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SECTION 1

SUMMARY

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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.

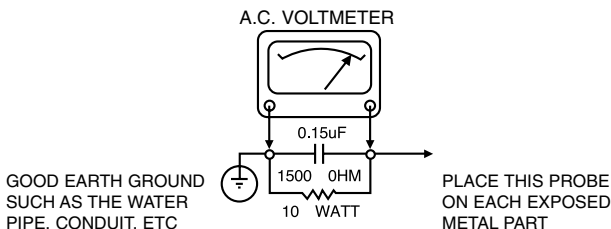
WHILE SERVICING, USE AN ISOLATION TRANSFORMER FOR PROTECTION FROM A.C. LINE SHOCK.

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 RECEIVING TUBE OR A RESISTOR RATED AT 1 WATT OR MORE. LEAD TENSION AROUND PROTRUDING 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. VOLT-METER, 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 MILLIAMPS A.C ANY VALUE EXCEEDING THIS LIMIT CONSTITUTES A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED IMMEDIATELY.



SUBJECT: GRAPHIC SYMBOLS



THE LIGHTNING FLASH WITH ARROWHEAD 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 ESSENTIAL THAT SERVICE PERSONNEL HAVE AVAILABLE AN ACCURATE AND RELIABLE HIGH VOLTAGE METER. THE CALIBRATION 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 RECORDED 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 EXCESSIVE 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 INTEGRAL 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, CUBBY-HOLE 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 GENERALLY 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 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 publication, always follow the safety precautions.

Remembers Safety First:

General Servicing Precautions

1. Always unplug the 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 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 which instruments covered by this service manual might be equipped.
5. Do not apply AC power to this DVD and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly 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 grounded-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 protective 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.)

SPECIFICATIONS

• GENERAL

Power requirements	AC 110~240V, 50/60Hz
Power consumption	14W
Dimensions(approx.)	360 x 69 x 215mm (W/h/d)
Mass(approx.)	2.52kg
Operating temperature	5°C to 35°C (41°F to 95°F)
Operating humidity	5% to 90%

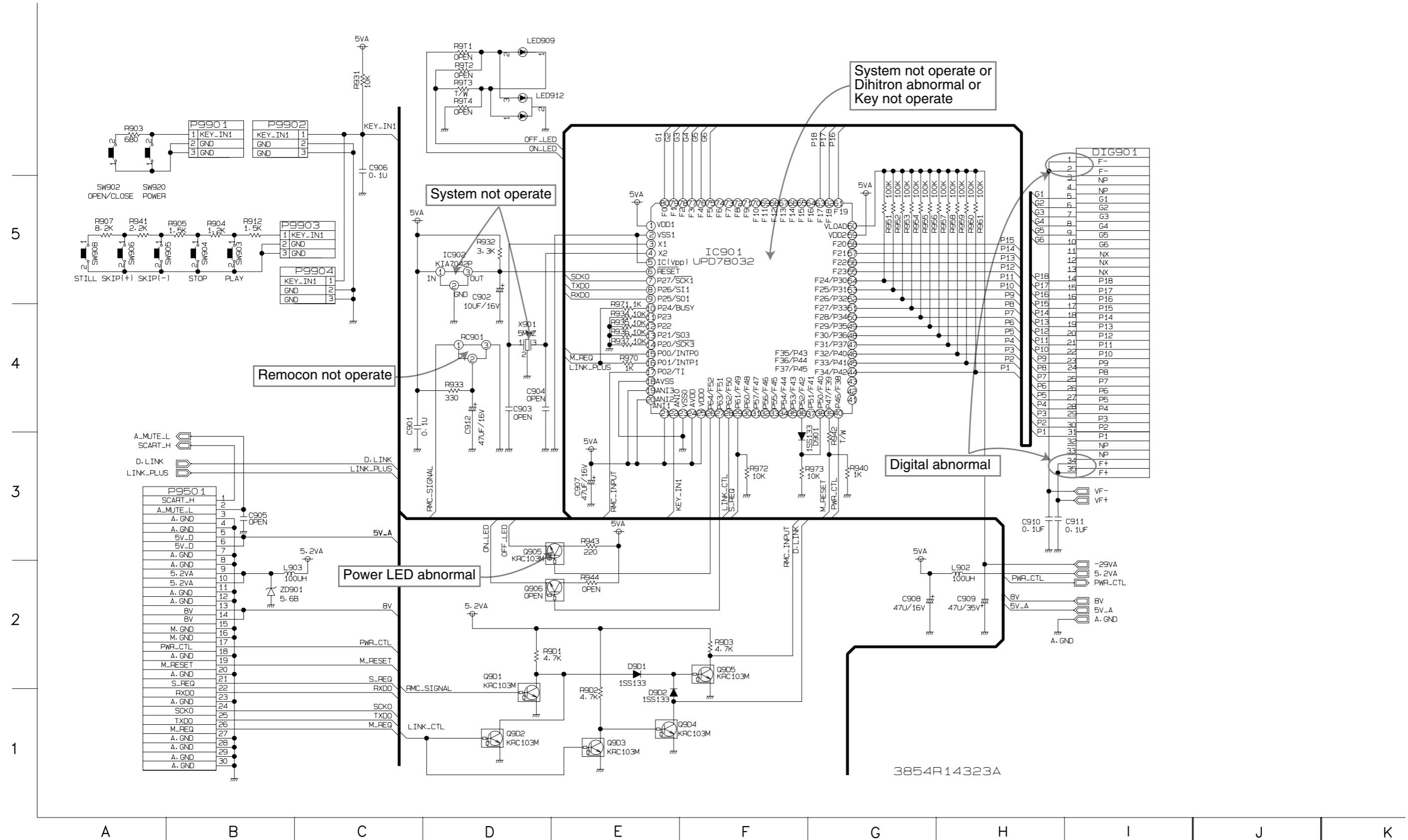
• SYSTEM

Laser	Semiconductor laser, wavelength 650nm
Signal system	PAL/NTSC
Frequency response	DVD (PCM 96kHz): 8Hz to 44kHz DVD (PCM 48kHz): 2Hz to 22kHz CD: 8Hz to 20kHz
Signal-to-noise ratio	More than 100dB (ANALOG OUT connectors only)
Harmonic distortion	Less than 0.008%
Dynamic range	More than 100dB(DVD) More than 95dB(CD)

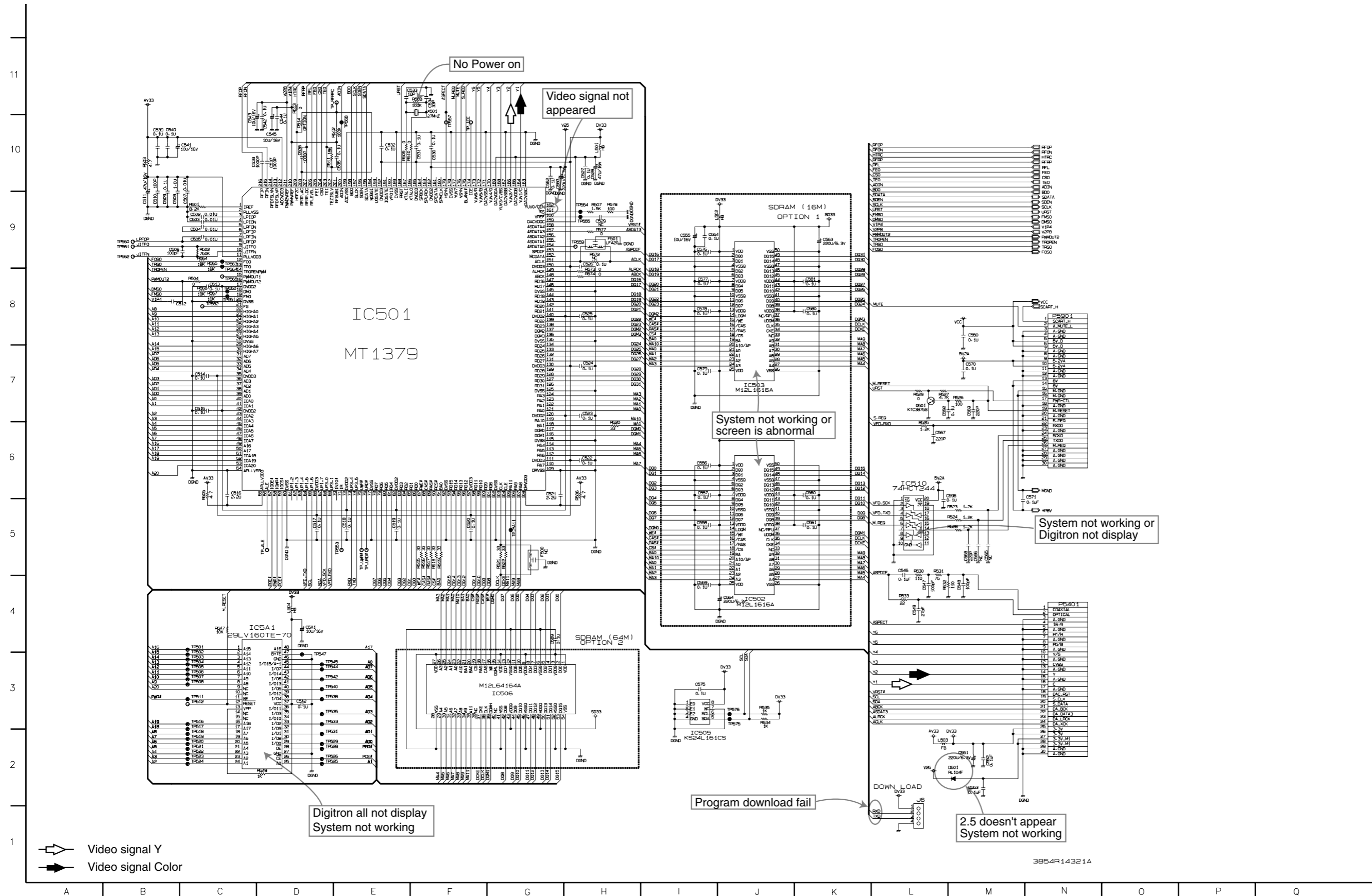
• OUTPUTS

VIDEO OUT	1 V (p-p) 75 Ω , sync negative, RCA jack x 1 / SCART (TO TV)
Audio output (digital audio)	0.5 V (p-p), 75 Ω , RCA jack x 1
Audio output (analog audio)	2.0 Vrms (1 kHz, 0 dB), 600 Ω , RCA jack (L, R) x 1 / SCART (TO TV)

4. FRONT CIRCUIT DIAGRAM



2. SYSTEM CIRCUIT DIAGRAM



CIRCUIT DIAGRAMS

1. POWER(SMPS) CIRCUIT DIAGRAM

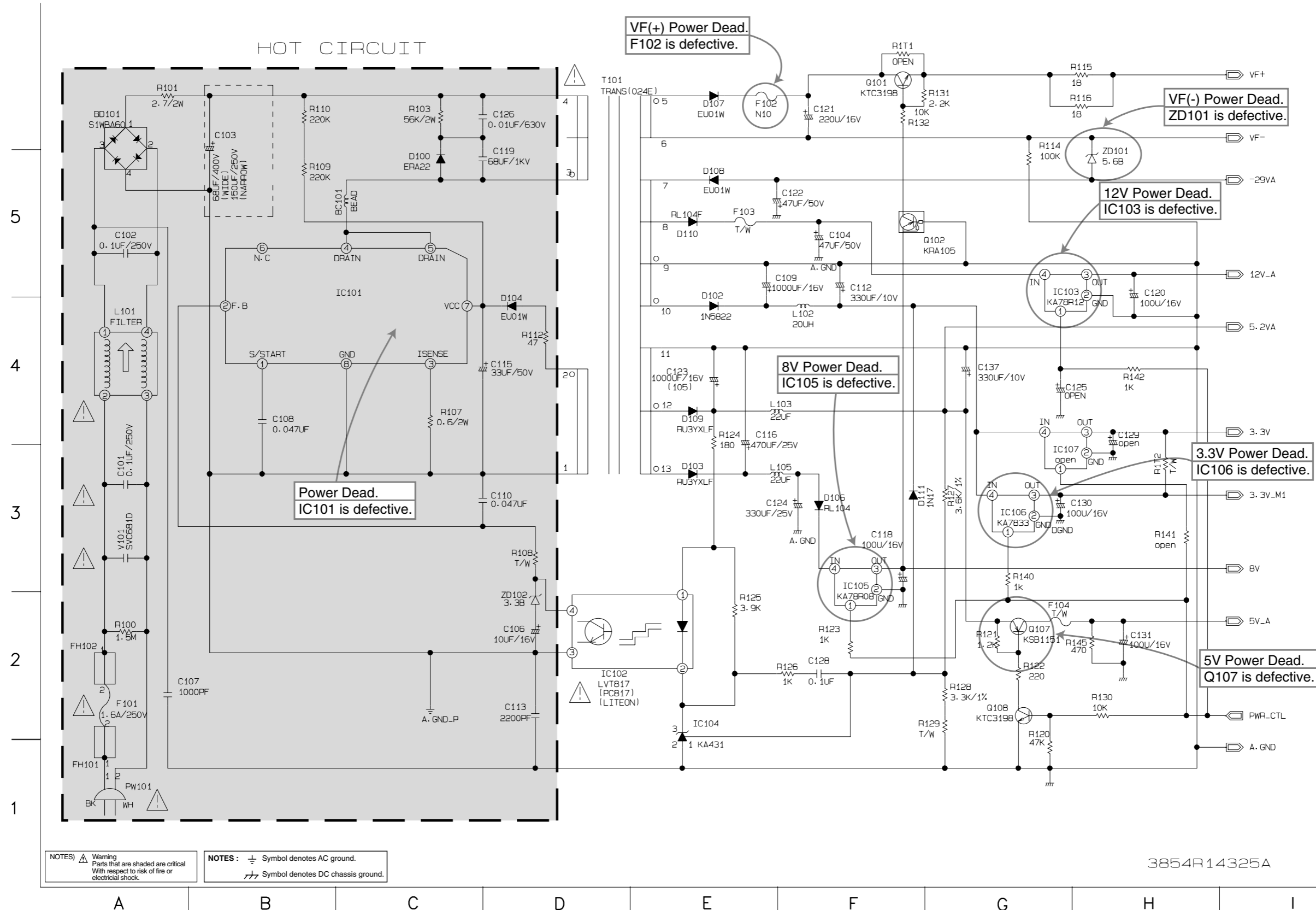
IMPORTANT SAFETY NOTICE

WHEN SERVICING THIS CHASSIS, UNDER NO CIRCUMSTANCES SHOULD THE ORIGINAL DESIGN BE MODIFIED OR ALTERED WITHOUT PERMISSION FROM THE LOEWE CORPORATION. ALL COMPONENTS SHOULD BE REPLACED ONLY WITH TYPES IDENTICAL TO THOSE IN THE ORIGINAL CIRCUIT.

SPECIAL COMPONENTS ARE SHADED ON THE SCHEMATIC FOR EASY IDENTIFICATION. THIS CIRCUIT DIAGRAM MAY OCCASIONALLY DIFFER FROM THE ACTUAL CIRCUIT USED. THIS WAY, IMPLEMENTATION OF THE LATEST SAFETY AND PERFORMANCE IMPROVEMENT CHANGES INTO THE SET IS NOT DELAYED UNTIL THE NEW SERVICE LITERATURE IS PRINTED.

NOTE :

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

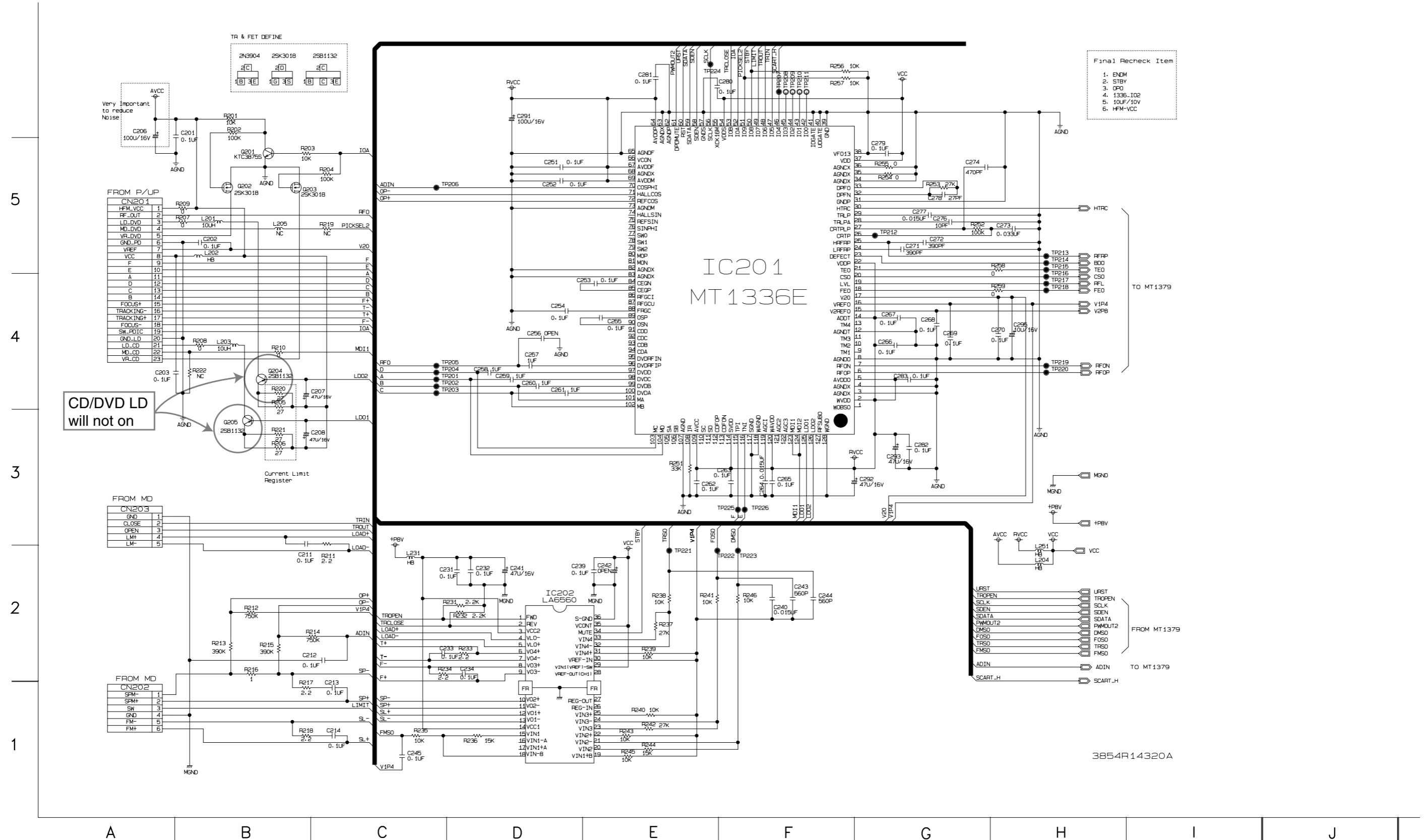


NOTES) ⚠ Warning
Parts that are shaded are critical
With respect to risk of fire or
electrical shock.

NOTES : ⚡ Symbol denotes AC ground.
⏏ Symbol denotes DC chassis ground.

