

Service Manual

74CD72 / 10B/12B/17B

Compact disc player



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marantz®

model CD-72SE

First issue : 1992

4822 725 51005

PCS 66 286

MARANTZ DESIGN AND SERVICE

Using superior design and selected high grade components, MARANTZ company has created the ultimate in stereo sound.

Only **original MARANTZ parts** can insure that your MARANTZ product will continue to perform to the specifications for which it is famous.

Parts for your MARANTZ equipment are generally available to our National Marantz Subsidiary or Agent.

ORDERING PARTS:

Parts can be ordered either by mail or by telex. In both cases, correct part number has to be specified. The following information must be supplied to eliminate delays in processing your order:

1. Complete address
2. Complete part numbers and quantities required
3. Description of parts
4. Model number for which part is required
5. Way of shipment
6. Signature: any order form or telex must be signed otherwise such part order will be considered as null and void.

MARANTZ INTERNATIONAL
Vestdijk 9
5600 MD Eindhoven
The Netherlands
Phone: +31/40.758290
Telefax: +31/40.75.82.99
Telex: 35000 PHTC NL routing IND NLMTFAT

PARTS ORDERING

Parts may be ordered or advice can be given at the following addresses:

AUSTRIA
MARANTZ
Hietzinger Kai 137a
1130 Wien

BELGIUM
MARANTZ EUROPE B.V.
Div. Benelux
P.O. Box 218
Building HCM9
5600 MD Eindhoven
The Netherlands
Fax: 11 01 11

CHILE
MARANTZ
DIVISION OF PHILIPS S.A.
AV. Santa Maria, 0760
Casilla 2687
Santiago
Telex: 240.239

DENMARK
MARANTZ
Horsvinget 5
2630 Tastrup

NORWAY
MARANTZ
Postboks 7034
Assiden
3007 Drammen

FRANCE
MARANTZ FRANCE
4 Rue Bernard Palissy
92600 Asnières
France
Telex: 611651

GERMANY
MARANTZ GERMANY GmbH
Alexanderstraße 1
2000 Hamburg
Germany

THE NETHERLANDS
MARANTZ EUROPE B.V.
Div. Benelux
P.O. Box 218
Building HCM9
5600 MD Eindhoven
The Netherlands
Fax: 040 - 75 52 66

SWEDEN
MARANTZ
Box 1324
171 25 Solna

FINLAND
MARANTZ
Kuortanegatan 1
00520 Helsingfors 52

GREAT BRITAIN
MARANTZ HiFi U.K. Ltd.
Kingsbridge House
Padbury oaks
575-583 Bath Road
Long ford
Middlesex UB7 OEH
Faxnr.: 0753 680 428

GREECE
SHERTON ELECTRONICS S.A.
P.O.Box 21025
Hippocratus Street 188
Athens 11471
Greece
Telex: 216.795

JAPAN
MARANTZ JAPAN, Inc.
35-1, 7-chome, Sagamiono
Sagamihara-shi, Kanagawa
Japan

KUWAIT
AL ALAMIAHA ELECTRONICS
Ussama Building
Fahd al Saleem Street
P.O.Box 23781
Safat-Kuwait
Telex: 22694

ITALY
MARANTZ ITALIANA S.P.A.
Via Chiese, 74
20126 Milano
Italy

SAUDI ARABIA
AL ALAMIAH ELECTRONICS
P.O.Box 5954
University Street
Riyadh 11432
Saudi Arabia
Telex: 401530

SOUTH AFRICA
MARANTZ
DIVISION OF PHILIPS S.A.
Main Road Martindale
P.O.Box 58088
Newville 21114
South Africa

SPAIN
Euroservice S.A.
Bernardo obrégón, 26
28012 Madrid
Faxnr.: 3412 306 198

SWITZERLAND
MARANTZ
Technischer Service
Duenstraße 3
3186 Dürdingen
Switzerland

TURKEY
DOGRUOL Ltd.
I.M.C.
6 Blok N°6310
Unkapani
Istanbul
Turkey
Telex: 22085

MALTA
CACHIA & GALEA
Republic Street, 68D
Valetta
Telex: 1682

PORTUGAL
MARANTZ
Divisao Philips S.A. service
Ourelra-carnaxide
2795 LinDA-A-VELHA
Telex: 43906

All of the above locations are fully equipped to take care of your total service needs. Because various countries have differing configuration requirements, it is necessary that you contact the service facility in your particular country. In the event that there is no service location listed for your country, please, contact the nearest facility for the necessary assistance.

In case of difficulties, do not hesitate to contact the Technical Department at above mentioned address.

TECHNICAL SPECIFICATIONS

Audio Characteristics

Channels 2 channels
D/A conversion 1 -bit linear/channel

Frequency Characteristics

Line output jack (FIXED) 2 to 20,000Hz, \pm 0.2 dB
Line output jack (VARIABLE) 2 to 20,000Hz, \pm 0.2 dB
Dynamic range 98 dB
S/N ratio 100 dB
Channel separation 96 dB or more (1 kHz)
THD 0.003 % (1 kHz)
Wow & flutter Precision of quarts
Analog output jacks
Line output jacks (FIXED) Output level 2 V RMS
Output impedance 200 Ohms
Matching load impedance 10 k ohms or more
Line output jacks (VARIABLE) Output level 4 V RMS
Output impedance 200 Ohms
Matching load impedance 10 k ohms or more
Digital output Pin jack, 0.5 Vp-p/ 75 ohms
(Rectangular optical connector)
optical output – 19 dBm

Optical Readout System

Laser AIGSAs semiconductor
Wavelength 780 nm

Signal System

Sampling frequency 44.1 kHz
Quantization 16 -bit linear/channel
Error correction Cross-interleave read solomon
code (CIRC),
Class A D/A conversion

Power Supply

/12 version 230 V AC 50/60 Hz
/17 version 240 V AC 50/60 Hz
Power Consumption 12 W

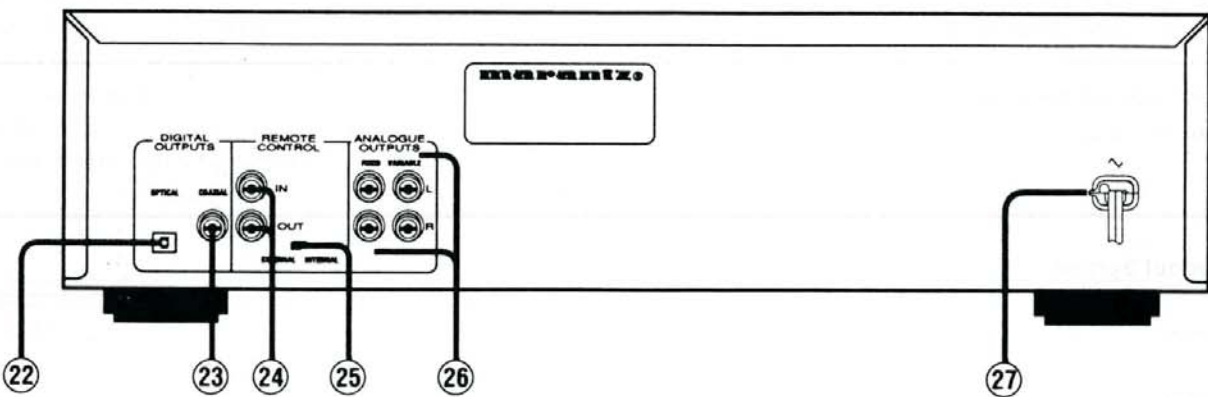
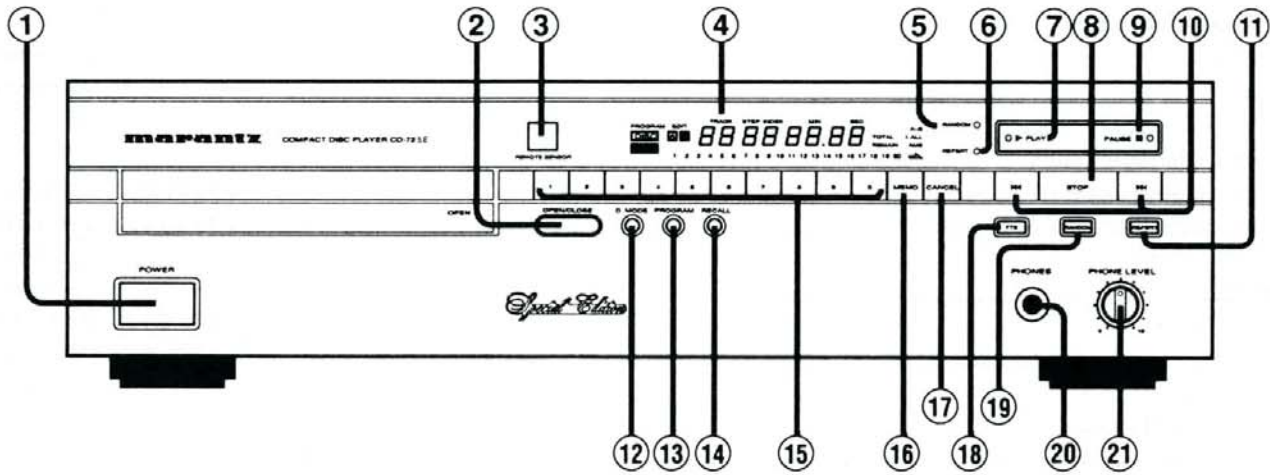
Cabinet, etc.

Dimensions (Black)
Width 420 mm
Height 119 mm
Depth 297 mm
Net weight 5 kg
Operating temperatures + 5°C ~ + 35°C
Operating humidity 5 % ~ 9 % (without Dew)

Accessories

Remote control unit (RC-72CD) 1
Dimensions (W x H x D) 60 x 15 x 175 mm
Weight (Without batteries) 85 g
R03 Batteries 2
Stereo audio cable with RCA pins 1

CONTROLS AND CONNECTIONS



- | | |
|----------------------------------|--|
| ① POWER switch | ⑮ Numeric buttons (0-9) |
| ② OPEN/CLOSE button | ⑯ MEMO button |
| ③ REMOTE SENSOR | ⑰ CANCEL button |
| ④ Display | ⑱ FTS button |
| ⑤ RANDOM indicator | ⑲ RANDOM button |
| ⑥ REPEAT indicator | ⑳ PHONES jack |
| ⑦ PLAY (▶) button | ㉑ PHONE LEVEL control |
| ⑧ STOP button | ㉒ DIGITAL OUTPUT OPTICAL output jack |
| ⑨ PAUSE () button | ㉓ DIGITAL OUTPUT COAXIAL output jack |
| ⑩ ◀▶ buttons currently playing | ㉔ REMOTE CONTROL IN/OUT jacks |
| ⑪ REPEAT button | ㉕ REMOTE switch |
| ⑫ D. MODE button | ㉖ ANALOG OUTPUT (VARIABLE FIXED) jacks |
| ⑬ PROGRAM button | ㉗ AC POWER SOURCE CORD |
| ⑭ RECALL button | |

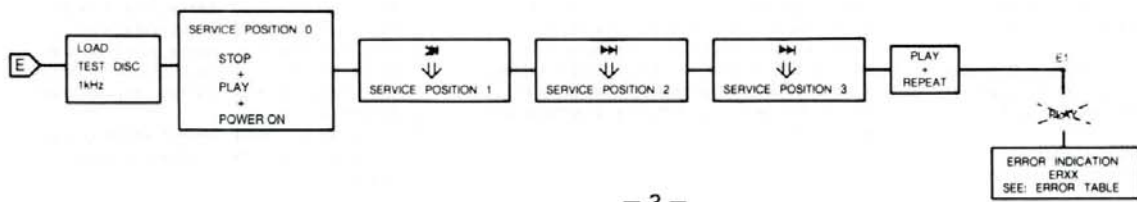
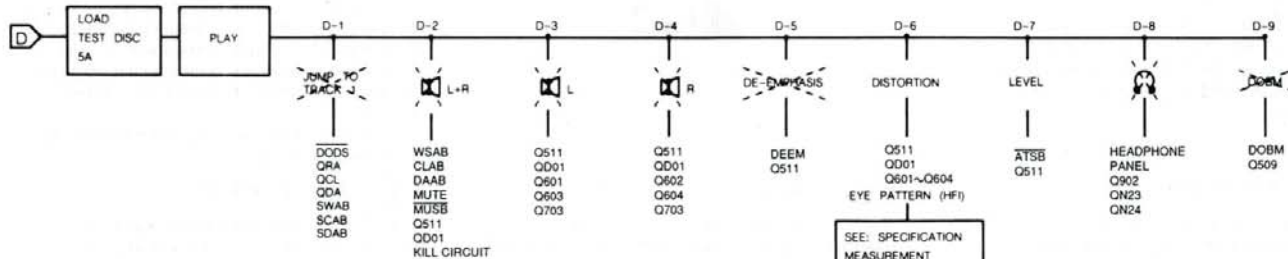
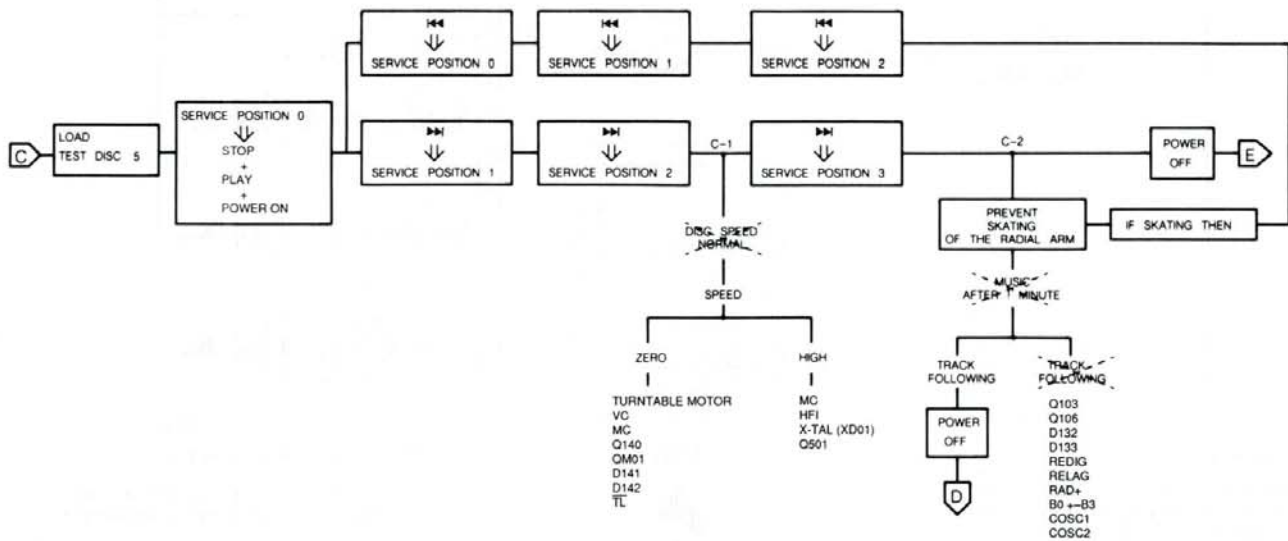
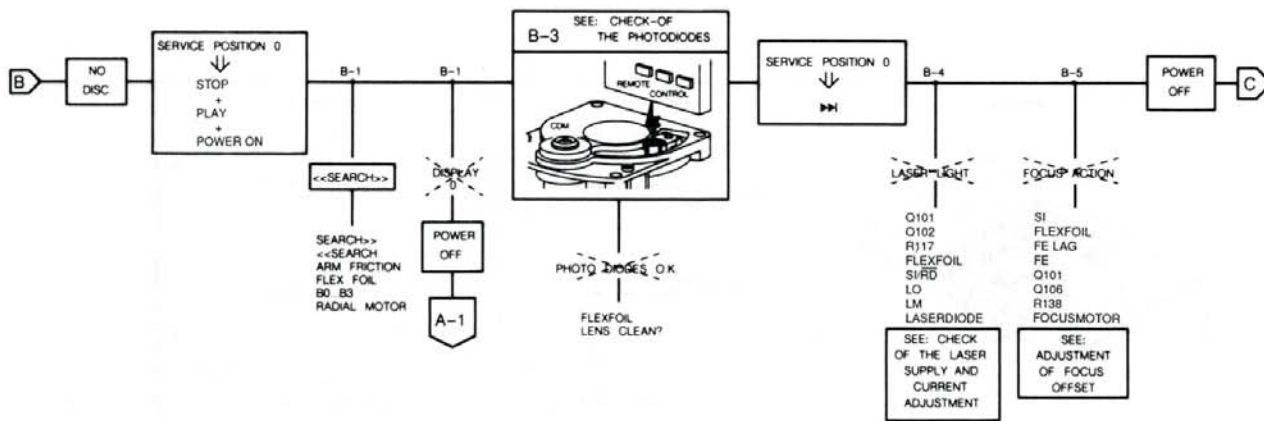
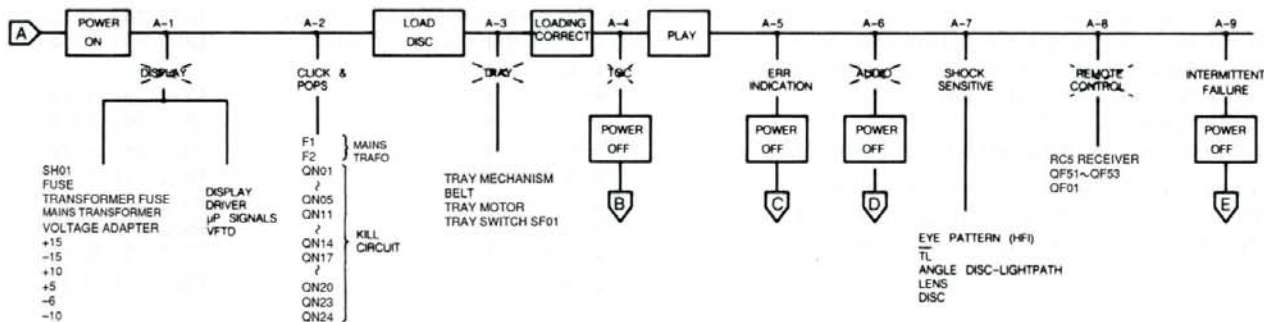
MEASUREMENTS AND ADJUSTMENTS

TROUBLE SHOOTING (FAULT FINDING TREE)

Follow the path of the faultfinding tree beginning at the top left. Perform the actions you come across in the various blocks. Look at the various side branches to find out if the information you see there applies to your problem. If, for instance, you find the indication **display**, this means that no picture appears on the display.

