ORDER NO. MD9604025C8

Service Manual

Portable Stereo CD System

MASH* multi-stage noise shaping

COMPACT disc DIGITAL AUDIO

Radio Cassette

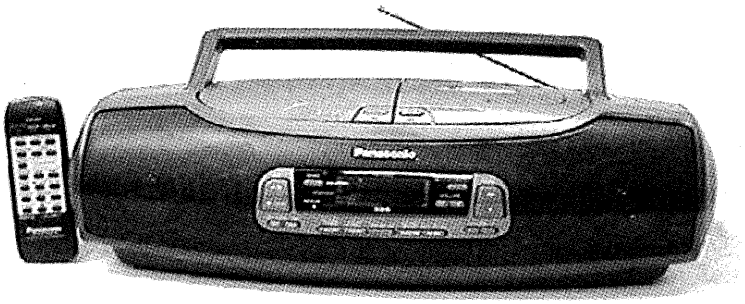
RX-ES50

Colour

(K) ... Black Type

Area

Suffix for Model No.	Area	Colour
(EB)	Great Britain	(K)
(EG)	Germany and Italy	
(GN)	Oceania	



* MASH is a trademark of NTT.

TAPE DECK : AR-2 MECHANISM SERIES
TRAVERSE DECK : RAE0150Z MECHANISM SERIES

■ Specifications

■ RADIO

Frequency range

FM	87.5 – 108MHz
LW	144 – 288kHz ... (EB,EG)
MW	522 – 1611kHz ... (EB,EG)
AM	531 – 1602kHz (9kHz step) ... (GN)
	530 – 1600kHz (10kHz step) ... (GN)

Intermediate Frequency

FM	10.7MHz
AM	459kHz ... (EB,EG)
	450kHz ... (GN)

Sensitivity

FM	17dB/50mW ... (EB,EG)
	18dB/50mW ... (GN)
LW	54dB/m/50mW ... (EB,EG)
MW	53dB/m/50mW ... (EB,EG)
AM	49dB/m/50mW ... (GN)

■ CD PLAYER

Sampling frequency	44.1kHz
Decoding	16 bit linear
Beam source	Semiconductor laser (wavelength 780nm)
No. of channels	2 channels, stereo
Digital Filter	8 fs
Wow and flutter	Less than possible measurement data
D/A converter	MASH (1 bit DAC)

■ TAPE RECORDING

Track system	Stereo
Recording system	AC bias (100kHz)
Erasing system	AC
Monitor system	Variable sound monitor
Frequency range	
Normal	50 – 16000Hz
High	50 – 17000Hz

■ GENERAL

Power requirement	230 – 240V, 50Hz
Power consumption	36W
Battery	12V (Eight R20/LR20, UM-1 batteries)
Memory back-up for computer/clock	6V (Four R6/LR6, UM-3 batteries)
Speakers	2 Woofers; 2.7Ω
Jacks	
Input	MIX MIC; 5mV (3kΩ)
Output	PHONES; 32Ω
Dimensions (W x H x D)	499 x 162 x 262mm
Weight	3.8kg without batteries

Notes :
Specifications are subject to change without notice.
Weight and dimensions shown are approximate.

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic®

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Contents

■ Contents

■ Precaution of Laser Diode

CAUTION : This product utilizes a laser diode with the unit turned "ON", invisible laser radiation is emitted from the pick up lens.
Wavelength : 780 nm
Maximum output radiation power from pick up : 100 μW/VDE

Laser radiation from pick up unit is safety level, but be sure the followings:

1. Do not disassemble the optical pick up unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pick up unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pick up lens for a long time.

ACHTUNG: Dieses produkt enthält eine laserdiode. Im eingeschalteten zustand wird unsichtbare laserstrahlung von der lasereinheit abgestrahlt.

Wellenlänge : 780nm
Maximale strahlungsleistung der lasereinheit :100μW/VDE

Die strahlung an der lasereinheit ist ungefährlich, wenn folgende punkte beachtet werden:

1. Die lasereinheit nicht zerlegen, da die strahlung an der freigelegten laserdiode gefährlich ist.
2. Den werkseitig justierten einstellregler der lasereinhit nicht verstellen.
3. Nicht mit optischen instrumenten in die fokussierlinse blicken.
4. Nicht über längere zeit in die fokussierlinse blicken.

ADVARSEL: I dette a apparat anvendes laser.

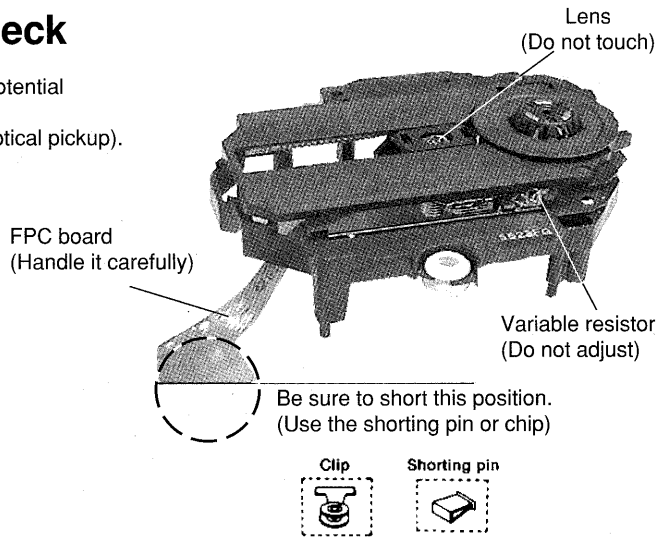
CAUTION!
THIS PRODUCT UTILIZES A LASER.
USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

■ Handling Precautions for Traverse Deck

The laser diode in the traverse deck (optical pickup) may break down due to potential difference caused by static electricity of clothes or human body.
So, be careful of electrostatic breakdown during repair of the traverse deck (optical pickup).

- **Handling of traverse deck (optical pickup)**

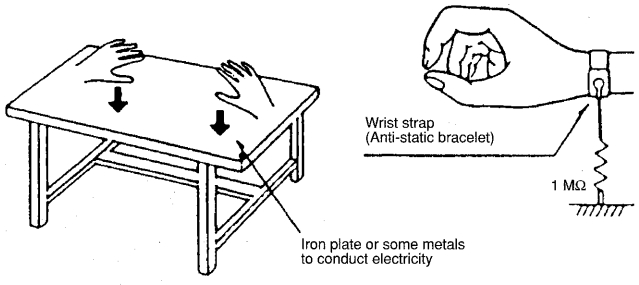
1. Do not subject the traverse deck (optical pickup) to static electricity as it is extremely sensitive to electrical shock.
2. To prevent the breakdown of the laser diode, an antistatic shorting pin is inserted into the flexible board (FPC board). When removing or connecting the short pin, finish the job in as short time as possible.
3. Take care not to apply excessive stress to the flexible board (FPC board).
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.



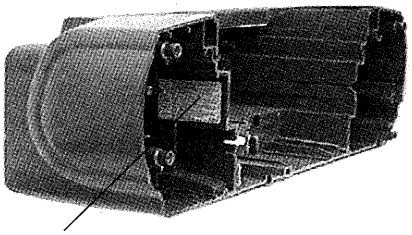
- **Grounding for electrostatic breakdown prevention**

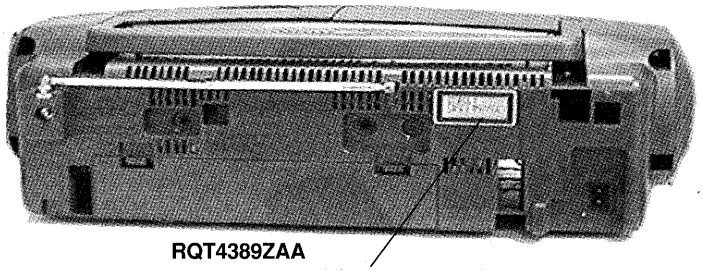
1. Human body grounding
   Use the anti-static wrist strap to discharge the static electricity from your body.
2. Work table grounding
   Put a conductive material (sheet) or steel sheet on the area where the traverse deck (optical pickup) is placed, and ground the sheet.

Caution :
The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the traverse deck (optical pickup).



■ Use of Caution Labels





RQT4389ZAA

DANGER	INVISIBLE LASER RADIATION WHEN OPENAND INTERLOCK DEFEATED. AVOID DIRECT EXPOSURE TO BEAM.
ADVARSEL	USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDEAF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VARO!	AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTÖNTÄ LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING	OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.
ADVARSEL	USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES. UNNGÅ EKSPONERING FOR STRÅLEN.
VORSICHT	UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET UND SICHERHEITSVERRIEGELUNG ÜBERBRÜCKT. NICHT DEM STRAHL AUSSETZEN. RQLS0119

CLASS 1
LASER PRODUCT

LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT

■ Operation Checks and Main Component Replacement Procedures

Warning : This product uses a laser diode. Refer to caution statements.

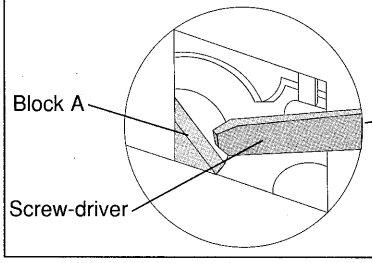
ACHTUNG : • Die lasereinheit nicht zerlegen.
• Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

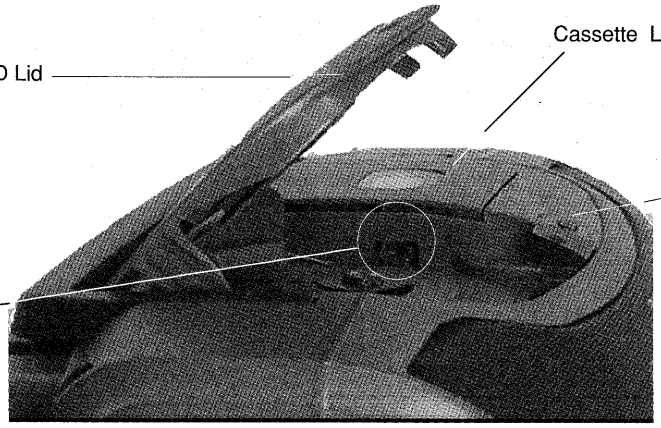
1. This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.
2. For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.
3. Select items from the following index when checks or replacement are required.

• Contents

■ How to open the Cassette Lid manually

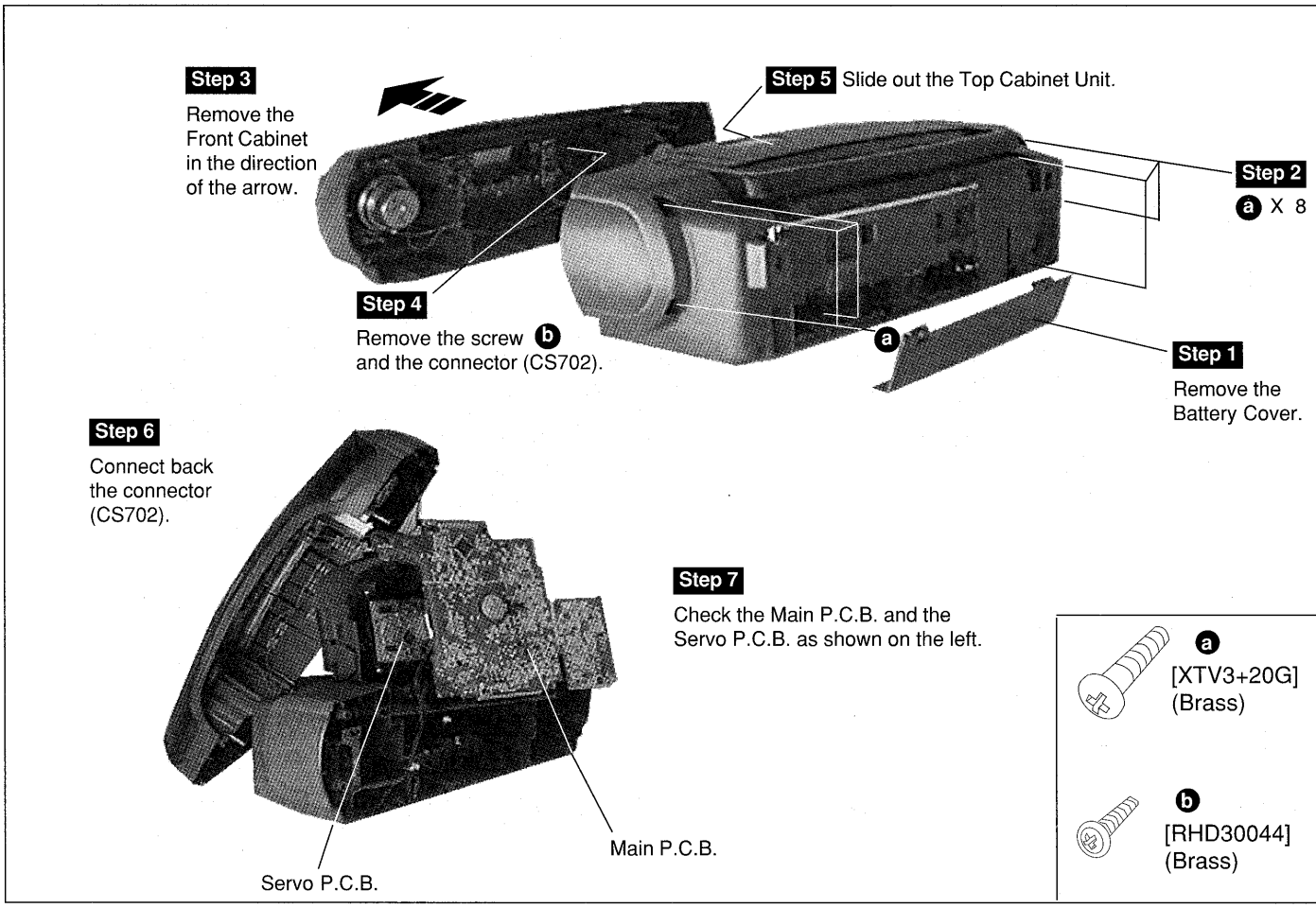
Step 2
Push the Block A downward with a screw-driver and the Cassette Lid will be opened.





Step 1
Press the Open Button to open the CD Lid.

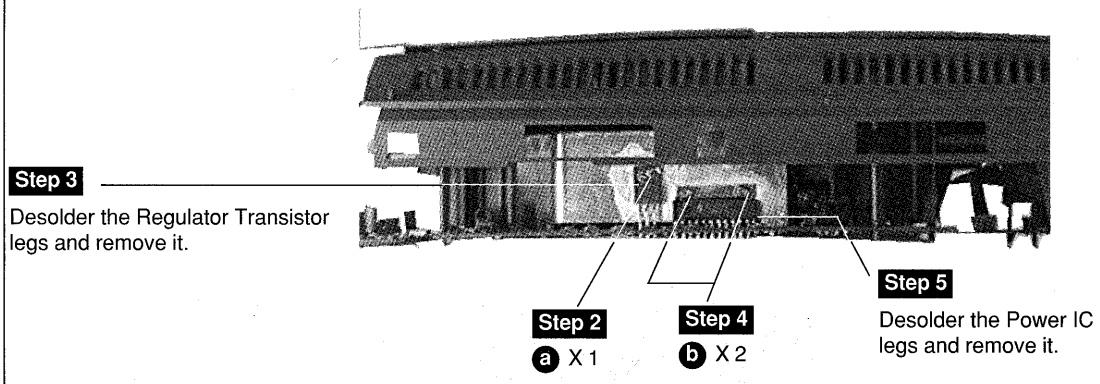
■ Checking Procedure for Main P.C.B. and Servo P.C.B.



■ Main Component Replacement Procedures

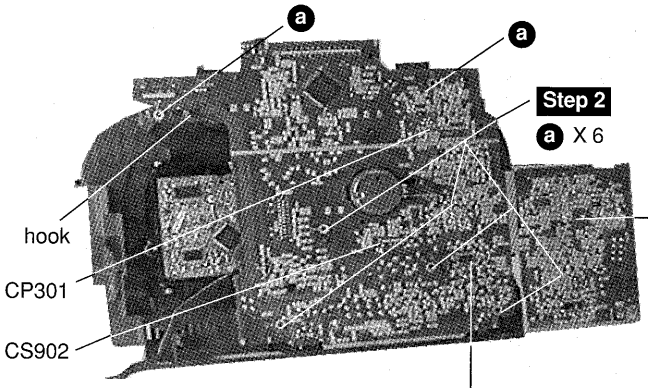
1. Replacement of Power IC and Regulator Transistor

Step 1 Follow the Checking Procedure for Main P.C.B. and Servo P.C.B. from step 1 to 5.



2. Replacement of the Traverse Deck

Step 1 Follow the Checking Procedure for Main P.C.B. and Servo P.C.B. from step 1 to 5.



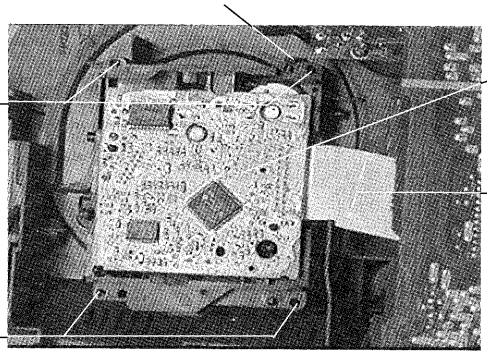
Step 2
a X 6

Step 3
Remove 2 hooks.

Step 4
Pull out the Main P.C.B. (Take note of CP902 and CP301)

Main P.C.B.

Step 5
Remove the hook.



Step 6
b X 4

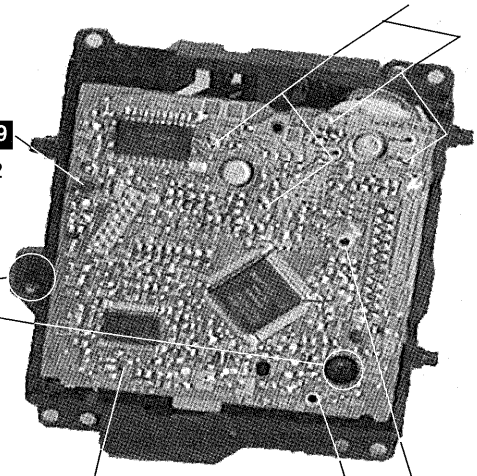
Step 7
Remove the FFC.

Step 8
Remove the CD unit.

Step 9
c X 2

Step 10
d X 1

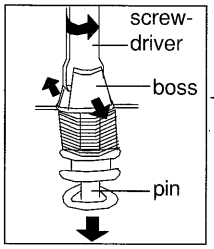
Step 11
Desolder the 4 legs of the 2 motors and pull out the Servo P.C.B.



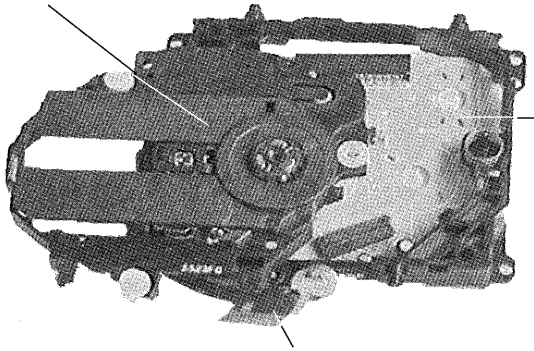
Servo P.C.B.

c

Step 12
Widen the 2 bosses with a flat screwdriver and pull out the 2 pins. Then remove the Traverse Deck.

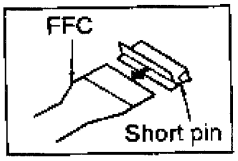


Traverse Deck

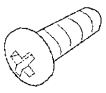


Servo P.C.B.

Step 13
Remove the FFC CN701.



CAUTION
Insert a short pin to the traverse unit FFC board. (Refer to "Handling Precautions for Traverse Deck".)



a , b
[XTV3+12G-M]
(Brass)

c
[XTV2+6G]
(Brass)

d
[XTN2+6G]
(Brass)

■ Caution for AC Mains Lead

[For [EB] area.]
For your safety, please read the following text carefully.

This appliance is supplied with a moulded three pin mains plug for your safety and convenience. A 5-ampere fuse is fitted in this plug. Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5-ampere and that it is approved by ASTA or BSI to BS1362. Check for the ASTA mark ⓐ or the BSI mark ♡ on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.
If you lose the fuse cover, the plug must not be used until a replacement cover is obtained. A replacement fuse cover can be purchased from your local dealer.

CAUTION !
IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OFF SAFELY.
THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13-AMPERE SOCKET.

If a new plug is to be fitted, please observe the wiring code as shown below.
If in any doubt please consult a qualified electrician.

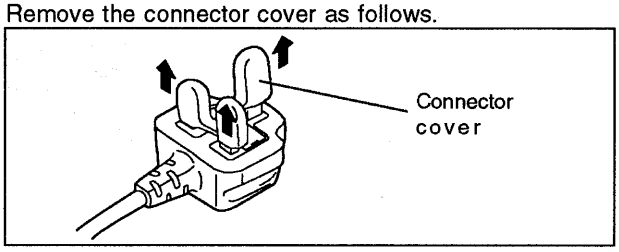
IMPORTANT
The wires in this lead are coloured in accordance with the following code:

Blue: Neutral
Brown: Live

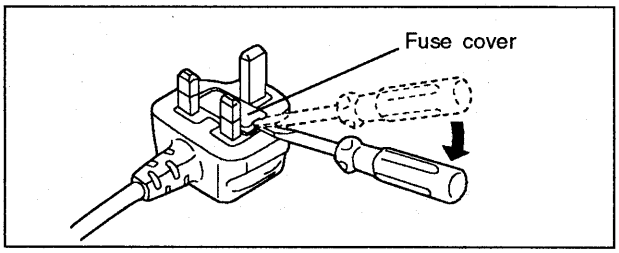
As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:
The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.
The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

Under no circumstances should either or these wires be connetced to the earth terminal of the three pin plug, marked with the letter E or the Earth symbol ⏚ .

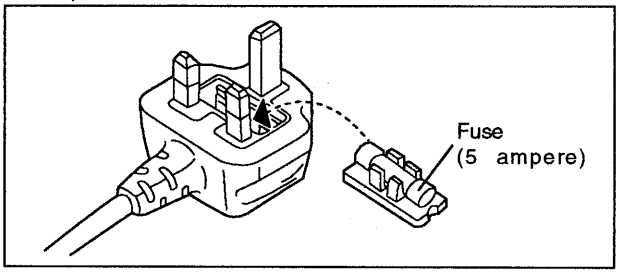
Before use
Remove the connector cover as follows.



