SPECIFICATIONS

[Format]

System	Minidisc digital audio system
Laser	Semiconductor laser
Recording method	Field modulation overwrite method
Audio compression	ATRAC (Adaptive TRansform Acoustic Coding)
Playing rotation	Approx. 400 rpm ~ 900 rpm (CLV)

[D/A conversion]

D/A conversion	1 Bit
Oversampling	8 fs (352.8 kHz)

[A/D converter]

A/D converter	5 th order sigma-delta conversion + D.R.I.V.E conversion
Sampling frequency	44.1 kHz

[Digital audio performance]

Frequency response (playback mode)	8 Hz ~ 20 kHz, ±1 dB
Signal to noise ratio (playback mode)	More than 105dB
Dynamic range (playback mode)	More than 92dB
Total harmonic distortion (1 kHz, playback mode)	Less than 0.007 %
Wow & flatter	Less than unmeasurable limit
Analog input sensitivity / input impedance	500 mV / 22 kΩ or more
Analog output level / output impedance	2.0 V / Less than 600 Ω
Headphone output	20 mW / 32 Ω load
Digital input	
Coaxial	0.5 Vp-p / 75 Ω
Optical(Wave length 660 nm)	-15 dBm ~ -21 dBm
Digital output	
Coaxial	0.5 Vp-p / 75 Ω
Optical(Wave length 660 nm)	-15 dBm ~ -21 dBm

[General]

Power consumption	25 W
Dimensions	W : 440 mm (17 - 5 / 16") H : 94 mm (3 - 11 / 16") D : 373 mm (14 - 11 / 16")
Weight (Net)	5.0 kg (11.0lb)

1. KENWOOD follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.
2. Sufficient performance may not be possible at very low temperatures(0 ℃ or less).

Note:
Component and circuity are subject to modification to insure best operation under differing local conditions. This manual is based on Europe (E) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.

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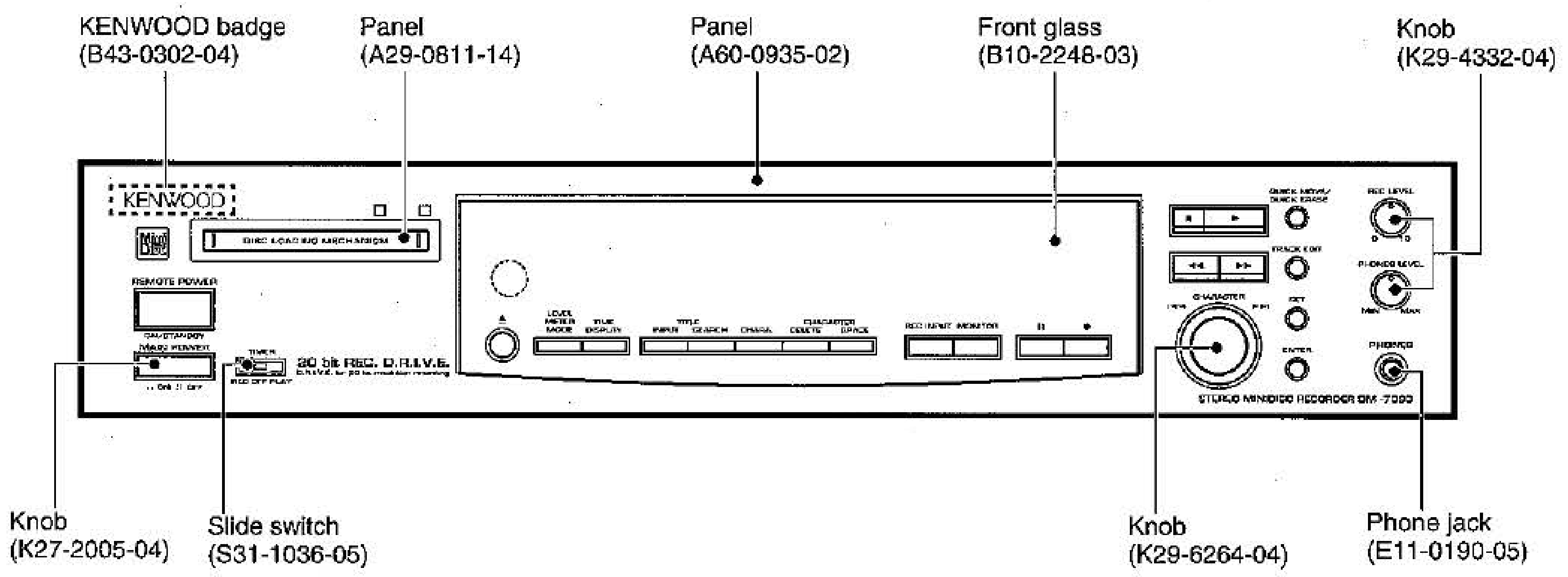
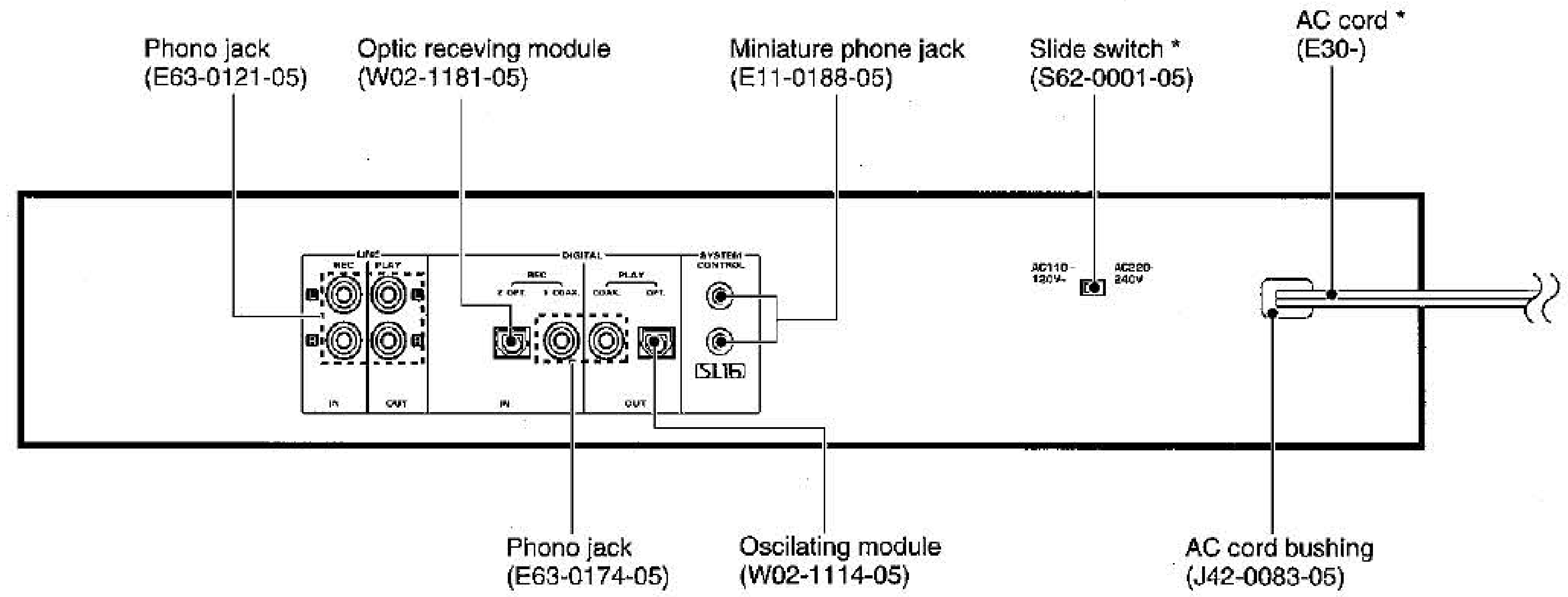
STEREO MINIDISC RECORDER

DM-7090

SERVICE MANUAL

KENWOOD


KENWOOD badge
(B43-0302-04)
Panel
(A29-0811-14)
Panel
(A60-0935-02)
Front glass
(B10-2246-03)
Knob
(K29-4332-04)
KENWOOD
Knob
(K27-2005-04)
Slide switch
(S31-1036-05)
Knob
(K29-6264-04)
Phone jack
(E11-0190-05)


Phono jack
(E63-0121-05)
Optic receving module
(W02-1181-05)
Miniature phone jack
(E11-0188-05)
Slide switch *
(S62-0001-05)
AC cord *
(E30-)
Phono jack
(E63-0174-05)
Oscilating module
(W02-1114-05)
AC cord bushing
(J42-0083-05)

*** Refer to parts list on page 42.**

In compliance with Federal Regulations, following are reproductions of labels on, or inside the product relating to laser product safety.

KENWOOD-Corp. certifies this equipment conforms to DHHS Regulations No. 21 CFR 1040. 10, Chapter 1, Subchapter J.

DANGER : Laser radiation when open and interlock defeated. AVOID DIRECT EXPOSURE TO BEAM.

CONTENTS / ACCESSORIES / CAUTIONS

Contents

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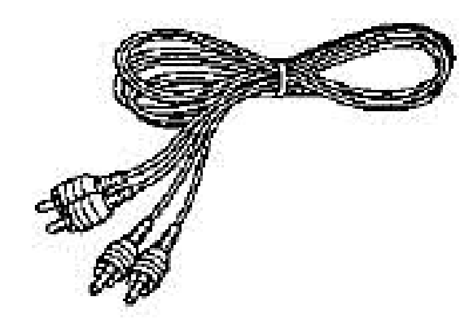
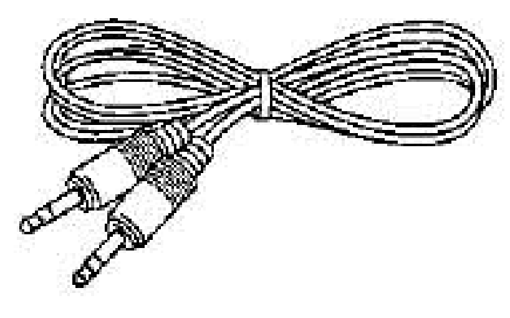
WIRING DAIGRAM 14
PC BOARD 16
SCHEMATIC DIAGRAM 23
EXPLODED VIEW 39
PARTS LIST 42
SPECIFICATIONS ....Back cover

Accessories

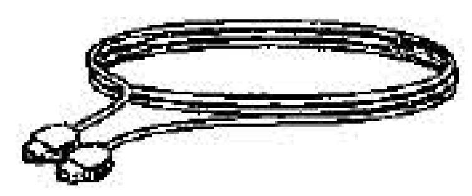
Audio cord (2)
(E30-0505-05)



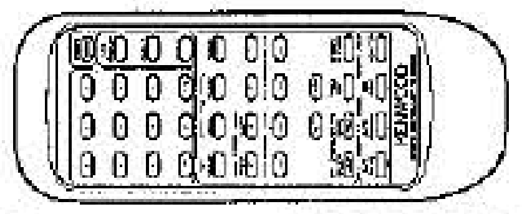
System control cord (1)
(E30-2733-05)



Optical fiber cable (1)
(B19-1529-05)

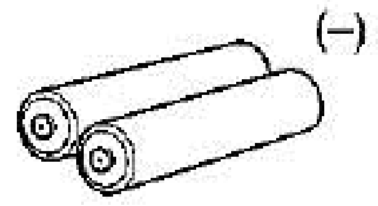


Remote control unit (1)
(A70-1075-05 : RC-M0500)

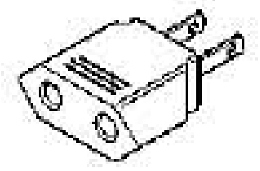


Battery cover (A09-0362-08)

Batteries (2)



AC plug adaptor (1)
(E03-0115-05)



- Use to adapt the plug on the power cord to the shape of the wall outlet. (Accessory only for regions where use is necessary.)

Cautions

Beware of condensation
When water vapor comes into contact with the surface of cold material, water drops are produced.
If condensation occurs, correct operation may not be possible, or the unit may not function correctly.
This is not a malfunction, however, and the unit should be dried. (To do this, turn the POWER switch ON and leave the unit for several hours.)

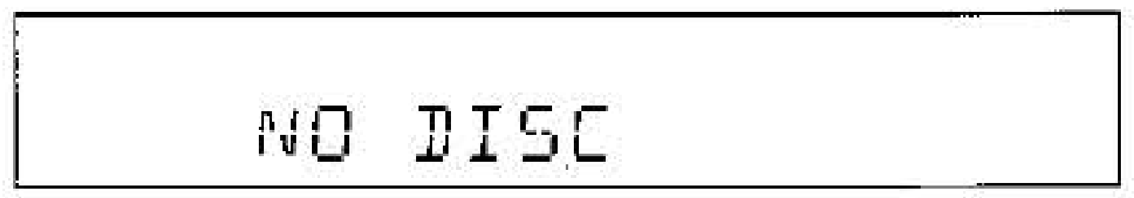
Be especially careful in the following conditions:

- When the unit is brought from a cold place to a warm place, and there is a large temperature difference.
- When a heater starts operating.
- When the unit is brought from an air-conditioned place to a place of high temperature with high humidity.
- When there is a large difference between the internal temperature of the unit and the ambient temperature, or in conditions where condensation occurs easily.

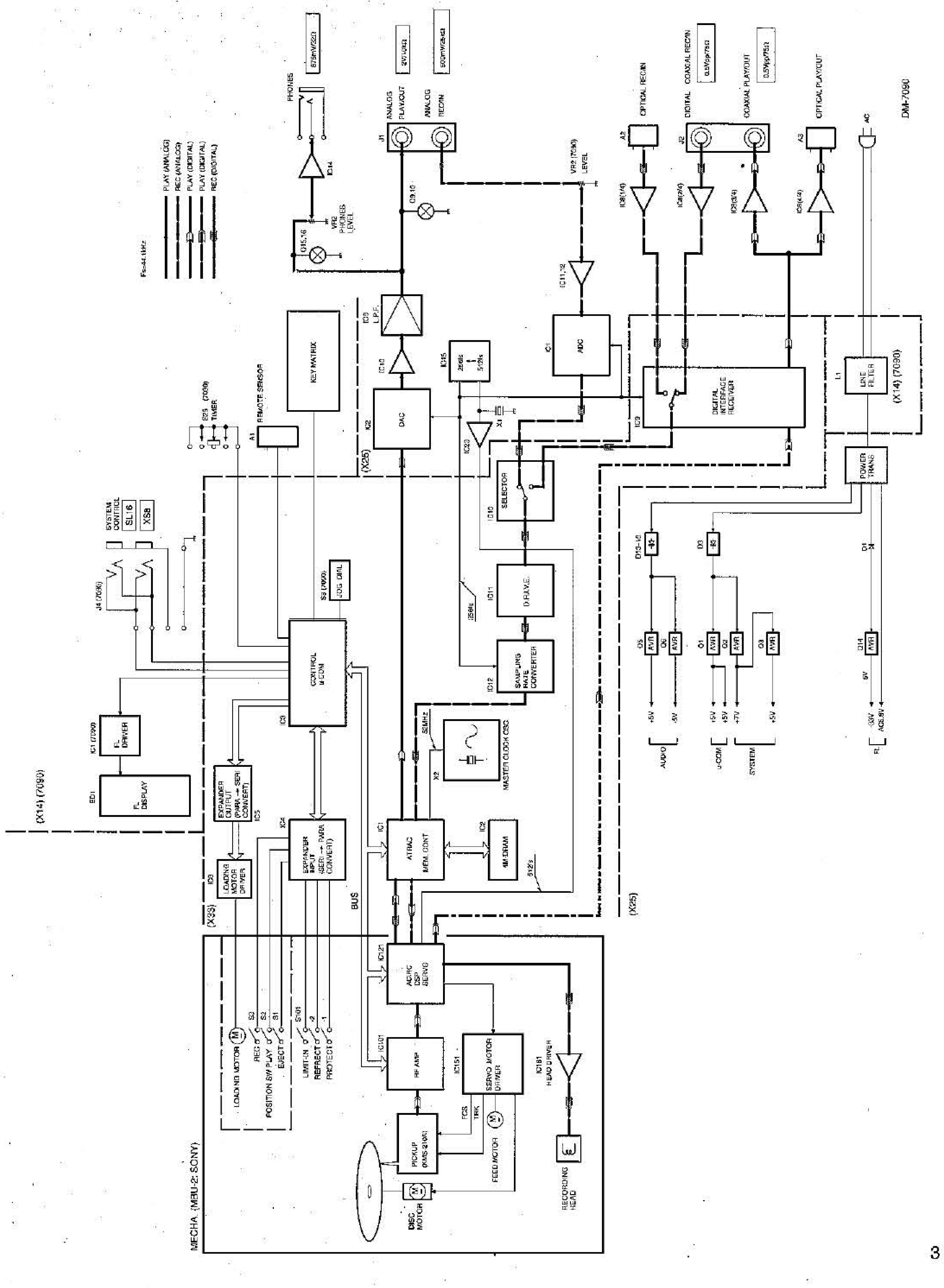
Note related to transportation and movement

Before transporting or moving this unit, carry out the following operations.

1. Make sure that the Mini Disc is not loaded in the unit, press the MAIN POWER key to OFF and press the REMOTE POWER key to ON.
   - Check that no disc is present in the unit.
2. Wait a few seconds and verify that the display shown appears.
3. Press the REMOTE POWER key to off(STANDBY), then Press the MAIN POWER key to OFF.



BLOCK DIAGRAM


DM-7090
PHONES
ANALOG PLAYOUT
ANALOG RECIN
OPTICAL RECIN
DIGITAL COAXIAL RECIN
COAXIAL PLAYOUT
OPTICAL PLAYOUT
AC
KEY MATRIX
REMOTE SENSOR
TIMER
LPF
DAC
ADC
DIGITAL INTERFACE RECEIVER
LINE FILTER
POWER TRANS
SELECTOR
D.F.V.E.
SAMPLING RATE CONVERTER
MASTER CLOCK OSC
CONTROL µCOM
FL DRIVER
FL DISPLAY
EXPANDER OUTPUT
EXPANDER INPUT
LOADING MOTOR DRIVER
ATRAC MEM CONT
4M SRAM
BUS
ADRC DSP SERVO
RF AMP
SERVO MOTOR DRIVER
HEAD DRIVER
RECORDING HEAD
PICKUP
DISC MOTOR
FEED MOTOR
LOADING MOTOR
MECHA (MDU-2: SONY)
AUDIO
µ-COM
SYSTEM
(X14) (7090)
(X25)
(X33)

1. Test mode

1-1. Setting the test mode

Connect a plug of AC power cord to an outlet of AC, while pressing POWER key.

1-2. Canceling the test mode

Unplug the AC power cord.
Connect a plug of AC power cord to an outlet of AC, while pressing EJECT key.

1-3. Basic operation in test mode

All operations are performed using the Rotary encoder, ENTER key, and TRACK EDIT key. The functions of each key are shown in the table below.

Function	Description
Rotary encoder	Changes the parameter and mode.
ENTER key	Proceeds for definition.
TRACK EDIT key	Returns for interrupt.

1-4. Selection of test mode

Eight test modes are selected by turning the Rotary encoder.

Display	Description	Section
TMP ADJUST	The work of adjustment is unnecessary in this mode	–
LDPWR ADJUST	Laser power adjustment	2-5
EFBAL ADJUST	Traverse adjustment	2-6
FBIAS ADJUST	Focus bias adjustment	2-7
FBIAS CHECK	The work of adjustment is unnecessary in this mode	–
CPLAY MODE	Continuous playback mode	1-4-1
CREC MODE	Continuous recording mode	1-4-2
EEP MODE	Nonvolatile memory mode *	1-4-3

For more information on each adjustment mode, refer to each section of 2, "Electrical adjustment".
If other adjustment mode has been entered incorrectly, press the TRACK EDIT key to exit the mode.
*The EEP mode is not used for service. If this EEP mode has been entered incorrectly, press the TRACK EDIT key immediately to exit the mode.

1-4-1. Operation in continuous playback mode

1. Entering the continuous playback mode
(1) Insert a recordable disc or compact disc (CD) into the unit.
(2) Turn the Rotary encoder to display "CPLAY MODE".
(3) Press the ENTER key. The display then changes from "CPLAY MODE" to "CPLAY IN".
(4) After the access operation is completed, the display changes from "CPLAY IN" to "CPLAY(####)".

2. Change the playback point.
(1) Press the ENTER key during continuous playback. The display then changes to "CPLAY MID" and "CPLAY OUT".
(2) After the access operation is completed, the display changes from "CPLAY MID" and "CPLAY OUT" to "CPLAY(####)".

3. Terminating the continuous playback mode
(1) Press the TRACK EDIT key. The display then changes to "CPLAY MODE".
(2) Press the EJECT key to take out the disc.

Note : The playback start addresses of IN, MID, and OUT are described below.

IN	40H cluster
MID	300H cluster
OUT	700H cluster

1-4-2. Operation in continuous recording mode

1. Entering the continuous recording mode
(1) Insert a recordable disc into the unit.
(2) Turn the Rotary encoder to display "CREC MODE".
(3) Press the ENTER key. The display then changes from "CREC MODE" to "CREC IN".
(4) Select "CREC-IN" "CREC-MID" "CREC-OUT" by pressing SET key. Press ENTER key after this selection work.
(5) After the access operation is completed, the display changes from "CREC IN" to "CREC(####)". The REC display then lights.

2. Terminating the continuous recording mode
(1) Press the TRACK EDIT key. The display then changes to "CREC MODE" and the REC display goes off.
(2) Press the EJECT key to take out the disc.

Notes :
1. The recording start addresses of IN, MID, and OUT are described below.

IN	40H cluster
MID	300H cluster
OUT	700H cluster

2. The TRACK EDIT key can be pressed at any time to stop the recording.
3. An erasure prevention control is not detected in the test mode. Be careful not to enter the continuous recording mode using a disc containing the data that should not be erased.
4. Do not record continuously for more than five minutes.
5. Take care that no vibration is applied during continuous recording.

1-4-3. Nonvolatile memory mode

The nonvolatile memory mode is used to read or write the contents of nonvolatile memory. This mode is not used for service. If this mode has been entered incorrectly, press the TRACK EDIT key immediately to exit this mode.

Note : The "#" display on the screen indicates an arbitrary figure.

1-5. Other key functions

Function	Description
►/II	Plays back continuously when this key is pressed during stop. Turns on and off the tracking servo when it is pressed during continuous playback.
MONITOR	Selects the spindle servo mode. (CLV-S and CLV-A)
DISPLAY MODE	Selects the contents of the display every time this key is pressed.

Note : An erasure prevention control is not detected in the test mode. Notice that recording is performed irrespective of the erasure prevention control position when the REC key is pressed.

1-6. Display in test mode

The display is selected in the order of MODE display, error rate display, and address display every time the DISPLAY MODE key is pressed.

1. MODE display
"TMP ADJUST" and "CPLAY MODE" are displayed as the MODE display.

2. Address display
The address display appears as described below.
h = #### a = #### (Recordable groove and pre-mastered disc)
h = Header address, a = ADIP address (Pre-mastered : a=0000)
* When no address can be read, "–" display appears.

3. Error rate display
The error rate display appears as described below.
C1 = #### AD = ####
C1 = C1 error, AD = ADER

1-7. Other displays

Display	Description	
	Lights	Goes off
►	Continuous playback	Stop
II	Tracking servo OFF	Tracking servo ON
PGM	CVL LOCK	CLV UNLOCK
P.C.	Low reflection	High reflection
TOTAL	CLV-S	CLV-A

1-8. Precaution on use of test mode

※ An erasure prevention control is not detected in the test mode. Therefore, when the recording laser power mode such as continuous recording mode and traverse adjustment mode is entered, the contents of the existing recording are erased irrespective of the control position. Be careful not to enter the continuous recording mode and traverse adjustment mode when using a disc, containing the data that should not be erased, in the test mode.

