	D2	C641	D6	C838	D10	IC505	K2	Q202	B5	R339	F8	R577	K4	R711	L12	TP658	C5
C330	G9	C553	J4	C643	D6	C839	D10	IC5F1	D2	Q203	B5	R340	C9	R578	K4	R714	B11	TP660	C5
C331	F8	C554	K4	C646	D6	C840	C10	IC601	C5	Q204	B5	R341	C9	R579	H4	R801	D11	TP695	D6
C332	F9	C556	G2	C649	D6	C841	E10	IC602	C4	Q205	B5	R348	E8	R580	I3	R802	C11	TP696	D6
C334	E8	C557	G2	C650	C6	C842	C10	IC603	E5	Q301	G9	R349	E8	R581	I3	R804	D11	TP6B1	D6
C335	F8	C561	I2	C651	D6	C843	G11	IC606	D3	Q302	G10	R3J1	G9	R582	I3	R805	E11	TP6G2	E5
C336	F8	C566	H8	C652	C6	C844	E10	IC607	E2	Q303	F10	R3J4	E8	R583	J3	R806	E11	TP6G3	E5
C337	F8	C567	I4	C653	C6	C845	E11	IC701	A7	Q305	F10	R403	I9	R586	H8	R807	F11	TU701	L12
C338	F8	C568	H9	C654	C6	C846	F11	IC801	D11	Q306	F10	R404	I9	R587	H8	R808	D9	V.H/SWTR	K10
C339	F8	C569	H9	C655	C6	C847	F11	IC901	H10	Q307	F10	R405	J9	R588	H8	R809	D9	X301	C8
C340	F8	C570	J3	C657	C6	C848	E11	J601	E2	Q309	E7	R406	J9	R589	J3	R810	D8	X302	C8
C341	E8	C571	J3	C658	C6	C849	E11	J602	E2	Q403	I9	R407	J9	R592	G1	R811	D11	X501	J3
C342	E8	C572	I3	C659	C6	C851	C11	J603	E2	Q404	I9	R408	J9	R593	G1	R812	D11	X502	J3
C343	F8	C573	I4	C660	C6	C866	B11	JK5L1	J1	Q405	I9	R409	J9	R594	I4	R813	C10	X503	K3
C344	E8	C574	J8	C661	C6	C871	C11	JK901	I12	Q501	J3	R410	J9	R595	K3	R814	C11	X601	C7
C346	E8	C577	I4	C662	C6	C872	D9	JK903	B12	Q503	K3	R411	J9	R596	K3	R817	C10	ZD501	I1
C347	E8	C578	H2	C663	C6	C873	F11	JK904	D12	Q504	H3	R412	J9	R597	I3	R818	D11	ZD502	I1
C348	E8	C579	H2	C664	C6	C874	E11	L201	A4	Q505	I3	R413	J9	R598	J3	R821	D11	ZD503	K1
C349	E8	C580	I4	C665	C6	C875	E11	L202	A4	Q507	H3	R414	K10	R599	I4	R822	C11	ZD504	L1
C350	D8	C581	H4	C667	C6	C876	F11	L203	A5	Q701	A11	R415	K9	R5C6	D2	R823	C11	ZD505	J1
C351	E8	C582	H4	C668	C6	C877	F11	L205	A5	Q805	D9	R416	I9	R5C7	H3	R836	D10	ZD506	J1
C352	E8	C583	I4	C669	C6	C878	E11	L206	A2	Q901	I9	R417	I9	R5D1	H3	R838	D10	ZD602	D4
C353	D8	C584	G2	C670	C6	C879	F11	L207	B6	Q902	I9	R418	I9	R5D2	H3	R839	D10	ZD603	D4
C354	D8	C585	J4	C671	C6	C880	F11	L300	G9	R201	B4	R419	I9	R5D3	H3	R842	E10	ZD701	B11
C355	D8	C586	K3	C672	C6	C881	E11	L301	C9	R202	B4	R420	H8	R5D4	H3	R843	E10	ZD901	K11
C356	E8	C588	I3	C673	B6	C882	B11	L302	G9	R203	B4	R422	J9	R5D5	H3	R844	E10	ZD902	K11
C357	E8	C589	I3	C674	B6	C883	D11	L303	F9	R204	B5	R423	I9	R5D6	H2	R845	E10	ZD903	K11
C358	D8	C590	I3	C675	C6	C884	E11	L304	F8	R205	B3	R424	I9	R5D7	H2	R851	D11	ZD904	K11
C359	D8	C591	E1	C676	B6	C885	E11	L306	F8	R206	C3	R425	I9	R5K1	G1	R856	C10	ZD905	K12
C360	D8	C592	K3	C677	D4	C886	D11	L307	E8	R207	C3	R501	K2	R5K2	G1	R857	C10	ZD906	K12
C362	D8	C593	I4	C678	E4	C887	C11	L308	C8	R208	C3	R502	L2	R5K3	H1	R858	C11	ZD907	J11
C363	D9	C594	I4	C679	D3	C888	C11	L311	C9	R209	C3	R504	J3	R5K4	I1	R866	D11	ZD908	I11
C365	D9	C595	J3	C683	E5	C889	C11	L402	J9	R210	C3	R505	J7	R5K5	F1	R867	D11	ZD909	J11
C366	D9	C596	J3	C684	E5	C902	I11	L501	I2	R213	B5	R507	K2	R5L1	I1	R874	E11	ZD910	J11
C367	E9	C597	I3	C685	F5	C903	H11	L511	J3	R214	B5	R508	I4	R5X1	K4	R901	K12	ZD911	J11
C368	E9	C598	I3	C686	F5	C904	I11	L512	K3	R217	A3	R509	H3	R601	B4	R902	J11	ZD912	J11
C369	E9	C5D2	I4	C687	F6	C906	F12	L5F1	J1	R218	A3	R511	E1	R602	B4	R903	J11	ZD913	H12
C370	D9	C5D3	I4	C695	E3	C907	C12	L5F2	K1	R219	A3	R512	J8	R603	B4	R904	J11	ZD914	H12
C371	E9	C5D4	I4	C698	E2	C908	F12	L5G1	D2	R220	A3	R513	E1	R604	B4	R905	G10		

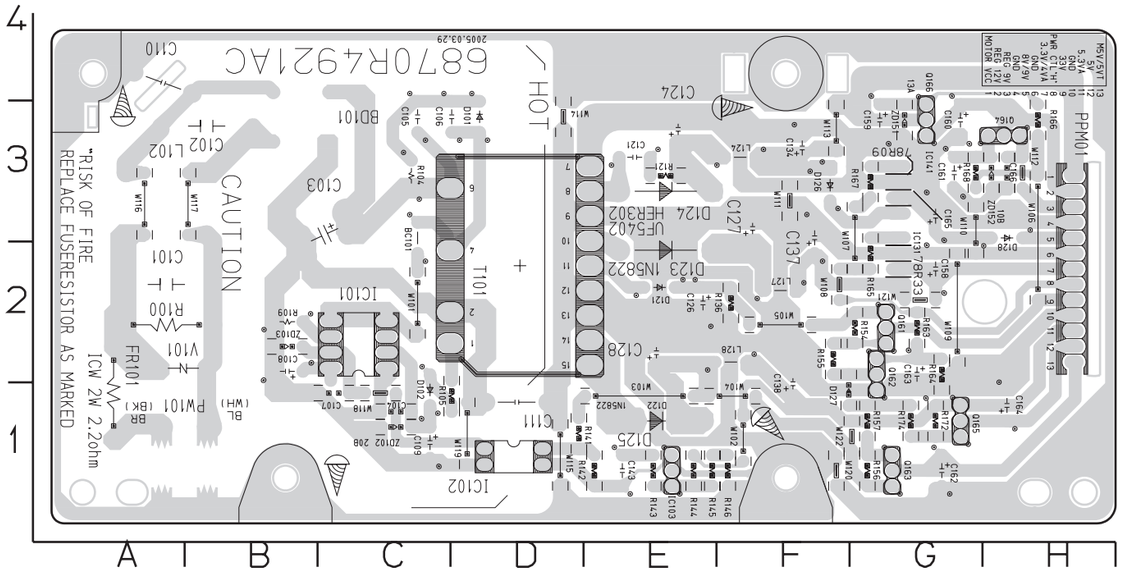
2. MAIN P.C.BOARD (BOTTOM SIDE)



LOCATION GUIDE

IC301	H8	TP663	J4
IC501	D4	TP664	J5
PIN0028	G8	TP665	J4
PIN0031	G9	TP666	J5
PIN0057	I9	TP667	I5
PIN0208	F8	TP668	I4
REC:BIAS:TP	F9	TP669	I4
REC:HI:TP	G10	TP670	I5
SLIT1	I3	TP671	I4
SLIT2	K4	TP672	I4
TP601	J4	TP673	I5
TP602	J4	TP674	I4
TP603	J4	TP675	I5
TP604	J4	TP676	I5
TP605	J4	TP677	H5
TP606	J4	TP678	I5
TP607	J4	TP680	I5
TP608	J4	TP681	I5
TP609	J4	TP682	I5
TP610	J4	TP683	H5
TP611	J3	TP684	I5
TP612	J3	TP685	I5
TP613	J3	TP686	H6
TP614	J3	TP687	I5
TP615	J3	TP688	I6
TP616	J3	TP689	I5
TP617	J3	TP690	I6
TP618	J3	TP691	I6
TP619	J3	TP692	I6
TP620	J3	TP693	I6
TP621	J3	TP694	I6
TP622	J3	TP697	I6
TP623	J3	TP698	I6
TP624	J3	TP699	I6
TP625	J3	TP6A1	I6
TP626	J4	TP6A2	I6
TP627	I4	TP6A3	I6
TP628	I4	TP6A4	I6
TP629	I4	TP6A6	J6
TP630	I4	TP6A7	I6
TP631	I4	TP6A8	J6
TP633	J6	TP6B2	I6
TP635	J5	TP6B3	I6
TP638	J6	TP6B4	I6
TP639	J5	TP6B5	I6
TP640	J5	TP6B6	I6
TP641	J5	TP6D1	I3
TP642	J5	TP6D2	I2
TP643	J5	TP6D3	I4
TP644	J5	TP6D4	J4
TP648	L5	TP6D5	J4
TP649	L6	TP6E9	I4
TP651	J5	TP6G4	I4
TP653	J5	TP6G5	I4
TP654	K5	TP6G7	I4
TP655	K4	TP6G8	I4
TP656	J5	TP6G9	I3
TP657	J5	TP6H1	I3
TP659	J5	TP6H2	I3
TP661	J5	TP6H3	J3
TP662	J4		

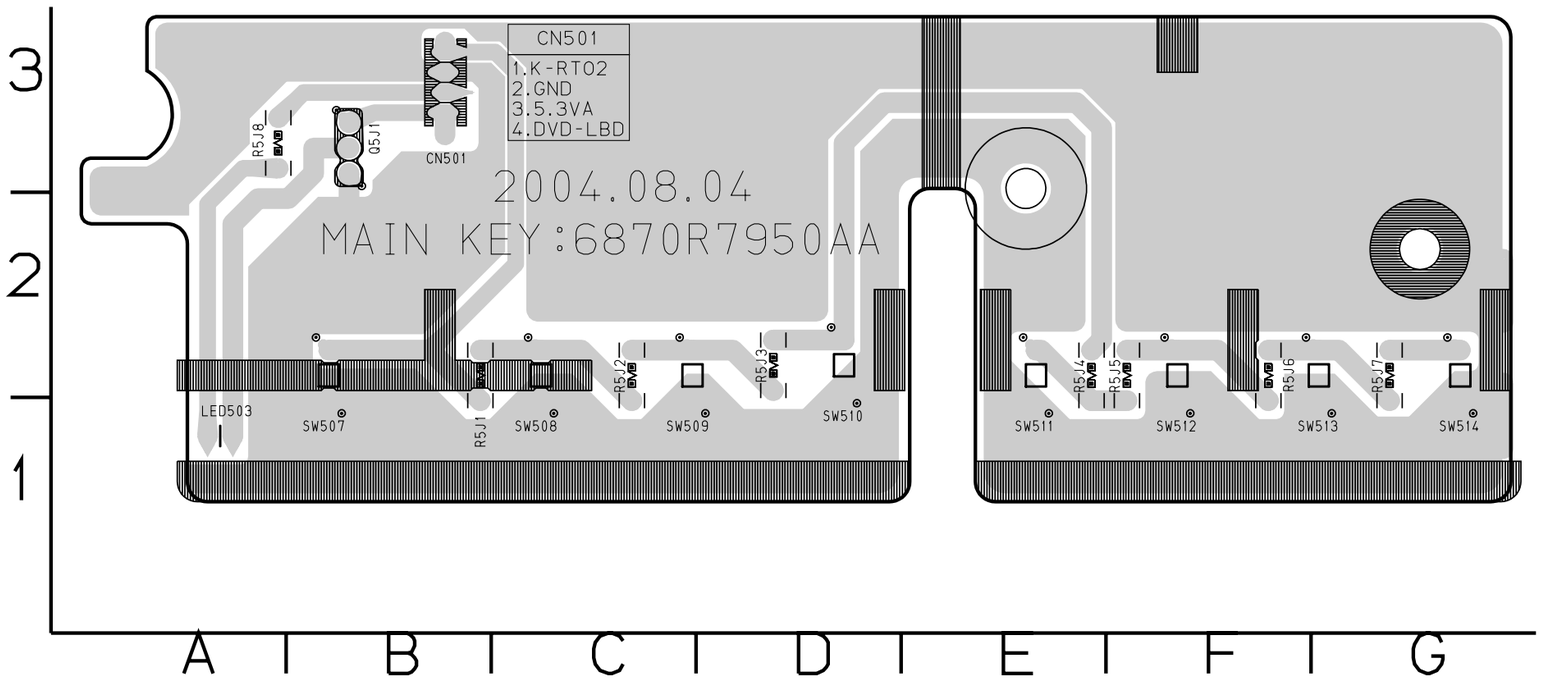
3. POWER P.C.BOARD



LOCATION GUIDE

BC101	C3	C159	G3	IC131	G2	R144	E1
BD101	B3	C160	G3	IC141	G3	R145	E1
C101	A2	C161	G3	L102	A3	R146	F1
C102	B3	C162	G1	L124	F3	R154	G2
C103	C3	C163	G2	L127	F2	R155	F2
C104	C1	C164	H1	L128	F2	R156	G1
C105	C3	C165	G3	PPM01	H3	R157	G1
C106	D3	C166	H3	PW101	B1	R163	G2
C107	C1	D101	D3	Q161	G2	R164	G2
C108	B2	D102	C1	Q162	G2	R165	G2
C109	C1	D121	E2	Q163	G1	R166	H3
C110	A4	D122	E1	Q164	H3	R167	G3
C111	D1	D123	E2	Q165	G1	R168	G3
C121	E3	D124	E3	Q166	G3	R172	G1
C124	E3	D125	E1	R100	A2	R174	G1
C126	E2	D126	F3	R104	C3	T101	D2
C127	F3	D127	F1	R105	D1	V101	A2
C128	E2	D128	H3	R109	B2	ZD102	C1
C134	F3	FR101	A1	R121	E3	ZD103	B2
C137	F3	IC101	C2	R136	F2	ZD151	G3
C138	F1	IC102	D1	R141	D1	ZD152	H3
C143	E1	IC103	E1	R142	E1		
C158	G2			R143	E1		

4. KEY P.C.BOARD

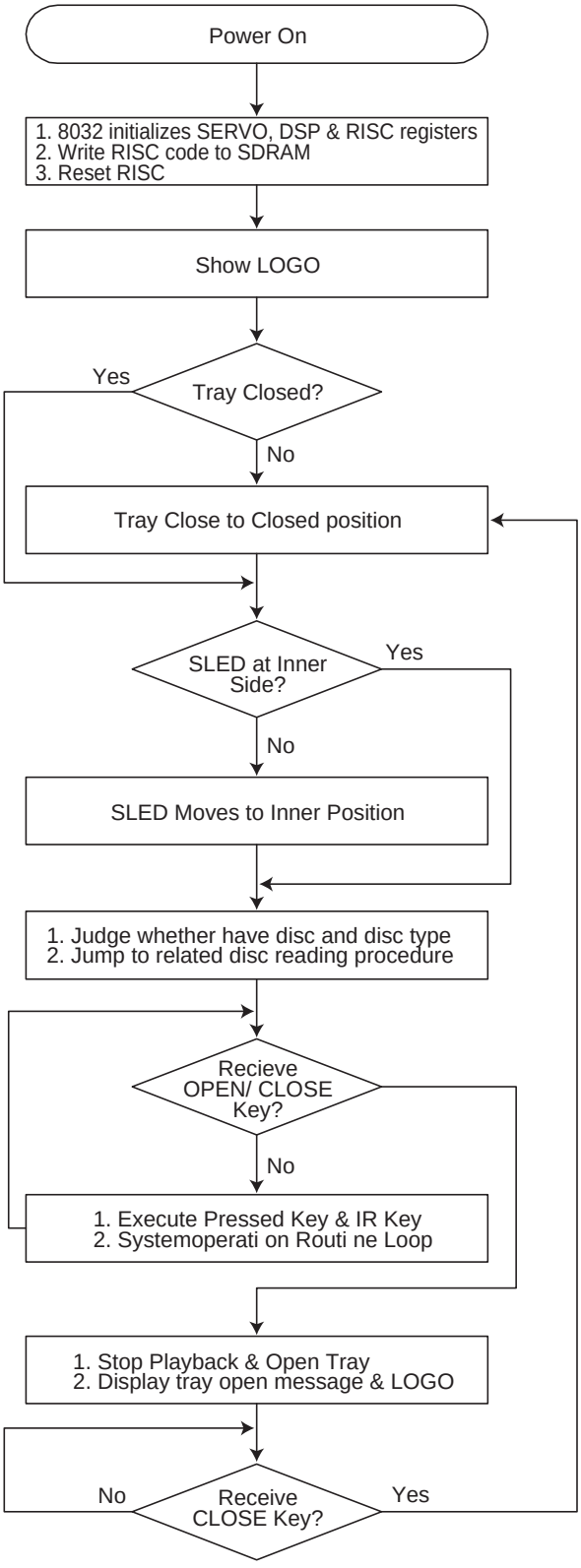


LOCATION GUIDE

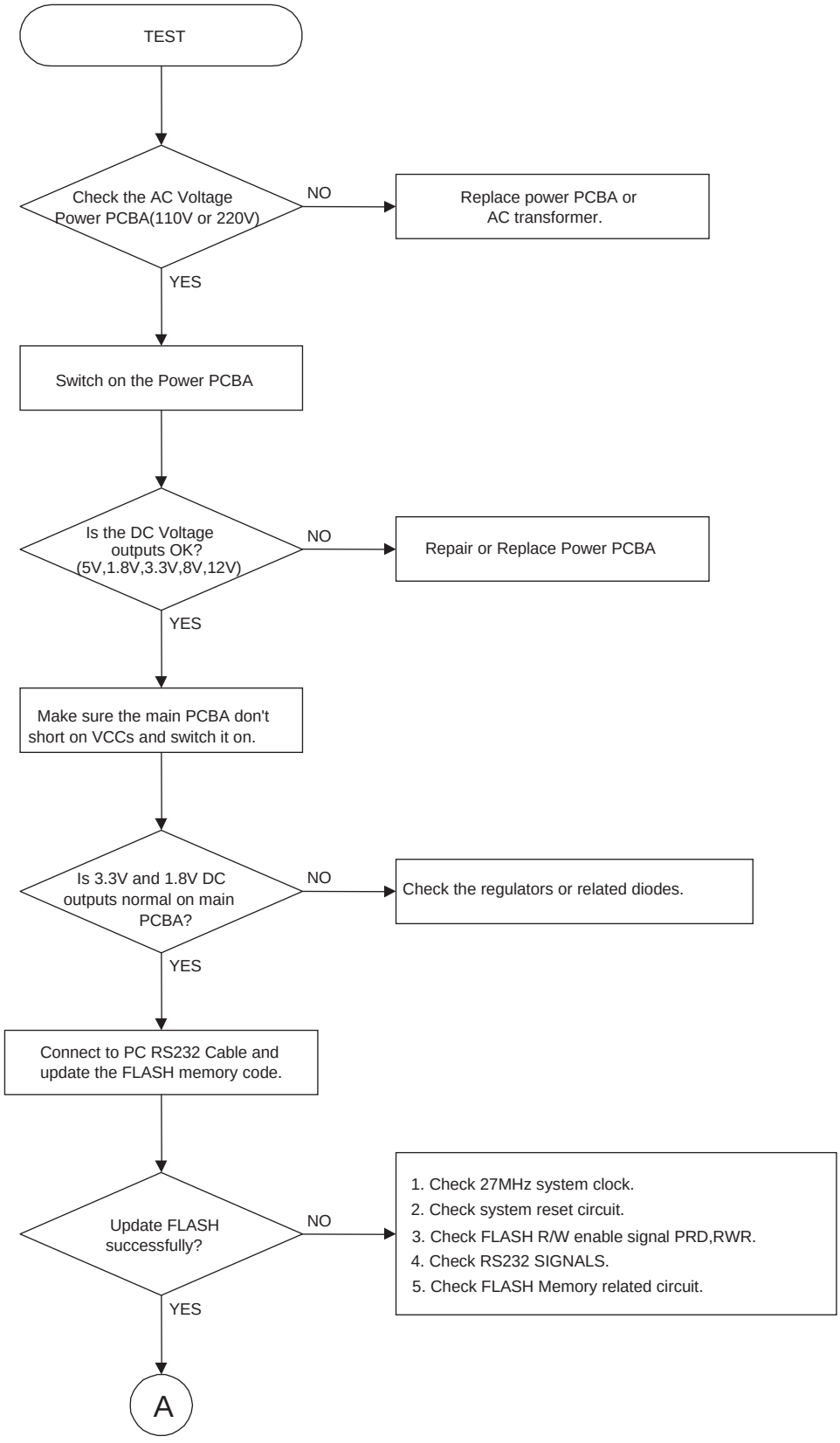
CN501	B3
LED503	A1
Q5J1	B3
R5J1	B2
R5J2	C2
R5J3	D2
R5J4	E2
R5J5	F2
R5J6	F2
R5J7	G2
R5J8	A3
SW507	B2
SW508	C2
SW509	C2
SW510	D2
SW511	E2
SW512	F2
SW513	G2
SW514	G2