How to replace the fuse
1. Remove the fuse cover with a screwdriver.



2. Replace the fuse and attach the fuse cover.

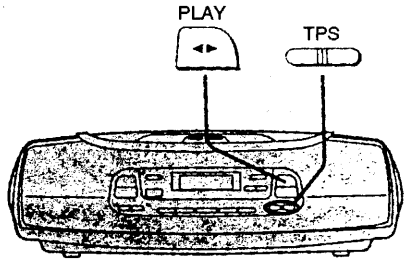


■ Self-Diagnostic Display Function

This unit is equipped with self-diagnosis display function. If a problem occurs, it will display an error code corresponding to the problem. Use this function when performing maintenance on the unit.

■ How to enter the Self-Diagnostic Function

Remove cassette tape from the compartment. ⇨ Press and hold the "STOP" button for at least 2 seconds. ⇩ While pressing the "STOP" button, press "FF" button for at least 2 seconds. ⇦ "T" will appear on the FL display (until is in the Self-Diagnostic Function).



■ To display of Self-Diagnostic results

Error code for Self-Diagnosis are stored in memory during normal operation period. If there is any problem, the error code will be shown each time you press "STOP" button (while the unit is in the Self-Diagnostic Function mode).

■ Cassette Deck Test Procedure

Cassette Deck can be tested with the following procedures (H02, H03, F01, F02) :

1. Set reverse mode to ⇄.
2. Set the self-diagnostic function mode.
3. Load the normal tape (recording prevention tab should be one side only).
4. Press "FF" and then "STOP".
5. Load the pre-recorded tape (recording prevention tab at both side).
6. Press "PLAY" and then "FF" to start TPS function.
7. Self-Diagnosis test will be completed when TPS is functioned.
   * If TPS does not functioned properly, leave the the tape till it stops automatically (Auto-Stop Function).
8. Press "STOP" button to show the error codes.

■ How to clear the Error Codes

• Press "POWER" button to OFF and then ON again to remove the error codes from FL (Display will change to normal indication).

Note : These error codes are still stored in memory and must be cleared when fault has been fixed as follow:

1. Remove batteries (for power and memory) and AC power supply.
2. Press and hold "POWER" button for at least 5 seconds.

■ Description of Error Code

Error code	Problem condition	Correction procedure
H01	Faulty operation of cassette mechanism. Example: Reverse-play operation performs when FWD button is pressed.	Faulty cassette mechanism mode switch [S971] and plunger. (Check and replace)
H02	Recording not possible, or recording mode entered even though erasure prevention tabs have been removed.	Faulty contact or short-circuit of erasure prevention switches [S974, S975]. (Check and replace)
H03	Playback not performed when Play (◀▶) button is pressed. Motor turns when Play (◀▶) button is pressed even though there is no tape cassette loaded in cassette holder.	Faulty contact or short-circuit of cassette half detect switch. [S972] (Check and replace)
H06	CrO_2 setting cannot be made.	Faulty CrO_2 detection switch. [S973] (Check and replace)
F01	When the Play (◀▶) button is pressed, the tape advances slightly and then stops.	Faulty reel pulse, faulty hole detect IC. [IC971] (Check and replace)
F02	Cassette deck will not perform TPS function.	Faulty playback /recording pre-amplifier IC or low pass filter IC. [IC302, IC303] (Check and replace)
F15	Relatively long time (about 8 seconds) is required to begin play when the CD Play/Pause (▶/▮▮) buttton is pressed from the power-off state or from a function other than CD player.	Faulty contact on CD mechanism optical pick-up rest switch [S701]. (Check and replace)
F26	CD does not function even when pressing CD Play/Pause (▶/▮▮) button. CD track jumps. CD rotates irregularly.	Faulty system contact (IC602) or servo processor (IC702). (Check and replace) Faulty connection or broken of FPC for CD circuit. (Check and replace)
F75	"NO DISC" indication show in the FL display even CD is loaded.	Faulty power circuit of CD (IC604 or cirucit for power supply) (Check and replace) Faulty servo processor IC (IC702). (Check and replace)
U01	When the unit is operating on batteries, power supply ceases soon after the POWER button is set to ON.	It is due to consumption of batteries. Replace the batteries with new ones.
U02	Settling the POWER button to ON causes no supply of power.	Chech the power plug (AC), or insert batteries (DC).

■ Measurements and Adjustments

■ ALIGNMENT INSTRUCTIONS

READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT	
1. Set volume level to maximum. 2. Set preset EQ. to OFF. 3. Set power source voltage to 12V DC.	4.Output of signal generator should be no higher than necessary to obtain an output reading.

< TUNER SECTION > ... (GN)

■ AM-IF ALIGNMENT

SIGNAL GENERATOR or SWEEPGENERATOR		RADIO DIAL SETTING	INDICATOR (ELECTRONIC VOLTMETER or OSCILLOSCOPE)	ADJUSTMENT (Shown in Fig. 1)	REMARKS
CONNECTIONS	FREQUENCY				
Fashion a loop of several turns of wire and radiate a signal into the loop ant. of receiver.	450 kHz 30% Mod. at 400Hz	Point of non-interference. (on/about 600Hz)	Headphones Jack (32Ω) Fabricate the plug as shown in Fig. 2 and then connect the lead wires of the plug to the measuring instrument.	T1 (AM IFT)	Adjust for maximum output.

■ AM-RF ALIGNMENT

SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (ELECTRONIC VOLTMETER or OSCILLOSCOPE)	ADJUSTMENT (Shown in Fig. 1)	REMARKS
CONNECTIONS	FREQUENCY				
Fashion a loop of several turns of wire and radiate a signal into the loop ant. of receiver.	594kHz	Tune to signal	TP7...(+) TP5...(–)	(*1) L3(AM ANT Coil)	Adjust for maximum output. Adjust L3 by moving coil along the ferrite core.
"	1,503kHz	"	"	CT1 (AM ANT Trimmer)	Adjust for maximum output.
(*1) Fix antenna coil with wax after completing alignment.					

< TUNER SECTION > ... (EB,EG)

■ AM-IF ALIGNMENT

SIGNAL GENERATOR or SWEEPGENERATOR		RADIO DIAL SETTING	INDICATOR (ELECTRONIC VOLTMETER or OSCILLOSCOPE)	ADJUSTMENT (Shown in Fig. 1)	REMARKS
CONNECTIONS	FREQUENCY				
Fashion a loop of several turns of wire and radiate a signal into the loop ant. of receiver.	459 kHz 30% Mod. at 400Hz	Point of non-interference. (on/about 600Hz)	Headphones Jack (32Ω) Fabricate the plug as shown in Fig. 2 and then connect the lead wires of the plug to the measuring instrument.	T1 (AM IFT)	Adjust for maximum output.

■ LW-RF ALIGNMENT

Fashion a loop of several turns of wire and radiate a signal into the loop ant. of receiver.	153kHz	Tune to signal	TP7...(+) TP5...(–)	(*2) L3-1(LW ANT Coil)	Adjust for maximum output. Adjust L3-1 by moving coil along the ferrite core.
"	270kHz		"	CT2 (LW ANT Trimmer)	Adjust for maximum output.
(*2) Fix antenna coil with wax after completing alignment.					

■ MW-RF ALIGNMENT

Fashion a loop of several turns of wire and radiate a signal into the loop ant. of receiver.	594kHz	Tune to signal	TP7...(+) TP5...(–)	(*3) L3-2(MW ANT Coil)	Adjust for maximum output. Adjust L3-2 by moving coil along the ferrite core.
"	1503kHz	"	"	CT1(MW ANT Trimmer)	Adjust for maximum output.
(*3) Cement antenna coil with wax after completing alignment.					

< CASSETTE DECK SECTION >

■ TAPE SPEED ADJUSTMENT

TEST TAPE	EQUIPMENT CONNECTION ELECTRONIC COUNTER	ADJUSTMENT (Shown in Fig. 5)	SPECIFICATION	REMARKS
QZZCWAT (3 kHz)	Headphones Jack (32Ω) (Fabricate the plug as shown in Fig. 2 and then connect the lead wires of the plug to the measuring instrument.)	Motor VR	3000 ± 30Hz	Playback mode

■ HEAD AZIMUTH ALIGNMENT

TEST TAPE	EQUIPMENT CONNECTION ELECTRONIC COUNTER	ADJUSTMENT (Shown in Fig. 3)	SPECIFICATION	REMARKS
QZZCAB (8kHz, -20dB)	Headphones Jack (32Ω) (Fabricate the plug as shown in Fig. 2 and then connect the lead wires of the plug to the measuring instrument.)	Azimuth screw	Maximum output	Playback mode

■ RECORD BIAS VOLTAGE & FREQUENCY CHECK

TEST TAPE	EQUIPMENT CONNECTION ELECTRONIC COUNTER (refer to Fig. 4)	ADJUSTMENT	SPECIFICATION	REMARKS
Use Normal tape	TP6...(+) TP4...(–)	———	16 ± 3mV	• Record mode
Use Normal tape	TP6...(+) TP4...(–)	———	100 ± 10kHz ... (GN) 95 ± 10kHz ... (EB,EG)	1. Set to Record mode 2. Confirm sine-wave appears without distortion/abnormal oscillation.

■ BEATPROOF (II – I) CHECK

TEST TAPE	EQUIPMENT CONNECTION ELECTRONIC COUNTER (refer to Fig. 4)	ADJUSTMENT	SPECIFICATION	REMARKS
Use Normal tape	TP6...(+) TP4...(–)	———	Frequency Shift from B.P. II — I (4.5 ± 1kHz)	1. Set the function selector to Tuner position. 2. Set to B.P. II 3. Confirm oscillating waveform to be sinusoidal without distortion/abnormal oscillation.

■ BEATPROOF (III – II) CHECK ... (for EB and EG only)

TEST TAPE	EQUIPMENT CONNECTION ELECTRONIC COUNTER (refer to Fig. 4)	ADJUSTMENT	SPECIFICATION	REMARKS
Use Normal tape	TP6 ...(+) TP4 ...(–)	———	Frequency Shift from B.P. III — II (2.5 ± 1kHz)	1. Set the function selector to Tuner position. 2. Set to B.P. III 3. Confirm oscillating waveform to be sinusoidal without distortion/abnormal oscillation.

■ ALIGNMENT POINT

• Please refer to Circuit Board and Wiring Connection Diagram for test point locations.

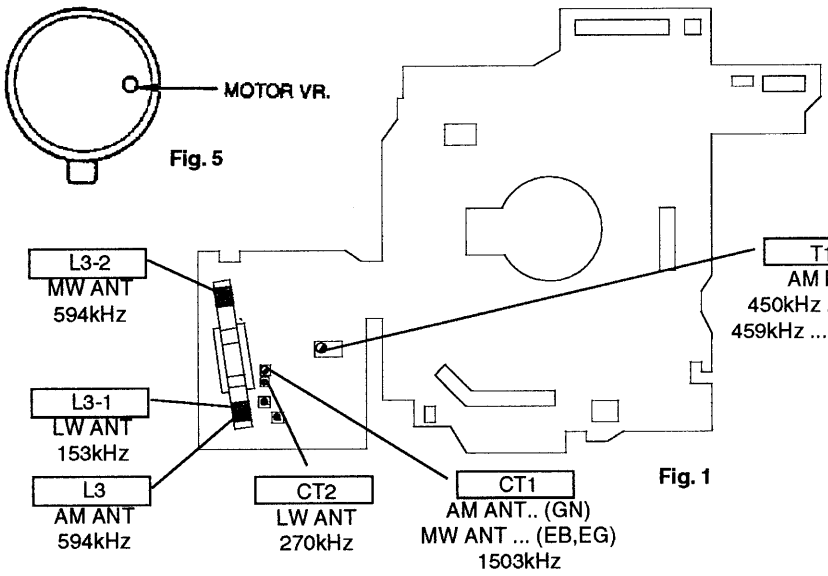


Fig. 5

Fig. 1

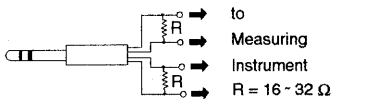


Fig. 2

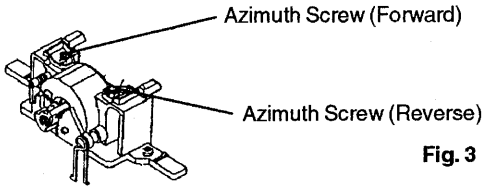


Fig. 3

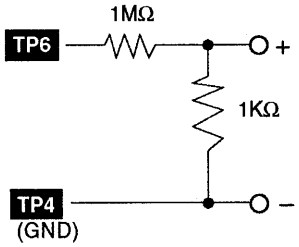


Fig. 4

■ Terminal Function of ICs

• IC701 (AN8835SBE1) Servo Amplifier

Pin No.	Mark	I/O	Function
1	PDA	I	PD signal input
2	PDB	I	PD signal input
3	VCC	I	Power supply connection
4	LPD	I	Laser PD connection
5	LD	O	Power out for LD driving
6	RF	O	RF signal output
7	RFIN	I	RF signal input
8	CAGC	I	AGC loop filter connection
9	ARF	O	RF-AGC output
10	CSBRT	I	Capacitor for detection connection
11	CEA	I	Capacitor connection for HPF amplifier
12	BDO	O	BDO output ("H" : drop out)
13	LDON	I	LD APC input ("H" : ON, "L" : OFF)
14	GND	—	Ground connection

Pin No.	Mark	I/O	Function
15	/RFDET	O	NRFDET output ("L" : detection)
16	CROSS	O	CROSS output (Track cross signal output)
17	OFTR	O	Off-track output("L" : ON track, "H" : OFF track)
18	VDET	O	VDET output("H" : Vibration detected)
19	ENV	O	RF envelope detection
20	TEBPF	I	Vibration detection signal input
21	CCRS	I	Capacitor for LPF connection
22	TE	O	Tracking error signal output
23	FE	O	Focus error signal output
24	TBAL	I	Tracking balance signal input
25	FBAL	I	Focus balance signal input
26	VREF	O	Reference voltage output
27	PDE	I	PD signal input
28	PDF	I	PD signal input

• IC702 (MN662741RPA) Servo processor / Digital signal processor / Digital filter / D/A converter

Pin No.	Mark	I/O	Function
1	BCLK	O	Serial bit clock terminal (Not used, open)
2	LRCK	O	L/R discriminating signal (Not used, open)
3	SRDATA	O	Serial data (Not used, open)
4	DVDD1	I	Power supply (digital circuit) terminal
5	DVSS1	—	GND (digital circuit) terminal
6	TX	O	Digital audio interface signal
7	MCLK	I	Microprocessor command clock signal
8	MDATA	I	Microprocessor command data signal
9	MLD	I	Microprocessor command load signal
10	SENSE	O	Sense signal output
			(OFT,FESL,MAGEND,NAJEND,POSAD,SFG)
11	/FLOCK	O	Optical servo condition(focus)("L" : lead-in)
12	/TLOCK	O	Optical servo condition(tracking)("L" : lead-in)
13	BLKCK	O	Sub-code block clock (f=75Hz)
14	SQCK	I	External clock signal input for sub-code Q
			register.
15	SUBQ	O	Sub-code Q code output
16	DMUTE	I	Muting input ("H" : mute)
17	STAT	O	Status signal output
			(CRC,CUE,CLVS,TTSTVP,FCLV,SQCK)
18	/RST	I	Reset input
19	SMCK	O	1/2-divided clock signal of crystal oscillating at
			MSEL = "H" (fSMCK=8.4672MHz)
			1/4-divided clock signal of crystal oscillating at
			MSEL="L" (fSMCK=4.2336MHz)
20	PMCK	O	1/192-divided clock signal of crystal oscillating
			(fPMCK=88.2kHz) (Not used, open)
21	TRV	O	Traverse servo control output
22	TVD	O	Traverse drive signal output
23	PC	O	Spindle motor ON signal output ("L" : ON)
24	ECM	O	Spindle motor drive signal output
			(forced mode output)
25	ECS	O	Spindle motor drive signal output
			(servo error signal output)
26	KICK	O	Kick pulse output
27	TRD	O	Tracking drive output
28	FOD	O	Focus drive output
29	VREF	I	D/A (drive) output (TVD,ECS,TRD,FOD,
			FBAL,TBAL) Reference voltage input.
30	FBAL	O	Focus balance adjustment output
			(Not used,open)
31	TBAL	O	Tracking balance adjustment output
32	FE	I	Focus error signal input (analog input)
33	TE	I	Tracking error signal input (analog input)
34	RFENV	I	RF envelope signal input
35	VDET	I	Vibration detection signal input ("H" : detection)

Pin No.	Mark	I/O	Function
36	OFT	I	Off-track signal input ("H" : off track)
37	TRCRS	I	Track cross signal input
38	/RFDET	I	RF detection signal input ("L" : detection)
39	BDO	I	Dropout signal input ("H" : Dropout)
40	LDON	O	Laser on signal output ("H" : ON)
41	TES	O	Tracking error shunt signal output ("H" : shunt)
42	PLAY	O	Play signal out ("H" : PLAY)
43	WVEL	O	Double speed status signal output ("H" : DS)
44	ARF	I	RF signal input
45	IREF	I	Reference current input
46	DRF	I	DSL bias (Not used, open)
47	DSLF	I/O	DSL loop filter
48	PLLF	I/O	PLL loop filter
49	VCOF	I/O	VCO loop filter (Not used, open)
50	AVDD2	I	Power supply input (for analog circuit)
51	AVSS2	—	GND (for analog circuit)
52	EFM	O	EFM signal output (Not used, open)
53	PCK	O	PLL extraction clock ouput (Not used, open)
			(fPCK=4.321 MHz during normal playback)
54	PDO	O	Phase comparison signal of EFM and PCK signals
			(Not used, open)
55	SUBC	O	Sub-code serial data output (Not used, open)
56	SBCK	I	Sub-code frame clock signal output
			(fCLDCK=7.35kHz during normal playback)
57	VSS	—	GND
58	X1	I	Crystal oscillating circuit input (f=16.9344MHz)
59	X2	O	Crystal oscillating circuit output (f=16.9344MHz)
60	VDD	I	Power supply input (for oscillating circuit)
61	BYTCK	O	Byte clock output (Not used, open)
62	/CLDCK	O	Clock input for sub-code serial data
			(Not used, open)
63	FCLK	O	Crystal frame clock signal output
			(fCLK=7.35kHz, double=14.7kHz)
64	PFLAG	O	Interpolation flag output ("H" : interpolation)
			(Not used, open)
65	FLAG	O	Flag output (Not used, open)
66	CLVS	O	Spindle servo phase synchronizing signal output
			("H" : CLV, "L" : rough servo) (Not used, open)
67	CRC	O	Sub-code CRC checked output
			("H" : OK, "L" : NG) (Not used, open)
68	DEMPH	O	De-emphasis ON signal output
			("H" : ON) (Not used, open)
69	RESY	O	Frame resynchronizing signal output
			(Not used, open)
70	/RST2	I	Reset input through MASH circuit ("L" : Reset)
71	/TEST	I	Test input

Pin No.	Mark	I/O	Function
72	AVDD1	I	Power supply input (for analog circuit)
73	OUTL	O	Left channel audio signal output
74	AVSS1	—	GND
75	OUTR	O	Right channel audio signal output
76	RSEL	I	RF signal polarity assignment input
			(at "H" level, RSEL="H", at "L" level, RESL="L")
77	CSEL	I	Crystal oscillating frequency designation input

Pin No.	Mark	I/O	Function
			"L" : 16.9344MHz "H" : 33.8688MHz
78	PSEL	I	Test input (normally "L") (Not used, open)
79	MSEL	I	Output mode switching of SUBQ terminal
			("H" : Q code buffer mode)
80	SSEL	I	Output frequency switching for SMCK terminal
			"H" : SMCK=8.4672MHz
			"L" : MCK=4.2336MHz (Not used, open)

• IC602 (MND3256REBE2) System Microprocessor

Pin No.	Mark	I/O	Function
1	VDD	I	+5V power input
2	OSC2	O	6.0MHz ceramic oscillator output
3	OSC1	I	6.0MHz ceramic oscillator input
4	VSS	—	GND
5	XI	I	32kHz x'tal oscillator input
6	XO	O	32kHz x'tal oscillator input
7	VREF-	—	AD convertor reference voltage (GND)
8	ADIN7	I	AD input 7 (REC INH, HALF, MODE)
9	ADING	I	AD input 7 (REEL, PULSE, TPS)
10	MBPF2	O	μ-com beat proof select output 2
11	MBPF1	O	μ-com beat proof select output 1
12	PWRDET	I	Power circuit output detection
13	VCCDET	I	Power detection input
14	ADINI	I	Operation key input
15	ADINO	I	Operation key input
16	VREF+	I	AD convertor reference voltage (VDD)
17	REM STBY	I	Power on input for remote control receiver
18	CDCLSW	I	CD lid closed detection SW (L : closed)
19	MCLK	O	Data output for CD signal processor IC
20	PWM	O	PWM output for volume control
21	MDATA	O	Data output for CD signal processor IC
22	MLD	O	Strobe output for CD signal processor IC
23	BC1	O	Bus control output 1 (use as 3 state)
24	BC2	O	Bus control output 2 (use as 3 state)
25	BC3	O	Bus control output 3 (use as 3 state)
26	BC4	O	Bus control output 4 (use as 3 state)
27	TC1	O	Treble control output 1 (use as 3 state)
28	TC2	O	Treble control output 2 (use as 3 state)
29	TC3	O	Treble control output 3 (use as 3 state)
30	TC4	O	Treble control output 4 (use as 3 state)
31	REMOCON IN	I	Remote control receiver pulse input
32	BLKCK	I	Sub-code block clock input
33	SENSE	I	CD SENSE input
34	FLOCK	I	CD focus lock signal (L : lock)
35	/RESET	I	+5V power input