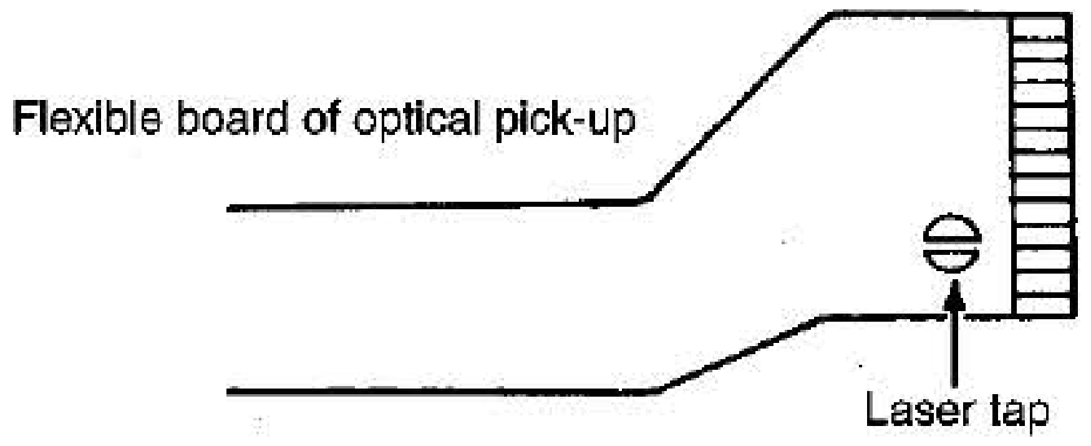
2. Electrical adjustment

2-1. Precaution during confirmation of Laser Diode emission

During adjustment, do not view the emission of a laser diode from just above for confirmation. This may damage your eyes.

2-2. Precaution on handling of Optical pick-up (KMS-210A)

The laser diode in an optical pick-up is easy to be subject to electrostatic destruction. Therefore, solder-bridge the laser tap on the flexible board when handling the optical pick-up. When removing the flexible board from the connector, make a solder bridge in advance, then remove the board. Be careful not to remove the solder bridge before inserting the connector. Moreover, take careful measures against electrostatic destruction. The flexible board is cut easily. Handle the flexible board with care.



2-3. Precaution during adjustment

1)Perform the adjustment and confirmation marked with "O" in the order shown in the table when the parts below are replaced.

	Optical pick-up	BD board		
		IC171	D101	IC101,IC121,IC191
1. Laser power adjustment	O	X	X	O
2. Traverse adjustment	O	O	X	O
3. Error rate confirmation	O	O	X	O

2)In the test mode, perform the adjustment. After adjustment is completed, cancel the test mode.
3)Perform the adjustment in the order described.
4)Use the following tools and measurement equipment.
- CD test disc TDYS-1
- Laser power meter
- Oscilloscope (with bandwidth of more than 40 MΩ) (Calibrate the probe before measurement.)
- Digital voltmeter
- Thermometer

5)Take care that VC and GND (ground) are not connected on the oscilloscope when two or more signals are monitored on the oscilloscope. (VC and GND are short-circuited in this case.)
6)Do not move VR105 on the BD board. If VR105 is replaced, set new VR105 to the mechanical center position of a semi-fixed resistor.

Note : The "#" display on the screen indicates an arbitrary figure.

CIRCUIT DESCRIPTION

2-4. Creating the recordable continuous recording disc

This disc is used for focus bias adjustment and error rate confirmation. How to create the recordable continuous recording disc is described below.

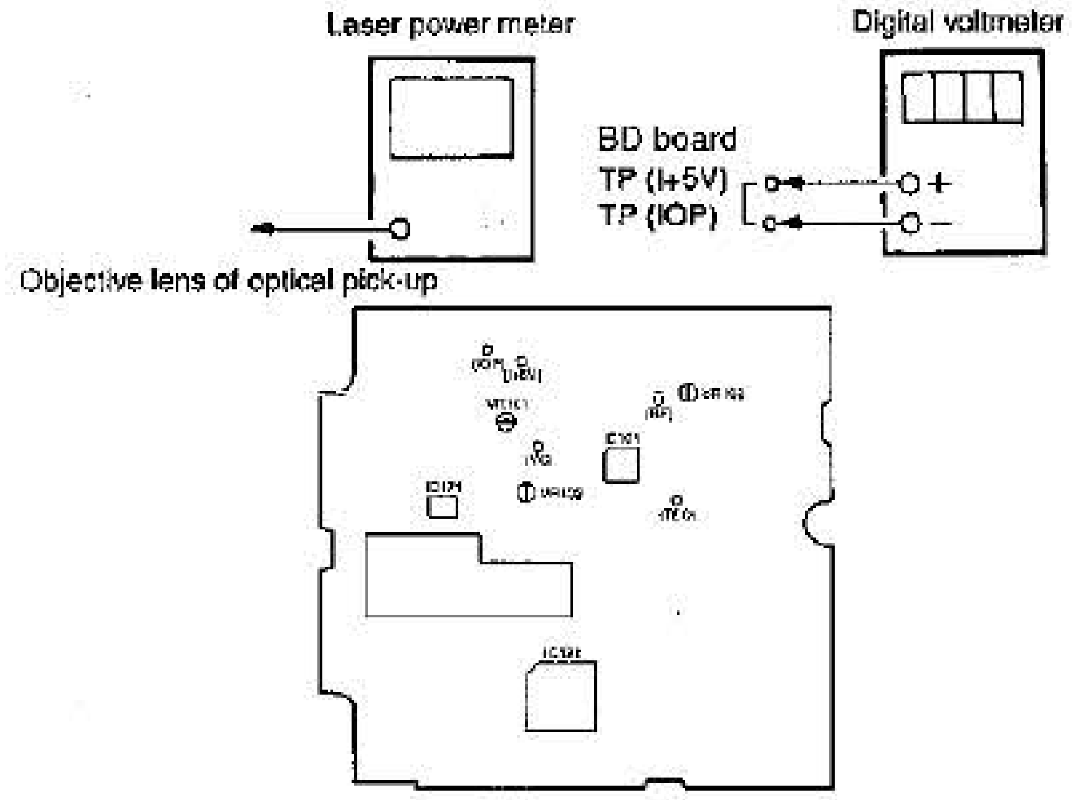
1. Insert a commercial recordable disc (blank disc).
2. Turn the Rotary encoder to display "CREC MODE."
3. Press the ENTER key to display "CREC IN".
4. A display indicates "CREC-MID" by pressing SET key. Next a display indicates "CREC(02FF)" by pressing ENTER key and recording begins.
5. Terminate the recording within five minutes.
6. Press the TRACK EDIT key to stop the recording.
7. Press the EJECT key to take out the recordable disc.

As a result, a continuously recorded disc can be created for focus bias adjustment and error rate confirmation.

Note : Take care that no vibration is applied during continuous recording.

2-5. Laser power adjustment

Connection :



Adjustment :

1. Put the laser power meter on the objective lens of the optical pick-up. Connect the digital voltmeter to TP(IOP) and TP(I+5V).
2. Turn the Rotary encoder to display "LDPWR ADJUST". (Laser power : For adjustment use)
3. Press the ENTER key two times to display "LD$4B=3.5mW".
4. Adjust VR102 on the BD board so that the laser power meter reads 3.4 mW.
5. Press the ENTER key to display "LD$96=7.0mW". (Laser power : MO write)
6. Confirm that the laser power meter and digital voltmeter at that time read the specified value.

Specification :
Reading of laser power meter : 7.0 ±0.3 mW
Reading of digital voltmeter : Optical pick-up indication value ±10%

(Optical pick-up label)

KMS210A
27X40
B0825

In this case, Iop = 82.5 mA
Iop(mA) = Reading of digital voltmeter (mV)/1(Ω)

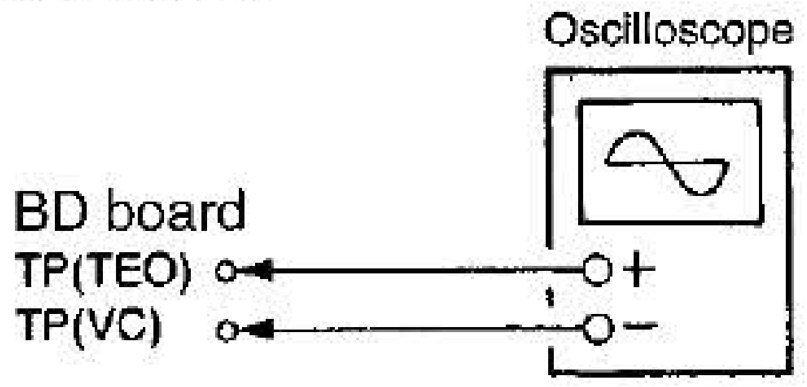
7. Press the ENTER key to display "LD$0F=0.7mW". (Laser power = MO read)
8. Confirm that the laser power meter at that time reads the specified value.

Specification :
Reading of laser power : 0.70 ±0.1 mW

9. Press the key to display "LDPWR ADJUST" and stop the laser emission. (The ERASE key can be pressed at any time to stop the laser emission.)

2-6. Traverse Adjustment

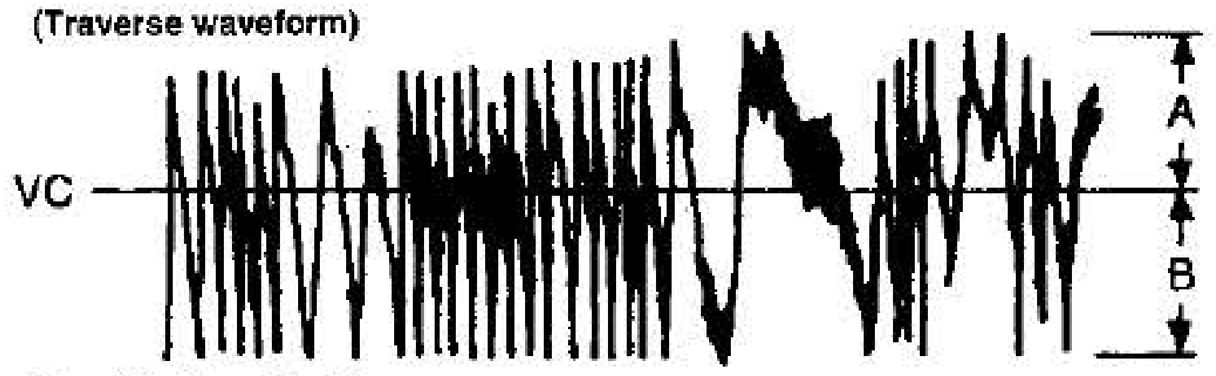
Connection :



Adjustment :

1. Connect the oscilloscope to TP(TEO) and TP(VC) on the BD board.
2. Insert a commercial recordable disk.
3. Turn the Rotary encoder to display "EFBAL ADJUST".
4. Press the ENTER key to display "EFBAL MO-W". At this time, optical pick-up moves to 0100h cluster. (Laser power WRITE power, focus servo ON, tracking servo OFF, and spindle(S) servo ON)
5. Adjust VR101 on the BD board so that the waveform on the oscilloscope satisfies the specified value. (MO groove write power traverse adjustment)

(Traverse waveform)



Specification : A = B

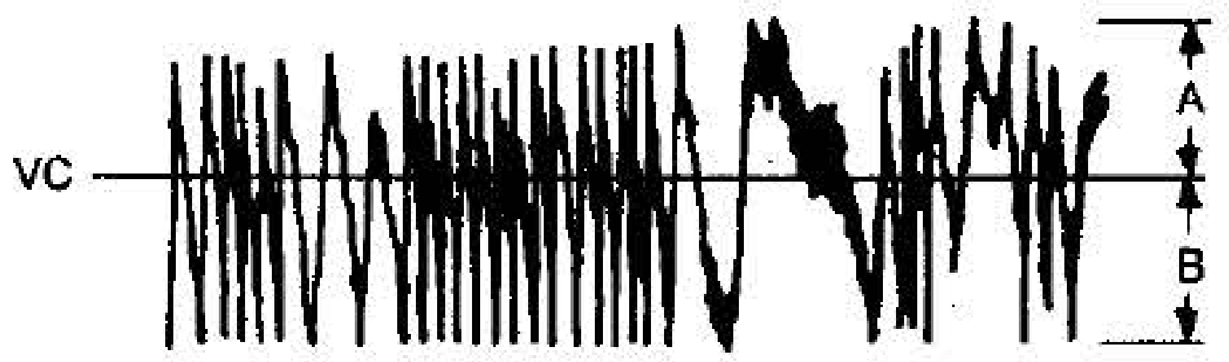
6. Enter the ENTER key to display "EFB=$#MO-R". (The display may require much time for its change or may not change. However, proceed to the next adjustment because adjustment is possible.) (Laser power : MO read)

Note :
1. The "#" display on the screen indicates an arbitrary figure.
2. "VR###" printed on Schematic diagram and Parts list, through "RV###" printed on PCB.

CIRCUIT DESCRIPTION

7. Turn the Rotary encoder so that the waveform on the oscilloscope satisfies the specified value. (When the Rotary encoder is turned, the #-marked figure in "EFB=$#" changes and the waveform also changes.) During this adjustment, the oscilloscope changes in units of about 3%. Adjust so that the waveform comes nearest to the specified value. (MO groove read power traverse adjustment)

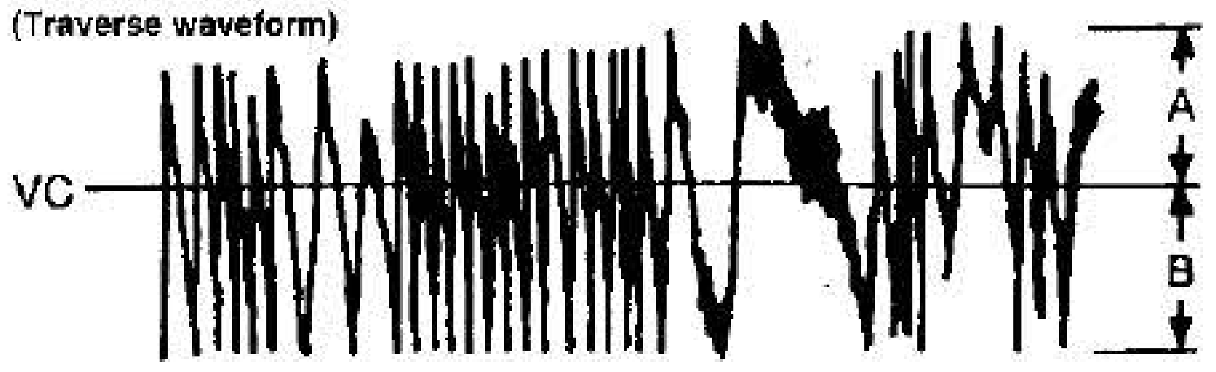
(Traverse waveform)



Specification : A = B

8. Press the ENTER key to display "EFB=$#SAVE" momentarily and save the adjustment result in non-volatile memory. After that, "EFBAL MO-P" is displayed. After save, a pick-up moves automatically to pit block area.
9. Press the ENTER key to display "EFB=$#MO-P". The optical pick-up automatically moves to the area of the pit block to establish a servo. (The display may require much time for its change or may not change. However, proceed to the next adjustment because adjustment is possible.)
10. Turn the Rotary encoder so that the waveform on the oscilloscope comes near to the specified value. During this adjustment, the waveform changes in units of about 3%. Adjust so that the waveform comes nearest to the specified value.

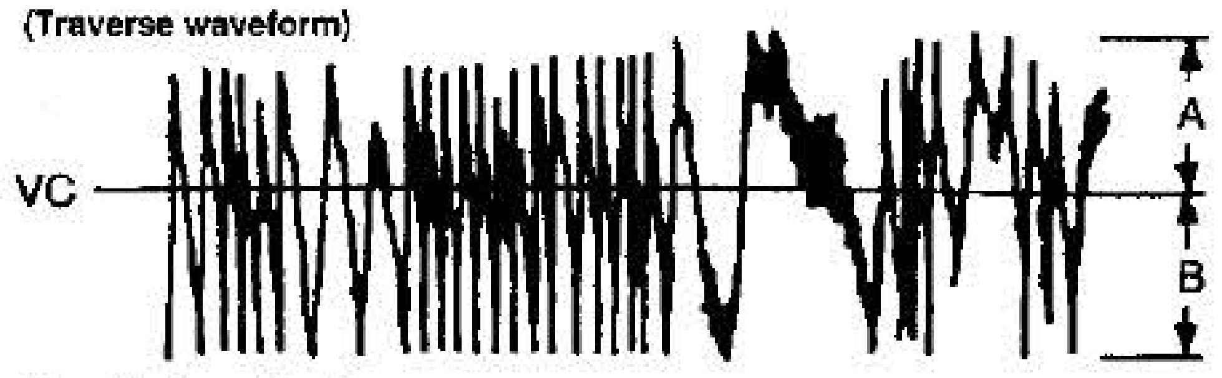
(Traverse waveform)



Specification : A = B

11. Press the ENTER key to display "EFB=$#SAVE" momentarily and save the adjustment result in non-volatile memory. After that, "EFBAL CD" is displayed. The disc rotation stops automatically.
12. Press the EJECT key to take out a recordable disc.
13. Insert test disc TDYS-1.
14. Press the ENTER key to display "EFB=$#CD". A servo is established automatically.
15. Turn the Rotary encoder so that the waveform on the oscilloscope comes near to the specified value. During this adjustment, the waveform changes in units of about 3%. Adjust so that the waveform comes nearest to the specified value.

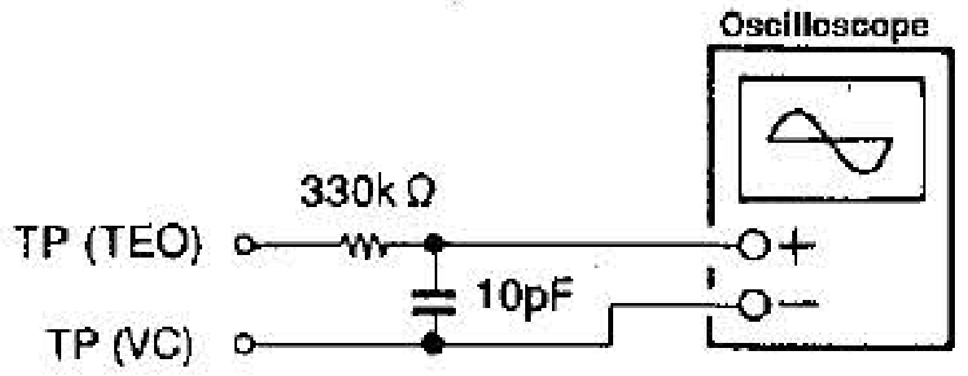
(Traverse waveform)



Specification : A = B

16. Press the ENTER key to display "EFB=$#SAVE" momentarily and save the adjustment result in non-volatile memory. After that, "EFBAL ADJUST" is displayed.
17. Press the EJECT key to take out test disc TDYS-1.

Notes :
1. Data is erased during MO write when a recorded disc is used for this adjustment.
2. If the traverse waveform is difficult to be monitored, connect an oscilloscope as shown in the figure below.



2-7. Focus bias adjustment

Connection :

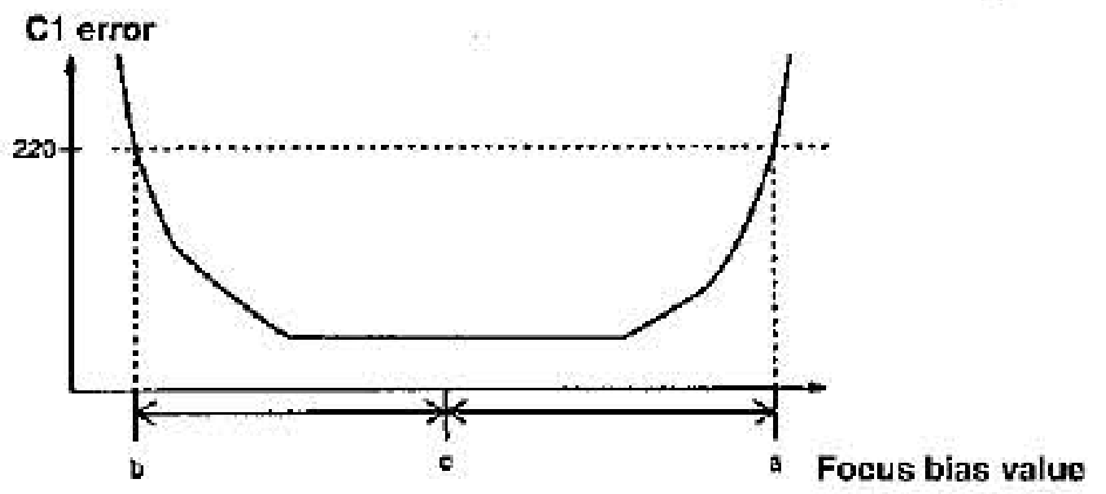
1. Insert a continuously recorded disc (refer to 2-4, "Creating the recordable continuous recording disc").
2. Turn the Rotary encoder to display "CPLAY MODE".
3. When the access of "CPLAY IN" presses ENTER key once again after completion, a display indicates "CPLAY MID".
4. Press the DISPLAY MODE key two times. Press the TRACK EDIT key when "CPLAY(030#) is displayed.
5. Turn the Rotary encoder to display "FBIAS ADJUST".
6. Press the ENTER key to display "####/##a=##". The first four-digit figure indicates the C1 error rate, the two-digit figure after "/" indicates ADER, and the two-digit figure after "a=" indicates the focus bias value.
7. Turn the Rotary encoder clockwise and detect the focus bias value in which the C1 error rate becomes 220.
8. Press the ENTER key to display "####/##b=##".
9. Turn the Rotary encoder counterclockwise and detect the focus bias value in which the C1 error rate becomes 220.
10. Press the ENTER key to display "####/##c=##".
11. Confirm that the C1 error rate at that time is less than 50 and that ADER is 00, then press the ENTER key.
12. If the value indicated by "(##)" in the "##-##-##(##)" display is more than 20, press the ENTER key. If it is less than 20, press the TRACK EDIT key and readjust steps 2 and later.
13. Press the EJECT key to take out a continuous recording disc.

Note :
1. The "#" display on the screen indicates an arbitrary figure.
2. "VR###" printed on Schematic diagram and Parts list, through "RV###" printed on PCB.

CIRCUIT DESCRIPTION

Notes :

1. The relation between the C1 error and focus bias value is shown in the figure below. Points "a" and "b" in the figure are detected by the above adjustment. Focal position "C" is automatically obtained from points "a" and "b" by calculation.
2. The C1 error rate fluctuates. Therefore, perform the adjustment according to the observed mean value.



2-8. Error rate confirmation

2-8-1. CD error rate confirmation

Confirmation :

1. Insert test disc TDYS-1.
2. Turn the Rotary encoder to display "CPLAY MODE".
3. Press ENTER key once again when the access of "CPLAY IN" finished.
4. "C1=####AD=##" is displayed.
5. Confirm that the C1 error rate is less than 20.
6. Press the TRACK EDIT key to stop the playback, then press the EJECT key to take out a test disc.