If you establish this fault, follow the branch and perform the recommended actions. Check the signals mentioned. In a number of branches further reference is made to measurements you could carry out. These measurements are explained in several tables further on in this manual.

START-UP PROCEDURE



B-3 CHECK OF THE PHOTODIODES

Step	Signal	Mode					Remarks
1	D2 D1 D3 D4	power on	 	-	-	signal 4:6:7:8	Signal depends on Distance lens ↔ IR LED of remote control

T-22793A

B-4 CHECK OF LASER SUPPLY

The laser, the lasersupply plus the monitor diode form a feedback system.

A defect in the lasersupply may result in the destruction of the laser. If, in that case, the laser is replaced, (= complete C.D.M.-unit) the new laser will also become defective. However, it is impossible to check and repair a feedback system if a link is missing. For this reason the laser supply can be checked with the replacement circuit for laser assembly.

Step	Signal	Mode			Remarks
1	LO	serv. pos. 2 SK		1.8<V <2.3	<p>REPLACEMENT CIRCUIT FOR LASER ASSEMBLY</p> <p>CONNECT DIRECTLY TO PANEL</p> <p>The feedback system sees it that the same amount of current flows through the LED. When SK is open and when SK is closed the LED emits little light.</p> <p>PRS 06615 102/9020</p>
	LM	SK		170<mV <220	
2	LO	serv. pos. 2 SK		1.8<V <2.3	
	LM	SK		170<mV <220	
3	LO	Power on		0V ± 0.2V	No light

After opening SK the LED will emit a little more light for a short moment.

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B-4 LASER CURRENT ADJUSTMENT

STEP	SIGNAL	MODE					REMARKS
1	--	POWER OFF	--	--	--	--	CHECK IF FLEX-FOIL IS PROPERLY CONNECTED
2	--	POWER OFF		R134	1kΩ +10% -0	--	PRE ADJUSTMENT OHMIC VALUE
3	--	POWER OFF	--	R136	--	--	SET TO MID-POSITION
4	LASER CURRENT ≡ VOLTAGE ACROSS R114	TEST DISC 5A PLAY		--	≥15mV	--	IF < 15mV THEN GO TO STEP 3 AND SET R136 TO 1/4 OR 3/4. TRY AGAIN
5	LASER CURRENT ≡ VOLTAGE ACROSS R114	TEST DISC 5A PLAY		R134	50mV	--	--
6	FE-LAG	TEST DISC 5A TRACK 1 PLAY		R136	400mV	--	FINE ADJUSTMENT

MDA 02673
128/020

B-5 ADJUSTMENT OF FOCUS-OFFSET

Step	Signal	Mode					Remarks
1	-	Power on no disc	-	R136	-	-	adjust for optical mid-position of the focus motor
2	FE LAG	Play Test disc 5 Track 1	22	R136	400mV ± 40 mV DC	-	fine adjustment

ERROR TABLE

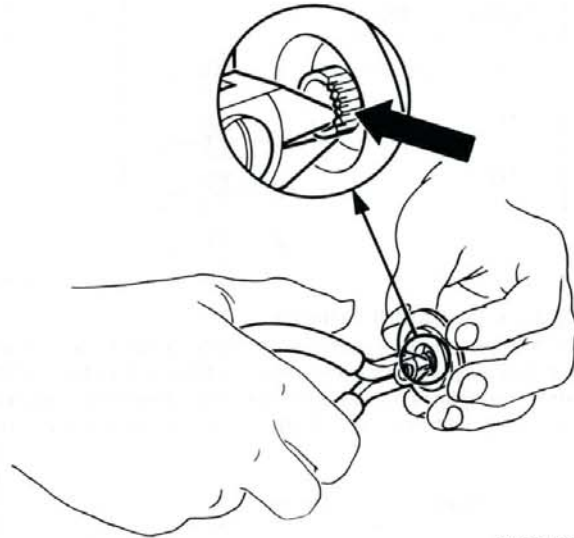
System errors

Indication	Cause	Check
Er 02	No \overline{TL} pulse at start-up	} \overline{Si} , Sc, RD, Photodiode signal processor \overline{TL} , HFI, CD disc present?
Er 03	No lead-in track found	
Er 06	No \overline{TL} pulse within 0.5 sec. during track jumping	CD disc, radial arm position, REdig, Radial error processor
Er 07	Subcoding error during PLAY	RE-lag circuit, \overline{TL} , REdig
Er 08	TOC error	HFI CD disc, turntable motor control, radial arm position

Operating errors

Er 30	"NEXT" key operated during the last track, with "REPEAT" turned off.
Er 31	"PREVIOUS" key operated during the first track, with "REPEAT" turned off.
Er 32	AB key operated in AMS mode.
Er 33	The selected index number does not exist on this disc.
Er 34	Programme survey requested; no programme present.
Er 35	The programme memory is full.
Er 36	The programmed track is not present on this CD disc.
Er 37	The selected track is not present on this CD disc.
Er 38	MEMO pressed during AMS while track not known. MEMO pressed during EDIT while cassette time = 0 sec.
Er 39	MEMO or CANCEL pressed while in play program.
Er 40	MEMO pressed when already a delete program has been made.
Er 41	CANCEL pressed when already a not deleted program has been made.
Er 42	Selected track is not a program block.
Er 43	FTS store error: memory full.
Er 44	FTS store error: no program..
Er 46	FTS play error: no FTS program in memory.
Er 47	FTS selection error: upper bound of fts memory. (next).
Er 49	FTS selection error: selection request while storing. (next/prev).
Er 51	FTS selection error: selection request while storing. (review).
Er 52	FTS selection clear error: clear request while storing.
Er 54	FTS store error: no record id (toc) available.
Er 56	AB key pressed when not in PLAY mode.
Er 60	Fast forward/reverse bound.
Er 63	No track possible to play in edit mode.
Er 74	Relative time not found.
Er 75	Binary search time out error.
Er 76	Time search time out error.

SERVICE DISC HOLD-DOWN

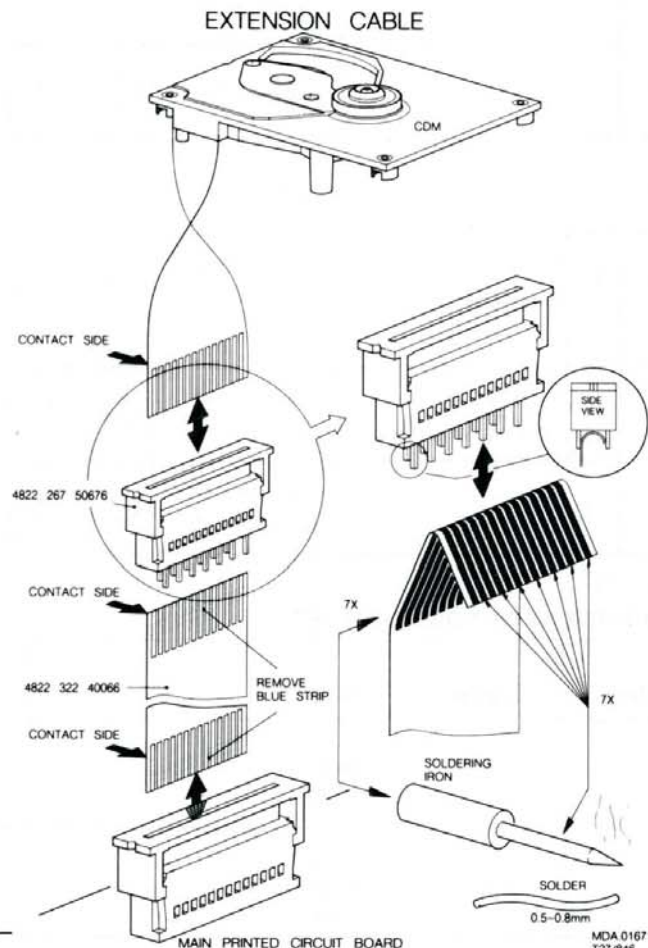


42 565 A12

Compose a service Disc hold-down in the following way

- Cut in the most inner ring of a disc hold-down (4822 462 50383) with small and sharp nippers, see fig. above.
- Enlarge the diameter of the innermost ring slightly with the hind part of a pencil or ballpoint, so that it jams onto the turntable with sufficient force.
- If the jamming force decreases after certain time of use, the diameter has to be enlarged with a pencil or ballpoint again.

SERVICE FOIL FOR CDM



SERVICING HINTS

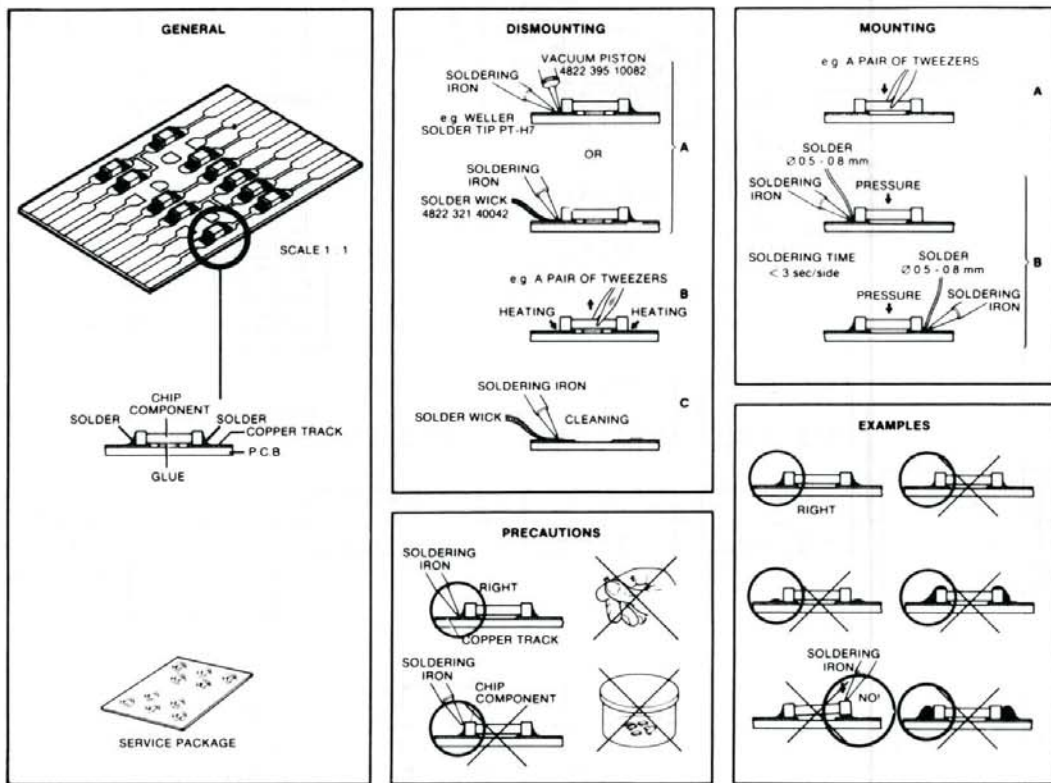
In the set chip components have been applied.
For disassembly and assembly of chip components see the figure below.

The disc should always rest properly on the turntable.
To achieve this a disc hold-down has been mounted in a bracket of the tray mechanism.
If the tray mechanism has to be disassembled for servicing, a separate disc hold-down should be used.
(See drawing "Service disc hold-down")
The set can function normally then.
Code number of the disc hold-down is 4822 462 50383.

When the tray mechanism has been disassembled, the tray switch must be activated immediately after pressing the play button in order to ensure normal operation.

SERVICE TOOLS

Audio signals disc	4822 397 30184
Disc without errors (test disc 5) + disc with DO errors, black spots and fingerprints (test disc 5A)	4822 397 30096
Disc 65 min 1 kHz without pause	4822 397 30155
Max. diameter disc(58.0 mm)	4822 397 60141
Torx screwdrivers	
Set (straight)	4822 395 50145
Set (square)	4822 395 50132
13th order filter	4822 395 30204
Service cable (4p)	4822 321 21284
Service flexfoil (14p)	4822 322 40066
Service connector (14p)	4822 267 50676
Green LED CQY G11	5322 130 32182
Insulation cover	4822 444 60655



27 012C12

(GB) WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools also at this potential.

ESD



(NL) WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen. Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op hetzelfde potentiaal.

(F) ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfilez le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

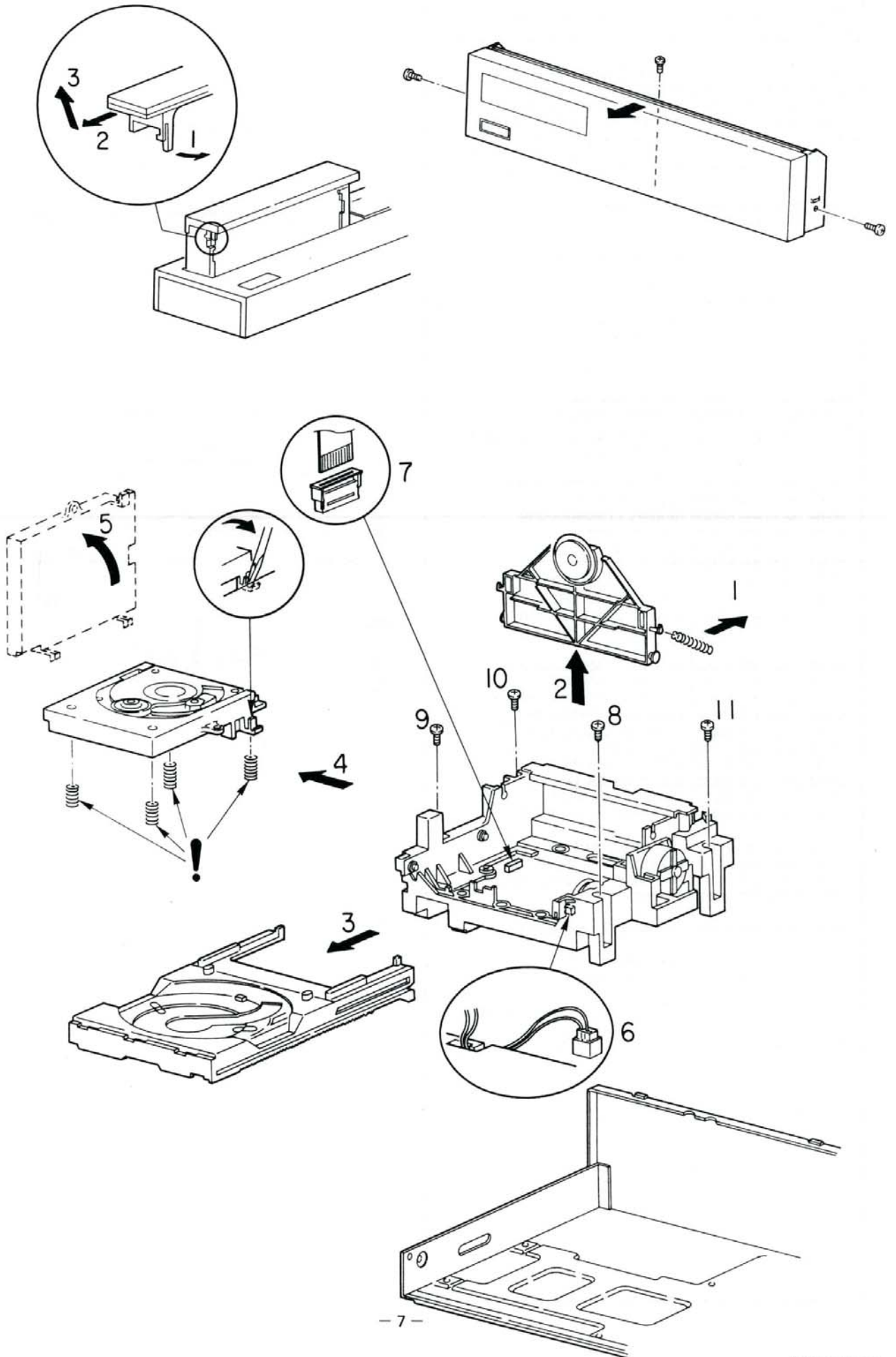
(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegen elektrostatische Entladungen (ESD).
Unsorgfältige Behandlung bei der Reparatur kann die Lebensdauer drastisch vermindern. Sorgen sie dafür, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand mit dem Massepotential des Gerätes verbunden sind. halten Sie Bauteile und Hilfsmittel ebenfalls auf diesem Potential.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