Pin No.	Mark	I/O	Function
36	TLOCK	I	CD tracking lock signal (L : lock)
37	CD RESET	O	CD reset output
38	FUNC CD	O	Function control output (CD : L)
39	SQCK	O	Clock input for CD sub-code
40	SUBQ	I	CD sub-code data input
41	NC	—	not used
42	SYNC	O	Divided clock pulse output
43	GND	I	Mode setting input for 1-chip μ-com (L : 1-chip)
44	PWRCNT	O	Power control output (H : power on)
45	MUTE A	O	Audio muting output (H : mute on)
46	/DMT	O	Mechanism muting output
47	REC H	O	Recording select output (H : REC)
48	BP3H	O	AM recording beat proof control output
49	BP2H	O	AM recording beat proof control output
50	PL	O	Mechanism plunger drive signal (H : on)
51	MOTOR	O	Mechanism motor drive signal (H : on)
52	TPS	I	TPS signal input (L : music exist) 50
53	CRO2	I	Tape type detection (H : CrO2)
54	DES1	I	Area selection input 1
55	DES2	I	Area selection input 2
56	DES3	I	Area selection input 3
57	STATUS	I	CD STATUS input
58	RESTSW	I	CD reset position detection input (H : reset position)
59	TUNED	I	Tuner reception condition input (L : Tuned)
60	T MUTE	O	Tuner muting output (H : on, Hi-z : off)
61	PLL DI	O	Tuner PLL data output
62	PLL CL	O	Tuner PLL clock output
63	PLL CE	O	Tuner PLL strobe output
64~68	NC	—	Not used
69~93	SEG 24 ~ 0	O	LCD segment signal output (24~0)
94~97	COM 3 ~ 0	O	LCD common output (3 ~ 0)
98	VLC 3	I	LCD bias reference voltage input 3
99	VLC 2	I	LCD bias reference voltage input 2
100	VLC 1	I	LCD bias reference voltage input 1

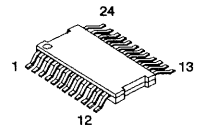
• IC703 (AN8389SE1) Focus coil / Tracking coil / Traverse motor / Spindle motor driver

Pin No.	Mark	I/O	Function
1	VCC	I	Power supply terminal
2	VREF	I	Reference voltage input
3	IN4	I	Motor driver (4) input
4	IN3	I	Motor driver (3) input
5	GND	—	Ground connection
6	NC	—	Not used
7	NRESET	I	Reset input
8	GND	—	Ground connection
9	IN2	I	Motor driver (2) input
10	PC2	I	PC2 (power cut) input
11	IN1	I	Motor driver (1) input
12	PC1	I	PC1 (power cut) input (Not used, open)

Pin No.	Mark	I/O	Function
13	PVCC1	I	Power supply (1) for driver
14	PGND1	—	Ground connection (1) for driver
15	D1–	O	Motor driver (1) reverse-action output
16	D1+	O	Motor driver (1) forward-action output
17	D2–	O	Motor driver (2) reverse-action output
18	D2+	O	Motor driver (2) forward-action output
19	D3–	O	Motor driver (3) reverse-action output
20	D3+	O	Motor driver (3) forward-action output
21	D4–	O	Motor driver (4) reverse-action output
22	D4+	O	Motor driver (4) forward-action output
23	PGND2	—	Ground connection (2) for driver
24	PVCC2	I	Power supply (2) for driver

■ Terminal Guide of ICs, Transistors and Diodes

AN8389SE1



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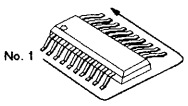

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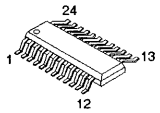

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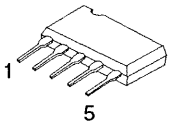

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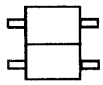

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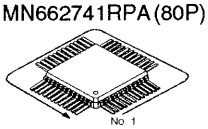

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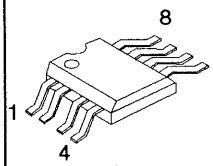

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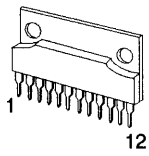

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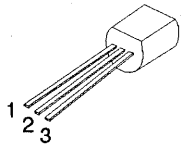

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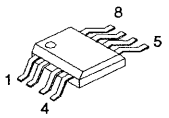

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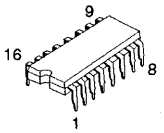

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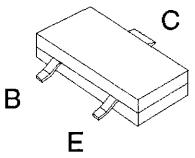

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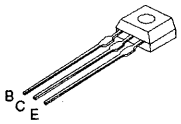

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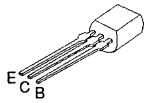

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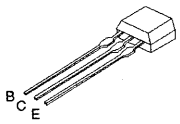

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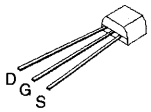

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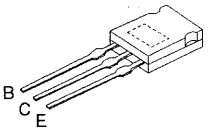

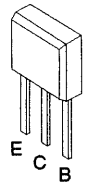

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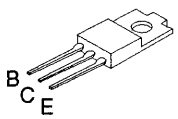

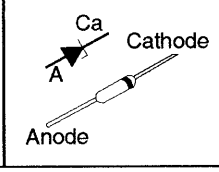

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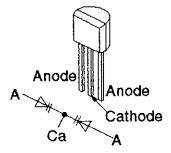
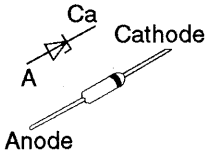
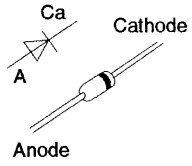
KV1520NT

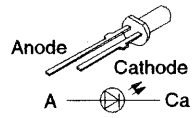




MTZJ5R6BTA
RVDMTZ12BTA
MTZJ12BTA
MTZJ9R1BTA

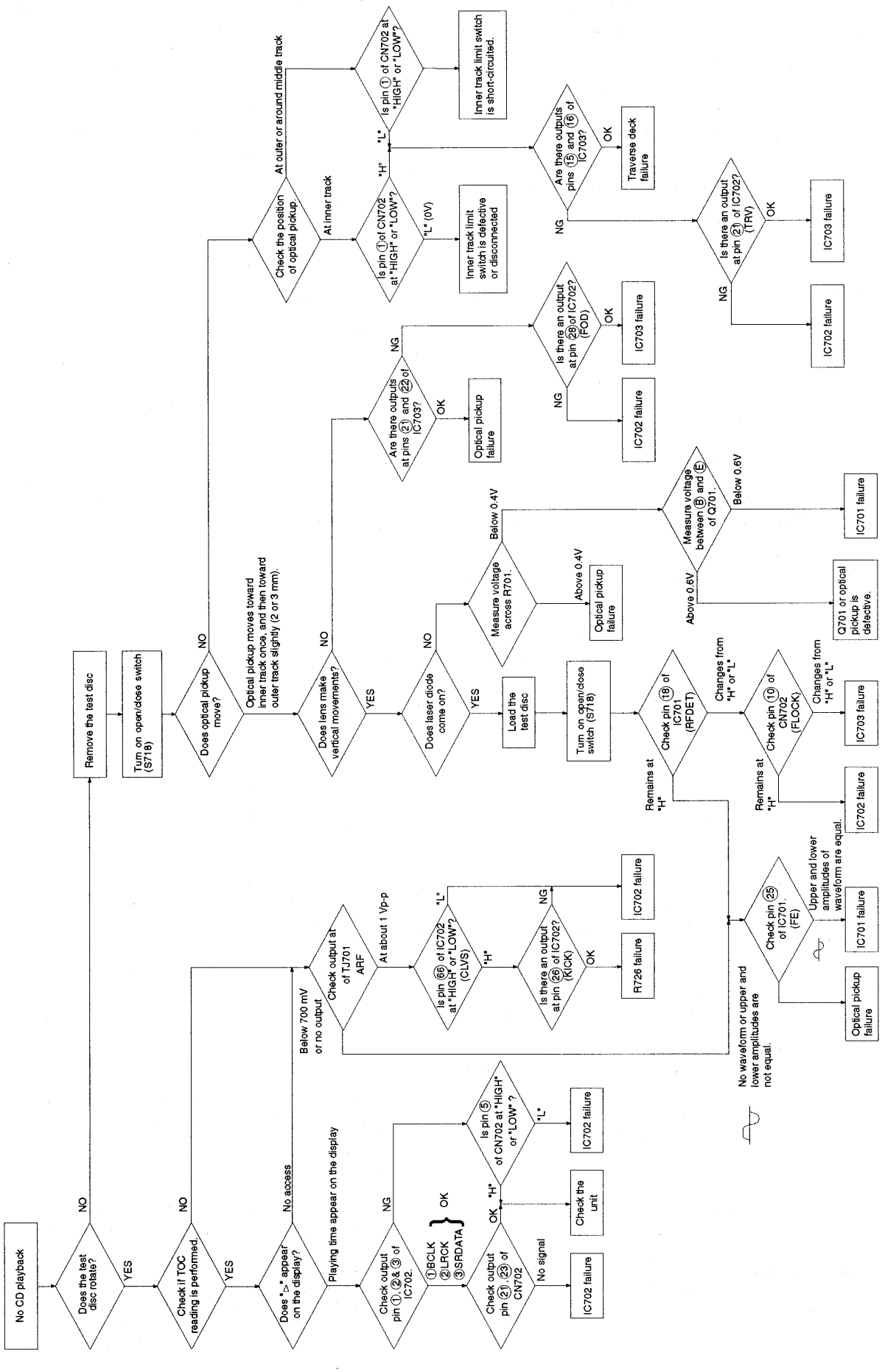


1SR35200TB
1SS254TA
MA165TA
RB441QT77
RVD1SS135TA



BR5385XJ220K

■ Troubleshooting Guide



■ Schematic Diagrams

(All schematic diagrams may be modified at any time with the development of new technology)

Note :

< for Servo circuit > (Page 16 - 17)

- **S701** : Reset switch

< for Main circuit, Mechanism Control circuit, Cassette Eject circuit and Panel circuit > (Page 18 - 24)

- **S700** : Cassette open switch
- **S701** : CD stop/clear switch
- **S702** : CD record switch
- **S703** : Record/pause switch
- **S704** : Rewind switch
- **S705** : Tape stop switch
- **S706** : Tape play switch
- **S707** : Power switch
- **S708** : Volume increase switch
- **S709** : Volume decrease switch
- **S710** : CD play/pause switch
- **S711** : FM/AM switch
- **S712** : FF/Skip switch
- **S713** : Rev/skip switch
- **S714** : Time switch
- **S715** : Timer switch
- **S716** : EQ switch
- **S717** : Tape FF switch
- **S718** : CD open/close switch
- **S719** : CD level switch
- **S971** : Mode detect switch
- **S972** : Tape detect switch
- **S973** : CrO2 detect switch
- **S974** : Record detect switch
- **S975** : Record detect switch

< Power Supply circuit and Battery circuit > (Page 25)

- **S901** : AC IN switch (JK901)

< Gerenal >

•Battery Current

Vol. min	230mA (FM ... GN)	Vol. max	880mA (FM ... GN)
	230mA (FM ... EB,EG)		940mA (FM ... EB,EG)
	230mA (AM ... GN)		640mA (AM ... GN)
	230mA (AM ... EB,EG)		660mA (AM ... EB,EG)
	320mA (Tape)		940mA (Tape)
	440mA (CD)		1510mA (CD)
Recording (Vol max).....	1.22A (GN)		
	1.08A (EB,EG)		

(Measurement condition:
Radio : FM 60 dB, 30%mod
AM 74 dB/m, 30%mod
Tape : 315 Hz, 0dB
CD : 1kHz, 0dB)

•Signal line

: +B line
: FM OSC signal line
: FM/AM signal line
: Main signal line
: Playback signal line
: Record signal line
: CD signal line
: FM signal line
: AM signal line
: AM OSC signal line
: MIC signal line

•The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis.
Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.

No mark : Playback (( )) : CD ( ) : AM < > : FM

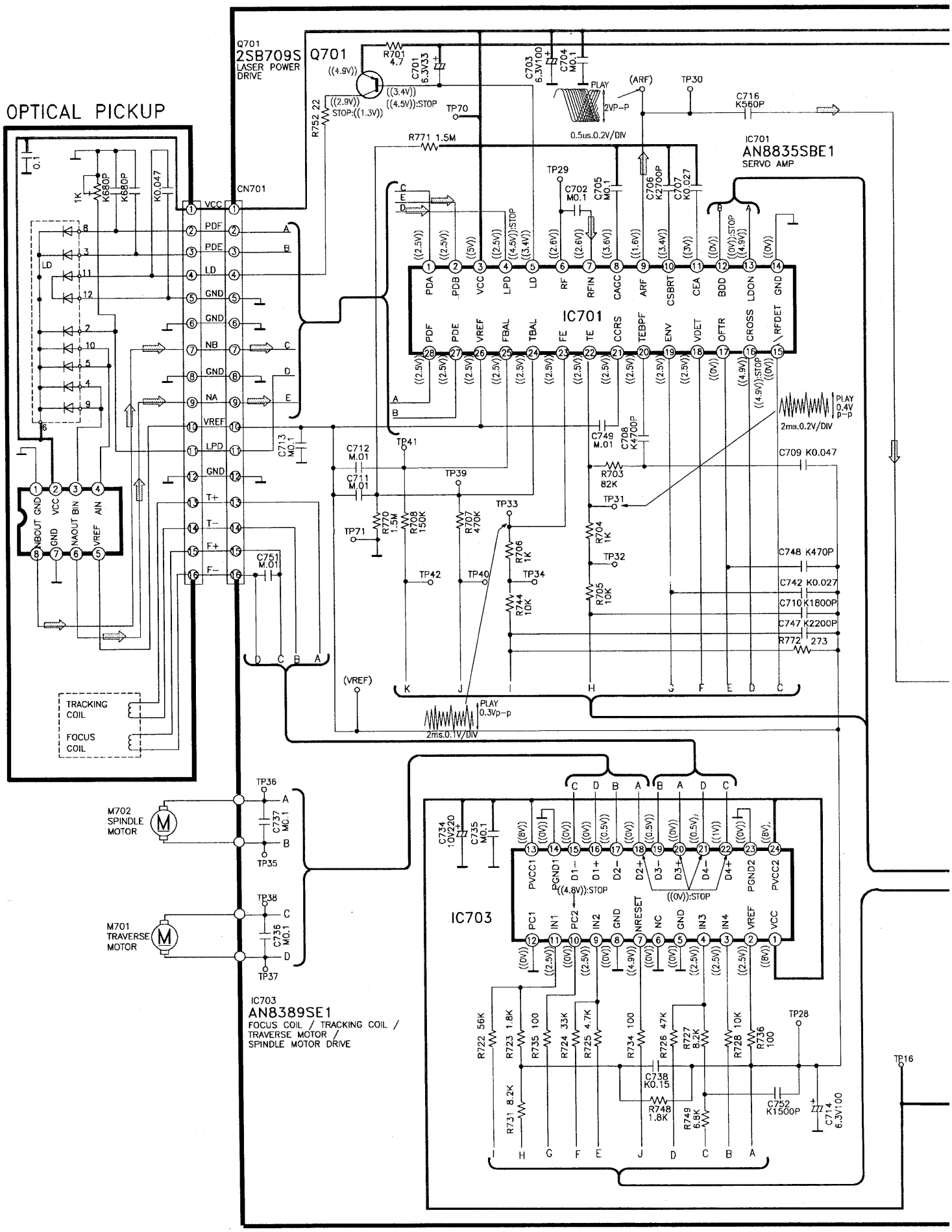
•Importance safety notice:

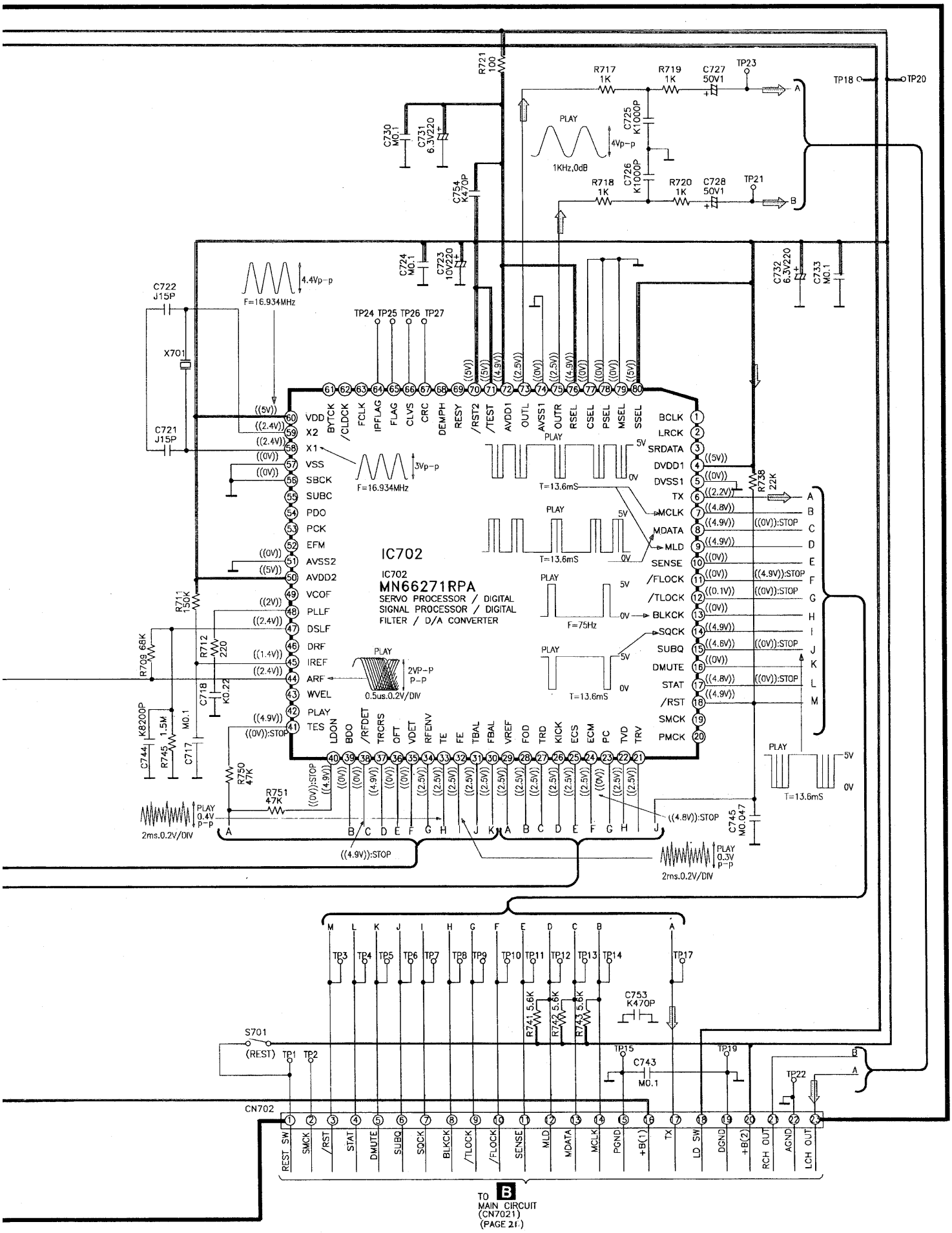
Components identified by ⚠ mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

Caution !

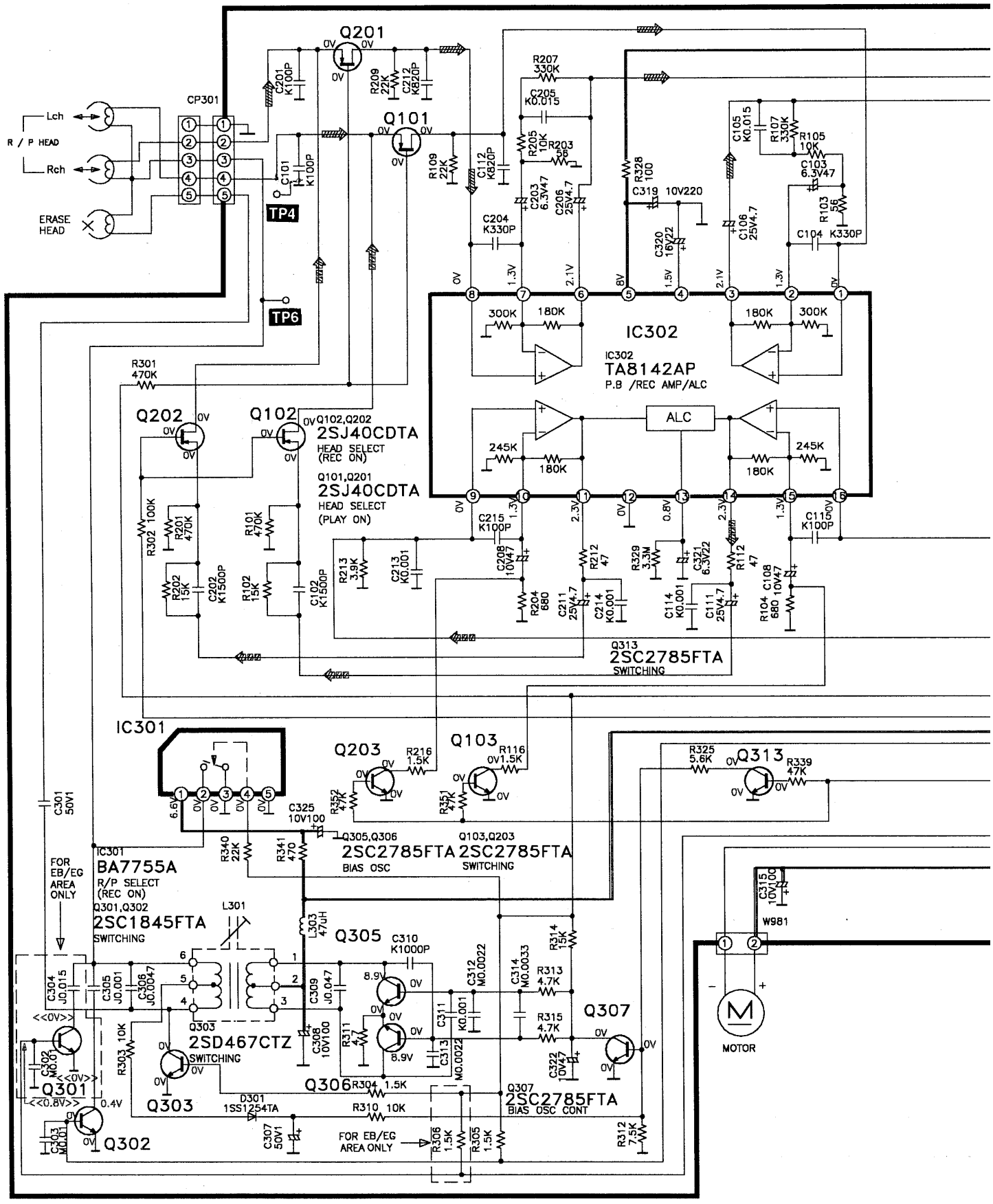
IC, LSI and VLSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.
•Cover the parts boxes made of plastics with aluminium foil.
•Ground the soldering iron.
•Put a conductive mat on the work table.
•Do not touch the pins of IC, LSI or VLSI with fingers directly.