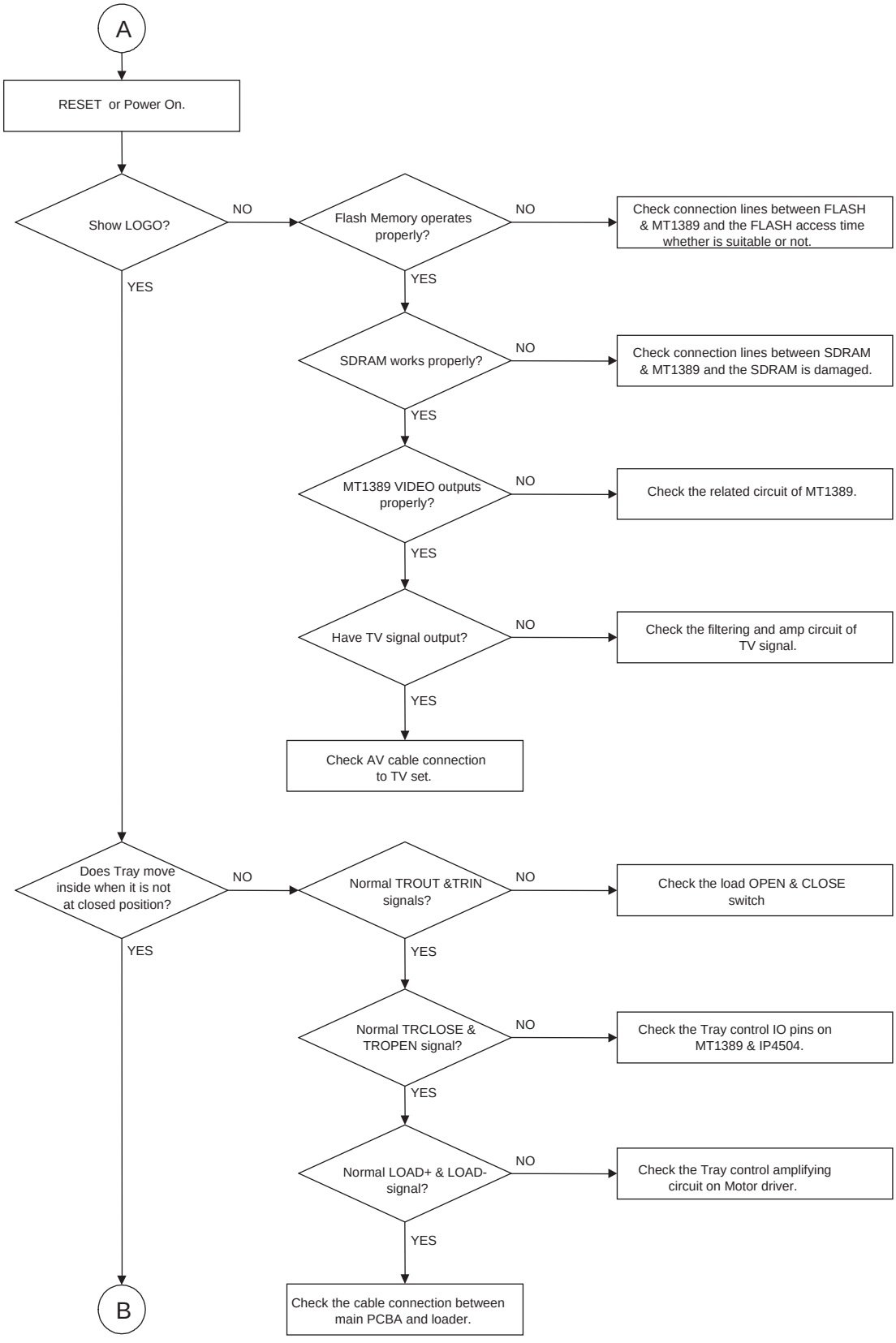
DVD PART
ELECTRICAL TROUBLESHOOTING GUIDE

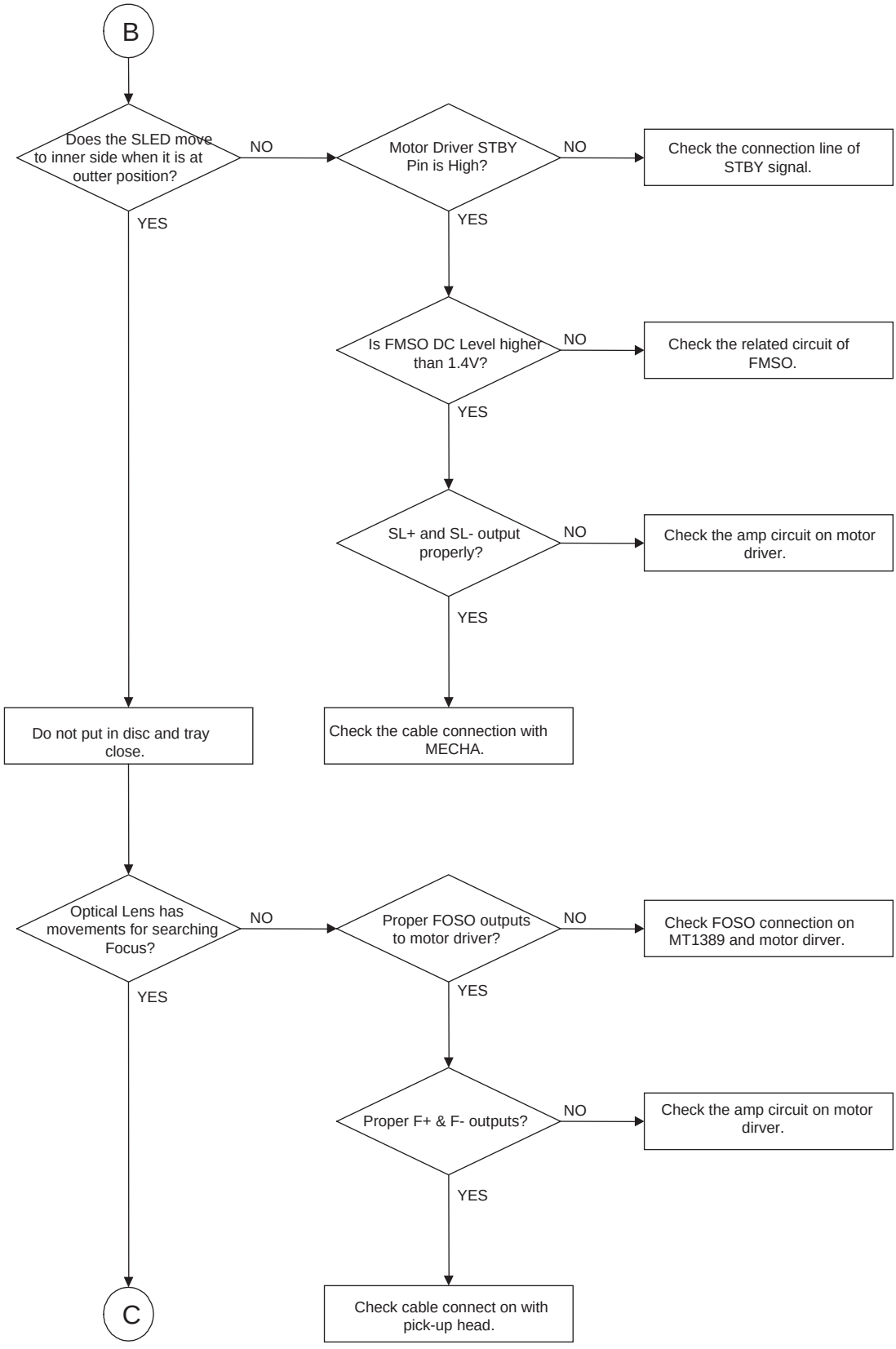
1. System operation flow

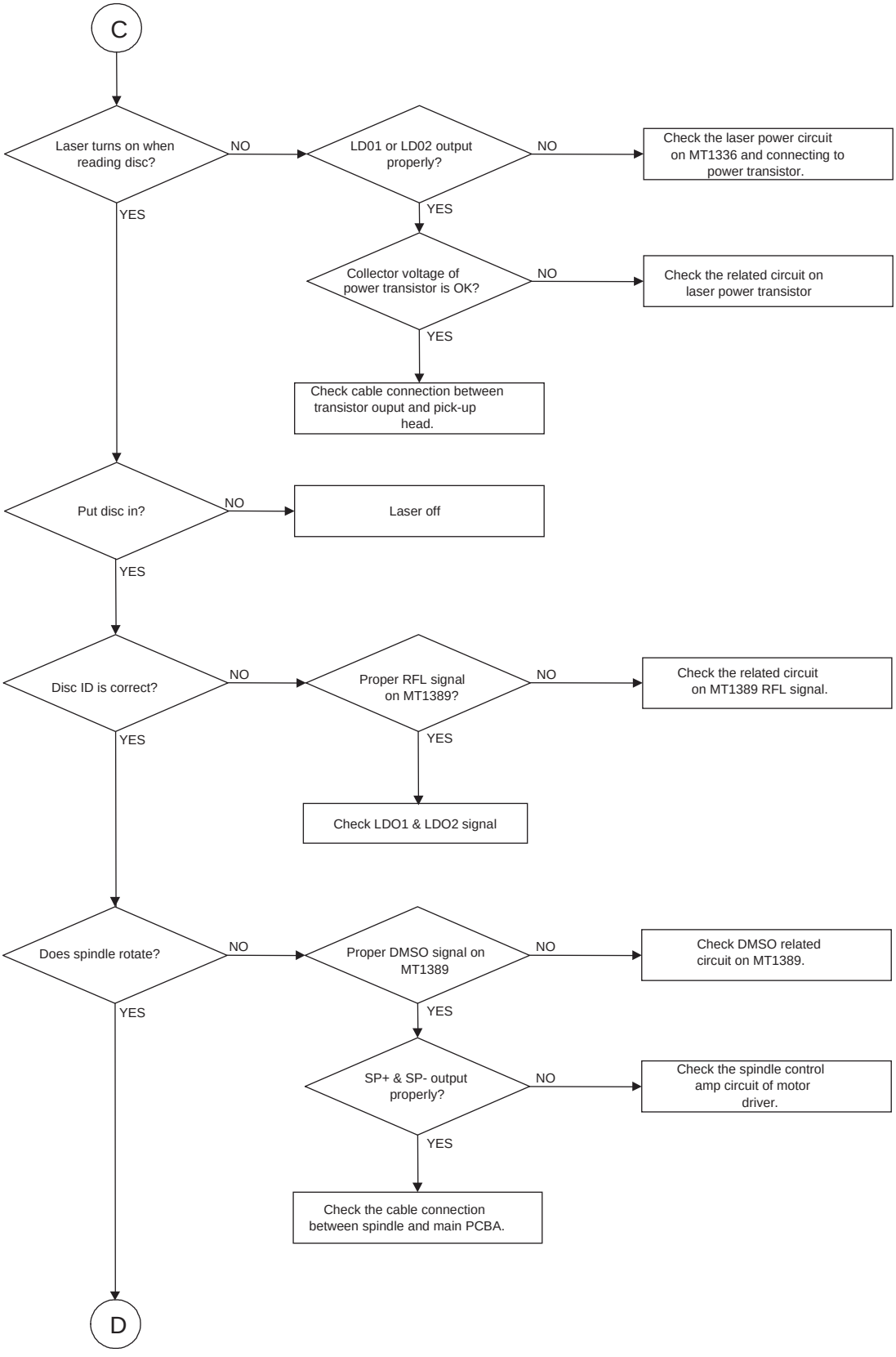


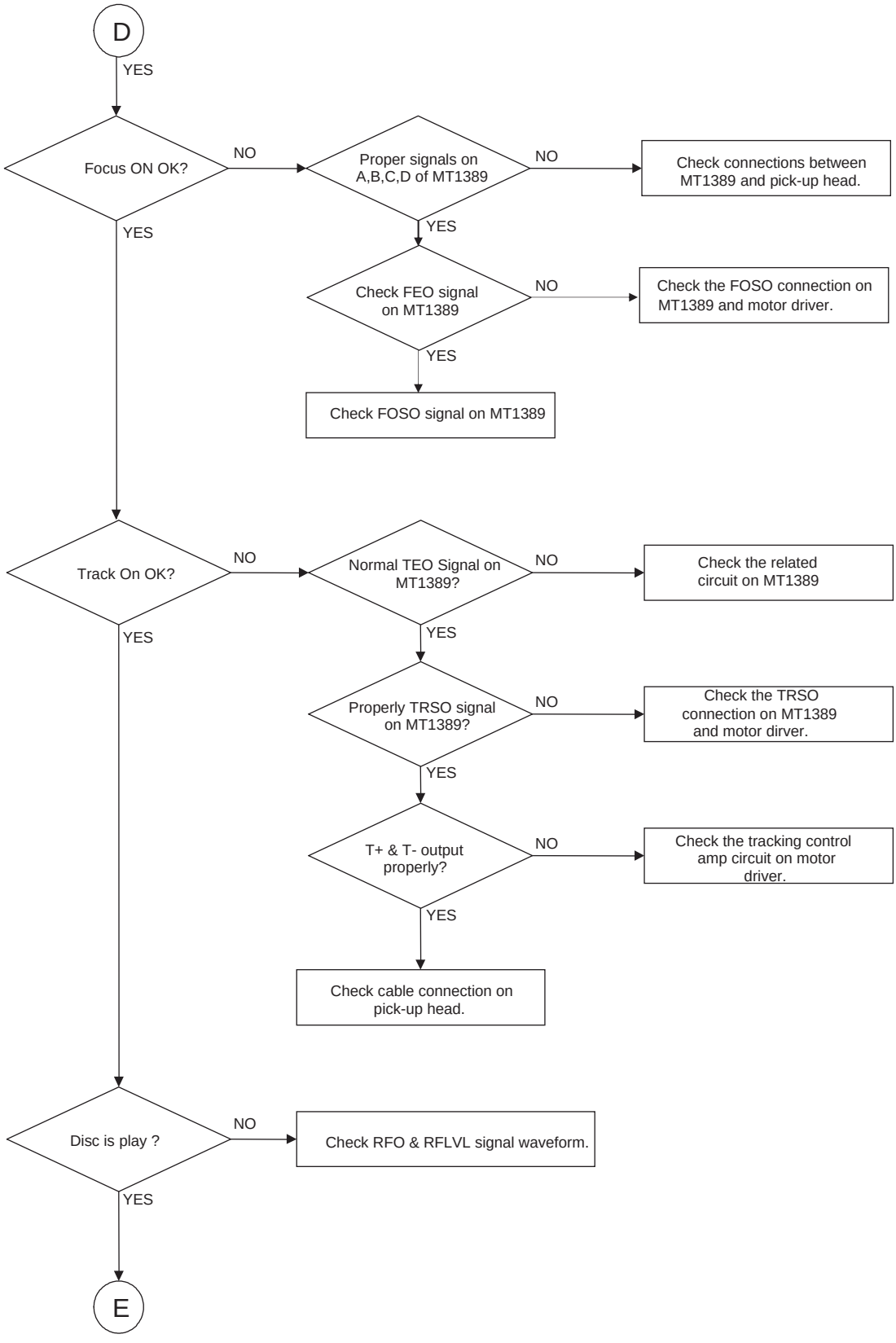
2. SYSTEM Test flow

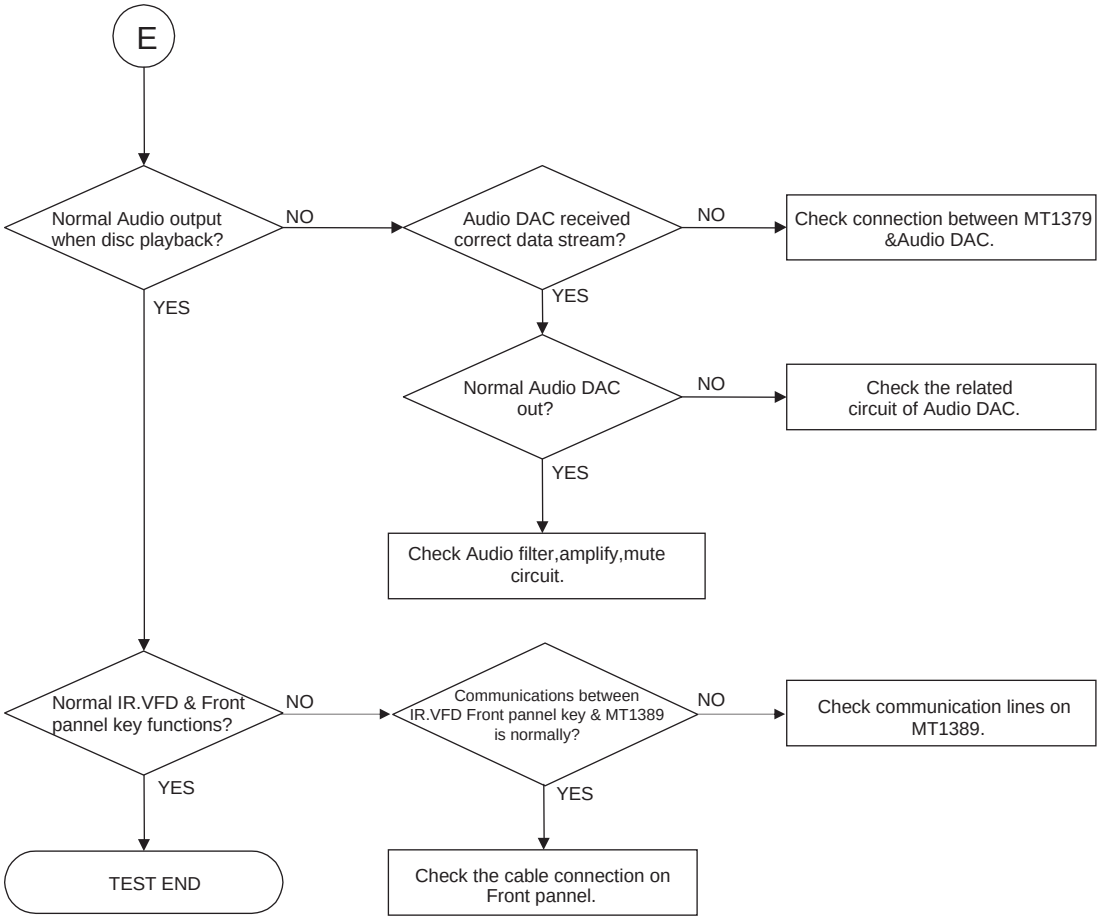



A
RESET or Power On.
Show LOGO?
NO
YES
Flash Memory operates properly?
NO
YES
Check connection lines between FLASH & MT1389 and the FLASH access time whether is suitable or not.
SDRAM works properly?
NO
YES
Check connection lines between SDRAM & MT1389 and the SDRAM is damaged.
MT1389 VIDEO outputs properly?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


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

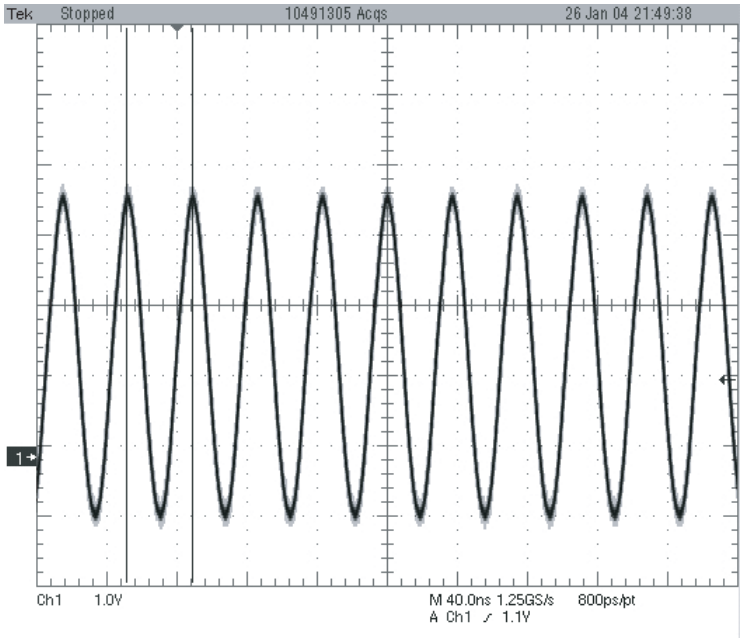

D
YES
Focus ON OK?
NO
Proper signals on A,B,C,D of MT1389
NO
Check connections between MT1389 and pick-up head.
YES
YES
Check FEO signal on MT1389
NO
Check the FOSO connection on MT1389 and motor driver.
YES
Check FOSO signal on MT1389
Track On OK?
NO
Normal TEO Signal on MT1389?
NO
Check the related 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

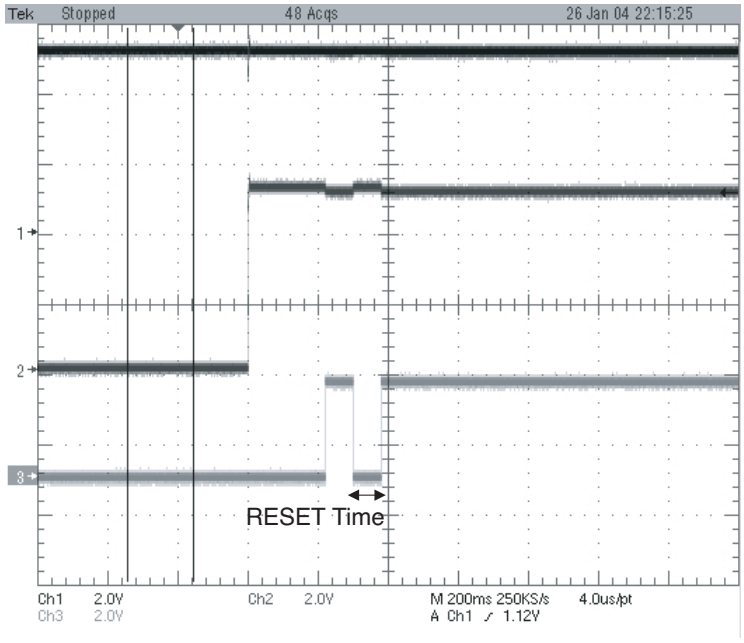
1) MT1389 main clock is at 27MHz(X501)



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)

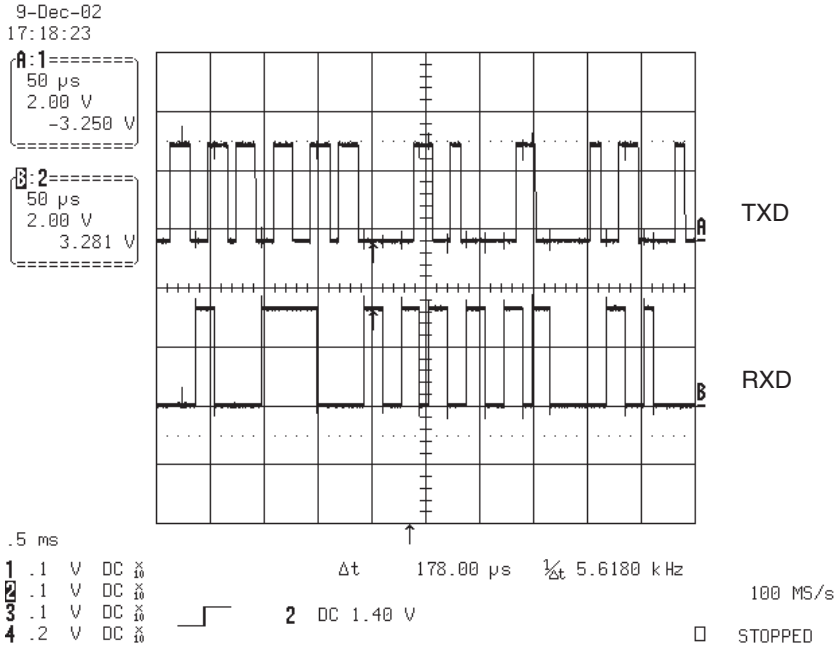


FIG 1-3

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

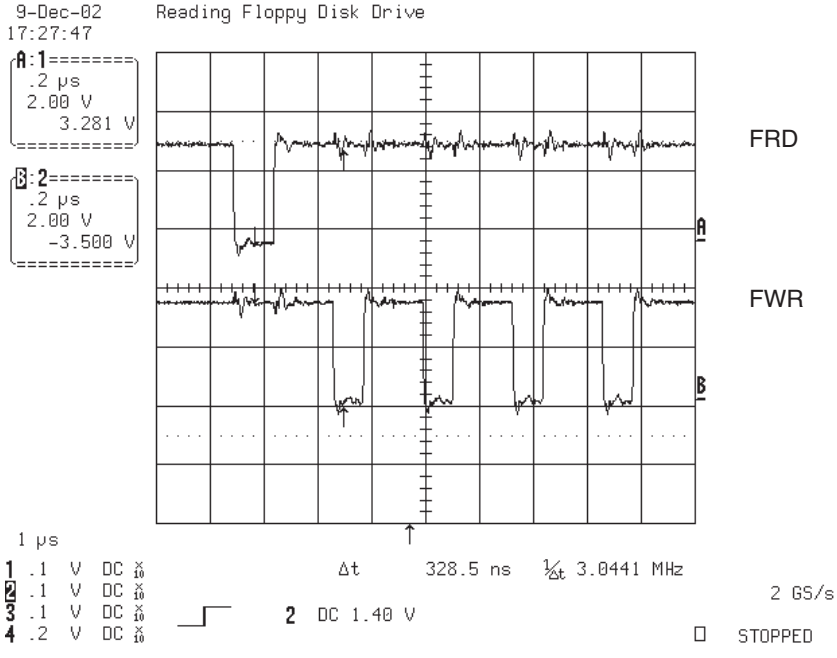


FIG 1-4

2. SDRAM CLOCK

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

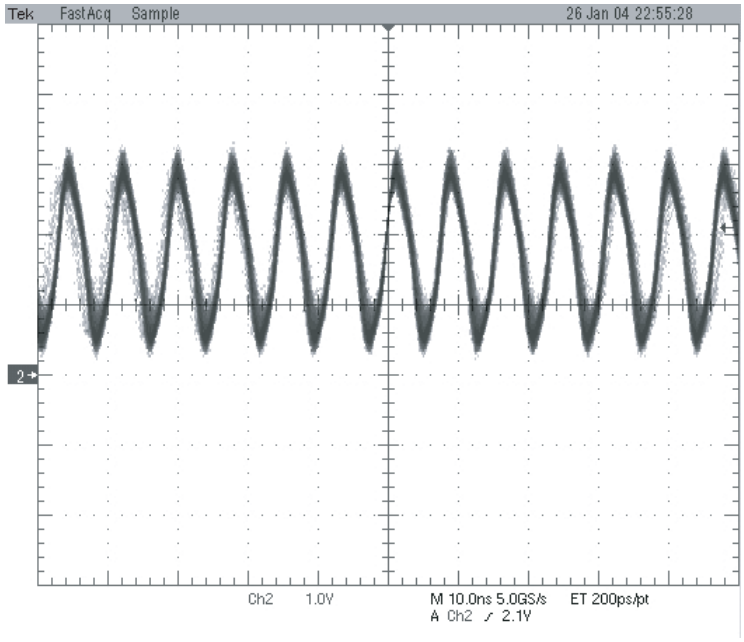


FIG 2-1

3. TRAY OPEN/CLOSE SIGNAL

1) Tray open/close waveform

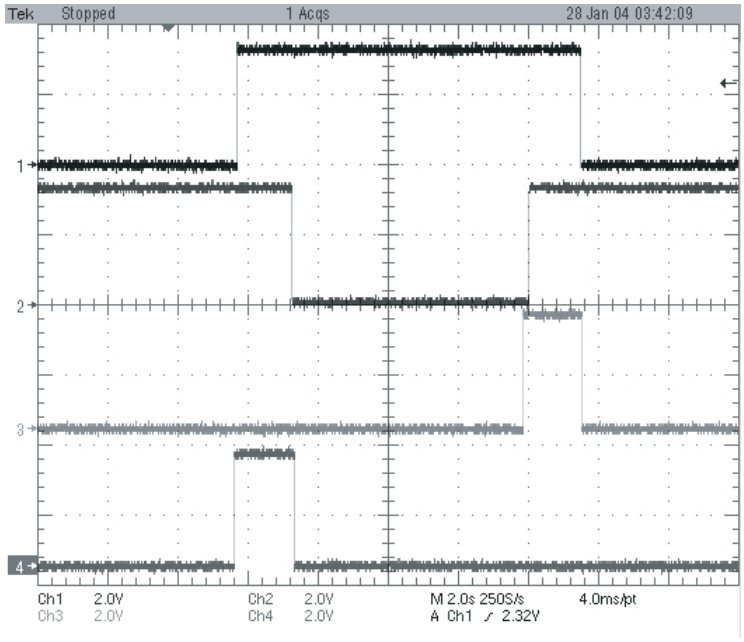
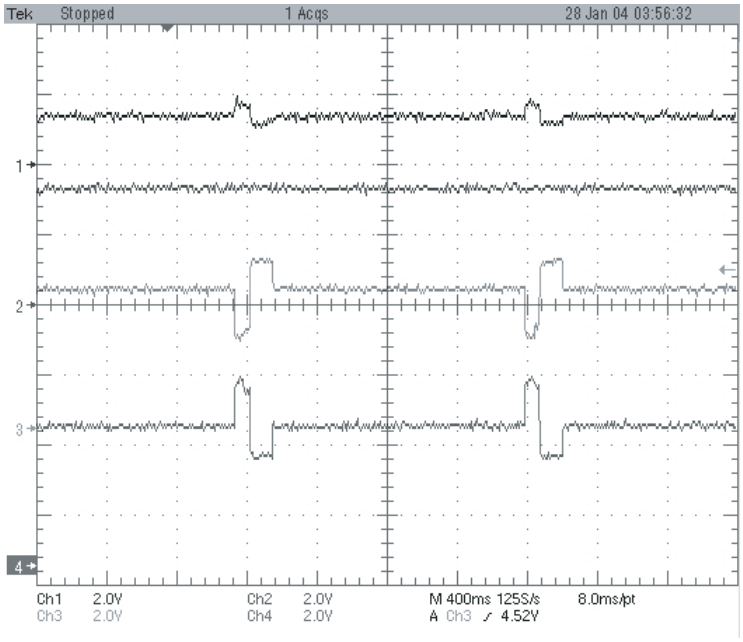


FIG 3-1

4. SLED CONTROL RELATED SIGNAL (NO DISC CONDITION)



FMSO(2.0V/1.4V/1.0V)

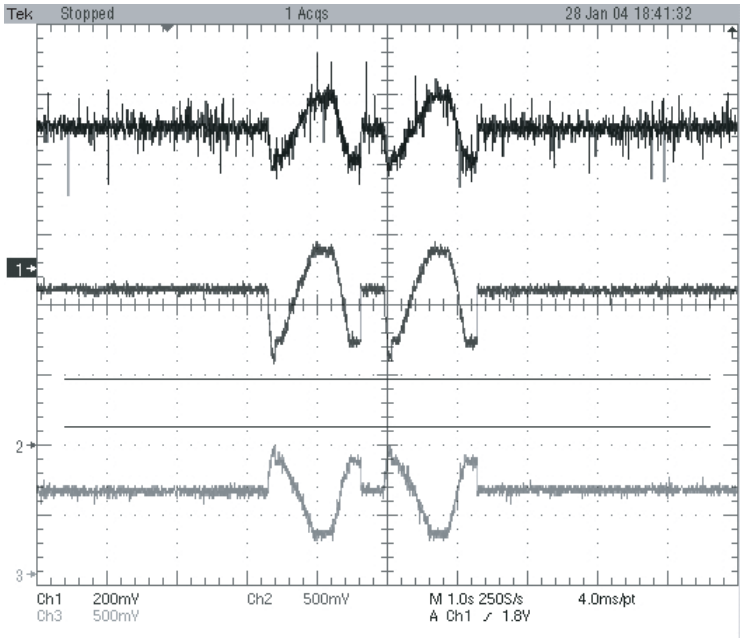
STBY(3.3V)

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)



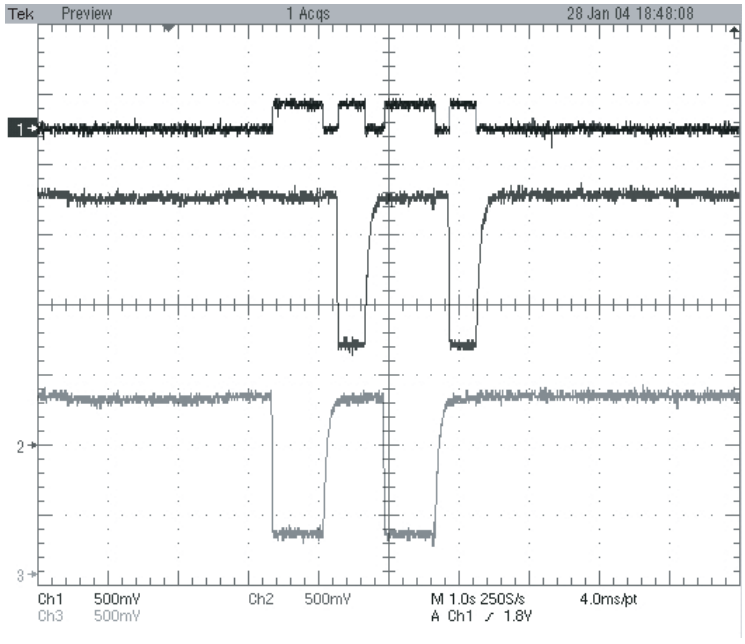
FOSO(1.5V/1.4V/1.3V)

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)



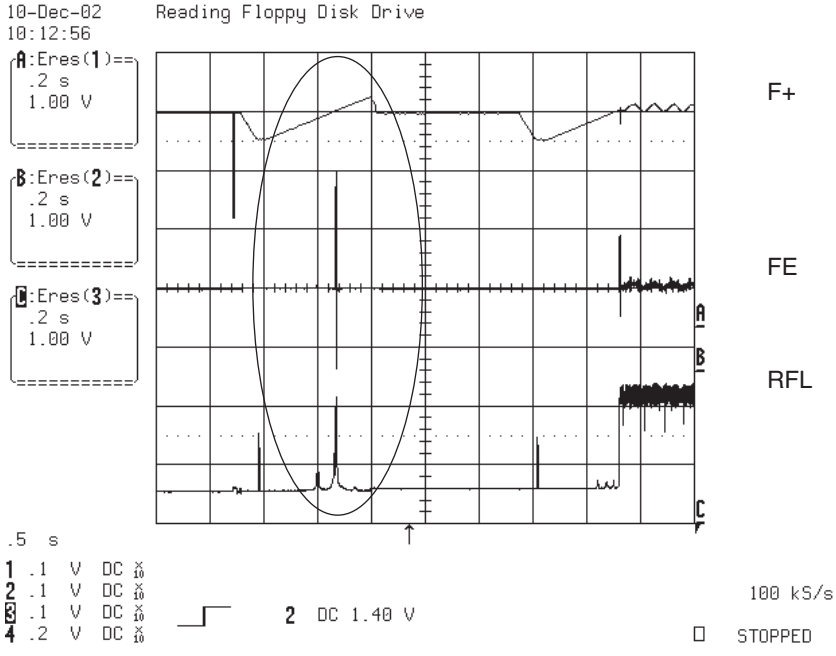
MDI1(0V/180mV)

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)

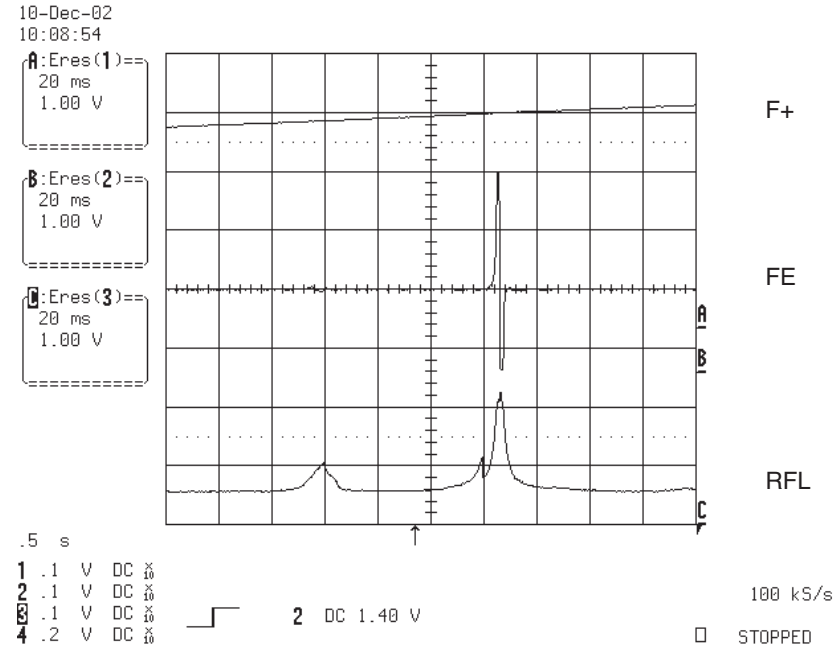


FIG 7-2 (DVD)

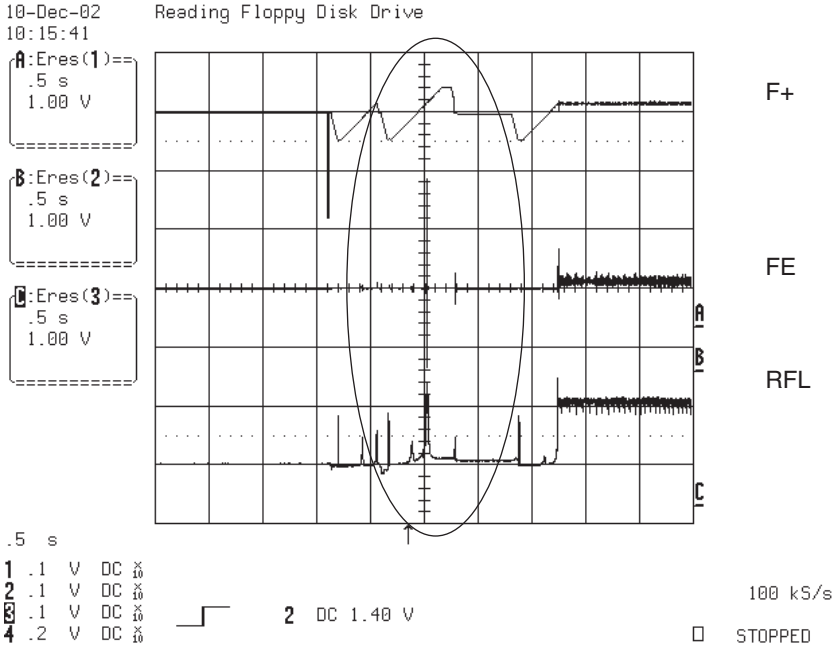


FIG 7-3 (CD)

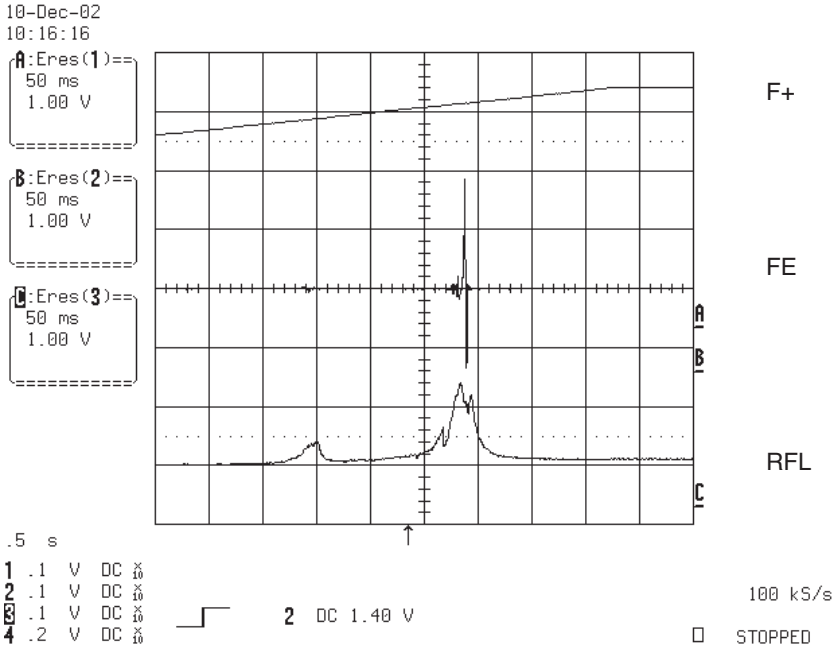


FIG 7-4 (CD)

8. FOCUS ON WAVEFORM

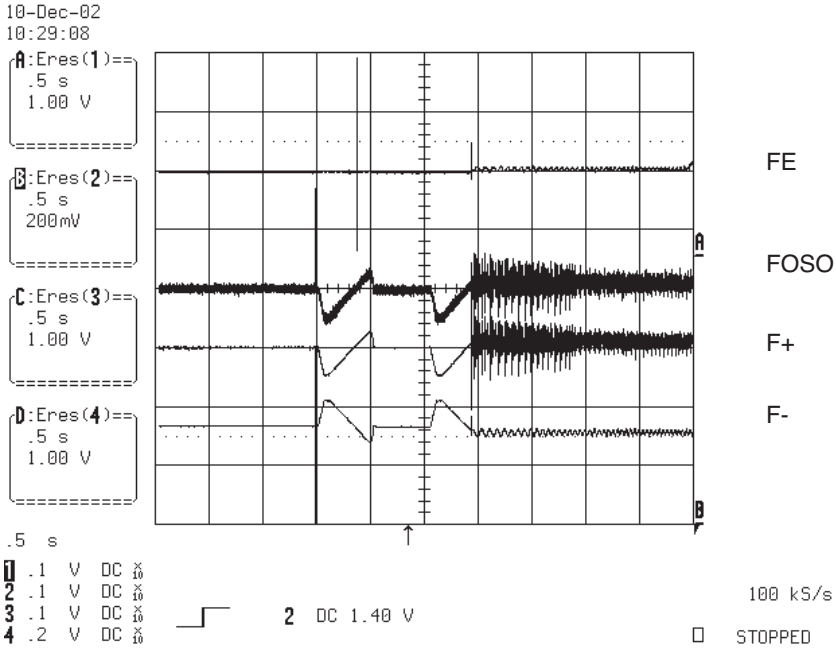


FIG 8-1 (DVD)

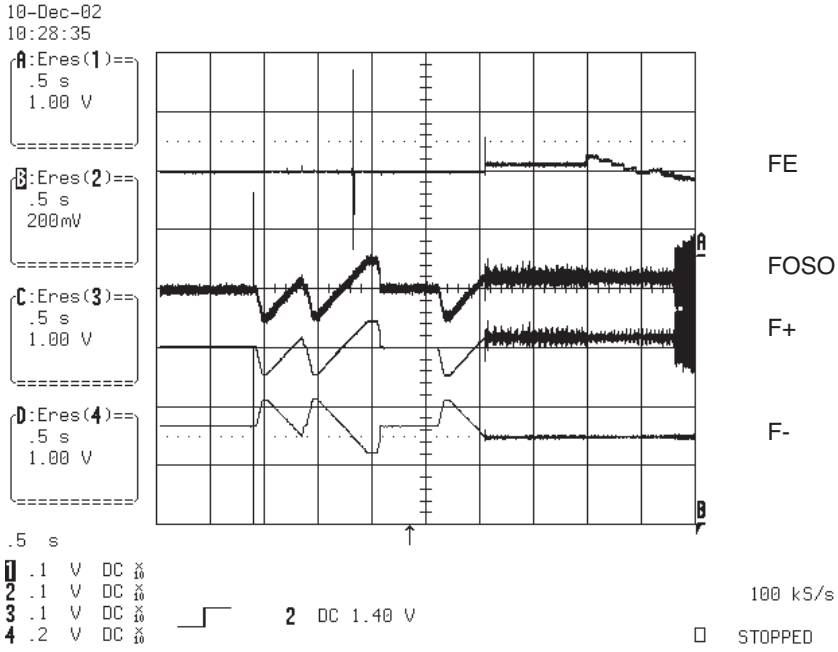


FIG 8-2 (CD)

9. SPINDLE CONTROL WAVEFORM (NO DISC CONDITION)

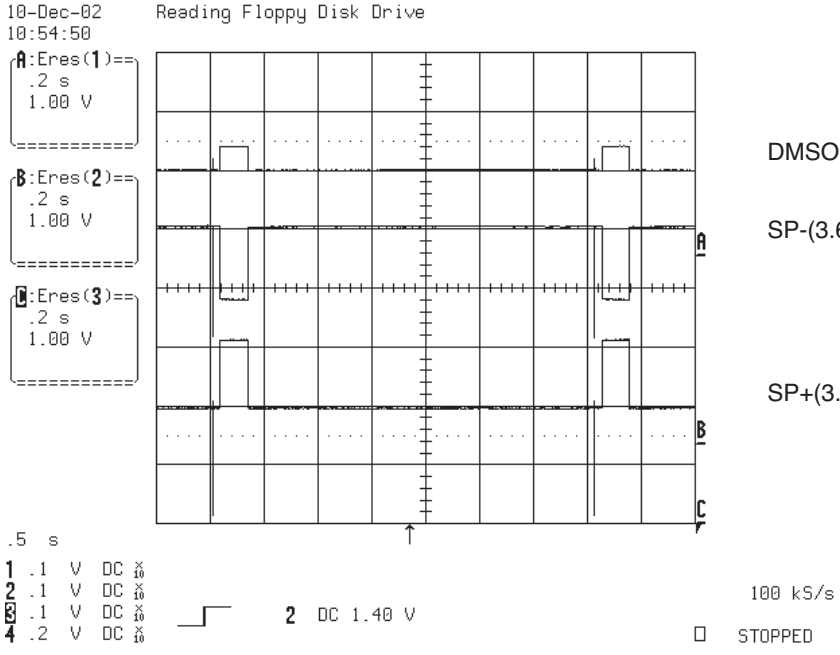


FIG 9-1

10. TRACKING CONTROL RELATED SIGNAL(System checking)

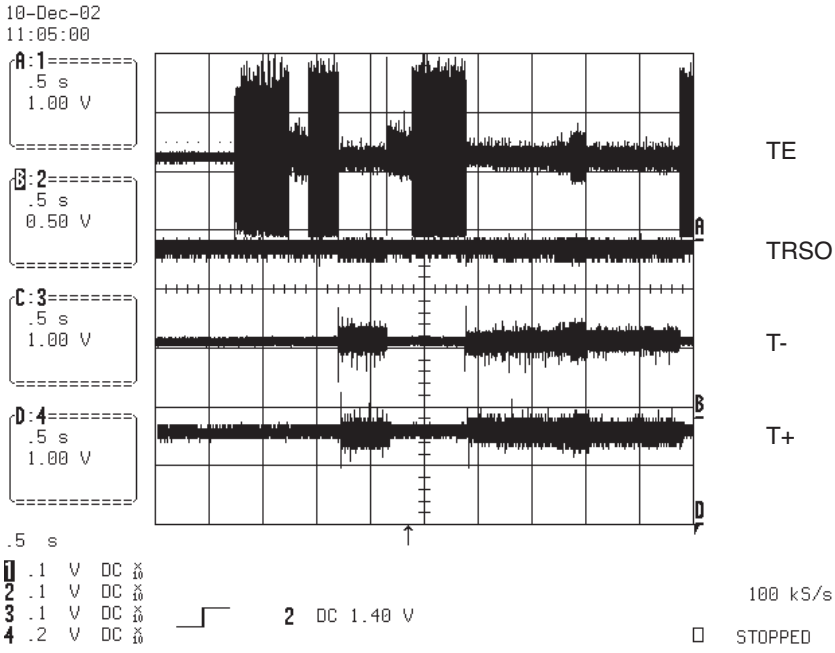


FIG 10-1(DVD)