2-8-2. MO error rate confirmation

Confirmation :

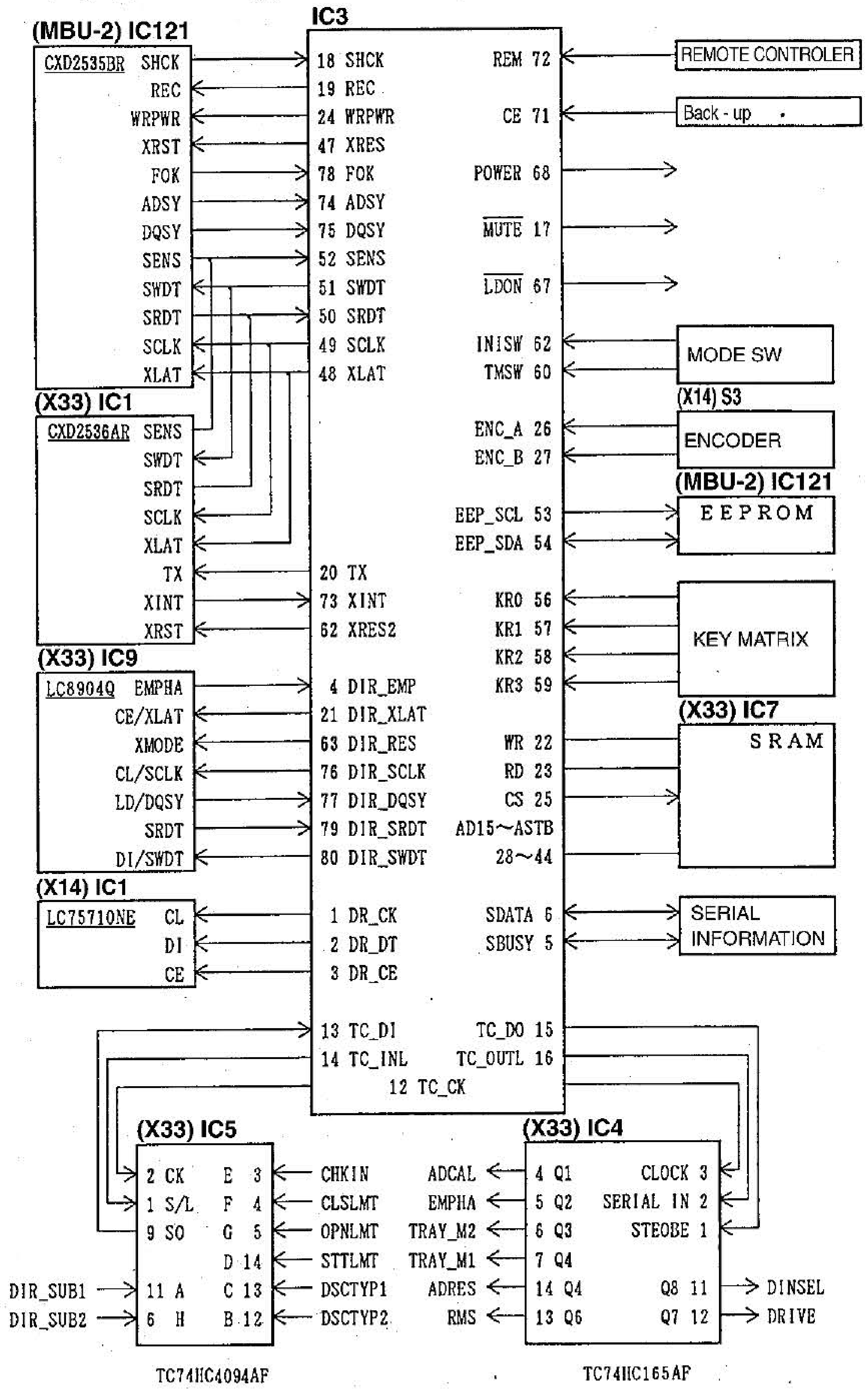
1. Insert a continuously recorded disc (refer to 2-4, "Creating the recordable continuous recording disc").
2. Turn the Rotary encoder to display "CPLAY MODE".
3. When the access of "CPLAY IN" presses ENTER key once again after completion, a display indicates "CPLAY MID".
4. "C1=####AD=##" is displayed.
5. Confirm that the C1 error rate is less than 50 and that ADER is 00.
6. Press the TRACK EDIT key to stop the playback, then press the EJECT key to take out a continuous recording disc.

Note : The "#" display on the screen indicates an arbitrary figure.

CIRCUIT DESCRIPTION

3. Microprocessor : µPD784026GC 501 (X33 : IC3)

3-1. µ-COM Block diagram


IC3
(MBU-2) IC121
CXD2535BR
SHCK
REC
WRPWR
XRST
FOK
ADSY
DQSY
SENS
SWDT
SRDT
SCLK
XLAT
(X33) IC1
CXD2536AR
SENS
SWDT
SRDT
SCLK
XLAT
TX
XINT
XRST
(X33) IC9
LC8904Q
EMPHA
CE/XLAT
XMODE
CL/SCLK
LD/DQSY
SRDT
DI/SWDT
(X14) IC1
LC75710NE
CL
DI
CE
18 SHCK
19 REC
24 WRPWR
47 XRES
78 FOK
74 ADSY
75 DQSY
52 SENS
51 SWDT
50 SRDT
49 SCLK
48 XLAT
20 TX
73 XINT
62 XRES2
4 DIR_EMP
21 DIR_XLAT
63 DIR_RES
76 DIR_SCLK
77 DIR_DQSY
79 DIR_SRDT
80 DIR_SWDT
1 DR_CK
2 DR_DT
3 DR_CE
13 TC_DI
14 TC_INL
12 TC_CK
TC_DO 15
TC_OUTL 16
REM 72
CE 71
POWER 68
MUTE 17
LDON 67
INISW 62
TMSW 60
ENC_A 26
ENC_B 27
EEP_SCL 53
EEP_SDA 54
KR0 56
KR1 57
KR2 58
KR3 59
WR 22
RD 23
CS 25
AD15~ASTB
28~44
SDATA 6
SBUSY 5
REMOTE CONTROLER
Back - up
MODE SW
(X14) S3
ENCODER
(MBU-2) IC121
EEPROM
KEY MATRIX
(X33) IC7
SRAM
SERIAL INFORMATION
(X33) IC5
2 CK
1 S/L
9 SO
11 A
6 H
E 3
F 4
G 5
D 14
C 13
B 12
CHKIN
CLSLMT
OPNLMT
STTLMT
DSCTYP1
DSCTYP2
DIR_SUB1
DIR_SUB2
TC74HC4094AF
(X33) IC4
ADCAL
EMPHA
TRAY_M2
TRAY_M1
ADRES
RMS
4 Q1
5 Q2
6 Q3
7 Q4
14 Q4
13 Q6
CLOCK 3
SERIAL IN 2
STEOBE 1
Q8 11
Q7 12
DINSEL
DRIVE
TC74HC165AF

CIRCUIT DESCRIPTION

3-2. Pin description

PIN No.	Name	I/O	Description		
			Function name	Active	
1	DR_CK	O	FL driver clock		P. DOWN(GND)
2	DR_DT	O	FL driver data		P. DOWN(GND)
3	DR_CE	O	FL driver CE		P. DOWN(GND)
4	DIR_EMP	I	DIR_IC emphasis	H: EMPHASIS ON L: EMPHASIS OFF	P.DOWN(GND)
5	SBUSY	I/O	16bit_ serial BUSY		
6	SDATA	I/O	16bit_serial DATA		
7	RESET		u-COM reset		reset
8	Vdd		u-COM power supply		Vdd
9	X2		u-COM oscillation		Xout
10	X1		u-COM oscillation		Xin
11	Vss		u-COM power supply (GND)		GND
12	TC_CK	O	Expansion I/O clock		—
13	TC_DI	I	Expansion IN data		—
14	TC_INL	O	Expansion IN latch		P. DOWN(GND)
15	TC_DO	O	Expansion OUT data		—
16	TC_OUTL	O	Expansion OUT latch		P. DOWN(GND)
17	MUTE	O	Analogue MUTE	H: MUTE OFF L: MUTE ON	P.DOWN(GND)
18	SHCK	I	TRACK JUMP detection	H: SHOCK OFF L: SHOCK ON	P. UP(+5V)
19	REC	O	REC control	H: REC L: PLAY	P. DOWN(GND)
20	TX	O	REC/MONITOR control	H: REC OUT ENABLE L: REC OUT DISABLE	P.DOWN(GND)
21	DIR_XLAT	O	DIR_XLAT latch		P.UP(+5V)
22	WR(SRAM)		SRAM control		—
23	RD(SRAM)		SRAM control		—
24	WRPWR	O	Laser power control	H: REC POWER L: PLAY POWER	P.DOWN(GND)
25	CS(SRAM)	O	SRAM control		P.UP(Vdd)
26	ENC_A	I	Encoder input		P.UP(+5V)
27	ENC_B	I	Encoder input		P.UP(+5V)
28~35	A15~A8(SRAM)		SRAM control		—
36~43	AD7~AD0(SRAM)		SRAM control		—
44	ASTB(SRAM)		SRAM control		—
45	VSS		µ-COM power supply (GND)		GND
46	TEST		µ-COM test terminal (GND)		GND
47	XRES	O	System IC reset	H: L: RESET	P.UP(+5V)
48	XLAT	O	System IC latch		P.UP(+5V)
49	SCLK	O	System IC clock		P.UP(+5V)
50	SRDT	I	System IC read data		P.UP(+5V)

CIRCUIT DESCRIPTION

PIN No.	Name	I/O	Description		
			Function name	Active	
51	SWDT	O	System IC white data		P.UP(+5V)
52	SENS	I	System IC SENS		P.DOWN(GND)
53	EEP_SCL	O	EEPROM clock		P.UP(+5V)
54	EBP_SDA	I/O	EEPROM data		P.UP(+5V)
55	Vdd		u-COM power supply		Vdd
56	KR0	I	Key return 0		ANALOG
57	KRI	I	Key return 1		ANALOG
58	KR2	I	Key return 2		ANALOG
59	KR3	I	Key return 3		ANALOG
60	TMSW	I	Timer SW(A/D)(PLY=2.5V/REC=5V)	0V: NONE/2.5V: PLAY 5V: REC	ANALOG
61	INISW	I	Model/type switch	0V: J_type 5V: elseJ_type	ANALOG
62	XRES2	O	System IC reset	H: L: RESET	P.UP(+5V)
63	DIR_RES	O	DIR_IC reset	H: L: RESET	P.UP(+5V)
64	AVdd		A/D power supply(Vdd)		Vdd
65	AVref1		A/D standard voltage (+5V)		+5V
66	AVss		A/D GND(GND)		GND
67	LDON	O	Laser control (D/A)	H: LASER OFF L: LASER ON	Transistor_SW
68	POWER	O	Main power control	H: POWER ON L: POWER OFF	Transistor_SW
69	AVref2		D/A standard voltage 2		+5V
70	AVref3		D/A standard voltage 3		GND
71	CE	I	CE detection/WUP interruption	H: u-COM ENABLE ↑ interrupt L: DISABLE	CE/WUP
72	REM	I	Remote controller reception signal interruption	H: L: ↓ interrupt	P.UP(+5V)
73	XINT	I	ATRAC interruption	H: L: ↓ interrupt	P.UP(+5V)
74	ADSY	I	ADIP interruption	H: L: ↓ interrupt	P.UP(+5V)
75	DQSY	I	SUBQ interruption	H: L: ↓ interrupt	P.UP(+5V)
76	DIR_SCLK	O	DIR_IC clock		P.UP(+5V)
77	DIR_DQSY	I	DIR_IC SUBQ interruption	H: L: ↓ interrupt	P.UP(+5V)
78	FOK	I	Focus OK	H: FOCUS OK L: FOCUS ERROR	P.DOWN(GND)
79	DIR_SRDT	I	DIR_IC read data		P.UP(+5V)
80	DIR_SWDT	O	DIR_IC write data		P.UP(+5V)

CIRCUIT DESCRIPTION

3-3. Expansion IC pin description

Expansion IN(X33: IC4)(TC74HC165AF)

PIN	Port	Description (IN)	
11(A)	DIR_SUB1	DIR_IC sampling f monitor	
12(B)	DSCTYP2	DISC type (PROTECT)	H: ON L: OFF
13(C)	DSCTYP1	DISC type (Low reflection)	H: LOW L: HIGH
14(D)	STTLMT	Start limit SW	H: OFF L: ON
3(E)	CHKLMT	SW	H: OFF L: ON
4(F)	CLSLMT	Close limit SW	H: OFF L: ON
5(G)	OPNLMT	Open limit SW	H: OFF L: ON
6(H)	DIR_SUB2	DIR_IC sampling f monitor	

Expansion OUT(X33: IC5)(TC74HC4094)

PIN	Port	Description (OUT)	
4(Q1)	ADRST	A/D RESET	
5(Q2)	EMPHA	EMPHASIS	H: OFF L: ON
6(Q3)	TRAY_M2	TRAY motor (OUT)	L: OPEN
7(Q4)	TRAY_M1	TRAY motor (IN)	L: CLOSE
14(Q5)	DARST	D/A RESET	
13(Q6)	RMS	PU	H: OFF L: ON
12(Q7)	DRIVE	DRIVE ON/OFF	H: OFF L: ON
11(Q8)	DINSEL	Switching of input	L: DIGITAL H: ANALOG

3-4. MODEL/Type switch

＊＊＊[INISW]＊＊＊

µ-COM	Volt.	5V	3.5V	1.5V	0V
Pin No.	Port				
61	INISW(A/D)	Overseas			Japan

3-5. Timer SW table

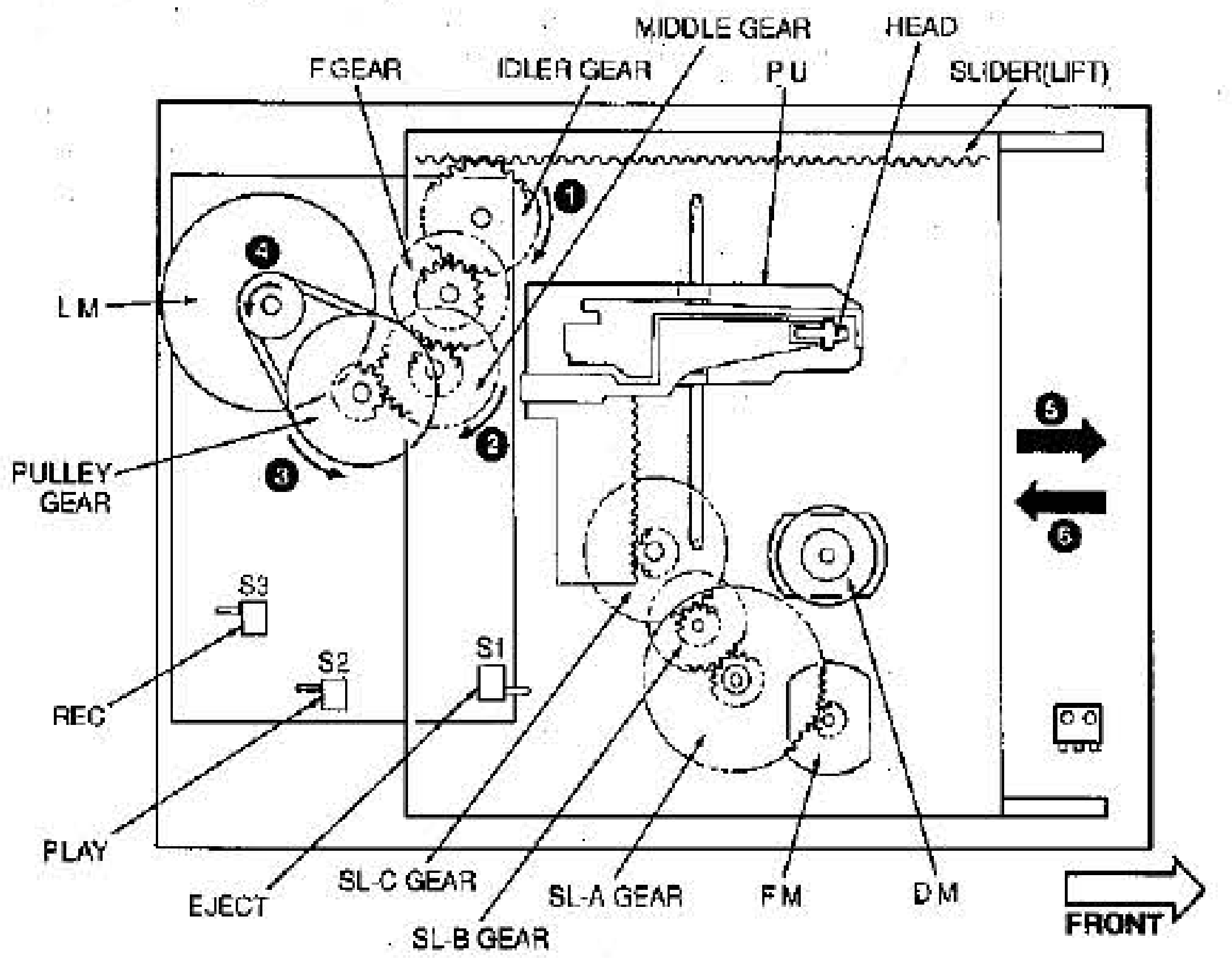
＊＊＊[TMSW]＊＊＊

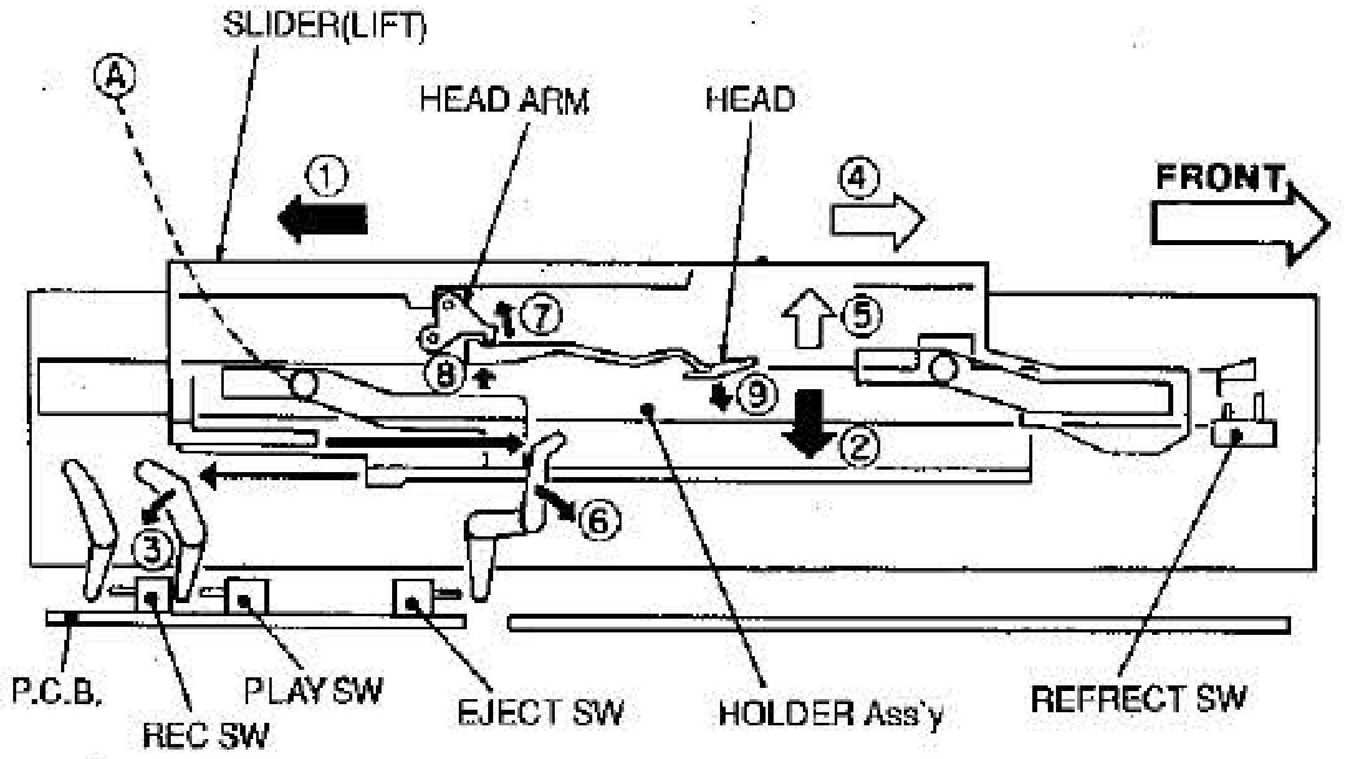
µ-COM	Volt.	5V	2.5V	0V
Pin No.	**Port**			
60	TMSW(A/D)	TIMER REC	TIMER PLAY	TIMER OFF

3-6. Key matrix

Volt. Port	0V	0.8V	1.6V	2.4V	3.2V	4.0V	5V
KR0(A/D)	POWER	EJECT	PAUSE	SKIP UP	FF		off
KR1(A/D)	STOP	REC	PLAY	SKIP DOWN	FB	TT SEARCH	off
KR2(A/D)	ENTER	SET	TRK EDIT	Q. MOVE	LEVEL METER MODE	TT INPUT	off
KR3(A/D)	MONITOR	REC INPUT	CHR SPACE	CHR DELETE	CHARACTER	TIME DISP	off

MECHANISM OPERATION





1. EJECT

1. Shaft of loading motor (LM) turns counter clock wise(❹) and pulley gear turns same direction(❸).
2. Middle gear turns clock wise (❷) and idle gear turns same direction .
3. Slider-lift moves front wards (❺) by turning of idle gear (❶)
4. Eject arm pushes eject switch (❻) by moving of slider-lift front (❹) wards.
5. LM stops to turn.

2. LOADING

1. Eject switch releases by sliding of slider-lift (❶) backwards.
2. LM turns clock wise. Idler and middle gears turn counterclock wise, and pulley gear does clock wise. Slider-lift moves backwards (❻).
3. Sloder-lift and holder assy move backwards (❶).
4. Holder assy moves downwards by groove of slider and boss(A) of holder assy.
5. play switch works by play arm (❸) and moving of slider-lift backwards.
6. LM and slider-lift stops to work.

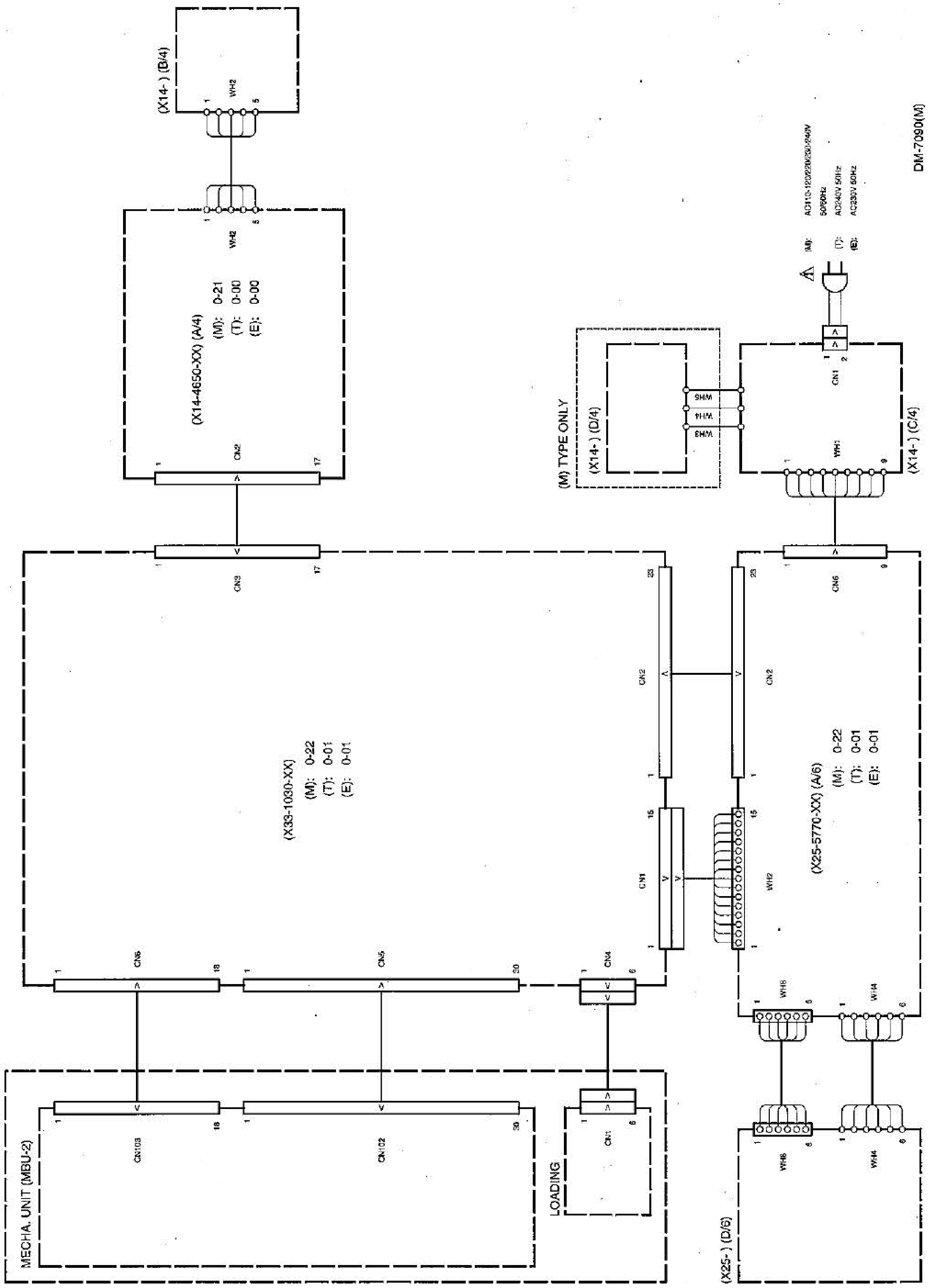
3. RECORDING

1. LM turns more clock wise and slider-lift moves backwards more.
2. Head of pickup moves downwards (❽,❾) by release of head arm (❼) and moving of slider-lift backwards (❶).
3. Rec switch works(play switch keeps on) by being pushed rec arm and moving of slider-lift backwards more.
4. LM and slider stops to work.