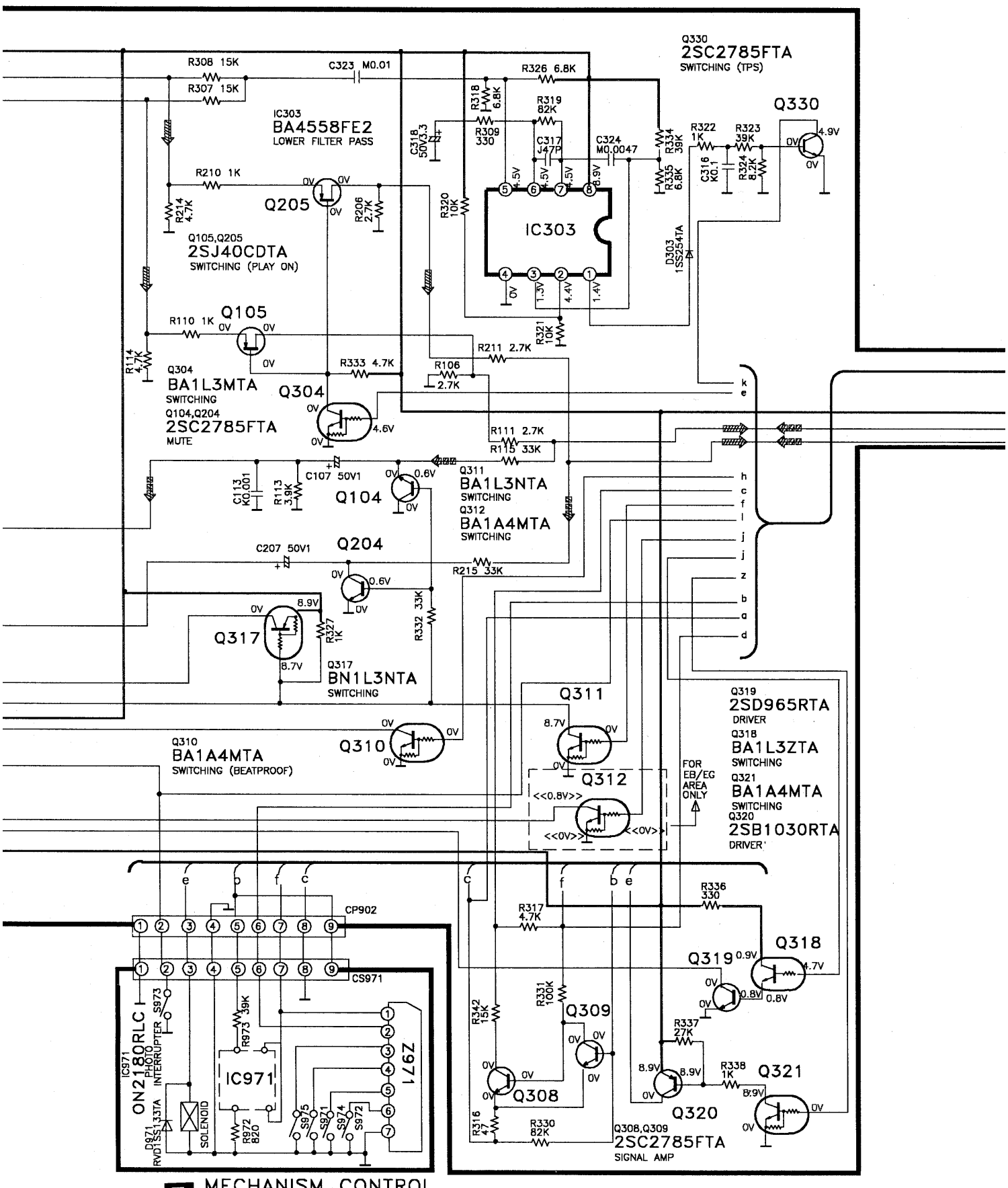
A SERVO CIRCUIT



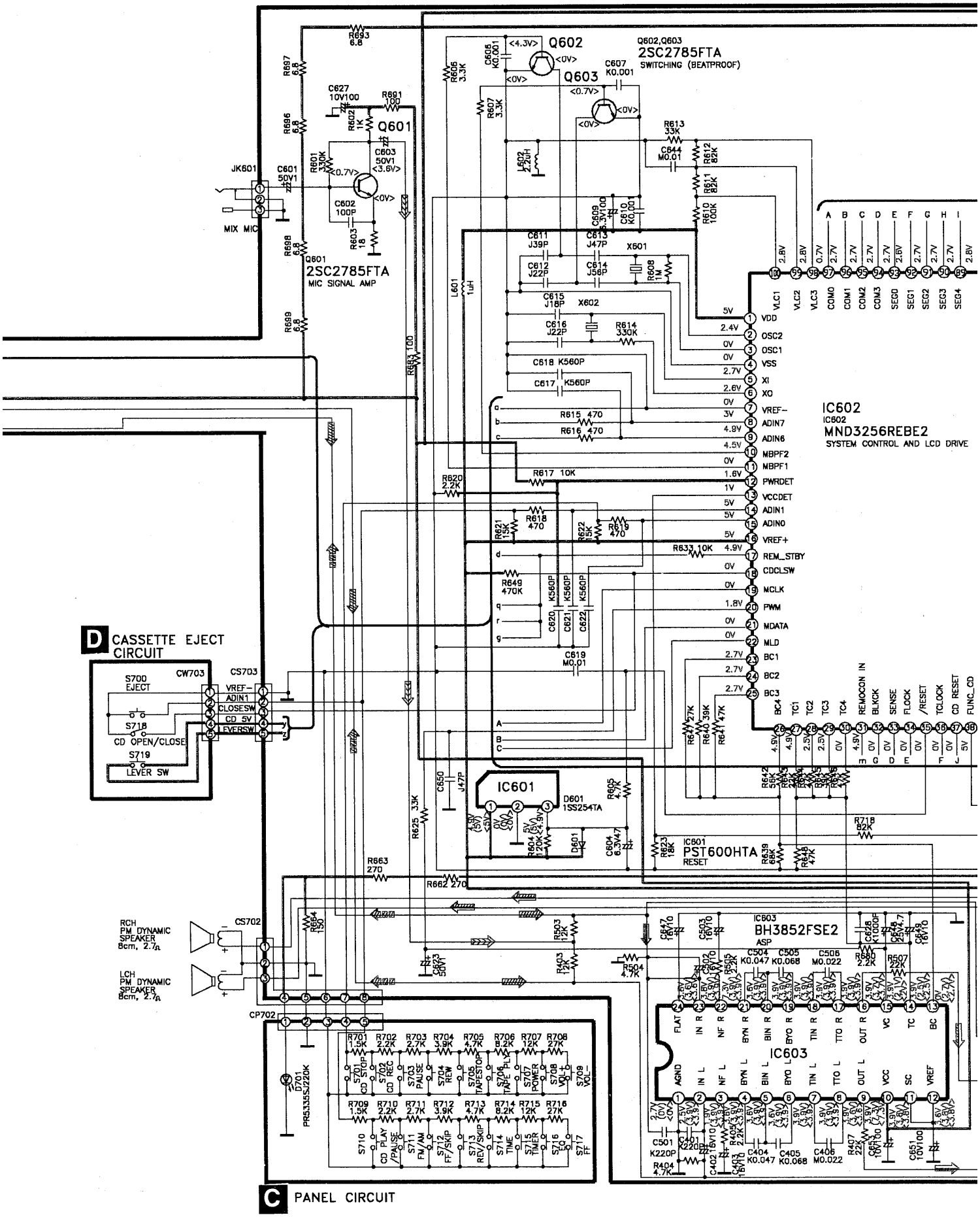

IC702
IC702
MN66271RPA
SERVO PROCESSOR / DIGITAL
SIGNAL PROCESSOR / DIGITAL
FILTER / D/A CONVERTER
VDD
X2
X1
VSS
SBCK
SUBC
PDO
PCK
EFM
AVSS2
AVDD2
VCOF
PLLF
DSLF
DRF
IREF
ARF
WVEL
PLAY
TES
BCLK
LRCK
SRDATA
DVDD1
DVSS1
TX
MCLK
MDATA
MLD
SENSE
/FLOCK
/TLOCK
BLKCK
SQCK
SUBQ
DMUTE
STAT
/RST
SMCK
PMCK
BYTCK
/CLDCK
FCLK
IPFLAG
FLAG
CLVS
CRC
DEMPH
RESY
/RST2
/TEST
AVDD1
OUTL
AVSS1
OUTR
RSEL
CSEL
PSEL
MSEL
SSEL
LDON
BDO
/RFDET
TRCRS
OFT
VDET
RFENV
TE
FE
TBAL
FBAL
VREF
FOD
TRD
KICK
ECS
ECM
PC
TVD
TRV
X701
F=16.934MHz
4.4Vp-p
3Vp-p
C722 J15P
C721 J15P
C724 M0.1
C723 10V220
C730 M0.1
C731 6.3V220
C732 6.3V220
C733 M0.1
C754 K470P
C725 K1000P
C726 K1000P
C727 50V1
C728 50V1
C753 K470P
C743 M0.1
C745 M0.047
C744 K8200P
C717 M0.1
C718 K0.22
R721 100
R717 1K
R719 1K
R718 1K
R720 1K
R738 22K
R711 150K
R709 68K
R712 220
R745 1.5M
R750 47K
R751 47K
R741 5.6K
R742 5.6K
R743 5.6K
PLAY
1KHz,0dB
4Vp-p
2VP-P
0.5us.0.2V/DIV
2ms.0.2V/DIV
0.4V p-p
0.3V p-p
T=13.6mS
F=75Hz
5V
0V
TP18
TP20
TP21
TP23
TP24 TP25 TP26 TP27
TP3 TP4 TP5 TP6 TP7 TP8 TP9 TP10 TP11 TP12 TP13 TP14 TP17
TP15
TP19
TP22
S701
(REST)
TP1
TP2
CN702
REST SW
SMCK
/RST
STAT
DMUTE
SUBQ
SQCK
BLKCK
/TLOCK
/FLOCK
SENSE
MLD
MDATA
MCLK
PGND
+B(1)
TX
LD SW
DGND
+B(2)
RCH OUT
AGND
LCH OUT
TO B
MAIN CIRCUIT
(CN7021)
(PAGE 21)

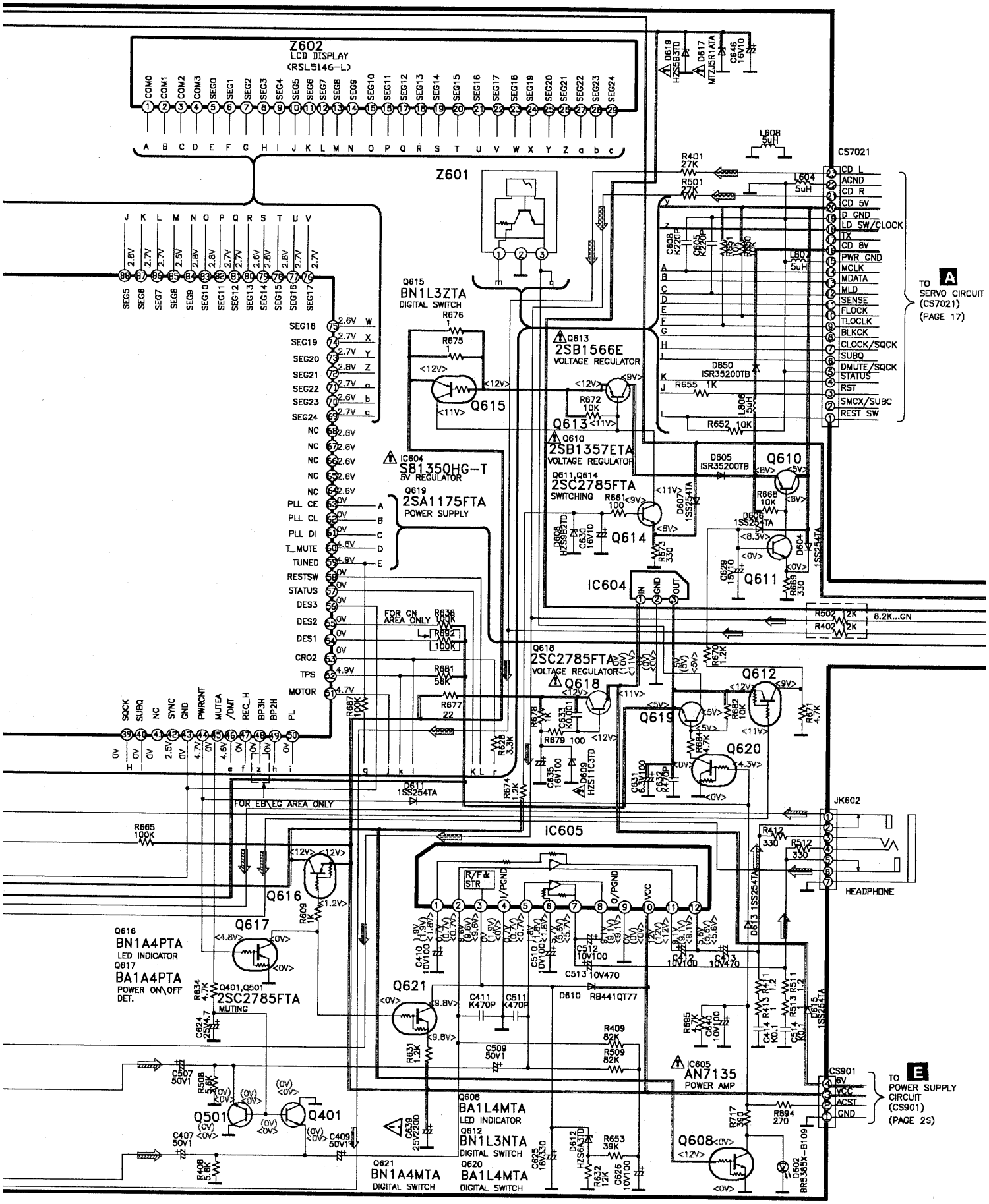
B MAIN CIRCUIT



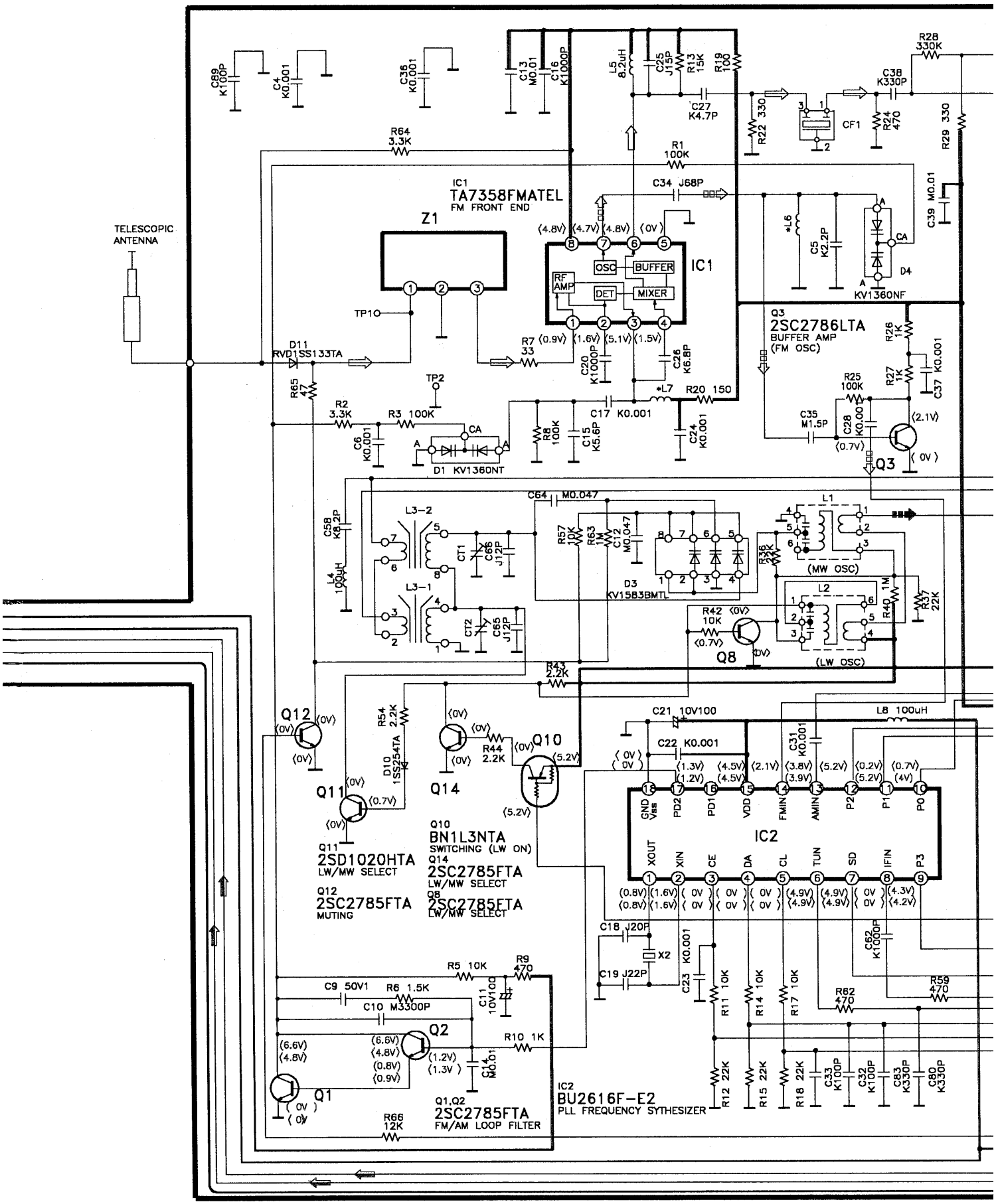


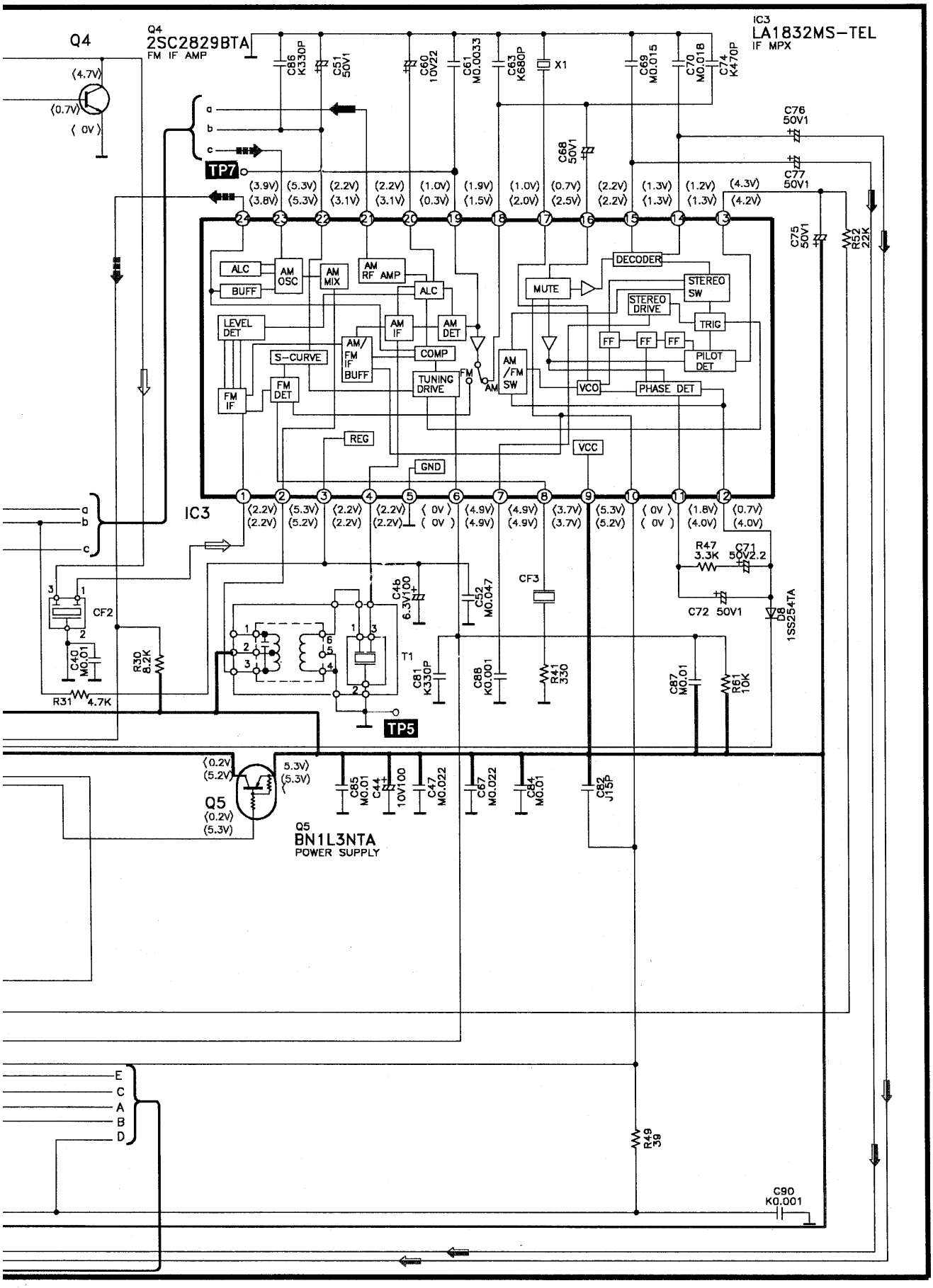
F MECHANISM CONTROL CIRCUIT


Q602,Q603
2SC2785FTA
SWITCHING (BEATPROOF)
Q602
Q603
Q601
2SC2785FTA
MIC SIGNAL AMP
IC602
MND3256REBE2
SYSTEM CONTROL AND LCD DRIVE
IC601
PST600HTA
RESET
IC603
BH3852FSE2
ASP
D601
1SS254TA
X501
X602
D CASSETTE EJECT CIRCUIT
S700 EJECT
S718 CD OPEN/CLOSE
S719 LEVER SW
CW703
CS703
CS702
CP702
RCH PM DYNAMIC SPEAKER 8cm, 2.7Ω
LCH PM DYNAMIC SPEAKER 8cm, 2.7Ω
MIX MIC
JK601
C PANEL CIRCUIT