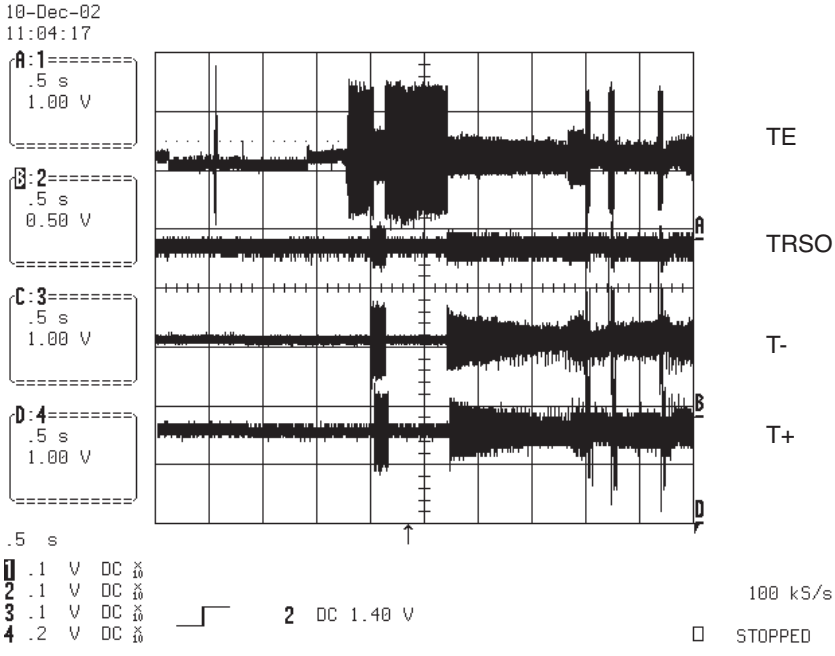


FIG 10-2(CD)

11. MT1389 AUDIO OPTICAL AND COAXIAL OUTPUT(SPDIF)

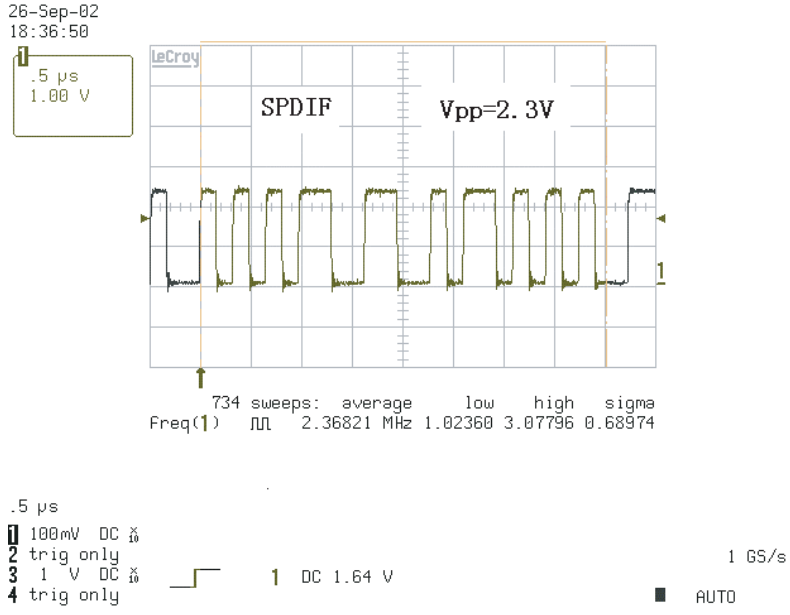


FIG 11-1

12. MT1389 VIDEO OUTPUT WAVEFORM

1) 100%

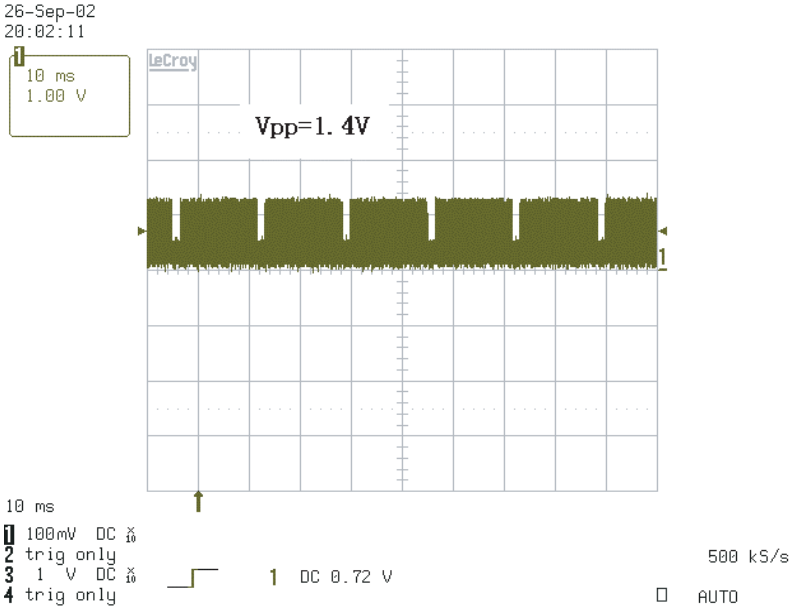


FIG 12-1

2) COMPOSITE VIDEO SIGNAL

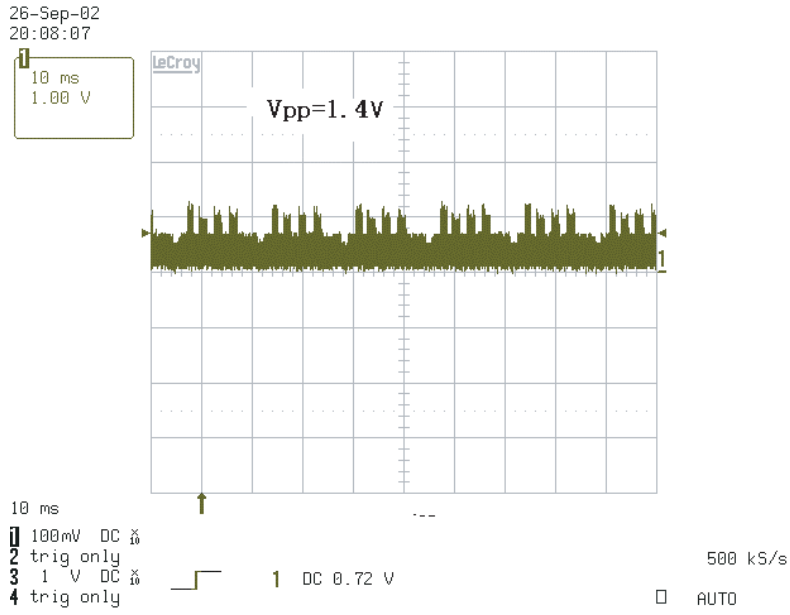


FIG 12-2

13. MT1389 AUDIO OUTPUT TO AUDIO DAC

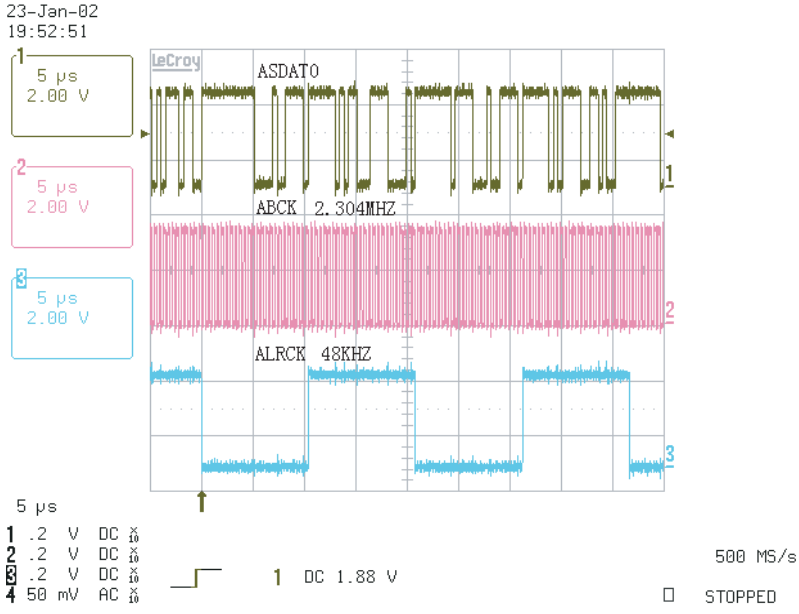


FIG 13-1

14. AUDIO OUTPUT FROM AUDIO DAC

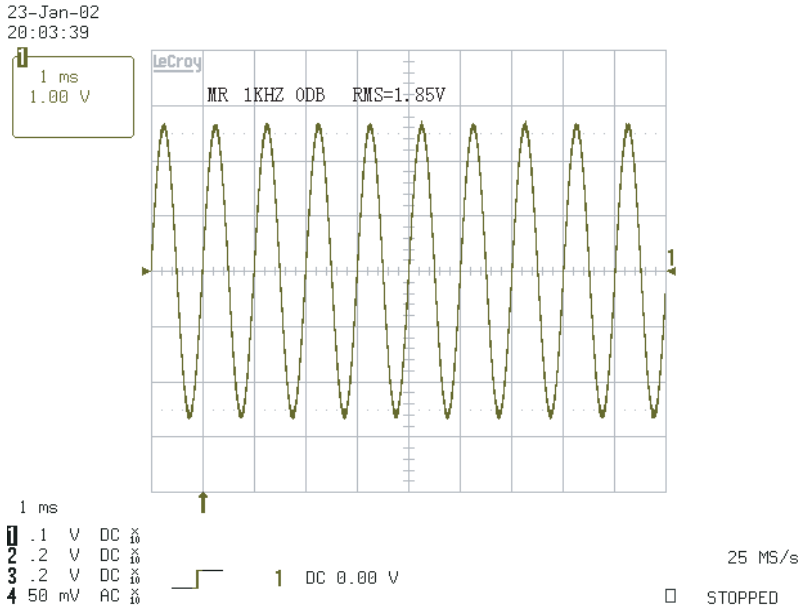
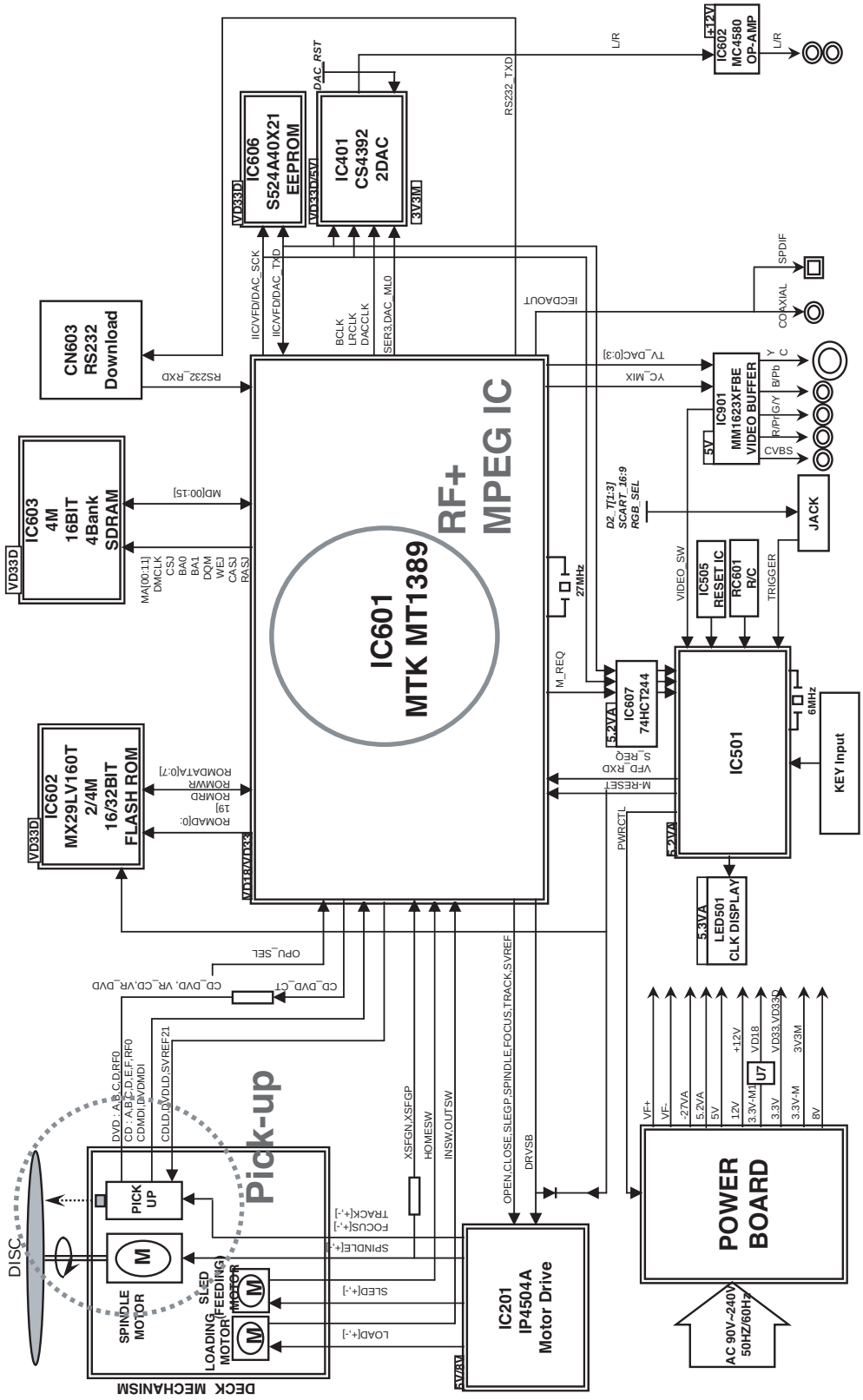