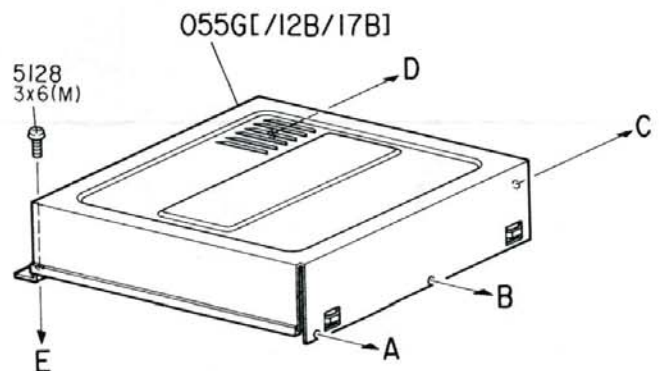
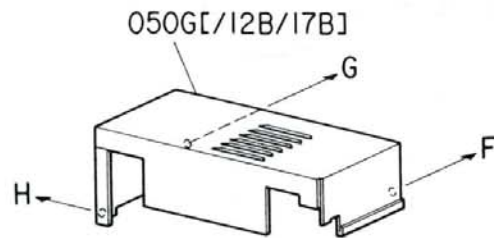
DISASSEMBLY OF LOADING AND COM



MECHANICAL PARTS LIST

(252K)

REF. DESIG.	PART NO.	DESCRIPTION
001B	4822 444 40482	FRONT PANEL ASSY (BLACK)
003B	4822 410 61551	BUTTON,10 KEYS (BLACK)
004B	4822 381 11285	LENS, LED PLAY/PAUSE
005B	4822 410 61552	BUTTON, PLAY/PAUSE (BLACK)
006B	4822 444 40479	FRONT PANEL AL UPPER (BLACK)
011B	4822 444 40575	FRONT PANEL AL LOWER (BLACK)
016B	4822 459 11096	BADGE, SPECIAL EDITION
020B	4822 450 61951	WINDOW
021B	4822 459 10943	BADGE (BLACK)
030B	4822 256 91819	HOLDER, F.L.TUBE
031B	4822 459 10942	STICKER, ADHESIVE SHEET
041B	4822 502 13315	B.T.SCREW (W/TL) 3 x 8 (M)
043B	4822 410 60873	KNOB, HEAD PHONE VOLUME(BLACK)
060B	4822 410 61556	BUTTON, POWER (BLACK)
071B	4822 444 40478	ESCUTCHEON, TRAY LID (BLACK)
072B	4822 532 12112	RETAINER, TRAY LID
007D	4822 501 11008	B. T.SCREW (W/W) 4 x 8 (M)
004G	4822 462 41947	LEG, ALUMINUM
030G	4822 402 61394	LINK, POWER SWITCH
911G	4822 325 50202	BUSHING, AC CORD /10B /12B
911G	4822 532 61184	BUSHING, AC CORD /17B
001M	4822 464 50872	CHASSIS, LOADING FRAME
002M	4822 402 50276	LEVER, SWITCH
003M	4822 492 52123	SPRING, COMPRESSION
010M	4822 528 81447	PULLEY, MOTOR
015M	4822 358 10115	BELT, TRAY DRIVE
016M	4822 528 81455	PULLEY, DRIVE
020M	4822 402 61132	GUIDE, FRAME RIGHT
025M	4822 402 61252	GUIDE, FRAME LEFT
026M	4822 492 52094	SPRING, COMPRESSION
029M	4822 532 11396	WASHER, SPACER
030M	4822 492 51902	SPRING, COMPRESSION
031M	4822 466 61587	BUFFER, GROMMET
035M	4822 691 30209	MECHANISM CDM-4 MINI
036M	4822 402 61196	CHASSIS, SUPPOT PIECE
040M	4822 466 92251	TRAY, LIFT PLATE ASSY
050M	4822 444 50603	TRAY ASSY
052M	4822 532 51756	BUFFER, GROMMET
061M	4822 444 60568	LID, CLAMPER ARM
062M	4822 528 90639	ROLLER, CLAMPER
063M	4822 466 92257	RETAINER, PIVOT PLATE
064M	4822 402 61207	CENTRING, RING
065M	4822 530 80503	CLAMPER, PRESSURE RING K
068M	4822 520 40177	SUSTAINER, BEARING BALL
075M	4822 492 32883	SPRING
M001	4822 361 30368	D.C.MOTOR, TRAY DRIVE
001T	4822 736 21495	PACKING USER MANUAL
J082	4822 321 22611	CONNECTIVE CORD, RCA (GOLD)
T100	4822 218 10427	REMOTE COMMANDER, RC-72CD



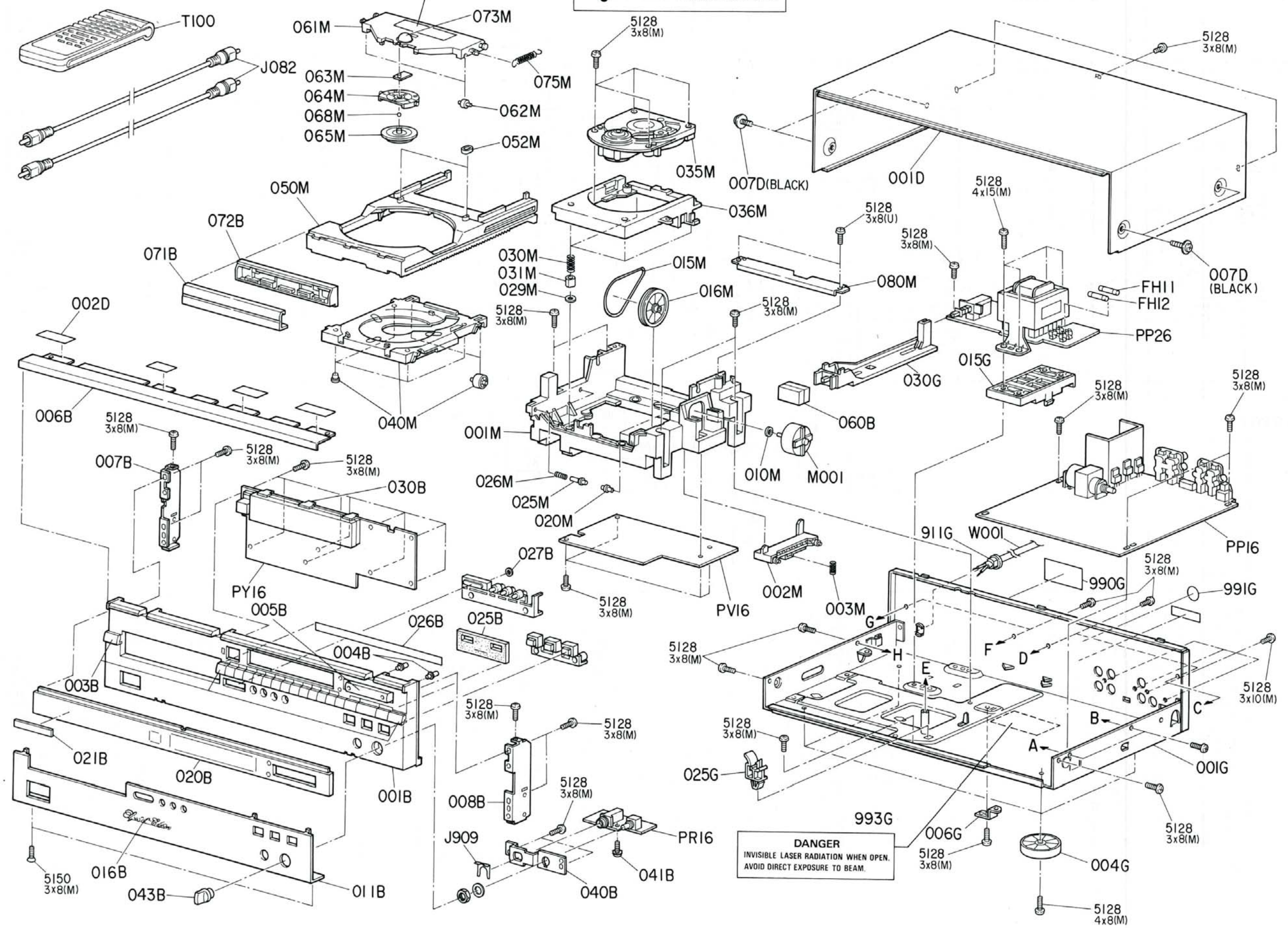
EXPLODED VIEW

048G
Warning Label

DANGER: INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM.

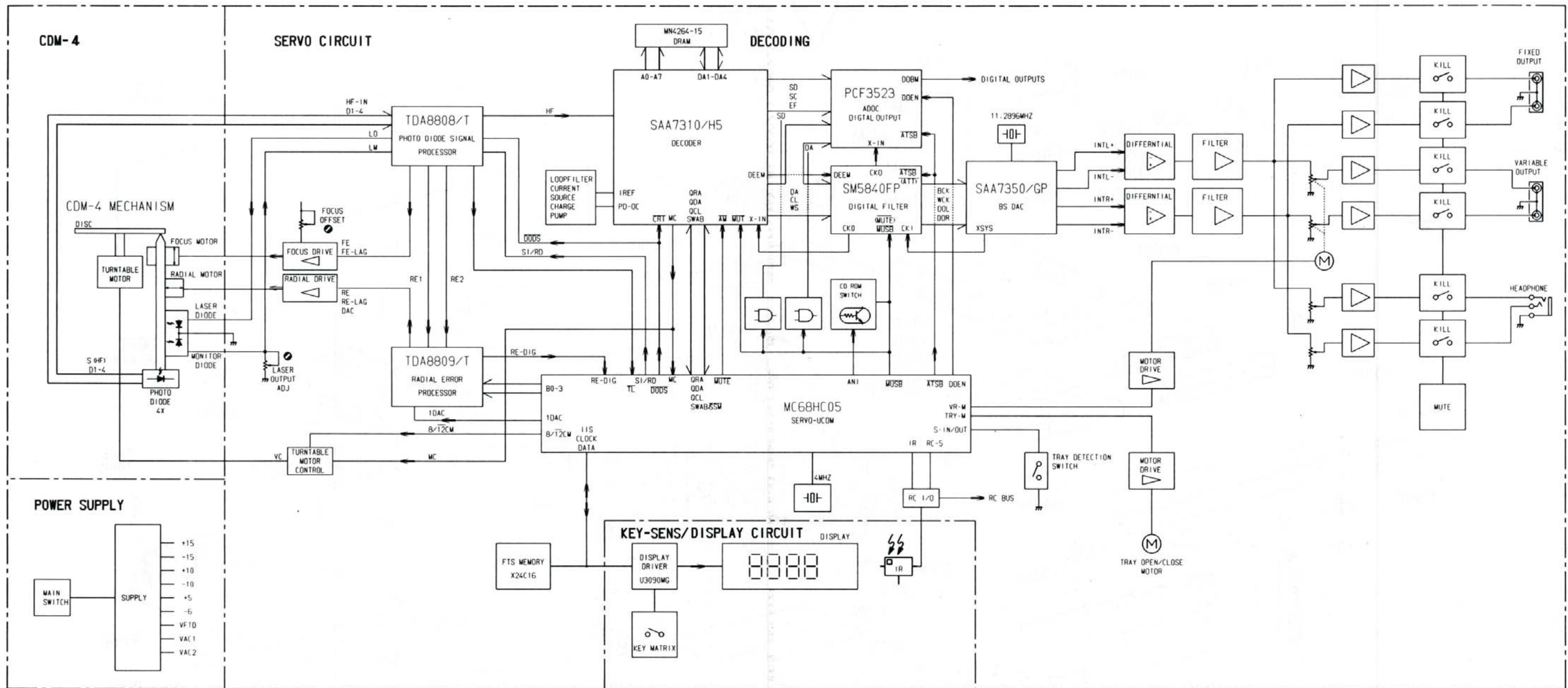
CAUTION: HAZARDOUS LASER RADIATION WHEN OPEN AND INTERLOCK DEFEATED.

ATTENTION: RAYONNEMENT LASER DANGEREUX SI OUVERT AVEC L'ENCLACHEMENT DE SECURITE ANNULE.



DANGER
INVISIBLE LASER RADIATION WHEN OPEN.
AVOID DIRECT EXPOSURE TO BEAM.

BLOCK DIAGRAM



AGC-----AUTOMATIC GAIN CONTROL
 BO-B3-----CONTROL BITS FOR RADIAL CIRCUIT
 BEQ-----EQUALIZER REFERENCE CURRENT INPUT
 BGC-----DC AND LF GAIN CONTROL REFERENCE INPUT
 COSC1-----CAPACITOR WOBBLE OSCILLATOR
 COSC2-----CAPACITOR WOBBLE OSCILLATOR
 DEC-----DECOUPLING INPUT INTERNAL BYPASS
 DET-----HF DETECTOR VOLTAGE INPUT
 DIV4-----DIVIDE BY 4 INPUT
 DODS-----DROP OUT DETECTOR SUPPRESSION
 D1-4-----PHOTODIODE CURRENTS
 FE-----FOCUS ERROR SIGNAL
 FE LAG----FOCUS ERROR SIGNAL FOR LAG NETWORK
 HF-----HF OUTPUT FOR DEMOD
 HFD-----HF DETECTOR OUTPUT FOR DEMOD
 HF IN-----HF CURRENT INPUT TO HF AMPLIFIER
 HF OUT----HF AMPLIFIER AND EQUALIZER VOLTAGE OUTPUT
 LM-----LASER MONITOR DIODE INPUT
 LO-----LASER AMPLIFIER CURRENT OUTPUT

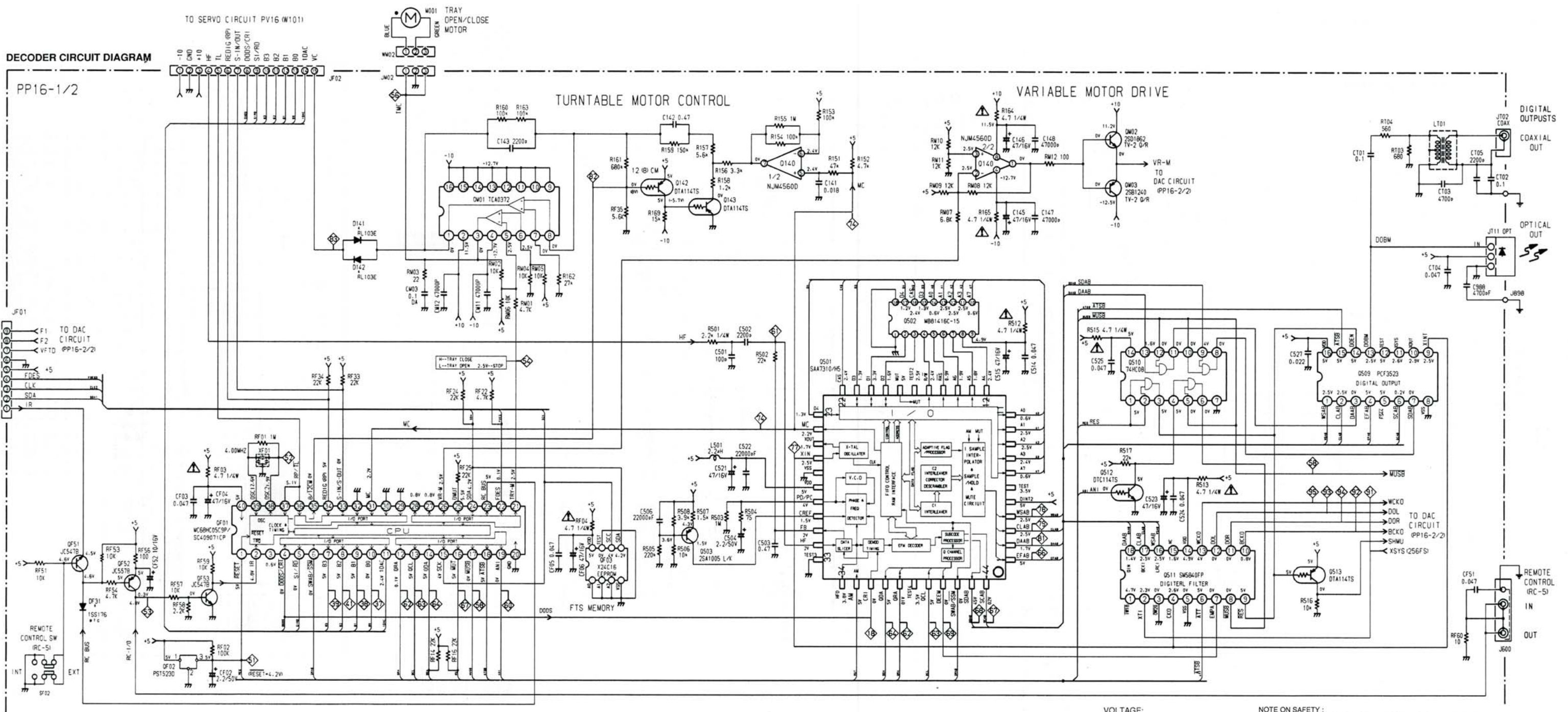
MC-----MONITOR CONTROL SIGNAL
 OFFSET IN--OFFSET CONTROL INPUT
 OFFSET OUT--OFFSET CONTROL OUTPUT
 PLLH-----PLL ON HOLD OUTPUT
 RADOUT----OUTPUT OF RE2-RE1 INPUT
 RE-----RADIAL ERROR SIGNAL
 ROSC-----RESISTOR WOBBLE OSCILLATOR
 RWOB-----WOBBLE GENERATOR INPUT
 RE1-----RADIAL ERROR SIGNAL 1
 RE2-----RADIAL ERROR SIGNAL 2
 RE DIG----RADIAL ERROR DIGITAL
 RE LAG----RADIAL ERROR SIGNAL FOR LAG NETWORK
 SC-----STARTING UP CAPACITOR INPUT
 SI/RD-----ON/OFF CONTROL FOR LASER SUPPLY AND FOCUS
 CIRCUIT. READY SIGNAL. STARTING UP
 TL-----TRACK LOSS OUTPUT SIGNAL
 TTM+ ----CONTROL VOLTAGE FOR TURNTABLE MOTOR
 TTM- ----CONTROL VOLTAGE FOR TURNTABLE MOTOR
 VEXT- ---SUPPLY CONNECTION