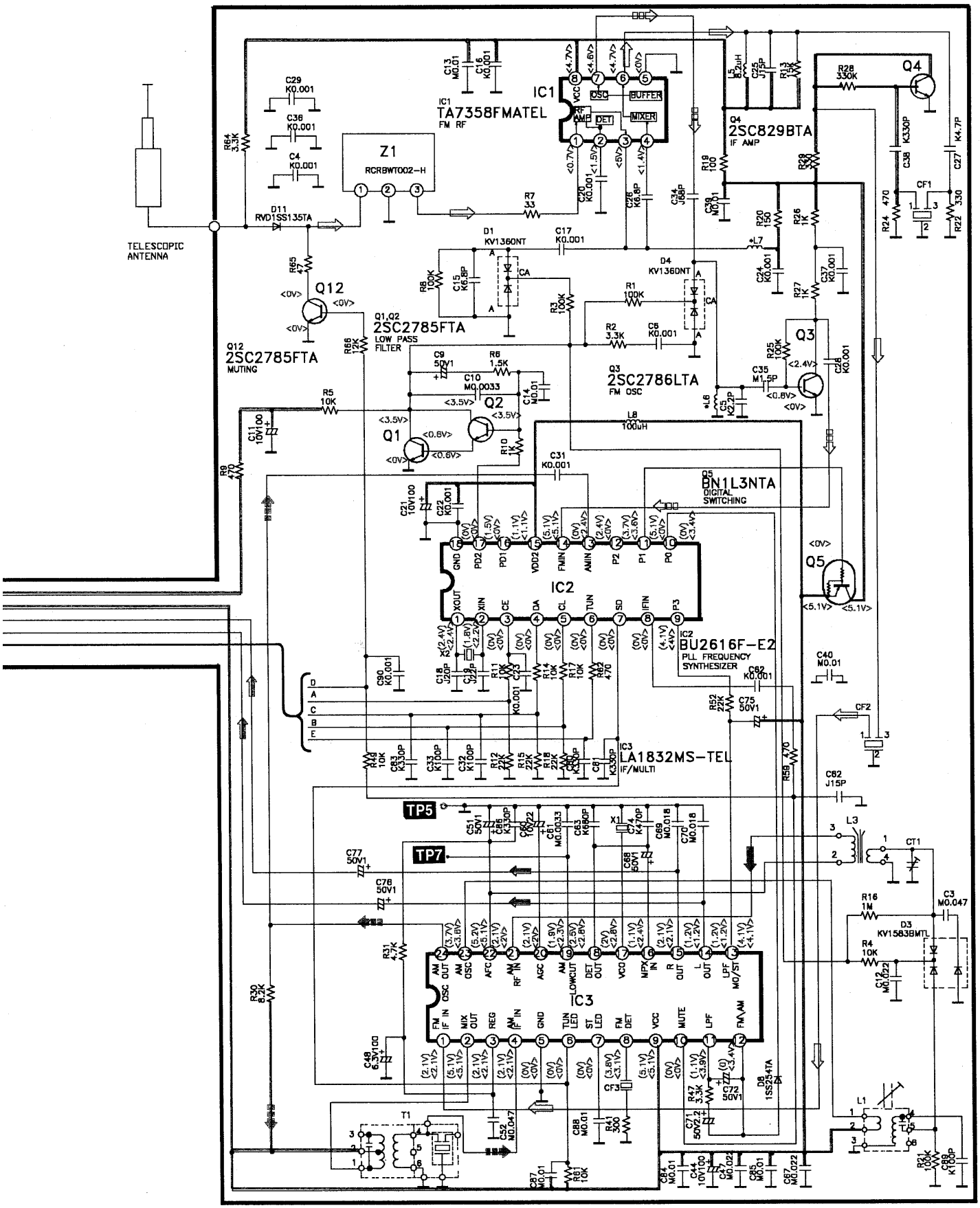

Z602
LCD DISPLAY
(RSL5146-L)
Z601
CS7021
TO A SERVO CIRCUIT (CS7021) (PAGE 17)
Q615 BN1L3ZTA DIGITAL SWITCH
Q613 2SB1566E VOLTAGE REGULATOR
Q610 2SB1357ETA VOLTAGE REGULATOR
Q611,Q614 2SC2785FTA SWITCHING
IC604 S81350HG-T 5V REGULATOR
Q619 2SA1175FTA POWER SUPPLY
Q618 2SC2785FTA VOLTAGE REGULATOR
IC605
Q616
Q617 BA1A4PTA POWER ON/OFF DET.
Q616 BN1A4PTA LED INDICATOR
Q401,Q501 2SC2785FTA MUTING
Q621 BN1A4MTA DIGITAL SWITCH
Q608 BA1L4MTA LED INDICATOR
Q612 BN1L3NTA DIGITAL SWITCH
Q620 BA1L4MTA DIGITAL SWITCH
IC605 AN7135 POWER AMP
JK602
HEADPHONE
CS901
TO E POWER SUPPLY CIRCUIT (CS901) (PAGE 25)
FOR EB\EG AREA ONLY
FOR GN AREA ONLY

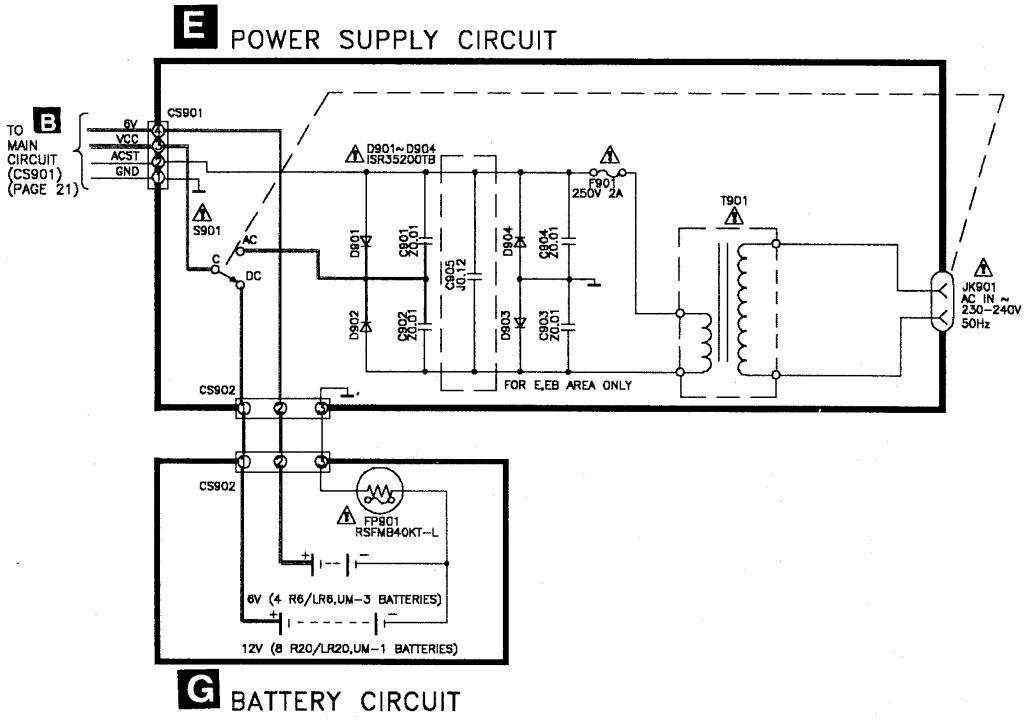
FOR EB,EG AREA




Q4
2SC2829BTA
FM IF AMP
IC3
LA1832MS-TEL
IF MPX
TP7
TP5
IC3
Q5
BN1L3NTA
POWER SUPPLY
ALC
AM OSC
AM MIX
AM RF AMP
BUFF
LEVEL DET
S-CURVE
FM IF
FM DET
AM IF
AM DET
AM/FM IF BUFF
COMP
TUNING DRIVE
AM/FM SW
MUTE
DECODER
STEREO SW
STEREO DRIVE
TRIG
PILOT DET
PHASE DET
VCO
REG
VCC
GND
CF2
CF3
T1
X1
D8 1SS254TA

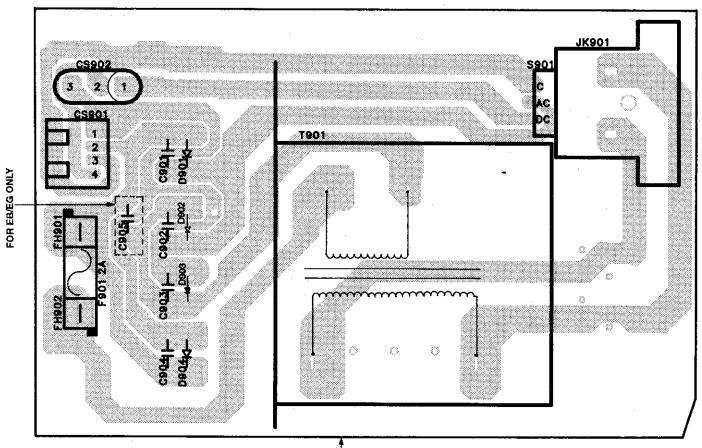
FOR GN AREA ONLY



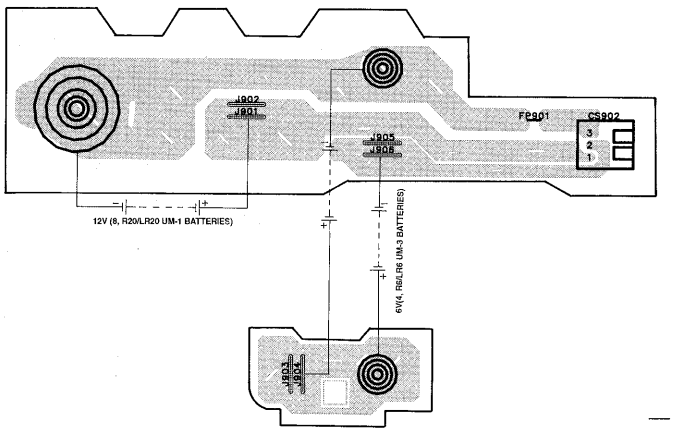


■ Printed Circuit Board

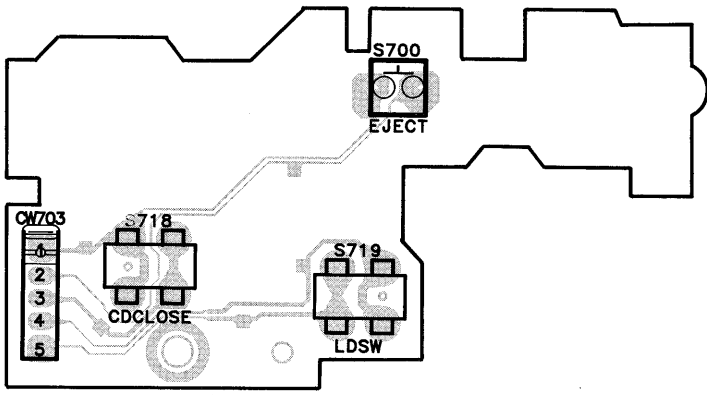
E POWER SUPPLY P.C.B. (REP2232E ... GN) (REP2232C ... EB,EG)



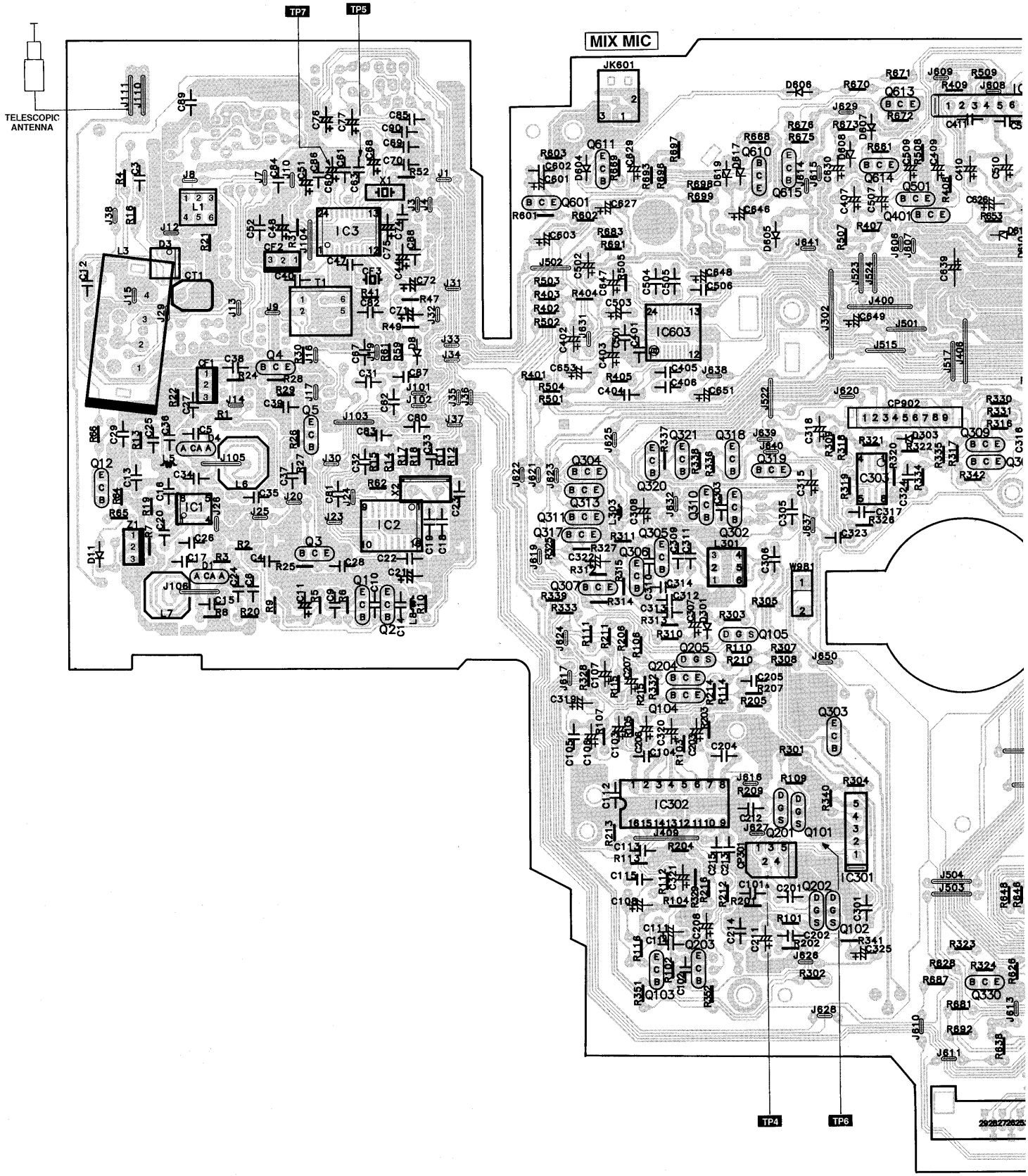
G BATTERY P.C.B. (REP2232E ... GN) (REP2232C ... EB,EG)

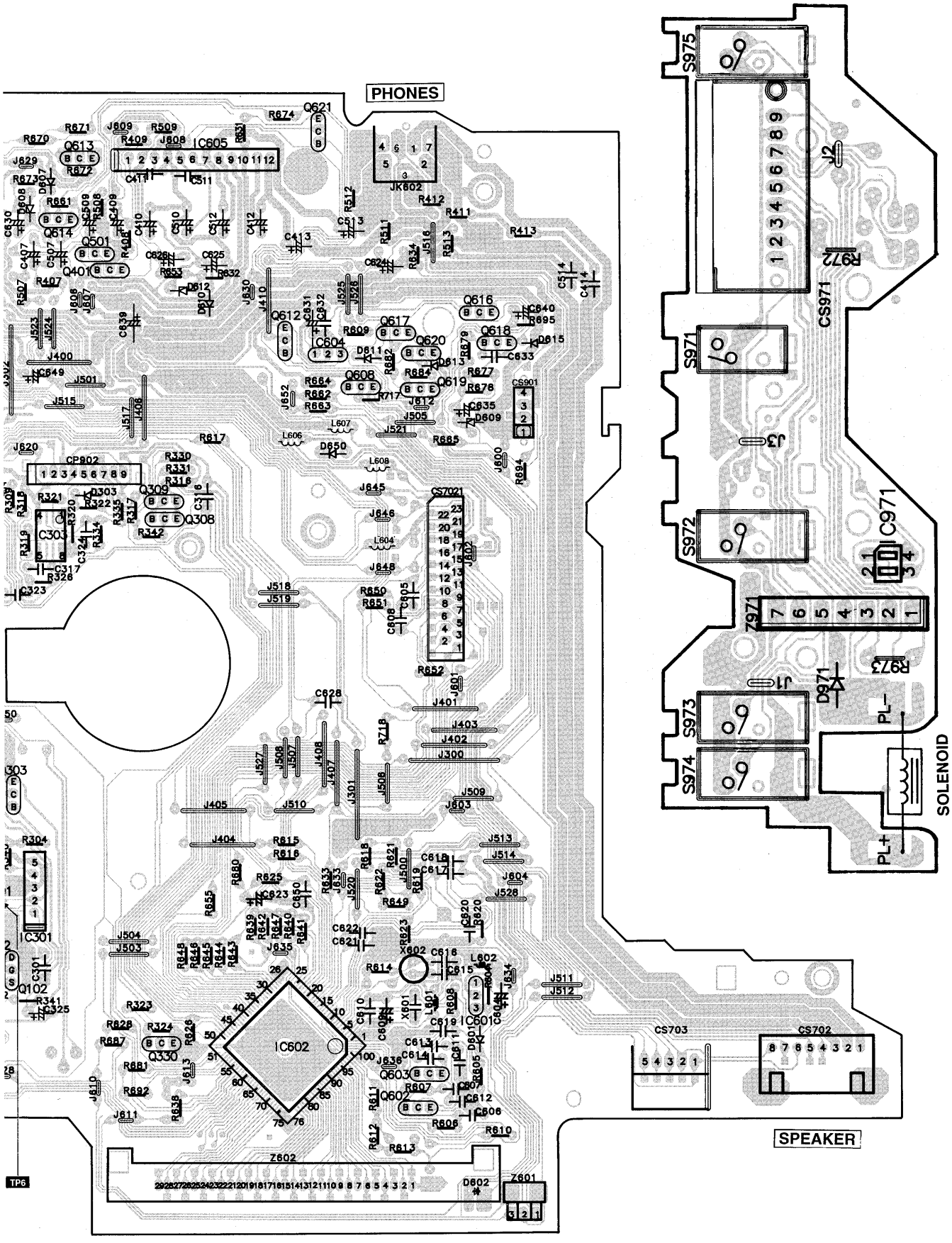


D CASSETTE EJECT P.C.B. (REP2232E ... GN) (REP2232C ... EB,EG)



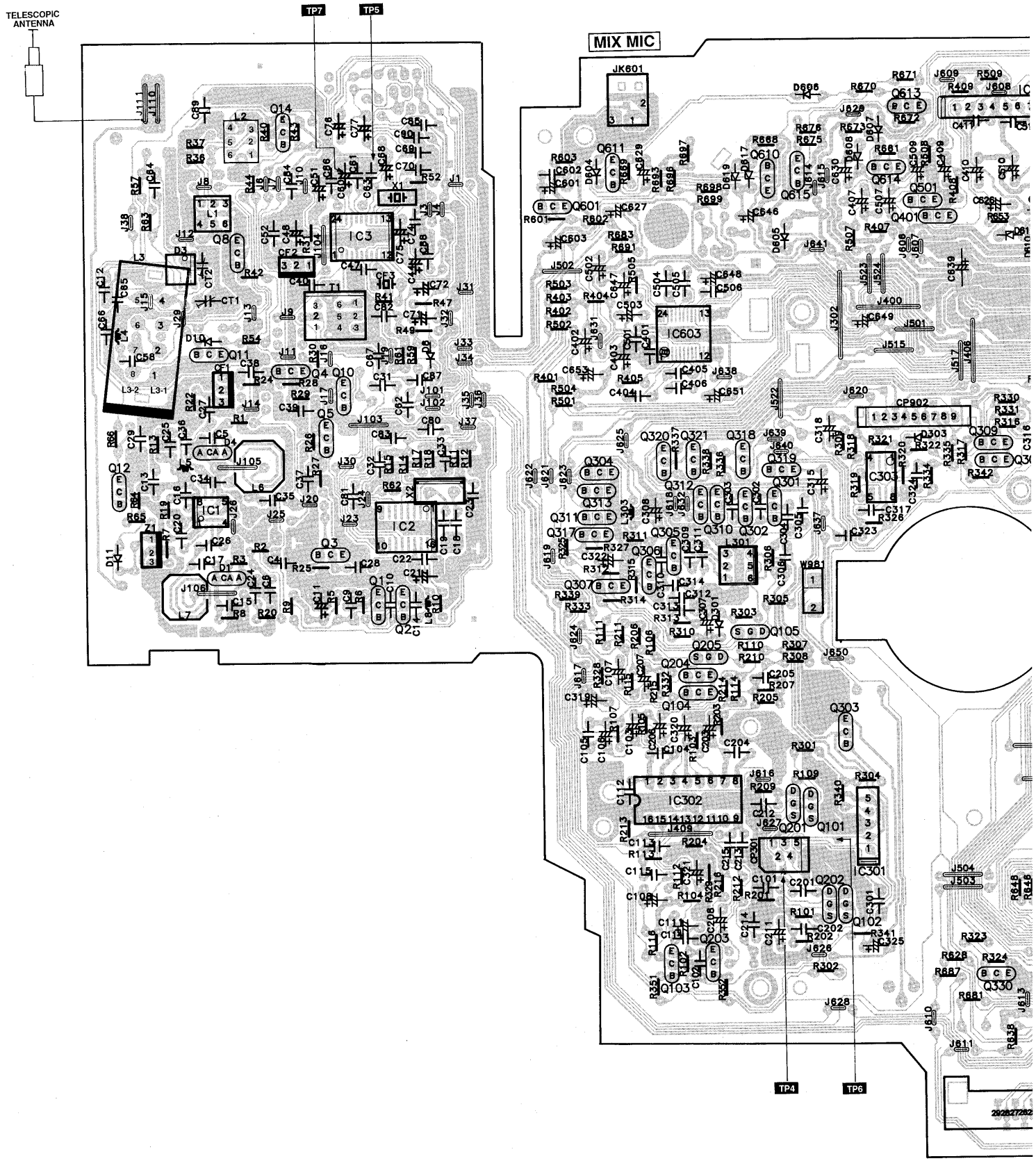
B MAIN P.C.B. (REP2232E ... GN)