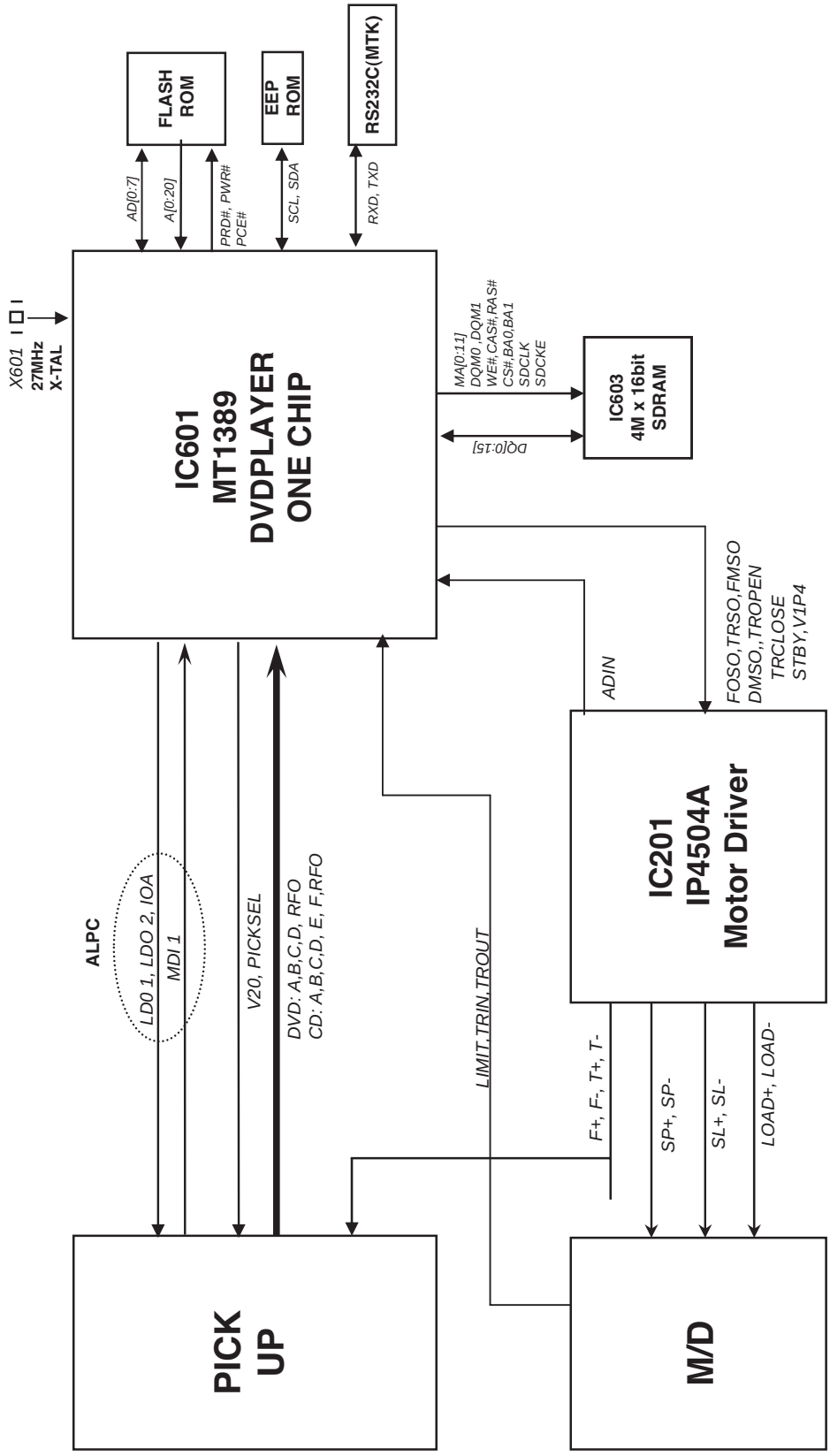
FIG 14-1

BLOCK DIAGRAMS

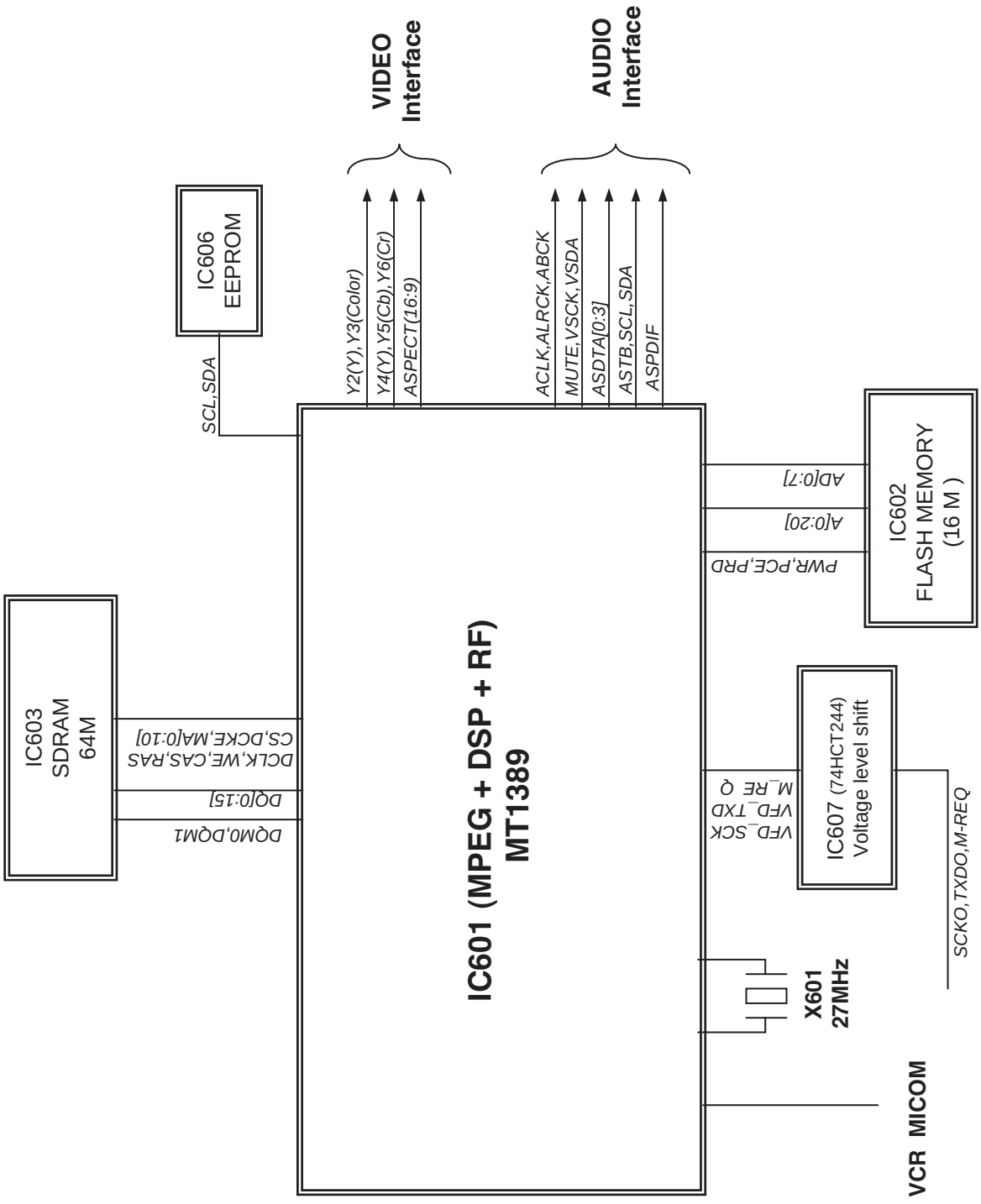
1. OVERALL BLOCK DIAGRAM



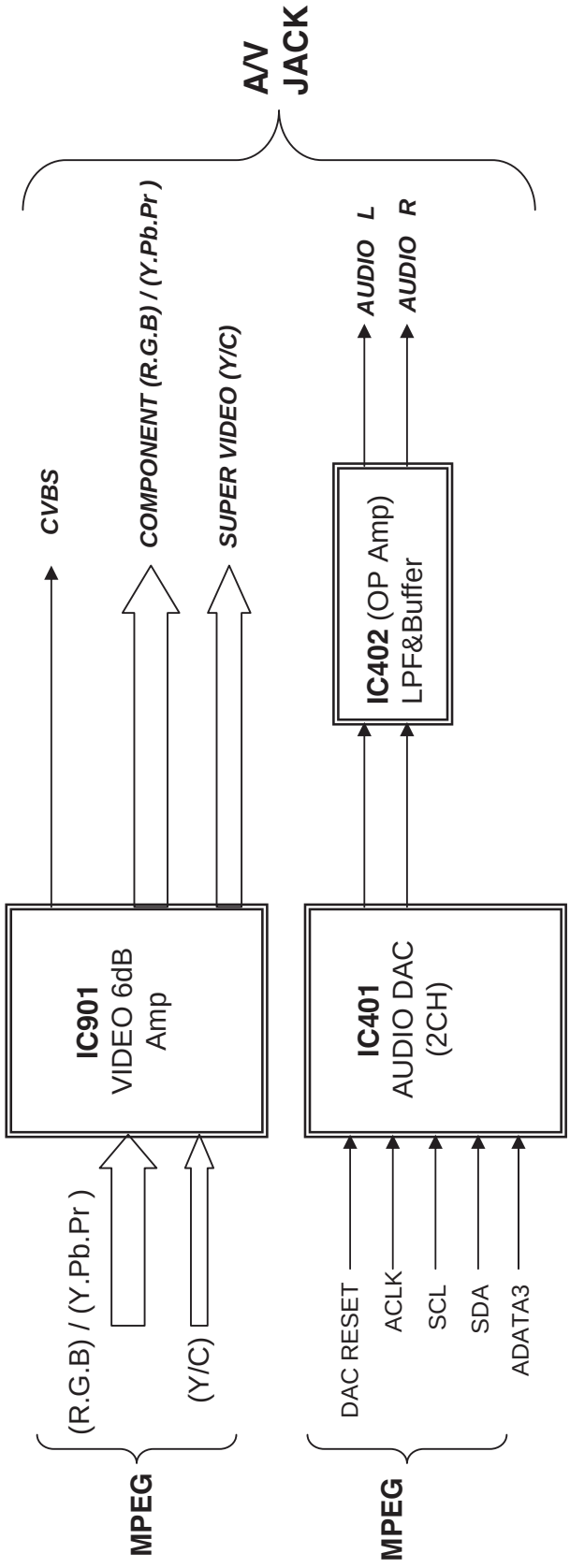
2. SERVO BLOCK DIAGRAM



3. MPEG & MEMORY Block Diagram



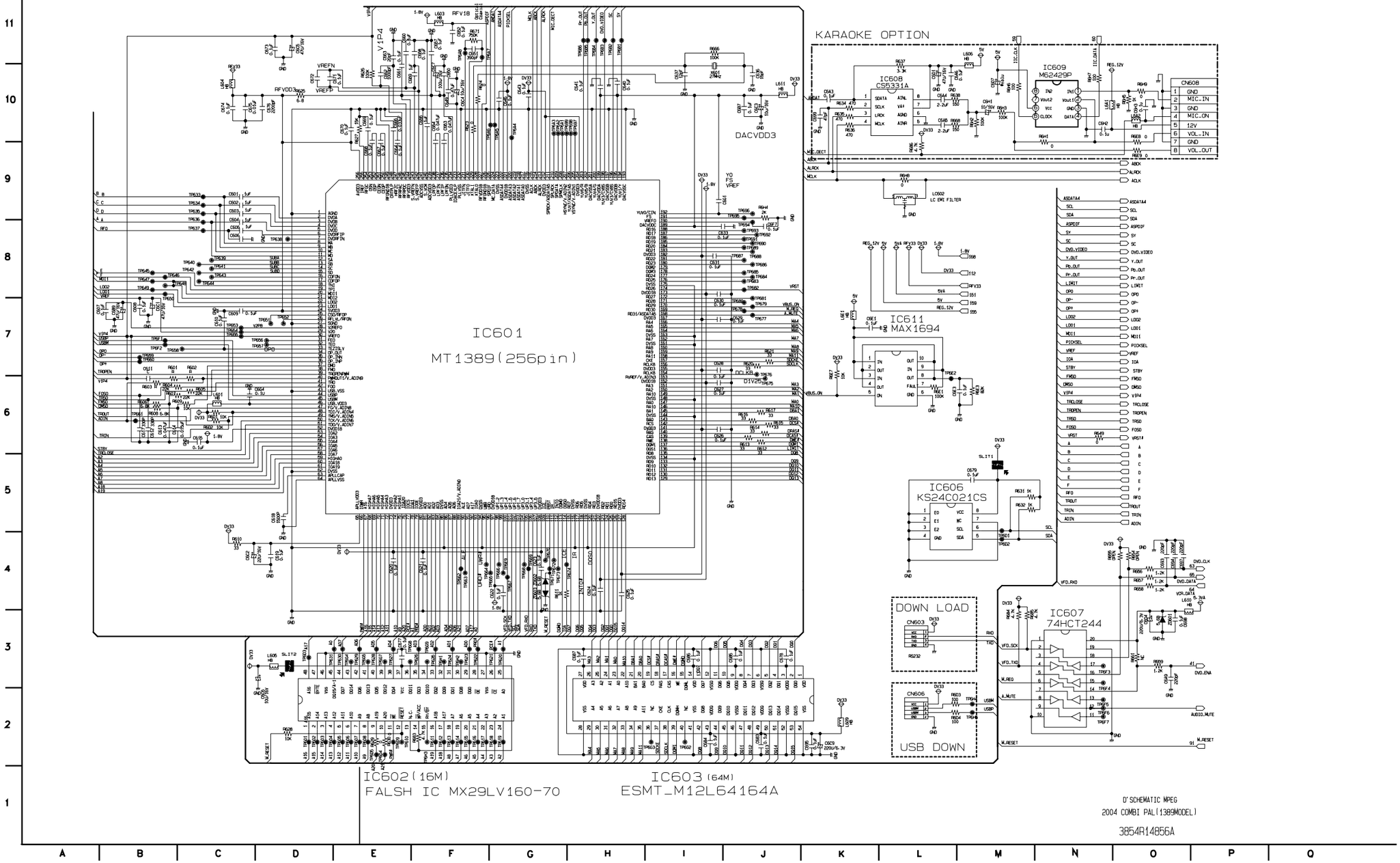
4. VIDEO & AUDIO Block Diagram



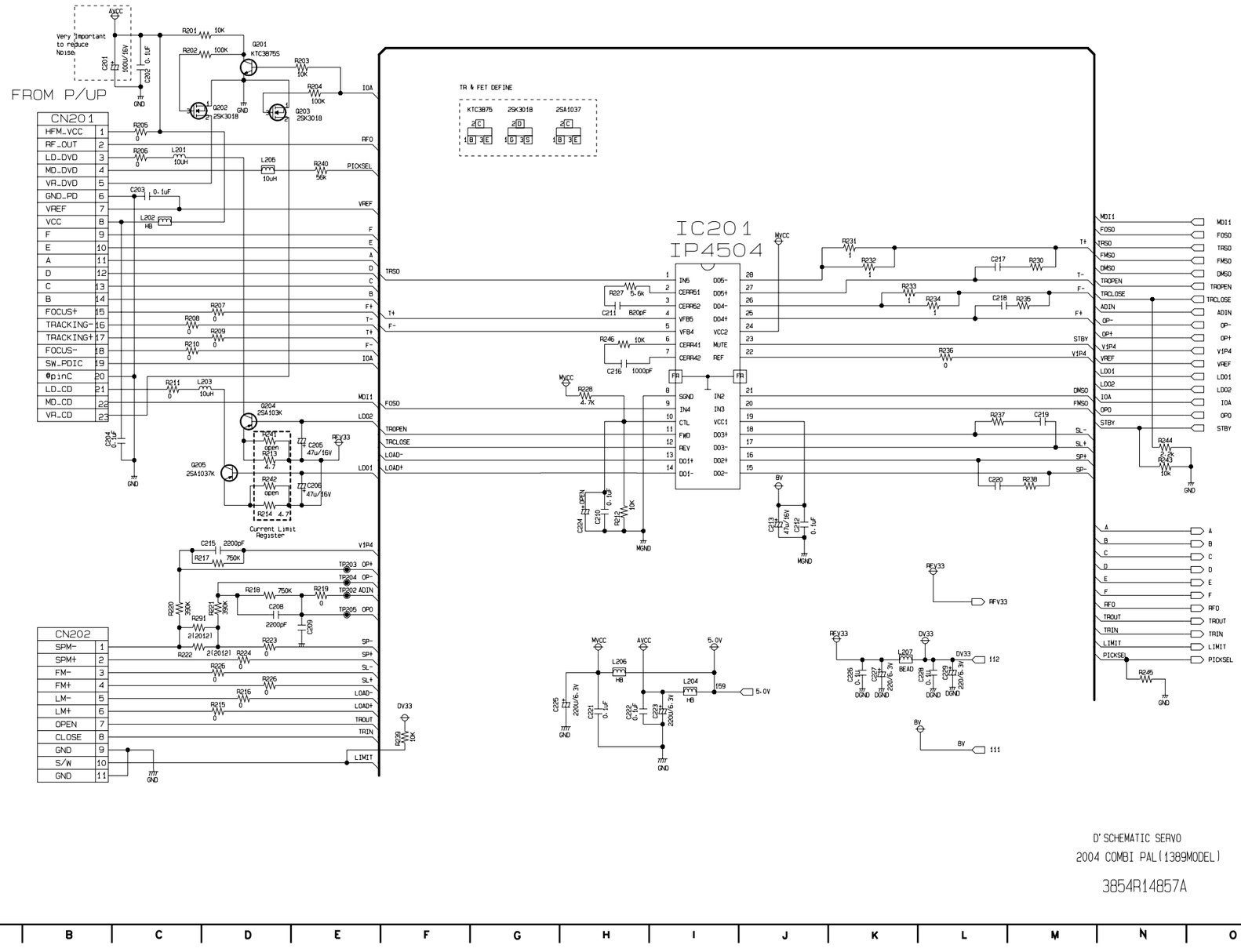
MEMO

CIRCUIT DIAGRAMS

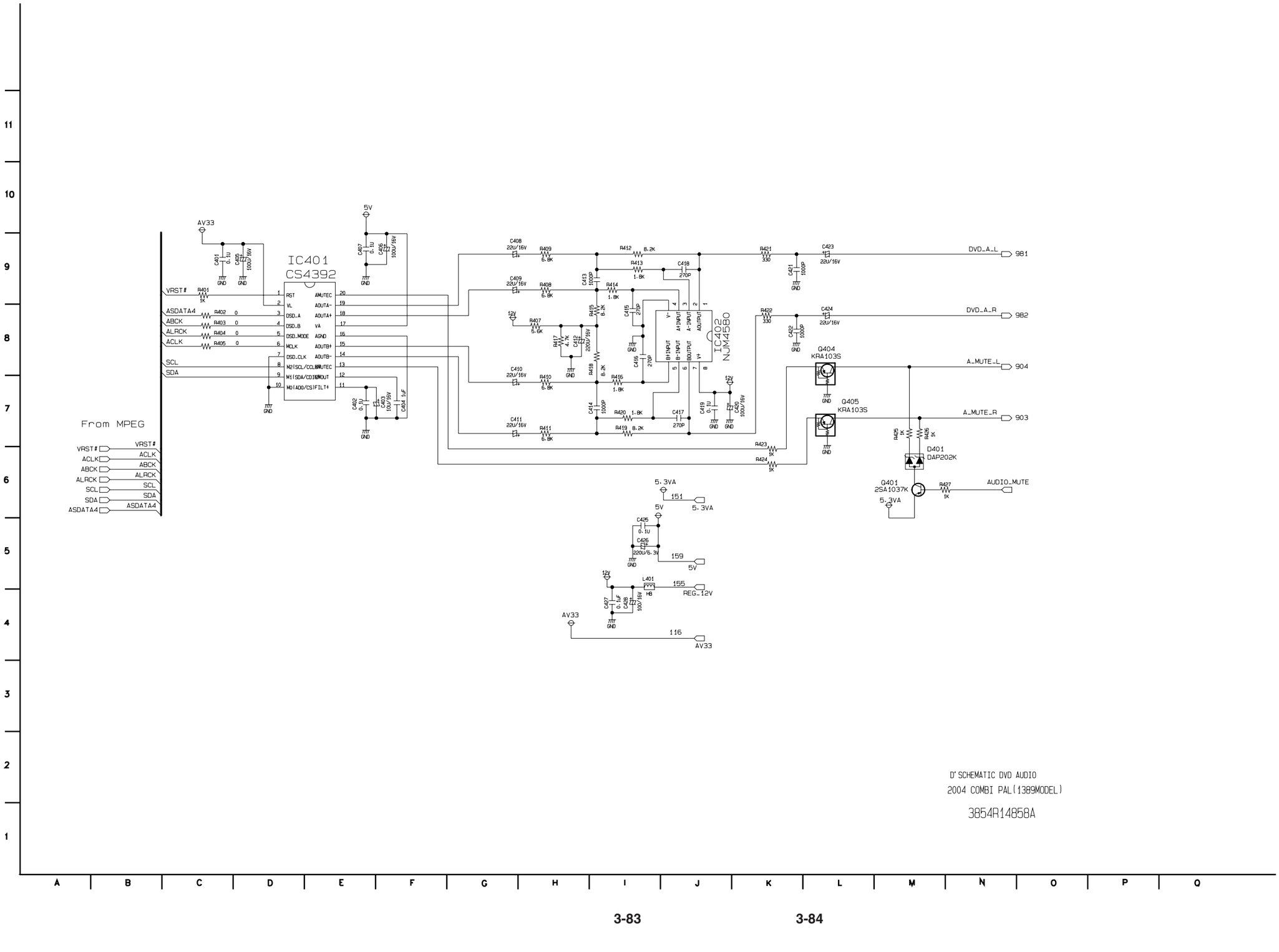
1. SYSTEM CIRCUIT DIAGRAM



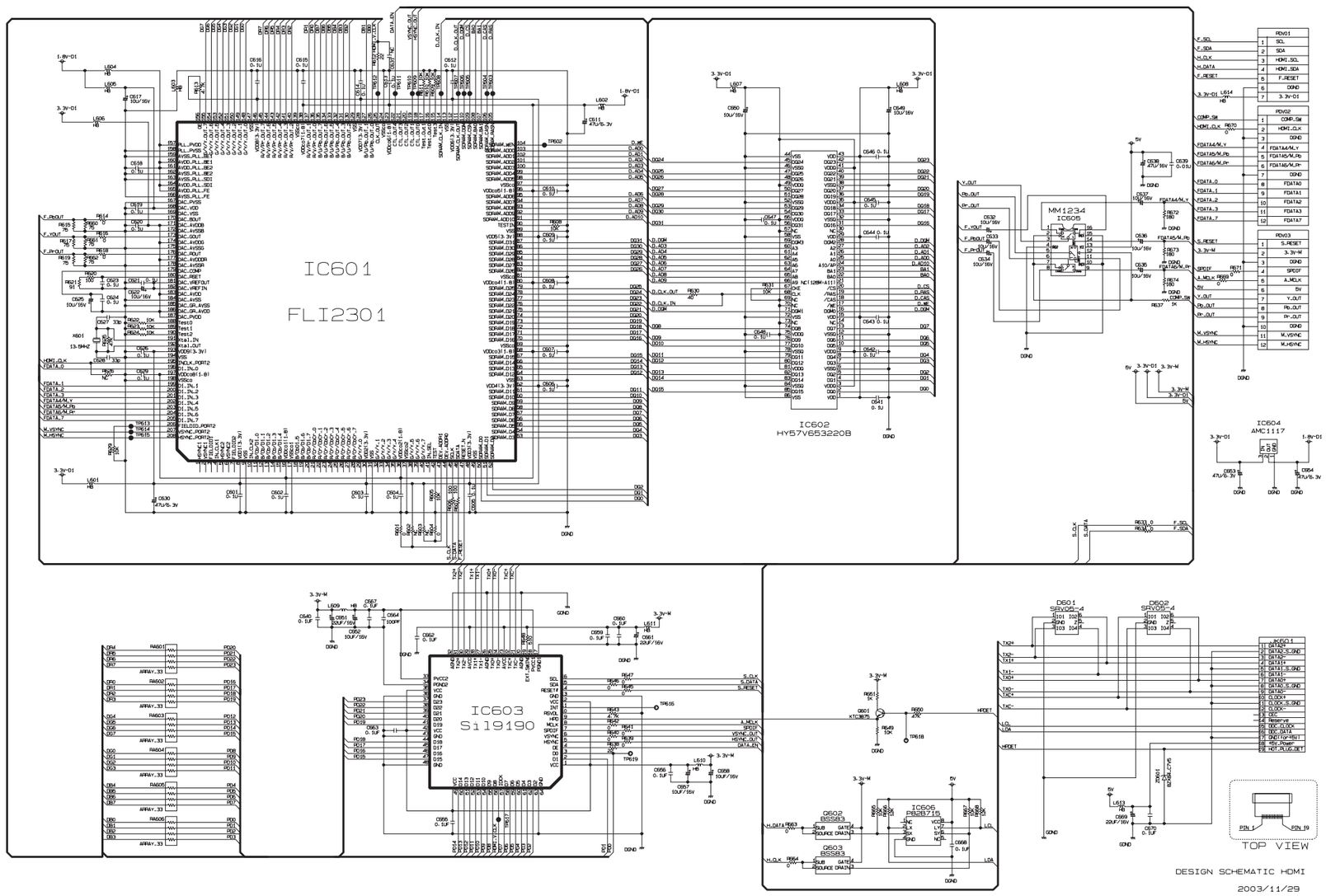
2. RF & DSP SERVO CIRCUIT DIAGRAM



3. AV/JACK CIRCUIT DIAGRAM



4. HDMI CIRCUIT DIAGRAM

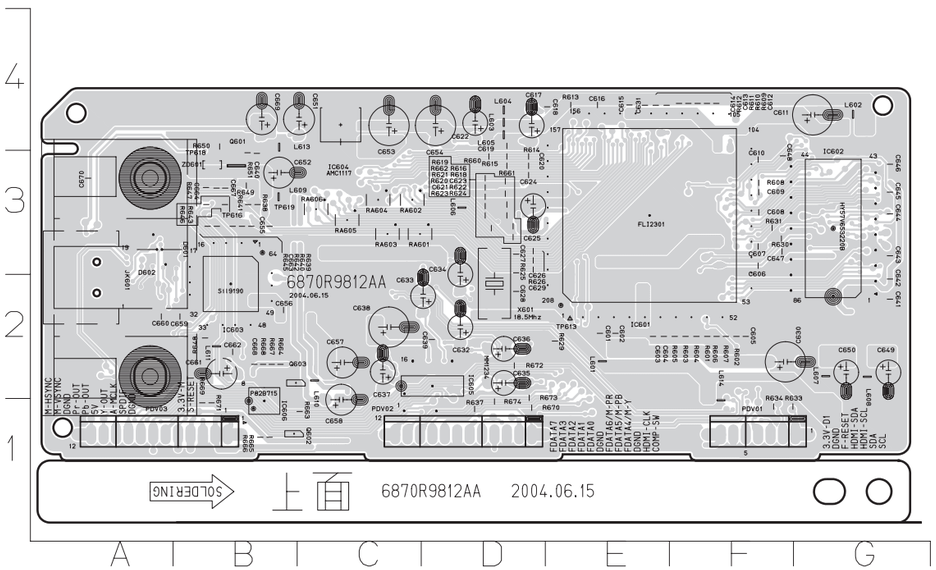


• CIRCUIT VOLTAGE CHART

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

PRINTED CIRCUIT DIAGRAMS

1. HDMI P.C.BOARD

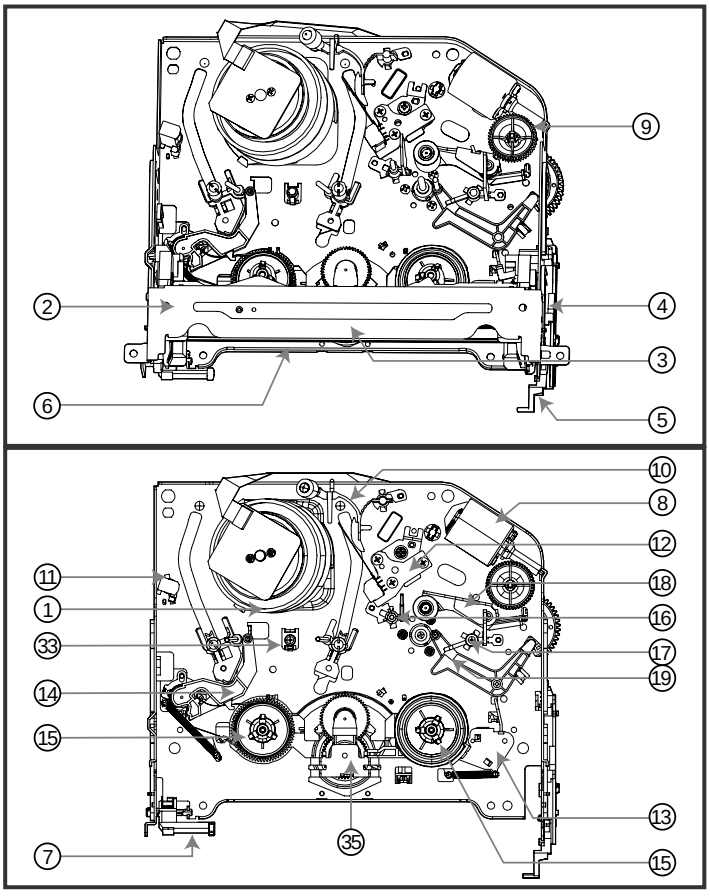


SECTION 4 MECHANISM OF VCR PART(D-37)

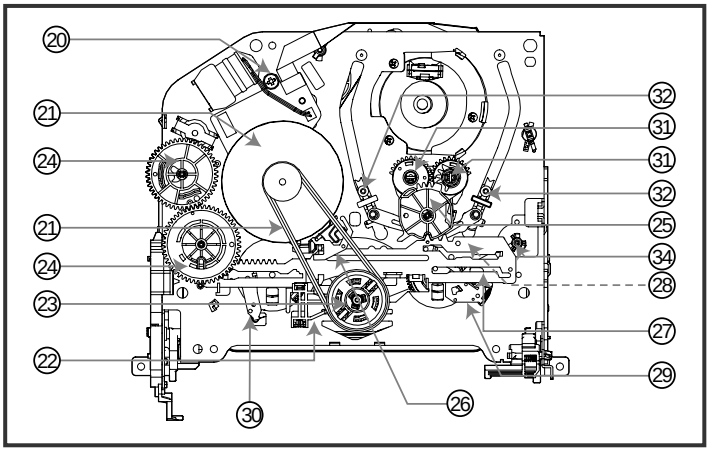
CONTENTS

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.

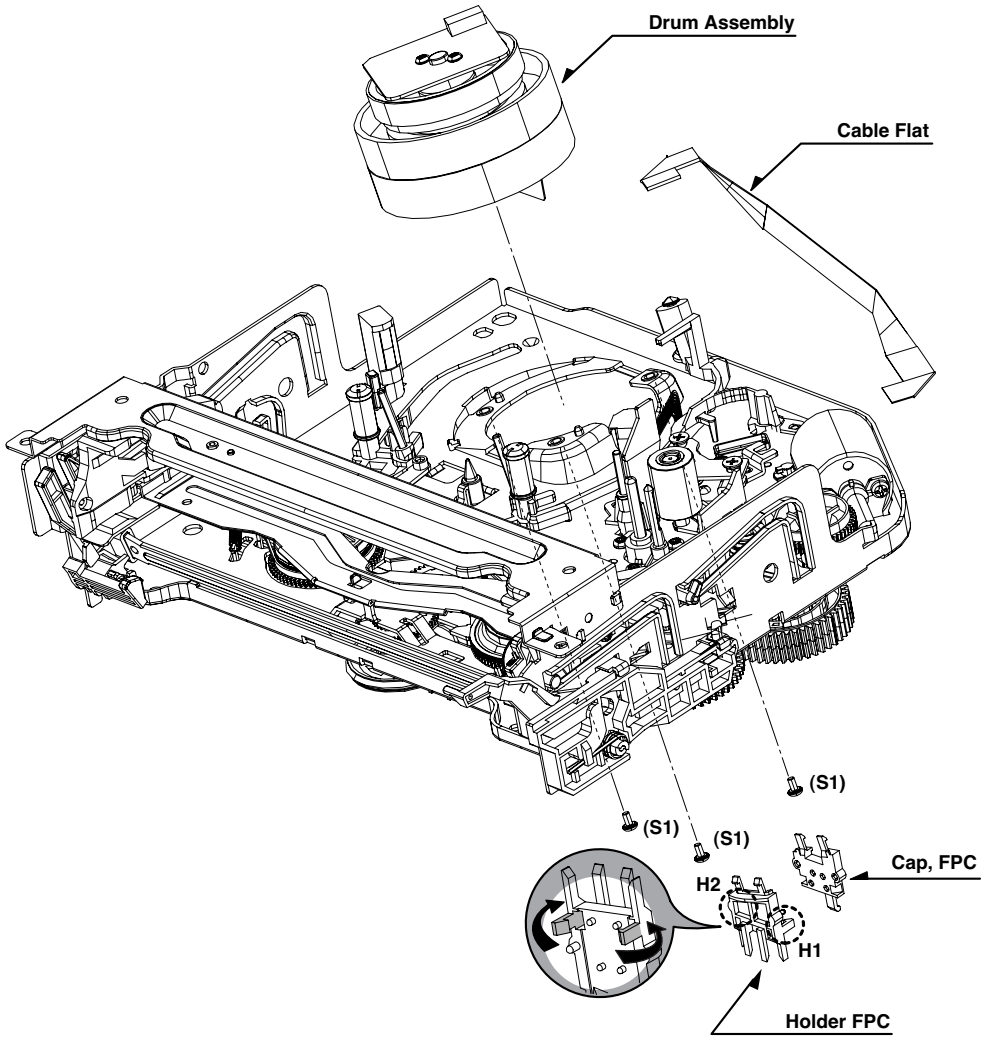
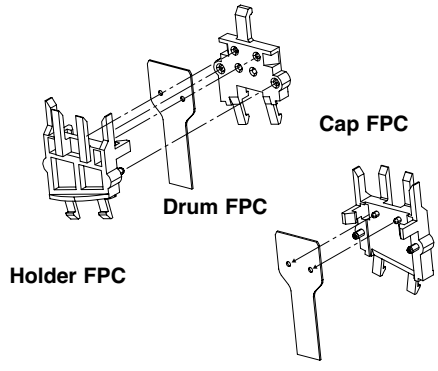


Fig. A-1

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

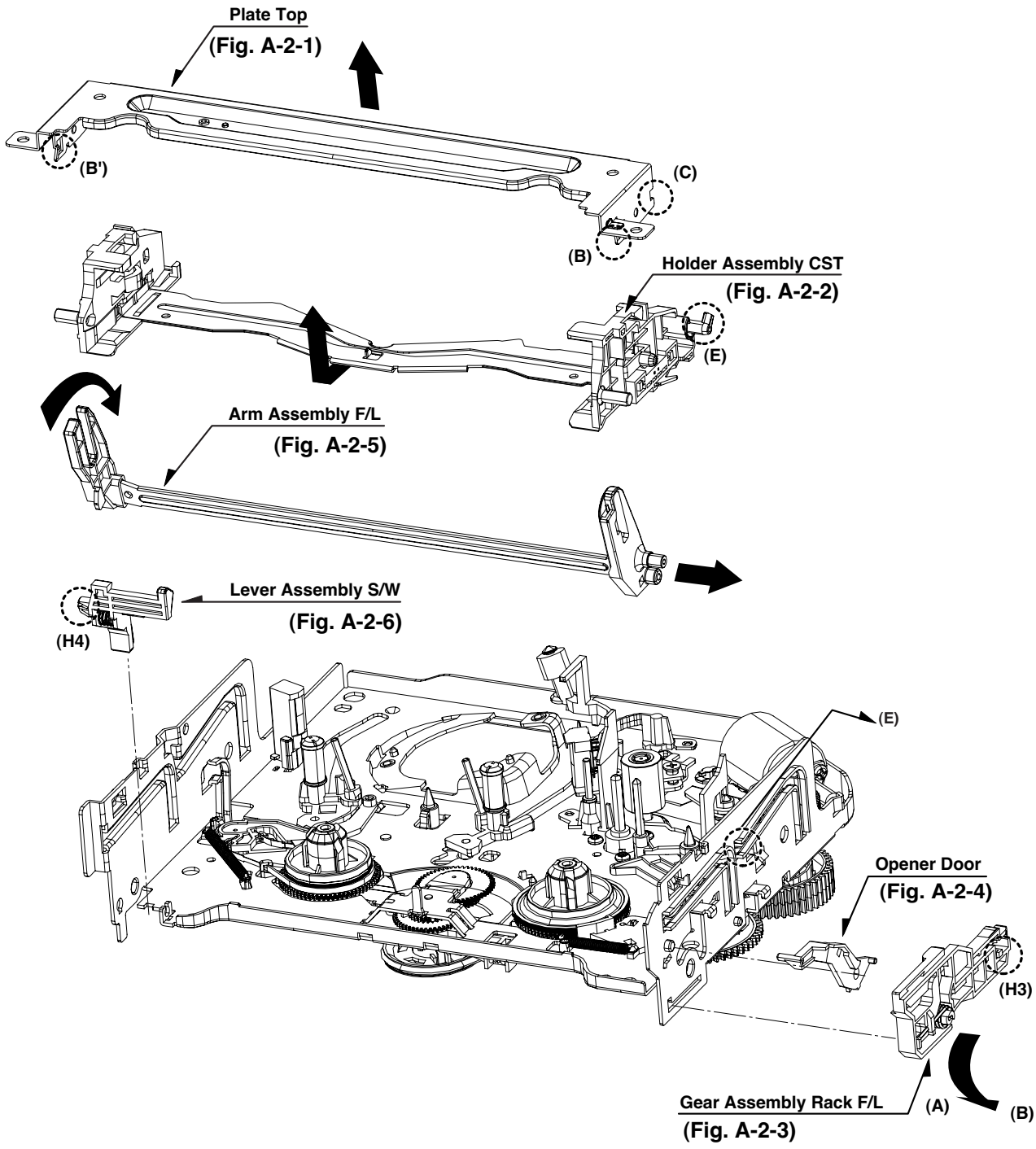


Fig. A-2

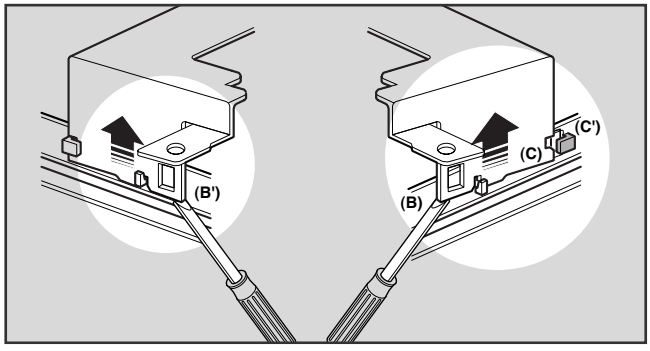
DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

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)

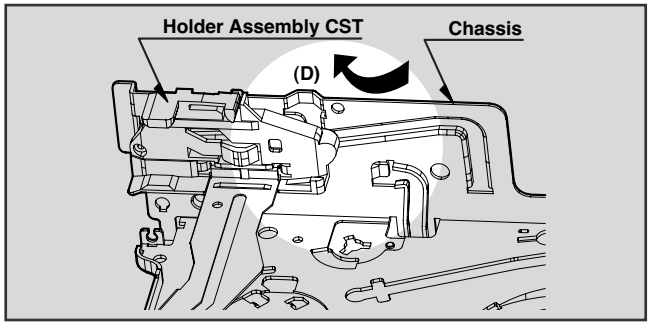
CAUTIONS

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

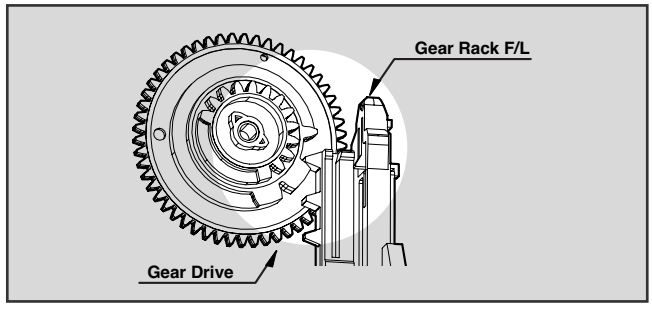
Assemble by inserting the left part after firstly inserting the (E) part of the holder assembly CST into the groove on the (E') part of chassis.

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)

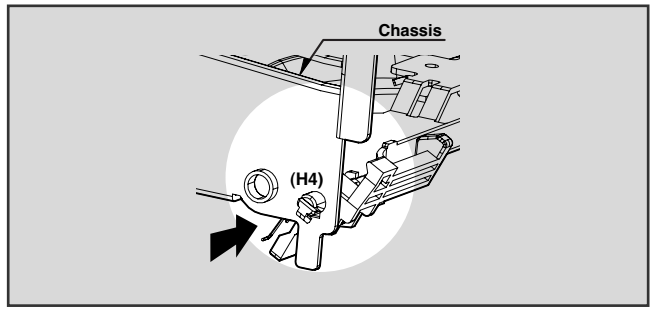
1) Separate the opener door ahead from the guide hole of chassis while turning it clockwise.

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

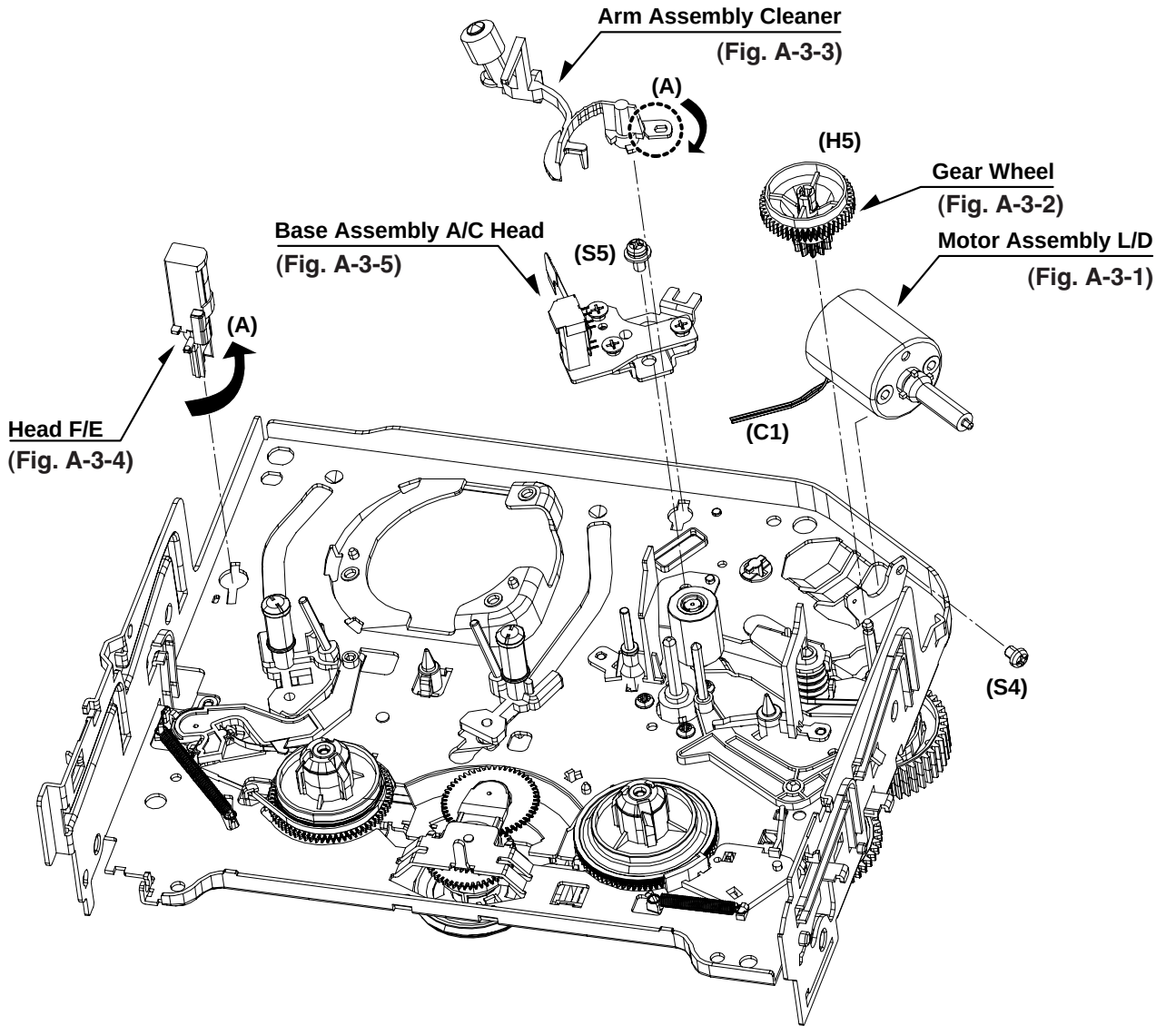


Fig. A-3

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

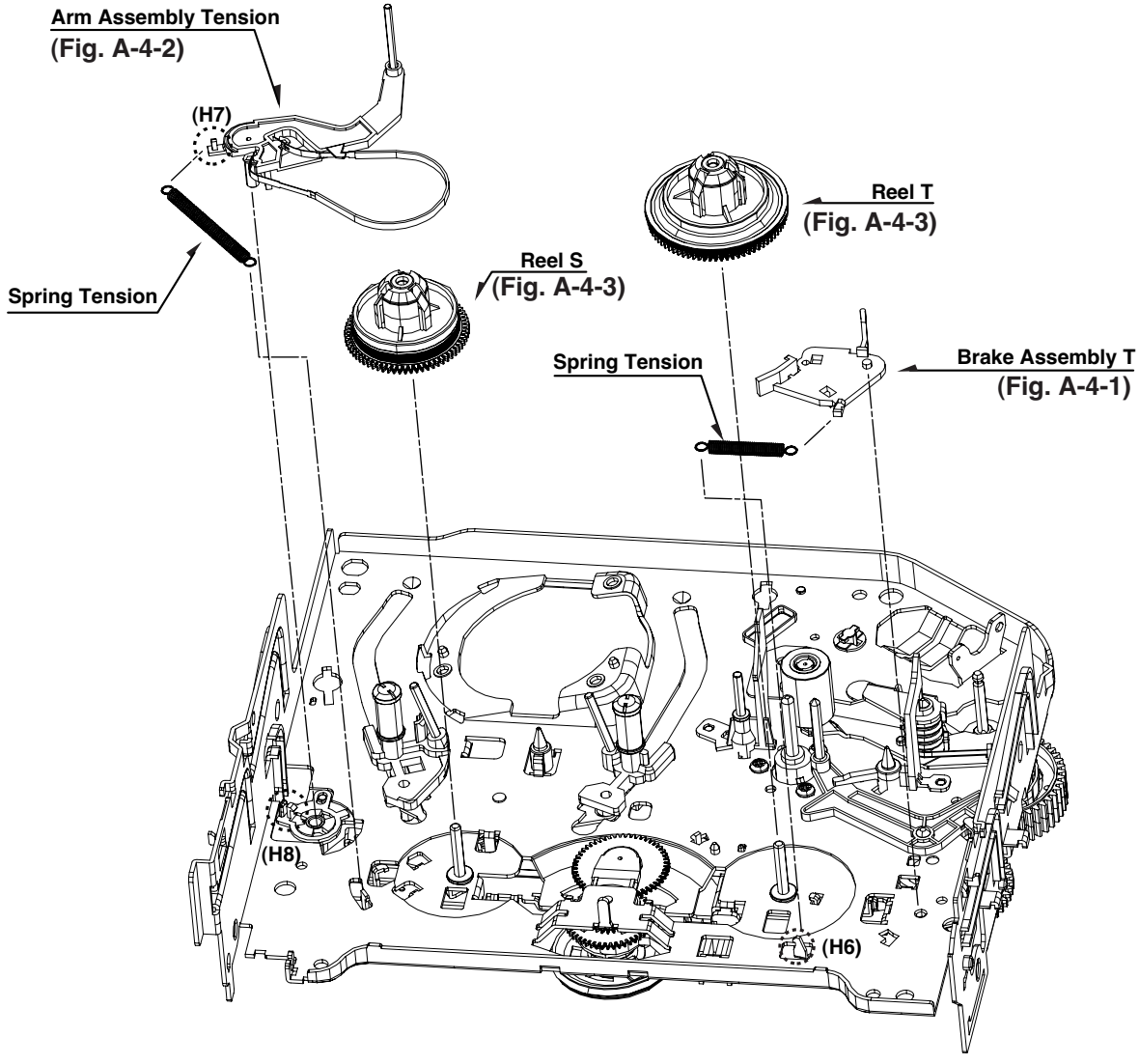


Fig. A-4

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)

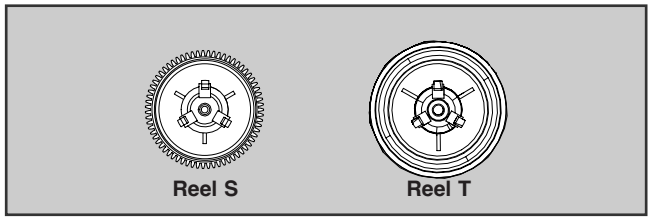
1) Release the spring tension the hook (H7) from the arm assembly tension.
2) After releasing the hook (H8) of the base tension, separate it while holding it up.