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3. RF & SERVO CIRCUIT DIAGRAM



SECTION 2
CABINET & MAIN CHASSIS

CONTENTS

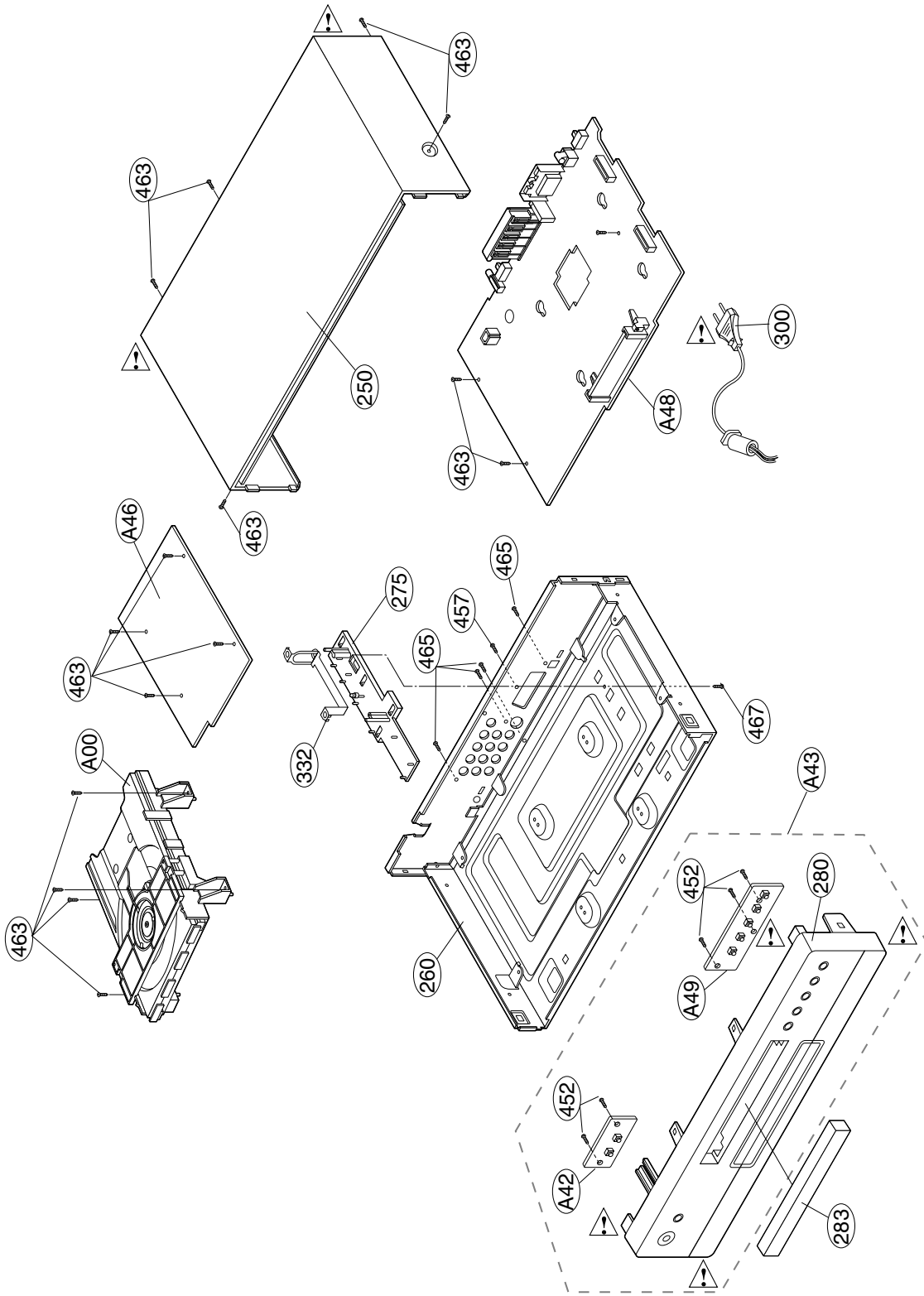
- 1. EXPLODED VIEWS2-2**
 - 1. Cabinet and Main Frame Section2-2**
 - 2. Deck Mechanism Section.....2-3**
 - 3. Packing Accessory Section2-4**

EXPLODED VIEWS

1. Cabinet and Main Frame Section

★ OPTIONAL PART

5
4
3
2
1



2. Deck Mechanism Section

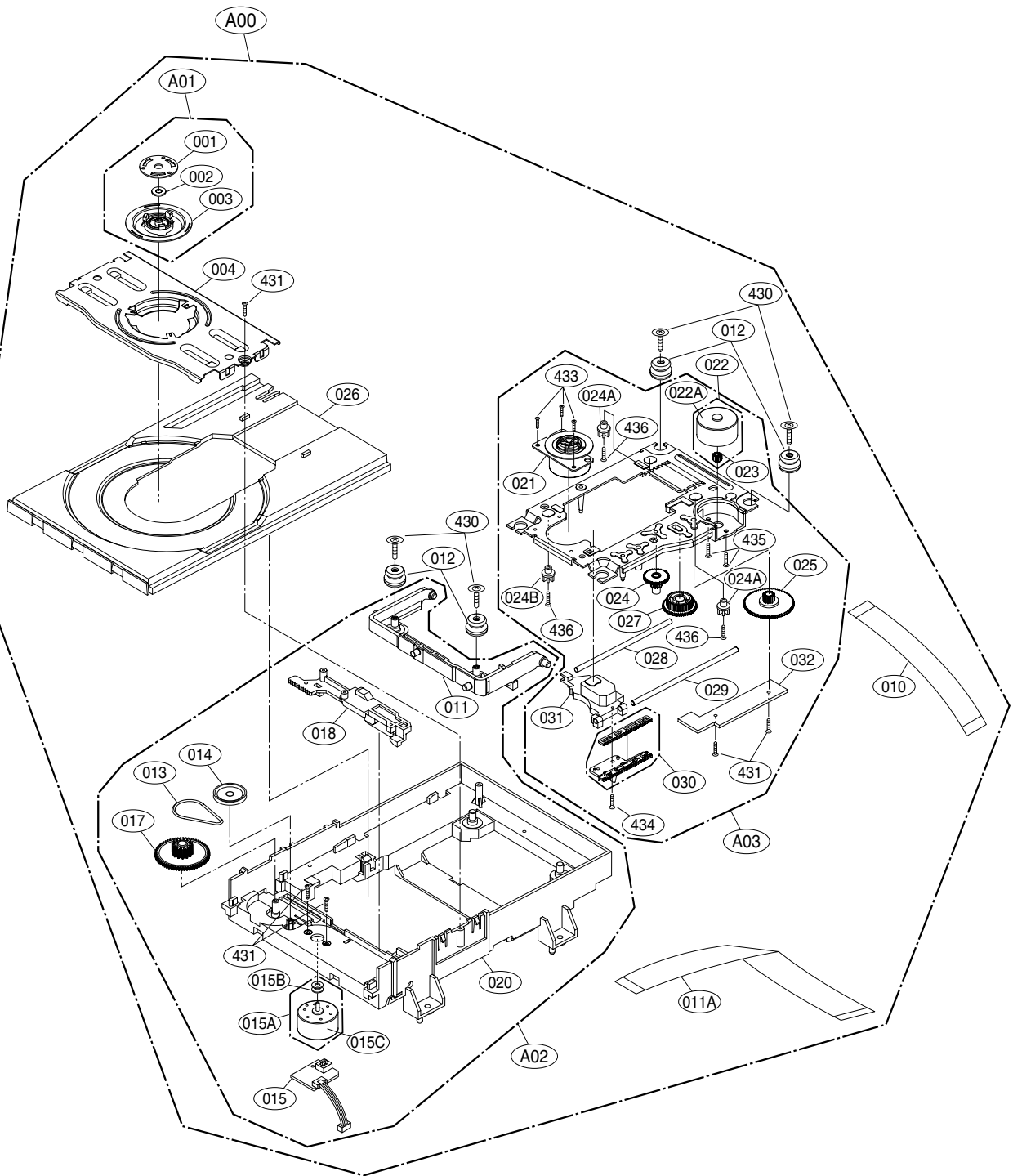
5

4

3

2

1



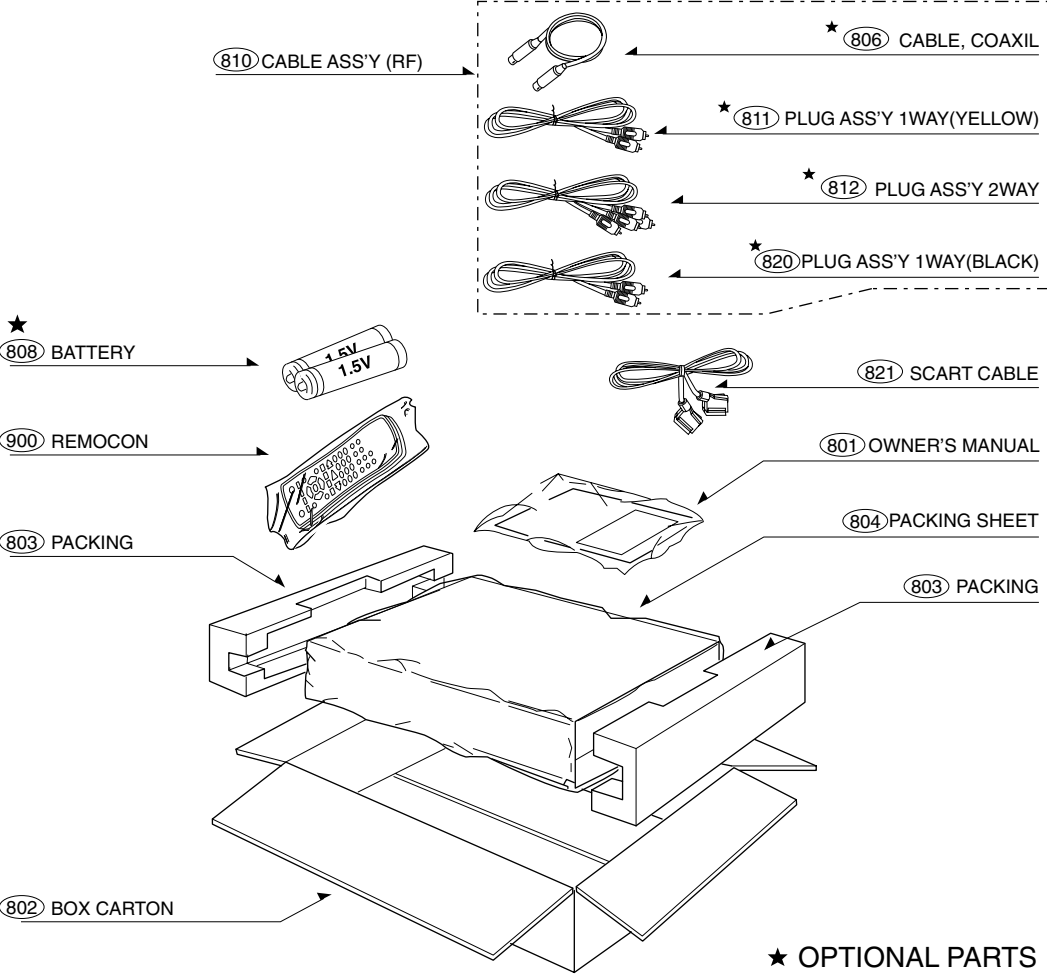
A

B

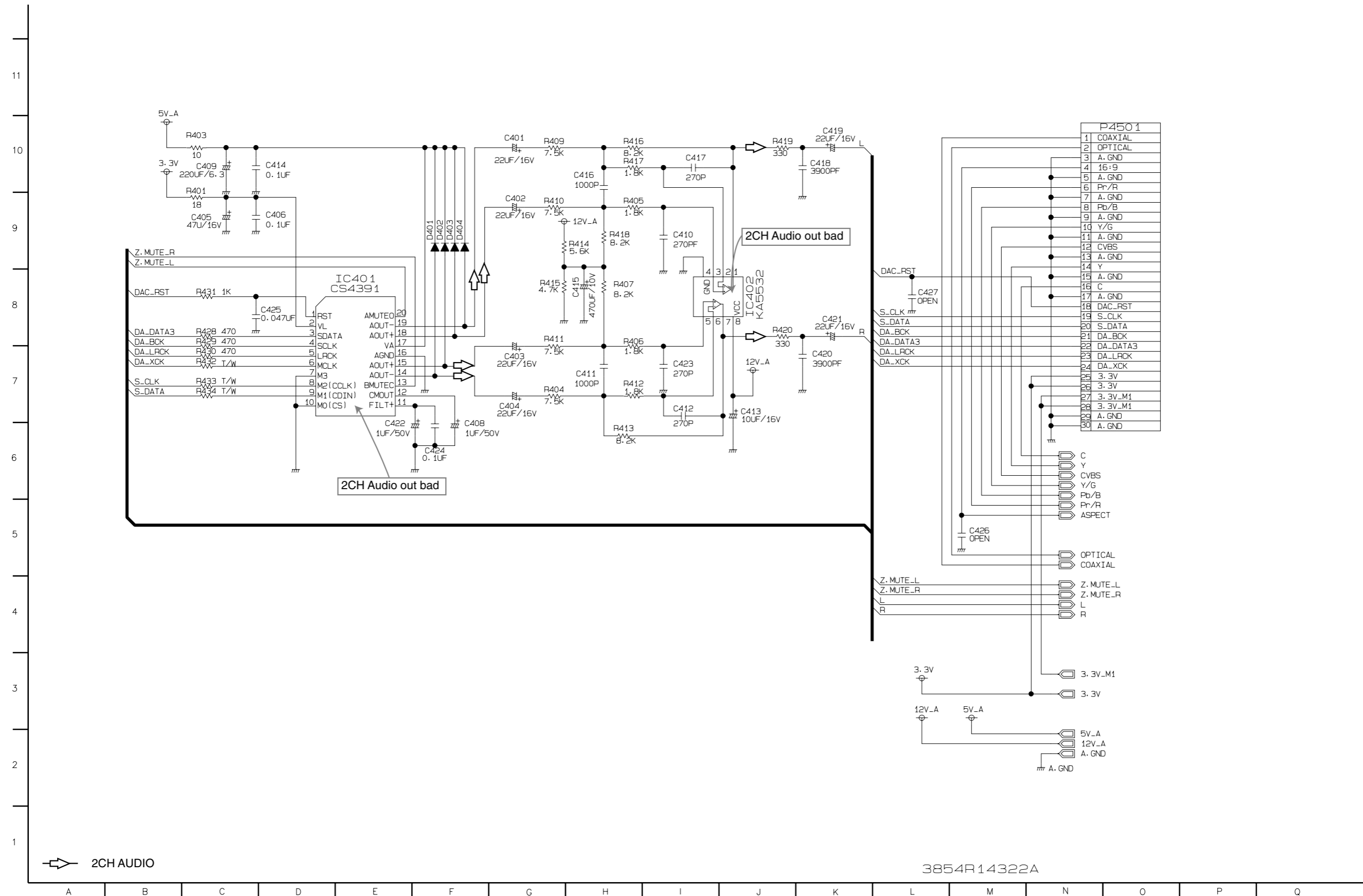
C

D

3. Packing Accessory Section



5. AUDIO CIRCUIT DIAGRAM

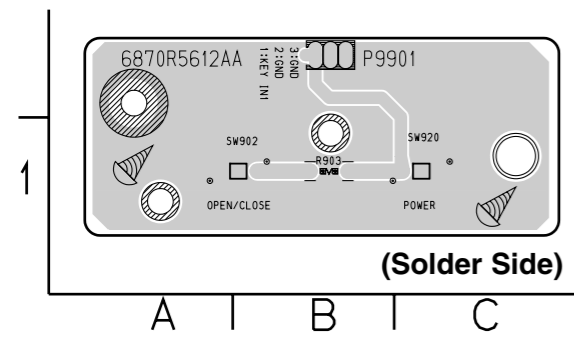


P4501	
1	COAXIAL
2	OPTICAL
3	A. GND
4	16:9
5	A. GND
6	Pr/R
7	A. GND
8	Pb/B
9	A. GND
10	Y/G
11	A. GND
12	CVBS
13	A. GND
14	Y
15	A. GND
16	C
17	A. GND
18	DAC_RST
19	S_CLK
20	S_DATA
21	DA_BCK
22	DA_DATA3
23	DA_LRCK
24	DA_XCK
25	3.3V
26	3.3V
27	3.3V_M1
28	3.3V_M1
29	A. GND
30	A. GND

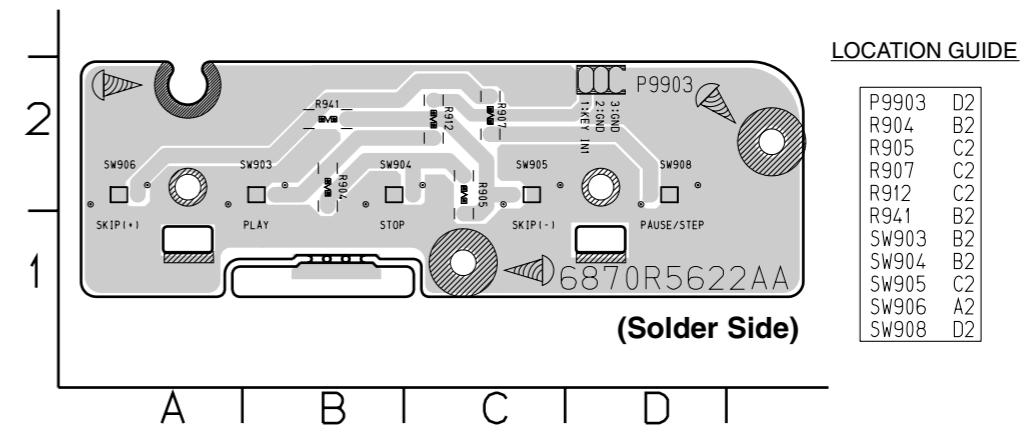
2CH AUDIO

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3. KEY P.C.BOARD (LEFT)



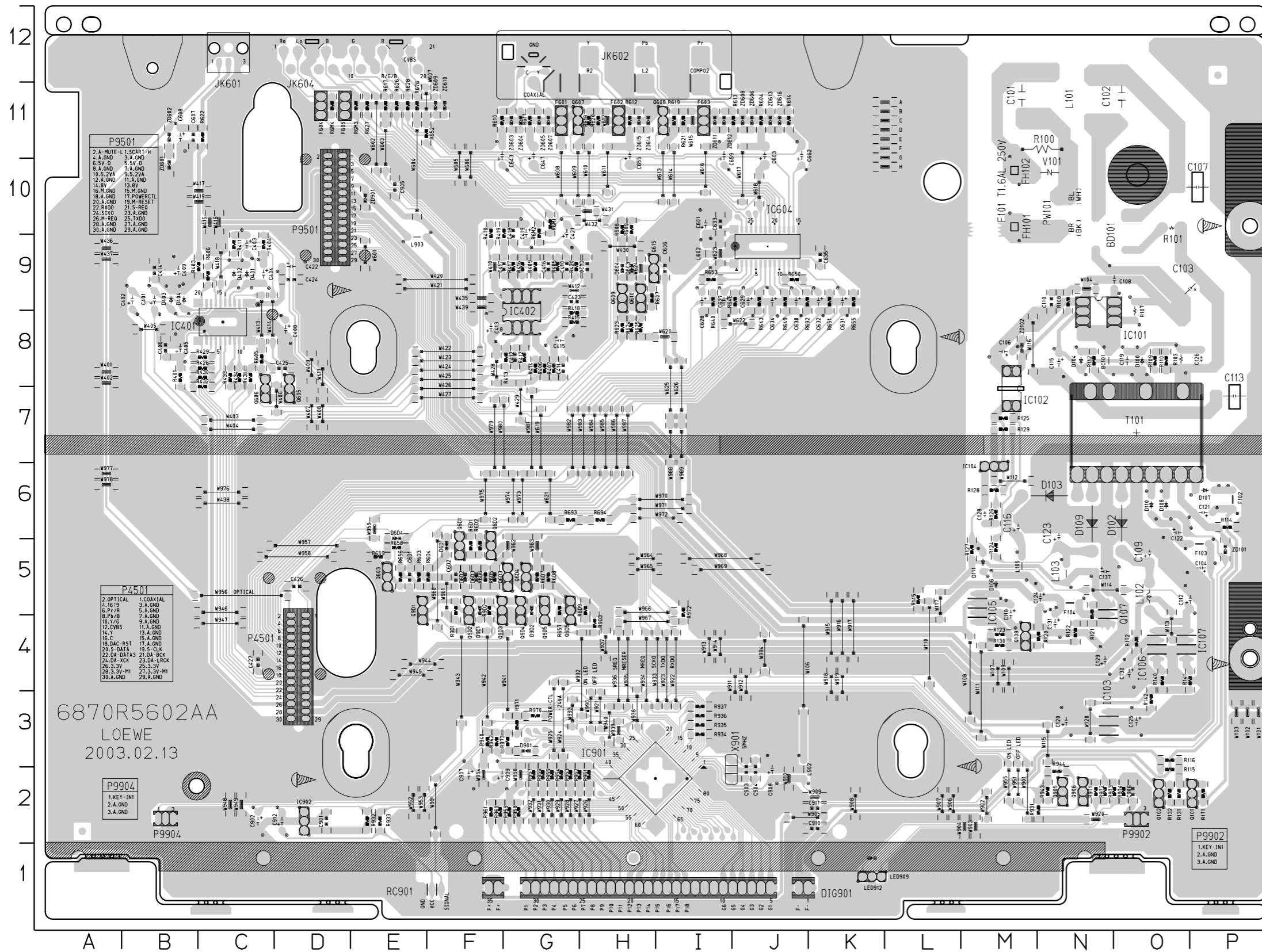
4. KEY P.C.BOARD (RIGHT)