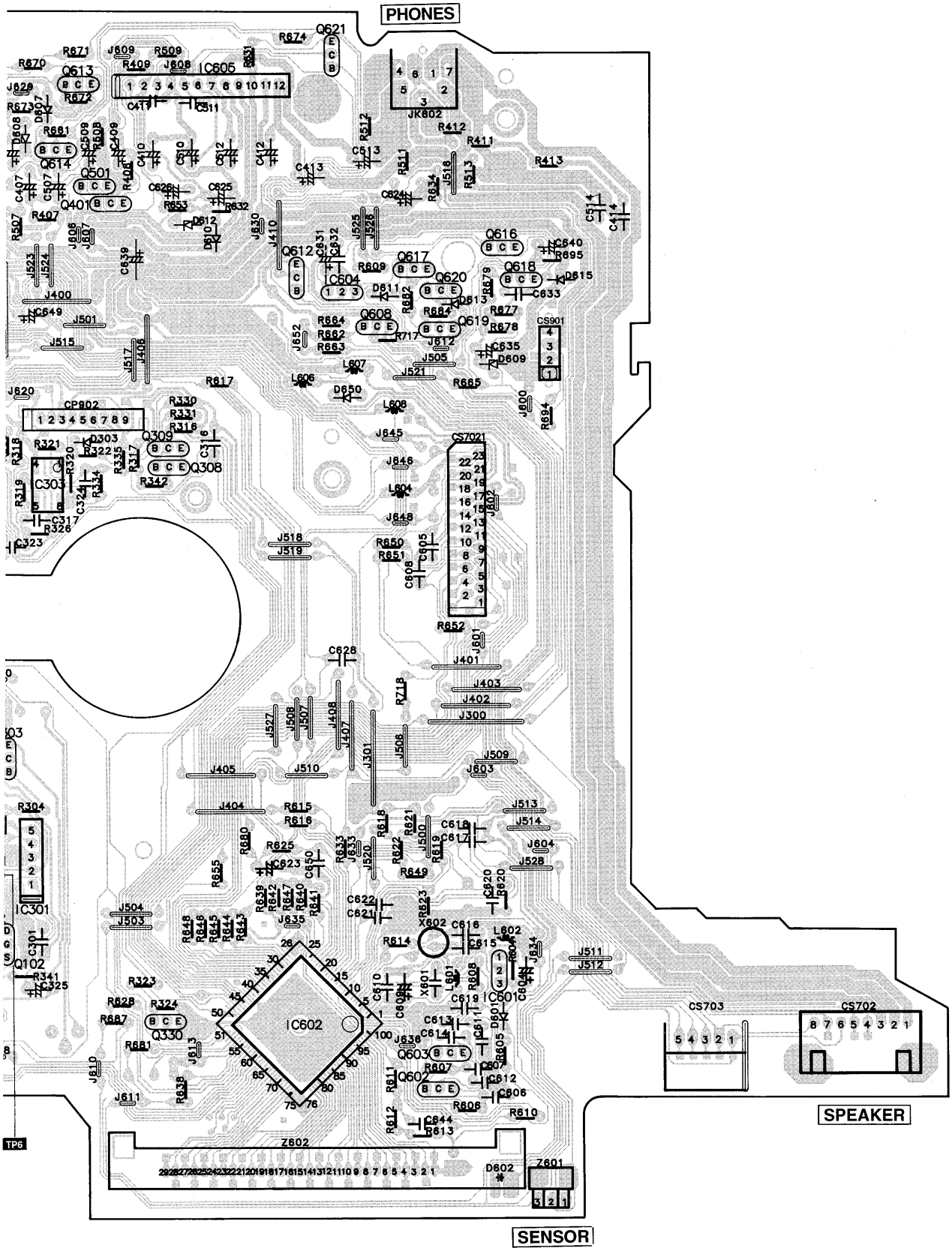




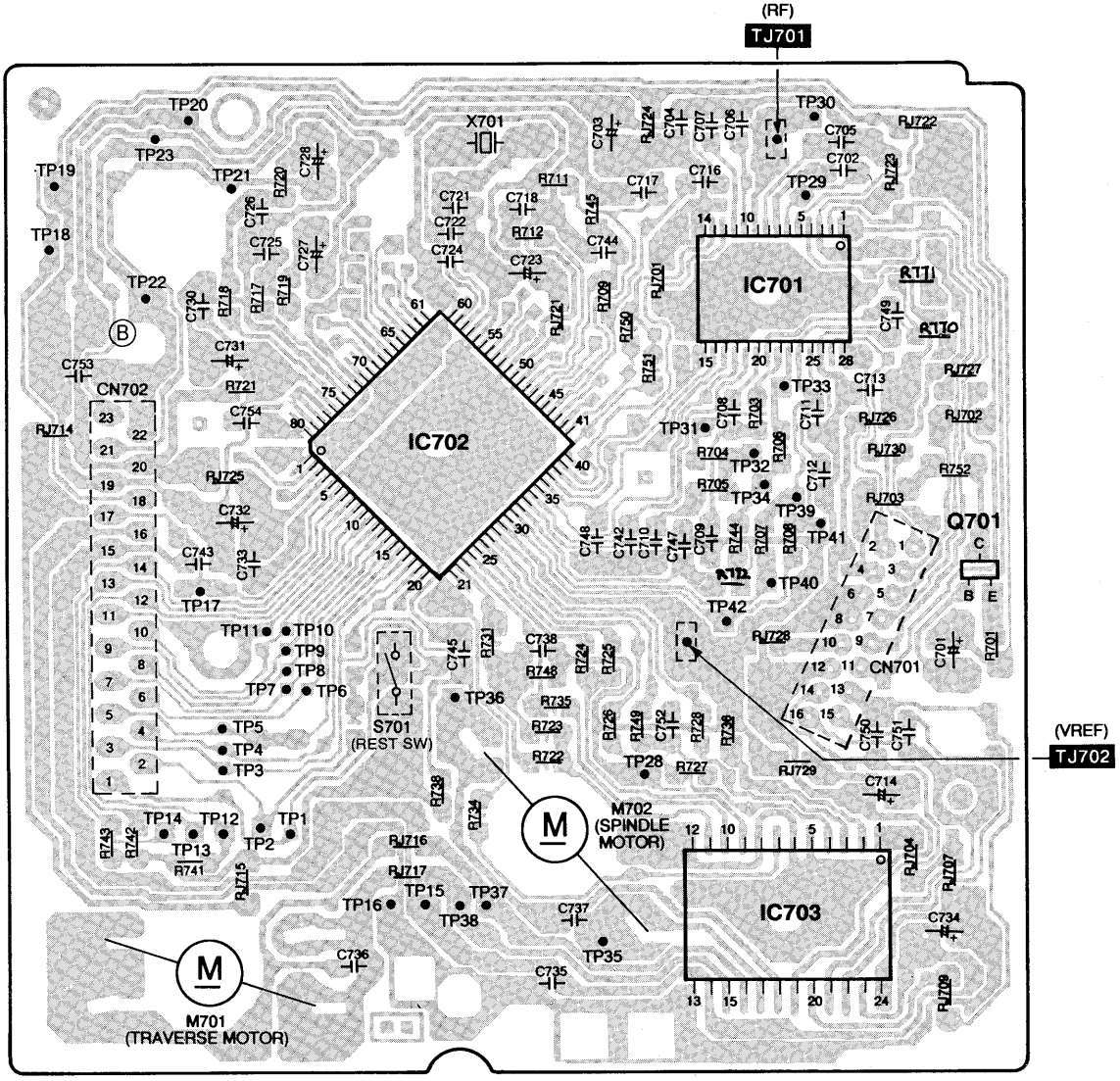
■MECHANISM CONTROL P.C.B. (REPX0108)

B MAIN P.C.B. (REP2232C ... EB,EG)

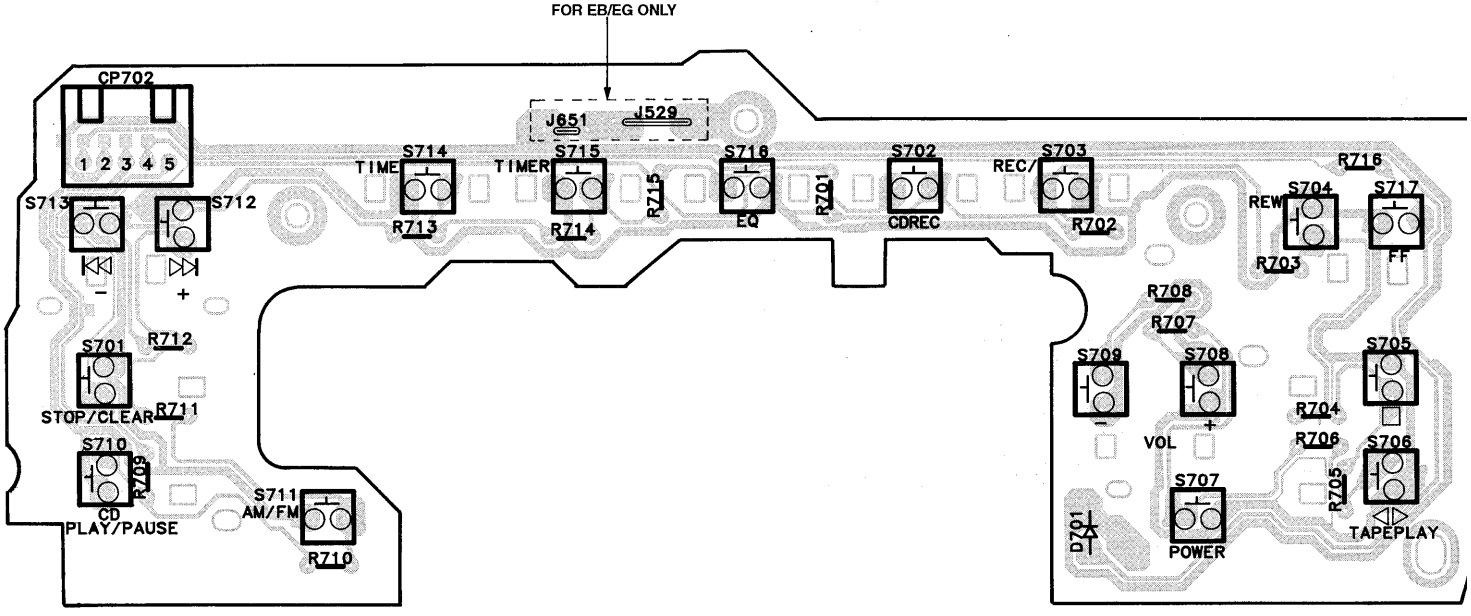



PHONES
SPEAKER
SENSOR
IC602
IC605
IC604
IC601
IC301
JK602
CS703
CS702
CS901
CS7021
CP902
Z602
Z601
TP6

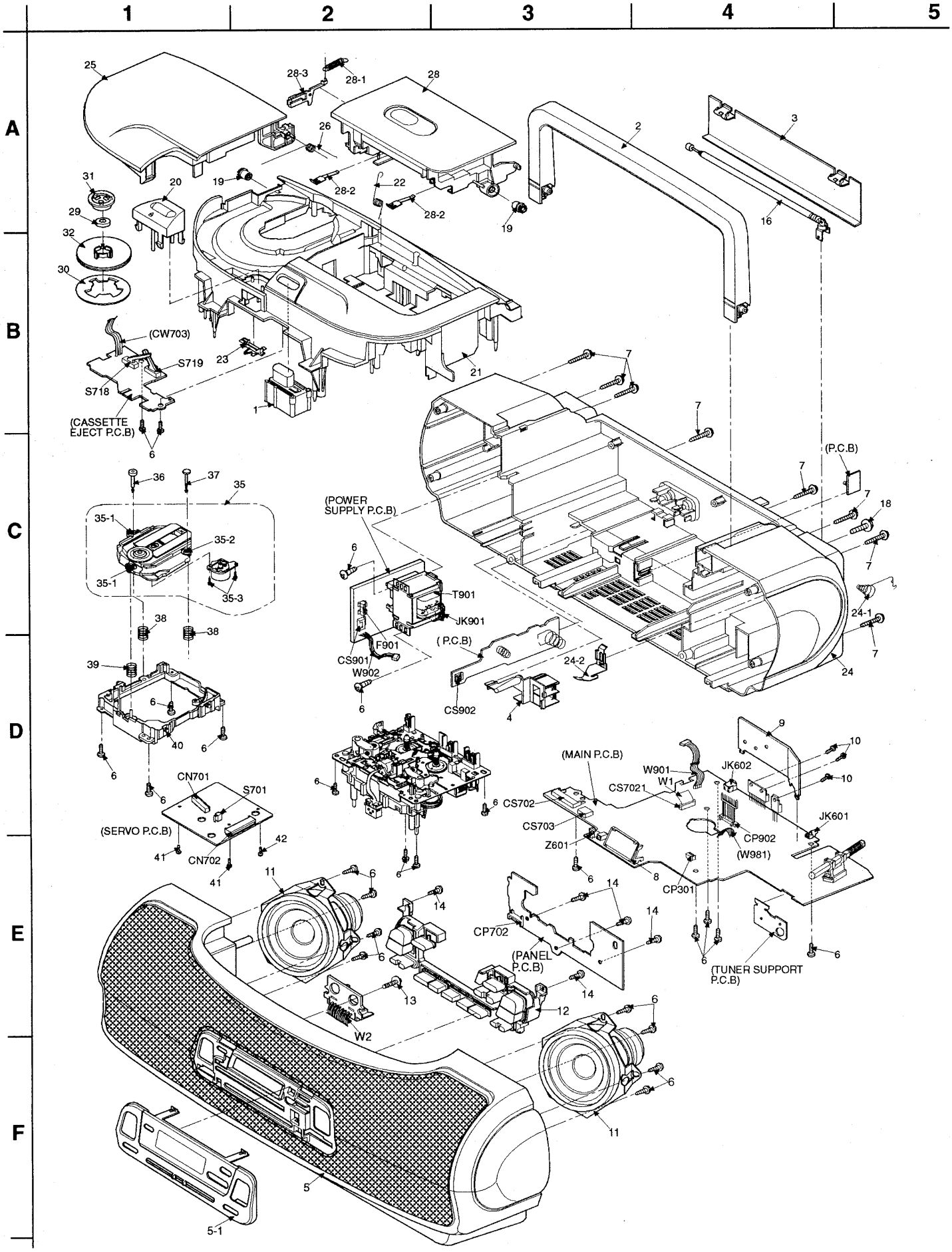
A SERVO P.C.B. (REPX0109)



C PANEL P.C.B. (REP2232E ... GN) (REP2232C ... EB,EG)



■ Cabinet Parts Location



■ Replacement Parts List

Notes: * Important safety notice :
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
* The parenthesized indications in the Remarks column specify the areas. (refer to the cover page for area.)
Parts without these indications can be used for all areas.
* [M] in Remarks column indicates parts that are supplied by **MESA**.
* **Warning:** This product uses a laser diode. Refer to caution statements on page 2 and 3.
* **ACHTUNG**: Die lasereinheit nicht zerlegen.
Die lasereinheit darf nur gegen einc vom hersteller spezifizierte einheit ausgetauscht werden.

Ref No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS	
1	RGU1335-K	CASS. EJ. BUTTON	[M]
2	RKH0034-K	HANDLE	[M]
3	RKK347ZA-K	BATTERY COVER	[M]
4	RMR0957-W	SAFETY COVER	[M]
5	RFKGXES50GCK	FRONT CABINET ASS'Y	[M](GN)
5	RFKGXES50EBK	FRONT CABINET ASS'Y	[M](EB,EG)
5-1	RGP0519B-Q	LCD PANEL	[M]
6	XTV3+12G-M	SCREW (PCB & SP)	[M]
7	XTV3+20G	REAR CAB SCREW	
8	RMN0363A	LCD HOLDER	[M]
9	RMY0172	HEAT SINK	[M]
10	XTV3+10F	SCREW (HEAT SINK)	
11	EAS8P342A6	SPEAKER	[M]
12	RGU1336A-K	OPERATION BUTTON	[M]
13	RHD30044	SP CONNECTOR SCREW	
14	XTBS26+10J	SCREW	
16	XEARR210C-Y	R.ANTENNA	[M]
18	XYN3+F8FY	R. ANTENNA SCREW	
19	RDG0183-L	DAMPER GEAR	[M]
20	RGU1334-K	CD EJ. BUTTON	[M]
21	RKQ0191-K	TOP CAB	[M]
22	RME0202	CASS. OPEN SPRING	[M]
23	RMLX0009-KJ	CD EJECT LEVER	[M]
24	RFKHXES50EBK	BACK CABINET ASS'Y	[M](EB,GN)
24	RFKHXES50EGK	BACK CABINET ASS'Y	[M](EG)
24-1	RJC91006	BATT. TERMINAL	[M]
24-2	RJR0161	ROD ANT. TERMINAL	[M]
25	RKF0470-K	CD LID	[M]
26	RME0201	CD OPEN SPRING	[M]
28	RFKLRXES50K	CASS HOLDER ASS'Y	[M]
28-1	RMB0448-J	CASS. EJ. LEV. SPRIN	[M]
28-2	RUS757ZAA	CASS. HALF SPRING	[M]
28-3	RMM0147	ROCK ROD	
29	RHM245ZA	MAGNET	[M]
30	RMG0274-K	CLAMPER RUBBER	
31	RMQ0152-E	FIXTURE	[M]
32	RMQ0225-K	CLAMPER	[M]
35	RAE0150Z	TRAVERSE UNIT	

Ref No.	Part No.	Part Name & Description	Remarks
35-1	SHGD112	FLOATING RUBBER (A)	
35-2	SHGD113-1	FLOATING RUBBER (B)	
35-3	SNSD38	SCREW	
36	RMS0350	FIXED PIN B	
37	RMS0123-1	FIXED PIN A	
38	RME0109	FLOATING SPRING A	
39	RME0142	FLOATING SPRING B	
40	RMR0698-K	TRAVERSE CHASSIS	
41	XTV2+6G	SCREW	
42	XTN2+6G	SCREW	
		INTEGRATED CIRCUITS	
IC1	TA7358FMATEL	IC,FM RF	
IC2	BU2616F-E2	IC,PLL	[M]
IC3	LA1832MS-TEL	IC, IF/MULT1 IC	
IC301	BA7755A	IC,SW	
IC302	TA8142AP	IC,PB/REC PRE-AMP	
IC303	BA4558FE2	IC,LOW PASS FILTER	[M]
IC601	PST600HTA	IC,RESET	
IC602	MND3256REBE2	IC,MICROCOMPUTOR	[M]
IC603	BH3852FSE2	IC,ASP	[M]
IC604	S81350HG-T	IC,5V REGULATOR	[M] ⚠
IC605	AN7135	IC,POWER AMP	⚠
IC701	AN8835SBE1	IC, SERVO AMP.	
IC702	MN662741RPA	IC, DIGITAL LSI	
IC703	AN8389SE1	IC, COIL/MOTOR DRIVE	
IC971	0N2180RLC	IC,HALL	
		TRANSISTORS	
Q1	2SC2785FTA	TRANSISTOR	
Q2	2SC2785FTA	TRANSISTOR	
Q3	2SC2786LTA	TRANSISTOR	
Q4	2SC829BTA	TRANSISTOR	
Q5	BN1L3NTA	TRANSISTOR	[M]
Q8	2SC2785FTA	TRANSISTOR	
Q10	BN1L3NTA	TRANSISTOR	[M]
Q11	2SD1020HTA	TRANSISTOR	[M]
Q12	2SC2785FTA	TRANSISTOR	
Q14	2SC2785FTA	TRANSISTOR	

Ref No.	Part No.	Part Name & Description	Remarks
Q101	2SJ40CDTA	TRANSISTOR	
Q102	2SJ40CDTA	TRANSISTOR	
Q103	2SC2785FTA	TRANSISTOR	
Q104	2SC2785FTA	TRANSISTOR	
Q105	2SJ40CDTA	TRANSISTOR	
Q201	2SJ40CDTA	TRANSISTOR	
Q202	2SJ40CDTA	TRANSISTOR	
Q203	2SC2785FTA	TRANSISTOR	
Q204	2SC2785FTA	TRANSISTOR	
Q205	2SJ40CDTA	TRANSISTOR	
Q301	2SC1845FTA	TRANSISTOR	
Q302	2SC1845FTA	TRANSISTOR	
Q303	2SD467CTZ	TRANSISTOR	[M]
Q304	BA1L3MTA	TRANSISTOR	[M]
Q305	2SC2785FTA	TRANSISTOR	
Q306	2SC2785FTA	TRANSISTOR	
Q307	2SC2785FTA	TRANSISTOR	
Q308	2SC2785FTA	TRANSISTOR	
Q309	2SC2785FTA	TRANSISTOR	
Q310	BA1A4MTA	TRANSISTOR	[M]
Q311	BA1L3NTA	TRANSISTOR	[M]
Q312	BA1A4MTA	TRANSISTOR	[M]
Q313	2SC2785FTA	TRANSISTOR	
Q317	BN1L3NTA	TRANSISTOR	[M]
Q318	BA1L3ZTA	TRANSISTOR	[M]
Q319	2SD965RTA	TRANSISTOR	
Q320	2SB1030RTA	TRANSISTOR	
Q321	BA1A4MTA	TRANSISTOR	[M]
Q330	2SC2785FTA	TRANSISTOR	
Q401	2SC2785FTA	TRANSISTOR	
Q501	2SC2785FTA	TRANSISTOR	
Q601	2SC2785FTA	TRANSISTOR	
Q602	2SC2785FTA	TRANSISTOR	
Q603	2SC2785FTA	TRANSISTOR	
Q608	BA1L4MTA	TRANSISTOR	[M]
Q610	2SB1357ETA	TRANSISTOR	[M] ⚠
Q611	2SC2785FTA	TRANSISTOR	
Q612	BN1L3NTA	TRANSISTOR	[M]
Q613	2SB1566E	TRANSISTOR	[M] ⚠
Q614	2SC2785FTA	TRANSISTOR	
Q615	BN1L3ZTA	TRANSISTOR	[M]