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

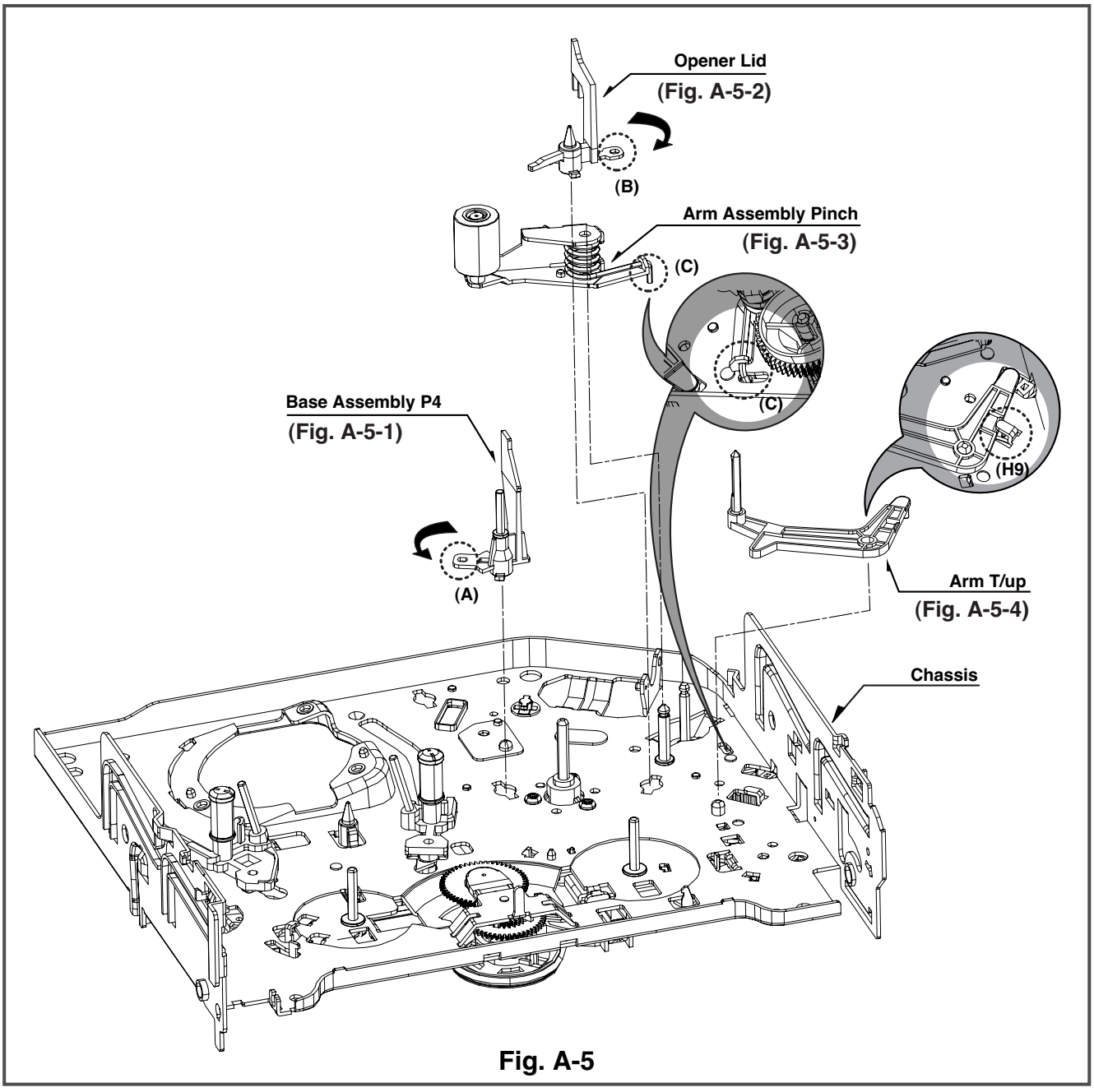


Fig. A-5

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

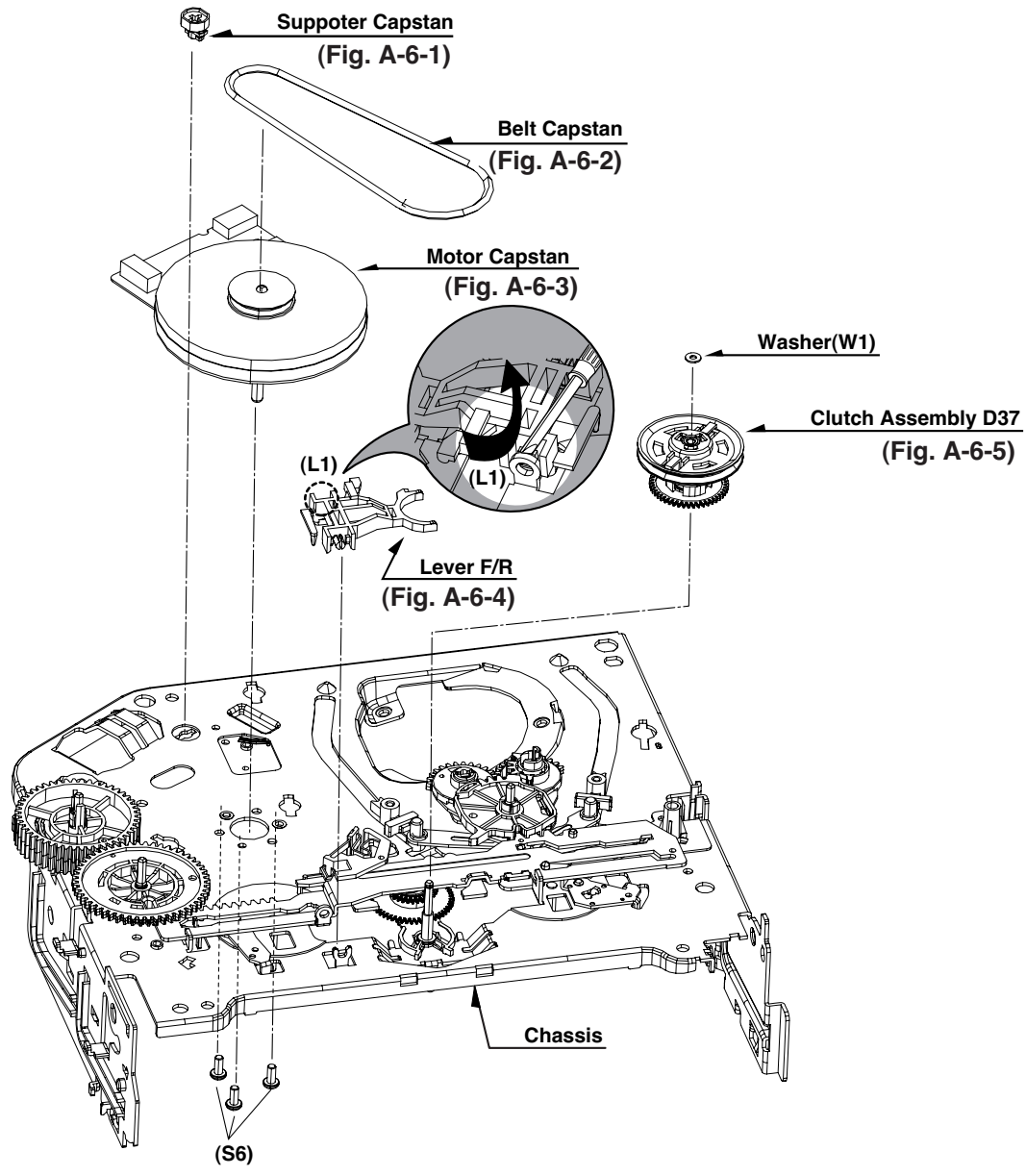


Fig. A-6

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

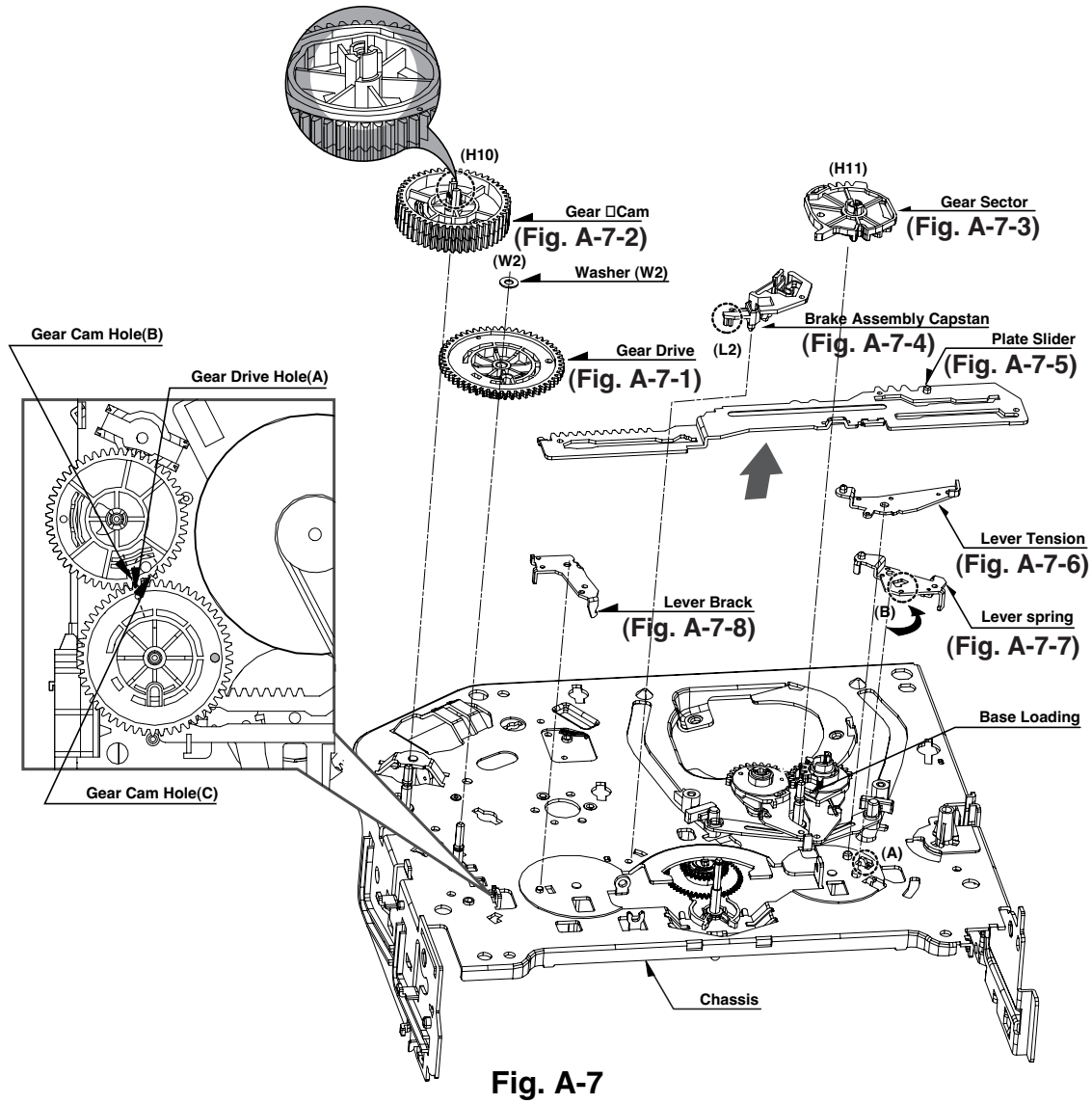


Fig. A-7

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

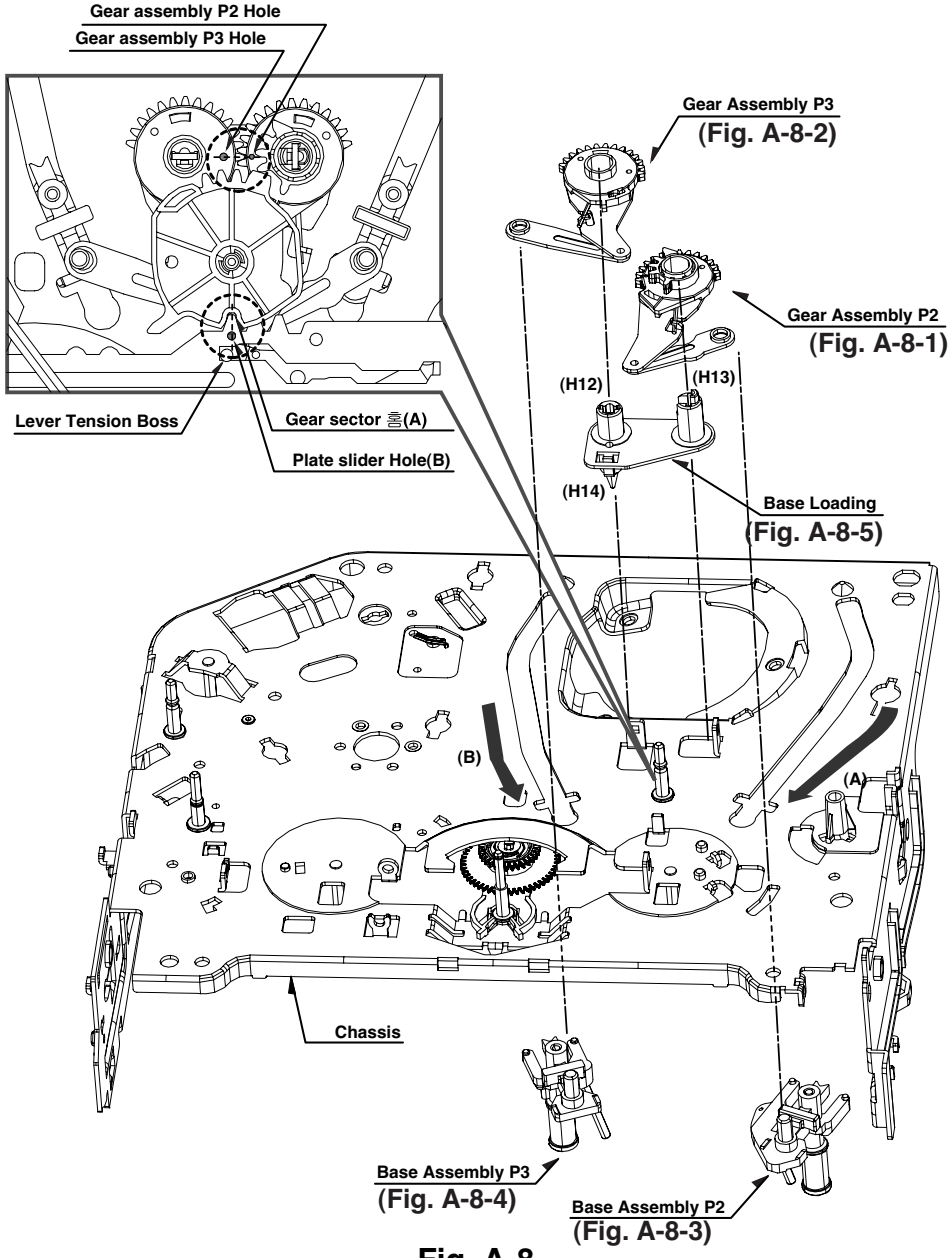


Fig. A-8

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.

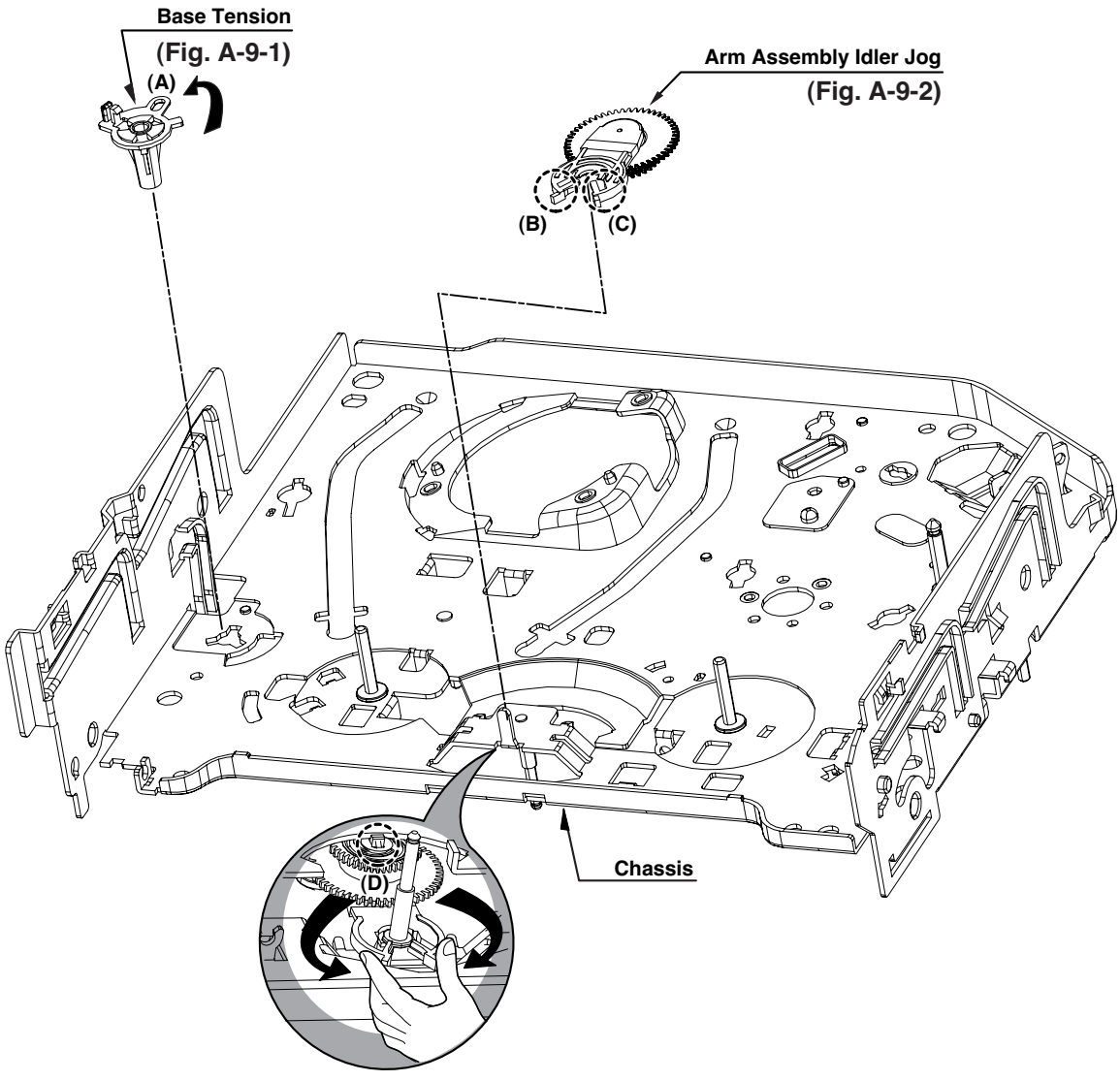


Fig. A-9

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)

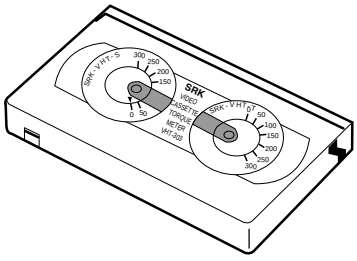
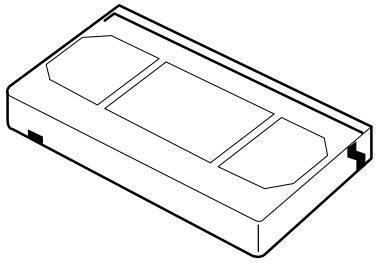
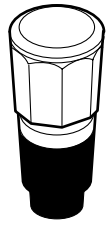
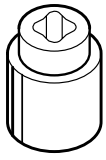
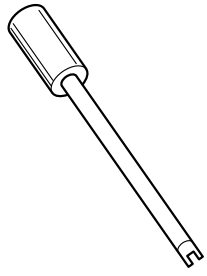
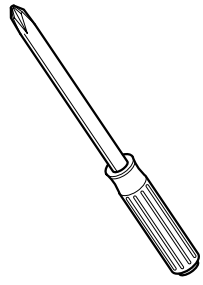
1) Push both (B), (C) parts in Fig. A-9-2 toward the arrow direction.
2) Disassemble the arm assembly idler upward.

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

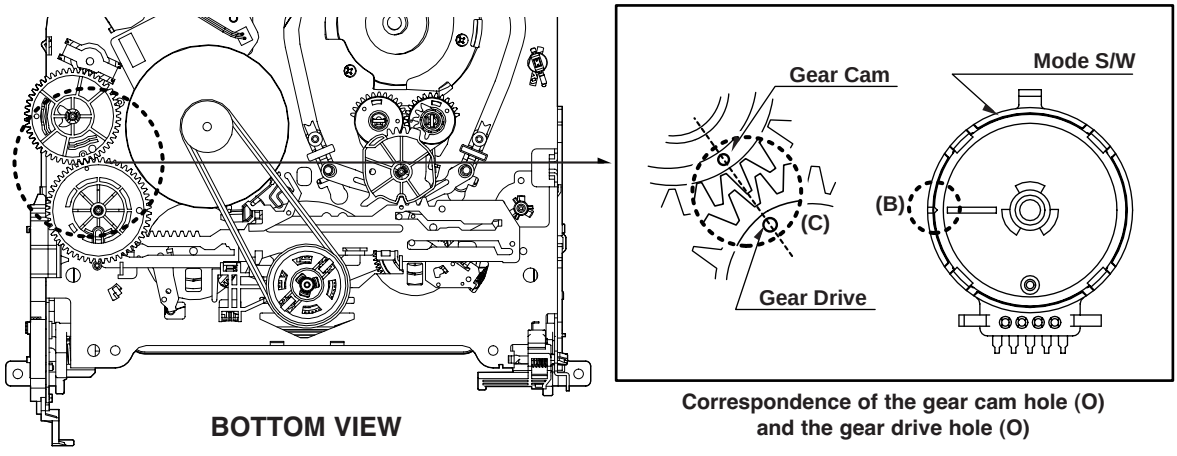


Fig. C-1

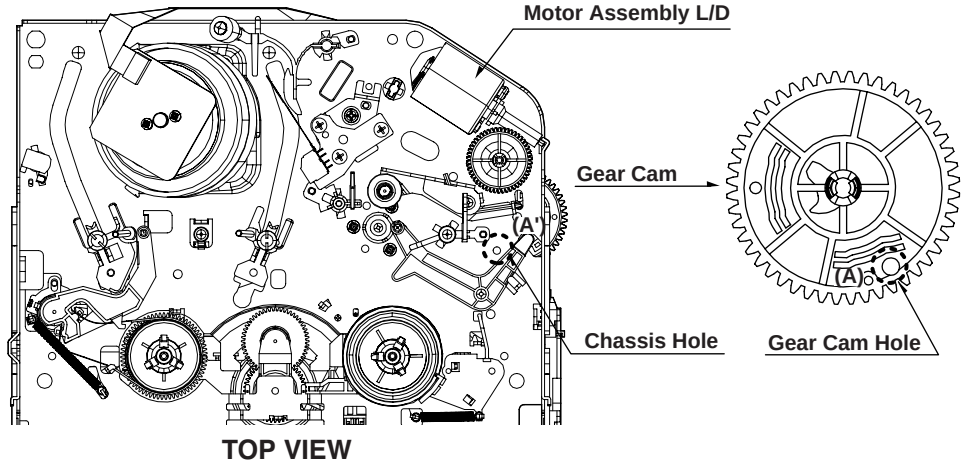


Fig. C-2

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)

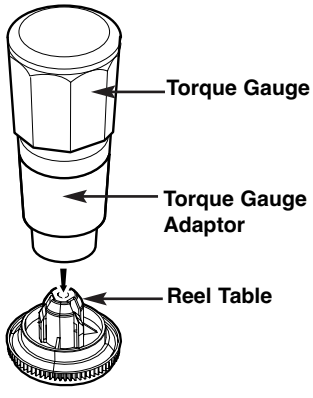


Fig. C-3-1

• Cassette Torque Meter (SRK-VHT-303)

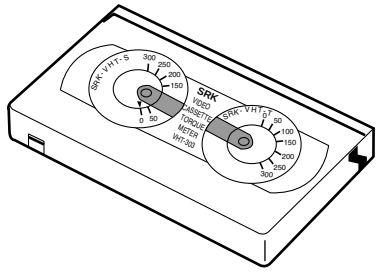


Fig. C-3-2

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

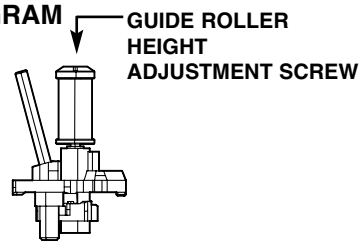


Fig. C-4-1

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

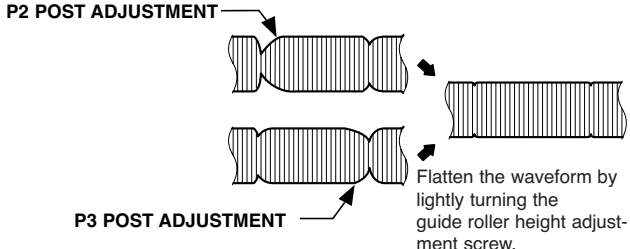


Fig. C-4-2

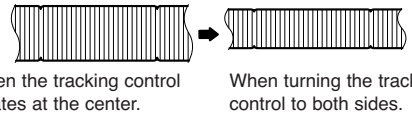
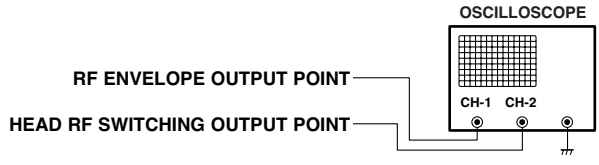


Fig. C-4-2

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)

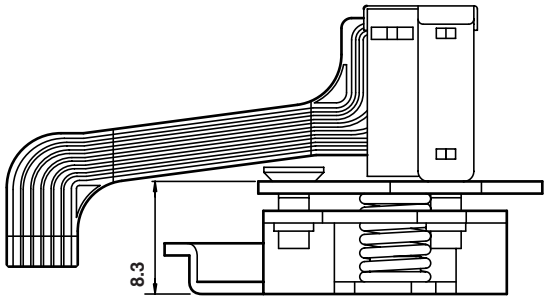
Fixtures and tools used	VCR (VCP) status	Adjustment position
• Blank Tape (Empty Tape) • Driver (+) Type ø 5	• Play the blank tape (empty tape).	• Tilt adjusting screw (C) • Height adjusting screw (B) • Azimuth adjusting screw (A)

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

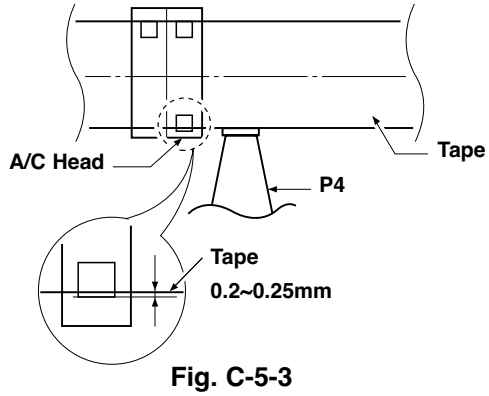
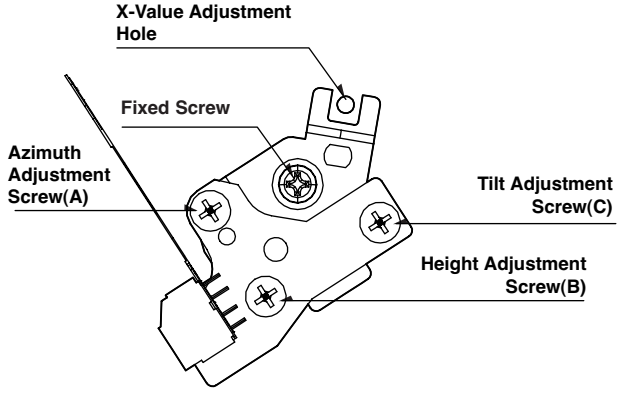


Fig. C-5-3



A/C Head Assembly

Fig. C-5-2

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).

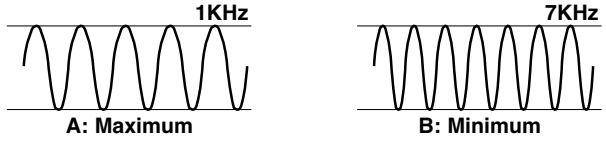
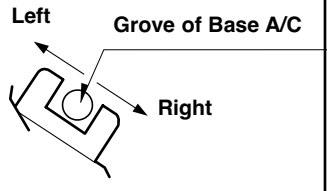


Fig. C-5-4

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

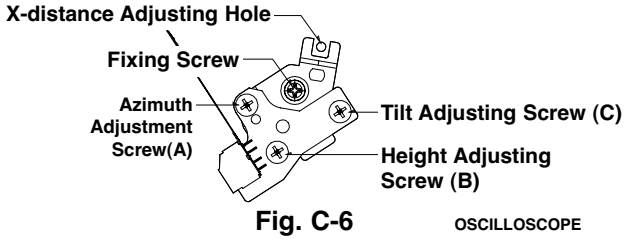
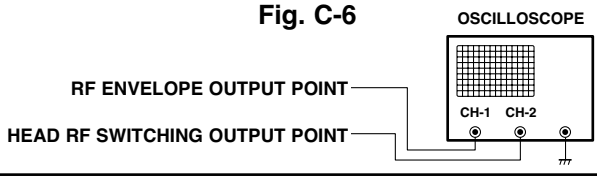


Fig. C-6



DECK MECHANISM ADJUSTMENT

7. Adjustment after Drum Assembly (Video Heads)

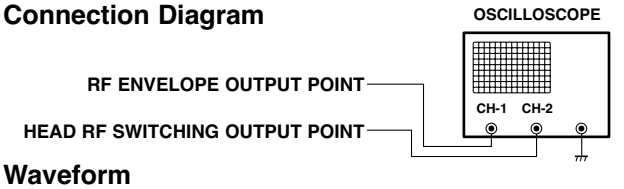
Purpose of adjustment : To adjust and stabilize the height change, X-distance change, etc depending on the guide roller after assembling the drum.

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

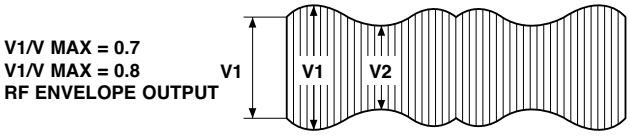
Checking/Adjustment Procedure

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.

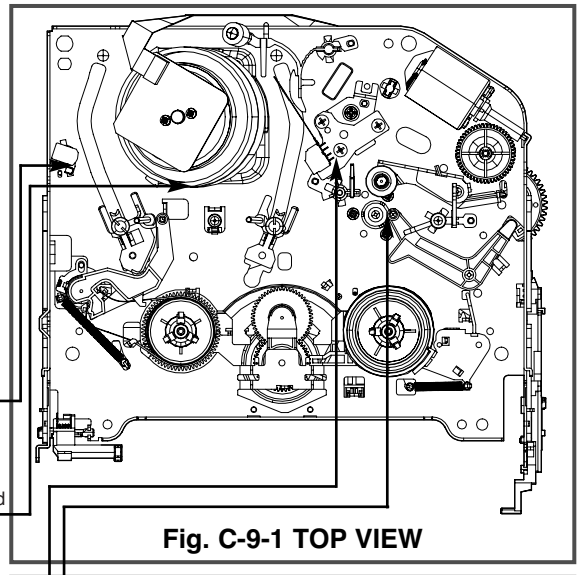


Fig. C-9-1 TOP VIEW

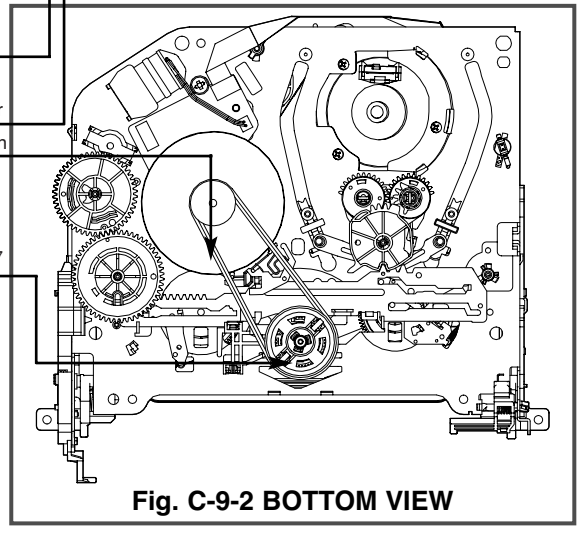


Fig. C-9-2 BOTTOM VIEW

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

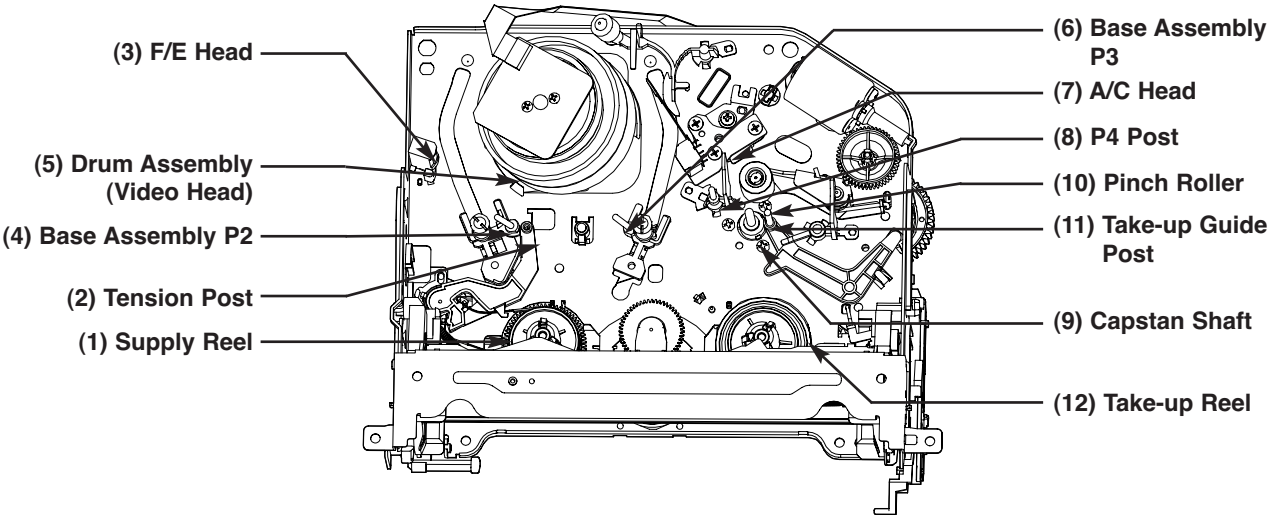


Fig. C-9-3 Tape Transport System

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.

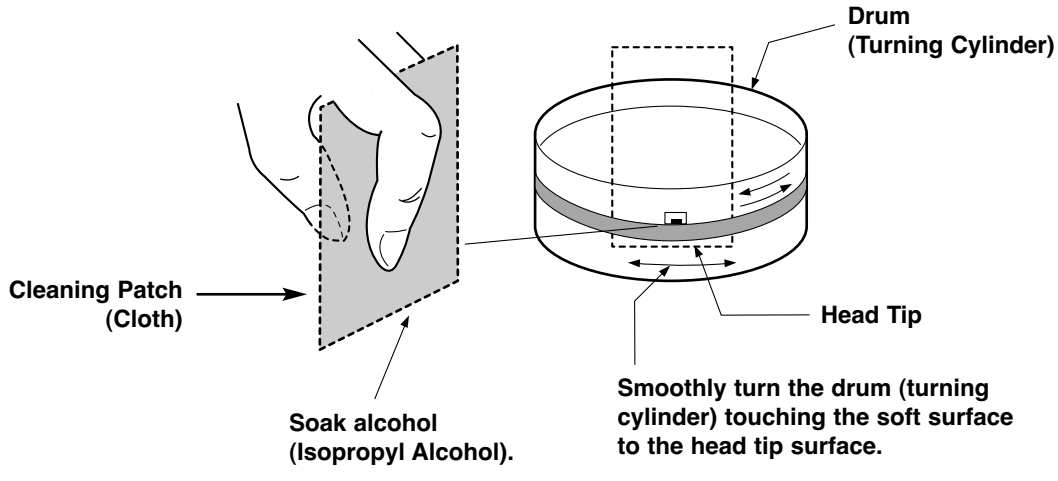


Fig. C-9-4

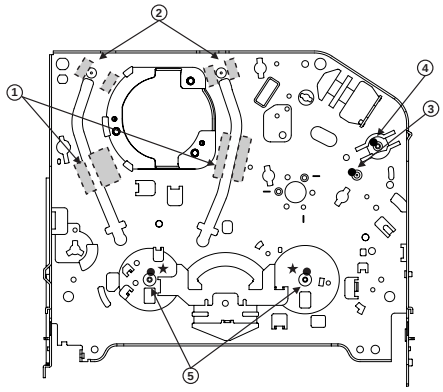
5-2) Grease Applications

(1) Grease Application Method

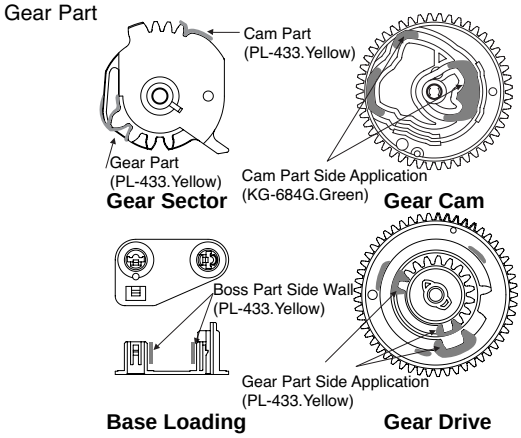
Apply grease by using a cloth swab or brush. Care must be exercised so that excess quantity should not be used. If the excessive quantity is applied, wipe it with the gauze soaked in alcohol (Isopropyl Alcohol).