LOCATION GUIDE

P9903	D2
R904	B2
R905	C2
R907	C2
R912	C2
R941	B2
SW903	B2
SW904	B2
SW905	C2
SW906	A2
SW908	D2

2. I/O P.C.BOARD

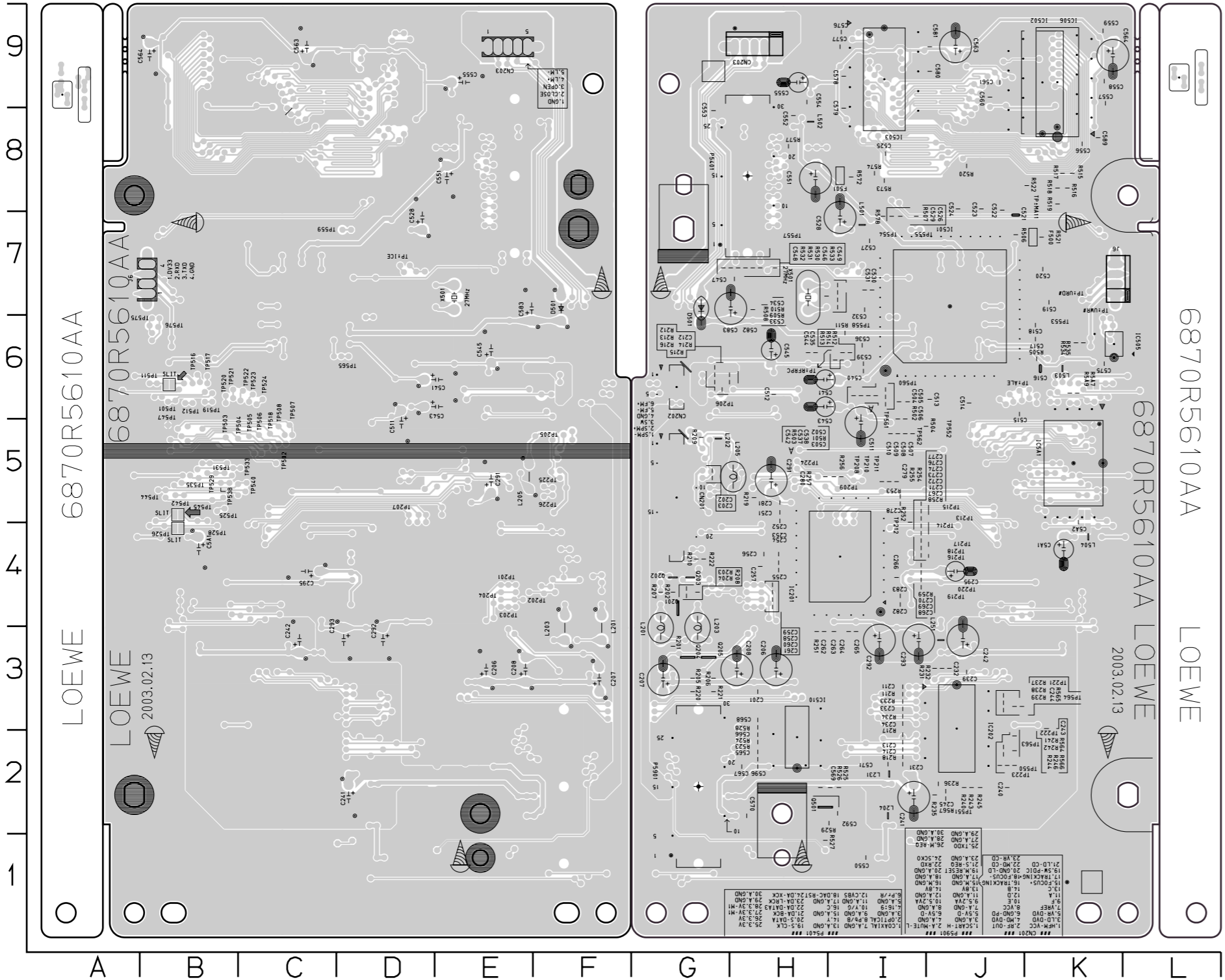


LOCATION GUIDE

BC101	N8	C635	K9	L102	05	R403	C9	R6D5	F5
BD101	N9	C643	F11	L103	N5	R404	C9	R6D6	F5
C101	M11	C647	G11	L105	M5	R405	G9	R6D7	G5
C102	011	C655	H11	L602	19	R406	G8	R6D8	G5
C103	P9	C659	I11	L902	J2	R407	G8	R6D9	H5
C104	P5	C662	J11	L903	E9	R409	G9	R6M1	G10
C106	M8	C6D1	E5	LED909	K1	R410	F10	R6M2	G10
C107	P10	C6D2	F5	LED912	K1	R411	C9	R6M3	E11
C108	09	C901	D2	P4501	D4	R412	G8	R6M4	D11
C109	05	C902	C2	P9501	D10	R413	G8	R931	N2
C110	N9	C903	J2	P9902	02	R414	G8	R932	E2
C112	P5	C904	J2	P9904	B2	R415	G8	R933	E2
C113	P7	C905	E10	PW101	N10	R416	G9	R934	I3
C115	N8	C906	02	Q101	P2	R417	G9	R935	I3
C116	M6	C907	F2	Q102	02	R418	G8	R936	I3
C118	M5	C908	J2	Q107	N5	R419	G10	R937	I3
C119	08	C909	F2	Q108	M4	R420	G9	R940	F3
C120	N3	C910	K2	Q603	E5	R428	C8	R942	F3
C121	P6	C911	K2	Q605	D7	R429	C8	R943	N2
C122	06	C912	D2	Q606	C7	R430	C8	R944	N2
C123	N6	D100	08	Q607	G11	R431	C8	R951	H2
C124	N5	D102	06	Q608	I11	R432	C7	R952	H2
C125	03	D103	N6	Q609	H9	R433	C8	R953	G2
C126	P8	D104	N8	Q610	H9	R434	C8	R954	G2
C128	M6	D106	M5	Q615	H9	R604	J11	R955	G2
C129	N4	D107	P6	Q6D1	F5	R605	C8	R956	G2
C130	04	D108	06	Q6D2	F5	R606	C9	R957	G2
C131	N4	D109	N6	Q6D3	G5	R607	H9	R958	G2
C137	N5	D110	06	Q6D4	G5	R608	H10	R959	G2
C401	B9	D111	M5	Q6D5	G5	R609	H10	R960	F2
C402	B9	D401	C9	Q905	N2	R610	F11	R961	F2
C403	C9	D402	C9	Q906	N2	R611	G11	R970	G3
C404	C9	D403	B9	Q9D1	E5	R612	H11	R971	G3
C405	B8	D404	B9	Q9D2	F5	R613	J11	R972	I5
C406	B8	D603	H9	Q9D3	F5	R614	J11	R973	G3
C408	D8	D604	H9	Q9D4	G5	R617	E11	R9D1	F5
C409	B9	D6D1	F5	Q9D5	G5	R618	H11	R9D2	F5
C410	G9	D6D2	F5	R100	N11	R619	I11	R9D3	H4
C411	G8	D6D3	F5	R101	010	R620	H11	R9T1	N2
C412	G8	D6D4	E6	R103	08	R621	I11	R9T2	N2
C413	F8	D9D1	G3	R107	08	R622	C11	R9T3	02
C414	B9	D9D1	F5	R108	N9	R623	H8	R9T4	02
C415	G8	D9D2	G5	R109	08	R624	H8	RC901	F1
C416	G9	DIG901	J1	R110	08	R625	H8	T101	07
C417	G9	F102	P6	R112	N8	R626	E11	V101	N10
C418	G10	F103	P5	R114	P6	R627	E11	X901	I2
C419	G10	F104	N5	R115	02	R628	E11	ZD101	P5
C420	H9	F601	G11	R116	03	R640	I9	ZD102	M8
C421	G10	F602	H11	R120	N4	R643	J9	ZD601	B10
C422	D9	F603	I11	R121	N5	R646	J9	ZD602	B11
C423	G9	F604	D11	R122	N4	R649	J9	ZD603	G11
C424	D9	F605	D11	R123	M4	R650	J9	ZD604	G11
C425	D8	FH101	M10	R124	M5	R651	K9	ZD605	G11
C426	D5	FH102	M10	R125	M7	R652	E11	ZD606	J11
C427	C4	IC101	09	R126	M6	R653	I9	ZD607	G11
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C603	J11	IC103	N3	R128	M6	R656	E5	ZD609	F11
C606	I9	IC104	M6	R129	M7	R657	G5	ZD610	F11
C607	B11	IC105	M5	R130	M4	R658	E5	ZD611	I11
C608	B11	IC106	04	R131	02	R659	E5	ZD612	I11
C627	I9	IC107	04	R132	02	R676	E11	ZD613	J11
C628	I9	IC402	G9	R140	04	R692	J9	ZD614	H11
C629	J9	IC901	H2	R141	P4	R693	G6	ZD615	H11
C630	J9	IC902	D2	R142	03	R694	H6	ZD616	J11
C631	K9	JK601	C12	R145	L5	R6D1	F5	ZD901	E10
C632	K9	JK602	H12	R1T1	P2	R6D2	F5		
C633	I10	JK604	E12	R1T2	04	R6D3	E5		
C634	J9	L101	N11	R401	B8	R6D4	F5		

PRINTED CIRCUIT DIAGRAMS

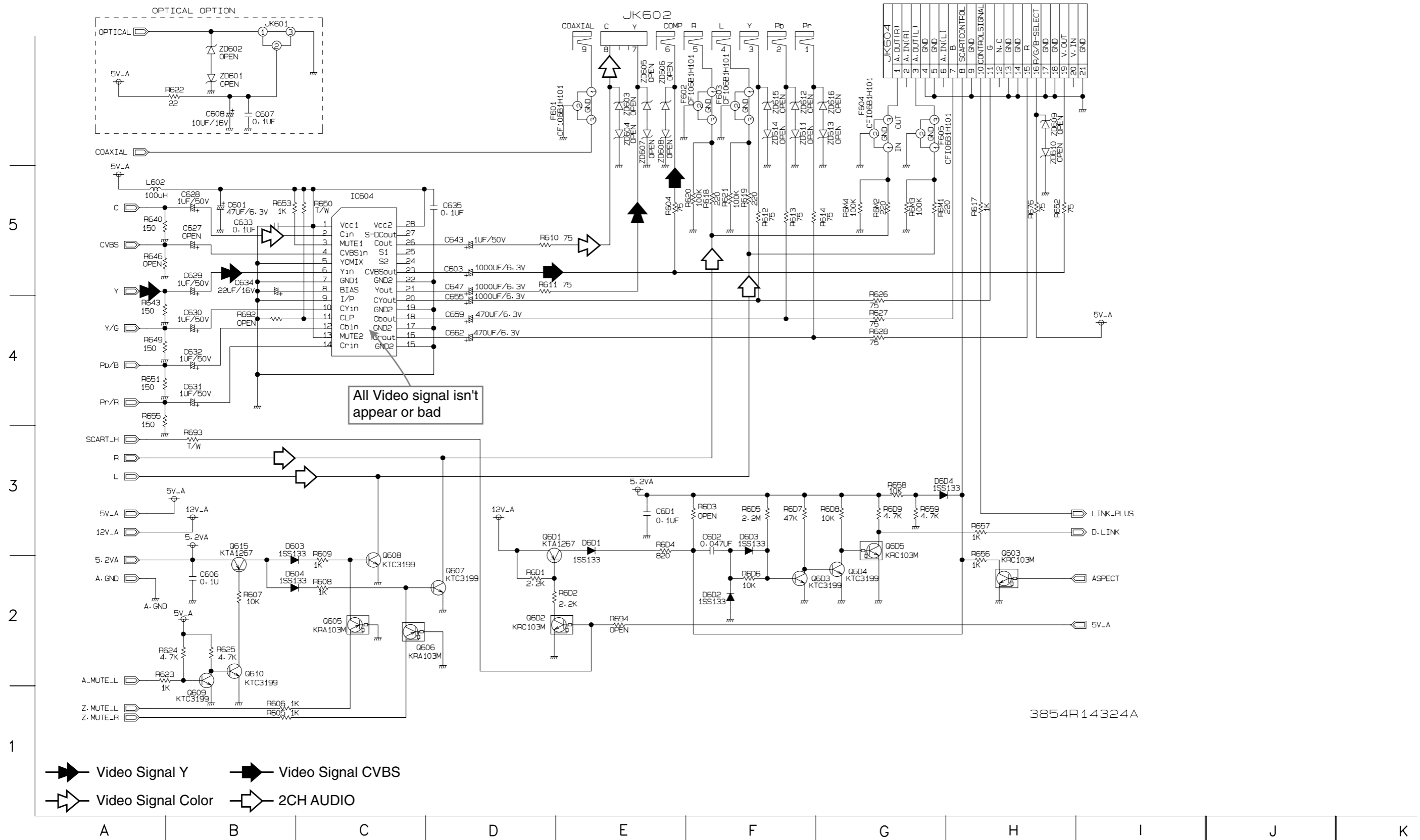
1. MAIN P.C.BOARD



LOCATION GUIDE

TP201	E4	C201	H3	C506	I5	C568	H3	R209	G5	R523	H2
TP202	E4	C202	G5	C507	I5	C569	H2	R210	G4	R524	H2
TP203	E4	C203	G5	C508	I5	C570	H2	R211	I3	R525	I2
TP204	E4	C206	H3	C509	I5	C571	I2	R212	G6	R526	I2
TP205	F5	C207	G3	C510	I5	C575	K6	R213	G6	R527	H1
TP207	D4	C208	H3	C511	I5	C576	I9	R214	H6	R528	H3
TP225	F5	C211	I3	C512	H6	C577	I9	R215	G6	R529	I2
TP226	F5	C212	H6	C513	J6	C578	I9	R216	G6	R530	H7
TP501	B6	C213	I2	C514	J6	C579	I8	R217	I2	R531	H7
TP502	C5	C214	I2	C515	J6	C580	J9	R218	I2	R532	H7
TP503	B5	C231	I2	C516	K6	C581	J9	R219	H5	R533	H7
TP504	B5	C232	J3	C517	K6	C582	H7	R220	G3	R534	K6
TP505	C5	C233	I3	C518	K6	C583	H7	R221	G3	R535	K6
TP506	C5	C234	I3	C519	K7	C589	K8	R222	G4	R564	J2
TP507	C5	C239	J3	C520	K7	C592	I2	R231	J3	R565	J3
TP508	C5	C240	J2	C521	J7	C596	H2	R232	J3	R566	J2
TP511	B6	C241	I2	C522	J8	C5A1	K4	R233	I3	R567	J2
TP512	B6	C242	J3	C523	J8	C5A2	K4	R234	I3	R572	I8
TP516	B6	C243	J2	C524	J8	CN201	G5	R235	J2	R573	I8
TP517	B6	C244	J3	C525	I8	CN202	G6	R236	J2	R574	I8
TP518	C5	C245	J2	C526	I7	CN203	H9	R237	J3	R577	H8
TP519	B6	C251	H5	C527	I7	D501	G7	R238	J3	R578	I7
TP520	B6	C252	H5	C528	I7	F500	K7	R239	J3	R5A7	K6
TP521	B6	C253	H4	C529	I7	F501	I8	R240	J2	R5A9	K6
TP522	C6	C254	H4	C530	I7	IC201	J4	R241	J2	TP206	H6
TP523	C6	C255	H4	C531	I7	IC202	J3	R242	J2	TP208	I5
TP524	C6	C256	H4	C532	I7	IC501	J7	R243	J2	TP209	I5
TP525	B5	C257	H4	C533	I7	IC502	K9	R244	J2	TP210	I5
TP526	B4	C258	H4	C534	I7	IC503	I9	R245	J2	TP211	I5
TP528	B5	C259	H4	C535	H6	IC505	K6	R246	J2	TP212	I4
TP529	B5	C260	H4	C536	I6	IC506	K9	R251	H3	TP213	J5
TP531	B5	C261	H4	C537	I6	IC510	H2	R252	I4	TP214	J4
TP533	C5	C262	H3	C538	I6	IC5A1	K5	R253	I5	TP215	J5
TP535	B5	C263	I3	C539	I6	J6	K7	R254	I5	TP216	J4
TP538	B5	C264	I3	C540	I6	L201	G3	R255	I5	TP217	J4
TP540	C5	C265	I3	C541	H6	L202	G5	R256	I5	TP218	J4
TP542	B5	C266	I4	C542	I6	L203	G3	R257	I5	TP219	J4
TP544	B5	C267	I4	C543	H6	L204	I2	R258	I4	TP220	J4
TP545	B5	C268	I4	C544	H6	L205	H5	R259	I4	TP221	J3
TP547	B5	C269	I4	C545	H6	L231	I2	R501	I6	TP222	J2
TP559	D7	C270	I4	C546	H7	L251	J3	R502	I5	TP223	J2
TP565	D6	C271	I4	C547	H7	L501	I7	R503	I6	TP224	H5
TP575	B6	C272	I4	C548	G7	L502	H8	R504	I5	TP550	J2
TP576	B6	C273	I4	C549	H7	L503	K6	R505	K6	TP551	J2
TP+ICE	L7	C274	I5	C550	I1	L504	K4	R506	J7	TP552	J5
		C275	I5	C551	H8	P5401	H8	R507	I7	TP553	K6
		C276	I5	C552	H8	P5901	G2	R508	H7	TP554	I7
		C277	I5	C553	G8	Q201	G4	R509	I7	TP555	I7
		C278	I5	C554	H9	Q202	G4	R510	I7	TP557	H7
		C279	I5	C555	H9	Q203	G4	R511	I6	TP558	I6
		C280	H5	C556	K8	Q204	G3	R512	I6	TP560	I6
		C281	H5	C557	K9	Q205	G3	R513	I6	TP561	I6
		C282	I4	C558	K9	Q501	H2	R514	I6	TP562	I5
		C283	I4	C559	K9	R201	G3	R515	K8	TP563	J2
		C284	I4	C560	J9	R202	G4	R516	K8	TP564	K3
		C291	H5	C561	J9	R203	G4	R517	K8	TP+ALE	K6
		C292	I3	C562	J9	R204	G4	R518	K8	TP+MA11	K8
		C293	I3	C563	J9	R205	G3	R519	K8	TP+RFRP	D6
		C295	J4	C564	K9	R206	G3	R520	J8	TP+URD#	K7
		C502	I6	C565	H2	R207	G4	R521	K7	TP+UWR#	K7
		C503	I6	C566	H2	R208	G4	R522	K8	X501	H7
		C504	I6	C567	H2						
		C505	I6								

6. JACK CIRCUIT DIAGRAM



All Video signal isn't appear or bad

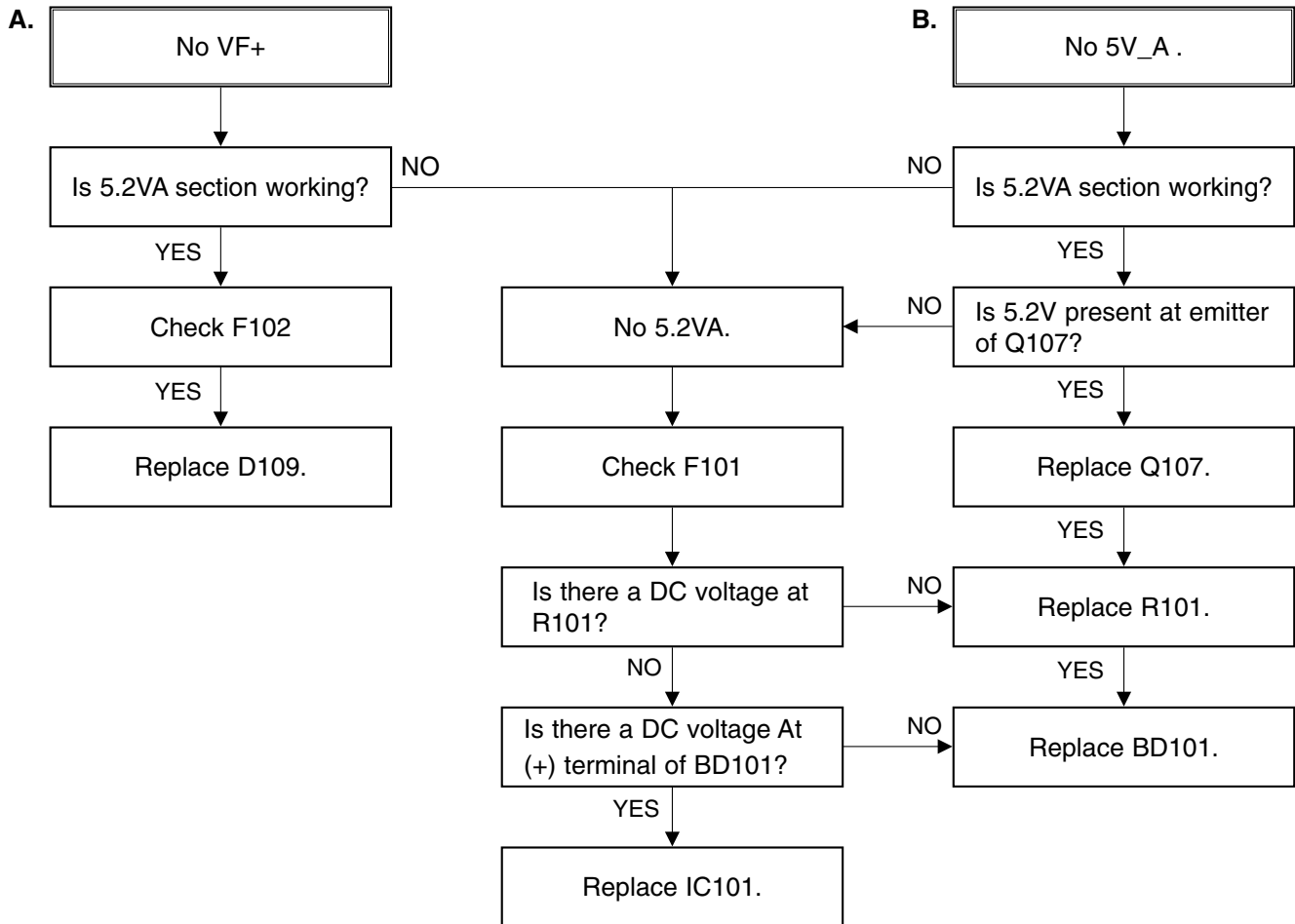
3854R14324A

SECTION 3 ELECTRICAL CONTENTS

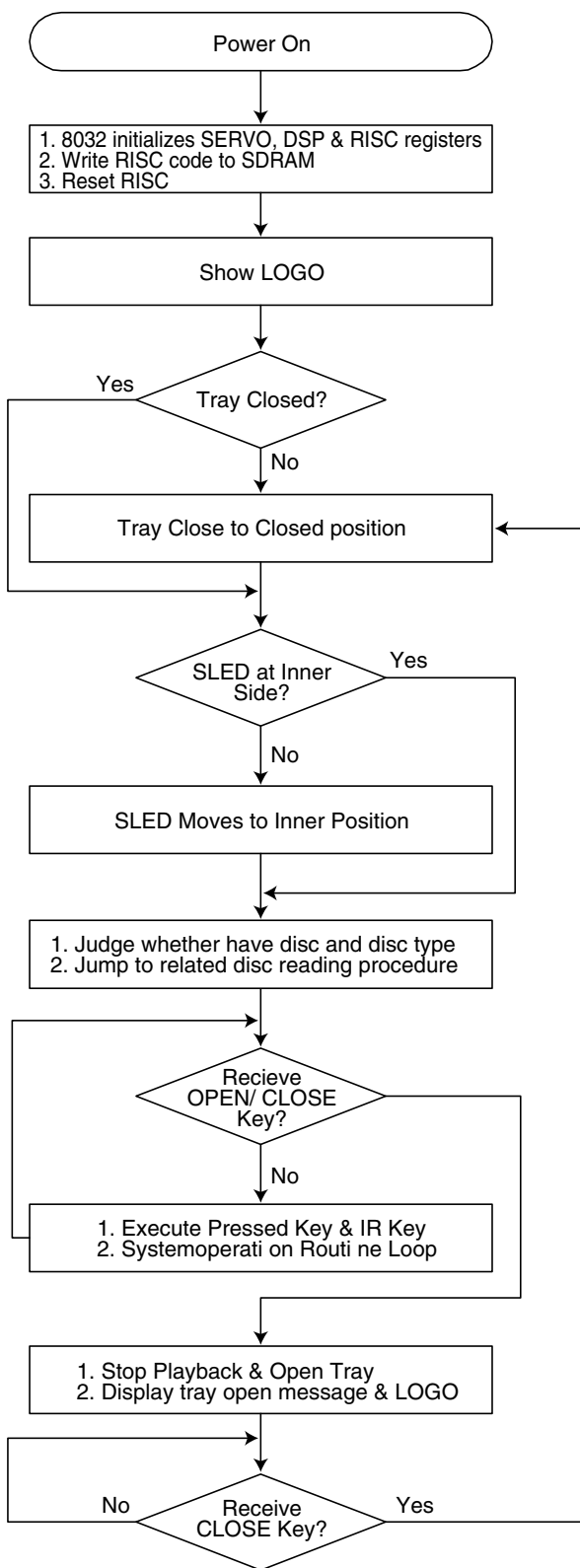
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ELECTRICAL TROUBLESHOOTING GUIDE