Ref No.	Part No.	Part Name & Description	Remarks
Q616	BN1A4PTA	TRANSISTOR	[M]
Q617	BA1A4PTA	TRANSISTOR	[M]
Q618	2SC2785FTA	TRANSISTOR	⚠
Q619	2SA1175FTA	TRANSISTOR	[M]
Q620	BA1L4MTA	TRANSISTOR	[M]
Q621	BN1A4MTA	TRANSISTOR	[M]
Q701	2SB709S	TRANSISTOR	
		DIODES	
D1	KV1360NT	DIODE	
D3	KV1583BMTL	DIODE	
D4	KV1360NT	DIODE	
D8	1SS254TA	DIODE	
D10	1SS254TA	DIODE	
D11	RVD1SS135TA	DIODE	
D95	MA165TA	DIODE	
D301	1SS254TA	DIODE	
D303	1SS254TA	DIODE	
D601	1SS254TA	DIODE	
D602	BR5385X-B109	DIODE	[M]
D604	1SS254TA	DIODE	
D605	1SR35200TB	DIODE	
D606	1SS254TA	DIODE	
D607	1SS254TA	DIODE	
D608	HZS9B2TD	DIODE	[M]
D609	HZS11C3TD	DIODE	[M] ⚠
D610	RB441QT77	DIODE	
D611	1SS254TA	DIODE	
D612	HZS6A3TD	DIODE	[M]
D613	1SS254TA	DIODE	
D615	1SS254TA	DIODE	
D617	HZS5B3TD	DIODE	[M]
D619	HZS5B3TD	DIODE	[M]
D650	1SR35200TB	DIODE	
D701	BG5385XJ220K	DIODE	[M]
D901	1SR35200TB	DIODE	⚠
D902	1SR35200TB	DIODE	⚠
D903	1SR35200TB	DIODE	⚠
D904	1SR35200TB	DIODE	⚠
D971	MA165TA	DIODE	
		SWITCHES	
S700	EVQ21405R	SW,CASS. OPEN	
S701	RSM0006-P	SW, RESET (SERVO)	
S701	EVQ21405R	SW,CD STOP/CLEAR	
S702	EVQ21405R	SW,CD RECORD MODE	

Ref No.	Part No.	Part Name & Description	Remarks
S703	EVQ21405R	SW,REC/PAUSE	
S704	EVQ21405R	SW,REW	
S705	EVQ21405R	SW,TAPE STOP	
S706	EVQ21405R	SW,TAPE PLAY	
S707	EVQ21405R	SW,POWER	
S708	EVQ21405R	SW,VOL INCREASE	
S709	EVQ21405R	SW,VOL DECREASE	
S710	EVQ21405R	SW,CDPLAY/PAUSE	
S711	EVQ21405R	SW,FM/AM	
S712	EVQ21405R	SW,FF/SKIP	
S713	EVQ21405R	SW,REV/SKIP	
S714	EVQ21405R	SW,TIME	
S715	EVQ21405R	SW,TIMER	
S716	EVQ21405R	SW,EQ	
S717	EVQ21405R	SW,TAPE FF	
S718	RSH1A033-U	SW,CD OPEN/CLOSE	[M]
S719	RSH1A033-U	SW, LEVER SW	[M]
S901	RJJ1SE01-1H	JACK W/SW (JK901)	⚠
S971	RSH1A018-1U	SW,MODE DETECT	
S972	RSH1A019-2U	SW,TAPE DETECT	
S973	RSH1A019-2U	SW,Cr02 DETECT	
S974	RSH1A019-2U	SW,REC DETECT	
S975	RSH1A019-2U	SW,REC DETECT	
		CONNECTORS	
CN701	RJU035T016-1	16 PIN FFC CONNECTOR	
CN702	RJS1A6723-1Q	23 PIN FFC CONNECTOR	
CP301	RJS1A6805-J	CONNECTOR (5 P)	[M]
CP702	RJT029W005-1	CONNECTOR (5 P)	[M]
CP902	RJT071H09A	CONNECTOR (9 P)	
CS702	RJT060B08	SP PLUG (8P)	
CS703	RJS5T6ZA	CONNECTOR (3P)	[M]
CS901	RJT029W004-1	PLUG (4P)	[M]
CS902	RJT029W003-1	BATT PLUG (3P)	
CS971	RJU071H09M1	9P CONNECTOR	[M]
CS7021	RJS1A6823	23P FPC CONNECTOR	
		COMP. COMBINATION	
Z1	RCRBWT002-H	OSC COIL	
Z601	RCD12042SR	REM. CONTROL UNIT	[M]
Z602	RSL5146-L	LCD	[M]
		COILS,TRANSFORMERS	
L1	RL02B011-T	COIL	(EB,EG)
L1	RL02B012-T	COIL	(GN)

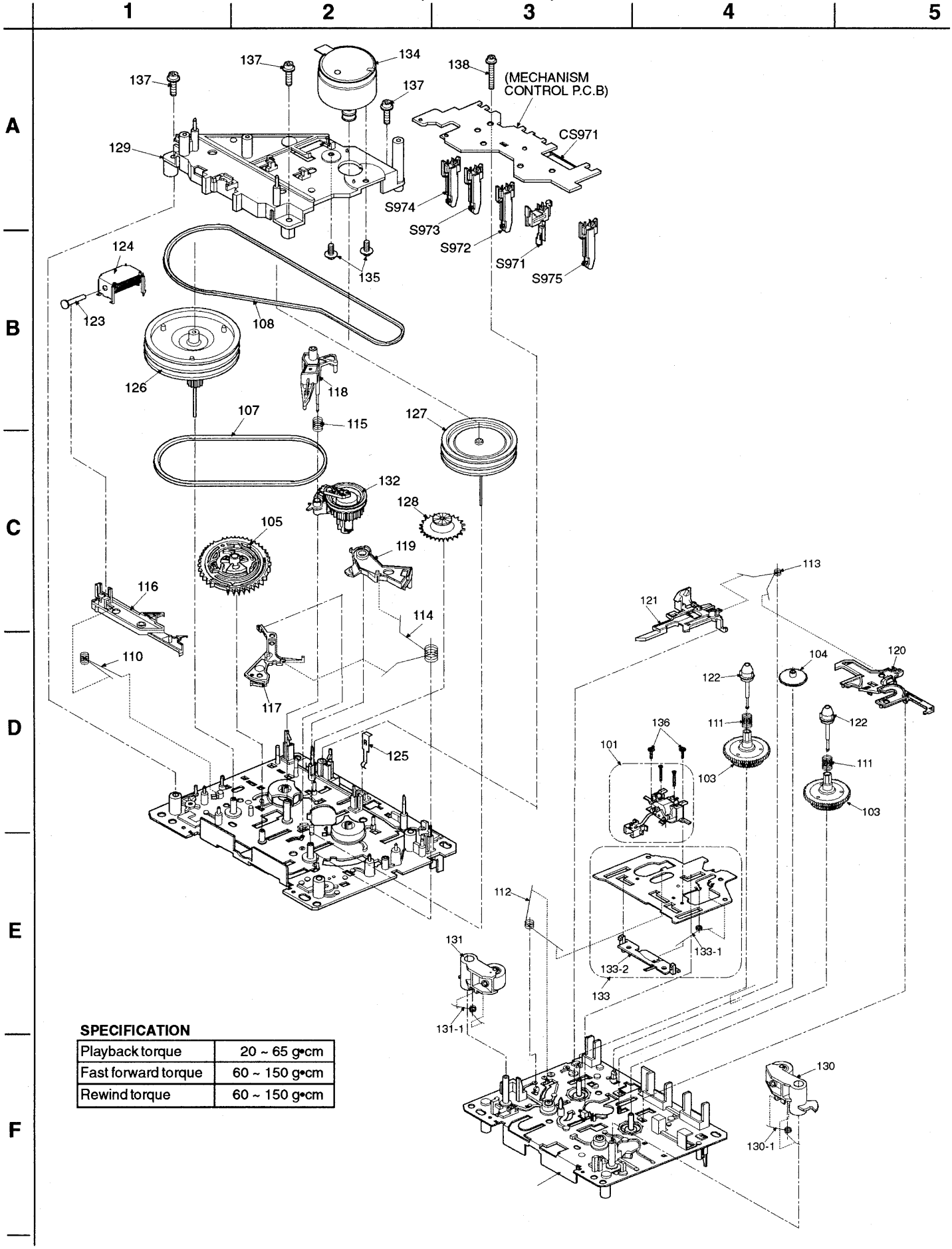
Ref No.	Part No.	Part Name & Description	Remarks
L2	RL01B004-T	COIL	
L3	RLV6C013-0	AM F. ANT	(EB,EG)
L3	RLV2C022-0	AM F. ANT	(GN)
L4	RLQZP101KT-Y	AXIAL COIL	
L5	RLQZP8R2JT-Y	AXIAL COIL	
L8	RLQZP101KT-Y	AXIAL COIL	
L301	RL08B003-K	BIAS OSC COIL	
L303	RLQA470JT1-Y	AXIAL COIL	
L601	RLQZP100KT-Y	AXIAL COIL	
L602	RLQZP2R2KT-Y	AXIAL COIL	
L604	RLL500050T-Y	RF CHOKE COIL	
L606	RLL500050T-Y	RF CHOKE COIL	
L607	RLL500050T-Y	RF CHOKE COIL	
L608	RLL500050T-Y	RF CHOKE COIL	
T1	RLI2Z019-T	FM IFT	(EB,EG)
T1	RLI2Z010-T	FM IFT	(GN)
T901	RTP1U1B004-X	POWER TRANSFORMER	[M] ⚠
		TRIMMERS	
CT1	RCV10AF1T-S	TRIMMER	
CT2	ECRLA030E53R	TRIMMER CAPACITOR	
		CERAMIC FILTERS	
CF1	RLFFETMLA02D	FILTER	
CF2	RLFFETMLA02D	FILTER	
CF3	RLFDFT14AD	FM RESONATOR	
		OSCILLATORS	
X1	RSXZ456KM01	19KHZ OSC	
X2	RSXC7M20S04T	XTAL 7.2MHZ	
X601	EF0EN6004T4	CERAMIC OSC	[M]
X602	RSXD32K7S02	32.768HKZ X'TAL	[M]
X701	RSXZ16M9M01T	CERAMIC OSC	
		FUSES	
F901	XBA2C20TB0	FUSE	⚠
		FUSE PROTECTORS	
FP901	RSFMB40KT-L	FUSE PROTECTOR	⚠

Ref No.	Part No.	Part Name & Description	Remarks
		FUSE HOLDERS	
FH901	RJR0169T	FUSE HOLDER	[M]
FH902	RJR0169T	FUSE HOLDER	[M]
		JACKS	
JK601	RJJD3M6ZB-C	JK, MIC	
JK602	RJJ37TK01-C	JK, HEAD PHONE	
JK901	RJJ1SE01-1H	JK,W/SW (S901)	⚠
		WIRES	
W1	REE0667	WIRE,FFC	[M]
W2	REX0778	WIRE, SPEAKER	[M]
W901	REX0779	WIRE,MAIN TO POWER	[M]
W902	REX0780	WIRE,BATTERY	[M]

■ Mechanism Parts List

Ref No.	Part No.	Part Name & Description	Remarks
		CASSETTE DECK	
101	RED0037	HEAD BLOCK ASS'Y	
103	RDG0300	REEL TABLE BASE	
104	RDG0301	GEAR	
105	RDK0026	GEAR	
107	RDV0033-1	BELT	
108	RDV0034	BELT	
110	RMB0312	SPRING	
111	RMB0400	REEL TABLE SPRING	
112	RMB0403	SPRING	
113	RMB0404	SPRING	
114	RMB0406	SPRING	
115	RMB0408	SPRING	
116	RML0370	LEVER	
117	RML0371	LEVER	
118	RML0372	ARM	
119	RML0374	LEVER	
120	RMM0131	LEVER	
121	RMM0133	LEVER	
122	RMQ0519	REEL TABLE HEAD	
123	RMS0398-1	SHAFT	
124	RSJ0003	PLUNGER	
125	RUS609ZC	SPRING	
126	RXF0049	FLYWHEEL ASS'Y	
127	RXF0050	FLYWHEEL ASS'Y	
128	RXG0040	GEAR	
129	RMK0283	PLATE	
130	RXL0124	PINCH ROLLER ASS'Y	
130-1	RMB0401	SPRING	
131	RXL0125	PINCH ROLLER ASS'Y	
131-1	RMB0402	SPRING	
132	RXL0126	GEAR	
133	RXQ0412	ROD	
133-1	RMB0405	SPRING	
133-2	RMM0132	ROD	
134	RFKPXES50GCK	MOTOR ASS'Y	[M]
135	RHD26022	SCREW	
136	XTW2+5L	SCREW	
137	XTW26+10S	SCREW	
138	XYC2+JF17	SCREW	

■ Mechanism Parts Location (RAA4105)



SPECIFICATION

Playback torque	20 ~ 65 g•cm
Fast forward torque	60 ~ 150 g•cm
Rewind torque	60 ~ 150 g•cm

■ Packing Materials & Accessories

Notes: *Important safety notice :
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
* The parenthesized indications in the Remarks column specify the areas. (refer to the cover page for area.)
Parts without these indications can be used for all areas.
* [M] indicates in Remarks column parts that are supplied by **MESA**.
* The "(SF)" mark denotes the standard part.
* Remote Control Unit :
Supply period for three years from terminal of production.

Ref No.	Part No.	Part Name & Description	Remarks
		PACKING MATERIALS	
P1	RPG2843	GIFT BOX	[M](EB)(EG)
P1	RPG2848	GIFT BOX	[M](GN)
P2	RPH0131	MIRAMAT SHEET	[M]
P3	RPN0943	POLYFOAM	[M]

Ref No.	Part No.	Part Name & Description	Remarks
		ACCESSORIES	
A1	RQT3458-B	INSTRUCTION MANUAL	[M](EB)(GN)
A1	RFKSXES50EGK	INSTRU MNL ASS'Y	[M](EG)
A2	EUR643823	REMOTE CONTROL	[M]
A2-1	UR64EC1638-1	BATTERY COVER (R C)	[M]

Ref No.	Part No.	Part Name & Description	Remarks
A3	VJA0733	AC-CORD ⚠	(EB) (SF)
A3	RJA0019-2K	AC CORD ⚠	(EG) (SF)
A3	RJA0035-K	AC CORD ⚠	(GN) (SF)

■ Resistors & Capacitors

Notes : * Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors),etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
* The parenthesized indications in the Remarks column specify the areas. (refer to the cover page for area.)
Parts without these indications can be used for all areas.
* Capacitor values are in microfarad (μF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
* Resistors values are in ohms, unless specified otherwise, 1k=1,000(OHM), 1M=1,000k(OHM)

Ref No.	Part No.	Values & Remarks
	RESISTORS	
R1	ERDS2TJ104T	100K 1/4W
R2	ERDS2TJ332T	3.3K 1/4W
R3	ERDS2TJ104T	100K 1/4W
R4	ERDS2TJ103T	10K 1/4W (GN)
R5	ERDS2TJ103T	10K 1/4W
R6	ERDS2TJ152T	1.5K 1/4W
R7	ERDS2TJ330T	33 1/4W
R8	ERDS2TJ104T	100K 1/4W
R9	ERDS2TJ471T	470 1/4W
R10	ERDS2TJ102T	1K 1/4W
R11	ERDS2TJ103T	10K 1/4W
R12	ERDS2TJ223T	22K 1/4W
R13	ERDS2TJ153T	15K 1/4W
R14	ERDS2TJ103T	10K 1/4W
R15	ERDS2TJ223T	22K 1/4W
R16	ERDS2TJ105T	1M 1/4W (GN)
R17	ERDS2TJ103T	10K 1/4W
R18	ERDS2TJ223T	22K 1/4W
R19	ERDS2TJ101T	100 1/4W

Ref No.	Part No.	Values & Remarks
R20	ERDS2TJ151T	150 1/4W
R21	ERDS2TJ104T	100K 1/4W (GN)
R22	ERDS2TJ331T	330 1/4W
R24	ERDS2TJ471T	470 1/4W
R25	ERDS2TJ104T	100K 1/4W
R26	ERDS2TJ102T	1K 1/4W
R27	ERDS2TJ102T	1K 1/4W
R28	ERDS2TJ334T	330K 1/4W
R29	ERDS2TJ331T	330 1/4W
R30	ERDS2TJ822T	8.2K 1/4W
R31	ERDS2TJ472T	4.7K 1/4W
R36	ERDS2TJ223T	22K 1/4W
R37	ERDS2TJ223T	22K 1/4W
R40	ERDS2TJ105T	1M 1/4W
R41	ERDS2TJ301T	300 1/4W
R42	ERDS2TJ103T	10K 1/4W
R43	ERDS2TJ222T	2.2K 1/4W
R44	ERDS2TJ222T	2.2K 1/4W
R47	ERDS2TJ332T	3.3K 1/4W
R49	ERDS2TJ103T	10K 1/4W
R52	ERDS2TJ223T	22K 1/4W
R54	ERDS2TJ222T	2.2K 1/4W

Ref No.	Part No.	Values & Remarks
R57	ERDS2TJ103T	10K 1/4W
R59	ERDS2TJ471T	470 1/4W
R61	ERDS2TJ103T	10K 1/4W
R62	ERDS2TJ471T	470 1/4W
R63	ERDS2TJ105T	1M 1/4W
R64	ERDS2TJ332T	3.3K 1/4W
R65	ERDS2TJ470T	47 1/4W
R66	ERDS2TJ123T	12K 1/4W
R101	ERDS2TJ474T	470K 1/4W
R102	ERDS2TJ153T	15K 1/4W
R103	ERDS2TJ560T	56 1/4W
R104	ERDS2TJ681T	680 1/4W
R105	ERDS2TJ103T	10K 1/4W
R106	ERDS2TJ272T	2.7K 1/4W
R107	ERDS2TJ334T	330K 1/4W
R109	ERDS2TJ223T	22K 1/4W
R110	ERDS2TJ102T	1K 1/4W
R111	ERDS2TJ272T	2.7K 1/4W
R112	ERDS2TJ470T	47 1/4W
R113	ERDS2TJ392T	3.9K 1/4W
R114	ERDS2TJ472T	4.7K 1/4W
R115	ERDS2TJ333T	33K 1/4W

Ref No.	Part No.	Values & Remarks
R116	ERDS2TJ152T	1.5K 1/4W
R201	ERDS2TJ474T	470K 1/4W
R202	ERDS2TJ153T	15K 1/4W
R203	ERDS2TJ560T	56 1/4W
R204	ERDS2TJ681T	680 1/4W
R205	ERDS2TJ103T	10K 1/4W
R206	ERDS2TJ272T	2.7K 1/4W
R207	ERDS2TJ334T	330K 1/4W
R209	ERDS2TJ223T	22K 1/4W
R210	ERDS2TJ102T	1K 1/4W
R211	ERDS2TJ272T	2.7K 1/4W
R212	ERDS2TJ470T	47 1/4W
R213	ERDS2TJ392T	3.9K 1/4W
R214	ERDS2TJ472T	4.7K 1/4W
R215	ERDS2TJ333T	33K 1/4W
R216	ERDS2TJ152T	1.5K 1/4W
R301	ERDS2TJ474T	470K 1/4W
R302	ERDS2TJ104T	100K 1/4W
R303	ERDS2TJ103T	10K 1/4W
R304	ERDS2TJ152T	1.5K 1/4W
R305	ERDS2TJ152T	1.5K 1/4W
R306	ERDS2TJ152T	1.5K 1/4W