4. SWITCH FUNCTION

Ref. No.	SW NAME	ON (SW : LOW)
S1	EJECT SW	EJECT OK
S2	PLAY SW	PLAY OK
S3	REC SW	REC OK
S101	LIMIT SW	PICKUP FULL INSIDE
S102-1	PROTECT SW	PROTECT
S102-2	REFRECT SW	RECORDABLE DISC

WIRING DIAGRAM

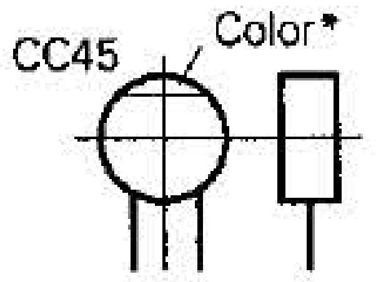

(X14-) (B/4)
WH2
1
5
(X14-4650-XX) (A/4)
(M): 0-21
(T): 0-00
(E): 0-00
CN2
17
DM-7090(M)
AC110-120/220/230-240V
(M):
50/60Hz
(T): AC240V 50Hz
(E): AC230V 50Hz
CN1
2
(M) TYPE ONLY
(X14-) (D/4)
WH5
WH4
WH3
WH1
9
(X14-) (C/4)
CN3
23
CN6
(X33-1030-XX)
(M): 0-22
(T): 0-01
(E): 0-01
15
CN1
CN4
6
CN5
30
18
(X25-5770-XX) (A/6)
(M): 0-22
(T): 0-01
(E): 0-01
WH8
MECHA. ASS'Y (MDM-03)
MECHA. UNIT (MBU-2)
CN103
CN102
LOADING
(X25-) (D/6)

PARTS DESCRIPTIONS

CAPACITORS

CC 45 TH 1H 220 J
1 2 3 4 5 6

1 = Type ... ceramic, electrolytic, etc.
2 = Shape ... round, square, ect.
3 = Temp. coefficient
4 = Voltage rating
5 = Value
6 = Tolerance



• Capacitor value

010 = 1pF
100 = 10pF
101 = 100pF
102 = 1000pF = 0.001μF
103 = 0.01μF

2 2 0 = 22pF
Multiplier
2nd number
1st number

• Temperature coefficient

1st Word	C	L	P	R	S	T	U
Color*	Black	Red	Orange	Yellow	Green	Blue	Violet
ppm/°C	0	-80	-150	-220	-330	-470	-750

2nd Word	G	H	J	K	L
ppm/°C	±30	±60	±120	±250	±500

Example : CC45TH = -470 ± 60ppm/°C

• Tolerance (More than 10pF)

Code	C	D	G	J	K	M	X	Z	P	No code
(%)	±0.25	±0.5	±2	±5	±10	±20	+40 -20	+80 -20	+100 -0	More than 10μF – 10 ~ +50 Less than 4.7μF –10 ~ +75

(Less than 10pF)

Code	B	C	D	F	G
(pF)	±0.1	±0.25	±0.5	±1	±2

• Voltage rating

2nd word / 1st word	A	B	C	D	E	F	G	H	J	K	V
0	1.0	1.25	1.6	2.0	2.5	3.15	4.0	5.0	6.3	8.0	–
1	10	12.5	16	20	25	31.5	40	50	63	80	35
2	100	125	160	200	250	315	400	500	630	800	–
3	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	–

• Chip capacitors

(EX) C C 7 3 F S L 1 H 0 0 0 J
1 2 3 4 5 6 7
(Chip) (CH, RH, UJ, SL)

(EX) C K 7 3 F F 1 H 0 0 0 Z
1 2 3 4 5 6 7
(Chip) (B, F)

☐ Refer to the table above.

1 = Type
2 = Shape
3 = Dimension
4 = Temp. coefficient
5 = Voltage rating
6 = Value
7 = Tolerance

Dimension (Chip capacitors)

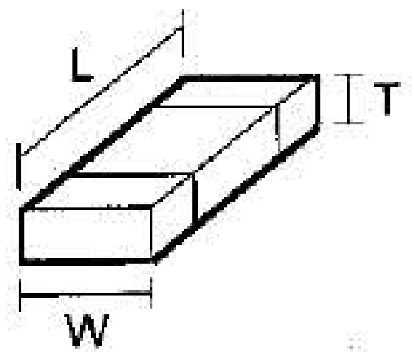
Dimension code	L	W	T
Empty	5.6 ± 0.5	5.0 ± 0.5	Less than 2.0
A	4.5 ± 0.5	3.2 ± 0.4	Less than 2.0
B	4.5 ± 0.5	2.0 ± 0.3	Less than 2.0
C	4.5 ± 0.5	1.25 ± 0.2	Less than 1.25
D	3.2 ± 0.4	2.5 ± 0.3	Less than 1.5
E	3.2 ± 0.2	1.6 ± 0.2	Less than 1.25
F	2.0 ± 0.3	1.25 ± 0.2	Less than 1.25
G	1.6 ± 0.2	0.8 ± 0.2	Less than 1.0

RESISTORS

• Chip resistor (Carbon)

(EX) R K 7 3 E B 2 B 0 0 0 J
1 2 3 4 5 6 7
(Chip) (B,F)

Dimension



• Carbon resistor (Normal type)

(EX) R D 1 4 B B 2 C 0 0 0 J
1 2 3 4 5 6 7

1 = Type
2 = Shape
3 = Dimension
4 = Temp. coefficient
5 = Rating wattage
6 = Value
7 = Tolerance

Dimension (Chip resistor)

Dimension code	L	W	T
E	3.2 ± 0.2	1.6 ± 0.2	1.0
F	2.0 ± 0.3	1.25 ± 0.2	1.0
G	1.6±0.2	0.8±0.2	0.5±0.1

Rating wattage

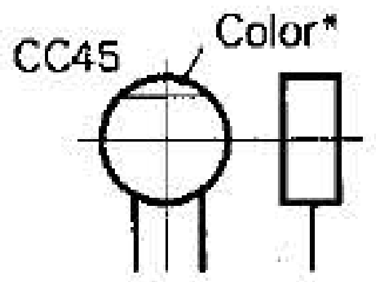
Code	Wattage	Code	Wattage	Code	Wattage
1J	1/16W	2C	1/6W	3A	1W
2A	1/10W	2E	1/4W	3D	2W
2B	1/8W	2H	1/2W		

PARTS DESCRIPTIONS

CAPACITORS

CC 45 TH 1H 220 J
1 2 3 4 5 6

1 = Type ... ceramic, electrolytic, etc.
2 = Shape ... round, square, ect.
3 = Temp. coefficient
4 = Voltage rating
5 = Value
6 = Tolerance



• Capacitor value

.010 = 1pF
100 = 10pF
101 = 100pF
102 = 1000pF = 0.001μF
103 = 0.01μF

2 2 0 = 22pF
Multiplier
2nd number
1st number

• Temperature coefficient

1st Word	C	L	P	R	S	T	U
Color*	Black	Red	Orange	Yellow	Green	Blue	Violet
ppm/°C	0	-80	-150	-220	-330	-470	-750

2nd Word	G	H	J	K	L
ppm/°C	±30	±60	±120	±250	±500

Example : CC45TH = -470 ± 60ppm/°C

• Tolerance (More than 10pF)

Code	C	D	G	J	K	M	X	Z	P	No code
(%)	±0.25	±0.5	±2	±5	±10	±20	+40 -20	+80 -20	+100 -0	More than 10μF - 10 ~ +50 Less than 4.7μF -10 ~ +75

(Less than 10pF)

Code	B	C	D	F	G
(pF)	±0.1	±0.25	±0.5	±1	±2

• Voltage rating

2nd word / 1st word	A	B	C	D	E	F	G	H	J	K	V
0	1.0	1.25	1.6	2.0	2.5	3.15	4.0	5.0	6.3	8.0	-
1	10	12.5	16	20	25	31.5	40	50	63	80	35
2	100	125	160	200	250	315	400	500	630	800	-
3	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	-

• Chip capacitors

(EX) C C 7 3 F S L 1 H 0 0 0 J
1 2 3 4 5 6 7
(Chip) (CH, RH, UJ, SL)

(EX) C K 7 3 F F 1 H 0 0 0 Z
1 2 3 4 5 6 7
(Chip) (B, F)

Refer to the table above.

1 = Type
2 = Shape
3 = Dimension
4 = Temp. coefficient
5 = Voltage rating
6 = Value
7 = Tolerance

Dimension (Chip capacitors)

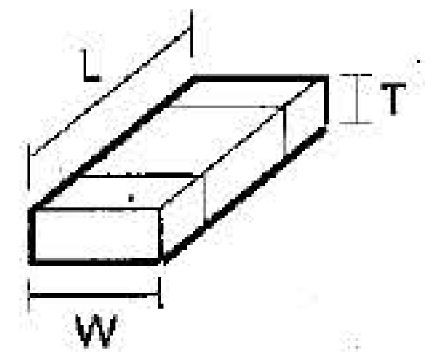
Dimension code	L	W	T
Empty	5.6 ± 0.5	5.0 ± 0.5	Less than 2.0
A	4.5 ± 0.5	3.2 ± 0.4	Less than 2.0
B	4.5 ± 0.5	2.0 ± 0.3	Less than 2.0
C	4.5 ± 0.5	1.25 ± 0.2	Less than 1.25
D	3.2 ± 0.4	2.5 ± 0.3	Less than 1.5
E	3.2 ± 0.2	1.6 ± 0.2	Less than 1.25
F	2.0 ± 0.3	1.25 ± 0.2	Less than 1.25
G	1.6 ± 0.2	0.8 ± 0.2	Less than 1.0

RESISTORS

• Chip resistor (Carbon)

(EX) R K 7 3 E B 2 B 0 0 0 J
1 2 3 4 5 6 7
(Chip) (B,F)

Dimension



• Carbon resistor (Normal type)

(EX) R D 1 4 B B 2 C 0 0 0 J
1 2 3 4 5 6 7

1 = Type
2 = Shape
3 = Dimension
4 = Temp. coefficient
5 = Rating wattage
6 = Value
7 = Tolerance

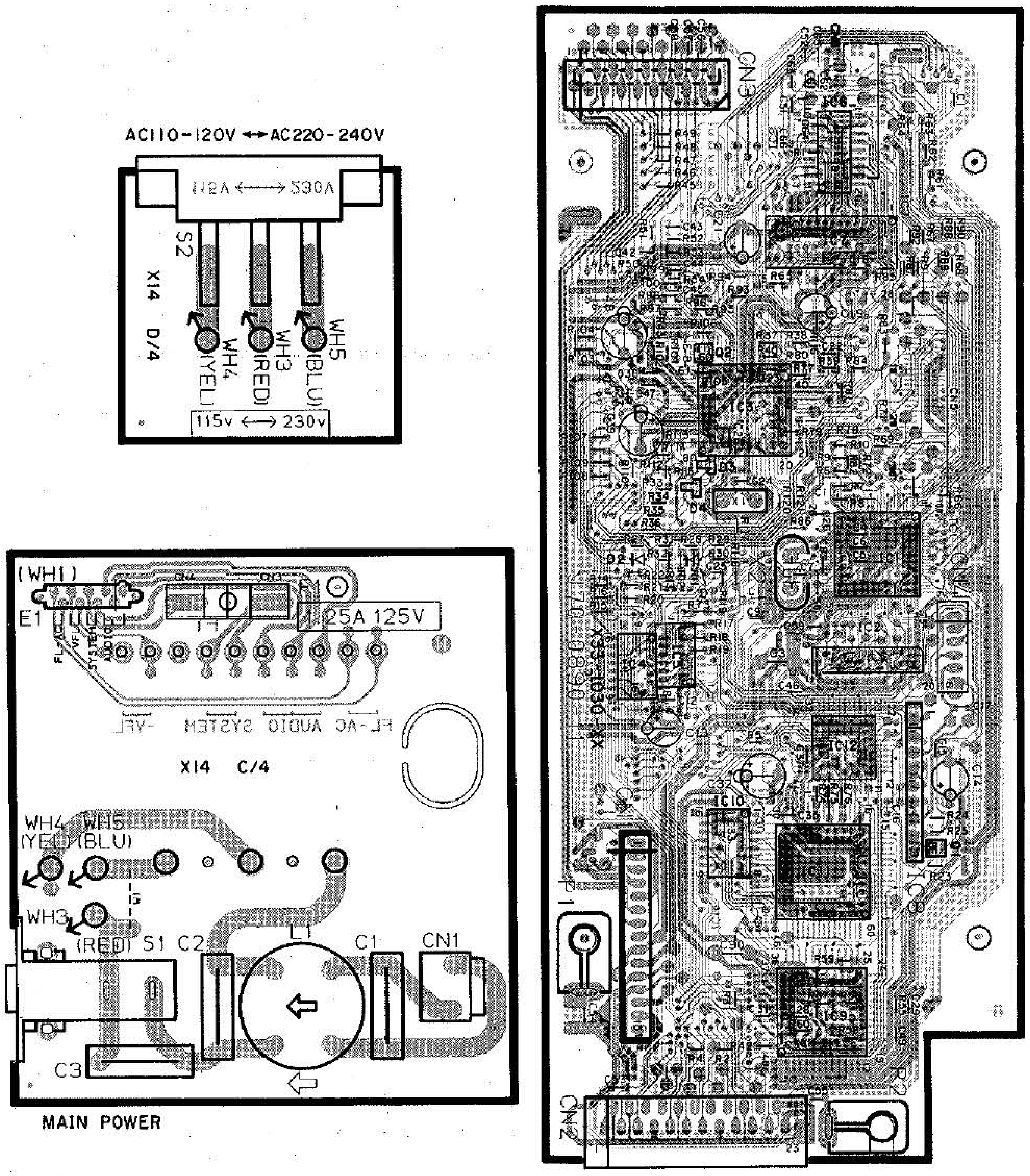
Dimension (Chip resistor)

Dimension code	L	W	T
E	3.2 ± 0.2	1.6 ± 0.2	1.0
F	2.0 ± 0.3	1.25 ± 0.2	1.0
G	1.6±0.2	0.8±0.2	0.5±0.1

Rating wattage

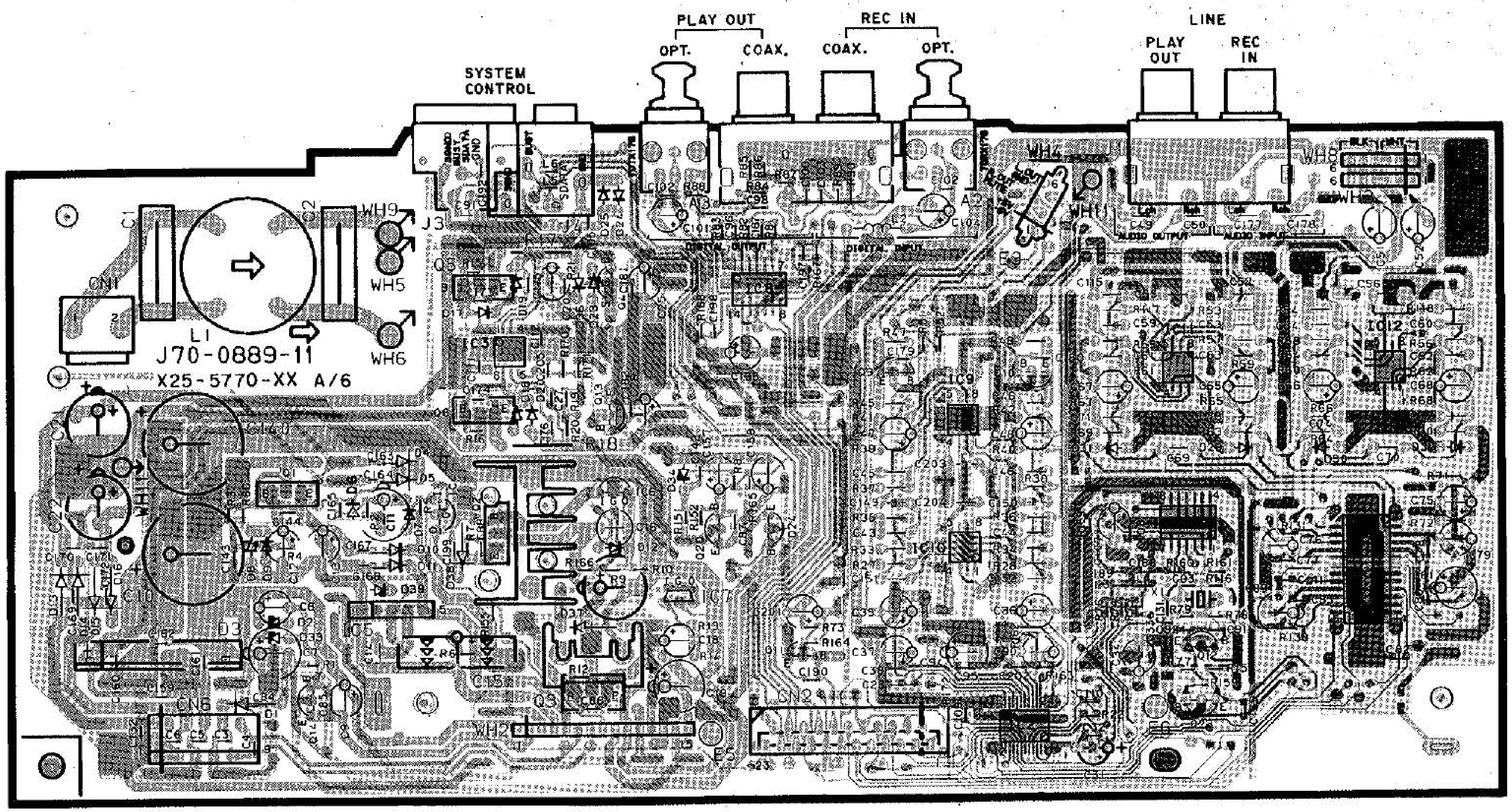
Code	Wattage	Code	Wattage	Code	Wattage
1J	1/16W	2C	1/6W	3A	1W
2A	1/10W	2E	1/4W	3D	2W
2B	1/8W	2H	1/2W		

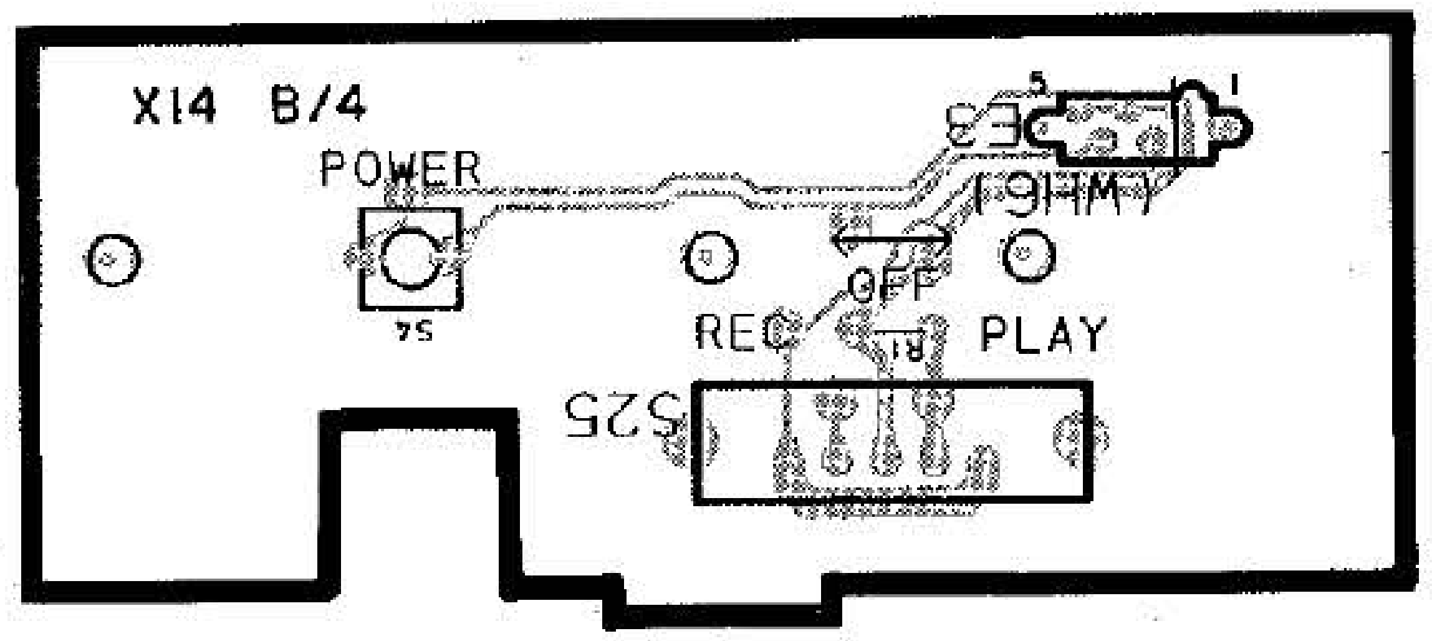
PC BOARD(Component side view)

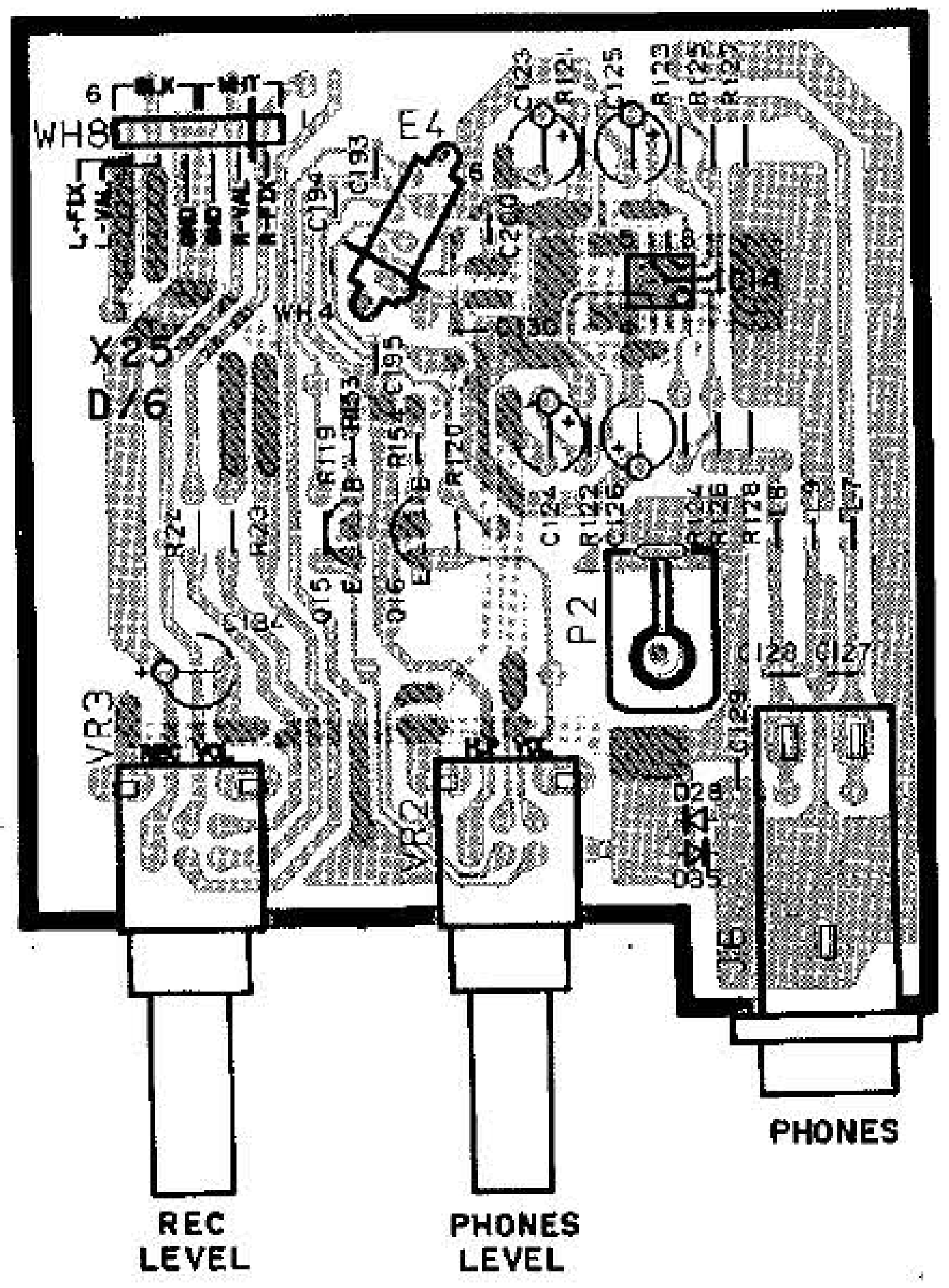


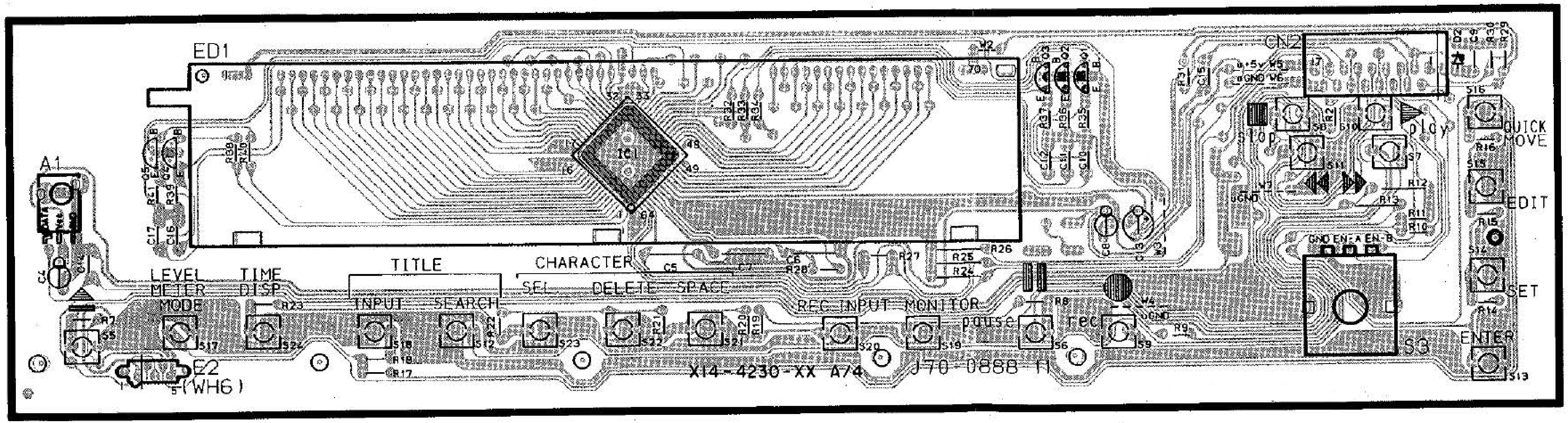
Refer to the schematic diagram for the value of resistors and capacitors.