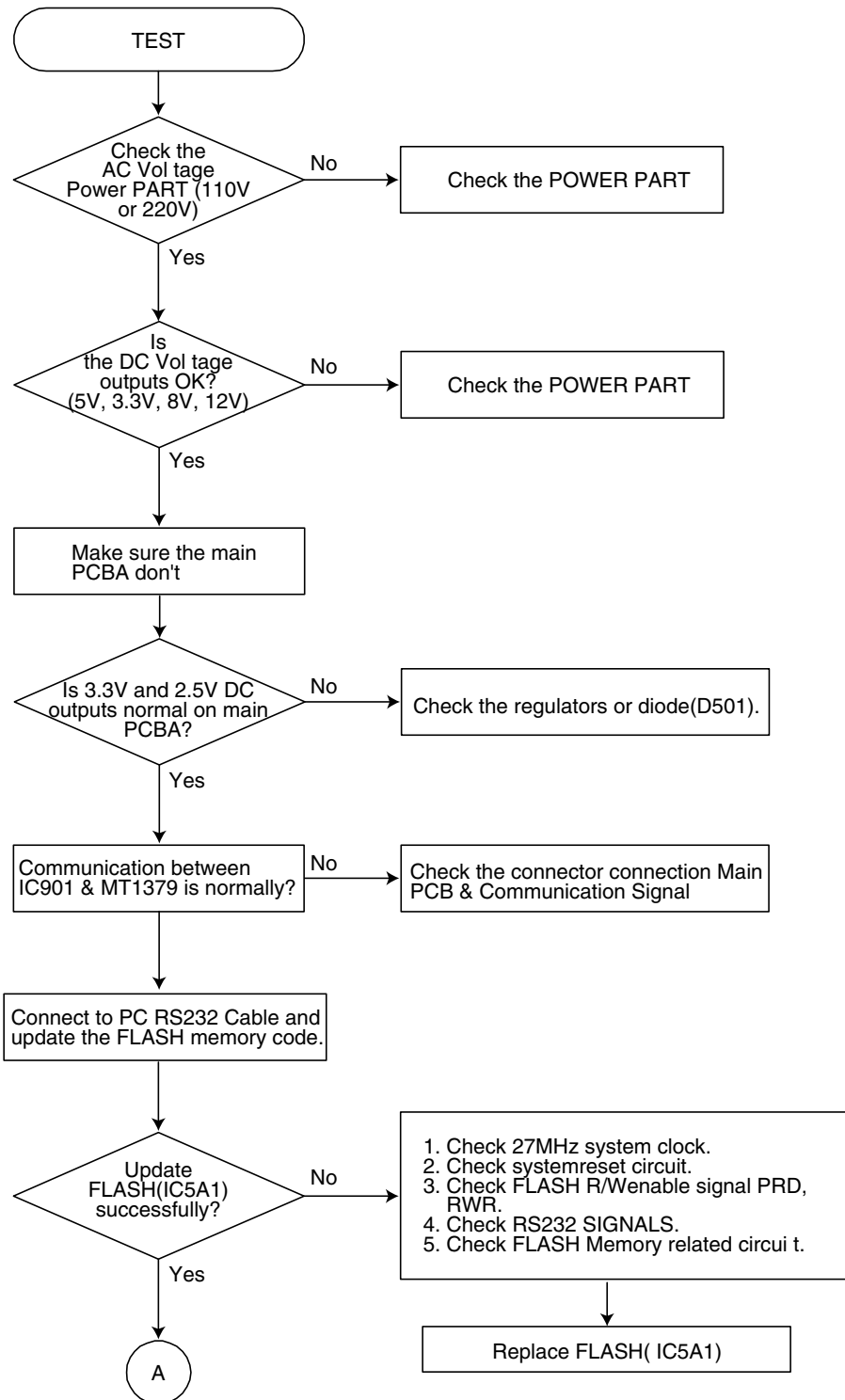
1. Power check flow

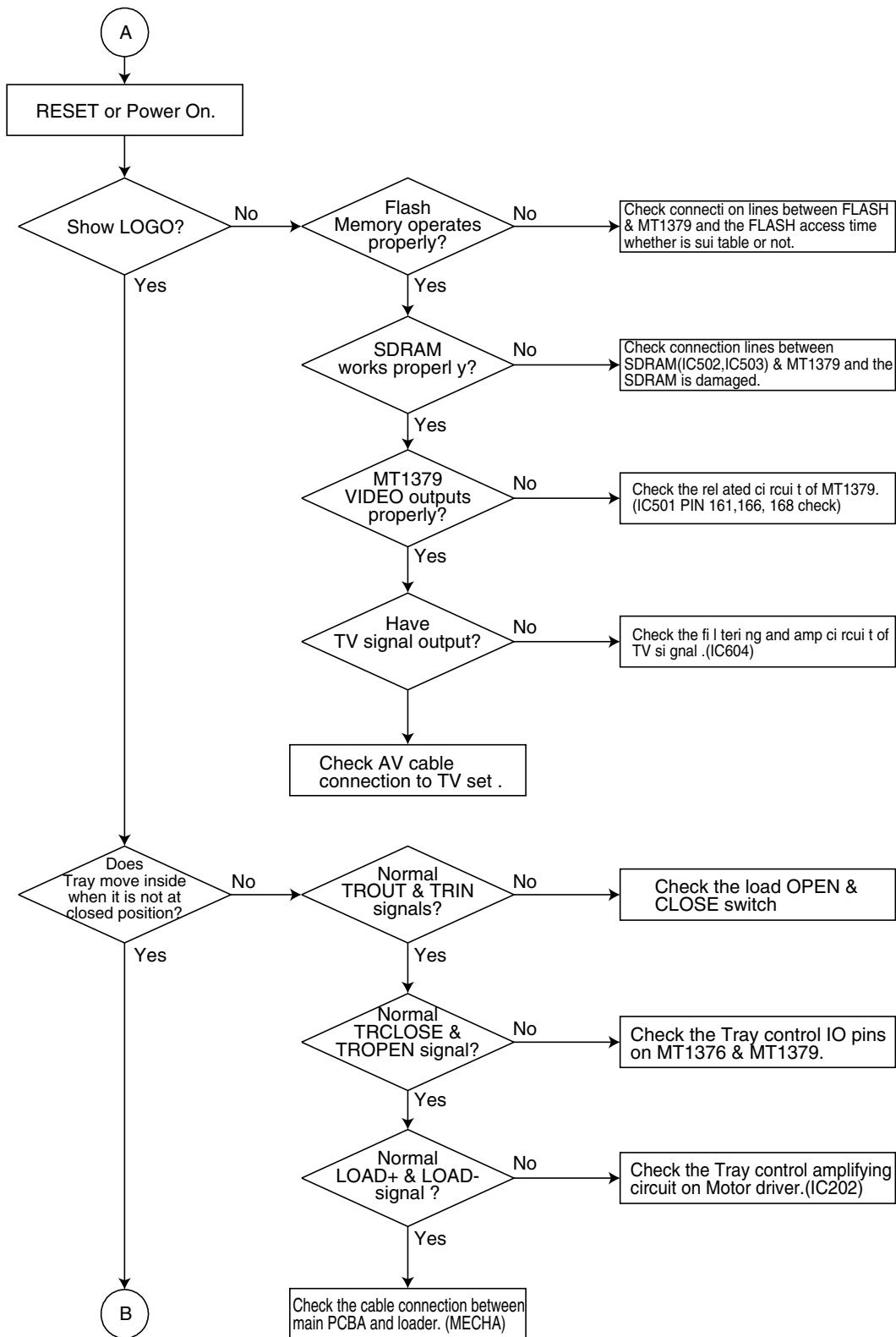


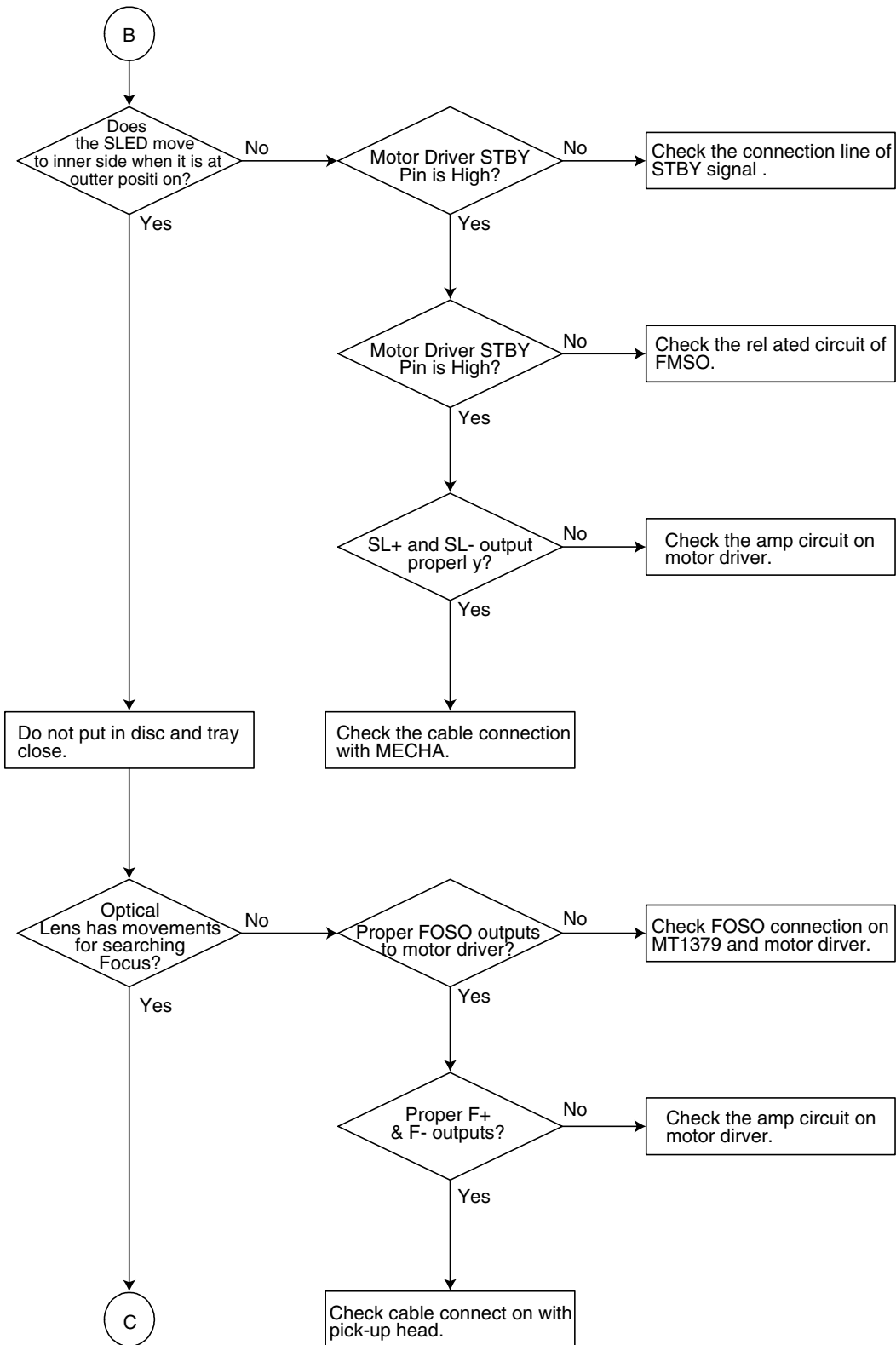
2. System operation flow

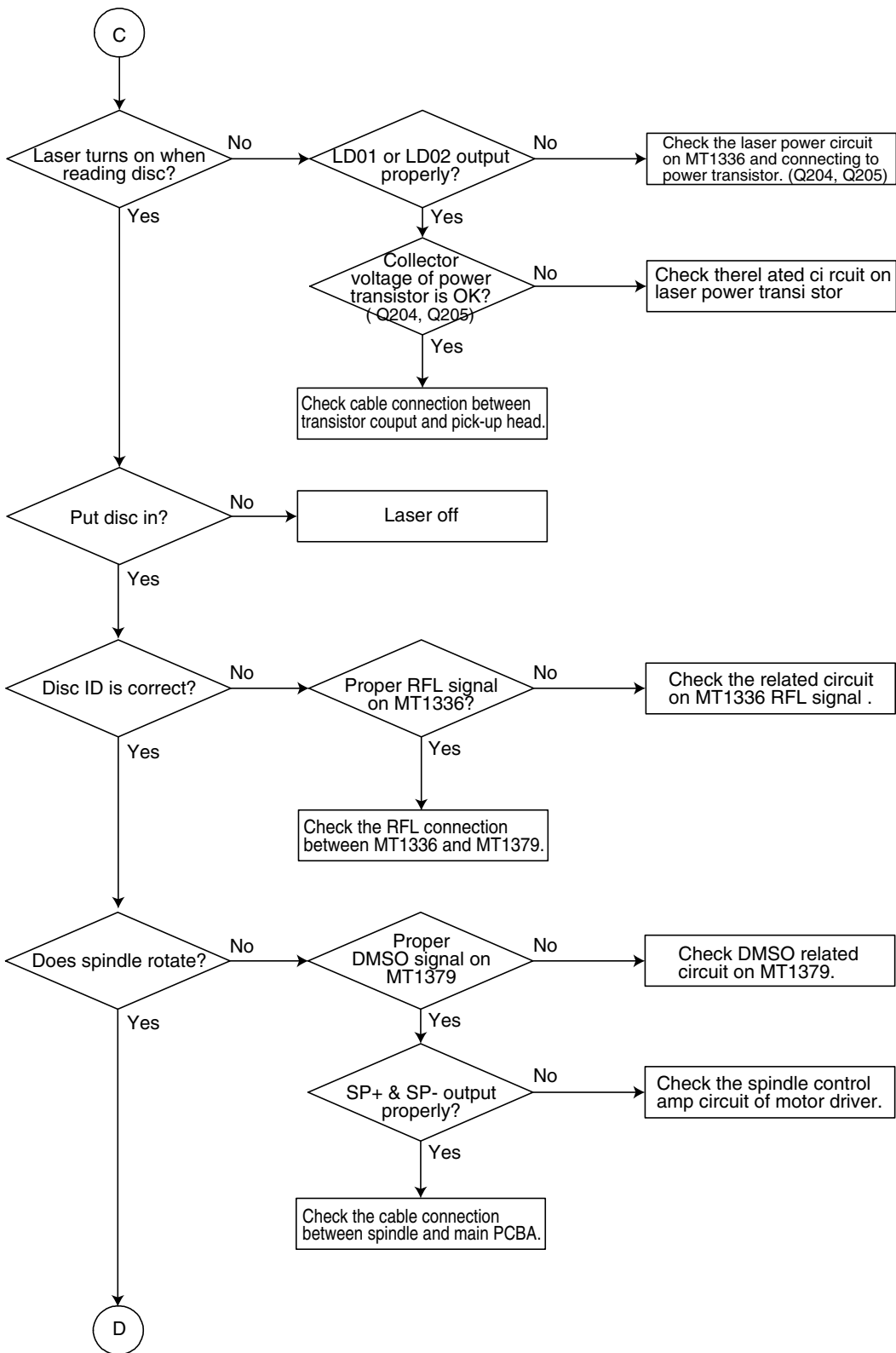


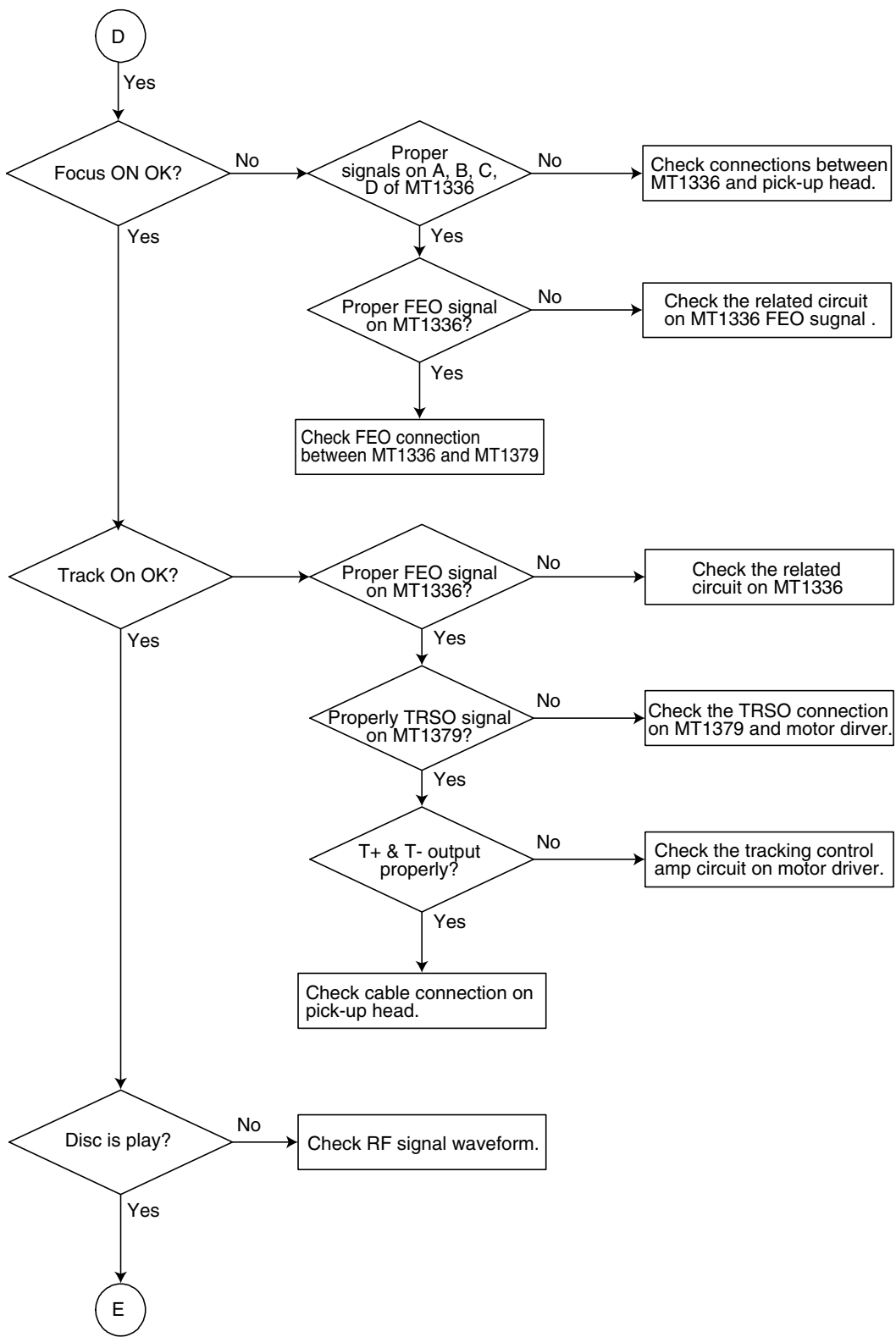
3. Test & debug flow

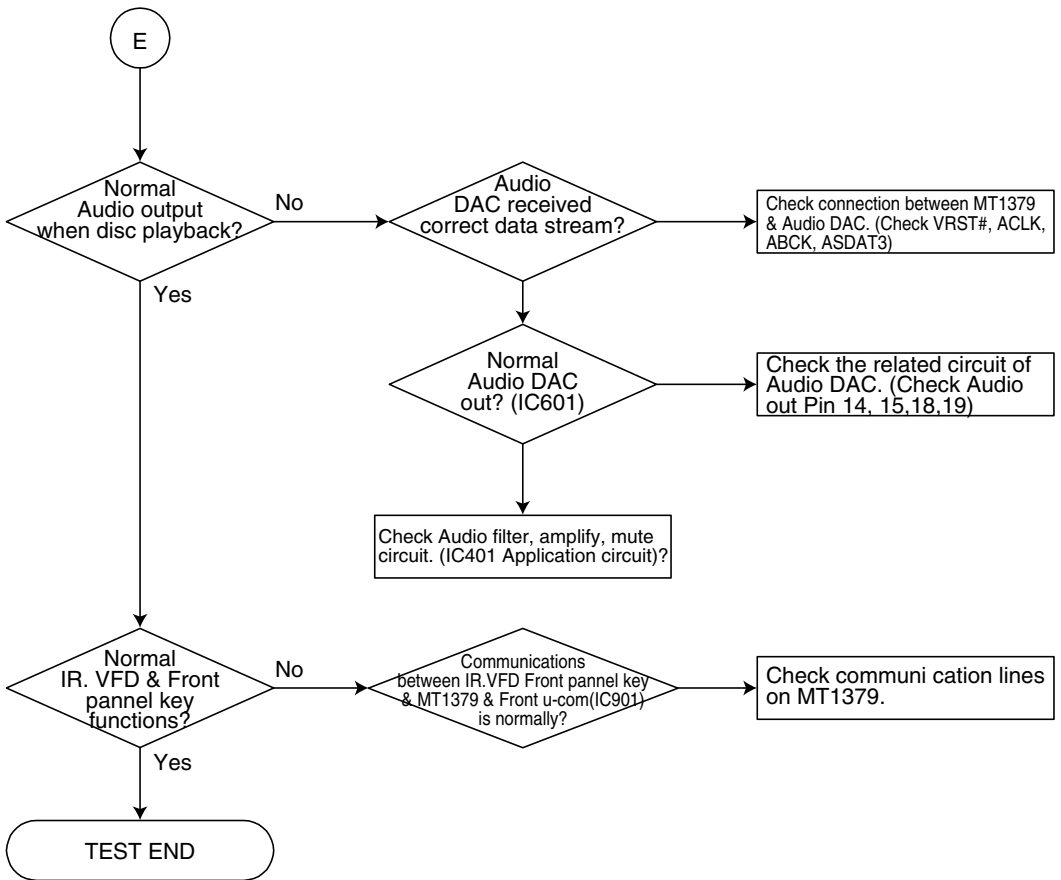












DETAILS AND WAVEFORMS ON SYSTEM TEST AND DEBUGGING

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

1) MT1379 main clock is at 27MHz(X501)

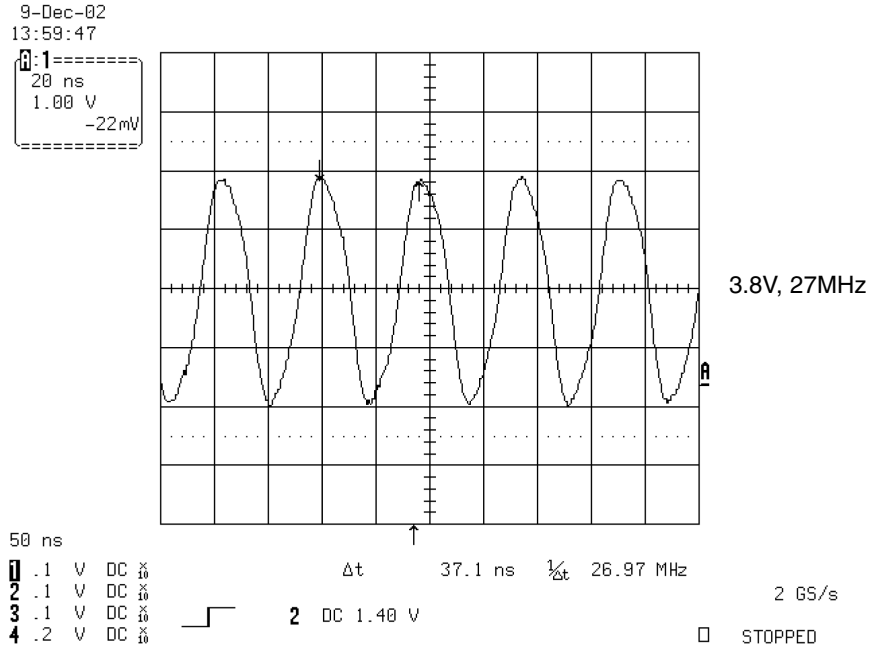


FIG 1-1

2) MT1379 & MT1336 reset is high active.