VEXT+ ---SUPPLY CONNECTION
 TCMF-----TURNTABLE CONTROL MOTOR PULSE
 8/12CM---BAND WIDTH SWITCH 8 OR 12CM DISC
 ANI-----DIGITAL DATA INFORMATION ON DISC SIGNAL
 AM-----ADDITIONAL MUTE
 ATSB-----ATTENUATION OF AUDIO LEVEL IN SEARCH POSITION
 CD ROM---DIGITAL DATA INFORMATION ON DISC SIGNAL
 SWITCH
 CEFM-----CLOCK EIGHT TO FOURTEEN MODULATOR
 CL-----CLOCK SIGNAL DECODER TO FILTER
 DEEM-----DEEMPHASIS
 DOBM-----DIGITAL AUDIO OUT: BIPHASE MODULATED SIGNAL
 DOEM-----DIGITAL OUTPUT ENABLE
 DOL-----IIS SERIAL DATA (20BIT) L CHANNEL
 DOR-----IIS SERIAL DATA (20BIT) R CHANNEL

EF-----ERROR FLAG DECODER TO ADOC
 MUTE-----MUTE SIGNAL
 MUSB-----SOFT MUTE SIGNAL
 PD/OC-----PHASE DETECTOR-OSCILLATOR CONTROL
 QCL-----Q-CHANNEL CLOCK SIGNAL
 QDA-----Q-CHANNEL DATA SIGNAL
 QRA-----Q-CHANNEL REQUEST ACKNOWLEDGE
 SC-----SUBCODE CLOCK DECODER TO ADOC
 SD-----SUBCODE DATA DECODER TO ADOC
 SWAB/SSM--SUBCODE WORD/START-STOP MOTOR SIGNAL
 TRY-M ---TRAY MOTOR CONTROL
 VR-M-----VOLUME MOTOR CONTROL
 WS-----WORD SELECT DECODER TO FILTER
 WCK-----WORD SELECT FILTER TO DAC
 XIN-----OSCILLATOR SIGNAL IN
 XSYS-----OSCILLATOR SIGNAL OUT

DECODER CIRCUIT DIAGRAM

PP16-1/2

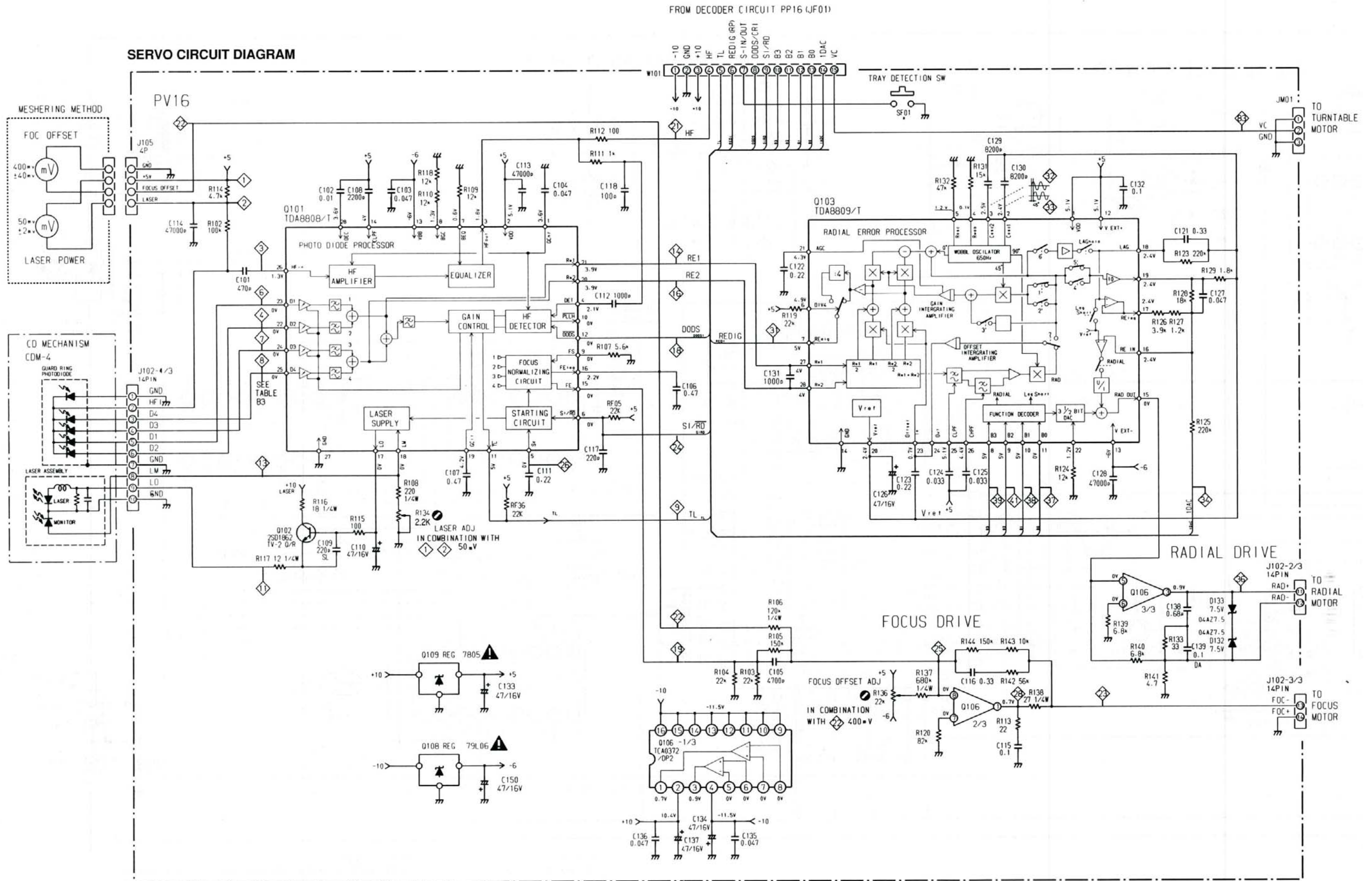


VOLTAGE:
MEASUREMENT CONDITION
DISC : SA
MODE : STOP (TOC)

NOTE ON SAFETY :
Symbol ⚠ Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symbol ⚠. Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

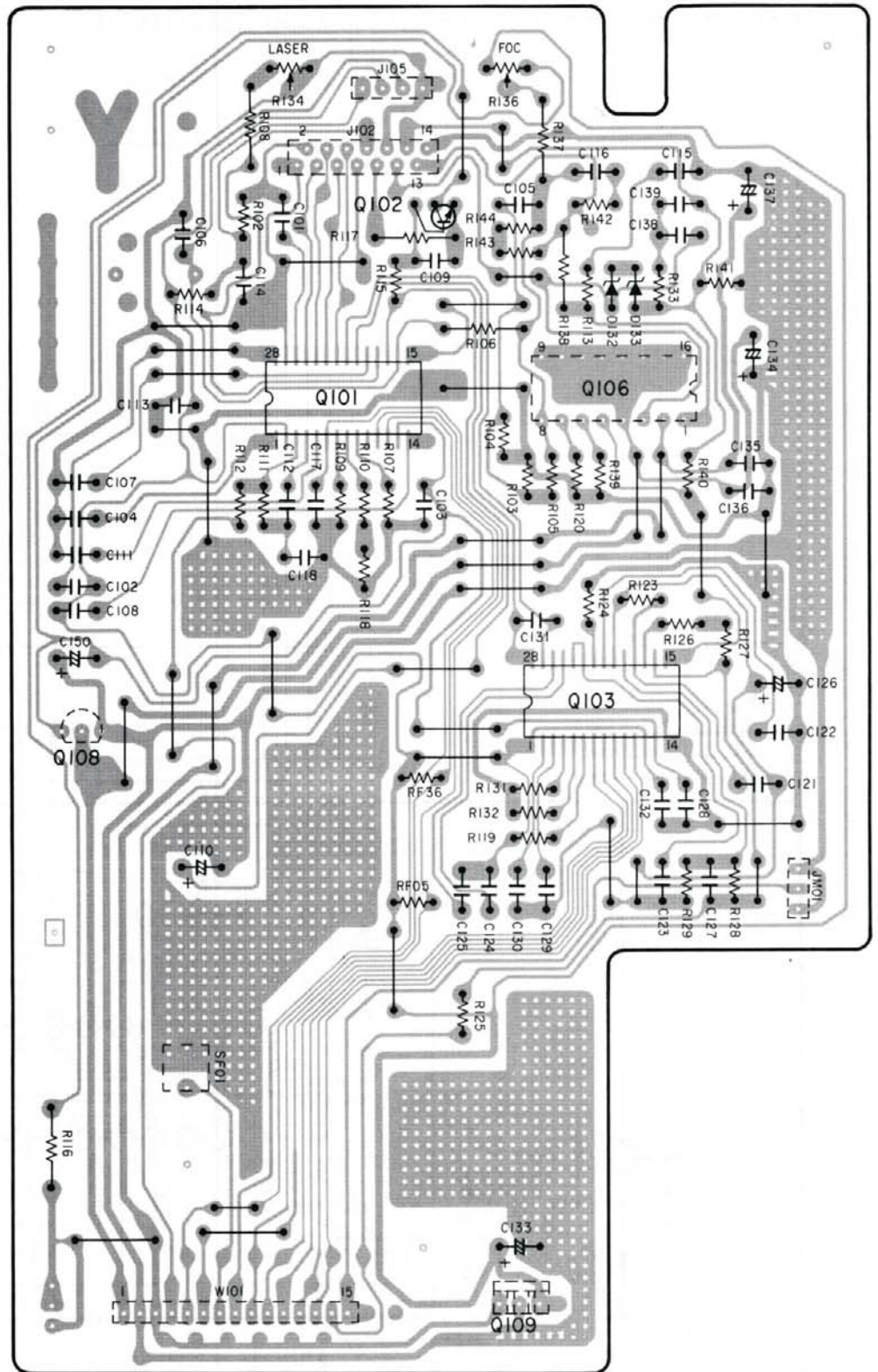
SCHEMATIC DIAGRAM AND PARTS LOCATION (PATTERN SIDE)

SERVO CIRCUIT DIAGRAM



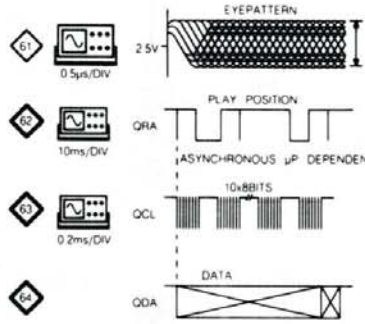
PV16

Q108 Q101 Q102 Q109 Q103 Q106



- 1 2 ADJUST 50mV DC SEE ALSO TABLE
 - 4 6 7 8 SEE TABLE
 - 9 LOW PULSES DURING SEARCH
 - 11 13 SAE TABLE
 - 14 16 200mV
5ms/Div
 - 18 LOW PULSES DURING (TRACK AND TRACK >)
 - 19 0.4s
0.1x/DIV
SERVICE POS 1
 - 21 2.5V
0.5s/Div
EYEPATTERN
 - 22 ADJUST 400mV DC SEE ALSO TABLE
 - 23 1.4V
0.2s/Div
SERVICE POS 1
 - 24 26 1.4V
0.5s/Div
POWER ON
1s 0.4s 3.25s
S₁ / R_D
S_C
 - 31 1.8ms
1ms/Div
 - 32 33 1.2V
1.8ms
0.5ms/Div
 - 34 2.5V
0.5ms/Div
BUMP AGAINST PLAYER IN PLAY MODE
 - 37 38 39 41
- | SERVICE POSITION 0 | | PLAY MODE |
|--------------------|--------|-----------|
| << SEARCH >> | SEARCH | SEARCH |
| B3 HIGH | HIGH | ACTIVITY |
| B2 HIGH | LOW | ACTIVITY |
| B1 HIGH | HIGH | ACTIVITY |
| B0 LOW | LOW | ACTIVITY |
- 50 5V
0.25us/Div
 - 80 0 V FOR 12 cm DISC
5 V FOR 8 cm DISC
 - 81 -1 V AT BEGINNING OF DISC
-0.6 V AT END OF DISC

- 18 LOW PULSES DURING NEXT AND PREVIOUS
- 53 ACTIVITY WHEN USING AN IR REMOTE CONTROL

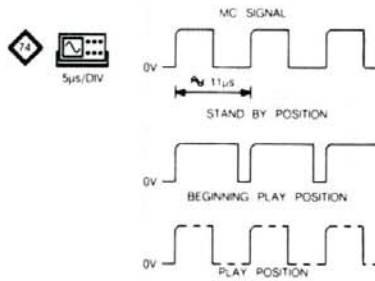


- 66 PULSES WHEN THE DISC IS SLOWLY BRAKED BY HAND

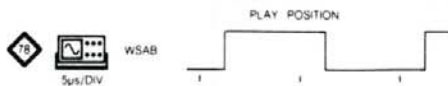


- 68 ACTIVITY DURING PLAY

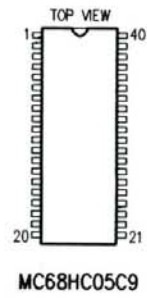
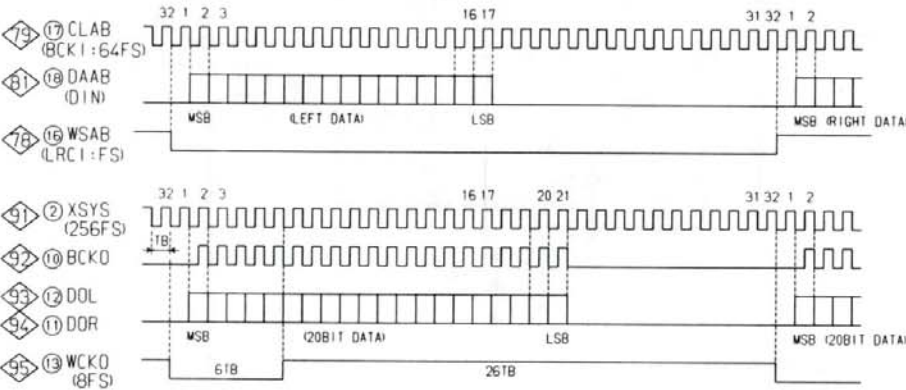
- 69 AUDIO SIGNALS DISC: HIGH ON TRACK 76 78 80 82 84 86 88
LOW ON TRACK 77 79 81 83 85 87 89