PC BOARD(Component side view)

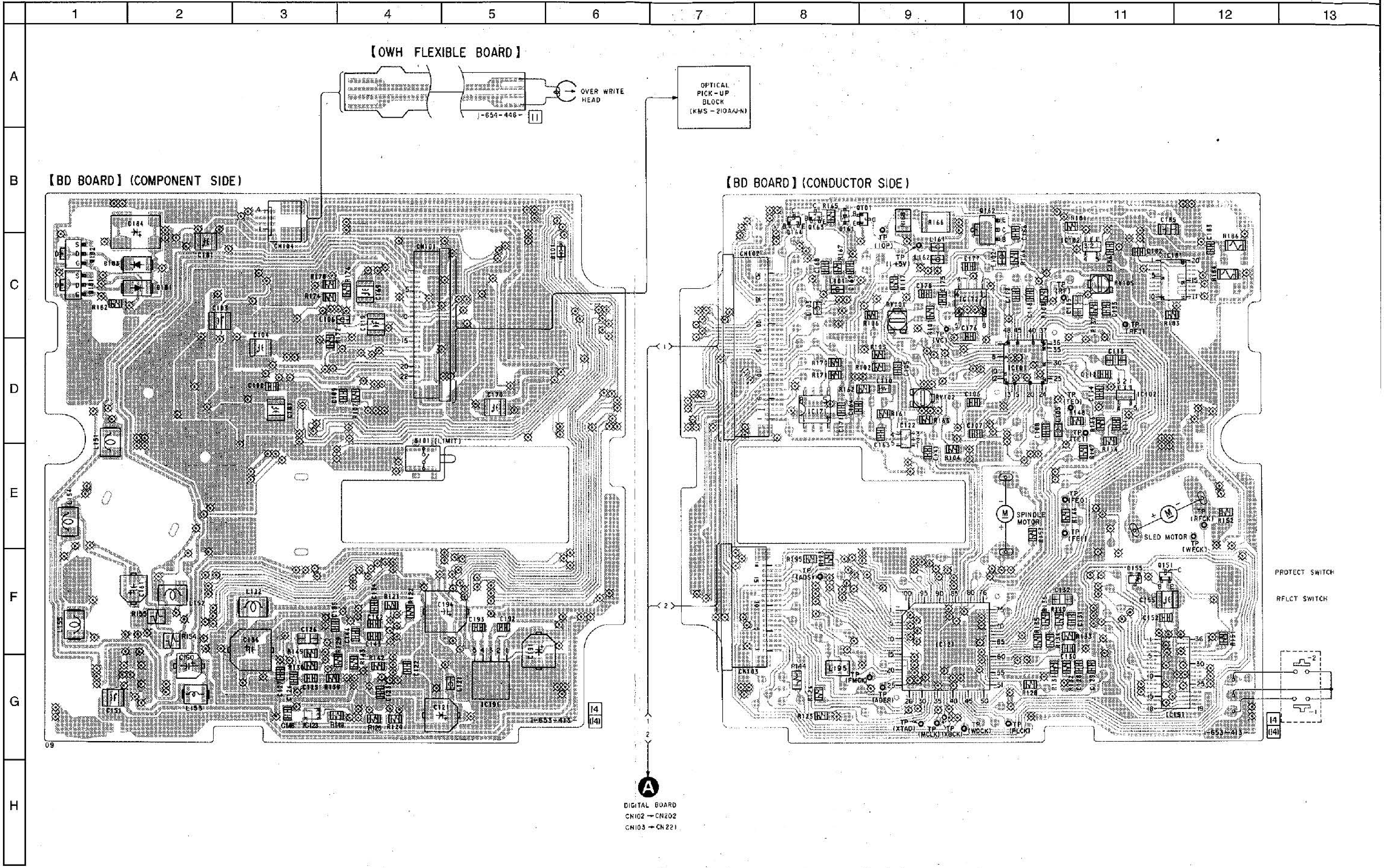

PLAY OUT
OPT.
COAX.
REC IN
COAX.
OPT.
LINE
PLAY OUT
REC IN
SYSTEM CONTROL
WH9
J3
WH5
WH6
L1
J70-0889-11
X25-5770-XX A/6
CN1
C1
C2
WH4
WH1
WH8
A3
A2
IC3
IC9
IC12
CN6
D3
Q3
WH2
CN2
E5
E6

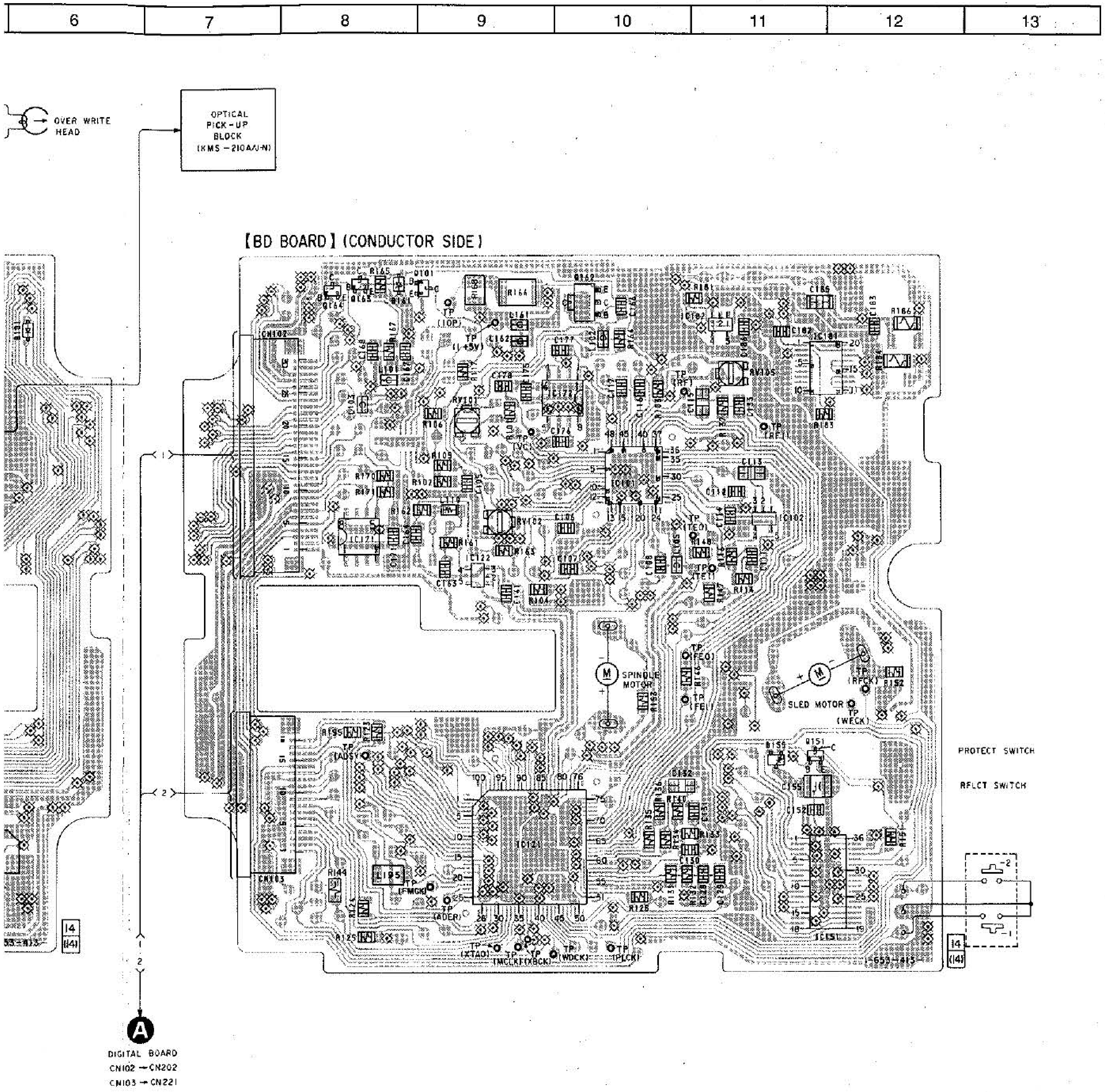

X14 B/4
POWER
REC
OFF
PLAY
S25
E3
WH7


WH8
E4
X25
D/6
VR3
VR2
P2
REC LEVEL
PHONES LEVEL
PHONES


ED1
A1
IC1
CN2
LEVEL METER MODE
TIME DISP
TITLE
INPUT
SEARCH
CHARACTER
SEL
DELETE
SPACE
REC INPUT
MONITOR
pause
rec
stop
play
QUICK MOVE
EDIT
SET
ENTER
S3
X14-4230-XX A/4
J70-0888-11
E2
(WH6)

Refer to the schematic diagram for the value of resistors and capacitors.


【OWH FLEXIBLE BOARD】
OVER WRITE HEAD
1-654-446-11
OPTICAL PICK-UP BLOCK (KMS-210A/J-N)
【BD BOARD】(COMPONENT SIDE)
【BD BOARD】(CONDUCTOR SIDE)
S101 (LIMIT)
SPINDLE MOTOR
SLED MOTOR
PROTECT SWITCH
RFLCT SWITCH
1-653-413-14 (14)
DIGITAL BOARD
CN102 → CN202
CN103 → CN221
A
1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H


6
7
8
9
10
11
12
13
OVER WRITE HEAD
OPTICAL PICK-UP BLOCK (KMS-210A/J-N)
【BD BOARD】(CONDUCTOR SIDE)
CN102
CN103
IC101
IC102
IC121
IC122
IC151
IC171
IC181
IC191
SPINDLE MOTOR
SLED MOTOR
TP (RFCK)
TP (WECK)
TP (FEO)
TP (FEI)
TP (TEO)
TP (TEI)
TP (RF)
TP (VC)
TP (IOP)
TP (+5V)
TP (ADSY)
TP (FMCK)
TP (ADER)
TP (XTAO)
TP (MCLK)
TP (XBCK)
TP (WDCK)
TP (PLCK)
RV101
RV102
RV105
PROTECT SWITCH
REFLCT SWITCH
14 (14)
53-815
A
DIGITAL BOARD
CN102 → CN202
CN103 → CN221

• Semiconductor location

Pin. No.	Location
D101	C-6
D155	F-11
D161	B-8
D181	C-2
D133	C-2
IC101	D-10
IC102	D-11
IC121	F-9
IC122	D-9
IC151	G-12
IC171	D-8
IC172	C-10
IC181	C-12
IC182	C-11
IC191	G-5
Q101	B-9
Q151	F-12
Q162	B-10
Q163	B-8
Q164	B-8
Q181	C-1
Q182	C-1

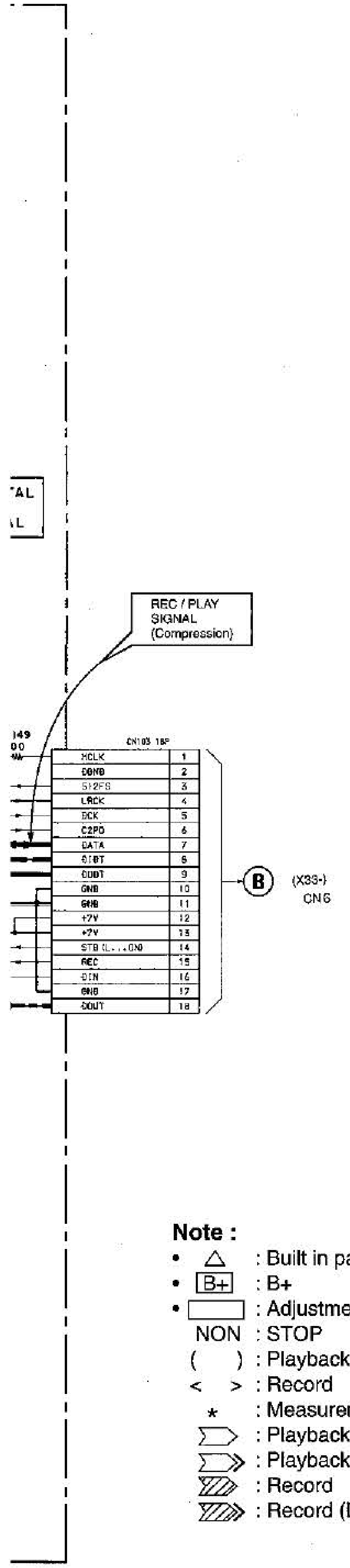
Note :

- ○— : Wire from parts side.
- — : Wire from foil side.
- ◈ : Through hole.
- ▨ : Viewpoint foil side.

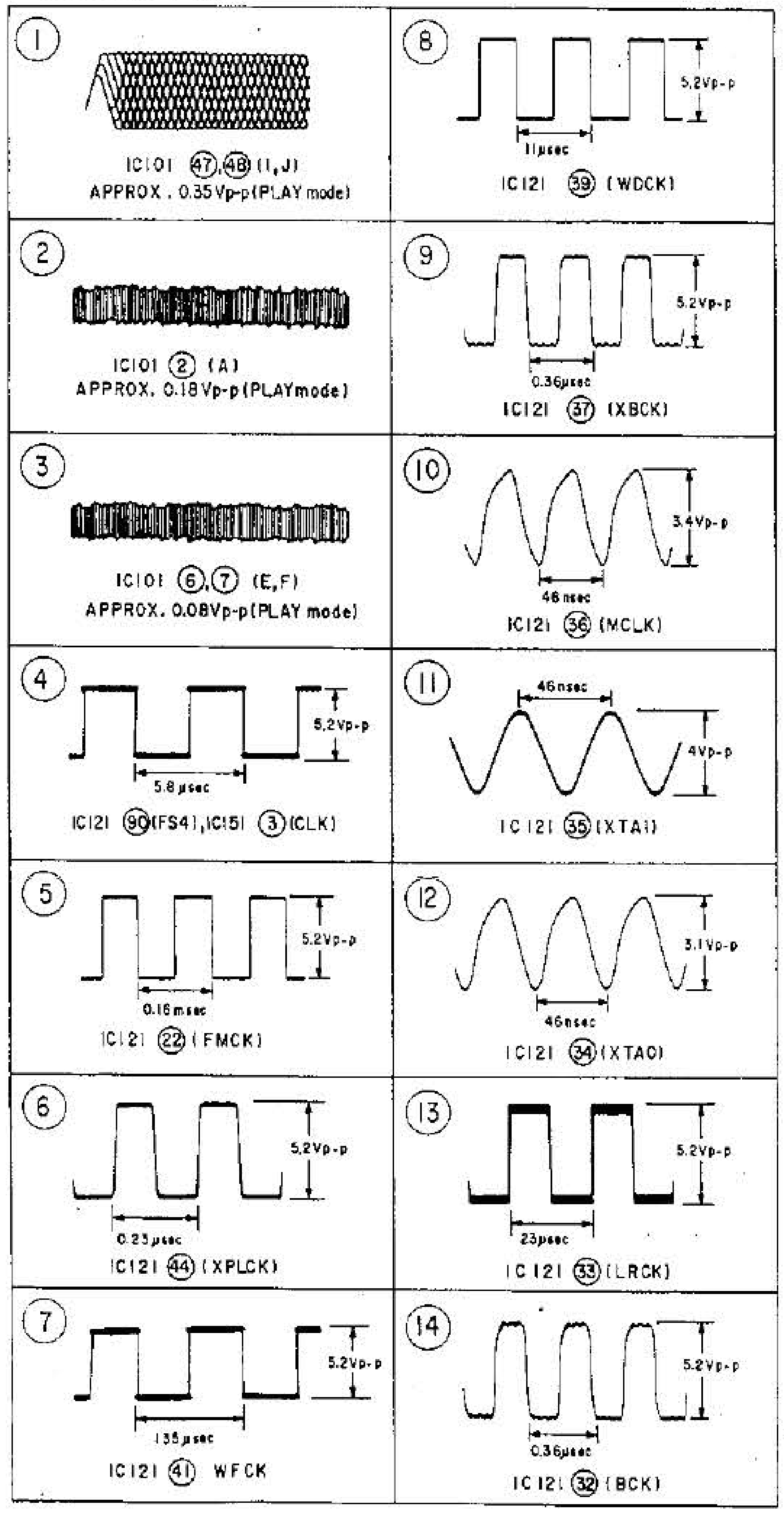
Ref No. RV in pc board shows as VR in schematic diagram and parts list.

Refer to the schematic diagram for the values of resistors and capacitors.

A
B
C
D
E
F
G
H
I
J
K
【MBU-2】
【OWH FLEXIBLE BOARD】
OVER LIGHT HEAD
OPTICAL PICK-UP BLOCK (KMS-210A/J-N)
2-AIXS DEVICE
TRACKING COIL
FOCUS COIL
HIGH POWER LD
PD
H.F. MOD
L.F. MOD
IV-AMP
PD-IC BOTTOM VIEW
Q181,182 OVER WRITE HEAD DRIVE
IC181
OVER WRITE HEAD DRIVE
IC182
INVERTER
IC172
BUFFER
IC101
RF AMP
CXA1981AR
E-F BALANCE
Q101 LASER ON SWITCH
LASER POWER
Q164 HF MODULE SWITCH
Q162 APC
Q163 APC
IC102
INVERTER
IC122
INVERTER
IC121
CXD2535BR
DIGITAL SIGNAL PROCESSOR
DIGITAL SERVO SIGNAL PROCESSOR
EFM/ACIRC ENCODER/DECODER
IC123
TC7SU04FU-TE85L
IC191
+5V REG.
L88MS05T-FA
IC171
MEMORY
X24C01S
IC151
SLED/SPINDLE MOTOR DRIVE, FOCUS/TRACKING COIL DRIVE
MPC17A38VMEL
Q151 RESET SWITCH
SLED MOTOR
SPINDLE MOTOR
S101 LIMIT SWITCH
CN102 30P
CN103 16P
-1 PROTECT SWITCH
-2 REFLECT SWITCH
REC SIGNAL
PLAY SIGNAL
DIGITAL REC SIGNAL
DIGITAL PLAY SIGNAL
(X33-) CN5
A
B+
MCLK
SGND
512FS
LRCK
BCK
C2PO
DATA
DIGT
DODT
GND
+7V
STB IL
REC
DIN
DOUT


K
L
REC / PLAY
SIGNAL
(Compression)
CN103 18P
MCLK 1
DGND 2
512FS 3
LRCK 4
BCK 5
C2PO 6
DATA 7
DIDT 8
DOUT 9
GND 10
GND 11
+7V 12
+7V 13
STB (L…ON) 14
REC 15
DIN 16
GND 17
DOUT 18
B
(X33-)
CN6

- **Wave form-figure**


①
IC101 ㊼,㊽ (I,J)
APPROX. 0.35Vp-p (PLAY mode)
②
IC101 ② (A)
APPROX. 0.18Vp-p (PLAYmode)
③
IC101 ⑥,⑦ (E,F)
APPROX. 0.08Vp-p (PLAY mode)
④
5.2Vp-p
5.8μsec
IC121 (90) (FS4), IC151 ③ (CLK)
⑤
5.2Vp-p
0.16msec
IC121 ㉒ (FMCK)
⑥
5.2Vp-p
0.23μsec
IC121 ㊹ (XPLCK)
⑦
5.2Vp-p
135μsec
IC121 ㊶ WFCK
⑧
5.2Vp-p
11μsec
IC121 ㊴ (WDCK)
⑨
5.2Vp-p
0.36μsec
IC121 ㊲ (XBCK)
⑩
3.4Vp-p
46nsec
IC121 ㊱ (MCLK)
⑪
46nsec
4Vp-p
IC121 ㉟ (XTAI)
⑫
3.1Vp-p
46nsec
IC121 ㉞ (XTAO)
⑬
5.2Vp-p
23μsec
IC121 ㉝ (LRCK)
⑭
5.2Vp-p
0.36μsec
IC121 ㉜ (BCK)

Note :

- △ : Built in parts.
- B+ : B+
- ▭ : Adjustment

NON : STOP
( ) : Playback
< > : Record
* : Measurement impassible.
▷ : Playback
▷▷ : Playback (Digital)
▨ : Record
▨▨ : Record (Digital)