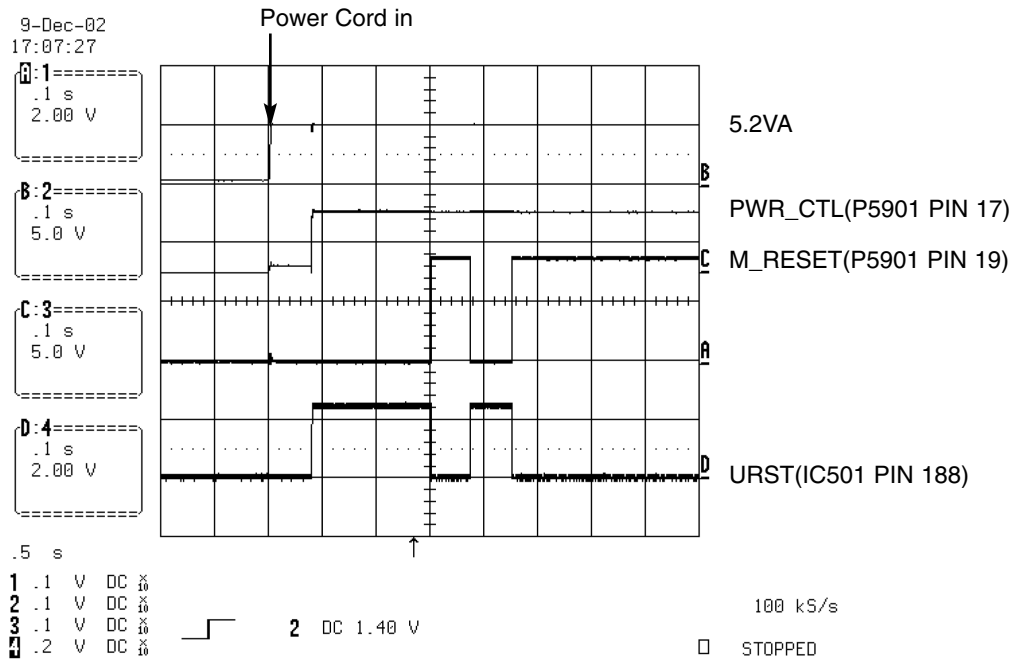


FIG 1-2

3) RS232 waveform during procedure(Downloading)

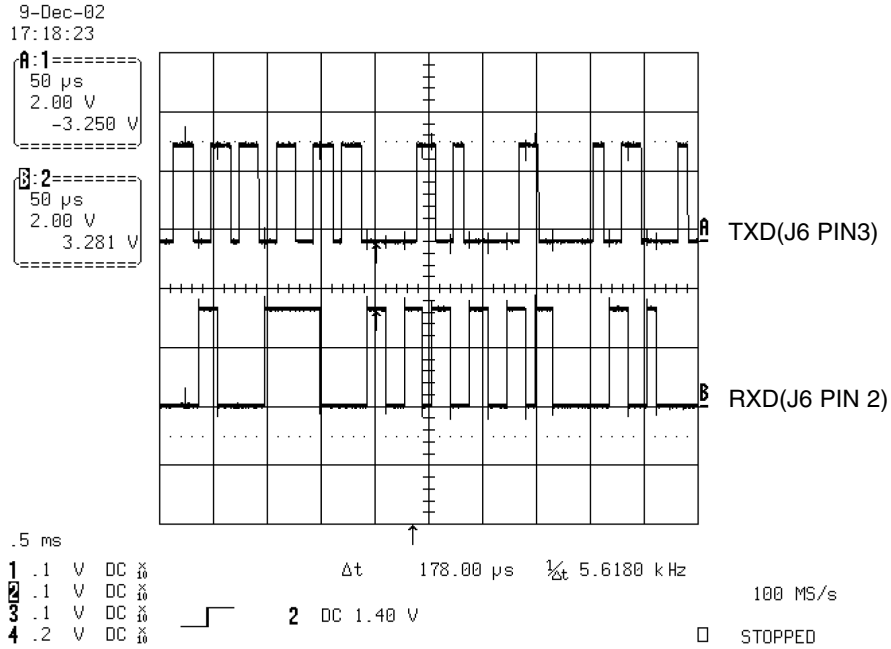


FIG 1-3

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

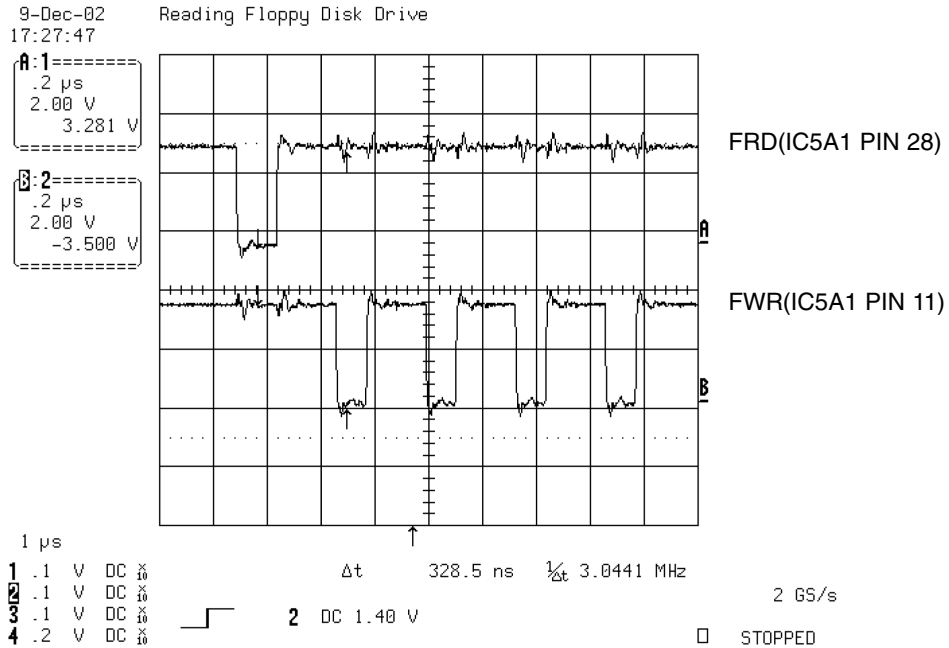


FIG 1-4

2. SDRAM CLOCK

1) MT1379 main clock is at 27MHz(X501)