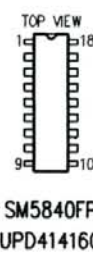
- 77 11.2896 MHz SINE WAVE



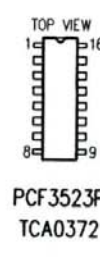
- 81 ACTIVITY DURING PLAY



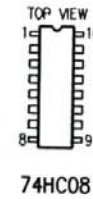
MC68HC05C9



SM5840FP
UPD41416C



PCF3523P
TCA0372



NJM4560D
NJM5532DD
NJM5534D
NJM2114D

74HC08



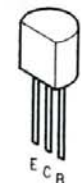
7805
7824
78M15



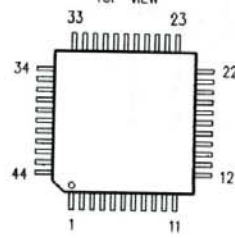
2SB1240Q/R
2SD1862Q/R



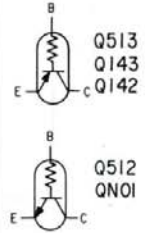
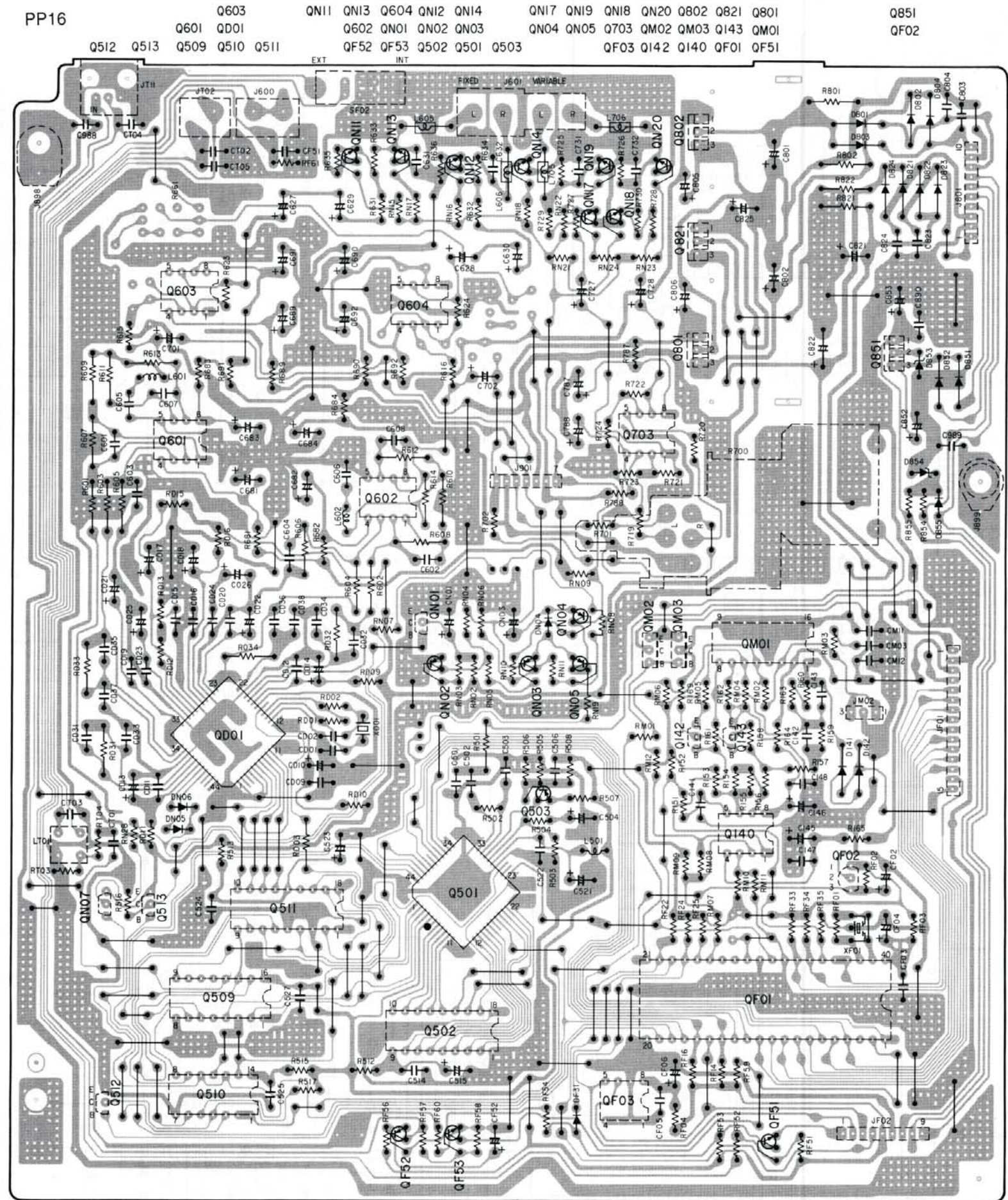
DTA114
DTC114
DTC144



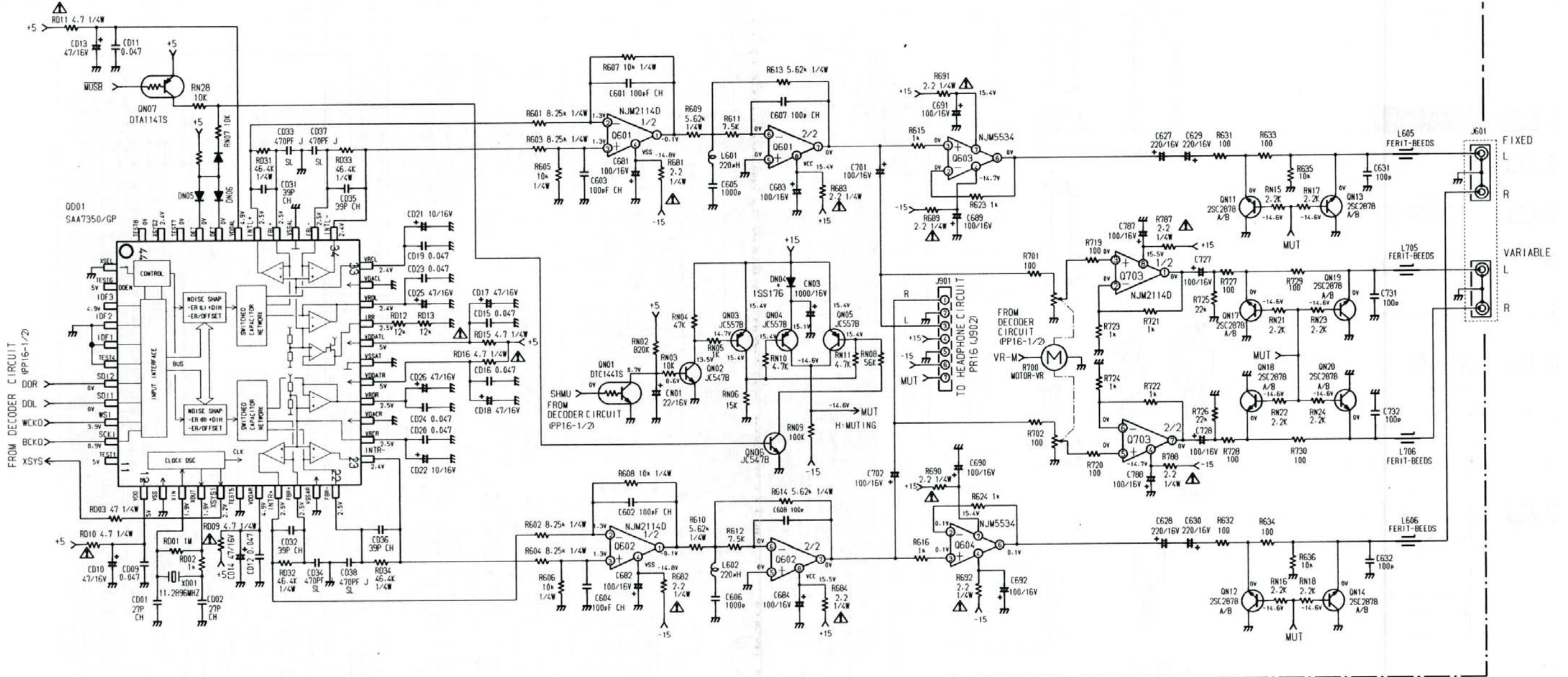
2SA1005
2SC2878A/B
JC547B
JC557B



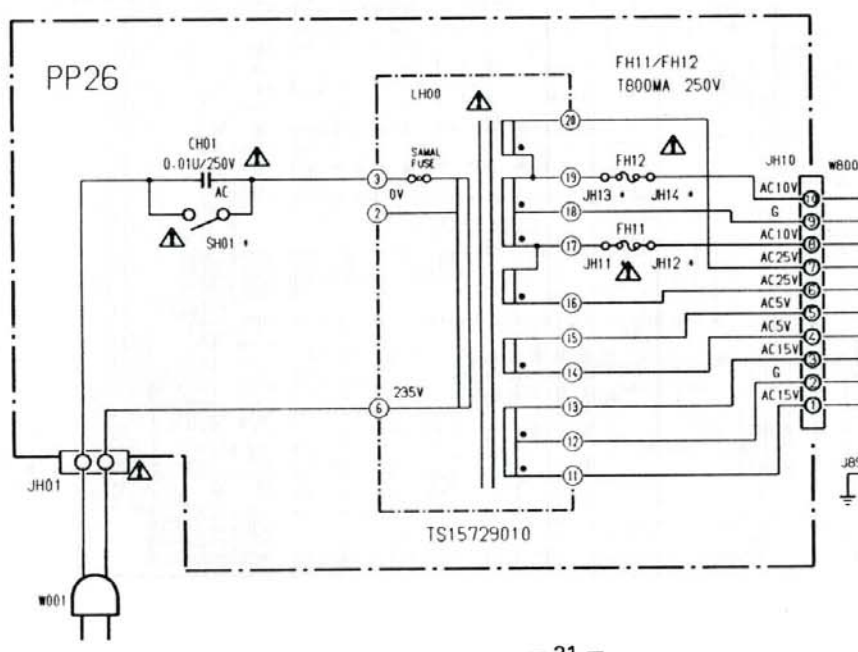
SAA7310GP
SAA7350GP



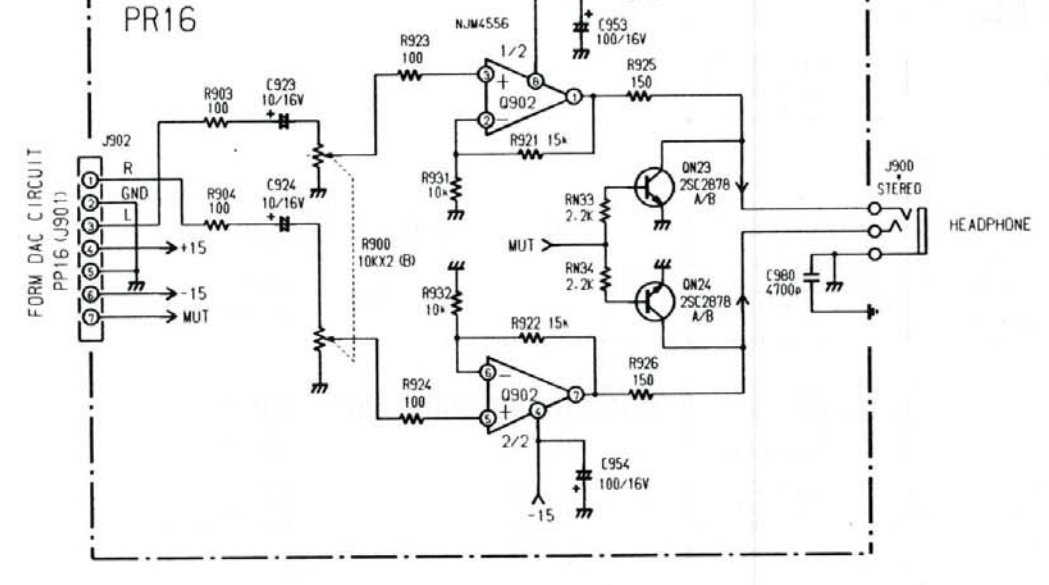
DAC/HEADPHONE/POWER SUPPLY CIRCUIT DIAGRAM

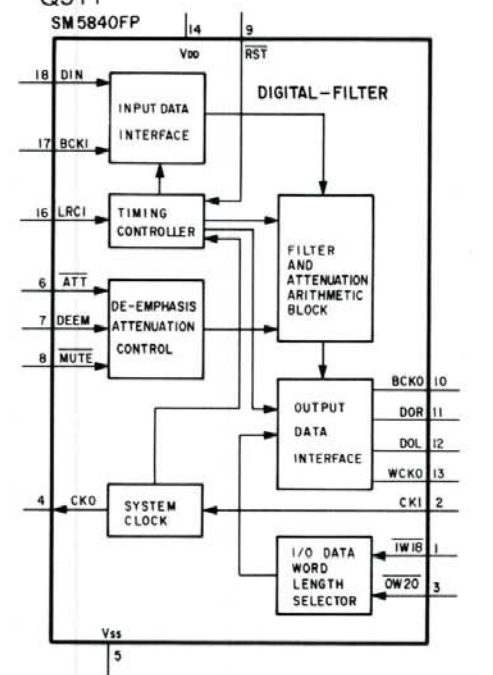
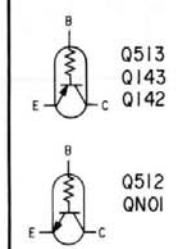
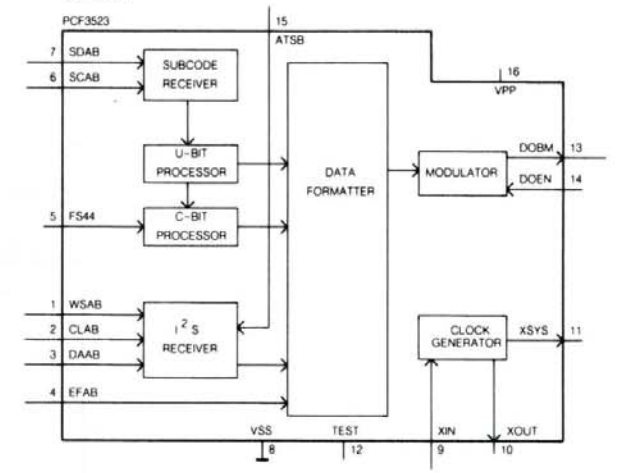
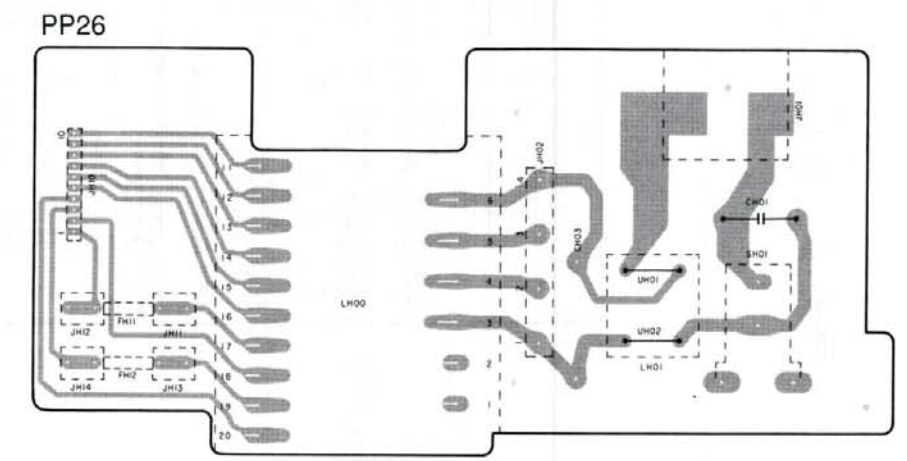
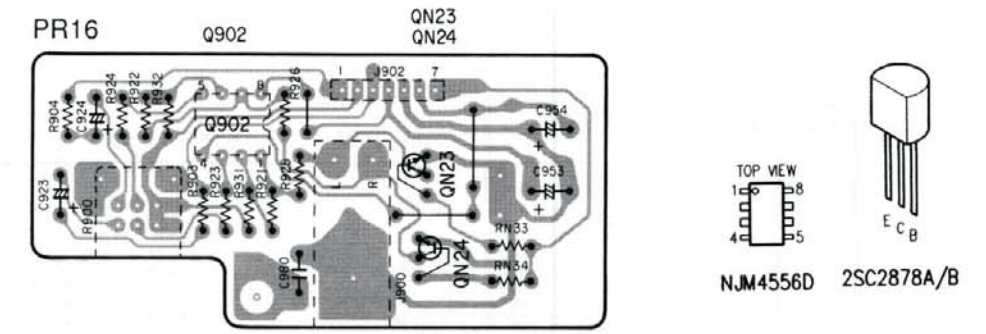
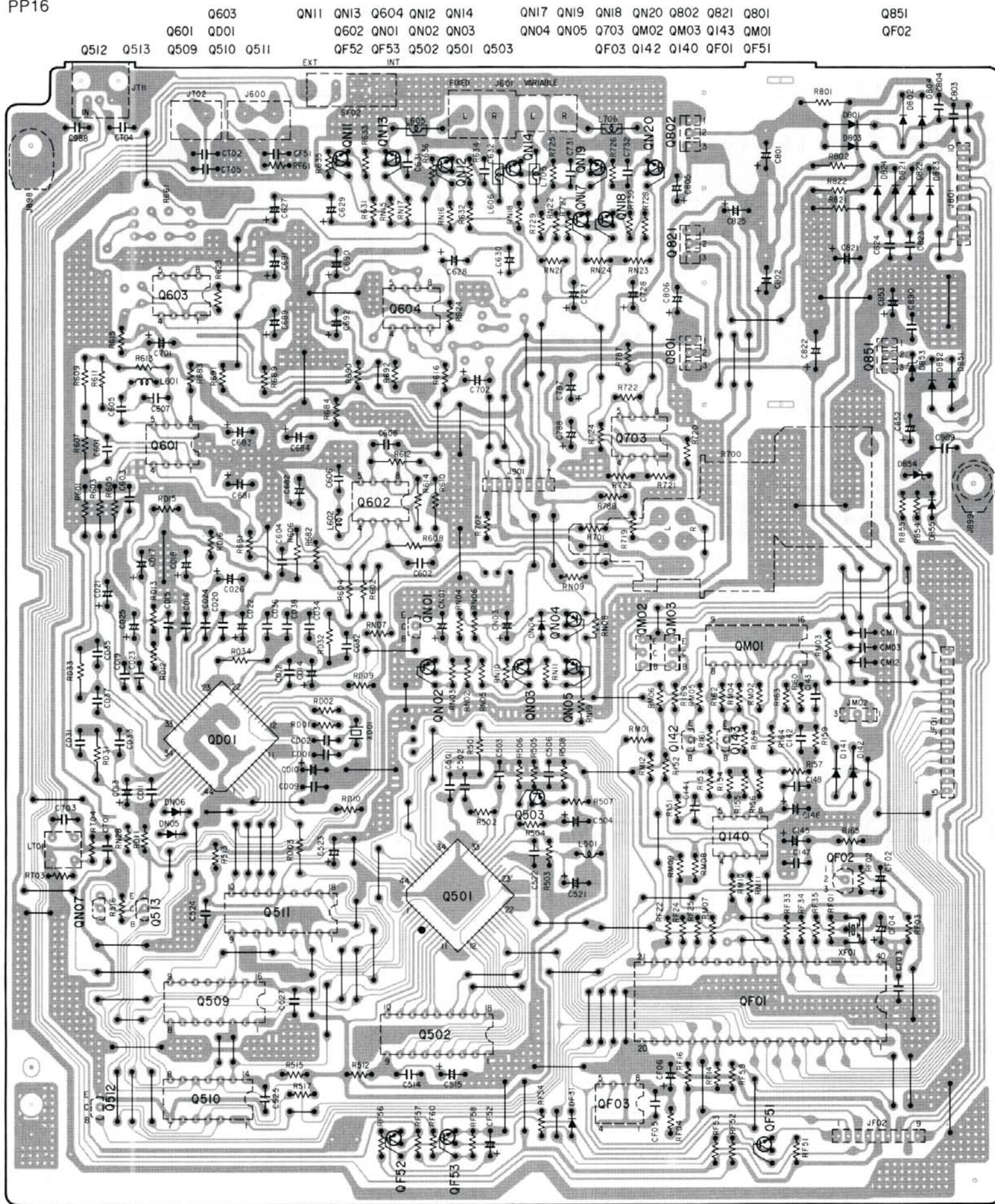