DM-7090

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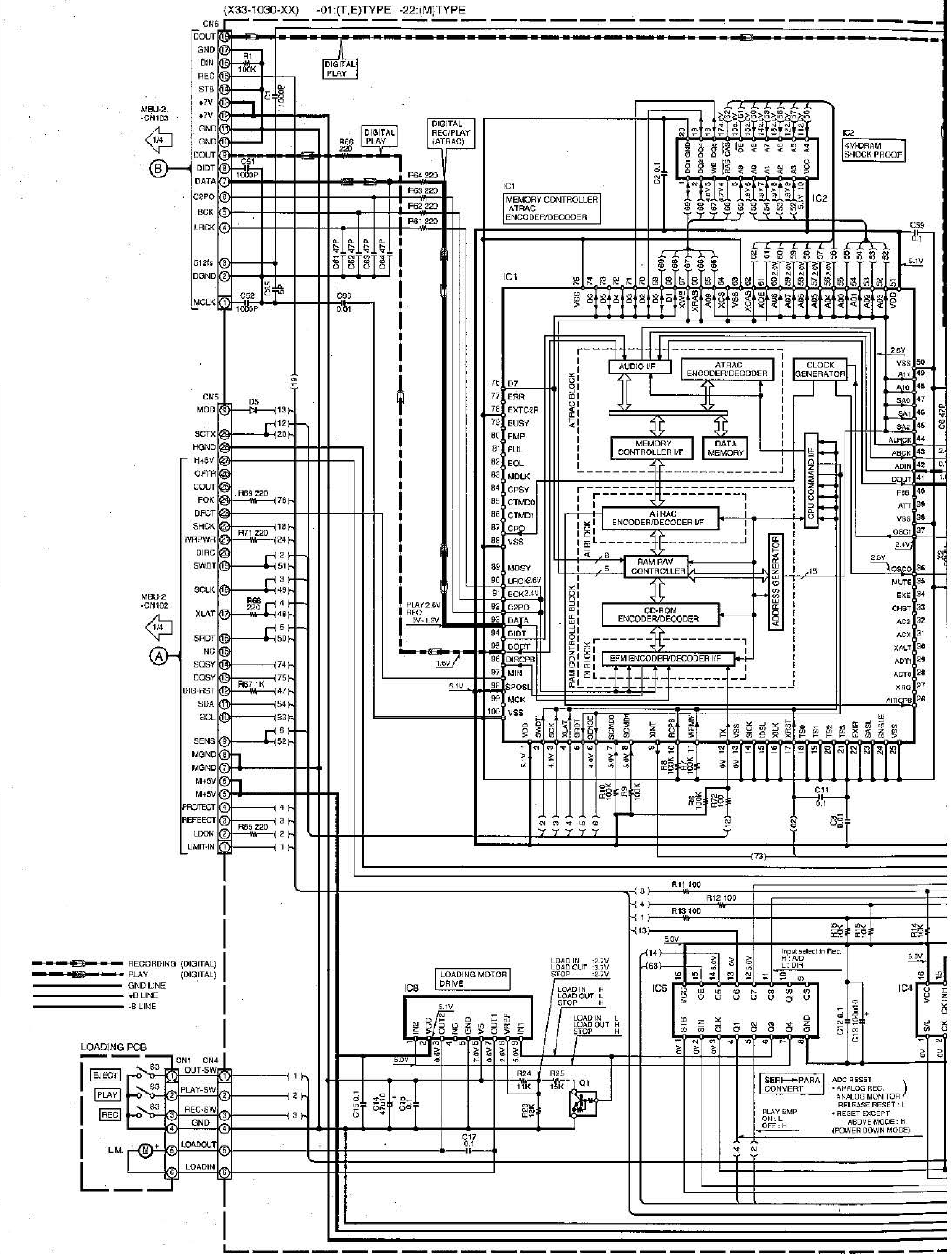
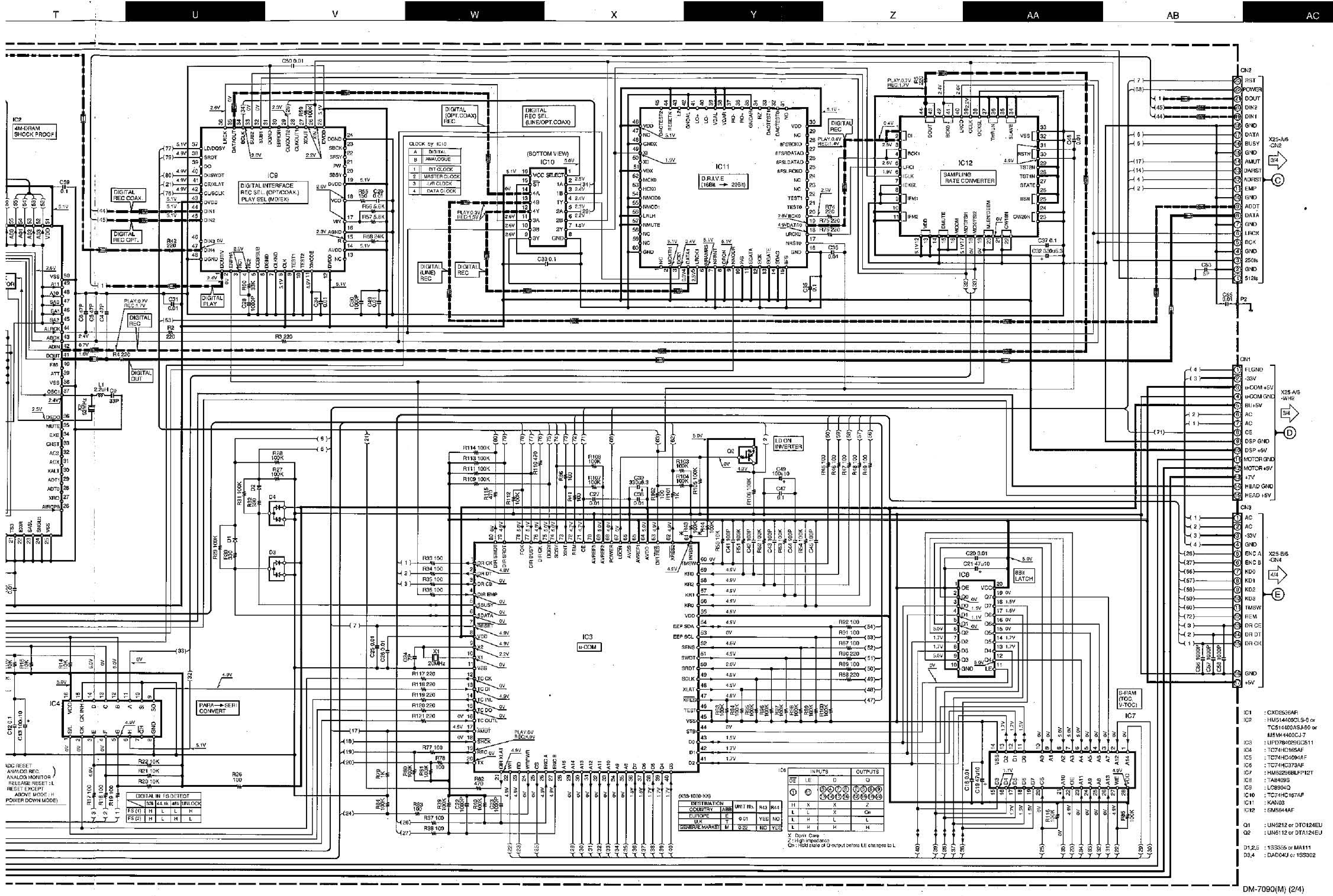
Y22-4652-71


P
Q
R
S
T
1
2
3
4
5
6
7
(X33-1030-XX) -01:(T,E)TYPE -22:(M)TYPE
CN6
DOUT
GND
DIN
REC
STB
+7V
+7V
GND
GND
DOUT
DIDT
DATA
C2PO
BCK
LRCK
512fs
DGND
MCLK
MBU-2 -CN103
1/4
B
R1 100K
C1 1000P
DIGITAL PLAY
DIGITAL REC/PLAY (ATRAC)
R66 220
R64 220
R63 220
R62 220
R61 220
C61 1000P
C92 1000P
C80 0.01
C81 47P
C82 47P
C83 47P
C84 47P
IC1 MEMORY CONTROLLER ATRAC ENCODER/DECODER
IC1
IC2
IC2 4M-DRAM SHOCK PROOF
C20 0.1
C59 0.1
ATRAC BLOCK
AUDIO I/F
ATRAC ENCODER/DECODER
CLOCK GENERATOR
MEMORY CONTROLLER I/F
DATA MEMORY
CPU COMMAND I/F
ATRAC ENCODER/DECODER I/F
RAM R/W CONTROLLER
ADDRESS GENERATOR
CD-ROM ENCODER/DECODER
EFM ENCODER/DECODER I/F
RAM CONTROLLER BLOCK
EFM BLOCK
D7
ERR
EXTC2R
BUSY
EMP
FUL
EQL
MDLK
CPSY
CTMD0
CTMD1
CPD
VSS
MDSY
LRCK
BCK
C2PO
DATA
DIDT
DODT
DIRCPB
MIN
SPOSL
MCK
VSS
CN5
MOD
SCTX
HGND
H+5V
CFTR
COUT
FOK
DFCT
SHCK
WRPWR
DIRC
SWDT
SCLK
XLAT
SRDT
NC
SQSY
DQSY
DIG-RST
SDA
SCL
SENS
MGND
MGND
M+5V
M+5V
PROTECT
REFECT
LDON
LIMIT-IN
D5
R69 220
R71 220
R68 220
R67 1K
R65 220
MBU-2 -CN102
1/4
A
PLAY 2.6V
REC 0V~1.8V
C11 0.1
C3 0.01
R11 100
R12 100
R13 100
RECORDING (DIGITAL)
PLAY (DIGITAL)
GND LINE
+B LINE
-B LINE
LOADING PCB
EJECT
PLAY
REC
S3
L.M.
M
CN1
CN4
OUT-SW
PLAY-SW
REC-SW
GND
LOADOUT
LOADIN
IC8
LOADING MOTOR DRIVE
LOAD IN / LOAD OUT / STOP
R24 11K
R25 15K
Q1
C17 0.1
IC5
IC4
SERI→PARA CONVERT
Input select in Rec. H: AD L: DIR
ADC RESET
PLAY EMP ON: L OFF: H

CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). ⚠ indicates safety critical components. For continued protection against risk of fire, replace only with same type and rating fuse(s). To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.


T
U
V
W
X
Y
Z
AA
AB
AC
AD
IC2
4M-DRAM SHOCK PROOF
IC9
DIGITAL INTERFACE REC SEL (OPT/COAX) PLAY SEL (MD/EX)
DIGITAL REC COAX
DIGITAL REC OPT.
DIGITAL PLAY
DIGITAL REC
DIGITAL OUT
DIGITAL (OPT.COAX) REC
DIGITAL REC SEL (LINE/OPT.COAX)
(BOTTOM VIEW)
IC10
VCC SELECT
DIGITAL (LINE) REC
PLAY:0.3V REC:1.3V
IC11
D.R.I.V.E (16Bit → 20Bit)
IC12
SAMPLING RATE CONVERTER
PLAY:0.7V REC:1.7V
PLAY:0.4V REC:1.4V
CN2
X25-A/6 -CN2
3/4
C
CN1
X25-A/5 -WH2
D
CN3
X25-B/6 -CN4
4/4
E
P2
LD ON INVERTER
Q2
IC3
u-COM
X1 20MHz
IC6
8Bit LATCH
IC7
S-RAM (TOC V-TOC)
IC4
PARA→SERI CONVERT
PLAY:0V REC:4.9V
ADC RESET
ANALOG REC
ANALOG MONITOR : L
RELEASE RESET : L
RESET EXCEPT
ABOVE MODE : H
POWER DOWN MODE)
D1
D2
D3
D4
D5

CLOCK by IC10

A	DIGITAL
B	ANALOGUE

1	BIT CLOCK
2	MASTER CLOCK
3	L/R CLOCK
4	DATA CLOCK

DIGITAL IN FS DETECT				
	32k	44.1k	48k	UNLOCK
FS (1)	H	L	L	H
FS (2)	H	L	H	L

(X33-1030-XX)

DESTINATION		UNIT No.	R43	R44
COUNTRY	ABB			
EUROPE	E	0-01	YES	NO
U.K	T			
GENERAL MARKET	M	0-22	NO	YES

IC6

INPUTS			OUTPUTS
$\overline{OE}$	LE	D	Q
①	⑪	③④⑦⑧⑬⑭⑰⑱	②⑤⑥⑨⑫⑮⑯⑲
H	X	X	Z
L	L	X	Qn
L	H	L	L
L	H	H	H

X : Don't Care
Z : High impedance
Qn : Hold state of Q output before LE changes to L

IC1	: CXD2536AR
IC2	: HM514400CLS-6 or TC514400ASJ-60 or M5M44400CJ-7
IC3	: UPD784026GC511
IC4	: TC74HC165AF
IC5	: TC74HC4094AF
IC6	: TC74HC373AF
IC7	: HM62256BLFP12T
IC8	: TA8409S
IC9	: LC8904Q
IC10	: TC74HC157AF
IC11	: KAN03
IC12	: SM5844AF
Q1	: UN5212 or DTC124EU
Q2	: UN5112 or DTA124EU
D1,2,5	: 1SS355 or MA111
D3,4	: DAD04U or 1SS302

DM-7090(M) (2/4)

(refer
same
:arried
r.

The DC voltage is an actual reading measured with a high impedance type voltmeter. The measurement value may vary depending on the measuring instruments used or on the product. Refer to the voltage during RECORDABLE MD PLAY unless otherwise specified; The value shown in ( ) is the voltage measured at the moment of STOP. The voltage followed by (REC) refers to the value during MD RECORDING.

Y22-4652-71

DM-7090

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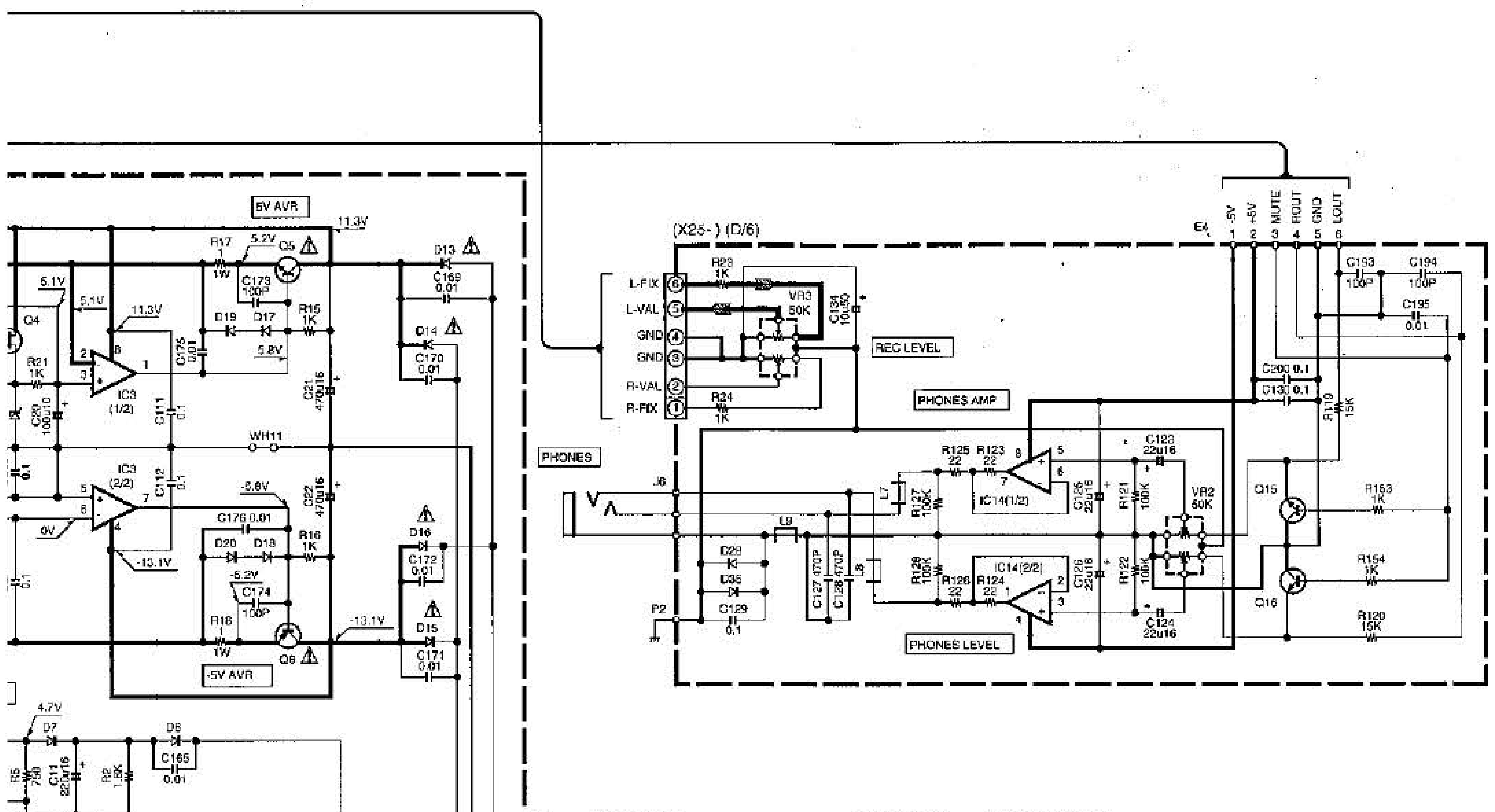
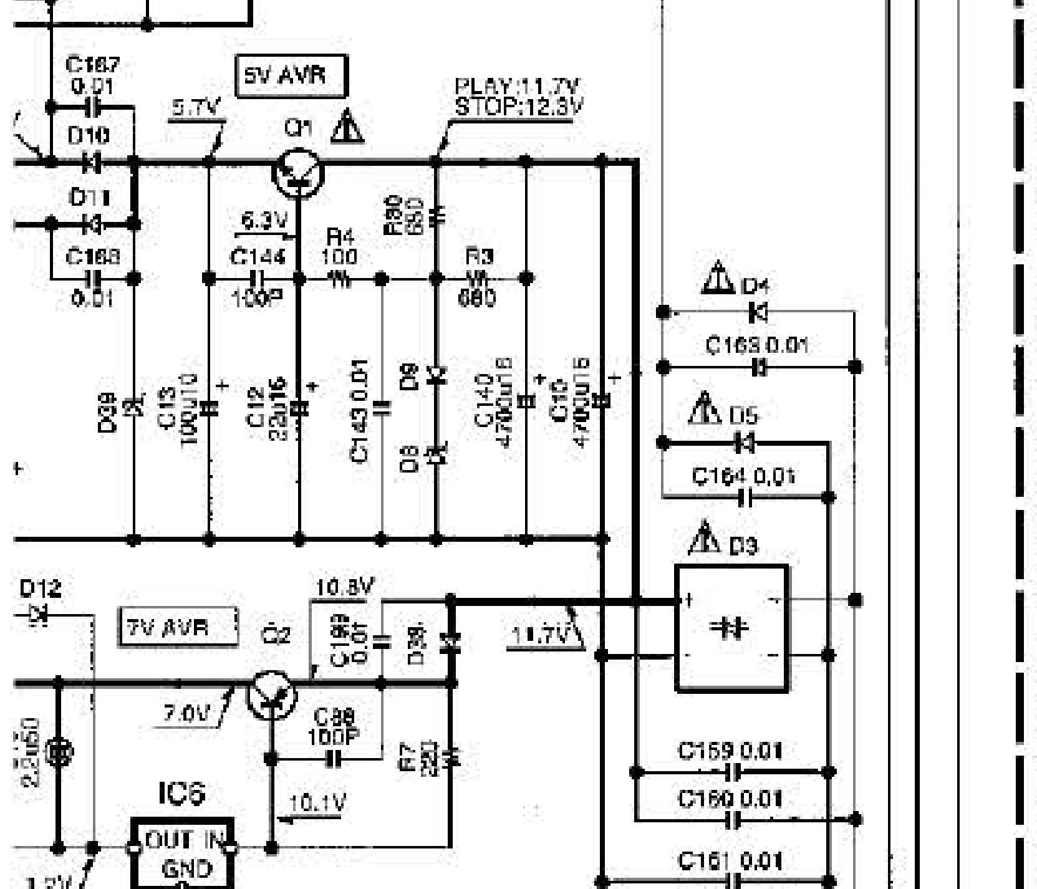
AE
AF
AG
AH
AI
AJ
AK
AL
AM
AN
(X25-5770-XX) (A/6) -01:(T,E)TYPE -22:(M)TYPE
WH6
L-FIX
L-VAL
GND
GND
R-VAL
R-FIX
ADC
IC1
(BOTTOM VIEW)
SERIAL OUTPUT INTERFACE
DECIMATION FILTER
LP FILTER
VOLTAGE REFERENCE
DAC
CALIBRATION SRAM
CONTROLLER
20kHz LPF
IC11 (1/2)
IC11 (2/2)
IC12 (1/2)
IC12 (2/2)
INVERTER
IC8
(BOTTOM VIEW)
DIGITAL PLAY
DIGITAL REC OPT.
DIGITAL REC COAX
A2
OUT
GND
VDD
OPTICAL (OPT.)
REC IN
J2
1 COAXIAL (COAX.)
2 COAXIAL (COAX.)
DIGITAL
PLAY OUT
A3
IN
VDD
GND
OPTICAL (OPT.)
J4
SYSTEM CONTROL
BUSY
DATA
GND
SGND
CN8
512FS
GND
256FS
GND
BCK
LRCK
GND
DADT
ADDT
GND
EMP
ADRST
DARST
A MUTE
GND
S BUSY
S DATA
GND
OPT IN2
OPT IN1
OPT OUT
POWER
RST
X33-CN2
2/4
C
DIGITAL OUT
BUFFER
OSC
Q12
X1 22.57MHz
IC15 512fs → 256fs
(BOTTOM VIEW)
DIGITAL REC COAX
DIGITAL REC OPT.
DIGITAL PLAY
IC2 DAC
SERIAL INPUT INTERFACE
DE EMPHASIS CONTROL
8X INTERPOLATOR
ΔΣ MODULATOR
CLOCK OSC/DIVIDER
SCF
CTF
(BOTTOM VIEW)
IC10 (1/2)
IC10 (2/2)
IC9 (1/2)
IC9 (2/2)
20kHz LPF
Q9
Q10
Q11
J1
1 Lch
2 Rch
3 Rch
4 Lch
REC IN
LINE
PLAY OUT
E8
WH4
LOUT
GND
ROUT
MUTE
+5V
-5V
Q20
Q24
Q13
Q4
IC3 (1/2)
IC3 (2/2)
RESET(CE)
IC4
RESET
IC5
Q1
6V AVR
7V AVR
Q2
IC6
BACK-UP CAPA
C15
IC7
5V AVR
Q3
-31V AVR
Q14
X33-CN1
2/4
D
WH2
FL GND
-33V
D+5V
SUB-8V
AC
AC
CE
D GND
D+5V
M GND
M-5V
M+7V
H GND
H+5V
A

CAUTION: *For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). ⚠ indicates safety critical components. For continued protection against risk of fire, replace only with same type and rating fuse(s). To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.*

The DC voltage is an actual reading measured with a high impedance type voltmeter. The measurement value may vary depending on the measuring instruments used or on the product. Refer to the voltage during RECORDABLE MD PLAY unless otherwise specified; The value shown in (   ) is the voltage measured at the moment of STOP. The voltage followed by (REC) refers to the value during MD RECORDING.