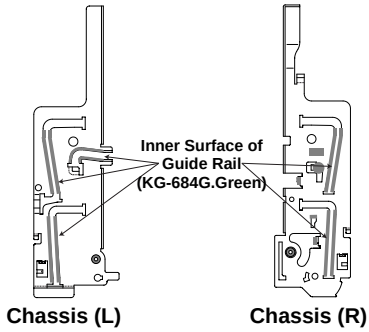
NOTE: POSITION OF GREASE APPLICATION

(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)

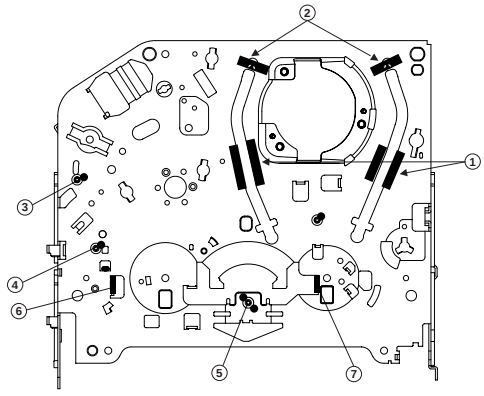




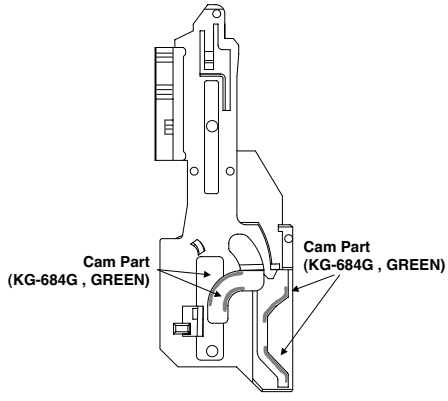
(2) Regular Grease Application

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

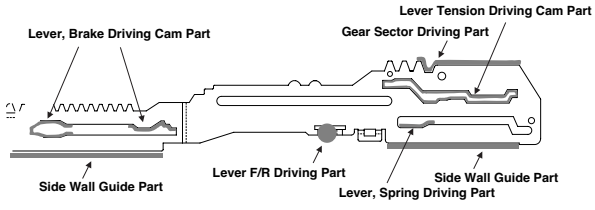
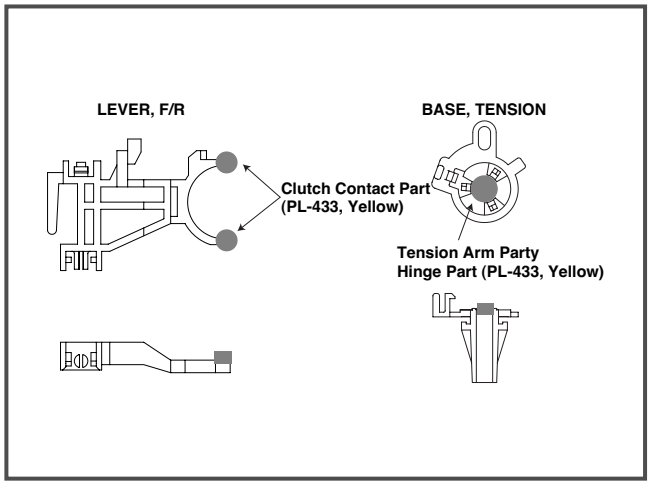
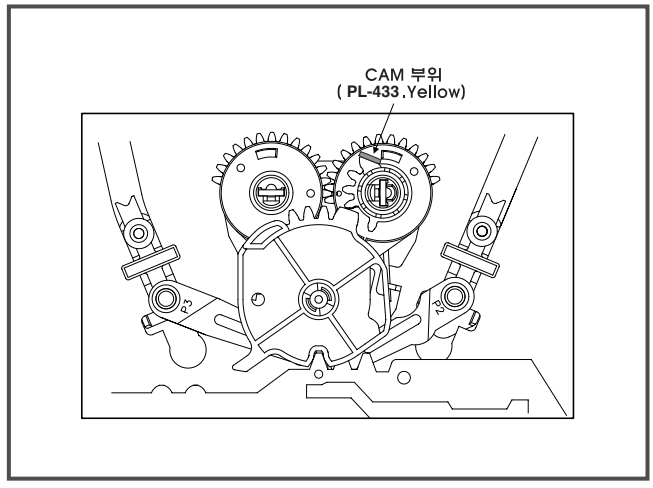


Plate Slider

Lever, F/R, Base, Tension

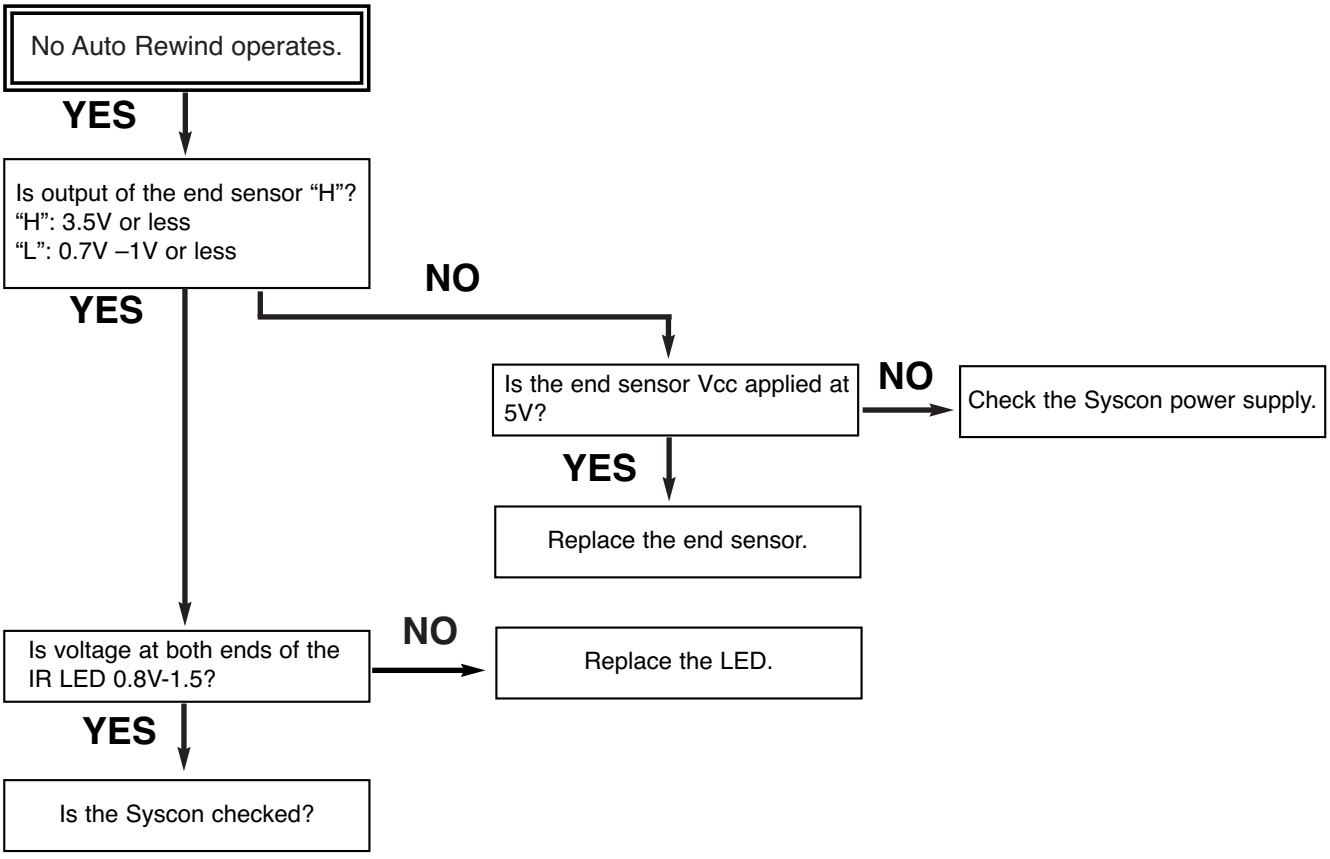


GEAR AY, P2 & P3

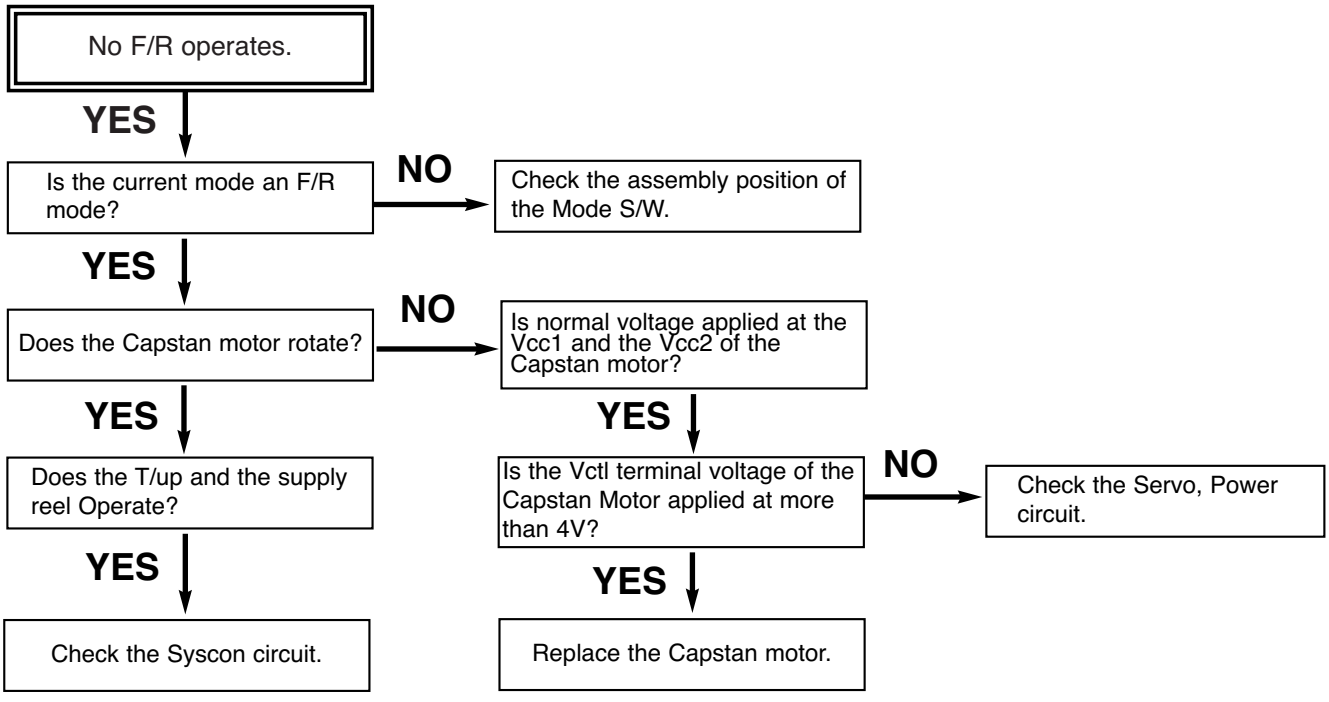


1.Deck Mechanism

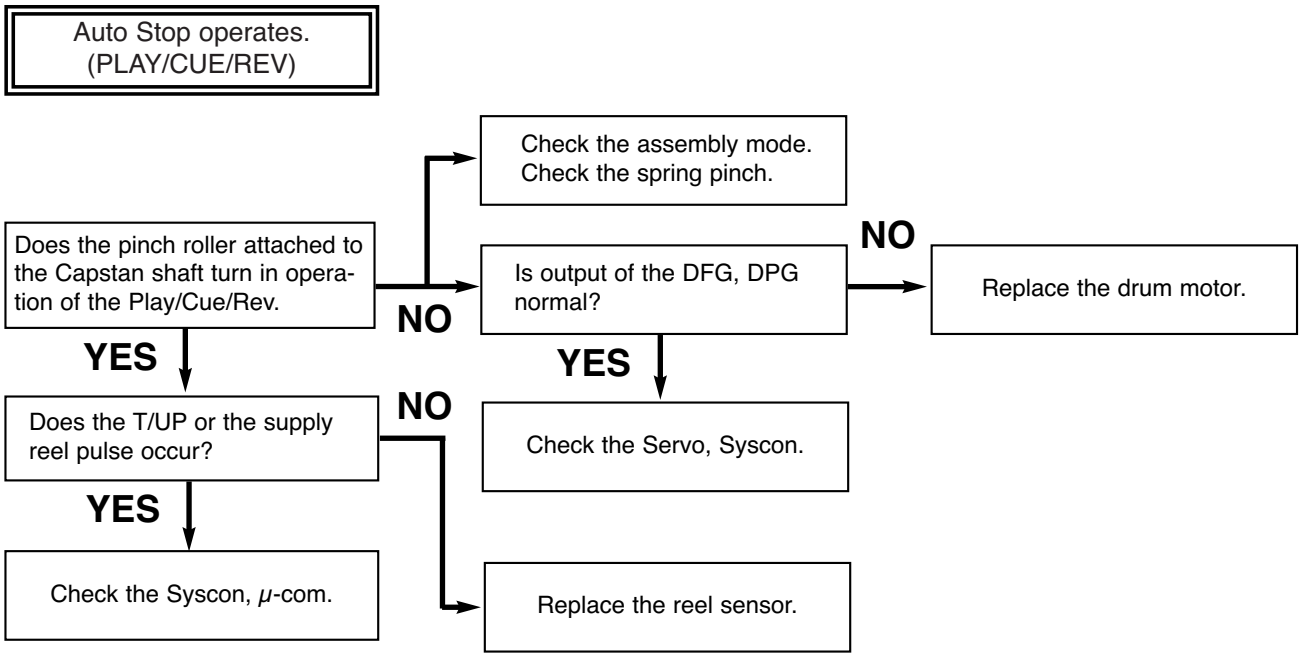
A.



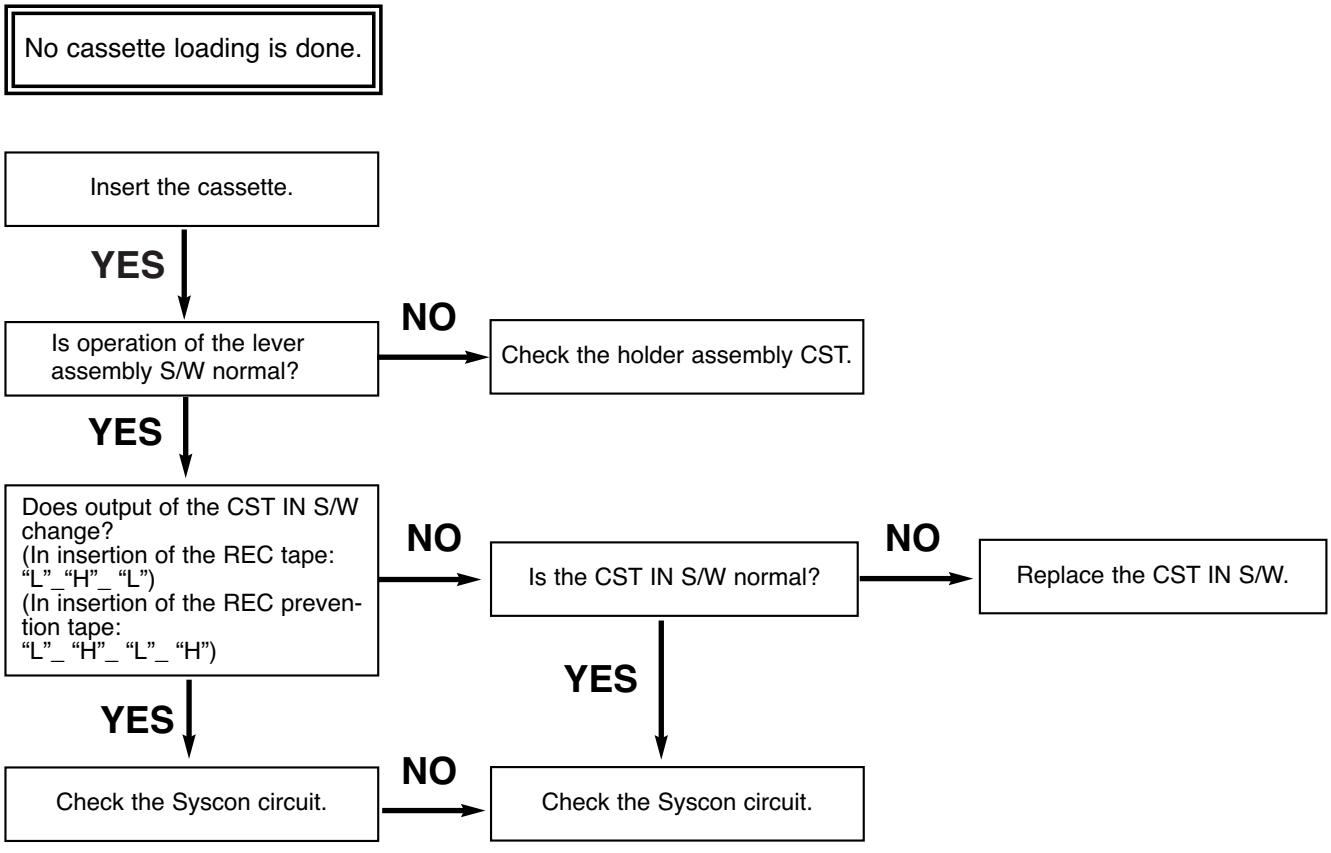
B.



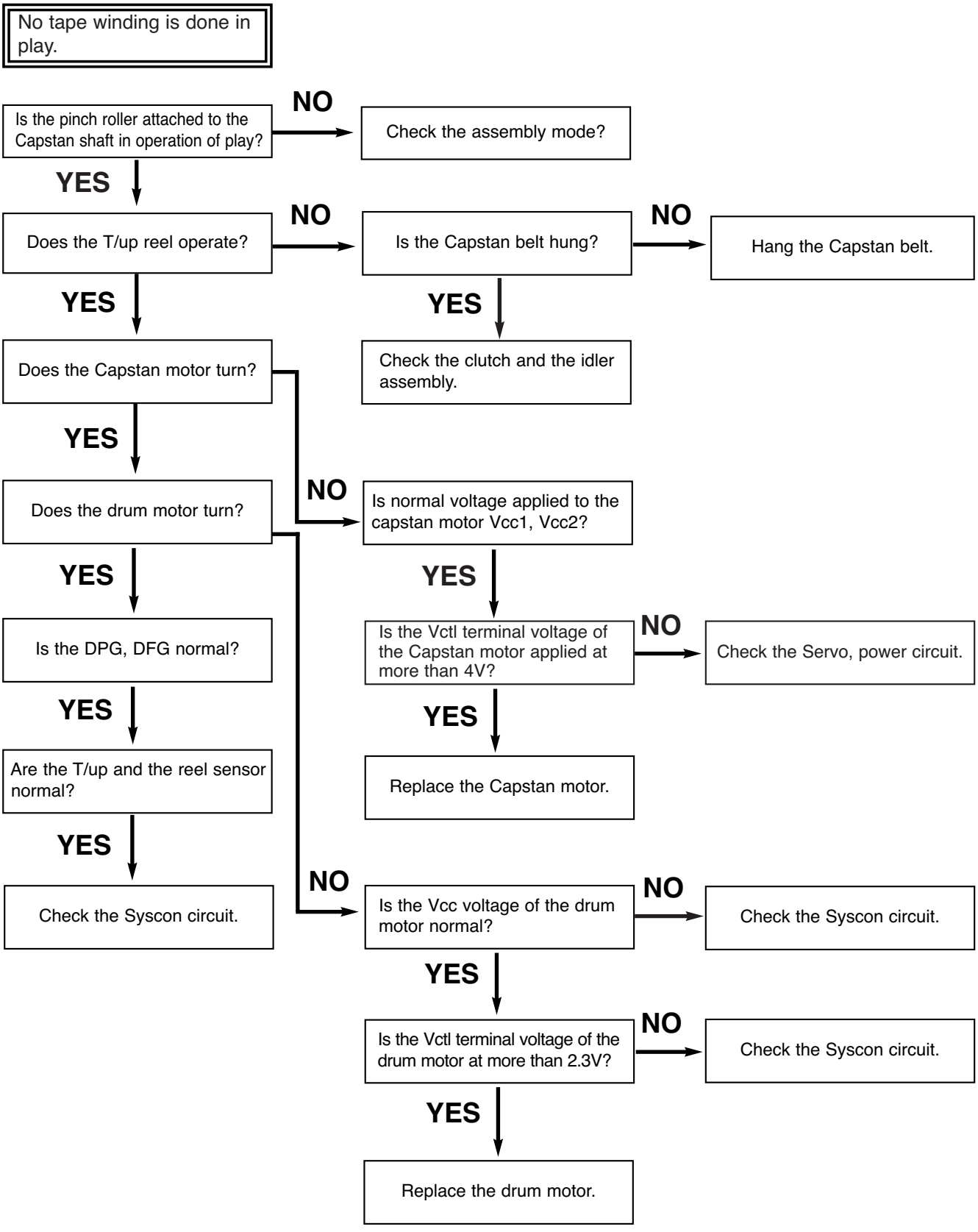
C.


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.

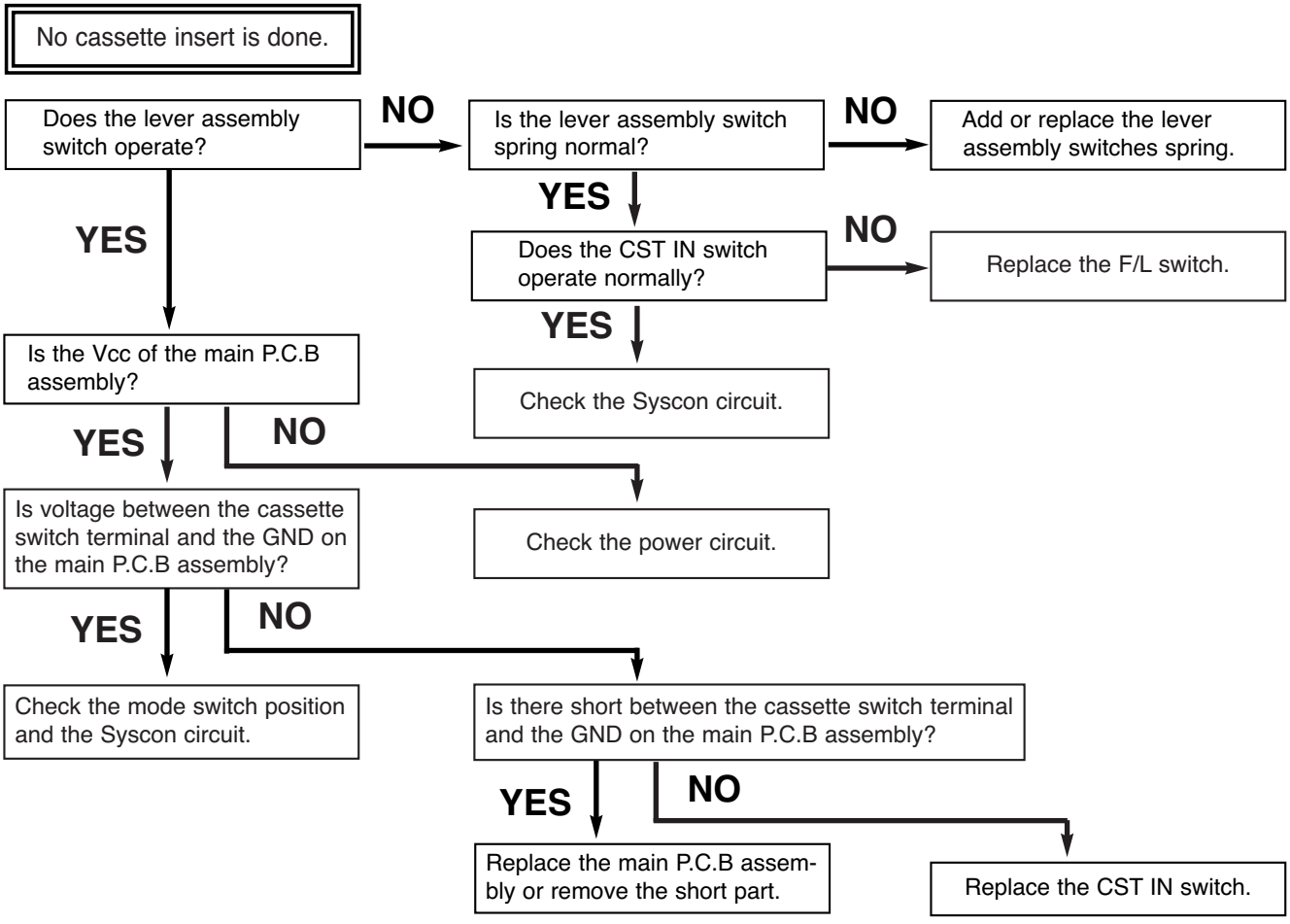

No cassette loading is done.
Insert the cassette.
YES
Is operation of the lever assembly S/W normal?
NO
Check the holder assembly CST.
YES
Does output of the CST IN S/W change?
(In insertion of the REC tape:
"L"_"H"_"L")
(In insertion of the REC prevention tape:
"L"_"H"_"L"_"H")
NO
Is the CST IN S/W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

E.

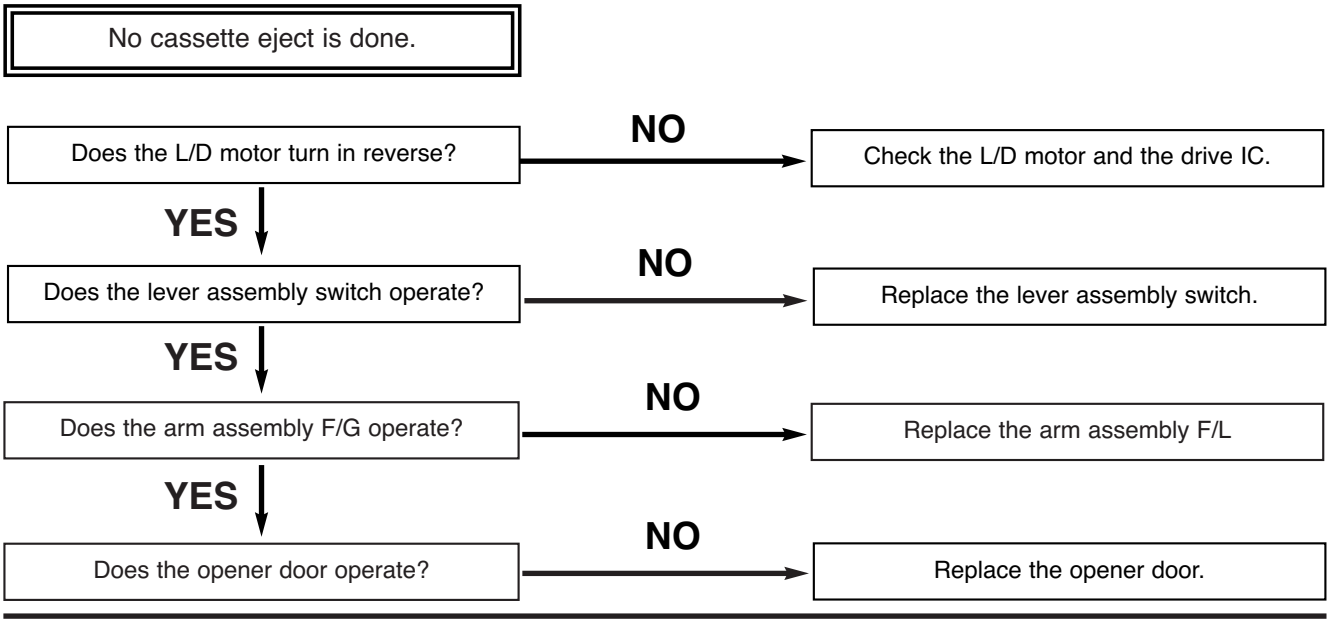

No tape winding is done in play.
Is the pinch roller attached to the Capstan shaft in operation of play?
NO
Check the assembly mode?
YES
Does the T/up reel operate?
NO
Is the Capstan belt hung?
NO
Hang the Capstan belt.
YES
YES
Check the clutch and the idler assembly.
Does the Capstan motor turn?
YES
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

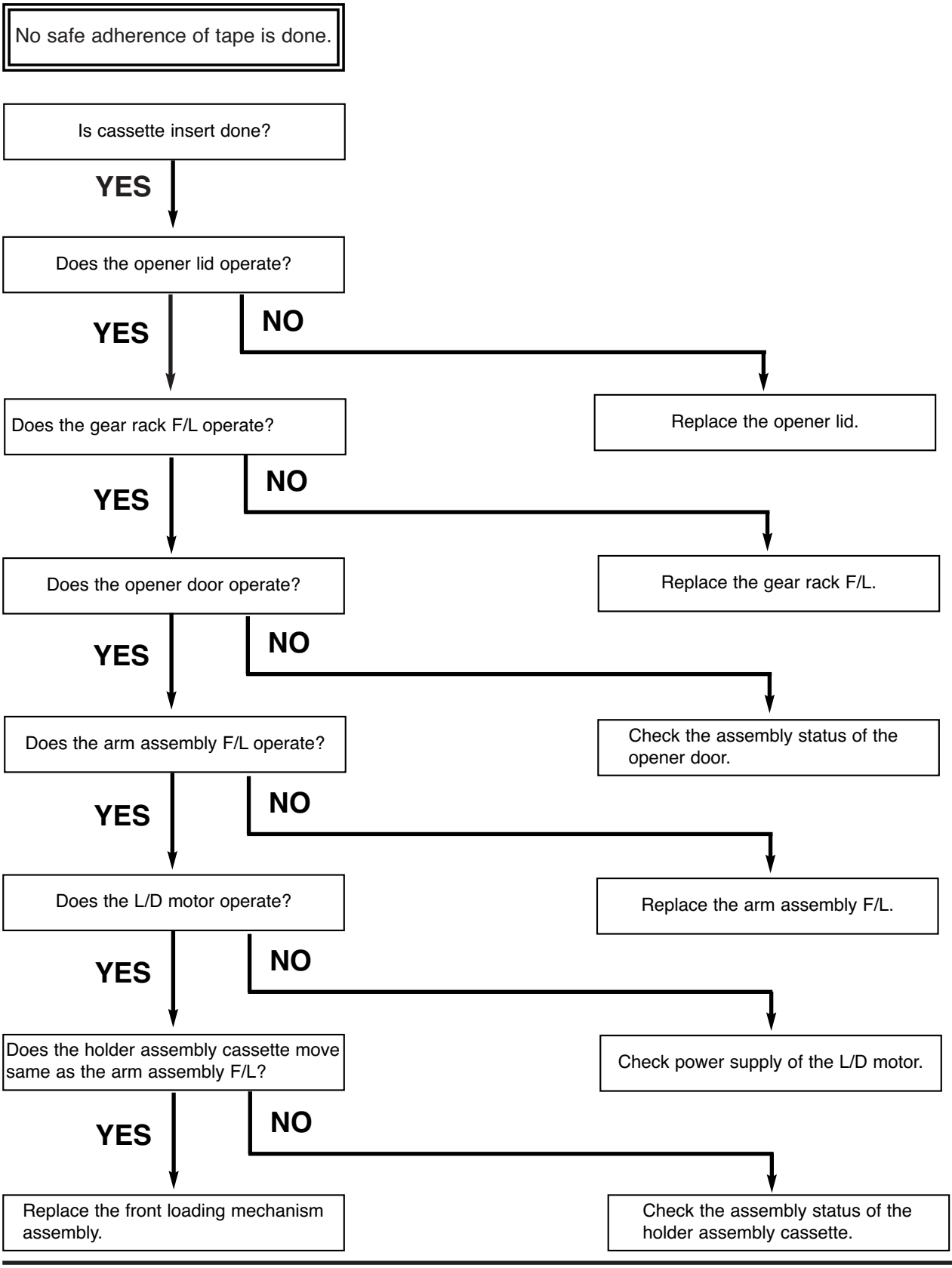
A.



B.

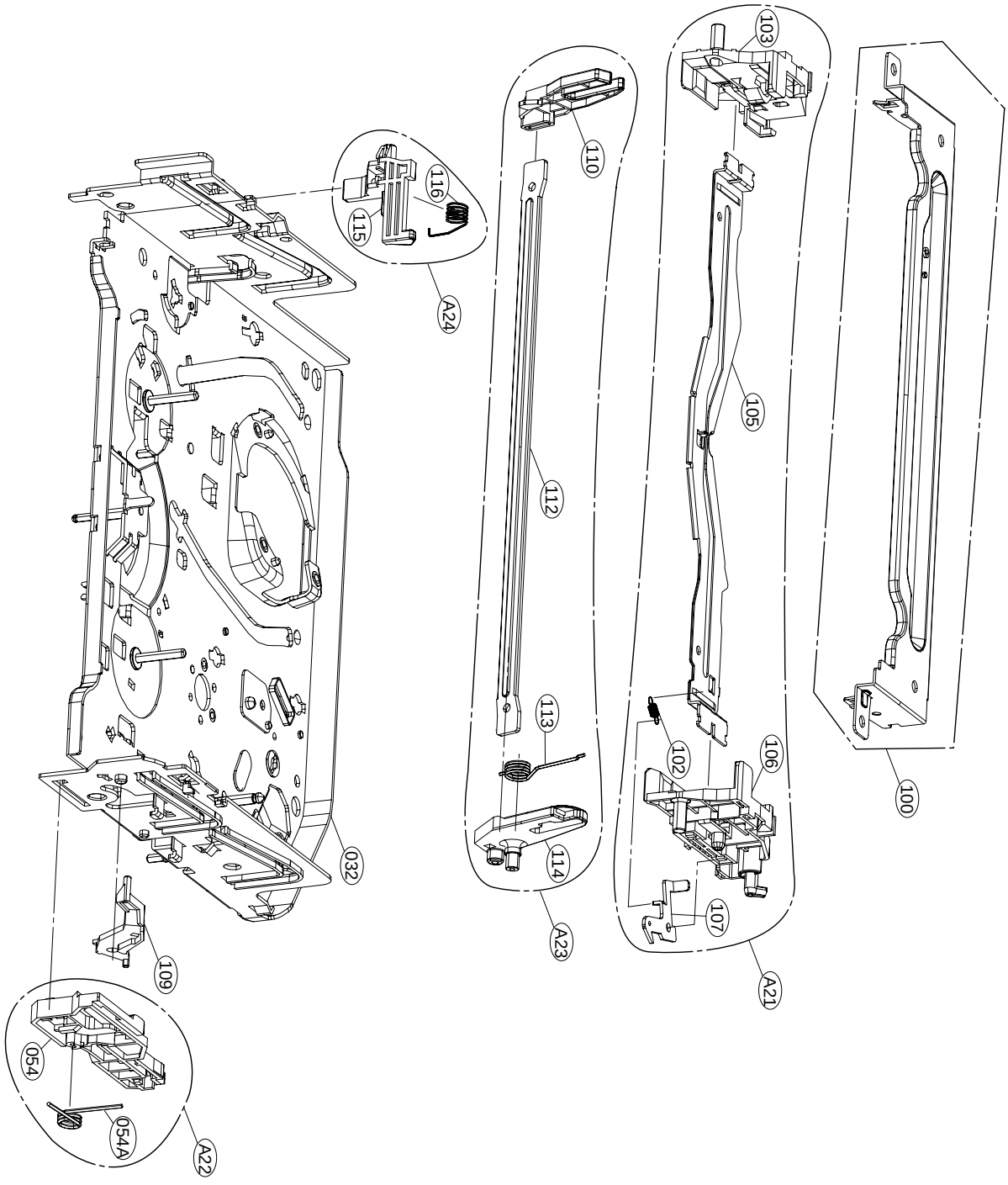


C.