Ref No.	Part No.	Values & Remarks
R307	ERDS2TJ153T	15K 1/4W
R308	ERDS2TJ153T	15K 1/4W
R309	ERDS2TJ331T	330 1/4W
R310	ERDS2TJ103T	10K 1/4W
R311	ERD2FCVJ4R7T	4.7 1/4W
R312	ERDS2TJ752T	7.5K 1/4W
R313	ERDS2TJ472T	4.7K 1/4W
R314	ERDS2TJ153T	15K 1/4W
R315	ERDS2TJ472T	4.7K 1/4W
R316	ERDS2TJ470T	47 1/4W
R317	ERDS2TJ472T	4.7K 1/4W
R318	ERDS2TJ682T	6.8K 1/4W
R319	ERDS2TJ823T	82K 1/4W
R320	ERDS2TJ103T	10K 1/4W
R321	ERDS2TJ103T	10K 1/4W
R322	ERDS2TJ102T	1K 1/4W
R323	ERDS2TJ393T	39K 1/4W
R324	ERDS2TJ822T	8.2K 1/4W
R325	ERDS2TJ562T	5.6K 1/4W
R326	ERDS2TJ682T	6.8K 1/4W
R327	ERDS2TJ102T	1K 1/4W
R328	ERDS2TJ101T	100 1/4W
R329	ERDS2TJ335T	3.3M 1/4W
R330	ERDS2TJ823T	82K 1/4W
R331	ERDS2TJ104T	100K 1/4W
R332	ERDS2TJ333T	33K 1/4W
R333	ERDS2TJ472T	4.7K 1/4W
R334	ERDS2TJ393T	39K 1/4W
R335	ERDS2TJ682T	6.8K 1/4W
R336	ERDS2TJ331T	330 1/4W
R337	ERDS2TJ273T	27K 1/4W
R338	ERDS2TJ102T	1K 1/4W
R339	ERDS2TJ473T	47K 1/4W
R340	ERDS2TJ223T	22K 1/4W
R341	ERDS2TJ471T	470 1/4W
R342	ERDS2TJ153T	15K 1/4W
R351	ERDS2TJ473T	47K 1/4W
R352	ERDS2TJ473T	47K 1/4W
R401	ERDS2TJ273T	27K 1/4W
R402	ERDS2TJ123T	12K 1/4W(EB,EG)
R402	ERDS2TJ822T	8.2K 1/4W (GN)
R403	ERDS2TJ123T	12K 1/4W
R404	ERDS2TJ472T	4.7K 1/4W
R405	ERDS2TJ222T	2.2K 1/4W
R407	ERDS2TJ223T	22K 1/4W
R408	ERDS2TJ562T	5.6K 1/4W
R409	ERDS2TJ823T	82K 1/4W
R411	ERDS2TJ1R2T	1.2 1/4W
R412	ERDS2TJ331T	330 1/4W
R413	ERDS2TJ1R0T	1 1/4W
R501	ERDS2TJ273T	27K 1/4W
R502	ERDS2TJ123T	12K 1/4W(EB,EG)
R502	ERDS2TJ822T	8.2K 1/4W (GN)
R503	ERDS2TJ123T	12K 1/4W
R504	ERDS2TJ472T	4.7K 1/4W
R505	ERDS2TJ222T	2.2K 1/4W
R507	ERDS2TJ223T	22K 1/4W
R508	ERDS2TJ562T	5.6K 1/4W
R509	ERDS2TJ823T	82K 1/4W
R511	ERDS2TJ1R2T	1.2 1/4W
R512	ERDS2TJ331T	330 1/4W
R513	ERDS2TJ1R0T	1 1/4W
R601	ERDS2TJ334T	330K 1/4W
R602	ERDS2TJ102T	1K 1/4W
R603	ERDS2TJ180T	18 1/4W
R604	ERDS2TJ124T	120K 1/4W
R605	ERDS2TJ472T	4.7K 1/4W
R606	ERDS2TJ332T	3.3K 1/4W
R607	ERDS2TJ332T	3.3K 1/4W
R608	ERDS2TJ105T	1M 1/4W
R609	ERDS2TJ102T	1K 1/4W
R610	ERDS2TJ104T	100K 1/4W
R611	ERDS2TJ823T	82K 1/4W
R612	ERDS2TJ823T	82K 1/4W
R613	ERDS2TJ333T	33K 1/4W
R614	ERDS2TJ334T	330K 1/4W
R615	ERDS2TJ471T	470 1/4W
R616	ERDS2TJ471T	470 1/4W
R617	ERDS2TJ103T	10K 1/4W
R618	ERDS2TJ471T	470 1/4W
R619	ERDS2TJ471T	470 1/4W
R620	ERDS2TJ222T	2.2K 1/4W
R621	ERDS2TJ153T	15K 1/4W
R622	ERDS2TJ153T	15K 1/4W
R623	ERDS2TJ183T	18K 1/4W
R625	ERDS2TJ333T	33K 1/4W
R626	ERDS2TJ104T	100K 1/4W (GN)
R628	ERDS2TJ332T	3.3K 1/4W
R631	ERDS2TJ122T	1.2K 1/4W
R632	ERDS2TJ123T	12K 1/4W
R633	ERDS2TJ103T	10K 1/4W
R634	ERDS2TJ472T	4.7K 1/4W
R638	ERDS2TJ104T	100K 1/4W
R639	ERDS2TJ683T	68K 1/4W
R640	ERDS2TJ393T	39K 1/4W
R641	ERDS2TJ473T	47K 1/4W
R642	ERDS2TJ563T	56K 1/4W
R643	ERDS2TJ223T	22K 1/4W
R644	ERDS2TJ273T	27K 1/4W
R645	ERDS2TJ393T	39K 1/4W
R646	ERDS2TJ473T	47K 1/4W
R647	ERDS2TJ273T	27K 1/4W
R648	ERDS2TJ473T	47K 1/4W
R649	ERDS2TJ474T	470K 1/4W
R650	ERDS2TJ103T	10K 1/4W
R651	ERDS2TJ103T	10K 1/4W
R652	ERDS2TJ103T	10K 1/4W
R653	ERDS2TJ393T	39K 1/4W
R655	ERDS2TJ102T	1K 1/4W
R661	ERDS2TJ101T	100 1/4W
R662	ERDS2TJ271T	270 1/4W
R663	ERDS2TJ271T	270 1/4W
R664	ERDS2TJ151T	150 1/4W
R665	ERDS2TJ104T	100K 1/4W
R668	ERDS2TJ103T	10K 1/4W
R669	ERDS2TJ331T	330 1/4W
R670	ERDS2TJ122T	1.2K 1/4W
R671	ERDS2TJ472T	4.7K 1/4W
R672	ERDS2TJ103T	10K 1/4W
R673	ERDS2TJ331T	330 1/4W
R674	ERDS2TJ122T	1.2K 1/4W
R675	ERDS2TJ1R0T	1 1/4W
R676	ERDS2TJ1R0T	1 1/4W
R677	ERD2FCVG220T	22 1/4W
R678	ERDS2TJ102T	1K 1/4W
R679	ERDS2TJ101T	100 1/4W
R680	ERDS2TJ222T	2.2K 1/4W
R681	ERDS2TJ563T	56K 1/4W
R682	ERDS2TJ103T	10K 1/4W
R683	ERDS2TJ101T	100 1/4W
R684	ERDS2TJ472T	4.7K 1/4W
R687	ERDS2TJ104T	100K 1/4W
R691	ERDS2TJ101T	100 1/4W
R692	ERDS2TJ104T	100K 1/4W (GN)
R693	ERDS2TJ6R8T	6.8 1/4W
R694	ERDS2TJ271T	270 1/4W
R695	ERDS2TJ472T	4.7K 1/4W
R696	ERDS2TJ6R8T	6.8 1/4W
R697	ERDS2TJ6R8T	6.8 1/4W
R698	ERDS2TJ6R8T	6.8 1/4W
R699	ERDS2TJ6R8T	6.8 1/4W
R701	ERDS2TJ152T	1.5K 1/4W
R702	ERDS2TJ222T	2.2K 1/4W
R703	ERDS2TJ272T	2.7K 1/4W
R704	ERDS2TJ392T	3.9K 1/4W
R705	ERDS2TJ472T	4.7K 1/4W
R706	ERDS2TJ822T	8.2K 1/4W
R707	ERDS2TJ123T	12K 1/4W
R708	ERDS2TJ273T	27K 1/4W
R709	ERDS2TJ152T	1.5K 1/4W
R710	ERDS2TJ222T	2.2K 1/4W
R711	ERDS2TJ272T	2.7K 1/4W
R712	ERDS2TJ392T	3.9K 1/4W
R713	ERDS2TJ472T	4.7K 1/4W
R714	ERDS2TJ822T	8.2K 1/4W
R715	ERDS2TJ123T	12K 1/4W
R716	ERDS2TJ273T	27K 1/4W
R717	ERDS2TJ391T	390 1/4W
R718	ERDS2TJ823T	82K 1/4W
R972	ERDS2TJ821T	820 1/4W
R972	ERDS2TJ821T	820 1/4W
R973	ERDS2TJ393T	39K 1/4W
R973	ERDS2TJ393T	39K 1/4W
	CAPACITORS	
C3	ECFR1C473MR	0.047 16V (GN)
C4	RCBS1H102KBY	1000P 50V
C5	ECBT1H2R2KC5	2.2P 50V
C6	RCBS1H102KBY	1000P 50V
C9	ECEA1HKN010B	1 50V
C10	ECBT1C332MR5	3300P 16V
C11	ECEA1AKA101B	100 10V
C12	ECFR1C473MR	0.047 16V(EB,EG)
C12	ECFR1C223MR	0.022 16V (GN)
C13	ECFR1C103MR	0.01 16V
C14	ECBT1C103MS5	0.01 16V
C15	ECBT1H5R6KC5	5.6P 50V
C16	RCBS1H102KBY	1000P 50V
C17	RCBS1H102KBY	1000P 50V
C18	ECBT1H200JC5	20P 50V
C19	ECBT1H220JC5	22P 50V
C20	RCBS1H102KBY	1000P 50V
C21	ECEA1AKA101B	100 10V
C22	RCBS1H102KBY	1000P 50V
C23	RCBS1H102KBY	1000P 50V
C24	RCBS1H102KBY	1000P 50V
C25	ECBT1H150JC5	15P 50V
C26	ECBT1H6R8KC5	6.8P 50V
C27	ECBT1H4R7KC5	4.7P 50V
C28	RCBS1H102KBY	1000P 50V
C29	RCBS1H102KBY	1000P 50V

Ref No.	Part No.	Values & Remarks
C31	RCBS1H102KBY	1000P 50V
C32	ECBT1H101KB5	100P 50V
C33	ECBT1H101KB5	100P 50V
C34	ECBT1H680J5	68P 50V
C35	ECBT1H1R5M5	1.5P 50V
C36	RCBS1H102KBY	1000P 50V
C37	RCBS1H102KBY	1000P 50V
C38	ECBT1H331KB5	330P 50V
C39	ECBT1C103MS5	0.01 16V
C40	ECBT1C103MS5	0.01 16V
C44	ECEA1AU101B	100 10V
C47	ECFR1C223MR	0.022 16V
C48	ECEA0JU101B	100 6.3V
C51	ECEA1HKA010B	1 50V
C52	ECFR1C473MR	0.047 16V
C58	ECBT1H8R2KC5	8.2P 50V
C60	ECEA1AKA220B	22 10V
C61	ECBT1C332MR5	3300P 16V
C62	RCBS1H102KBY	1000P 50V
C63	ECBT1H681KB5	680P 50V
C64	ECFR1C473MR	0.047 16V
C65	ECBT1H470J5	47P 50V
C66	ECBT1H100JC5	10P 50V
C67	ECFR1C223MR	0.022 16V
C68	ECEA1HKA010B	1 50V
C69	ECFR1C183MR	0.018 16V
C70	ECFR1C183MR	0.018 16V
C71	ECEA1HKA2R2B	2.2 50V
C72	ECEA1HKA010B	1 50V
C74	ECBT1H471KB5	470P 50V
C75	ECEA1HKA010B	1 50V
C76	ECEA1HKA010B	1 50V
C77	ECEA1HKA010B	1 50V
C80	ECBT1H331KB5	330P 50V
C81	ECBT1H331KB5	330P 50V
C82	ECBT1H150JC5	15P 50V
C83	ECBT1H331KB5	330P 50V
C84	ECBT1C103MS5	0.01 16V
C85	ECBT1C103MS5	0.01 16V
C86	ECBT1H331KB5	330P 50V
C87	ECBT1C103MS5	0.01 16V
C88	RCBS1H102KBY	1000P 50V(EB,EG)
C88	ECBT1C103MS5	0.01 16V (GN)
C89	ECBT1H101KB5	100P 50V
C90	RCBS1H102KBY	1000P 50V
C101	ECBT1H101KB5	100P 50V
C102	ECBT1C152KR5	1500P 16V
C103	ECEA0JKA470B	47 6.3V

Ref No.	Part No.	Values & Remarks
C104	ECBT1H331KB5	330P 50V
C105	ECFR1C153KR	0.015 16V
C106	ECEA1EKA4R7B	4.7 25V
C107	ECEA1HKA010B	1 50V
C108	ECEA1AU470B	47 10V
C111	ECEA1EKA4R7B	4.7 25V
C112	ECBT1H821KB5	820P 50V
C113	ECBT1H102KB5	1000P 50V
C114	ECBT1H102KB5	1000P 50V
C115	ECBT1H101KB5	100P 50V
C201	ECBT1H101KB5	100P 50V
C202	ECBT1C152KR5	1500P 16V
C203	ECEA0JKA470B	47 6.3V
C204	ECBT1H331KB5	330P 50V
C205	ECFR1C153KR	0.015 16V
C206	ECEA1EKA4R7B	4.7 25V
C207	ECEA1HKA010B	1 50V
C208	ECEA1AU470B	47 10V
C211	ECEA1EKA4R7B	4.7 25V
C212	ECBT1H821KB5	820P 50V
C213	ECBT1H102KB5	1000P 50V
C214	ECBT1H102KB5	1000P 50V
C215	ECBT1H101KB5	100P 50V
C301	ECEA1HN010SB	1 50V
C302	ECBT1C103MS5	0.01 16V
C303	ECBT1C103MS5	0.01 16V
C304	ECQP1152JZT	1500P 100V [M]
C305	ECQP1102JZT	1000P 100V
C306	ECQP2A472JZT	4700P 100V
C307	ECEA1HKA010B	1 50V
C308	ECEA1AU101B	100 10V
C309	ECQV1H473JZ3	0.047 50V
C310	ECBT1H102KB5	1000P 50V
C311	ECBT1H102KB5	1000P 50V
C312	ECBT1C222MR5	2200P 16V
C313	ECBT1C222MR5	2200P 16V
C314	ECBT1C332MR5	3300P 16V
C315	ECEA1AU101B	100 10V
C316	ECFR1C104KR	0.1 16V
C317	ECBT1H470J5	47P 50V
C318	ECEA1HKA3R3B	3.3 50V
C319	ECEA1AU221B	220 10V
C320	ECEA1CKA220B	22 16V
C321	ECEA0JKA220B	22 6.3V
C322	ECEA1AU470B	47 10V
C323	ECBT1C103MS5	0.01 16V
C324	ECBT1C472MR5	4700P 16V
C325	ECEA1AU101B	100 10V

Ref No.	Part No.	Values & Remarks
C401	ECBT1H221KB5	220P 50V
C402	ECEA1CKA100B	10 16V
C403	ECEA1CKA100B	10 16V
C404	ECFR1C473KR	0.047 16V
C405	ECFR1C683KR	0.068 16V
C406	ECBT0J223MS5	0.022 6.3V
C407	ECEA1HKA010B	1 50V
C409	ECEA1HKA010B	1 50V
C410	ECEA1AKA101B	100 10V
C411	ECBT1H471KB5	470P 50V
C412	ECEA1AKA101B	100 10V
C413	ECEA1AU471B	470 10V
C414	ECFR1C104KR	0.1 16V
C501	ECBT1H221KB5	220P 50V
C502	ECEA1CKA100B	10 16V
C503	ECEA1CKA100B	10 16V
C504	ECFR1C473KR	0.047 16V
C505	ECFR1C683KR	0.068 16V
C506	ECBT0J223MS5	0.022 6.3V
C507	ECEA1HKA010B	1 50V
C509	ECEA1HKA010B	1 50V
C510	ECEA1AKA101B	100 10V
C511	ECBT1H471KB5	470P 50V
C512	ECEA1AKA101B	100 10V
C513	ECEA1AU471B	470 10V
C514	ECFR1C104KR	0.1 16V
C601	ECEA1HKA010B	1 50V
C602	ECBT1H101KB5	100P 50V
C603	ECEA1HKA010B	1 50V
C604	ECEA0JKA470B	47 6.3V
C605	ECBT1H221KB5	220P 50V
C606	ECBT1H102KB5	1000P 50V
C607	ECBT1H102KB5	1000P 50V
C608	ECBT1H221KB5	220P 50V
C609	ECEA0JU101B	100 6.3V
C610	ECBT1H102KB5	1000P 50V
C611	ECBT1H390J5	39P 50V
C612	ECBT1H220JC5	22P 50V
C613	ECBT1H470J5	47P 50V
C614	ECBT1H560J5	56P 50V
C615	ECBT1H180JC5	18P 50V
C616	ECBT1H220JC5	22P 50V
C617	ECBT1H561KB5	560P 50V
C618	ECBT1H561KB5	560P 50V
C619	ECBT1C103MS5	0.01 16V
C620	ECBT1H561KB5	560P 50V
C621	ECBT1H561KB5	560P 50V
C622	ECBT1H561KB5	560P 50V

Ref No.	Part No.	Values & Remarks
C623	ECEA1HKA010B	1 50V
C624	ECEA1EKA4R7B	4.7 25V
C625	ECEA1CU331B	330 16V
C626	ECEA1AU101B	100 10V
C627	ECEA1AU101B	100 10V
C628	RCBS1H102KBY	1000P 50V
C629	ECEA1CKA100B	10 16V
C630	ECEA1CU100B	10 16V
C631	ECEA0JU101B	100 6.3V
C632	ECBT1H471KB5	470P 50V
C633	ECBT1H102KB5	1000P 50V
C635	ECEA1CU101B	100 16V
C639	ECEA1EU222B	2200 25V ⚠
C640	ECEA1AU101B	100 10V
C644	ECBT1C103MS5	0.01 16V
C646	ECEA1CKA100B	10 16V
C647	ECEA1CKA100B	10 16V
C648	ECEA1EKA4R7B	4.7 25V
C649	ECEA1CKA100B	10 16V
C650	ECBT1H470J5	47P 50V
C651	ECEA1AU101B	100 10V
C653	ECEA1AU101B	100 10V
C901	ECKR1H103ZF5	0.01 50V
C902	ECKR1H103ZF5	0.01 50V
C903	ECKR1H103ZF5	0.01 50V
C904	ECKR1H103ZF5	0.01 50V
C905	ECQV1H124JZ3	0.12 50V
	<SERVO>	
	RESISTORS	
R701	ERJ6GEYJ4R7V	4.7 1/10W
R703	ERJ6GEYJ823	82K 1/10W
R704	ERJ6GEYJ102V	1K 1/10W
R705	ERJ6GEYJ103V	10K 1/10W
R706	ERJ6GEYJ102V	1K 1/10W
R707	ERJ6GEYJ474V	470K 1/10W
R708	ERJ6GEYJ154V	150K 1/10W
R709	ERJ6GEYJ683V	68K 1/10W
R711	ERJ6GEYJ154V	150K 1/10W
R712	ERJ6GEYJ221V	220 1/10W
R717	ERJ6GEYJ102V	1K 1/10W
R718	ERJ6GEYJ102V	1K 1/10W
R719	ERJ6GEYJ102V	1K 1/10W
R720	ERJ6GEYJ102V	1K 1/10W
R721	ERJ6GEYJ101V	100 1/10W
R722	ERJ6GEYJ563V	56K 1/10W
R723	ERJ6GEYJ182V	1.8K 1/10W

Ref No.	Part No.	Values & Remarks
R724	ERJ6GEYJ333V	33K 1/10W
R725	ERJ6GEYJ472V	4.7K 1/10W
R726	ERJ6GEYJ473V	47K 1/10W
R727	ERJ6GEYJ822V	8.2K 1/10W
R728	ERJ6GEYJ103V	10K 1/10W
R731	ERJ6GEYJ822V	8.2K 1/10W
R734	ERJ6GEYJ101V	100 1/10W
R735	ERJ6GEYJ101V	100 1/10W
R736	ERJ6GEYJ101V	100 1/10W
R738	ERJ6GEYJ223V	22K 1/10W
R741	ERJ6GEYJ562V	5.6K 1/10W
R742	ERJ6GEYJ562V	5.6K 1/10W
R743	ERJ6GEYJ562V	5.6K 1/10W
R744	ERJ6GEYJ103V	10K 1/10W
R745	ERJ6GEYJ155V	1.5M 1/10W
R748	ERJ6GEYJ182V	1.8K 1/10W
R749	ERJ6GEYJ682V	6.8K 1/10W
R750	ERJ6GEYJ473V	47K 1/10W
R751	ERJ6GEYJ473V	47K 1/10W
R752	ERJ8GEYJ220V	22 1/8W
R770	ERJ6GEYJ155V	1.5M 1/10W
R771	ERJ6GEYJ155V	1.5M 1/10W
R772	ERJ6GEYJ273V	27K 1/10W
	CAPACITORS	
C701	ECEA0JKA330I	33 6.3V
C702	ECUZNE104MBN	0.1 25V
C703	ECEA0JKA101I	100 6.3V
C704	ECUZNE104MBN	0.1 25V
C705	ECUZNE104MBN	0.1 25V
C706	ECUV1H272KBN	2700P 50V
C707	ECUV1E273KBN	0.027 25V
C708	ECUV1H472KBN	4700P 50V
C709	ECUV1C473KBN	0.047 16V
C710	ECUV1H182KBN	1800P 50V
C711	ECUZNE104MBN	0.1 25V
C712	ECUZNE104MBN	0.1 25V
C713	ECUV1C104MBM	0.1 16V
C714	ECEA0JKA101I	100 6.3V
C716	ECUV1H561KBN	560P 50V
C717	ECUZNE104MBN	0.1 25V
C718	ECUV1C224KBN	0.22 16V
C721	ECUV1H150JCN	15P 50V
C722	ECUV1H150JCN	15P 50V
C723	ECEA1AKA221I	220 10V
C724	ECUV1C104MBM	0.1 16V
C725	ECUV1H102KBN	1000P 50V

Ref No.	Part No.	Values & Remarks
C726	ECUV1H102KBN	1000P 50V
C727	ECEA1HPK010I	1 50V
C728	ECEA1HPK010I	1 50V
C730	ECUZNE104MBN	0.1 25V
C731	ECEA0JKA221I	220 6.3V
C732	ECEA0JKA221I	220 6.3V
C733	ECUZNE104MBN	0.1 25V
C734	ECEA1AKA221I	220 10V
C735	ECUZNE104MBN	0.1 25V
C736	ECUZNE104MBN	0.1 25V
C737	ECUZNE104MBN	0.1 25V
C738	ECUV1C154KBN	0.15 16V
C742	ECUV1E273KBN	0.027 25V
C743	ECUZNE104MBN	0.1 25V
C744	ECUV1E822KBN	8200P 25V
C745	ECUV1C473MBN	0.047 16V
C747	ECUV1H222KBN	2200P 50V
C748	ECUV1H471KBM	470P 50V
C749	ECUZNE104MBN	0.1 25V
C751	ECUZNE104MBN	0.1 25V
C752	ECUV1H152KBN	1500P 50V
C753	ECUV1H471KBM	470P 50V
C754	ECUV1H471KBN	470P 50V
	CLIPS JUMPERS	
RJ701	ERJ8GEY0R00A	0 1/8W
RJ702	ERJ8GEY0R00A	0 1/8W
RJ703	ERJ8GEY0R00A	0 1/8W
RJ704	ERJ8GEY0R00A	0 1/8W
RJ707	ERJ8GEY0R00A	0 1/8W
RJ709	ERJ8GEY0R00A	0 1/8W
RJ714	ERJ8GEY0R00A	0 1/8W
RJ715	ERJ8GEY0R00A	0 1/8W
RJ716	ERJ8GEY0R00A	0 1/8W
RJ717	ERJ8GEY0R00A	0 1/8W
RJ721	ERJ8GEY0R00A	0 1/8W
RJ722	ERJ8GEY0R00A	0 1/8W
RJ723	ERJ8GEY0R00A	0 1/8W
RJ724	ERJ8GEY0R00A	0 1/8W
RJ725	ERJ8GEY0R00A	0 1/8W
RJ726	ERJ8GEY0R00A	0 1/8W
RJ727	ERJ8GEY0R00A	0 1/8W
RJ728	ERJ8GEY0R00A	0 1/8W
RJ729	ERJ8GEY0R00A	0 1/8W
RJ730	ERJ8GEY0R00A	0 1/8W

Ref No.	Part No.	Values & Remarks
	TEST JUMPERS	
TJ701	EYF8CU	TEST JUMPER
TJ702	EYF8CU	TEST JUMPER

Ref No.	Part No.	Values & Remarks

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