5V AVR
IC3 (1/2)
IC3 (2/2)
-5V AVR
(X25-) (D/6)
L-FIX
L-VAL
GND
GND
R-VAL
R-FIX
VR3 50K
REC LEVEL
PHONES AMP
PHONES
IC14(1/2)
IC14(2/2)
VR2 50K
PHONES LEVEL
-5V
-5V
MUTE
ROUT
GND
LOUT

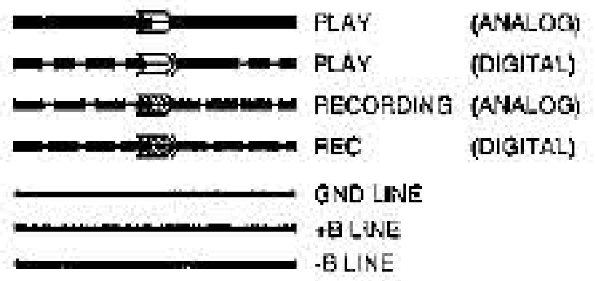

5V AVR
PLAY:11.7V
STOP:12.3V
7V AVR
IC6

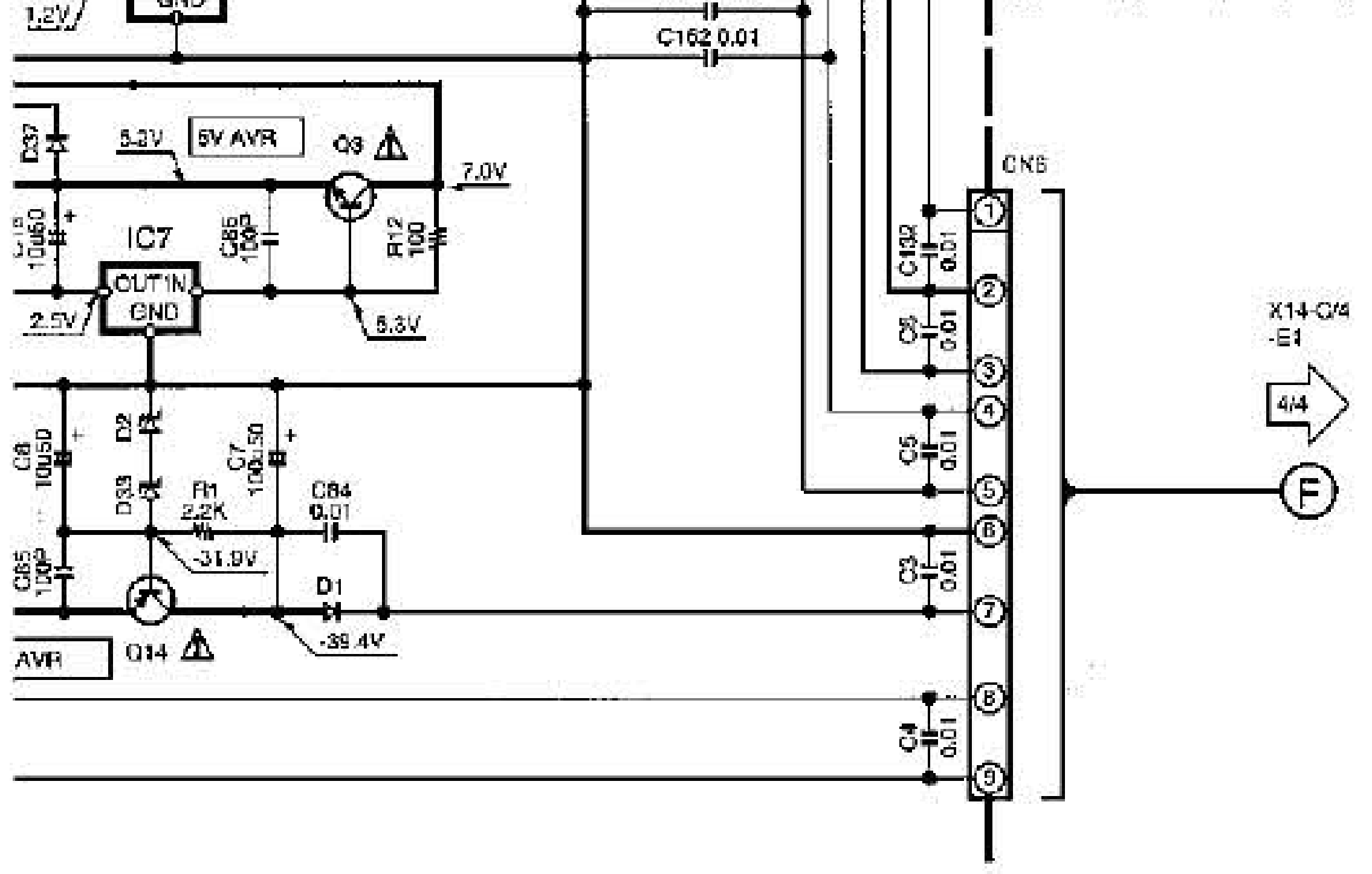
IC1 : AK5340-VS#1
IC2 : AK4320-VM
IC3 : NJM4558M
IC4 : PST993D-T
IC5 : M62005L
IC6 : M5237L
IC7 : TL431CLP
IC8 : TC74HCU04AF
IC9-12 : NJM4565M
IC14 : NJM4580E
IC15 : TC74HC74AF

Q1,3,5 : 2SD2061 or 2SD2012
Q2 : 2SB1370 or 2SB1375
Q4 : 2SK246(Y,GR)
Q6 : 2SB772
Q9,10,15,16
: 2SD1469(S,T)
Q11 : UN4116 or DTA143TS
Q12 : 2SC1923(R,O)
Q13 : UN4219 or DTC113ZS
Q14 : 2SA954(L,K)
Q20 : 2SC1845(F,E)
Q23 : 2SA1309A(Q,R) or 2SA1048(Y,GR)
Q24 : UN4212 or DTC124ES

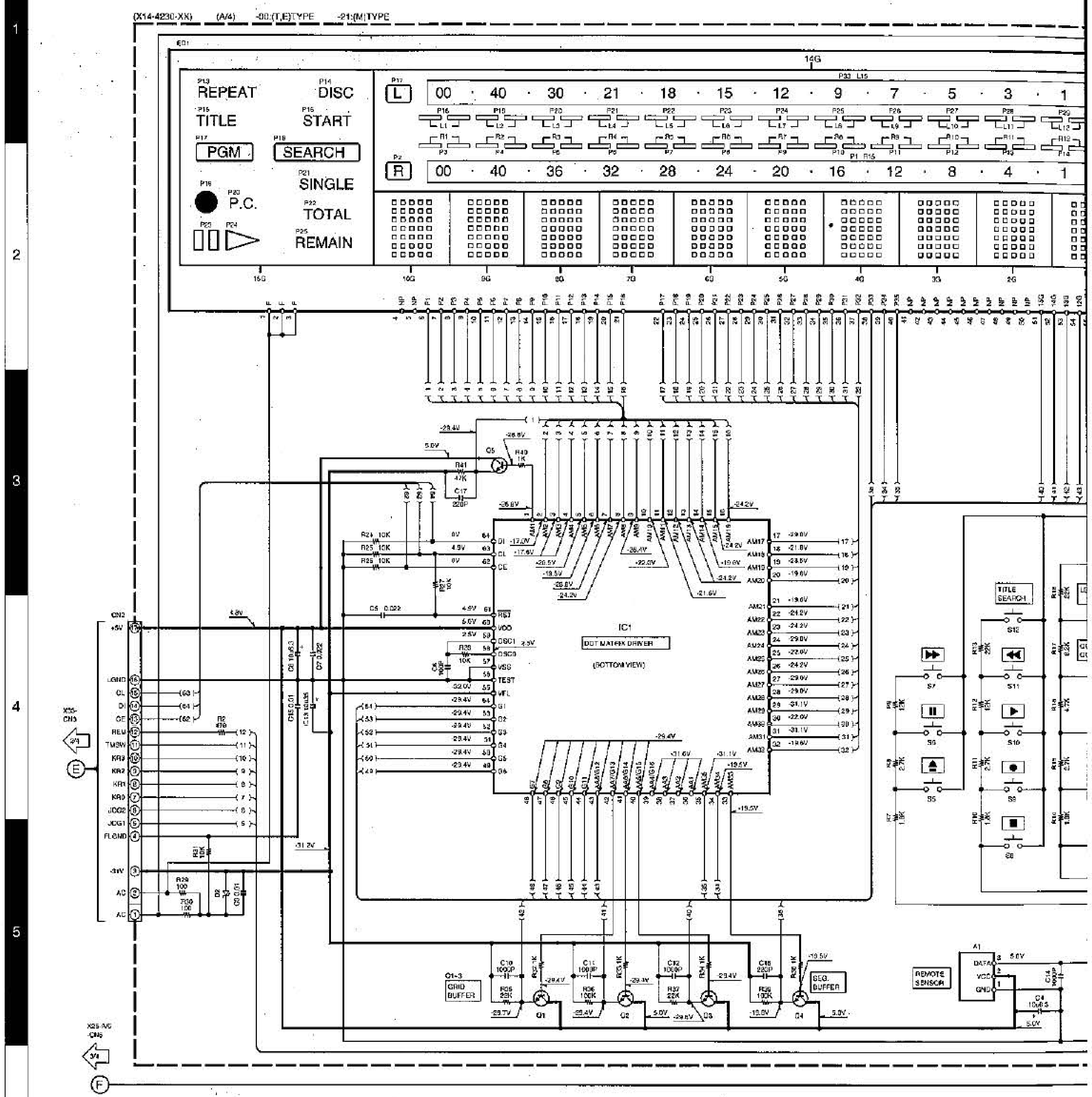
D1,4,5,13-16,39 : S5688B or 1SR139-100
D2 : RD18ES(B) or HZS18N(B)
D3 : D3SBA20F03 or RBV-402LFA
D6 : DTZ2.7(B)
D7,9-12,17-20,24,25,28-32,35-37
: 1SS133 or HSS104
D8 : RD5.6ES(B2) or HZS5.6N(B2)
D23,34 : RD6.1JS(B2) or HZS6.1S(B2)
D33 : RD15ES(B2) or HZS15N(B2)
D39 : RD8.2ES(B2) or HZS8.2N(B2)

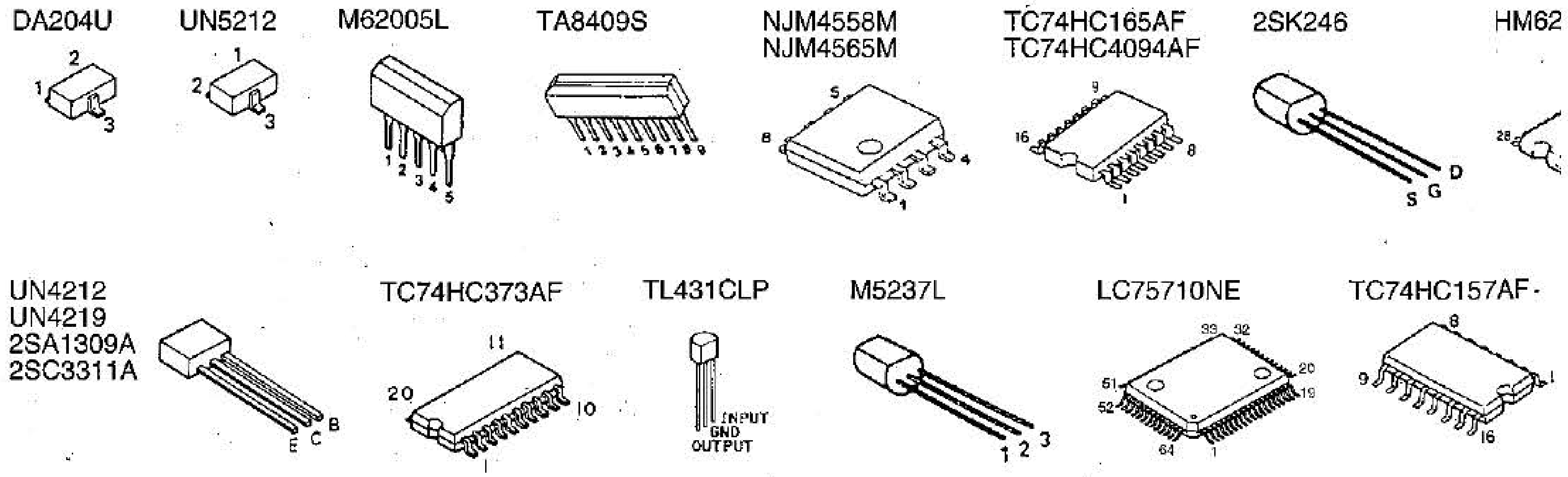
A2 : W02-1181-05
A3 : W02-1114-05


PLAY (ANALOG)
PLAY (DIGITAL)
RECORDING (ANALOG)
REC (DIGITAL)
GND LINE
+B LINE
-B LINE


5V AVR
IC7
CN6
X14-C/4 -E1
4/4
F
Q14

DM-7090(M) (3/4)


(X14-4230-XX) (A/4) -00:(T,E)TYPE -21:(M)TYPE
REPEAT
DISC
TITLE
START
PGM
SEARCH
SINGLE
P.C.
TOTAL
REMAIN
L
R
IC1
DOT MATRIX DRIVER
(BOTTOM VIEW)
TITLE SEARCH
GRID BUFFER
SEG. BUFFER
REMOTE SENSOR
X25-CN5
X25-IVC (CN6)
3/4
F


DA204U
UN5212
M62005L
TA8409S
NJM4558M
NJM4565M
TC74HC165AF
TC74HC4094AF
2SK246
HM62
UN4212
UN4219
2SA1309A
2SC3311A
TC74HC373AF
TL431CLP
INPUT
GND
OUTPUT
M5237L
LC75710NE
TC74HC157AF

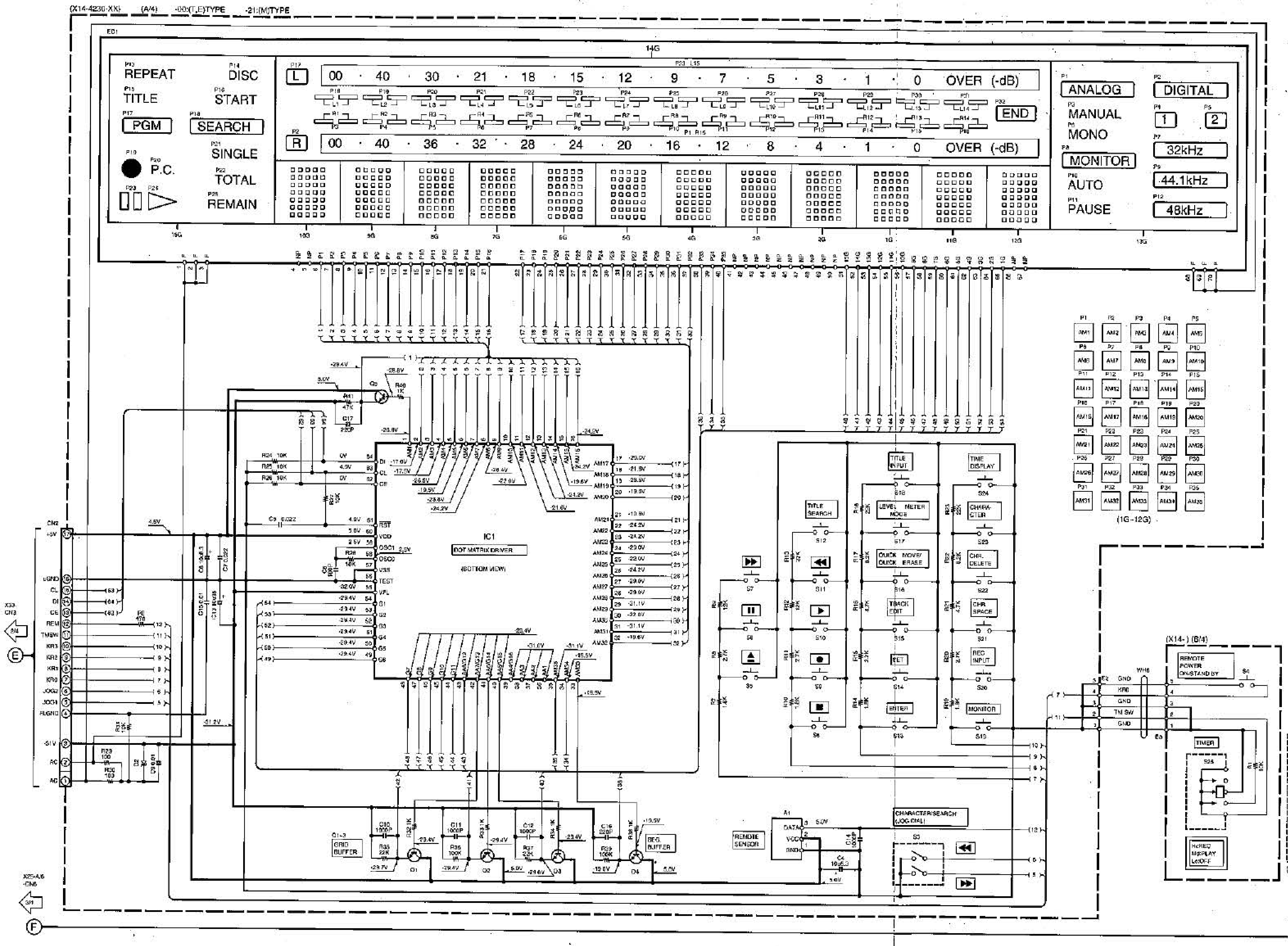
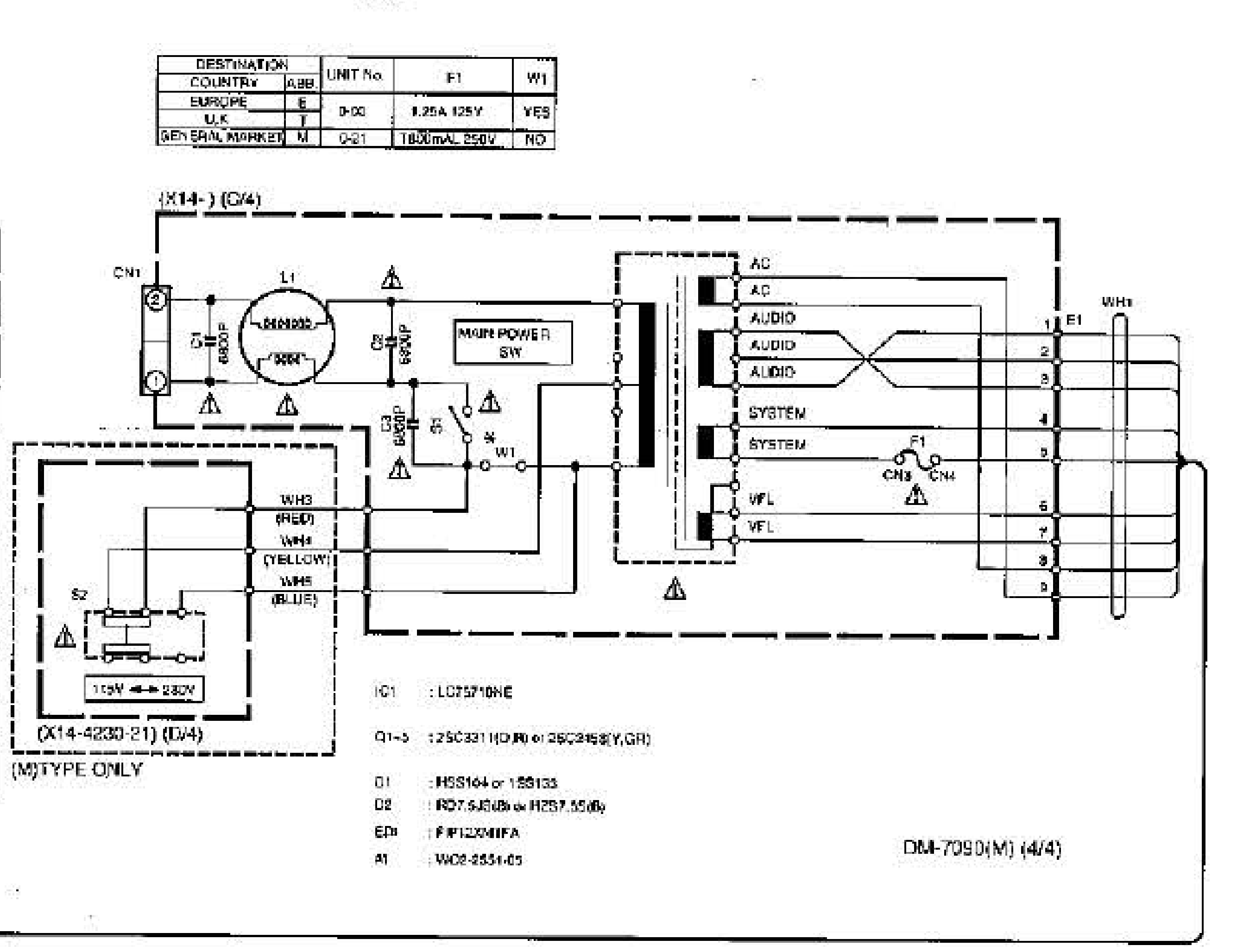
Y22-4652-71

DM-7090

KENWOOD

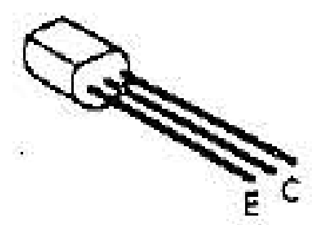
***CAUTION:** For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). ⚠ indicates safety critical components. For continued protection against risk of fire, replace only with same type and rating fuse(s). To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.*

The DC voltage is an actual reading measured with a high impedance type voltmeter. The measurement value may vary depending on the measuring instruments used or on the product. Refer to the voltage during RECORDABLE MD PLAY unless otherwise specified; The value shown in ( ) is the voltage measured at the moment of STOP. The voltage followed by (REC) refers to the value during MD RECORDING.

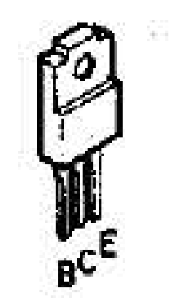


(X14-4230-XX) (A/4) -00:(T,E)TYPE -21:(M)TYPE
ED1
14G
REPEAT
DISC
TITLE
START
PGM
SEARCH
SINGLE
P.C.
TOTAL
REMAIN
L
00 · 40 · 30 · 21 · 18 · 15 · 12 · 9 · 7 · 5 · 3 · 1 · 0 OVER (-dB)
R
00 · 40 · 36 · 32 · 28 · 24 · 20 · 16 · 12 · 8 · 4 · 1 · 0 OVER (-dB)
END
ANALOG
DIGITAL
MANUAL
MONO
1
2
32kHz
MONITOR
44.1kHz
AUTO
PAUSE
48kHz
(1G~12G)
IC1
DOT MATRIX DRIVER
(BOTTOM VIEW)
CN2
CN3
X33
TITLE SEARCH
TITLE INPUT
LEVEL METER MODE
TIME DISPLAY
CHARACTER
QUICK MOVE/QUICK ERASE
CHR. DELETE
TRACK EDIT
CHR. SPACE
SET
REC INPUT
ENTER
MONITOR
REMOTE SENSOR
CHARACTER/SEARCH (JOG-DIAL)
GRID BUFFER
REG. BUFFER
(X14-) (B/4)
REMOTE POWER ON/STAND BY
TIMER
HI-REC MD PLAY LevOFF
(X14-) (C/4)
MAIN POWER SW
(X14-4230-21) (D/4)
(M)TYPE ONLY
115V ⟷ 230V
GND LINE
+B LINE
-B LINE
IC1 : LC75710NE
Q1~3 : 2SC3311(Q,R) or 2SC3458(Y,GR)
D1 : HSS104 or 1SS133
D2 : RD7.5(B) or RD7.5E(B)
ED1 : FIP12X4FA
A1 : W02-2531-05
DM-7090(M) (4/4)

DESTINATION COUNTRY		UNIT No.	F1	W1
EUROPE	E	0-00	1.25A 125V	YES
U.K.				
GENERAL MARKET	M	0-21	T500mAL 250V	NO

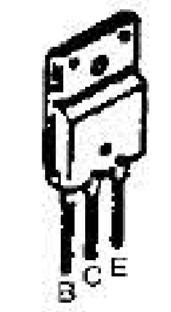
2SA954
2SC1845
2SC1923



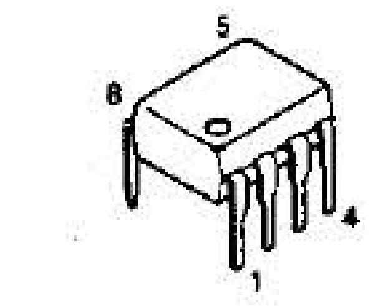
2SB1370
2SD2061



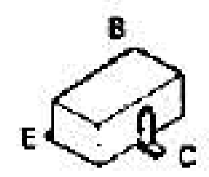
2SB1375
2SD2012



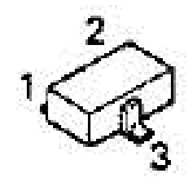
NJM4580E



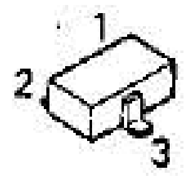
DTA123JU
DTA124EU
DTA144EU
DTC124EU
DTC144EU