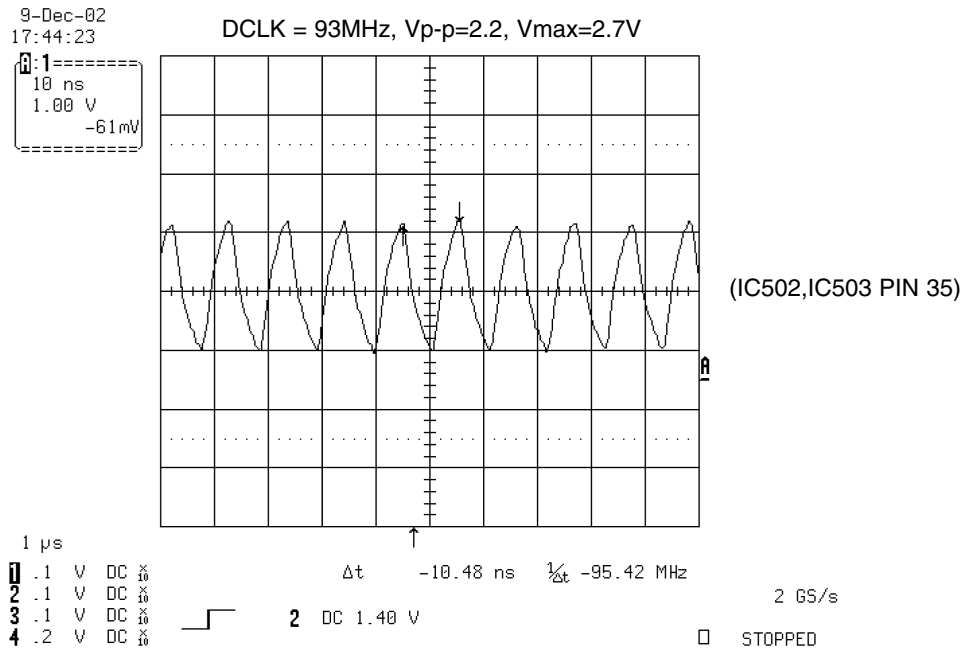


FIG 2-1

3. TRAY OPEN/CLOSE SIGNAL

1) Tray open/close waveform

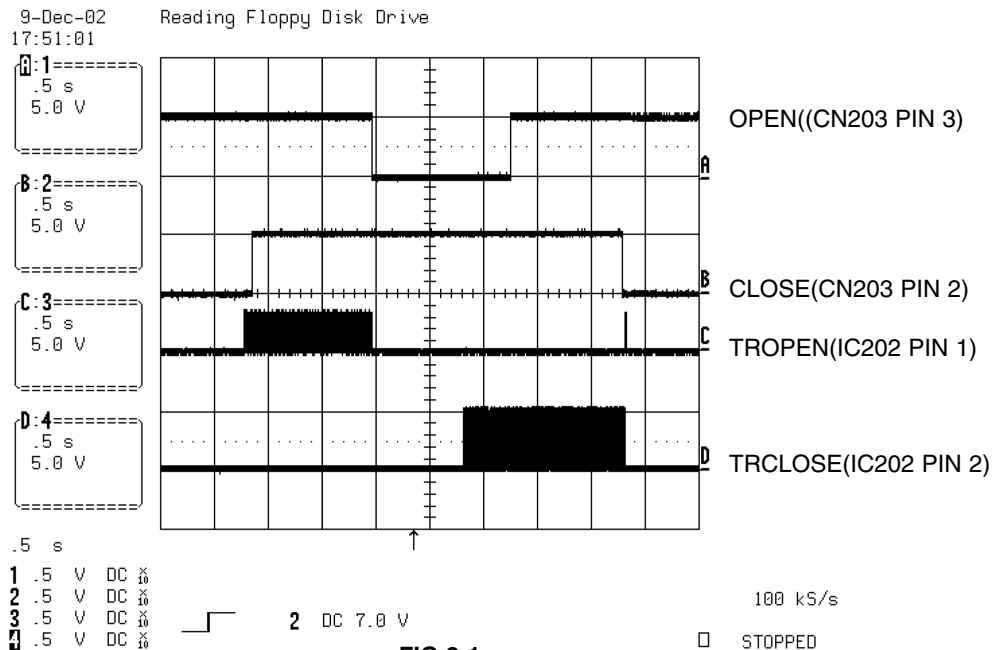


FIG 3-1

2) Tray close waveform

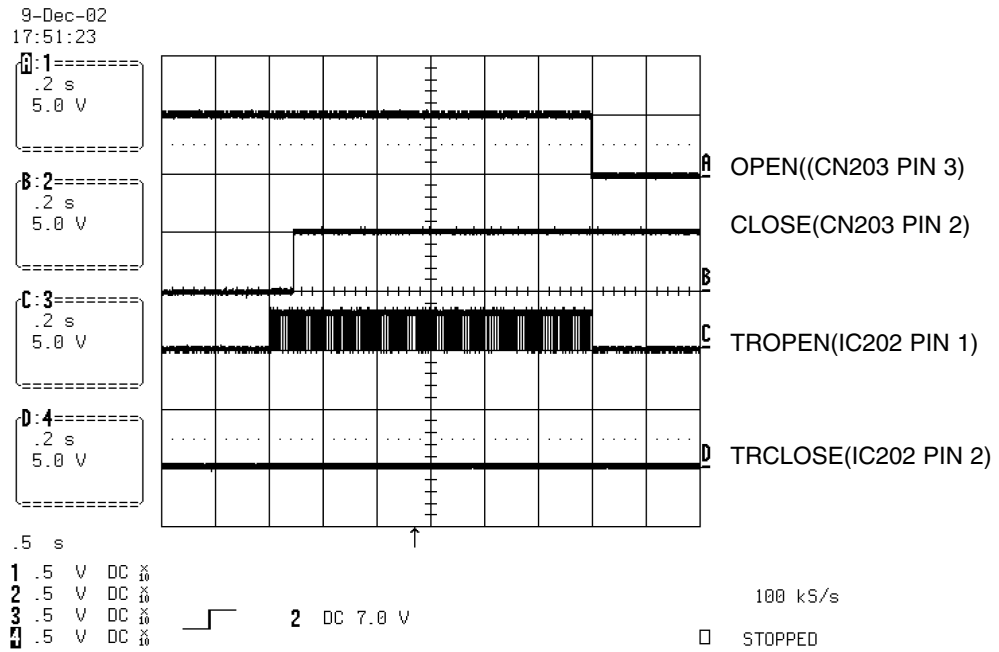


FIG 3-2

3) Tray open waveform

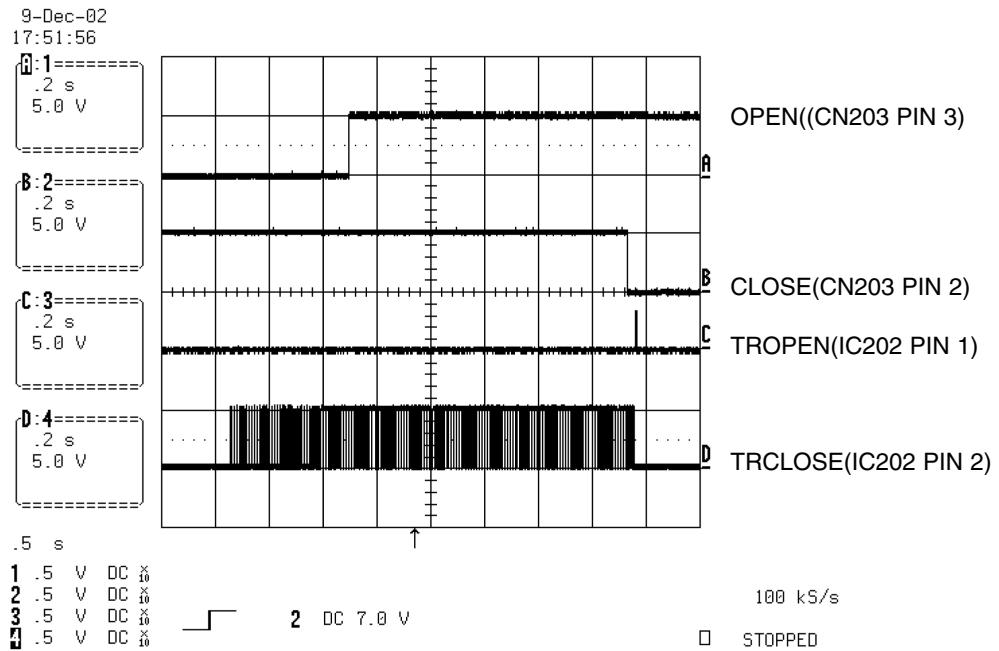


FIG 3-3

4. SLED CONTROL RELATED SIGNAL (NO DISC CONDITION)

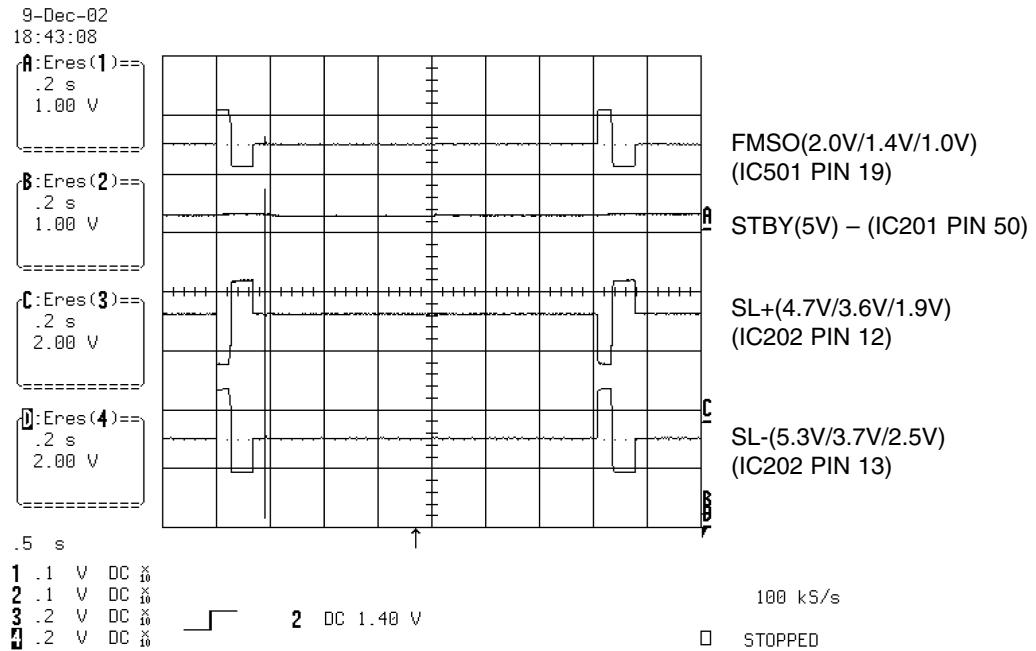


FIG 4-1

5. LENS CONTROL RELATED SIGNAL(NO DISC CONDITION)

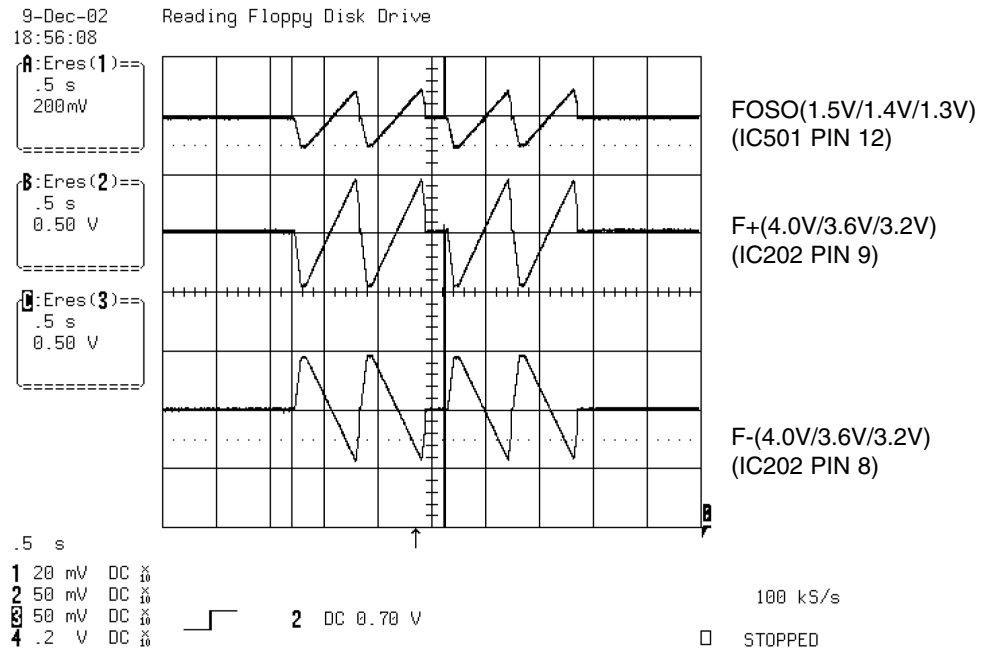


FIG 5-1

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

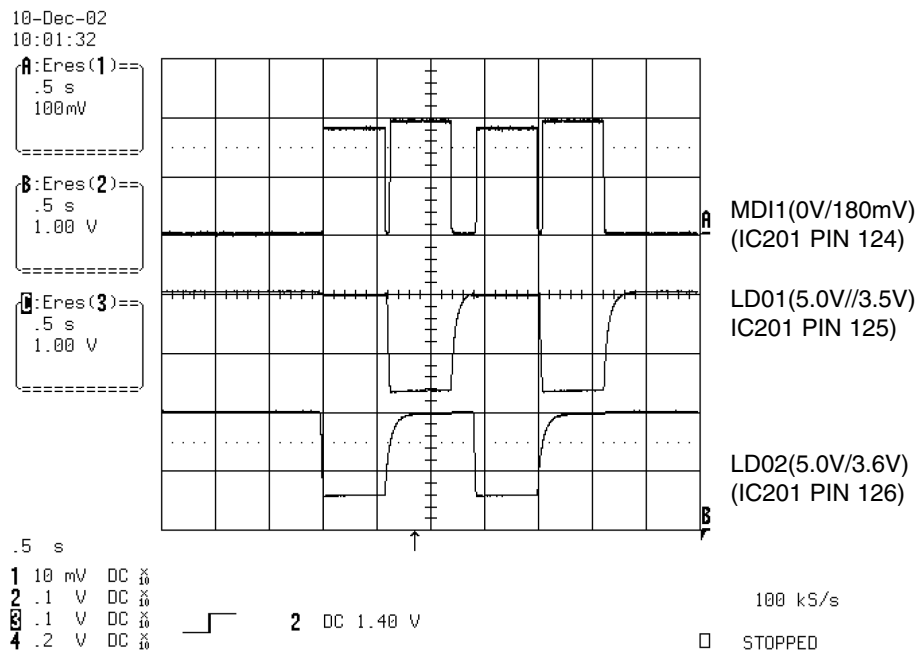


FIG 6-1

7. DISC TYPE JUDGEMENT WAVEFORM

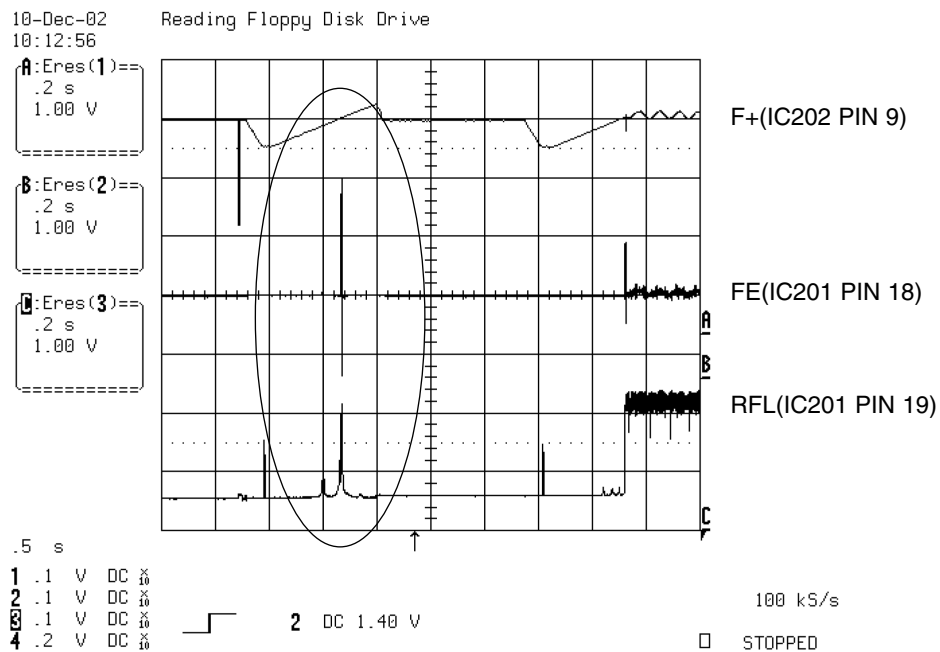


FIG 7-1 (DVD)

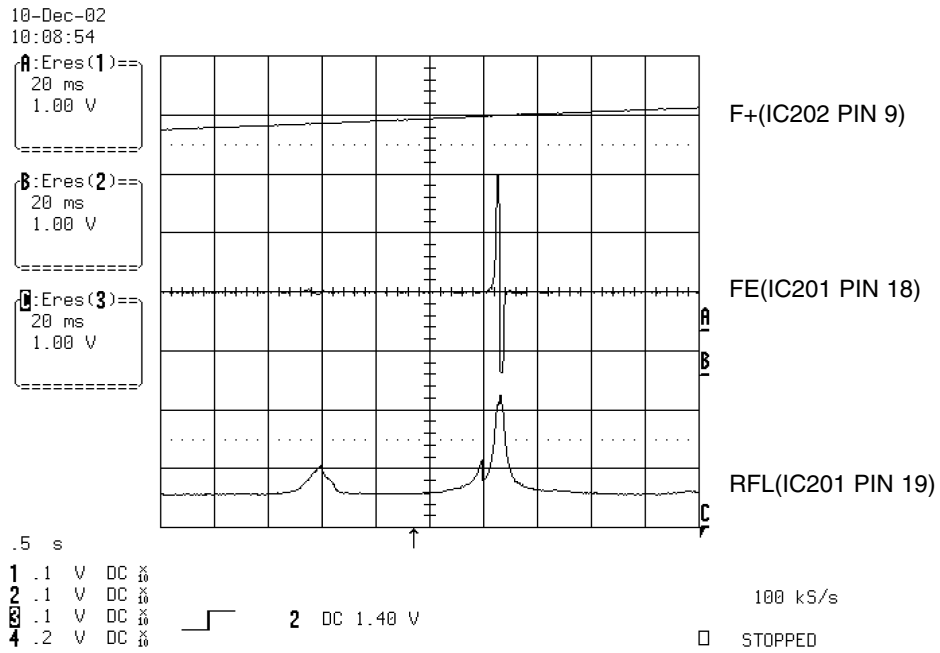


FIG 7-2 (DVD)

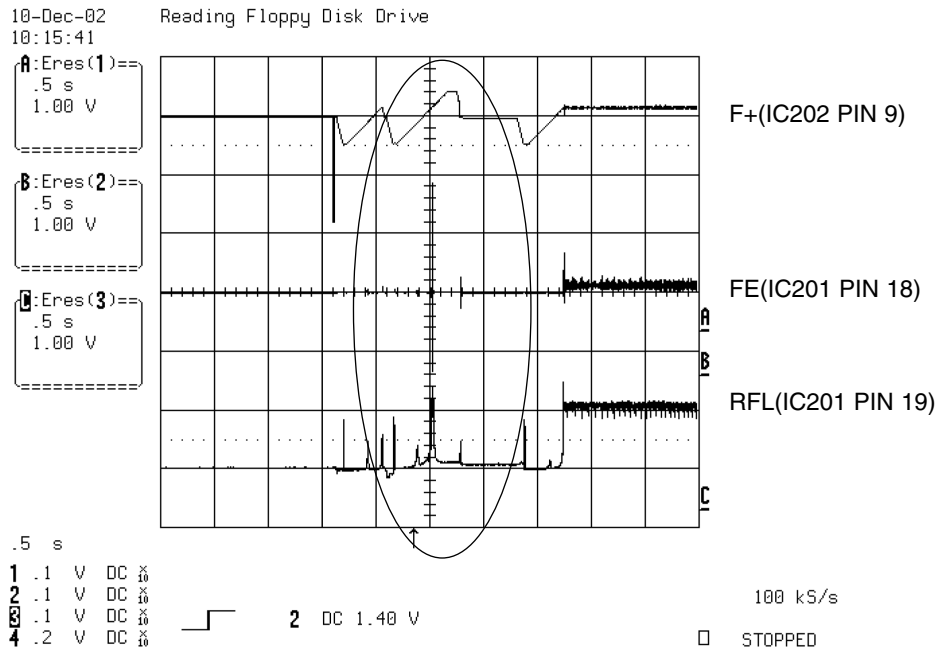


FIG 7-3 (CD)

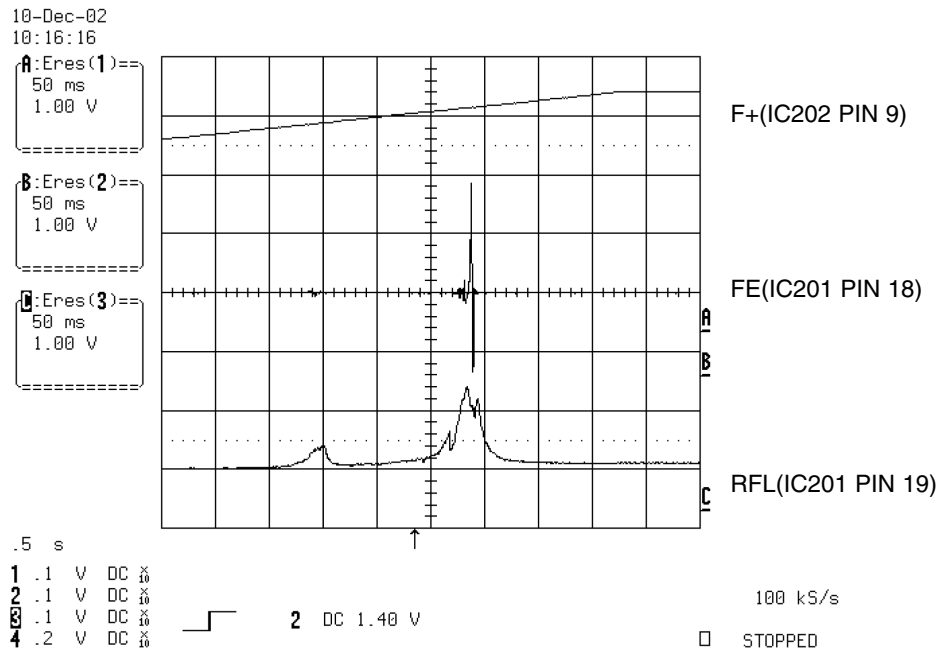


FIG 7-4 (CD)

8. FOCUS ON WAVEFORM

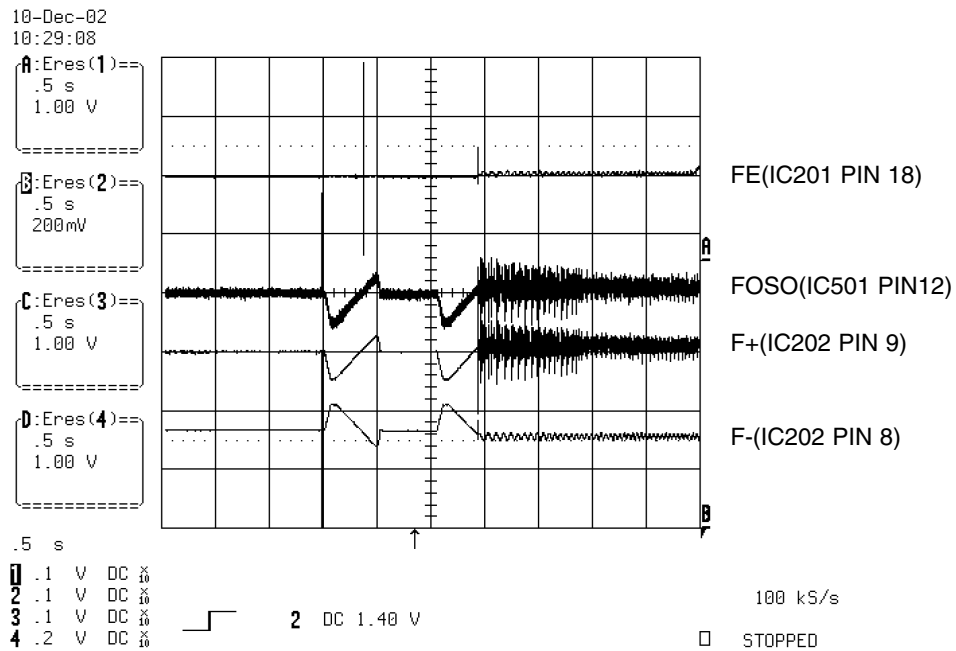


FIG 8-1 (DVD)

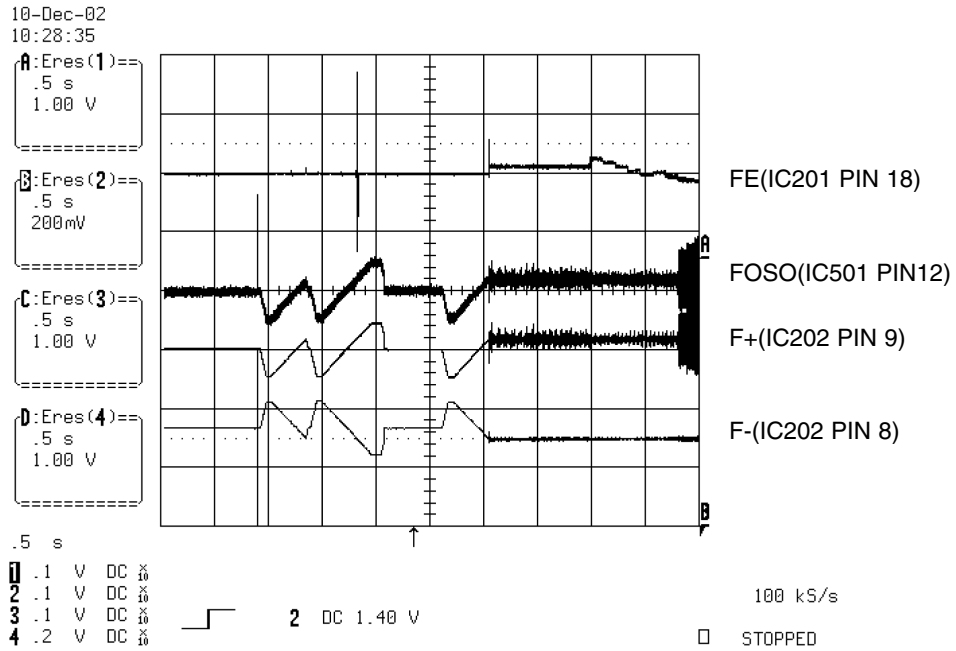


FIG 8-2 (CD)

9. SPINDLE CONTROL WAVEFORM (NO DISC CONDITION)

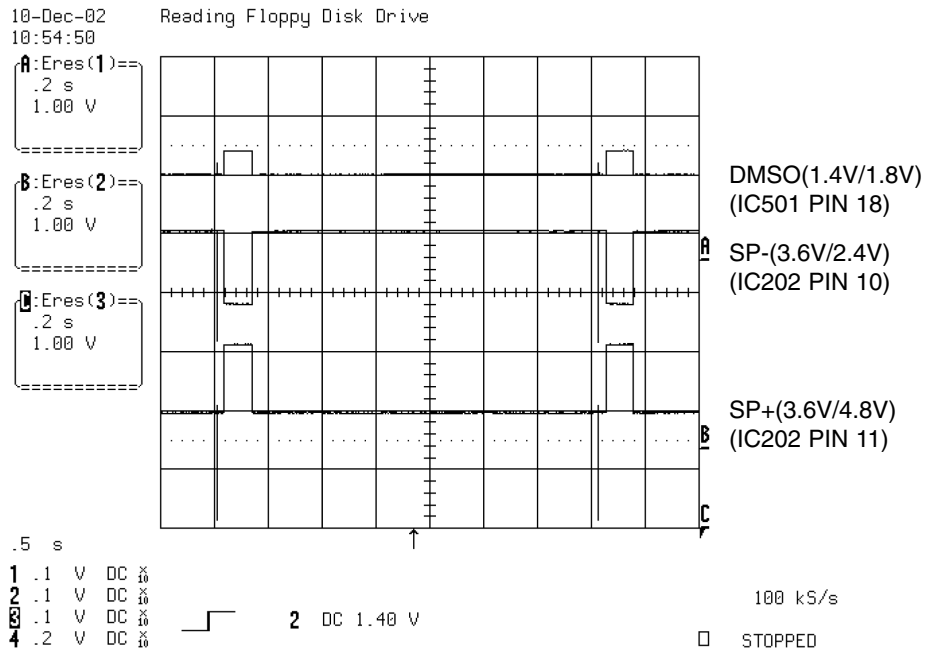


FIG 9-1

10. TRACKING CONTROL RELATED SIGNAL(System checking)

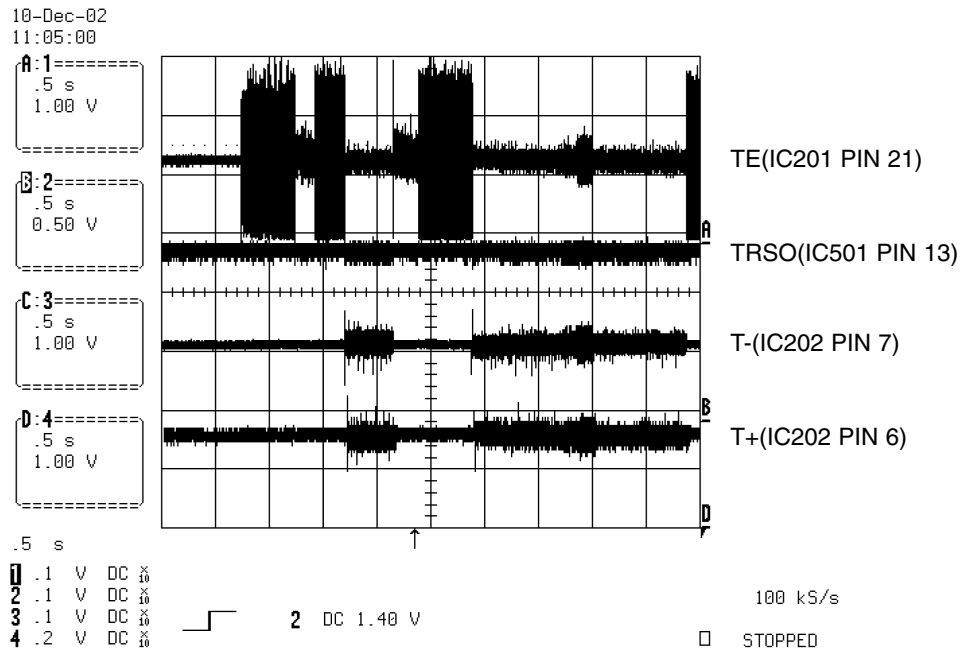


FIG 10-1(DVD)

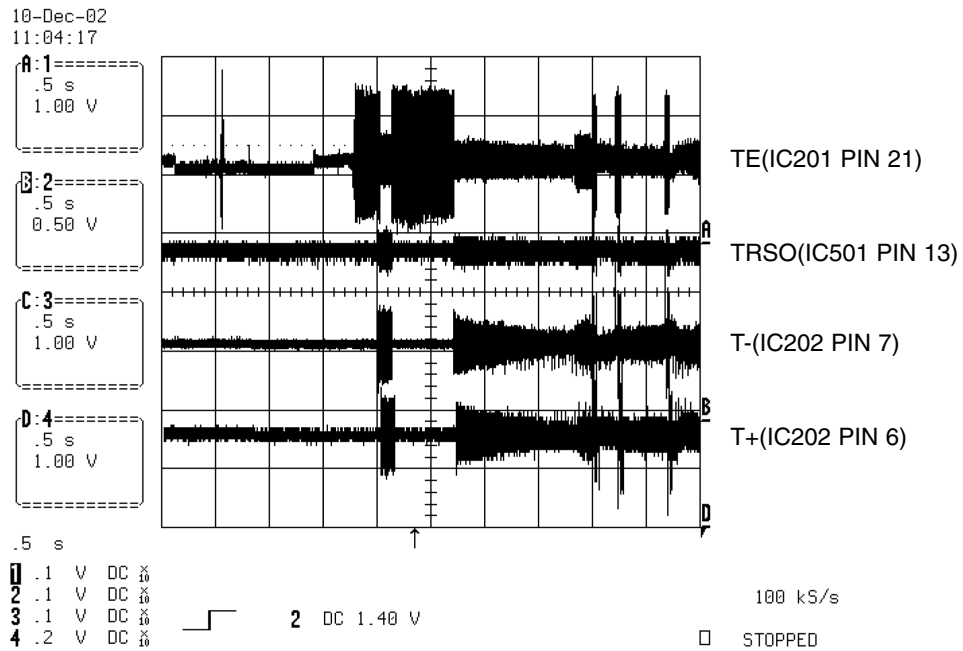


FIG 10-2(CD)