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.

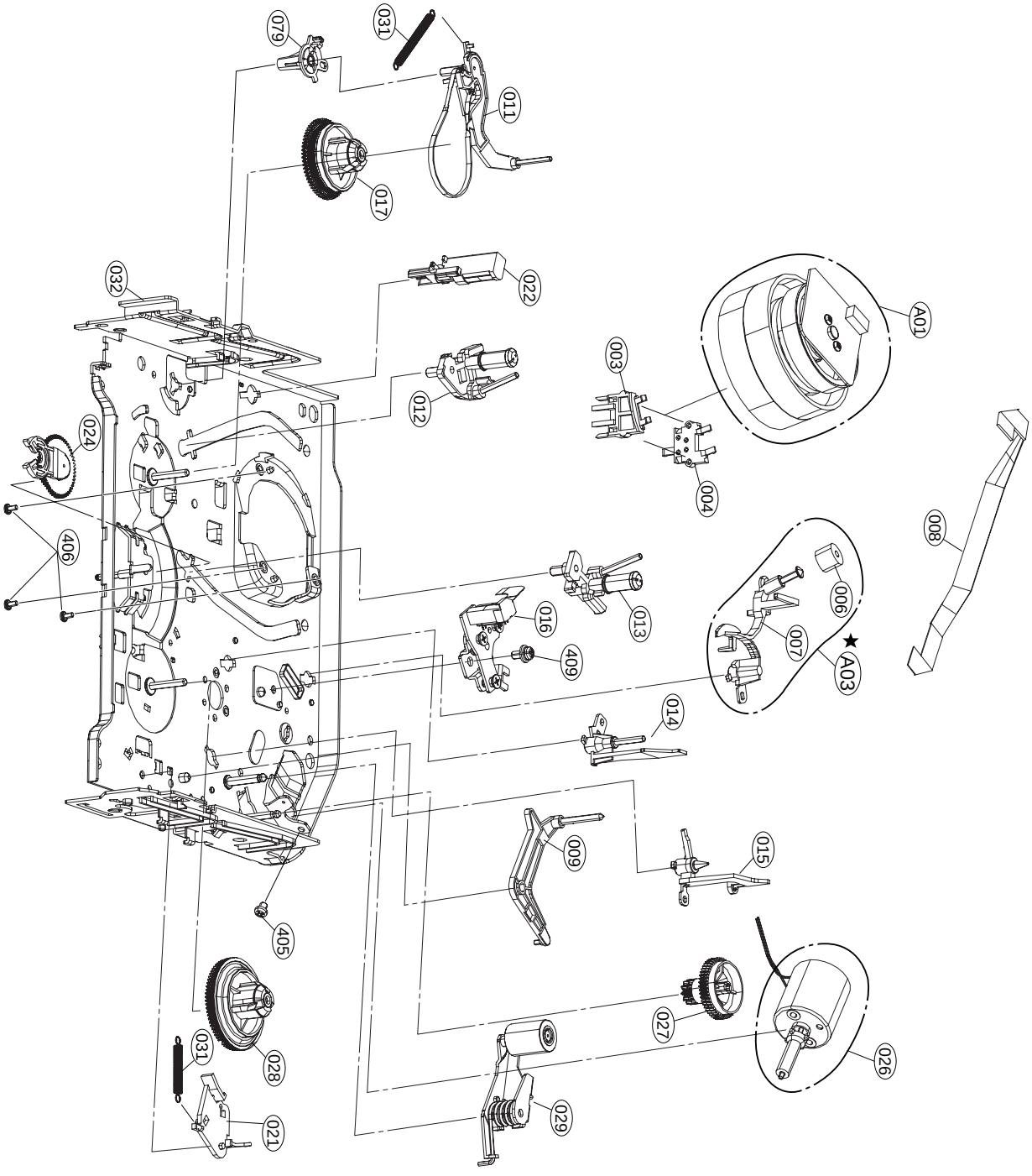
EXPLODED VIEWS

1. Front Loading Mechanism Section

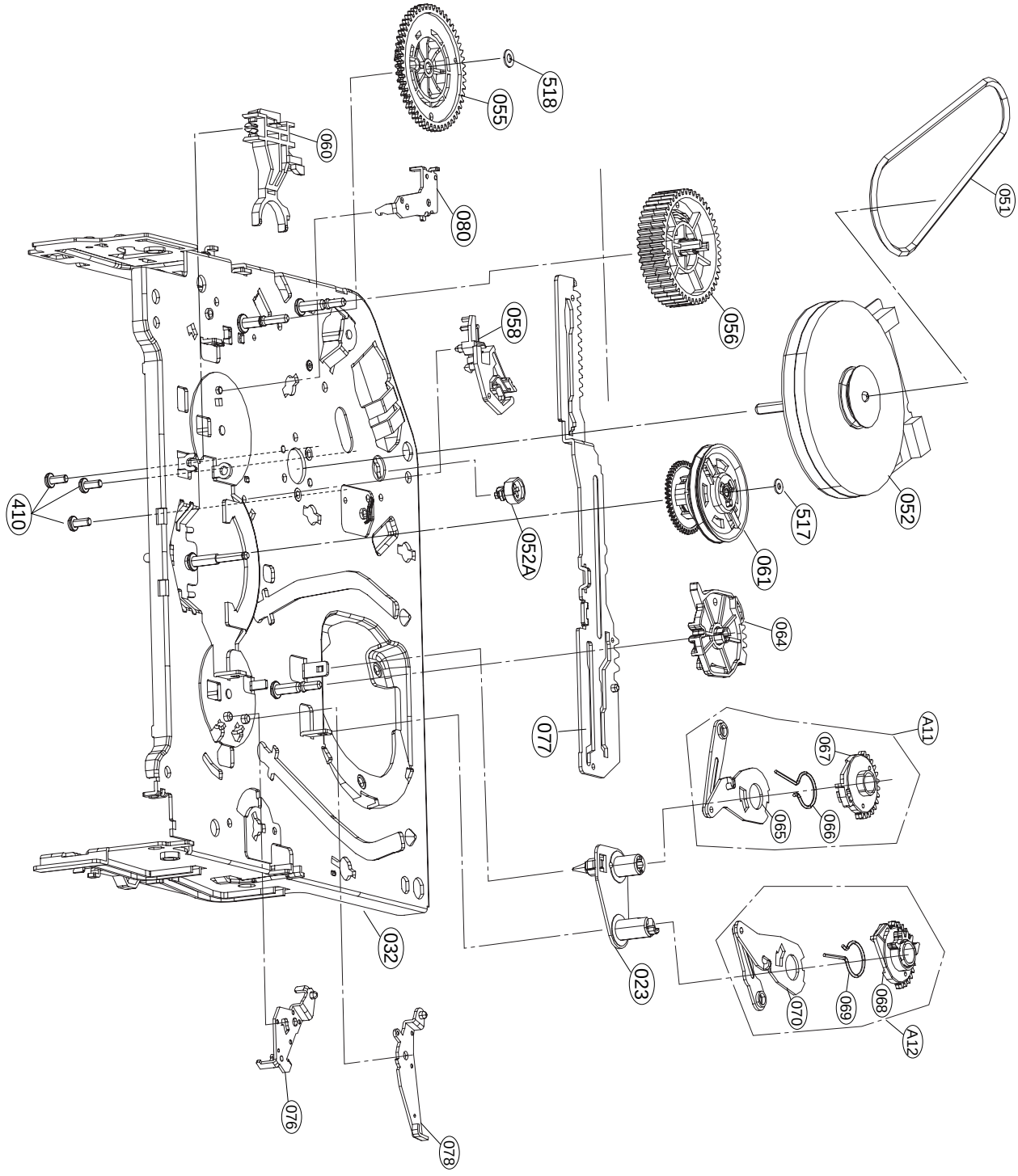


2. Moving Mechanism Section (1)

★ OPTIONAL PART



3. Moving Mechanism Section (2)



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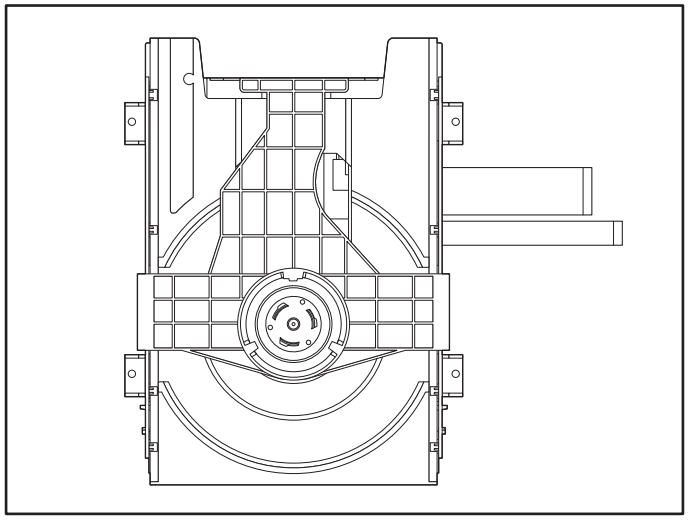
SECTION 5 MECHANISM OF DVD PART (DP-9C Zoran Chip)

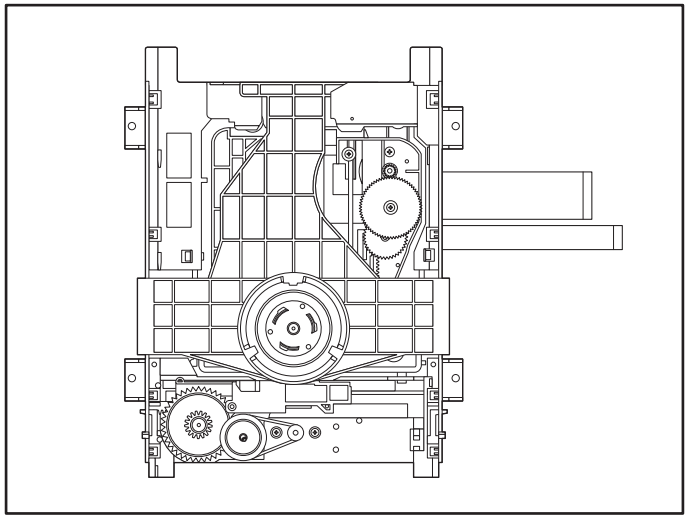
CONTENTS

DECK MECHANISM PARTS LOCATION

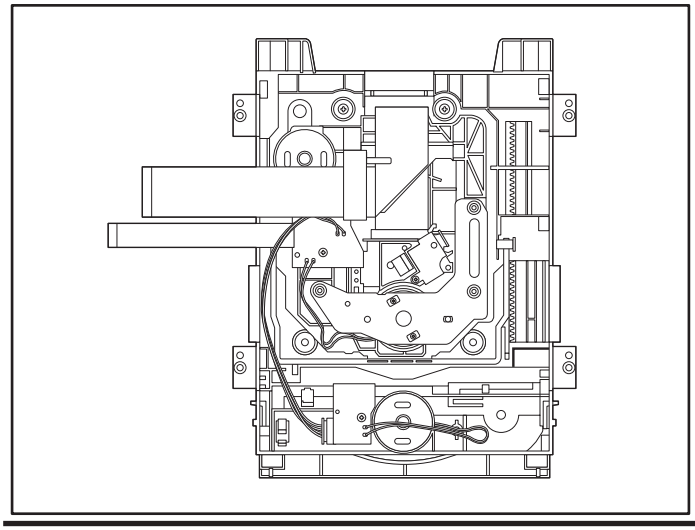
• Top View (With Tray)



• Top View (Without Tray)



• Bottom View



Procedure Starting No.		Parts	Fixing Type	Disassembly	Figure
	1	Main Base			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			5-3
1, 2, 6	8	Gear Feed	4 Screws, 1 Connector 1 Locking Tabs		5-3
1, 2, 6, 8	9	Gear Middle			5-3
1, 2, 6, 8, 9	10	Gear 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	2 Locking Tabs		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

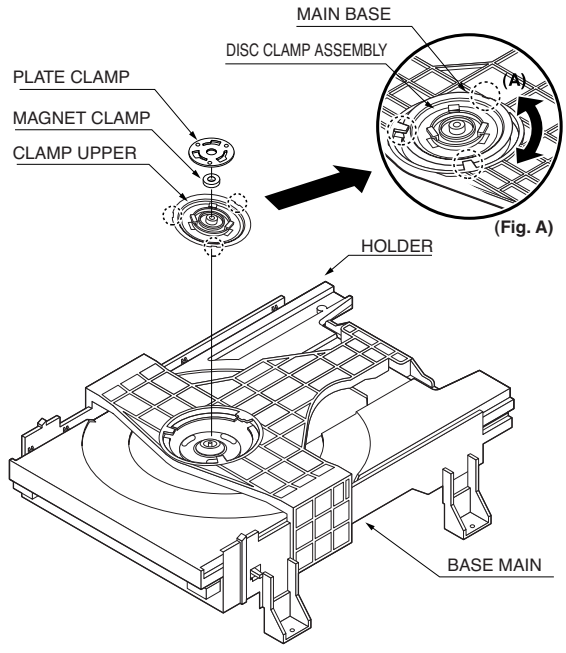


Fig. 5-1

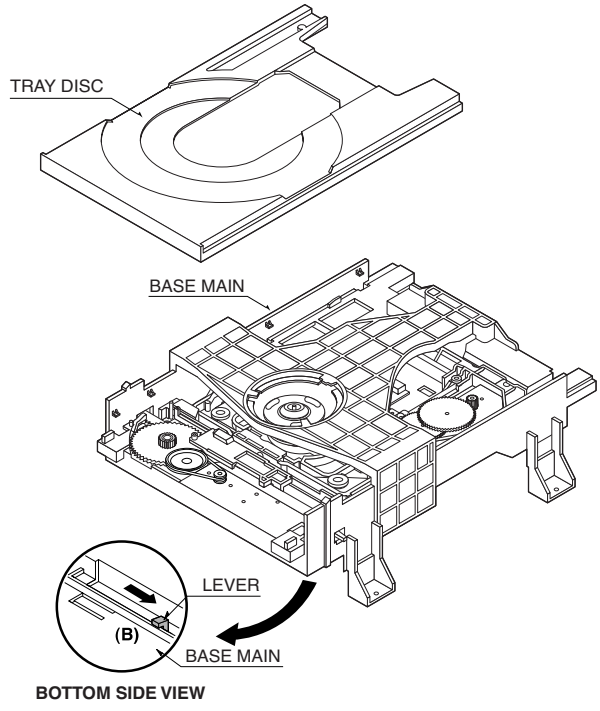


Fig. 5-2

1. Main Base (Fig. 5-1)

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

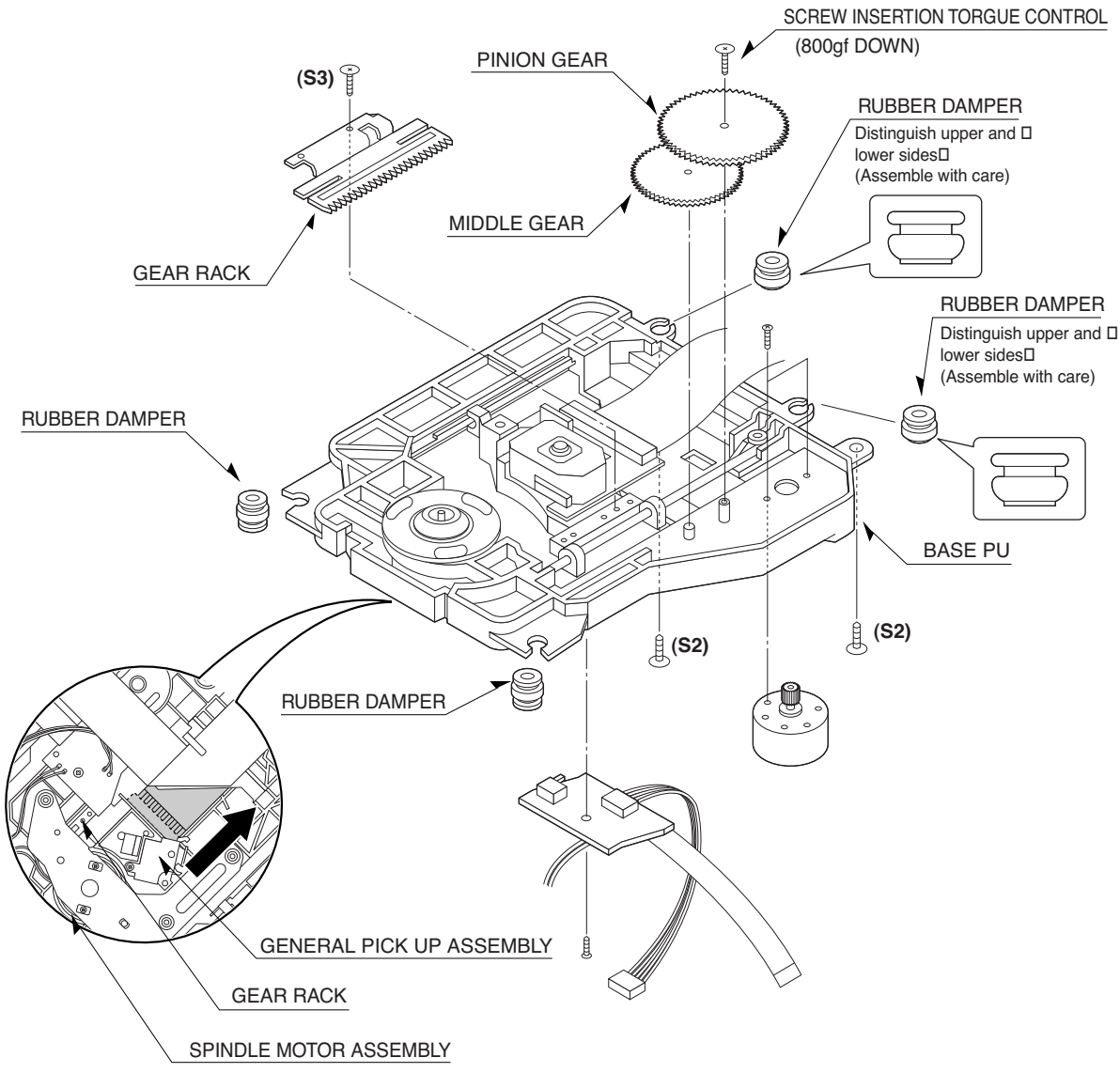


Fig. 5-3

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

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

3-1. Gear Feed

3-2. Gear Middle

3-3. Gear Rack

1) Release the Scerw(S3)

4. Rubber Rear (Fig. 5-3)

DECK MECHANISM DISASSEMBLY

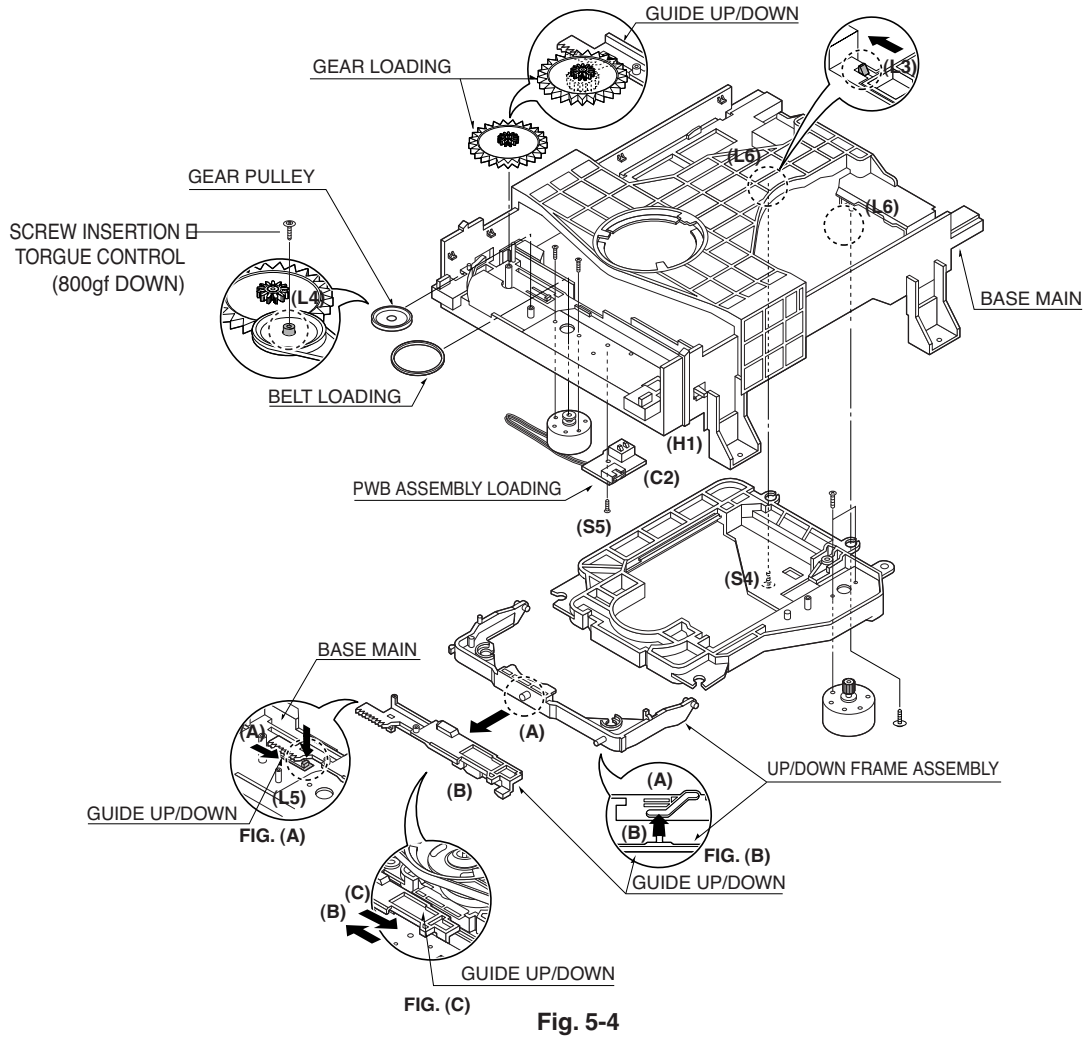


Fig. 5-4

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 1 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)

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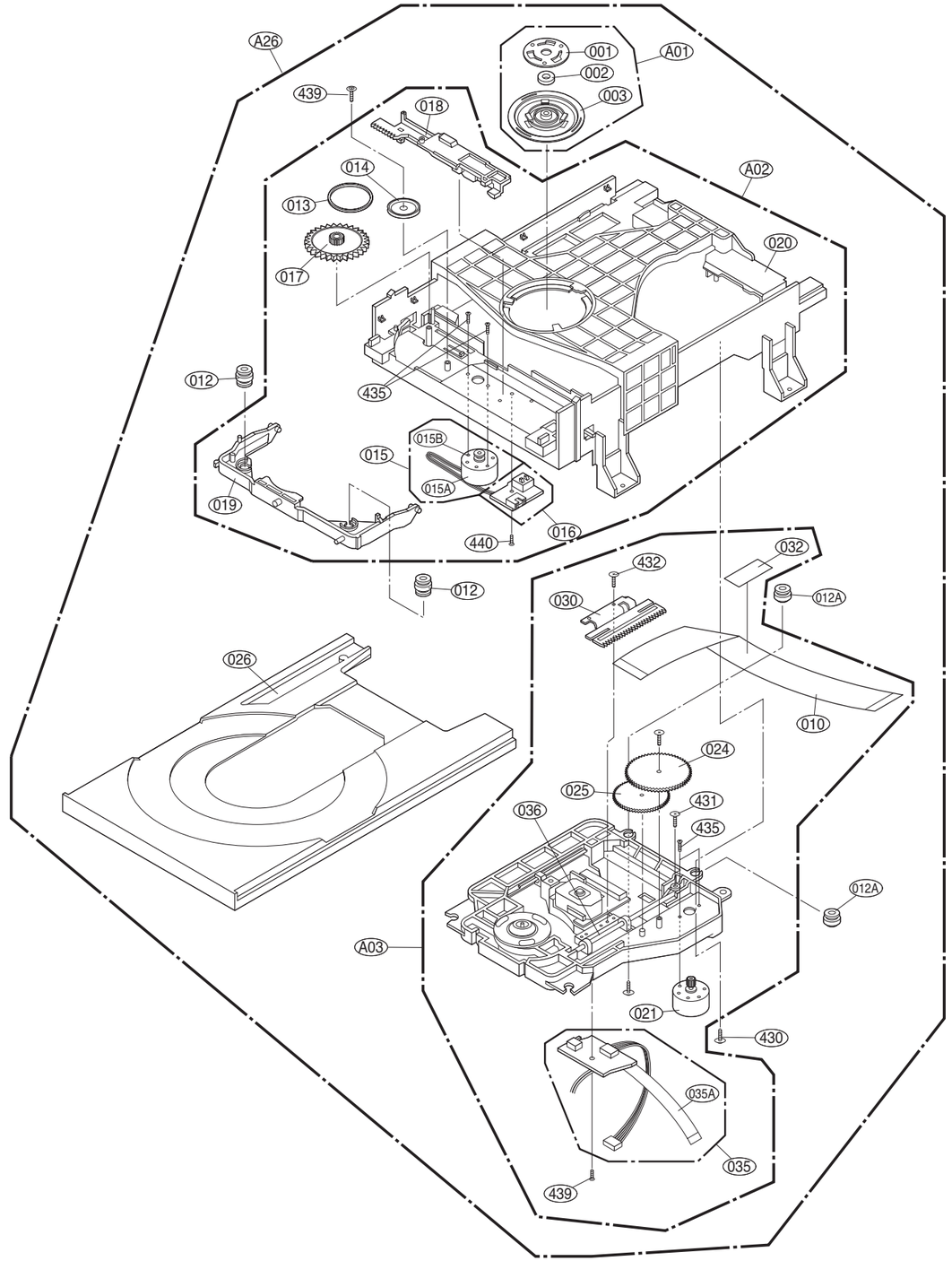
EXPLODED VIEWS

1. Deck Mechanism Exploded View



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LDX-514
DVD/VCR 1080i Up-Conversion

1080i Video Output A special video processing circuit upconverts DVD's to high-definition 1080i (more than a thousand lines of horizontal resolution) via HDMI output for use with compatible televisions.

Super Slim Design Stands only 3.1" high for convenient addition to existing home theater configurations.

- Multi Format Disc Playability: DVD Video/DVD±R/DVD±RW/ Audio CD/CD-R/CD-RW
- 4 Head Hi-Fi Stereo VCR
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- WMA/JPEG/MP3 CD Playback
- Single Cable HDMI with 1080i Upconversion
- 7-in-2 Memory Card Slot

Life's Good

LDX-514
DVD/VCR 1080i Up-Conversion

Disc Playback Capability

Disc Capacity	1
DVD (NTSC + PAL)	•
CD-R/RW	•
MP3 Audio	•
DVD-R	•
DVD-RW	•
DVD+R	•
DVD+RW	•
SVCD	•
VCD	•
WMA Audio	•
JPEG Photo	•
Music Photo Album	•
DivX A/V	•

Memory Card Capability

SD (Secure Digital)	•
MMC (Multi-Media Card)	•
CF (Compact Flash)	•
MD (Micro Drive)	•
MS (Memory Stick)	•
MS Pro (Memory Stick Pro)	•
xD-Picture	•

Memory Card Files Supported

JPEG Photo	•
WMA Audio	•
MP3 Audio	•

Tuner

Video Tuner Type	NTSC

Graphic User Interface

Set up	•
Playback	•
Language	English/Spanish/Portuguese

Video Capabilities

Digital/Analog Converter	27Mhz/10bit
Progressive Scan Output	•
1080i Upconversion	•

Audio Capabilities

Digital/Analog Conversion	96KHz/24bit
Signal/Noise Ratio	110db
DTS Decoding	•
Dolby Digital 5.1 ch Decoding	•
Dolby Digital 2 ch Down Mix	•
3D Surround Sound	•

DVD Playback Features

Zoom	•
Bookmark Search	•
Closed Caption	•
Resume	•
Parental Lock	•
Auto Play	•
Aspect Ratio Selection	•
Black Level Adjustment	•
Chapter Skip (REW/FWD)	•
Smooth Scan and Slow Motion	•
A-B Repeat Play (Looping)	•
Subtitle Still	•
Playback Control On/Off	•
Volume Leveler On/Off	•
1.5X Playback with Audio	•
Repeat Play	•
Search/Slow/Step Skip for Rev & Fwd	•

CD Playback Features

Programmable Play	•
Shuffle Play	•
Repeat Play	•
JPEG Preview	•
MP3 ID3 Tag Support	•

VCR Features

VCR Type	4 Head Hi-Fi
Recording Mode	SP/SLP
SQPB (Super Quasi Playback)	•
Auto Power Off	•
Auto Head Cleaner	•
Counter Reset	•
Return to Zero	•
Just Fit Record	•
Auto Tracking	•
Rewind Time	180+/-10sec.
Still/Slow Motion	•

Front Panel

Composite Video & Audio L/R In	•
Multi Memory Card Slot	7-in-2

Rear Panel/Inputs/Outputs

Optical Digital Audio Out	•
Coaxial Digital Audio Out	•
Composite Video & Audio L/R In	VCR Only
Composite Video & Audio L/R Out	•
S-Video Out	•
RF Antenna In	•
RF Out (DVD/VCR)	•
Component Video Out	•
Audio L/R Out	•
HDMI Out	•

Supplied Accessories

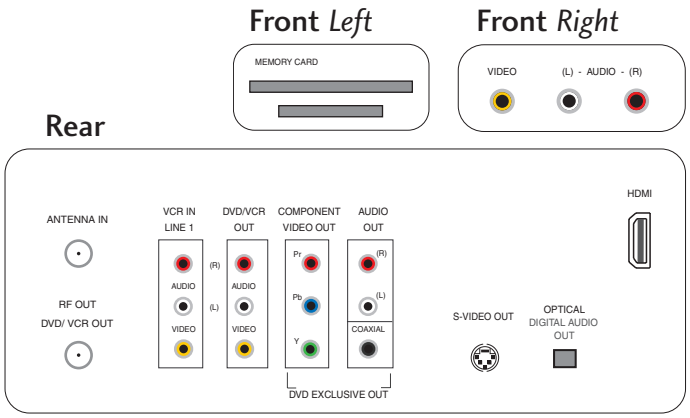
Remote Control Type	Universal
A/V Cable (RCA Type)	•
RF Cable	•
Battery (Size)	2 x AAA

Other Features

Screen Saver Mode	•
Auto Power Off	VCR Only
Display	Fluorescent

Dimensions

Dimensions	
- Width x Height x Depth	16.9" x 3.1" x 10.4"
- Weight Out of Package	9.3lb.
Dimensions with Packaging	
- Width x Height x Depth	20.5" x 6.5" x 14.6"
- Weight In Package	11.7lbs.
UPC	719192168404
Warranty	1 year parts/90 days labor



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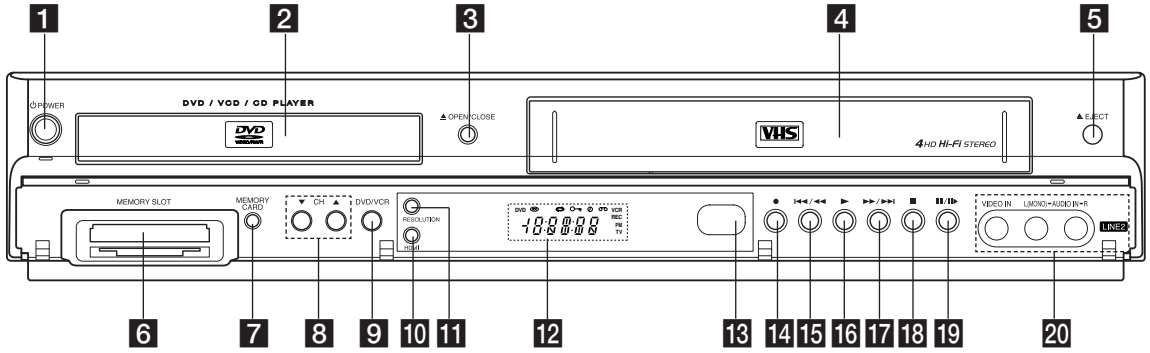
Front Panel



1 ⏻ **POWER**
Switches the DVD+VCR ON and OFF.

2 **Disc Tray (DVD deck)**
Insert a disc here.

3 ⏏ **OPEN/CLOSE**
Opens or closes the disc tray.

4 **Cassette Compartment (VCR deck)**
Insert a video cassette here.

5 ⏏ **EJECT**
Ejects the tape in the VCR deck.

6 **MEMORY SLOT**
Insert a memory card
(CF, MD, SMC, MMC, SD, MS, MS-Pro).

7 **MEMORY CARD**
Accesses the menu for memory card.

8 **CH (▼/▲)**
To scan up or down through memorized channels.

9 **DVD/VCR (output select)**
Select one of your output sources to view on the TV screen between DVD and VCR.

10 **HDMI**
Switches the HDMI mode to HDMI (active) and OFF (inactive).

11 **RESOLUTION**
You can change the resolution depending on your TV.
- HDMI mode : You can switch among the 480p, 720p or 1080i resolution.
- Component mode : You can switch among 480i, 480p, 720p or 1080i resolution.

12 **Display Windows**

DVD The DVD deck is selected.

A disc is in the DVD deck.
(Lights when a disc is in the DVD deck and Flashes when no disc.)

Indicates repeat mode.

Indicates when the DVD+VCR is locked.