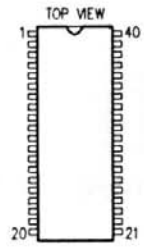
74CD72/10/12/17



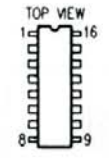
PR16







U3090MG



74HC75P



DTA114TS

PY16

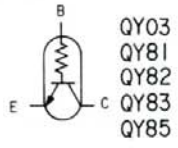
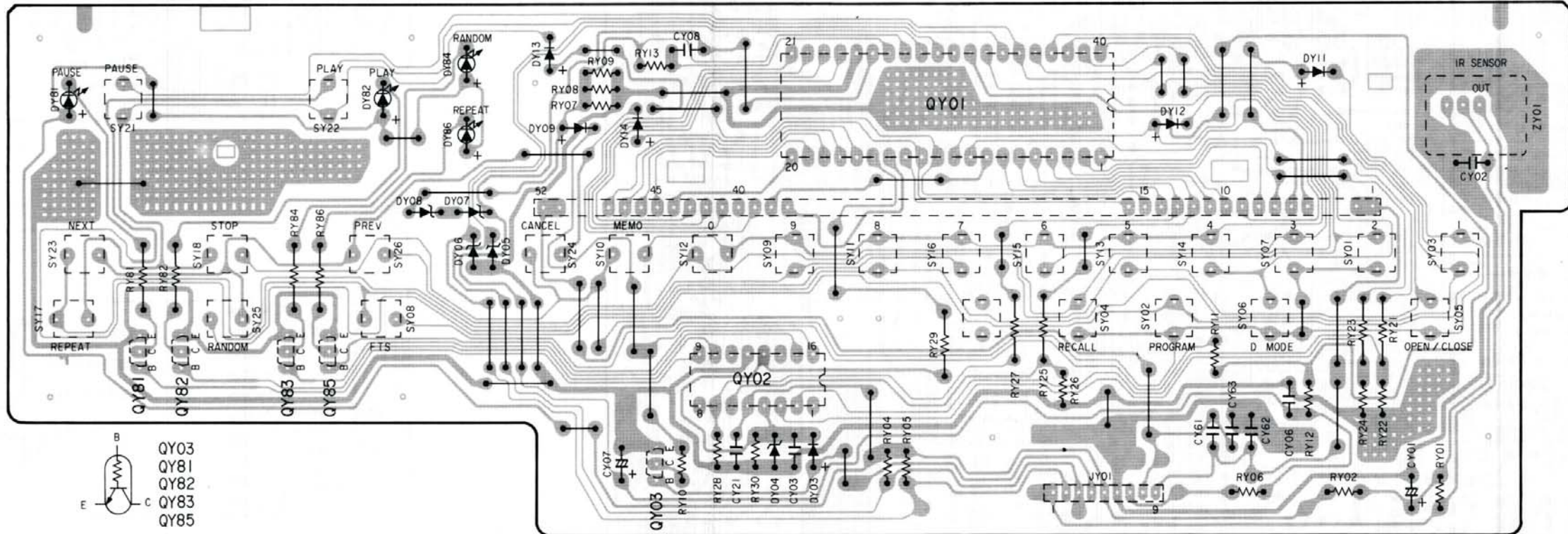
QY81 QY82

QY83 QY85

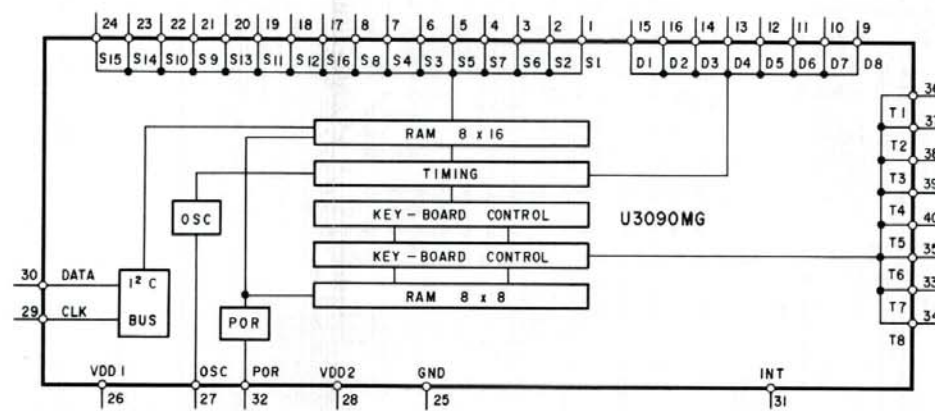
QY03

QY02

QY01



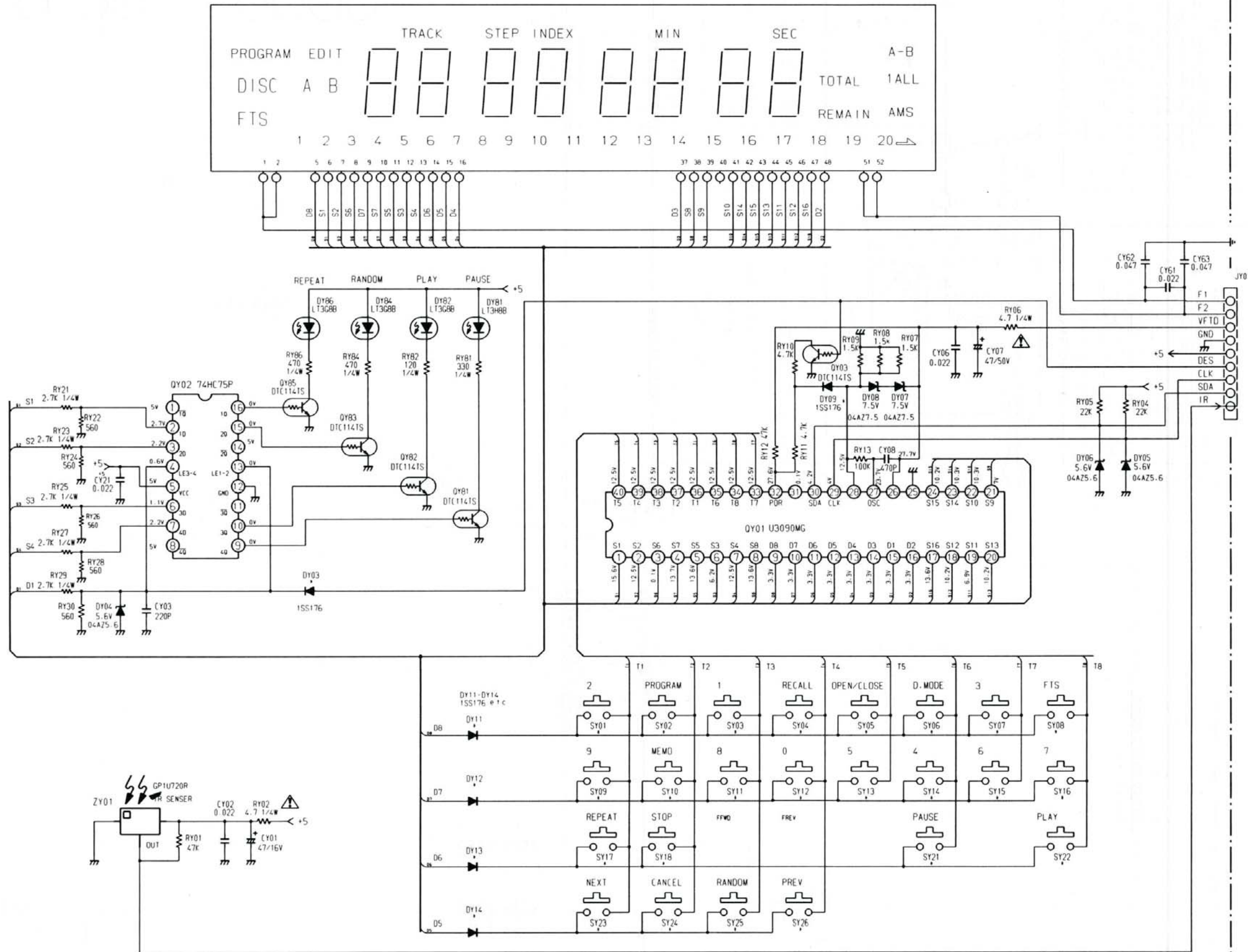
QY01



DISPLAY CIRCUIT DIAGRAM

PY16

FTD DISPLAY FV364G VY01

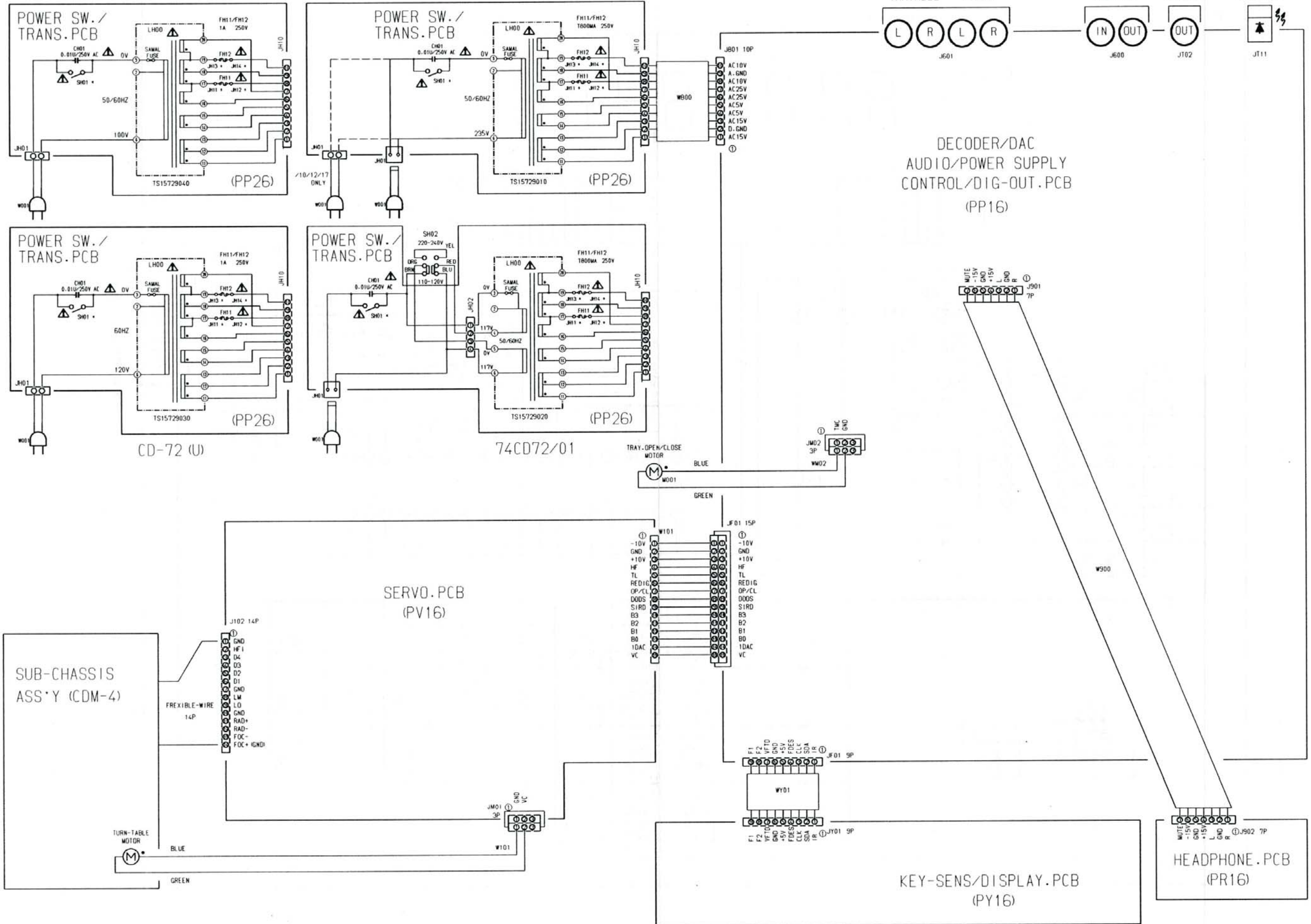


FROM DECODER CIRCUIT PP16 (JF01)

WIRING DIAGRAM

CD-72 (F)

74CD72/02/05/07/10/12/17



ELECTRICAL PARTS LIST

ASSIGNMENT OF COMMON PARTS CODES.

RESISTOR

- R***:** (1) GD05---140, Carbon film fixed resistor, $\pm 5\%$, 1/4W
R*:** (2) GD05---160, Carbon film fixed resistor, $\pm 5\%$, 1/6W

① — Resistance value

Examples

① Resistance value			
0.1 Ω ... 001	10 Ω ... 100	1k Ω ... 102	100k Ω ... 104
0.5 Ω ... 005	18 Ω ... 180	2.7k Ω ... 272	680k Ω ... 684
1 Ω ... 010	100 Ω ... 101	10k Ω ... 103	1M Ω ... 105
6.8 Ω ... 068	390 Ω ... 391	22k Ω ... 223	4.7M Ω ... 475

(Note) Please distinguish 1/4W from 1/6W by the shape of parts used actually.

C***: CERAMIC CAP.

- (1) DD1 --- 370, Ceramic condenser
 Disc type
 Temp. coeff. P350 — N1000, 50V
- ①② — Capacity value
 Tolerance

Examples

① Tolerance (Capacity deviation)

$\pm 0.25\text{pF}$... 0
$\pm 0.5\text{pF}$... 1
$\pm 5\%$... 5

* Tolerance of COMMON PARTS handled here are as follows.

0.5pF ~ 5pF ... $\pm 0.25\text{pF}$		
6pF ~ 10pF ... $\pm 0.5\text{pF}$		
12pF ~ 560pF ... $\pm 5\text{pF}$		
② Capacity value		
0.5pF ... 005	3pF ... 030	100pF ... 101
1pF ... 010	10pF ... 100	220pF ... 221
1.5pF ... 015	47pF ... 470	560pF ... 561

C***: CERAMIC CAP.