11. RF WAVEFORM

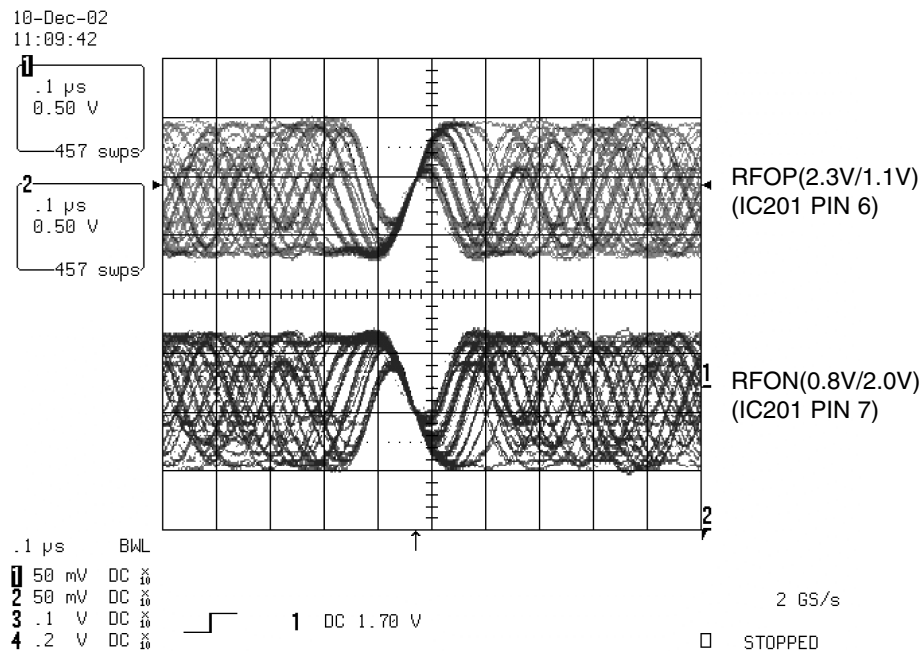


FIG 11-1

12. MT1379 AUDIO OPTICAL AND COAXIAL OUTPUT (ASPDIF)

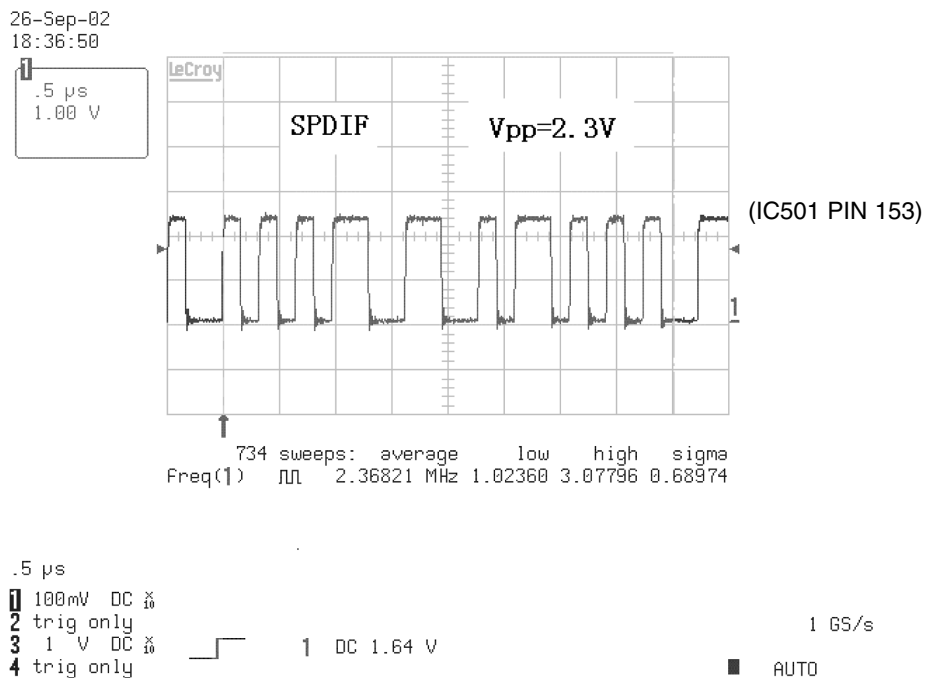


FIG 12-1

13. MT1379 VIDEO OUTPUT WAVEFORM

1) Full colorbar signal(CVBS)

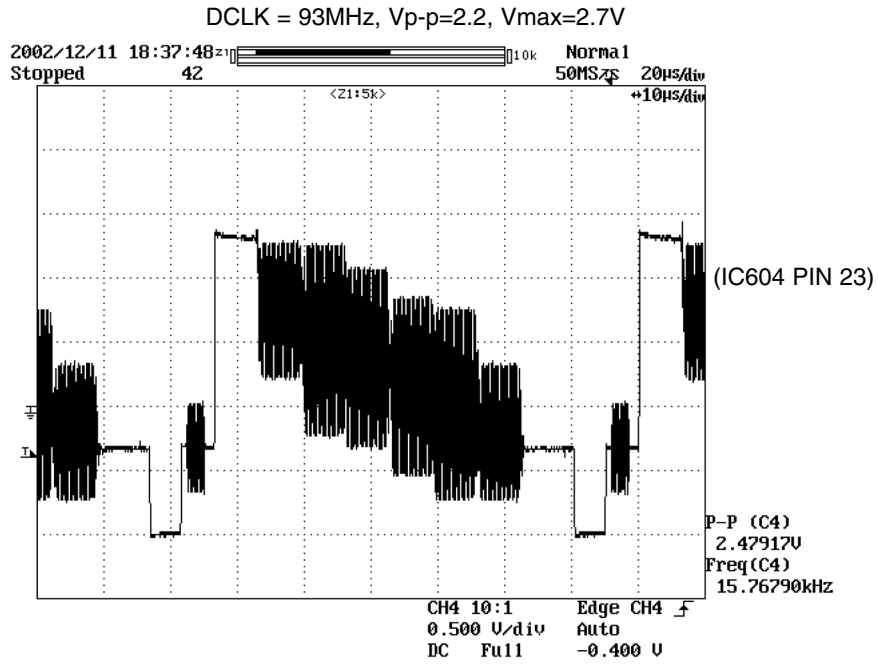


FIG 13-1

2) Y

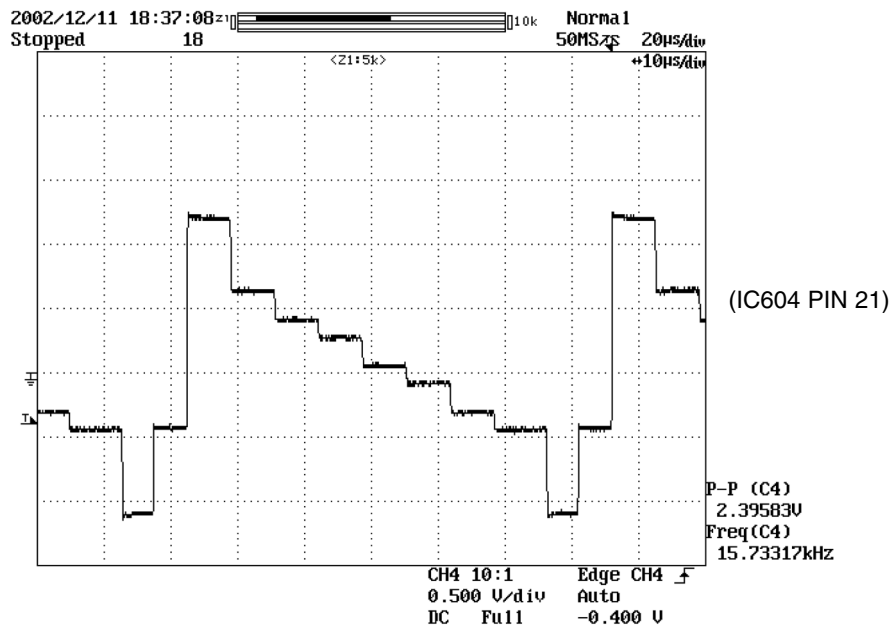


FIG 13-2

3) C

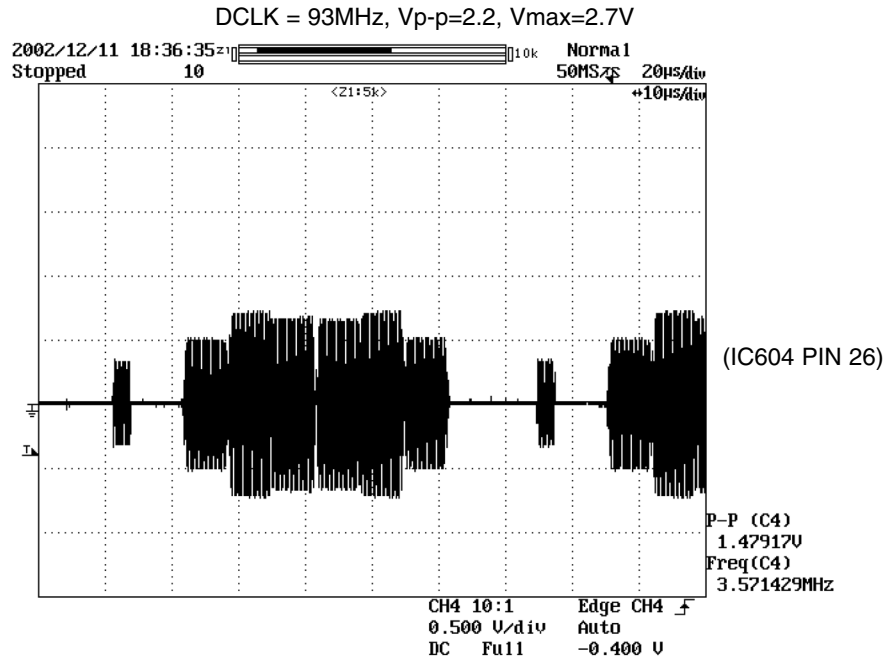


FIG 13-3

14. AUDIO OUTPUT FROM AUDIO DAC

1) Audio L/R

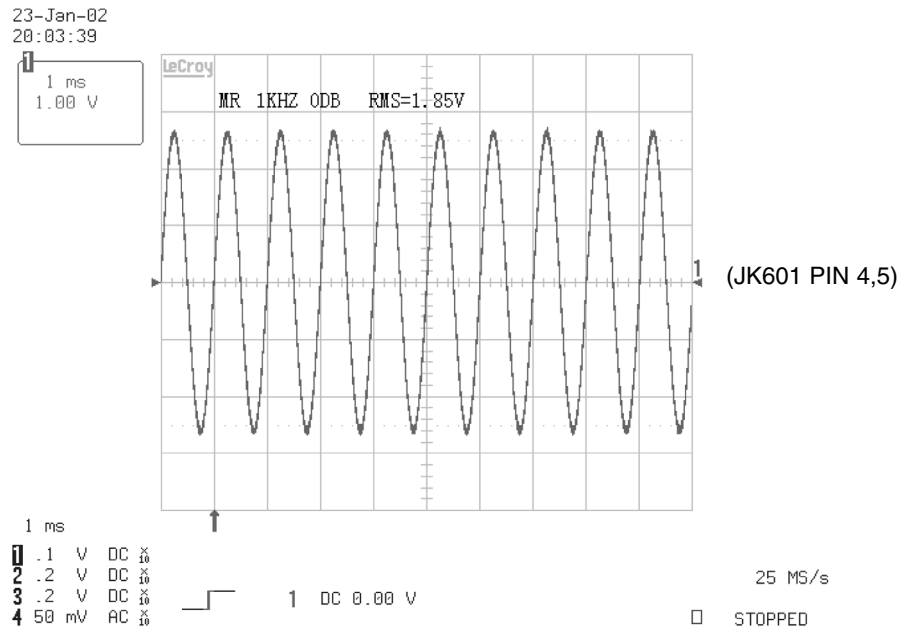


FIG 14-1

2) Audio related Signal

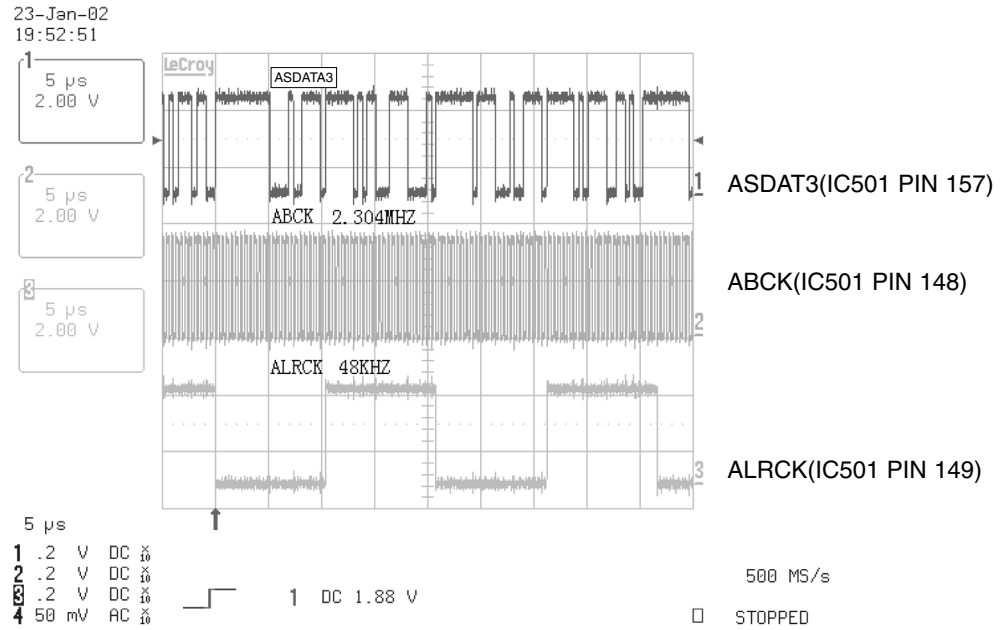
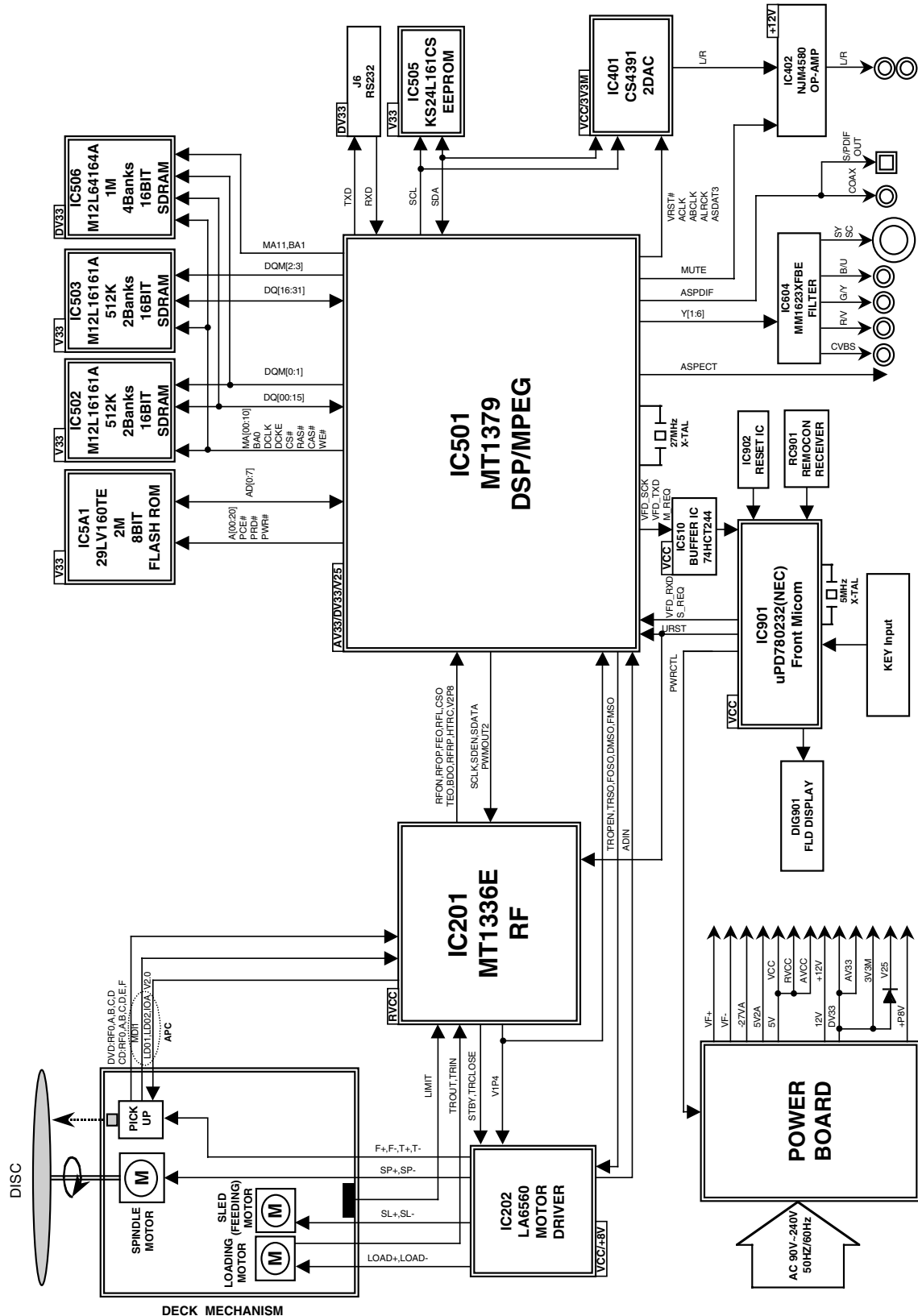