DVD+VCR is in timer recording or a timer recording is programmed (VCR part only).

A cassette is in the VCR deck.

VCR The VCR deck is selected.

REC DVD+VCR is Recording.(VCR part only)

PM Indicates PM time. (AM is not displayed.)

TV Lights when TV mode is active.

Indicates total playing time, elapsed time, remaining time or current deck status (Playback, Pause, etc).

13 **Remote Sensor**
Point the DVD+VCR remote control here.

14 ● **(REC) button**
Starts recording.
Press repeatedly to set the recording time.

15 ⏮/◀◀
- DVD: Skip to beginning of current chapter or track, press twice in quick successions to go to previous chapter or track. Press and hold button for about two seconds to search backward.
- **VCR:** Rewinds the tape during the stop mode or for fast backward picture search.

16 ▶
Starts playback of a disc or tape.

17 ▶▶/⏭
DVD: Skip to next chapter or track. Press and hold for two seconds for a fast forward search.
VCR: Advances the tape during the STOP mode or for fast forward picture search.

18 ■
Stops playback of the disc or tape.

19 ❚❚/❚▶
Pause playback or recording temporarily. Press repeatedly for frame-by-frame playback.

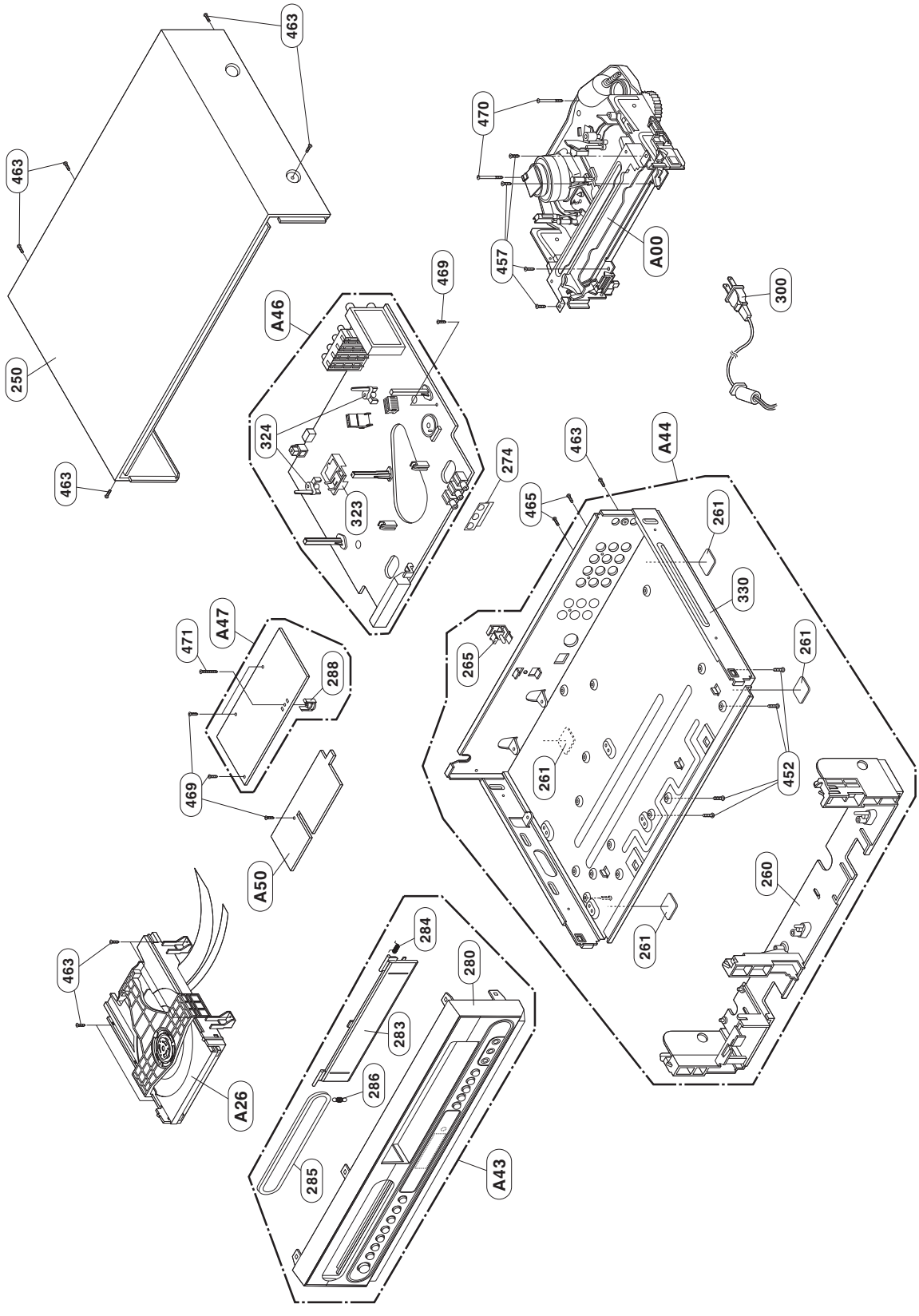
20 **LINE2 (VIDEO/AUDIO (L/R) input)**
Connect to the audio/video output of an external source (Audio system, TV/Monitor, Another VCR).

LOCK function

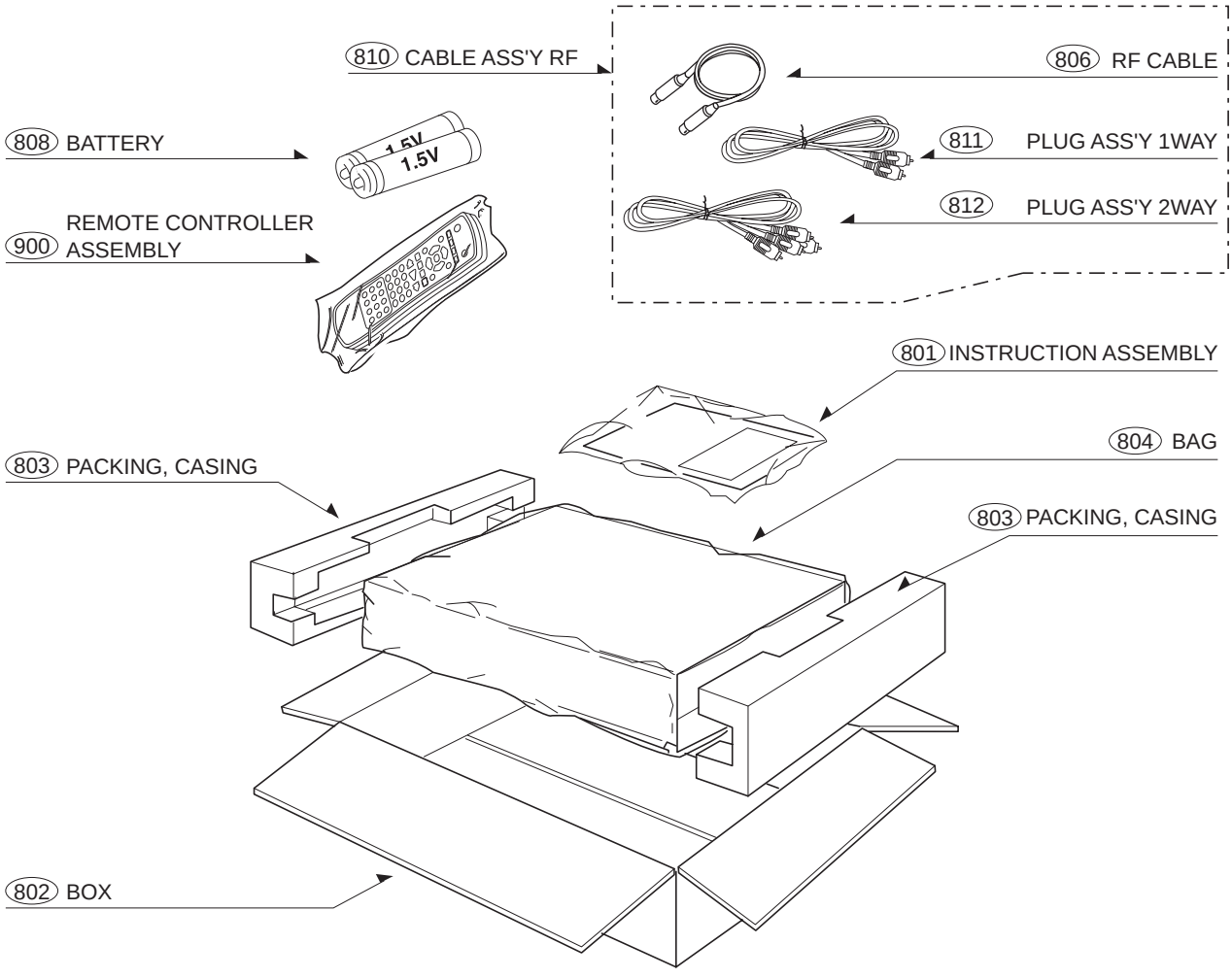
The Lock feature disables the front panel buttons to prevent children from tampering with the DVD+VCR. Simply press LOCK on the remote control to toggle this feature on and off.

EXPLODED VIEWS

1. Cabinet and Main Frame Section

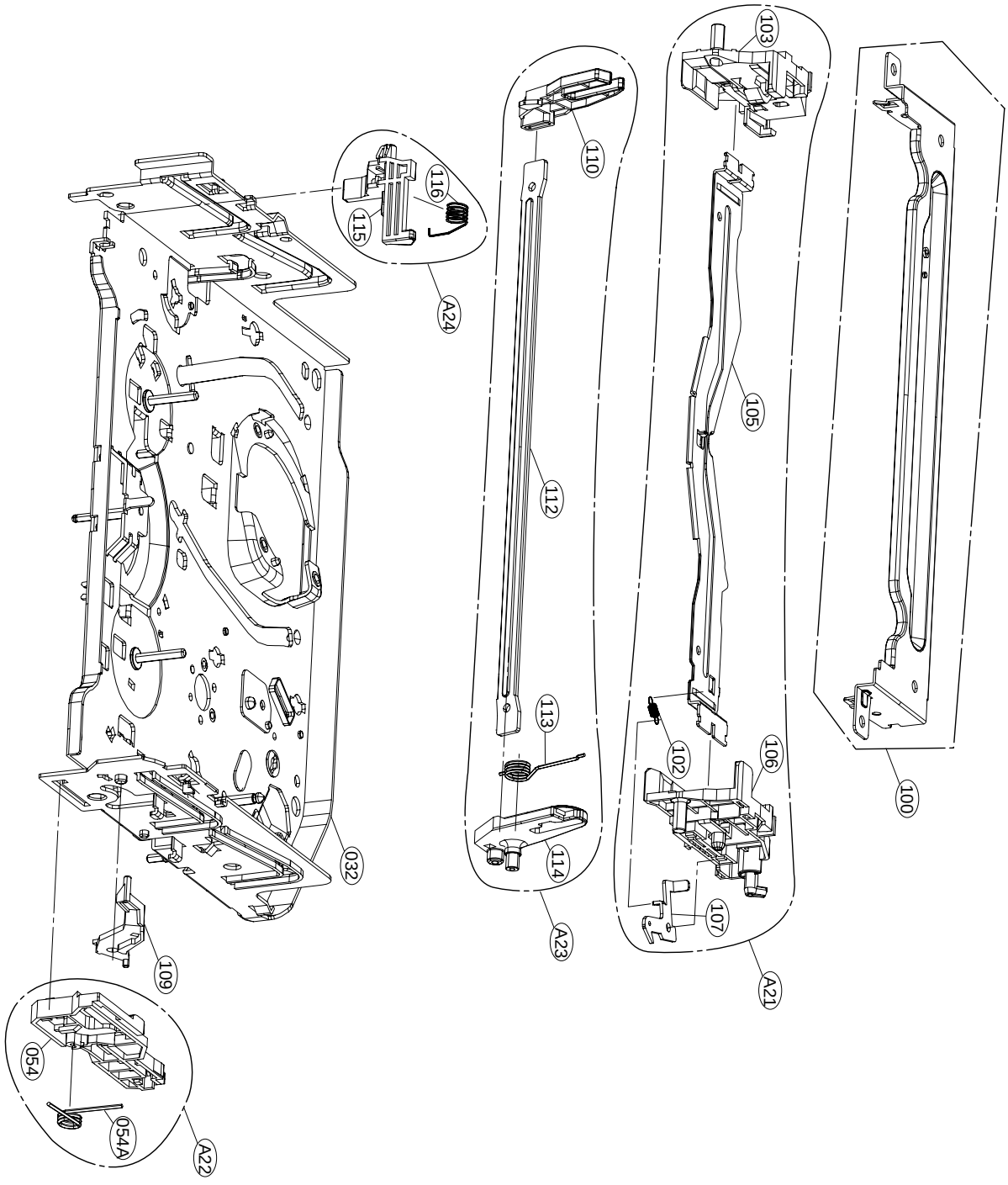


2. Packing Accessory Section



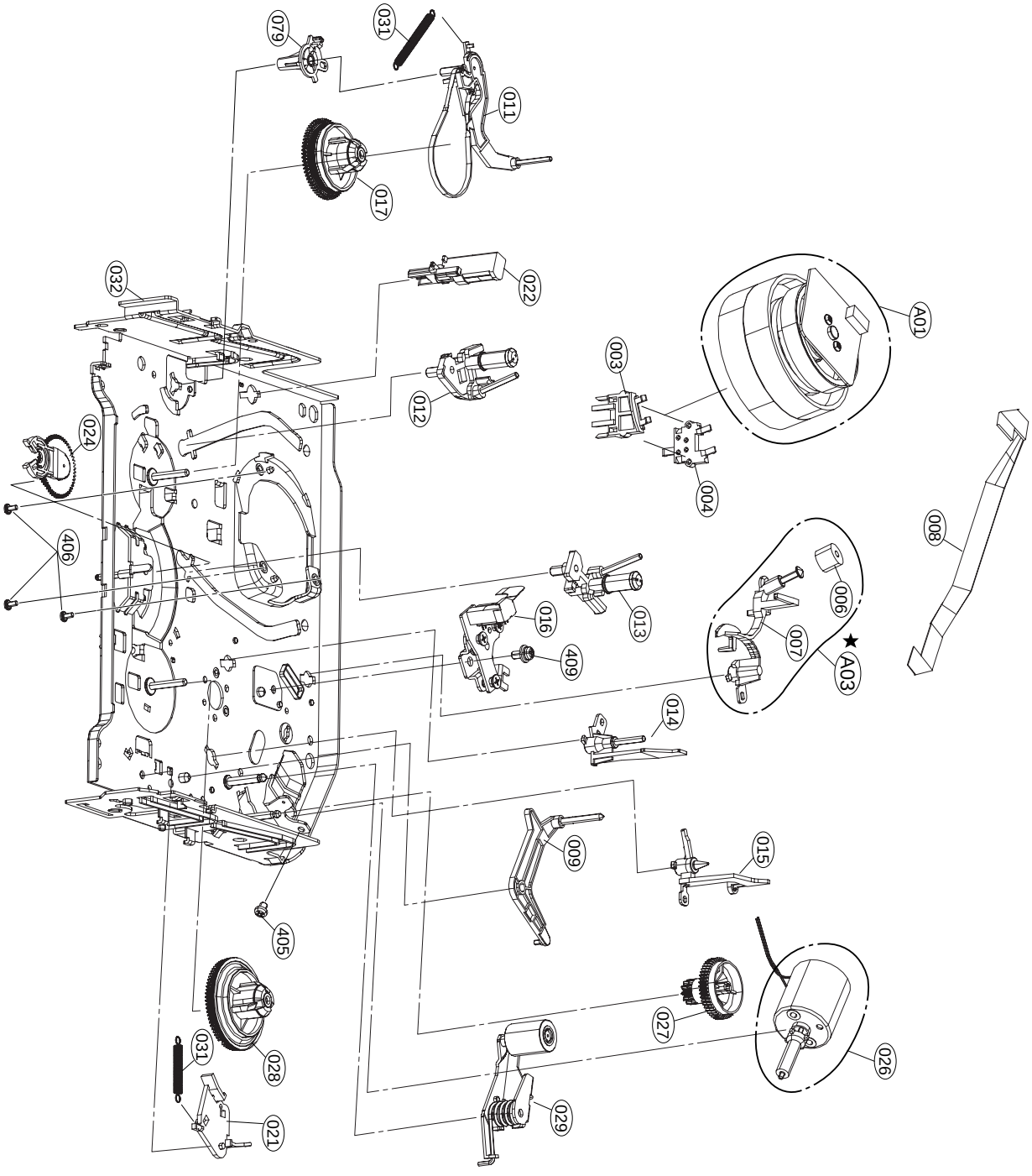
EXPLODED VIEWS

1. Front Loading Mechanism Section

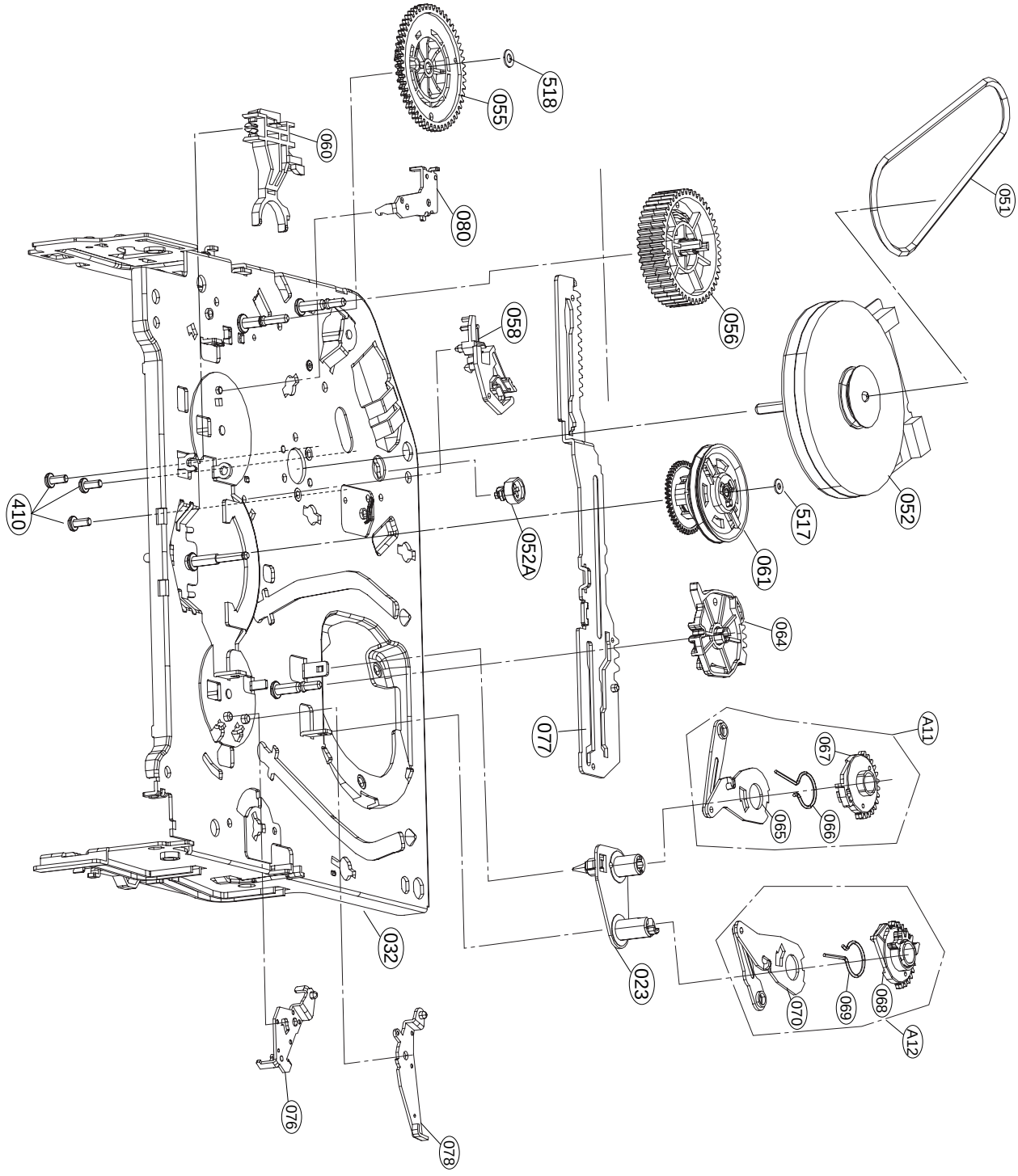


2. Moving Mechanism Section (1)

★ OPTIONAL PART

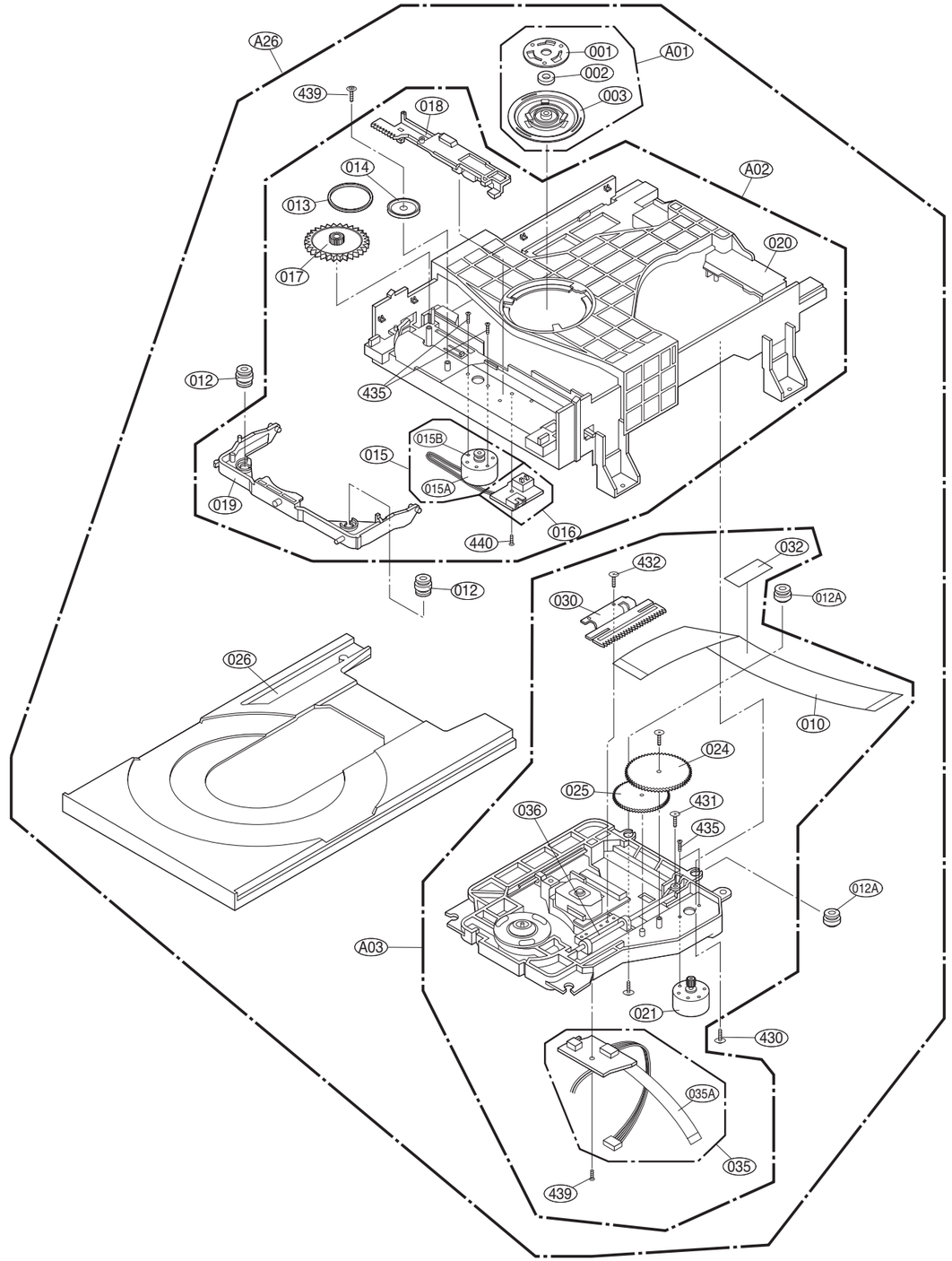


3. Moving Mechanism Section (2)



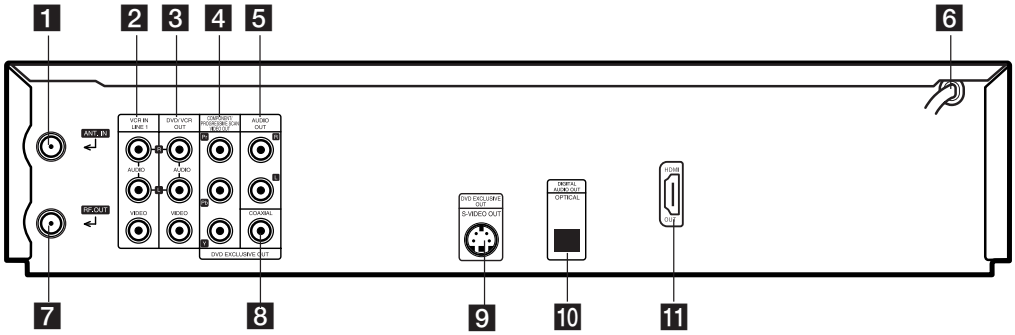
EXPLODED VIEWS

1. Deck Mechanism Exploded View



Rear Panel

⚠Caution
Do not touch the inner pins of the jacks on the rear panel. Electrostatic discharge may cause permanent damage to the unit.



1 **ANT.IN**
Connect the VHF/UHF/CATV antenna to this terminal.

2 **VCR IN LINE 1 (VIDEO/AUDIO (Left/Right))**
Connect the audio/video output of an external source (Audio system, TV/Monitor, VCR, Camcorder).

3 **DVD/VCR OUT (VIDEO/AUDIO (Left/Right))**
Connect to a TV with video and audio inputs.

4 **COMPONENT/PROGRESSIVE SCAN VIDEO OUT (Y Pb Pr) (DVD OUT)**
Connect to a TV with Y Pb Pr inputs.

5 **AUDIO OUT (Left/Right) (DVD OUT)**
Connect to a TV or other equipment with audio inputs.

6 **AC Power Cord**
Plug into the power source.

7 **RF. OUT(DVD/VCR OUT)**
Connect to a TV with RF coaxial inputs.

8 **COAXIAL (DIGITAL AUDIO OUT jack) (DVD OUT)**
Connect to digital (coaxial) audio equipment.

9 **S-VIDEO OUT (DVD OUT)**
Connect to a S-Video Input on TV.

10 **OPTICAL (DIGITAL AUDIO OUT jack) (DVD OUT)**
Connect to digital (optical) audio equipment.

11 **HDMI OUT**
HDMI output providing a high quality interface for digital audio and video.

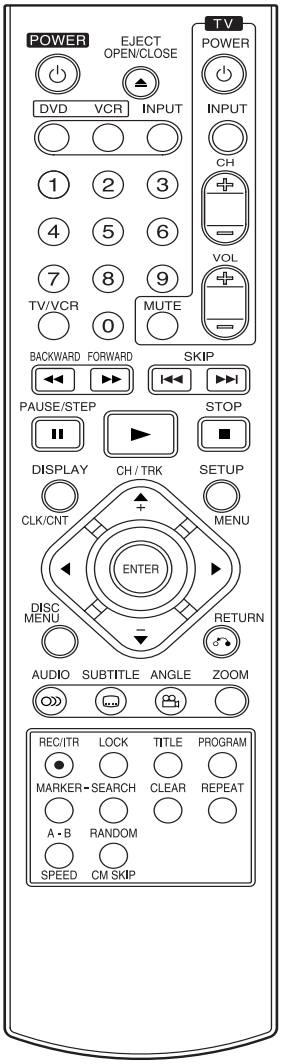
Preparation

Depending on your TV and other equipment there are various ways you can connect the player. Please refer to the manuals of your TV, VCR, stereo system or other devices as necessary for additional connection information.

Notes:

- The picture and sound of a nearby TV, VCR, or radio may be distorted during playback. Position the units away from each other or turn off the unit after removing the disc.
- Make sure the DVD+VCR is connected directly to the TV and tune the TV to the correct video input channel.
- Do not connect the DVD+VCR's AUDIO OUT jack to the phono in jack (record deck) of your audio system. Do not connect the DVD+VCR via another VCR. The DVD image could be distorted by the copy protection system.

Remote Control



POWER Switches DVD+VCR ON and OFF.

EJECT Ejects the tape in the VCR deck.
OPEN/CLOSE Opens and closes the disc tray.

DVD Select the DVD+VCR function mode to DVD.

VCR Select the DVD+VCR function mode to VCR.

INPUT Selects the VCR deck's source (Tuner, LINE 1, or LINE 2).

0-9 Selects numbered options in a menu.

TV/VCR To view channels selected by the VCR tuner or by the TV tuner.

TV Control Buttons
- **POWER:** Switches TV ON and OFF.
- **INPUT:** Selects the TV's source.
- **CH +/–:** Selects TV's channel.
- **VOL +/–:** Adjusts TV's volume.
- **MUTE:** Turns on or off TV sound.

BACKWARD / FORWARD (◀◀/▶▶)
- DVD: Search backward or forward.
- VCR: Rewinds/Advances the tape during the STOP mode, for fast backward/forward picture search.

SKIP (I◀◀ / ▶▶I) Go to next chapter or track. Returns to beginning of current chapter or track or go to previous chapter or track.

PAUSE/STEP (II) Pause playback or recording temporarily. Press repeatedly for frame-by-frame playback.

► (PLAY) Starts playback.

STOP (■) Stops playback or recording.

DISPLAY Accesses On-Screen Display.
CLK/CNT Switches between the clock, tape counter and tape remaining modes on the display.

SETUP, MENU Accesses or removes DVD Setup menu and VCR menu.

◄ ► ▲ ▼ Selects menu options.
CH/TRK(▲+/▼-) Selects VCR channels. Adjusts manually the tape's picture onscreen.

ENTER Confirms menu selections. Displays functions on the TV screen.

DISC MENU Accesses menu on a DVD disc.

RETURN (↶) Removes the setup menu, displays the video CD with PBC.

AUDIO Selects an audio language (DVD) or an audio channel (VCD).

SUBTITLE Selects a subtitle language.

ANGLE Selects a DVD camera angle, if available.

ZOOM Enlarges DVD video image.

REC/ITR (●) Starts recording. Press repeatedly to set the recording time.

LOCK Locks/unlocks front panel buttons.

TITLE Displays the disc's Title menu, if available.

PROGRAM Shows or hides Program menu.

MARKER Marks any point during playback.

SEARCH Displays Marker Search menu.

CLEAR Removes a mark on the Marker Search menu.

REPEAT Repeat chapter, track, title or all.

A-B Repeats sequence between two points (A and B).
SPEED Selects recording speed.

RANDOM Plays tracks in random order.
CM SKIP Fast forwards picture search through 30 seconds of recording.

Controlling Your TV with the Supplied Remote

You can control the sound level, input source, and power switch of your LG TV with the supplied remote.

By pressing	You can
POWER	Turn the TV on or off.
INPUT	Switch the TV's input source.
CH +/–	Scans up or down through memorized channels.
VOL +/–	Adjust the volume of the TV.
MUTE	Turns on or off TV sound.

Note:

Depending on the unit being connected, you may not be able to control your TV using some of the buttons.

Controlling other TVs with the remote

You can control the sound level, input source, and power switch of non-LG TVs as well. If your TV is listed in the table below, set the appropriate manufacturer code.

1. While holding down TV POWER button, press the number buttons to select the manufacturer code for your TV (see the table below).
2. Release TV POWER button.

Code numbers of controllable TVs

If more than one code number is listed, try entering them one at a time until you find the one that works with your TV.

Manufacturer	Code Number	Manufacturer	Code Number
ADMIRAL	16,33,37,44,45	MONTGOMERY	01,06,08,09
AIWA	70	WARD	23,24,32,33,34
AKAI	01	NEC	01,08
AMARK	09	NOBLEX	07
AOC	01	PACKARD BELL	43
BELL & HOWELL	33	PANASONIC	07,11,13,25,35,36
BROKSONIC	18,19	PHILCO	01,06,07,08,09,
CANDLE	51		15,38,43,58
CCE	07	PHILIPS	06,07,43,61,62,65
CENTURION	08	PIONEER	30
CINERAL	43	PORTLAND	09
CITIZEN	49,50,51,52,53,54,55	PROSCAN	03,37,44
CORONADO	09	QUASAR	11,13
CROWN	09	RADIO SHACK	16,17,23
CURTIS MATHES	01,03,08,33,35,37,44	RCA	01,03,37,44,69
DAEWOO	16,38,39,40,41,42,43	REALISTIC	16,17,23
DAYTRON	01,08	SAMPO	08
EMERSON	01,09,16,17,18,19	SAMSUNG	01,08,09,25,68
FISHER	28,29	SANYO	28,29
FUNAI	46,47	SCOTT	01,08
GENERAL ELECTRIC	03,10,11,13,37,44	SEARS	09,25,26,27,28,29
GRADIENTE	01,56,57,63,67	SEMP	64
HITACHI	09,14,15,43	SHARP	09,22,23,24,60,66
JC PENNEY	01,08,10,27,35	SIGNATURE 2000	01,06,08,09,10,
JVC	20,21,63,67		23,24,33,34
KIOTE	43	SONY	12,62
KMC	09	SOUNDESIGN	51
KTV	01,08,09,31	SYLVANIA	01,04,05,06,07,
LG (GOLDSTAR)	01,07,08,09,35,39,40		08,35,51
LODGENET	33	SYMPHONIC	46,47
LOGIK	33	TATUNG	11
LXI	09,24,25,26,27,28,29	TEKNIKA	07,09,16,33,51
MAGNAVOX	01,02,04,05,06,	TELERENT	09,33
	07,08,09,20,	THOMSON	69
	34,35,43,51,61,62,65	YORX	08
MAJESTIC	33	TOSHIBA	01,25,26,27,64
MARANTZ	01,32	WARDS	01,06,08,09,10,33,34
MEMOREX	33	XR1000	48
MGA/MITSUBISHI	01,08,32,34	ZENITH	01, 02,33,59

Notes:

- **Depending on your TV, some or all buttons may not function on the TV, even after entering the correct manufacturer code.**
- If you enter a new code number, the code number previously entered will be erased.
- When you replace the batteries of the remote, the code number you have set may be reset to the default setting. Set the appropriate code number again.