- (1) DK16 --- 300, High dielectric constant ceramic condenser
 Disc type
 Temp. chara. 2B4, 50V
- ① — Capacity value

Examples

② Capacity value

100pF ... 101	1000pF ... 102	10000pF ... 103
470pF ... 471	2200pF ... 222	

C***: ELECTROLY CAP. (\neq), FILM CAP. (\neq)

- (1) EA --- 10, Electrolytic condenser
 One-way lead type, Tolerance $\pm 20\%$
- ①② — Dielectric strength
 Capacity value

Examples

① Capacity value

0.1 μF ... 104	4.7 μF ... 475	100 μF ... 107
0.33 μF ... 334	10 μF ... 106	330 μF ... 337
1 μF ... 105	22 μF ... 226	1100 μF ... 108
		2200 μF ... 228

② Working voltage

6.3V ... 006	25V ... 025
10V ... 010	35V ... 035
16V ... 016	50V ... 050

- (2) DF15 --- 350, Plastic film condenser
 One-way type, Mylar $\pm 5\%$ 50V

① — Capacity value

Examples

① Capacity value

0.001 μF (1000pF) ... 102	0.1 μF ... 104
0.0018 μF ... 182	0.56 μF ... 564
0.01 μF ... 103	1 μF ... 105
0.015 μF ... 153	

REF. DESIG.	PART NO.	DESCRIPTION
		PP16-DECODER/DAC/AUDIO/POWER CIRCUIT BOARD
		PP16-CAPACITORS
CD01	4822 122 33638	CERAMIC 27PF $\pm 5\%$
CD02	4822 122 33638	CERAMIC 27PF $\pm 5\%$
CD09	4822 122 40589	CERAMIC 0.047 μF $\pm 20\%$ 50V
CD10	4822 124 41539	ELECT 47 μF 16V
CD11	4822 122 40589	CERAMIC 0.047 μF $\pm 20\%$ 50V
CD12	4822 122 40589	CERAMIC 0.047 μF $\pm 20\%$ 50V
CD13	4822 124 41539	ELECT 47 μF 16V
CD14	4822 124 41539	ELECT 47 μF 16V
CD15	4822 122 40589	CERAMIC 0.047 μF $\pm 20\%$ 50V
CD16	4822 122 40589	CERAMIC 0.047 μF $\pm 20\%$ 50V
CD17	4822 124 41539	ELECT 47 μF 16V
CD18	4822 124 41539	ELECT 47 μF 16V
CD19	4822 122 40589	CERAMIC 0.047 μF $\pm 20\%$ 50V
CD20	4822 122 40589	CERAMIC 0.047 μF $\pm 20\%$ 50V
CD21	4822 124 90352	ELECT 10 μF 16V
CD22	4822 124 90352	ELECT 10 μF 16V
CD23	4822 122 40589	CERAMIC 0.047 μF $\pm 20\%$ 50V
CD24	4822 122 40589	CERAMIC 0.047 μF $\pm 20\%$ 50V
CD25	4822 124 41539	ELECT 47 μF 16V
CD26	4822 124 41539	ELECT 47 μF 16V
CD31	4822 122 31069	CERAMIC 39PF $\pm 5\%$ 50V
CD32	4822 122 31069	CERAMIC 39PF $\pm 5\%$ 50V
CD33	4822 121 42327	FILM 470PF $\pm 5\%$ 50V
CD34	4822 121 42327	FILM 470PF $\pm 5\%$ 50V
CD35	4822 122 31069	CERAMIC 39PF $\pm 5\%$ 50V
CD36	4822 122 31069	CERAMIC 39PF $\pm 5\%$ 50V
CD37	4822 121 42327	FILM 470PF $\pm 5\%$ 50V
CD38	4822 121 42327	FILM 470PF $\pm 5\%$ 50V
CF02	4822 124 90357	ELECT 2.2 μF 50V
CF03	4822 122 40589	CERAMIC 0.047 μF $\pm 20\%$ 50V
CF04	4822 124 41539	ELECT 47 μF 16V
CF05	4822 122 40589	CERAMIC 0.047 μF $\pm 20\%$ 50V
CF06	4822 124 41539	ELECT 47 μF 16V
CF51	4822 122 40589	CERAMIC 0.047 μF $\pm 20\%$ 50V
CF52	4822 124 90352	ELECT 10 μF 16V
CM03	4822 122 11558	CERAMIC 0.1 μF $\pm 20\%$ 50V
CM11	4822 122 40589	CERAMIC 0.047 μF $\pm 20\%$ 50V
CM12	4822 122 40589	CERAMIC 0.047 μF $\pm 20\%$ 50V
CN01	4822 124 90358	ELECT 22 μF 16V
CN03	4822 124 22722	ELECT 1000 μF 16V
CT01	4822 122 11558	CERAMIC 0.1 μF $\pm 20\%$ 50V
CT02	4822 122 11558	CERAMIC 0.1 μF $\pm 20\%$ 50V
CT03	4822 122 33795	CERAMIC 4700PF $\pm 20\%$
CT04	4822 122 40589	CERAMIC 0.047 μF $\pm 20\%$ 50V
CT05	4822 126 11726	CERAMIC 2200PF $\pm 20\%$
C141	4822 121 42701	FILM 0.018 μF $\pm 5\%$ 50V
C142	4822 121 42668	FILM 0.47 μF $\pm 5\%$ 50V
C143	4822 121 42771	FILM 2200PF $\pm 5\%$ 50V
C145	4822 124 41539	ELECT 47 μF $\pm 20\%$ 16V
C146	4822 124 41539	ELECT 47 μF $\pm 20\%$ 16V
C147	4822 122 40589	CERAMIC 0.047 μF $\pm 20\%$ 50V
C148	4822 122 40589	CERAMIC 0.047 μF $\pm 20\%$ 50V
C501	4822 126 10513	CERAMIC 47PF $\pm 5\%$
C502	4822 126 11726	CERAMIC 2200PF $\pm 20\%$
C503	4822 121 42668	FILM 0.47 μF $\pm 5\%$ 50V
C504	4822 124 90357	ELECT 2.2 μF 50V
C506	4822 122 40588	CERAMIC 0.022 μF $\pm 20\%$
C514	4822 122 40589	CERAMIC 0.047 μF $\pm 20\%$ 50V
C515	4822 124 41539	ELECT 47 μF 16V
C521	4822 124 41539	ELECT 47 μF 16V
C522	4822 122 40588	CERAMIC 0.022 μF $\pm 20\%$
C523	4822 124 41539	ELECT 47 μF 16V
C524	4822 122 40589	CERAMIC 0.047 μF $\pm 20\%$ 50V

REF. DESIG.	PART NO.	DESCRIPTION
C525	4822 122 40589	CERAMIC 0.047 μ F \pm 20% 50V
C527	4822 122 40588	CERAMIC 0.022 μ F \pm 20%
C601	5322 122 32265	CERAMIC 100PF \pm 5% 50V
C604		
C605	4822 121 42722	FILM 1000PF \pm 5% 50V
C606	4822 121 42722	FILM 1000PF \pm 5% 50V
C607	5322 122 32265	CERAMIC 100PF \pm 5% 50V
C608	5322 122 32265	CERAMIC 100PF \pm 5% 50V
C627	4822 124 80123	ELECT 220 μ F 16V
C630		
C631	4822 126 10364	CERAMIC 100PF \pm 10%
C632	4822 126 10364	CERAMIC 100PF \pm 10%
C681	4822 124 90354	ELECT 100 μ F 16V
C684		
C689	4822 124 80119	ELECT 100 μ F 16V
C692		
C701	4822 124 90352	ELECT 10 μ F 16V
C702	4822 124 90352	ELECT 10 μ F 16V
C727	4822 124 90354	ELECT 100 μ F 16V
C728	4822 124 90354	ELECT 100 μ F 16V
C731	4822 126 10364	CERAMIC 100PF \pm 10%
C732	4822 126 10364	CERAMIC 100PF \pm 10%
C787	4822 124 90354	ELECT 100 μ F 16V
C788	4822 124 90354	ELECT 100 μ F 16V
C801	4822 124 80257	ELECT 1000 μ F 35V
C802	4822 124 80257	ELECT 1000 μ F 35V
C803	4822 122 40588	CERAMIC 0.022 μ F \pm 20%
C804	4822 122 40588	CERAMIC 0.022 μ F \pm 20%
C805	4822 124 41539	ELECT 47 μ F 16V
C806	4822 124 41539	ELECT 47 μ F 16V
C821	4822 124 22723	ELECT 1000 μ F 25V
C822	4822 124 22239	ELECT 3300 μ F 25V
C823	4822 122 40588	CERAMIC 0.022 μ F \pm 20%
C824	4822 122 40588	CERAMIC 0.022 μ F \pm 20%
C825	4822 124 90364	ELECT 220 μ F 16V
C852	4822 124 90355	ELECT 100 μ F 50V
C853	4822 124 22276	ELECT 47 μ F 50V
C890	4822 122 33795	CERAMIC 4700PF \pm 20%
C988	4822 122 33795	CERAMIC 4700PF \pm 20%
C989	4822 122 33795	CERAMIC 4700PF \pm 20%
PP16-RESISTORS		
RD01	4822 116 52235	1M Ω \pm 5% 1/6W
RD02	4822 050 11002	1K Ω \pm 5% 1/6W
RD03	4822 116 52367	47 Ω \pm 5% 1/4W
RD09	4822 111 90967	4.7 Ω \pm 5% 1/4W, FUSE
RD11		
RD12	4822 116 52231	12K Ω \pm 5% 1/6W
RD13	4822 116 52231	12K Ω \pm 5% 1/6W
RD15	4822 111 90967	4.7 Ω \pm 5% 1/4W, FUSE
RD16	4822 111 90967	4.7 Ω \pm 5% 1/4W, FUSE
RD31	5322 050 24643	46.4K Ω \pm 2% 1/4W
RD34		
RF01	4822 116 52235	1M Ω \pm 5% 1/6W
RF02	4822 116 52234	100K Ω \pm 5% 1/6W
RF03	4822 111 90967	4.7 Ω \pm 5% 1/4W, FUSE
RF04	4822 111 90967	4.7 Ω \pm 5% 1/4W, FUSE
RF14	4822 116 52257	22K Ω \pm 5% 1/6W
RF16	4822 116 52257	22K Ω \pm 5% 1/6W
RF22	4822 116 52283	4.7K Ω \pm 5% 1/6W
RF24	4822 116 52257	22K Ω \pm 5% 1/6W
RF25	4822 116 52257	22K Ω \pm 5% 1/6W
RF33	4822 116 52257	22K Ω \pm 5% 1/6W

REF. DESIG.	PART NO.	DESCRIPTION
RF34	4822 116 52257	22K Ω \pm 5% 1/6W
RF35	4822 116 52289	5.6K Ω \pm 5% 1/6W
RF51	4822 116 52233	10K Ω \pm 5% 1/6W
RF53	4822 116 52233	10K Ω \pm 5% 1/6W
RF54	4822 116 52283	4.7K Ω \pm 5% 1/6W
RF56	4822 116 52175	100 Ω \pm 5% 1/6W
RF57	4822 116 52233	10K Ω \pm 5% 1/6W
RF58	4822 116 52256	2.2K Ω \pm 5% 1/6W
RF59	4822 116 52233	10K Ω \pm 5% 1/6W
RF61	4822 116 52176	10 Ω \pm 5% 1/6W
RM01	4822 116 52283	4.7K Ω \pm 5% 1/6W
RM02	4822 116 52233	10K Ω \pm 5% 1/6W
RM03	4822 116 52186	22 Ω \pm 5% 1/6W
RM04	4822 116 52233	10K Ω \pm 5% 1/6W
RM06		
RM07	4822 116 52296	6.8K Ω \pm 5% 1/6W
RM08	4822 116 52231	12K Ω \pm 5% 1/6W
RM11		
RM12	4822 116 52175	100 Ω \pm 5% 1/6W
RN02	4822 116 52305	820K Ω \pm 5% 1/6W
RN03	4822 116 52233	10K Ω \pm 5% 1/6W
RN04	4822 116 52284	47K Ω \pm 5% 1/6W
RN05	4822 116 52204	1K Ω \pm 5% 1/6W
RN06	4822 116 52244	15K Ω \pm 5% 1/6W
RN07	4822 116 52233	10K Ω \pm 5% 1/6W
RN08	4822 116 52291	56K Ω \pm 5% 1/6W
RN09	4822 116 52234	100K Ω \pm 5% 1/6W
RN10	4822 116 52283	4.7K Ω \pm 5% 1/6W
RN11	4822 116 52283	4.7K Ω \pm 5% 1/6W
RN15	4822 116 52256	2.2K Ω \pm 5% 1/6W
RN18		
RN21	4822 116 52256	2.2K Ω \pm 5% 1/6W
RN24		
RN28	4822 116 52233	10K Ω \pm 5% 1/6W
RT03	4822 116 52228	680 Ω \pm 5% 1/6W
RT04	4822 116 52226	560 Ω \pm 5% 1/6W
R151	4822 116 52284	47K Ω \pm 5% 1/6W
R152	4822 116 52283	4.7K Ω \pm 5% 1/6W
R153	4822 116 52234	100K Ω \pm 5% 1/6W
R154	4822 116 52234	100K Ω \pm 5% 1/6W
R155	4822 116 52235	1M Ω \pm 5% 1/6W
R156	4822 116 52269	3.3K Ω \pm 5% 1/6W
R157	4822 116 52289	5.6K Ω \pm 5% 1/6W
R158	4822 116 52207	1.2K Ω \pm 5% 1/6W
R159	4822 116 52245	150K Ω \pm 5% 1/6W
R160	4822 116 52234	100K Ω \pm 5% 1/6W
R161	4822 116 52298	680K Ω \pm 5% 1/6W
R162	4822 116 52264	27K Ω \pm 5% 1/6W
R163	4822 116 52234	100K Ω \pm 5% 1/6W
R164	4822 111 90967	4.7 Ω \pm 5% 1/4W, FUSE
R165	4822 111 90967	4.7 Ω \pm 5% 1/4W, FUSE
R169	4822 116 52244	15K Ω \pm 5% 1/6W
R501	4822 116 52408	2.2K Ω \pm 5% 1/4W
R502	4822 116 52257	22K Ω \pm 5% 1/6W
R503	4822 116 52235	1M Ω \pm 5% 1/6W
R504	4822 111 41355	75 Ω \pm 5% 1/6W
R505	4822 116 52258	220K Ω \pm 5% 1/6W
R506	4822 116 52233	10K Ω \pm 5% 1/6W
R507	4822 116 52243	1.5K Ω \pm 5% 1/6W
R508	4822 116 52276	3.9K Ω \pm 5% 1/6W
R512	4822 111 90967	4.7 Ω \pm 5% 1/4W, FUSE
R513	4822 111 90967	4.7 Ω \pm 5% 1/4W, FUSE
R515	4822 111 90967	4.7 Ω \pm 5% 1/4W, FUSE
R516	4822 116 52233	10K Ω \pm 5% 1/6W

REF. DESIG.	PART NO.	DESCRIPTION
R517	4822 116 52257	22K Ω \pm 5% 1/6W
R601	4822 116 53394	8.25K Ω \pm 2% 1/4W
R604		
R605	4822 050 21003	10K Ω \pm 2% 1/4W
R608		
R609	4822 050 25662	5.62K Ω \pm 2% 1/4W
R610	4822 050 25662	5.62K Ω \pm 2% 1/4W
R611	4822 050 27502	7.5K Ω \pm 2% 1/4W
R612	4822 050 27502	7.5K Ω \pm 2% 1/4W
R613	4822 050 25662	5.62K Ω \pm 2% 1/4W
R614	4822 050 25662	5.62K Ω \pm 2% 1/4W
R615	4822 050 11002	1K Ω \pm 5% 1/6W
R616	4822 050 11002	1K Ω \pm 5% 1/6W
R623	4822 050 11002	1K Ω \pm 5% 1/6W
R624	4822 050 11002	1K Ω \pm 5% 1/6W
R631	4822 116 52175	100 Ω \pm 5% 1/6W
R634		
R635	4822 116 52233	10K Ω \pm 5% 1/6W
R636	4822 116 52233	10K Ω \pm 5% 1/6W
▲ R681	4822 116 83963	2.2 Ω \pm 5% 1/4W
▲ R684		
▲ R689	4822 116 83963	2.2 Ω \pm 5% 1/4W
▲ R692		
R700	4822 101 30763	10K Ω x2 VARIABLE, MOTOR VOL.
R701	4822 116 52175	100 Ω \pm 5% 1/6W
R702	4822 116 52175	100 Ω \pm 5% 1/6W
R719	4822 116 52175	100 Ω \pm 5% 1/6W
R720	4822 116 52175	100 Ω \pm 5% 1/6W
R721	4822 050 11002	1K Ω \pm 5% 1/6W
R724		
R725	4822 116 52257	22K Ω \pm 5% 1/6W
R726	4822 116 52257	22K Ω \pm 5% 1/6W
R727	4822 116 52175	100 Ω \pm 5% 1/6W
R730		
R787	4822 116 83963	2.2 Ω \pm 5% 1/4W
R788	4822 116 83963	2.2 Ω \pm 5% 1/4W
R801	4822 116 52426	4.7K Ω \pm 5% 1/4W
R802	4822 116 52426	4.7K Ω \pm 5% 1/4W
R821	4822 116 52452	10K Ω \pm 5% 1/4W
R822	4822 116 52452	10K Ω \pm 5% 1/4W
R854	4822 116 52224	470 Ω \pm 5% 1/6W
R855	4822 116 52283	4.7K Ω \pm 5% 1/6W
PP16-SEMICONDUCTORS		
DF31	4822 130 33305	DIODE, 1SS176, ETC. 30V 0.1A
DN04	4822 130 33305	DIODE, 1SS176, ETC. 30V 0.1A
▲ D141	4822 130 32508	DIODE, RL103E, ETC.
▲ D142	4822 130 32508	DIODE, RL103E, ETC.
▲ D801	4822 130 32508	DIODE, RL103E, ETC.
▲ D804		
▲ D821	4822 130 32508	DIODE, RL103E, ETC.
▲ D824		
▲ D851	4822 130 32508	DIODE, RL103E, ETC.
▲ D852	4822 130 32508	DIODE, RL103E, ETC.
D853	4822 130 80273	ZENER DIODE, 04AZ8.2 ETC. 8.2V
D854	4822 130 80932	ZENER DIODE, 04AZ6.2 ETC. 6.2V
D855	4822 130 80839	DIODE, S5688G, 400V 1A
QD01	4822 209 30438	IC, BS DAC SAA7350/QFP