FIG 14-2

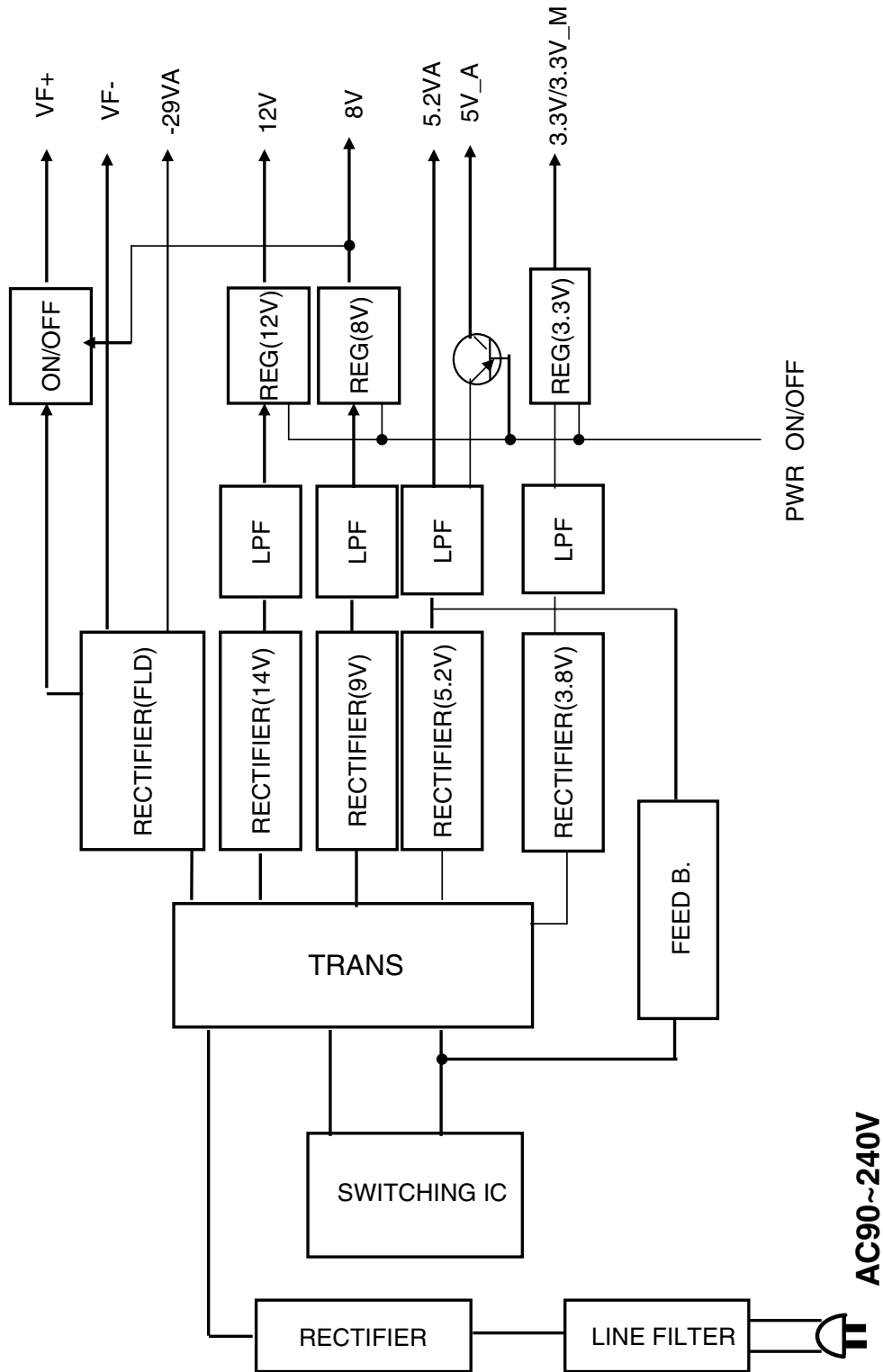
BLOCK DIAGRAMS

1. Overall Block Diagram



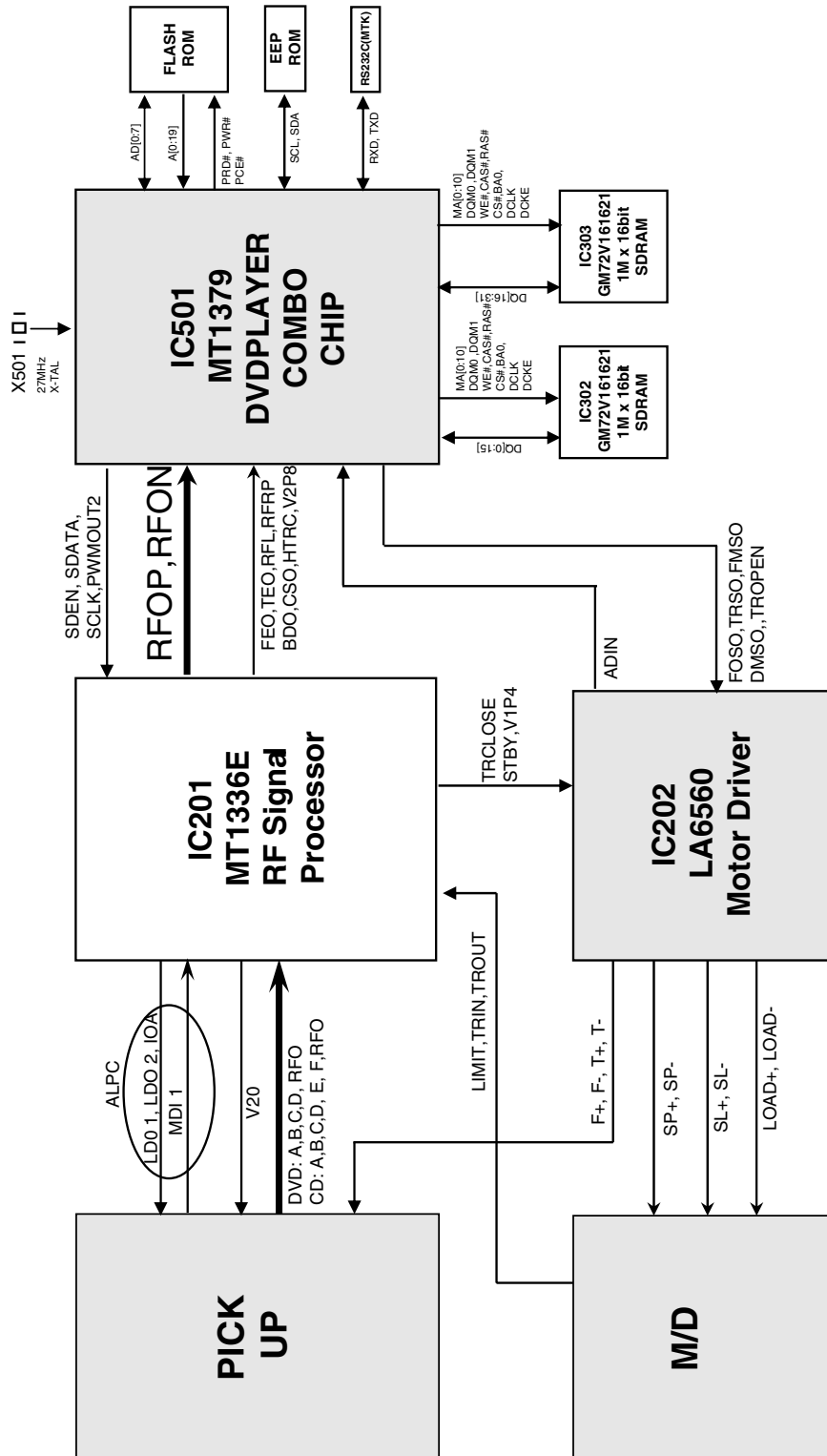
LOEWE

2. Power(SMPS) Block Diagram



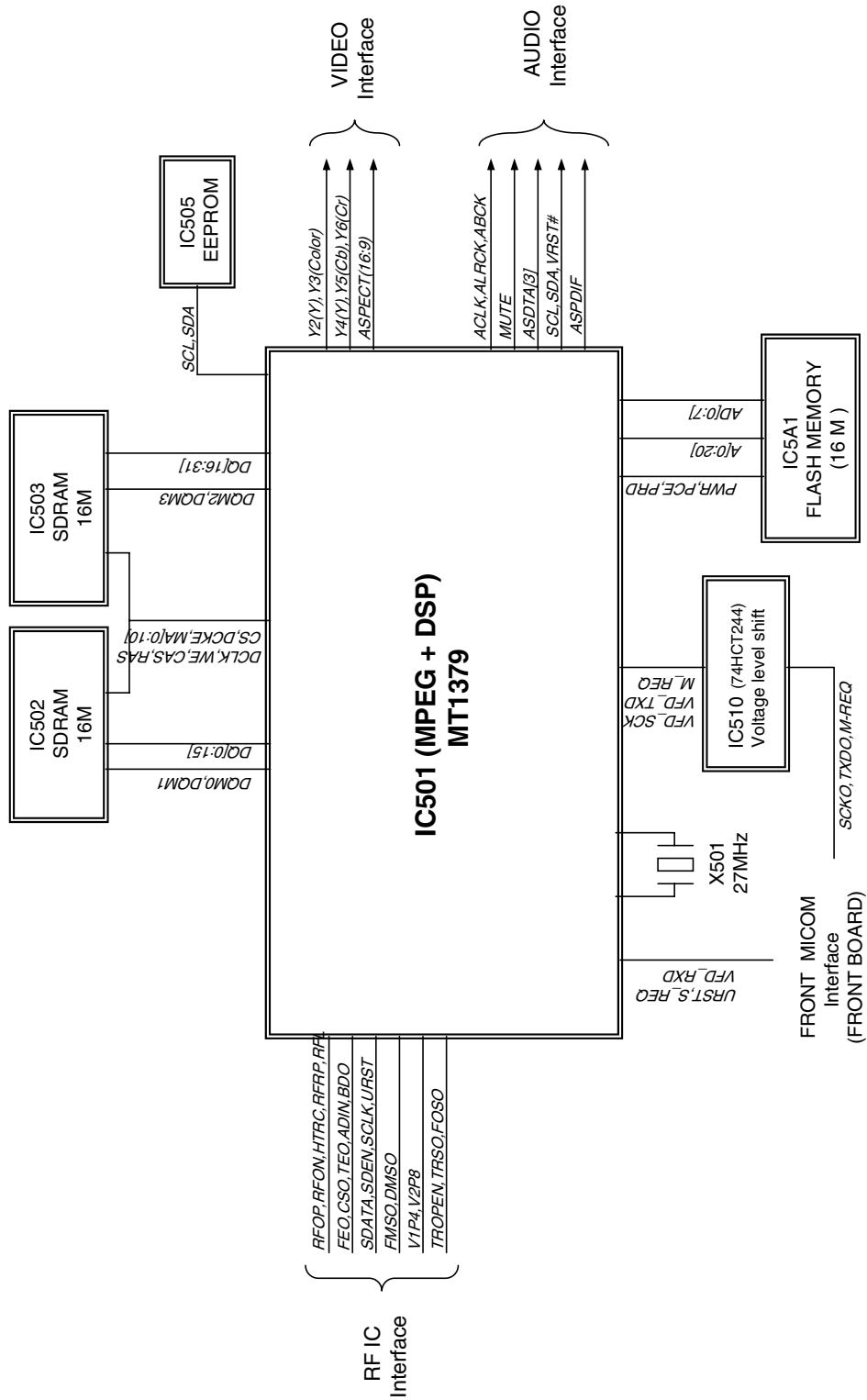
LOEWE

3. SERVO Block Diagram



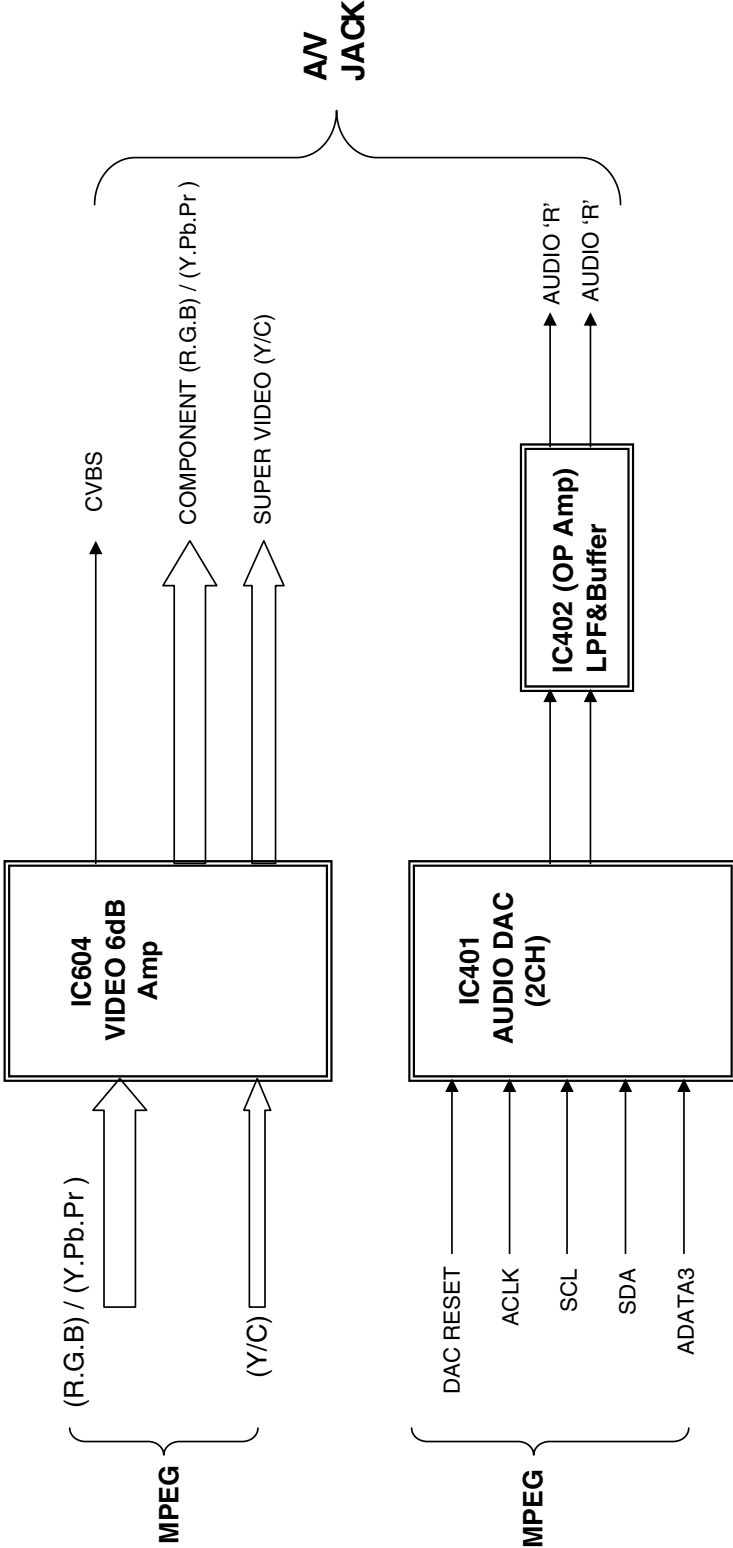
LOEWE

4. MPEG & MEMORY Block Diagram



LOEWE

5. VIDEO & AUDIO Block Diagram



LOEWE

• CIRCUIT VOLTAGE CHART

PIN	IC201(MT1336E)		IC202(MOTOR)		IC401(CS4391)		IC402(AMP)		IC501(MT1379)		IC502(SDRAM)		IC505(EEPROM)		IC510(BUFFER)		IC5A1(FLASH)		IC604(MM1623XFBE)		IC901(FUCOM)		
	STOP	PLAY	STOP	PLAY	STOP	PLAY	STOP	PLAY	STOP	PLAY	STOP	PLAY	STOP	PLAY	STOP	PLAY	STOP	PLAY	STOP	PLAY	STOP	PLAY	STOP
1	1.03	2.99	0	0	3.28	3.29	5.52	5.49	1.22	1.22	3.27	3.28	0	0	0	0	0.08	0.16	5.09	5.08	5.08	5.08	
2	5.11	5.08	0	0	3.28	3.28	5.52	5.48	0	0	1.18	1.26	0	0	2.59	2.55	1.82	0.45	2.43	2.42	0	0	
3	0	0	8.04	8.01	0	1.65	5.51	5.47	0.96	0.9	1.1	1.52	0	0	0	0	2.84	0	5.09	5.08	0	0	
4	0	0	0.12	0.06	1.63	1.64	0	0	2	2.06	0	0	0	0	2.59	2.56	2.83	3.12	1.45	0	3.13	3.13	
5	5.11	5.07	0	0.06	1.64	1.65	5.51	5.48	0	1.51	0.66	1.07	3.28	3.29	0	0	0.69	0.26	0	0	0	0	
6	0	1.95	3.64	3.69	1.59	1.61	5.51	5.48	1.48	1.47	0.85	1.12	3.28	3.29	3.24	3.23	1.72	0.25	1.45	1.69	5.1	5.07	
7	0	0	3.62	3.61	0	0	5.52	5.47	0	1.56	3.27	3.28	0	0	0	0	1.92	0.9	0	0	5.2	5.13	
8	0	0	3.64	3.53	3.28	0	12.03	12.03	3.2	1.52	0.51	0.97	3.28	3.29	0.14	0.08	1.7	1.45	2.47	2.46	5.2	5.15	
9	5.11	0	3.6	3.76	3.28	3.29			0.12	0.06	3.06	0			0	0	0	0	0	0	4.7	4.68	
10	5.11	5.08	3.62	2.43	0	0			0.12	0.06	0	0			0	0	0	1.14	1.76	5.1	5.06		
11	5.11	5.08	3.63	4.85	5.01	5.01			3.25	3.25	0.06	0.98			0.15	0.09	3.27	3.29	0	0	1.3	1.31	
12	0	0	3.62	3.72	2.31	2.31			1.41	1.49	3.18	0.87			0	0	3.56	3.55	2.42	2.42	1.4	1.31	
13	5.11	0	3.64	3.57	4.96	0			1.41	1.41	3.27	3.28			0.15	0.08	3.29	3.29	5.09	5.08	1.3	1.32	
14	5.11	5.08	8.04	8.01	1.42	2.41			0	0	2.94	2.56			5.19	5.19	0	0	2.43	2.42	1.4	1.31	
15	2.84	2.81	1.45	1.48	2.4	2.39			1.42	1.42	0.47	0.42			0.14	0.09	0.23	0.06	0	0	4.7	4.64	
16	1.45	1.43	0.27	1.39	0	0			3.3	0	2.93	3.01			5.25	5.24	0	0	2.49	2.47	5.1	5.06	
17	2.08	2.07	0.29	1.32	5.11	5.09			2.53	2.53	3.21	3.22			0.15	0.08	0	0	0	0	5.2	5.17	
18	1.37	1.42	1.45	1.43	2.41	2.41			1.42	2.27	2.87	2.95			5.23	5.23	0	0.87	2.48	2.47	0	0	
19	0.69	2.3	1.45	1.43	2.43	2.43			1.42	1.39	0.15	1.32			0	0	1.98	2.64	0	0	5.1	5.07	
20	2.4	0	1.45	0.82	0	0			0	0	0	0.05			5.25	5.25	2.28	2.18	1.18	2.3	5.07	5.07	
21	2.35	0	1.45	1.43					2.61	2.58	3.09	1.32			2.13	1.96	1.76	2.17	5.1	5.07			
22	5.11	5.08	1.45	1.43					0.75	1.46	3.09	1.32			1.67	2.01	0	0	4.7	4.35			
23	0	0	1.47	1.37					2.83	1	3.09	1.32			1.99	1.72	1.76	2.24	0	0			
24	2.59	3.2	1.45	1.43					1.9	0.89	3.09	1.33			1.93	2.19	0	0	5.1	5.07			
25	0.19	1.88	1.45	1.43					1.72	0.39	3.27	3.29			2.05	1.94	0	0	5.1	5.1			
26	1.58	0	0.95	0.91					0.68	0.31	0	0			0	0	0	0	3.7	3.5			
27	2.56	3.13	0	0					2.84	3.16	0.15	1.36			0	0	0.06	0.05	5.1	5.05			
28	2	2.01	1.45	1.43					0	0	1.84	2.36			0	0	5.09	0	0	0			
29	2	2.06	5.15	5.11					2.85	0.66	1	2.32			1.49	2.03			2.5	2.51			
30	2.96	1.52	1.45	1.43					1.83	0.49	0.54	1.75			0.16	1.07			0	0			
31	0	0	1.45	1.43					0.91	1.39	0.06	0.06			1.96	1.25			0	0			
32	0.06	2.07	1.45	1.43					1.43	1.2	0.05	0.06			0.16	1.1			0	0			
33	0.07	2.07	1.46	1.45					1.51	1.57	0	0			0.99	2.2			0	0			
34	0	0	5.08	5.06					1.51	1.43	0.73	1.26			1.17	1.07			0	0			
35	0	0	5.15	5.11					3.3	3.29	1.48	1.55			0.79	1.82			0	0			
36	0	0	0	0					0.81	1.26	2.91	2.53			0.15	1.07			0	0			
37	5.13	0							1.45	1.02	0.07	0			3.29	3.3			0	0			
38	0	0							1.82	1.6	3.27	3.28			1.93	3.09			0	0			
39	0	0							1.2	1.5	1.06	1.05			0.16	1.07			3.4	3.4			
40	0	0							2	2.06	0.47	0.98			1.5	2.2			4.97	4.97			
41	0	0							2.17	1.95	0	0			0.16	1.07			0	0			
42	5.12	5.09							2.53	2.52	0	0.6			1.21	2.64			0	0			
43	5.12	5.09							1.96	1.9	1.12	1.24			0.16	1.08			0	0			
44	5.12	5.09							1.79	1.9	3.27	3.28			1.64	1.48			-21.2	-21.2			
45	5.12	5.09							0.8	1.72	1.21	0.99			2.05	2.06			-19.1	-21.2			
46	5.12	5.09							0.8	1.96	1.31	1.34			0	0			-23.3	-27.4			
47	0	0							0.8	1.84	0	0			0	0			-25.3	-25.3			
48	5.12	5.09							3.3	2.63	1.43	1.44			0.07	0.13			-19.3	-19.3			
49	5.12	0							0	0.13	0.88	1.01							-25.3	-25.3			
50	5.08	5.06							0	0.07	0	0							-21.3	-23.3			
51	5.09	5.07							0	0									-27.3	-27.3			
52	5.1	0							0	0									-25.4	-25.3			
53	0	0							0	0									-23.3	-19.18			
54	5.13	0							0	0									-27.3	-27.3			
55	0.09	0.2							3.25	3.27									-25.4	-24.7			
56	1.61	0							1.21	1.18									-23.3	-24.7			
57	0	0							0	0									-26.7	-25.8			
58	0	0							3.29	3.29									-26.7	-26.7			
59	0	0							0	0									5.1	5.07			
60	0	0							0	0									-29.7	-29.7			
61	3.28	0							2.59	2.57									-26.6	-26.7			
62	0	0							2.58	2.58									-22.5	-22.6			
63	0	0							0	0									-28.5	-28.6			
64	0	0							2.59	2.56									-28.7	-28.7			
65	0	0							3.29	3.29									-26.6	-26.5			
66	0.26	0							3.3	3.29									-26.5	-26.7			
67	5.12	5.08							3.29	3.29									-26.4	-26.6			
68	0	0							2.57	2.56									-26.5	-26.6			
69	5.12	0							5.19	5.18									-26.4	-26.5			
70	3.21	2.03							2.59	2.57									-26.6	-26.5			
71	3.46	2.2							0.12	0.08									-26.5	-26.6			
72	2.81	0							2.53	2.52									-26.5	-26.7			
73	0	0							2.59	2.57									-26.4	-26.7			
74	0.21	0.09							3.29	3.29									-26.4	-26.6			
75	0.22	0							2.61	2.61									-26.5	-26.6			
76	0	0.1							3.27	3.24									-26.5	-26.7			
77	0.21	0.09							0	0									-26.6	-26.7			
78	0.23	0.09							0.94	1.04									-26.5	-26.5			
79	0.21	0.08							0.78	1.06									-26.5	-26.6			
80	0.23	0.08							0.89	1.15									-26.5	-26.5			

PIN	IC201(MT1336E)		IC202(MOTOR)		IC401(CS4391)		IC402(AMP)		IC50	
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PIN	IC201(MT1338E)		IC202(MOTOR)		IC401(CS4391)		IC402(AMP)		IC501(MT1379)		IC502(SDRAM)		IC505(EEPROM)		IC510(BUFFER)		IC5A1(FLASH)		IC604(MM1623XFB)		IC901(F/UCOM)	
	STOP	PLAY	STOP	PLAY	STOP	PLAY	STOP	PLAY	STOP	PLAY	STOP	PLAY	STOP	PLAY	STOP	PLAY	STOP	PLAY	STOP	PLAY	STOP	PLAY
161									0	1.27												
162									0	2.35												
163									0	0												
164									0	0.73												
165									0	3.27												
166									0	0.5												
167									0	0												
168									0	0.53												
169									0	3.27												
170									0	0.59												
171									0	0												
172									3.01	0.72												
173									0	0.72												
174									0	0												
175									0	2.73												
176									0	3.13												
177									0	3.13												
178									0	3.25												
179									0	0												
180									0	0												
181									2.04	2.64												
182									0	2.52												
183									0	0												
184									0	0.09												
185									0	3.26												
186									-	-												
187									0	0.08												
188									0	0												
189									0	0												
190									0	0												
191									0.23	0												
192									0	3.29												
193									0	0												
194									0	0												
195									0	0												
196									0	0												
197									0	1.63												
198									0	0												
199									0	0												
200									0	2.15												
201									0	1.44												
202									0	1.44												
203									0	1.43												
204									0	1.43												
205									0	1.42												
206									0	2.1												
207									0	2.07												
208									0	1.41												
209									0	1.52												
210									0	1.43												
211									0	2.81												
212									0	3.28												
213									0	0.12												
214									0	0.12												
215									1.02	1.43												
216									0	1.43												

	Q201		Q202		Q203		Q204		Q205		Q501		Q603		Q605		Q606	
	stop	play	stop	play	stop	play	stop	play	stop	play	stop	play	stop	play	stop	play	stop	play
E	0	0	0	0	0	0	5.14	4.34	5.14	5.1	0	0	0	0	1.64	0	1.63	0
C	0	5.09	0	0	0	0.19	0	2.42	0.5	0	0	0	0.1	11.96	0	-1.6	0.7	-1.7
B	0.68	0	0	5.04	5.04	0	5.08	3.64	5.08	5.05	0.83	0.83	3.25	0	0	0	0	0
	Q607		Q608		Q609		Q610		Q615		Q6D1		Q6D2		Q6D3		Q6D4	
	stop	play	stop	play	stop	play	stop	play	stop	play	stop	play	stop	play	stop	play	stop	play
E	0	0	0	0	0	0	0	0	5.2	5.19	12.07	12.07	0	0	0	0	0	0
C	0	0	0	0	0	0	5.53	5.57	-1.52	-1.9	12.04	12.06	0	0	0	0	3.92	3.91
B	0.77	-1.87	0.76	-1.76	0.77	0.76	0	0	5.49	5.72	11.27	11.28	5.13	5.12	0.52	0.4	0	0
	Q905		Q9D1		Q9D2		Q9D3		Q9D4		Q6D5		Q9D5					
	stop	play	stop	play	stop	play	stop	play	stop	play	stop	play	stop	play				
E	-1.64	-1.63	0	0	0	0	0	0	0	0	0	0	0	0				
C	5.09	5.08	0	0	0	0	4.45	4.44	0	0	0	0	5.19	0				
B	-1.41	-1.43	2.34	2.33	0	0	0	0	4.45	4.44	3.93	3.91	0.1	3.91				