REF. DESIG.	PART NO.	DESCRIPTION
QF01	4822 209 30444	MICROPROCESSOR, MC68HC05C9/SC409071CP PST523D
QF02	4822 209 73951	IC, RESET
QF03	4822 209 52171	IC, EEPROM X24C16
QF51	4822 130 62295	TRANSISTOR, JC547B, NPN
QF52	4822 130 62386	TRANSISTOR, JC557B, PNP
QF53	4822 130 62295	TRANSISTOR, JC547B, NPN
QM01	4822 209 62755	IC, POWER OP AMP TCA0372
QM02	4822 130 61441	TRANSISTOR, 2SD1862 (Q,R)
QM03	4822 130 61417	TRANSISTOR, 2SB1240 (Q,R)
QN01	4822 130 61188	DIGITAL TRANSISTOR, DTC144TS
QN02	4822 130 62295	TRANSISTOR, JC547B, NPN
QN03	4822 130 62386	TRANSISTOR, JC557B, PNP
QN05		
QN06	4822 130 62295	TRANSISTOR, JC547B, NPN
QN07	4822 130 61189	DIGITAL TRANSISTOR, DTA114TS
QN11	4822 130 43819	TRANSISTOR, 2SC2878 (A, BRANK)
QN14		
QN17	4822 130 43819	TRANSISTOR, 2SC2878 (A, BRANK)
QN20		
Q140	4822 209 83627	IC NJM4560D
Q142	4822 130 61186	DIGITAL TRANSISTOR, DTA114TS
Q143	4822 130 61186	DIGITAL TRANSISTOR, DTA114TS
Q501	4822 209 63453	IC, DECODER SAA7310/H5
Q502	4822 209 73952	IC, D-RAM MB81416C-15
Q503	4822 130 61438	TRANSISTOR, 2SA1005 (L, K)
Q509	4822 209 30439	IC, ADOC PCF3523P
Q510	4822 209 63471	IC, AND GATE 74HC08
Q511	4822 209 30435	IC, DIGITAL FILTER SM5840FP
Q512	4822 130 61189	DIGITAL TRANSISTOR, DTC114TS
Q513	4822 130 61186	DIGITAL TRANSISTOR, DTA114TS
Q601	4822 209 31153	IC NJM2114D
Q602	4822 209 31153	IC NJM2114D
Q603	4822 209 70226	IC NJM5534D
Q604	4822 209 70226	IC NJM5534D
Q703	4822 209 31153	IC NJM2114D
▲ Q801	4822 209 82829	IC NJM78M15FA
▲ Q802	4822 209 61526	IC NJM79M15FA
▲ Q821	4822 209 71903	IC NJM7805FA
▲ Q851	4822 209 30441	IC NJM7824FA
PP16-MISCELLANEOUS		
JT02	4822 265 20354	TERMINAL, 1P; RCA DIGITAL
JT11	4822 265 30993	JACK, OPTICAL CONNEX. TOTX178
J600	4822 266 30274	TERMINAL, 2P; RCA
J601	4822 266 30369	TERMINAL, 4P; RCA (GOLD)
LT01	4822 142 60388	PULSE TRANSFORMER
L501	4822 152 20647	CHOKE COIL, 2.2 μ H
L601	4822 157 62899	CHOKE COIL, 220 μ H
L602	4822 157 62899	CHOKE COIL, 220 μ H
L605	4822 158 60605	FERRITE CORE, BEADS
L606	4822 158 60605	FERRITE CORE, BEADS
L705	4822 158 60605	FERRITE CORE, BEADS
L706	4822 158 60605	FERRITE CORE, BEADS
SF02	4822 277 21559	SLIDE SWITCH INT/EXT
XD01	4822 242 72395	CRYSTAL, 11.2896MHZ
XF01	4822 242 72223	CERAMIC, CST4.00MGW 4MHZ

REF. DESIG.	PART NO.	DESCRIPTION
		PP26-POWER SW./TRANSFORMER CIRCUIT BOARD
		PP26-CAPACITORS
▲ CH01	4822 121 43732	FILM 0.01μF ± 20% 250V AC
		PP26-MISCELLANEOUS
▲ FH11	4822 253 20168	FUSE, 800MA 250V
▲ FH12	4822 253 20168	FUSE, 800MA 250V
▲ JH01	4822 267 31521	PLUG, AC INLET
▲ LH00	4822 146 21646	POWER TRANSFORMER(10B/12B/17B)
▲ SH01	4822 276 12925	PUSH SWITCH, POWER
		PR16-HEADPHONE CIRCUIT BOARD
		PR16-CAPACITORS
C923	4822 124 90352	ELECT 10μF 16V
C924	4822 124 90352	ELECT 10μF 16V
C953	4822 124 90354	ELECT 100μF 16V
C954	4822 124 90354	ELECT 100μF 16V
C980	4822 122 33795	CERAMIC 4700PF ± 20%
		PR16-RESISTORS
RN33	4822 116 52256	2.2K Ω ± 5% 1/6W
RN34	4822 116 52256	2.2K Ω ± 5% 1/6W
R900	4822 100 20421	10K Ω X2 (B) VARIABLE, PHONE VR
R903	4822 116 52175	100 Ω ± 5% 1/6W
R904	4822 116 52175	100 Ω ± 5% 1/6W
R921	4822 116 52244	15K Ω ± 5% 1/6W
R922	4822 116 52244	15K Ω ± 5% 1/6W
R923	4822 116 52175	100 Ω ± 5% 1/6W
R924	4822 116 52175	100 Ω ± 5% 1/6W
R925	4822 116 52211	150 Ω ± 5% 1/6W
R926	4822 116 52211	150 Ω ± 5% 1/6W
R931	4822 116 52233	10K Ω ± 5% 1/6W
R932	4822 116 52233	10K Ω ± 5% 1/6W
		PR16-SEMICONDUCTORS
QN23	4822 130 43819	TRANSISTOR, 2SC2878 (A, BRANK)
QN24	4822 130 43819	TRANSISTOR, 2SC2878 (A, BRANK)
Q902	4822 209 83654	IC NJM4556D
		PR16-MISCELLANEOUS
J900	4822 267 31126	JACK, HEAD PHONE (BLACK)
		PV16-SERVO CIRCUIT BOARD
		PV16-CAPACITORS
C101	4822 126 11127	CERAMIC 470PF ± 10%
C102	4822 121 41857	FILM 0.01μF ± 5% 50V
C103	4822 122 40589	CERAMIC 0.047μF ± 20% 50V
C104	5322 121 42491	FILM 0.047μF ± 5% 50V
C105	4822 121 42726	FILM 4700PF ± 5% 50V
C106	4822 121 42668	FILM 0.47μF ± 5% 50V
C107	4822 121 42668	FILM 0.47μF ± 5% 50V
C108	4822 121 42771	FILM 2200PF ± 5% 50V
C109	4822 126 10408	CERAMIC 220PF ± 10%
C110	4822 124 41539	ELECT 47μF 16V
C111	4822 121 42666	FILM 0.22μF ± 5% 50V
C112	4822 122 33639	CERAMIC 1000PF ± 10%
C113	4822 122 40589	CERAMIC 0.047μF ± 20% 50V
C114	4822 122 40589	CERAMIC 0.047μF ± 20% 50
C115	4822 121 42698	FILM 0.1μF ± 5% 50V

REF. DESIG.	PART NO.	DESCRIPTION
C116	4822 121 42609	FILM 0.33μF ± 5% 50V
C117	4822 126 10408	CERAMIC 220PF ± 10% 50V
C118	4822 126 10364	CERAMIC 100PF ± 10% 50V
C121	4822 121 42609	FILM 0.33μF ± 5% 50V
C122	4822 121 42666	FILM 0.22μF ± 5% 50V
C123	4822 121 42666	FILM 0.22μF ± 5% 50V
C124	4822 121 42772	FILM 0.033μF ± 5% 50V
C125	4822 121 42772	FILM 0.033μF ± 5% 50V
C126	4822 124 41246	ELECT 47μF 16V
C127	5322 121 42491	FILM 0.047μF ± 5% 50V
C128	4822 122 40589	CERAMIC 0.047μF ± 20% 50V
C129	4822 121 42703	FILM 8200PF ± 5% 50V
C130	4822 121 42703	FILM 8200PF ± 5% 50V
C131	4822 122 33639	CERAMIC 1000PF ± 10% 50V
C132	4822 122 11558	CERAMIC 0.1μF ± 20% 50V
C133	4822 124 41539	ELECT 47μF 16V
C134	4822 124 41246	ELECT 47μF 16V
C135	4822 122 40589	CERAMIC 0.047μF ± 20% 50V
C136	4822 122 40589	CERAMIC 0.047μF ± 20% 50V
C137	4822 124 41539	ELECT 47μF 16V
C138	4822 121 42801	FILM 0.68 μF ± 5% 50V
C139	4822 122 11558	CERAMIC 0.1μF ± 20% 50V
C150	4822 124 41539	ELECT 47μF 16V
		PV-16-RESISTORS
RF05	4822 116 52257	22K Ω ± 5% 1/6W
RF36	4822 116 52257	22K Ω ± 5% 1/6W
R102	4822 116 52234	100K Ω ± 5% 1/6W
R103	4822 116 52257	22K Ω ± 5% 1/6W
R104	4822 116 52257	22K Ω ± 5% 1/6W
R105	4822 116 52245	150K Ω ± 5% 1/6W
R106	4822 111 41207	120K Ω ± 5% 1/4W
R107	4822 116 52289	5.6K Ω ± 5% 1/6W
R108	4822 116 52407	220 Ω ± 5% 1/4W
R109	4822 116 52231	12K Ω ± 5% 1/6W
R110	4822 116 52231	12K Ω ± 5% 1/6W
R111	4822 116 52204	1K Ω ± 5% 1/6W
R112	4822 116 52175	100 Ω ± 5% 1/6W
R113	4822 116 52186	22 Ω ± 5% 1/6W
R114	4822 116 52283	4.7K Ω ± 5% 1/6W
R115	4822 116 52175	100 Ω ± 5% 1/6W
R116	4822 111 41166	18 Ω ± 5% 1/4W
R117	4822 116 52336	12 Ω ± 5% 1/4W
R118	4822 116 52231	12K Ω ± 5% 1/6W
R119	4822 116 52257	22K Ω ± 5% 1/6W
R120	4822 116 52304	82K Ω ± 5% 1/6W
R123	4822 116 52258	220K Ω ± 5% 1/6W
R124	4822 116 52231	12K Ω ± 5% 1/6W
R125	4822 116 52258	220K Ω ± 5% 1/6W
R126	4822 116 52276	3.9K Ω ± 5% 1/6W
R127	4822 116 52207	1.2K Ω ± 5% 1/6W
R128	4822 116 52251	18K Ω ± 5% 1/6W
R129	4822 116 52249	1.8K Ω ± 5% 1/6W
R131	4822 116 52244	15K Ω ± 5% 1/6W
R132	4822 116 52284	47K Ω ± 5% 1/6W
R133	4822 116 52191	33 Ω ± 5% 1/6W
R134	4822 101 30707	2.2K Ω TRIMMING, LASER ADJ.
R136	4822 100 20539	22K Ω TRIMMING, FOC. ADJ.
R137	4822 116 52536	680K Ω ± 5% 1/4W
R138	4822 111 41222	27 Ω ± 5% 1/4W
R139	4822 116 52296	6.8K Ω ± 5% 1/6W
R140	4822 116 52296	6.8K Ω ± 5% 1/6W
R141	4822 116 53651	4.7 Ω ± 5% 1/6W
R142	4822 116 52291	56K Ω ± 5% 1/6W
R143	4822 116 52233	10K Ω ± 5% 1/6W
R144	4822 116 52245	150K Ω ± 5% 1/6W

REF. DESIG.	PART NO.	DESCRIPTION
		PV16-SEMICONDUCTORS
D132	4822 130 80272	ZENER DIODE, 04AZ7.5, ETC 7.5V
D133	4822 130 80272	ZENER DIODE, 04AZ7.5, ETC 7.5V
Q101	4822 209 30436	IC, HF TDA8808/T
Q102	4822 130 61441	TRANSISTOR, 2SD1862 (Q,R)
Q103	4822 209 30437	IC, RADIAL TDA8809/T
Q106	4822 209 62755	IC, POWER OP AMP TCA0372/DP2
▲Q108	4822 209 30442	IC NJM79L06A
▲Q109	4822 209 30441	IC NJM7805FA
		PV16-MISCELLANEOUS
J102	4822 267 50676	JACK, SUBCHASSIS CONNECTOR
SF01	4822 276 13163	PUSH SWITCH, TRAY DETECTER
		PY16-FRONT CIRCUIT BOARD
		PY16-CAPACITORS
CY01	4822 124 41539	ELECT 47 μ F 16V
CY02	4822 122 40588	CERAMIC 0.022 μ F \pm 20%
CY03	4822 126 10408	CERAMIC 220PF \pm 10%
CY06	4822 122 40588	CERAMIC 0.022 μ F \pm 20%
CY07	4822 124 22276	ELECT 47 μ F 50V
CY08	4822 126 11127	CERAMIC 470PF \pm 10%
CY21	4822 122 40588	CERAMIC 0.022 μ F \pm 20%
CY61	4822 122 40588	CERAMIC 0.022 μ F \pm 20%
CY62	4822 122 40589	CERAMIC 0.047 μ F \pm 20% 50V
CY63	4822 122 40589	CERAMIC 0.047 μ F \pm 20% 50V
		PY16-RESISTORS
RY01	4822 116 52284	47K Ω \pm 5% 1/6W
▲RY02	4822 111 90967	4.7 Ω \pm 5% 1/4W, FUSE
RY04	4822 116 52257	22K Ω \pm 5% 1/6W
RY05	4822 116 52257	22K Ω \pm 5% 1/6W
▲RY06	4822 111 90967	4.7 Ω \pm 5% 1/4W, FUSE
RY07		
}	4822 116 52243	1.5K Ω \pm 5% 1/6W
RY09		
RY10	4822 116 52283	4.7K Ω \pm 5% 1/6W
RY11	4822 116 52283	4.7K Ω \pm 5% 1/6W
RY12	4822 116 52284	47K Ω \pm 5% 1/6W
RY13	4822 116 52234	100K Ω \pm 5% 1/6W
RY21	4822 116 52413	2.7 Ω \pm 5% 1/4W
RY22	4822 116 52226	560 Ω \pm 5% 1/6W
RY23	4822 116 52413	2.7K Ω \pm 5% 1/4W
RY24	4822 116 52226	560 Ω \pm 5% 1/6W
RY25	4822 116 52413	2.7K Ω \pm 5% 1/4W
RY26	4822 116 52226	560 Ω \pm 5% 1/6W
RY27	4822 116 52413	2.7K Ω \pm 5% 1/4W
RY28	4822 116 52226	560 Ω \pm 5% 1/6W
RY29	4822 116 52413	2.7K Ω \pm 5% 1/4W
RY30	4822 116 52226	560 Ω \pm 5% 1/6W
RY81	4822 116 52416	330 Ω \pm 5% 1/4W
RY82	4822 116 52394	120 Ω \pm 5% 1/4W
RY84	4822 116 52425	470 Ω \pm 5% 1/4W
RY86	4822 116 52425	470 Ω \pm 5% 1/4W
		PY16-SEMICONDUCTORS
DY03	4822 130 33305	DIODE, 1SS176, 1SS176, ETC. 30V 0.1A
DY04		
}	4822 130 33948	ZENER DIODE, 04AZ5.6, ETC 5.6V
DY06		
DY07	4822 130 80272	ZENER DIODE, 04AZ7.5, ETC. 7.5V
DY08	4822 130 80272	ZENER DIODE, 04AZ7.5, ETC. 7.5V
DY09	4822 130 33305	DIODE, 1SS176, ETC, 30V 0.1A
DY11		
}	4822 130 33305	DIODE, 1SS176, ETC. 30V 0.1A
DY14		

REF. DESIG.	PART NO.	DESCRIPTION
DY81	4822 130 80325	L.E.D. YELLOW LT 3H8B
DY82	4822 130 80327	L.E.D. GREEN LT3G8B
DY84	4822 130 80327	L.E.D. GREEN LT3G8B
DY86	4822 130 80327	L.E.D. GREEN LT3G8B
QY01	4822 209 30434	IC, DISPLAY DRIV. U3090MG
QY02	4822 209 30443	IC, 4BIT D LATCH 74HC75AP
QY03	4822 130 61189	DIGITAL TRANSISTOR, DTC114TS
QY81		
}	4822 130 61189	DIGITAL TRANSISTOR, DTC114TS
QY83		
QY85	4822 130 61189	DIGITAL TRANSISTOR, DTC114TS
		PY16-MISCELLANEOUS
SY01	4822 276 20508	PUSH SWITCH 2
SY02	4822 276 20508	PUSH SWITCH PROGRAM
SY03	4822 206 20508	PUSH SWITCH 1
SY04	4822 276 20508	PUSH SWITCH RECALL
SY05	4822 276 20508	PUSH SWITCH OPEN/CLOSE
SY06	4822 276 20508	PUSH SWITCH D.MODE
SY07	4822 276 20508	PUSH SWITCH 3
SY08	4822 276 20508	PUSH SWITCH FTS
SY09	4822 276 20508	PUSH SWITCH 9
SY10	4822 276 20508	PUSH SWITCH MEMO
SY11	4822 276 20508	PUSH SWITCH 8
SY12	4822 276 20508	PUSH SWITCH 0
SY13	4822 276 20508	PUSH SWITCH 5
SY14	4822 276 20508	PUSH SWITCH 4
SY15	4822 276 20508	PUSH SWITCH 6
SY16	4822 276 20508	PUSH SWITCH 7
SY17	4822 276 20508	PUSH SWITCH REPEAT
SY18	4822 276 20508	PUSH SWITCH STOP
SY21	4822 276 20508	PUSH SWITCH PAUSE
SY22	4822 276 20508	PUSH SWITCH PLAY
SY23	4822 276 20508	PUSH SWITCH NEXT
SY24	4822 276 20508	PUSH SWITCH CANCEL
SY25	4822 276 20508	PUSH SWITCH RANDOM
SY26	4822 276 20508	PUSH SWITCH PREV
VY01	4822 130 91032	DISPLAY UNIT VFT FV364G
ZY01	4822 130 82393	PHOTO UNIT, IR-SENSER GP1U720R

NOTE ON SAFETY :

Symbol ▲ Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symble ▲. Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.