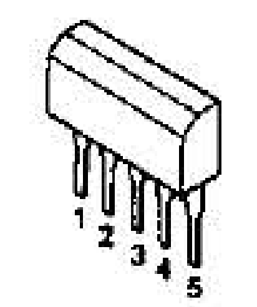
DA204U



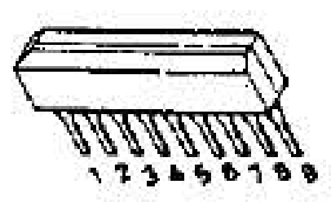
UN5212



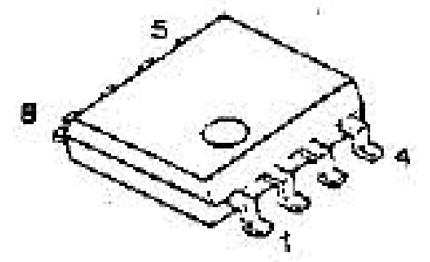
M62005L



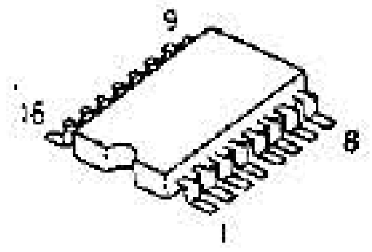
TA8409S



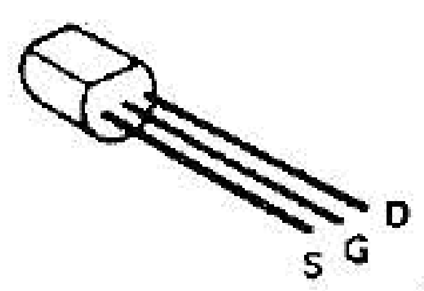
NJM4558M
NJM4565M



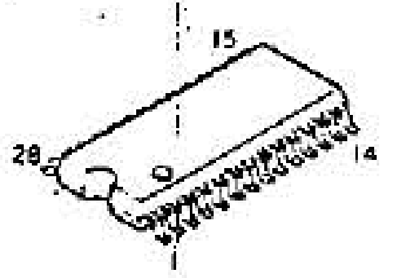
TC74HC165AF
TC74HC4094AF



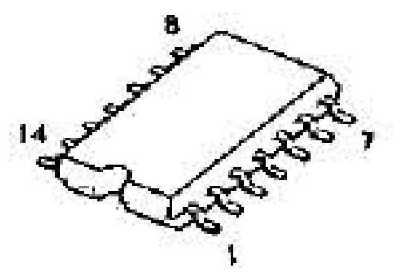
2SK246



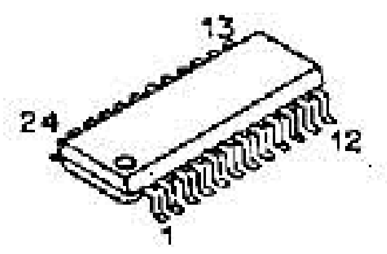
HM62256BLFP12T



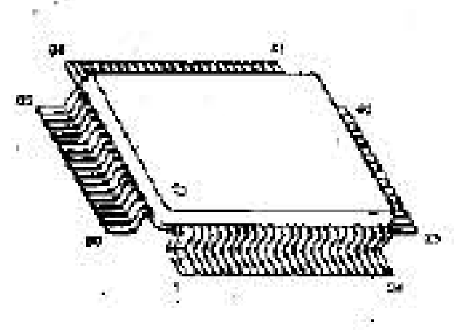
TC74HCU04AF
TC74HC74AF



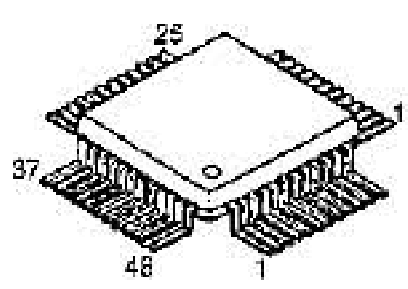
AK4320-VM



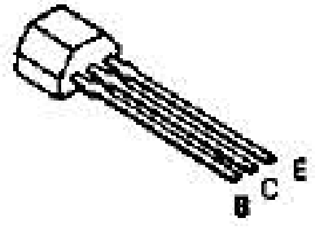
TC7SU04F



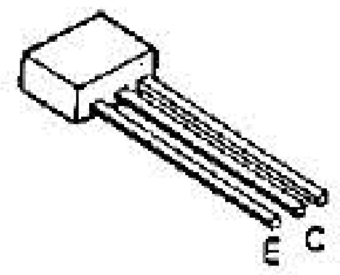
LC8904Q



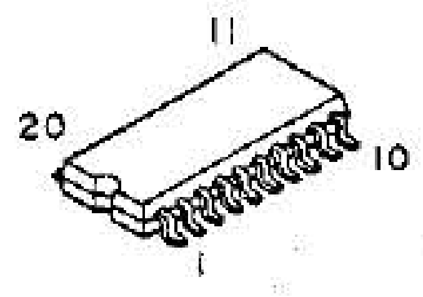
DTA143TS
DTC124ES
UN4116
2SA1048
2SC2458



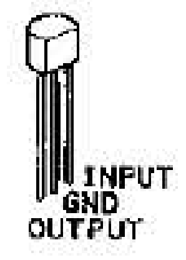
UN4212
UN4219
2SA1309A
2SC3311A



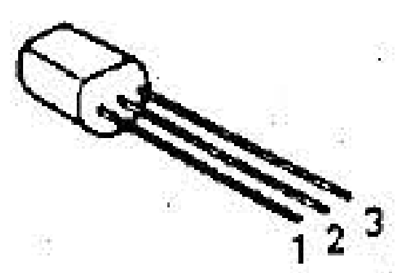
TC74HC373AF



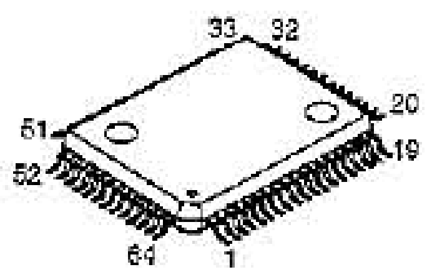
TL431CLP


INPUT
GND
OUTPUT

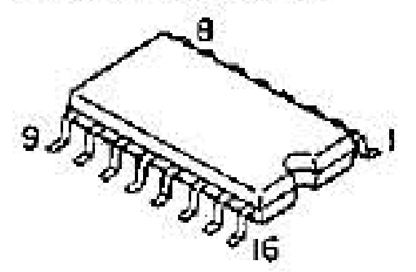
M5237L



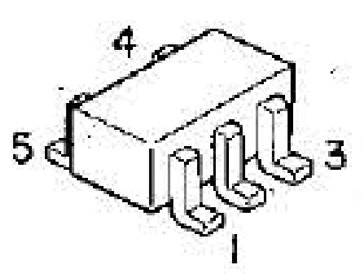
LC75710NE


33 32
51
52
20
19
64 1

TC74HC157AF



TC7SU04FU-TE85L



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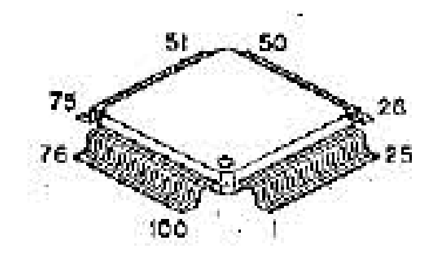
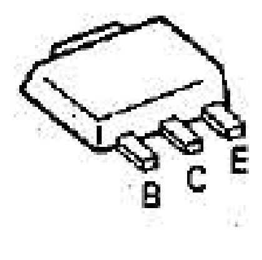
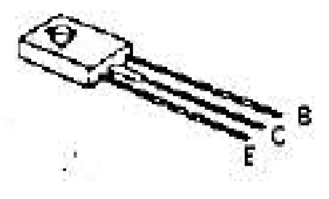

51 50
75
76
26
25
100 1

2SB798-DL



2SB772

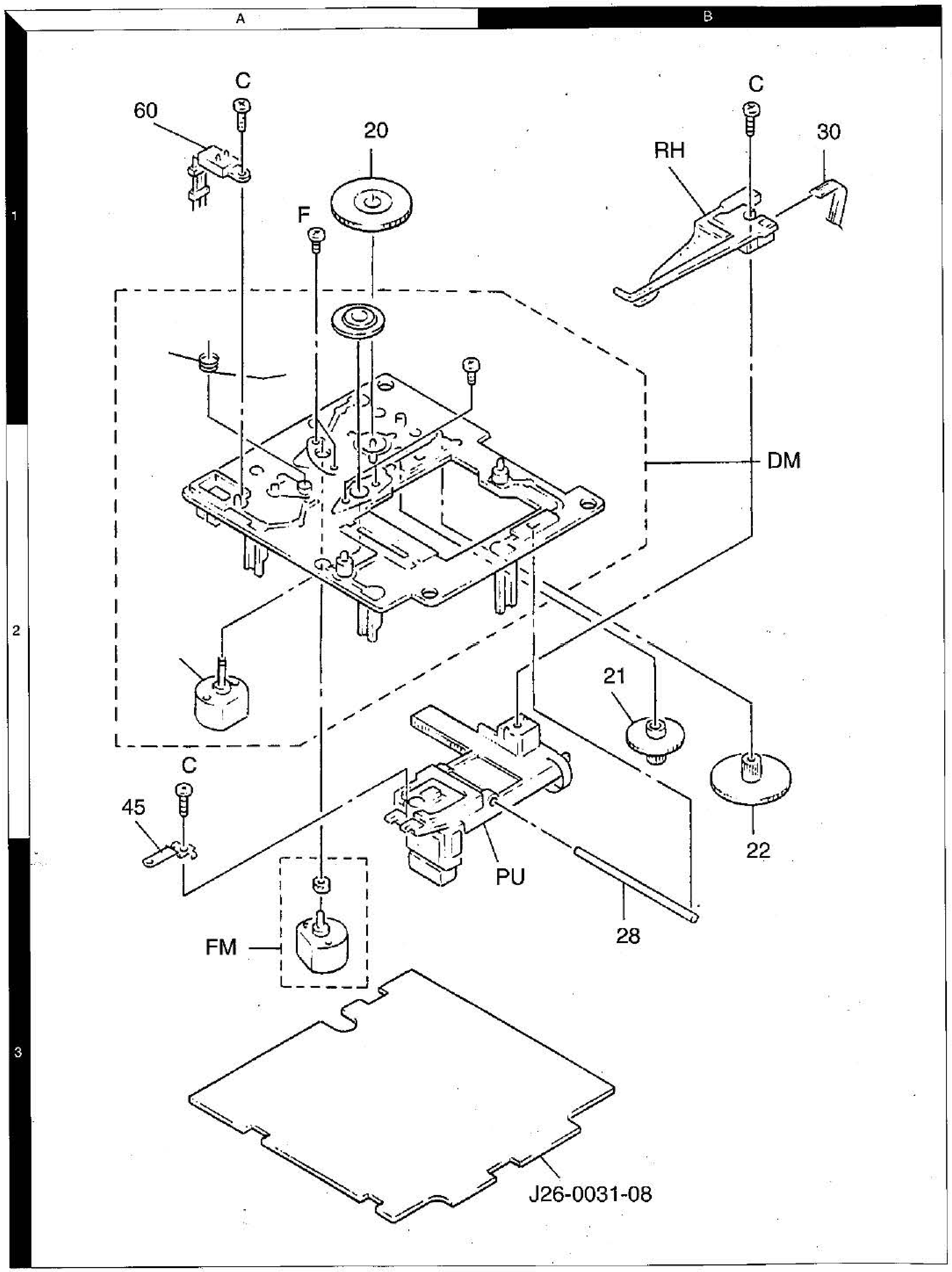


DM-7090

Y22-4652-71

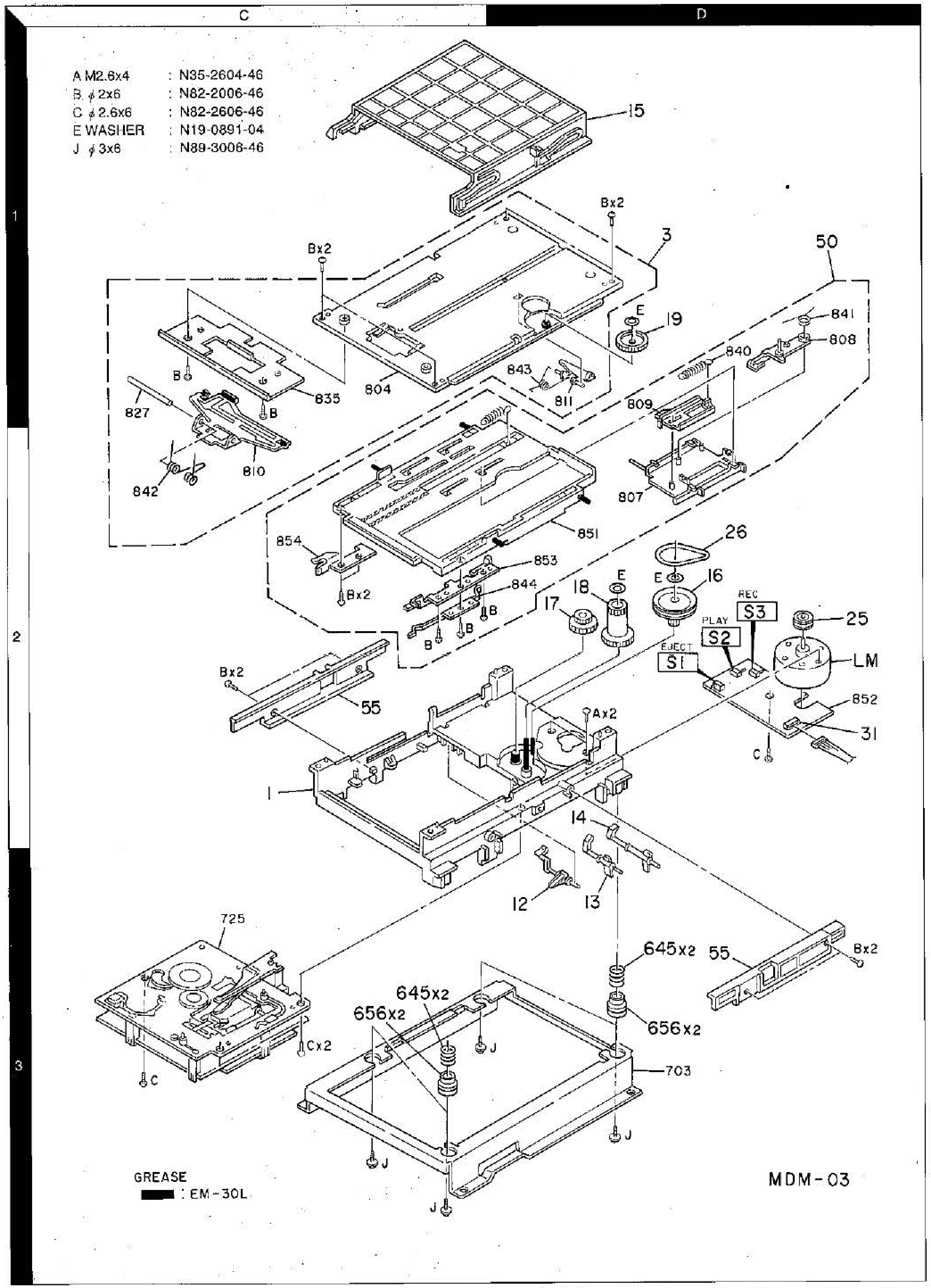
KENWOOD

EXPLODED VIEW (MD MECHANISM)


A
B
1
2
3
C
60
20
C
RH
30
F
DM
21
22
C
45
PU
28
FM
J26-0031-08

Parts with the exploded numbers larger than 700 are not supplied.

EXPLODED VIEW (MD MECHANISM)


A M2.6x4 : N35-2604-46
B. ϕ 2x6 : N82-2006-46
C ϕ 2.6x6 : N82-2606-46
E WASHER : N19-0891-04
J ϕ 3x6 : N89-3006-46

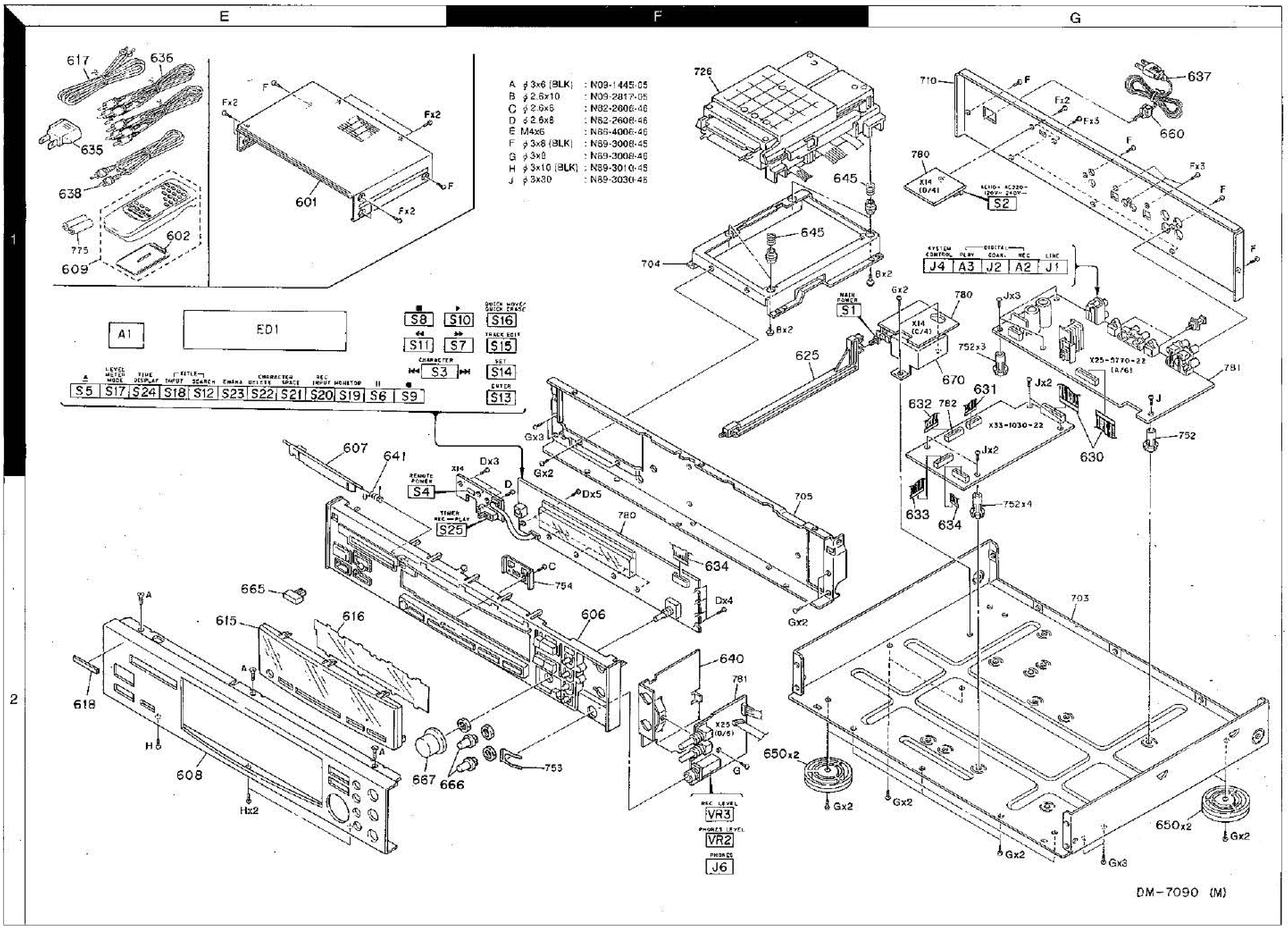
GREASE
▬ : EM-30L

C
D
1
2
3
15
Bx2
3
50
Bx2
E
19
841
808
840
B
835
804
843
811
809
827
B
810
842
807
26
854
851
853
E
16
Bx2
844
18
E
REC
B
B
B
17
PLAY
S3
25
EJECT
S2
S1
LM
Bx2
852
55
Ax2
31
C
1
14
12
13
725
645x2
55
Bx2
645x2
656x2
656x2
Cx2
J
C
703
J
J
J
MDM-03

Parts with the exploded numbers larger than 700 are not supplied.

DM-7090

EXPLODED VIEW (UNIT)


E
F
G
1
2
A φ3x6 (BLK) : N09-1445-05
B φ2.6x10 : N09-2817-05
C φ2.6x6 : N82-2606-46
D φ2.6x8 : N82-2608-46
E M4x6 : N86-4006-46
F φ3x8 (BLK) : N89-3008-45
G φ3x8 : N89-3008-46
H φ3x10 (BLK) : N89-3010-45
J φ3x30 : N89-3030-46
601
602
606
607
608
609
615
616
617
618
625
630
631
632
633
634
635
636
637
638
640
641
645
650x2
660
665
666
667
670
703
704
705
710
726
752
752x3
752x4
753
754
775
780
781
782
A1
ED1
S1
S2
S3
S4
S5
S6
S7
S8
S9
S10
S11
S12
S13
S14
S15
S16
S17
S18
S19
S20
S21
S22
S23
S24
S25
J1
J2
J3
J4
A2
A3
VR2
VR3
J6
X14 (0/4)
X14 (C/4)
X25-5770-22 (A/6)
X25 (0/6)
X33-1030-22
Fx2
Fx3
Gx2
Gx3
Hx2
Jx2
Jx3
Bx2
Dx3
Dx4
Dx5
DM-7090 (M)

Parts with the exploded numbers larger than 700 are not supplied.

DM-7090

PARTS LIST

* New Parts
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

❶

Ref. No	Add-ress	New Parts	Parts No.	Description	Desti-nation	Re-marks
				DM-7090		
601	1E	*	A01-3369-01	METALLIC CABINET		
602	1E		A09-0362-08	BATTERY COVER (for RC-M0500)		
606	2E,2F	*	A22-1747-01	SUB PANEL		
607	2E		A29-0811-14	PANEL		
608	2E	*	A60-0935-02	PANEL		
609	1E	*	A70-1075-05	REMOTE CONTROLLER (RC-M0500)		
615	1E	*	B10-2248-03	FRONT GLASS		
616	1E	*	B11-0336-03	COLOR FILTER		
617	1E		B19-1529-05	OPTICAL FIBER		
618	2E		B43-0302-04	KENWOOD BADGE		
-			B46-0310-03	WARRANTY CARD	TE	
-		*	B58-0965-13	CAUTION CARD (PL SENTENCE)	T	
-		*	B58-0966-13	CAUTION CARD (PL SENTENCE)	ME	
-		*	B60-2786-00	INSTRUCTION MANUAL	MT	
-		*	B60-2787-00	INSTRUCTION MANUAL	E	
-		*	B60-2788-00	INSTRUCTION MANUAL	E	
-		*	B60-2789-00	INSTRUCTION MANUAL	ME	
-		*	B60-2865-00	INSTRUCTION MANUAL	M	
-		*	B60-2866-00	INSTRUCTION MANUAL	M	
625,	1F		D21-1820-13	EXTENSION SHAFT		
630	1G		E31-7699-05	WIRING HARNESS		
631	1G		E35-1220-05	WIRING HARNESS		
632	1G		E35-1221-15	FLAT CABLE		
633	1G		E35-1222-05	FLAT CABLE		
634	2F,2G	*	E35-1486-05	FLAT CABLE		
⚠ 635	1E		E03-0115-05	AC PLUG ADAPTER	M	
636	1E		E30-0505-05	AUDIO CORD		
⚠ 637	1G		E30-2592-15	AC POWER CORD	ME	
⚠ 637	1G		E30-2721-05	AC POWER CORD	T	
638	1E		E30-2733-05	CORD WITH PLUG		
641	2E		G01-3845-04	TORSION COIL SPRING		
645	1F		G01-3859-04	COMPRESSION SPRING		
-			H10-7111-12	POLYSTYRENE FOAMED FIXTURE		
-			H10-7112-12	POLYSTYRENE FOAMED FIXTURE		
-		*	H12-2301-04	PACKING FIXTURE	T	
-			H20-0568-04	PROTECTION COVER	M	
-			H25-0232-04	PROTECTION BAG (235X350X0.03)	ME	
-			H25-0368-04	PROTECTION BAG	TE	
-			H25-0651-04	PROTECTION BAG	T	
-		*	H50-2027-04	ITEM CARTON CASE	ME	
-		*	H50-2057-04	ITEM CARTON CASE	T	
650	2F,2G		J02-1149-05	FOOT		
⚠ 660	1G		J42-0083-05	POWER CORD BUSHING		
-			J02-1150-04	INSULATOR (SI 60°)		
-		*	J21-6340-04	MOUNTING HARDWARE ASSY		
-			J61-0307-05	WIRE BAND		
665	2E		K27-2005-04	KNOB (BUTTON)		
666	2E		K29-4332-04	KNOB		
667	2E		K29-6264-04	KNOB		
⚠ 670	1F	*	L07-2177-05	POWER TRANSFORMER	TE	
⚠ 670	1F	*	L07-2178-05	POWER TRANSFORMER	M	

L : Scandinavia **K** : USA **P** : Canada **R** : Mexico
Y : PX(Far East, Hawaii) **T** : Europe **E** : Europe **G** : Germany
Y : AAFES(Europe) **X** : Australia **M** : Other Areas

⚠ indicates safety critical components.

* New Parts
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

❷

Ref. No	Add-ress	New Parts	Parts No.	Description	Desti-nation	Re-marks
				DISPLAY (X14-4232-71)		
⚠ C1 -3			C91-1488-05	MF 6800PF 250VAC		
C4			C90-3209-05	ELECTRO 10UF 6.3WV		
C5			C91-0085-05	CERAMIC 0.022UF N		
C6			C91-0745-05	CERAMIC 100PF K		
C7			C91-0085-05	CERAMIC 0.022UF N		
C8			C90-3209-05	ELECTRO 10UF 6.3WV		
C9			CK45FF1H103Z	CERAMIC 0.010UF Z		
C10 -12			CK45FB1H102K	CERAMIC 1000PF K		
C13			C90-3244-05	ELECTRO 10UF 35WV		
C14			CK45FB1H102K	CERAMIC 1000PF K		
C15			CK45FF1H103Z	CERAMIC 0.010UF Z		
C16 ,17			CC45FCH1H221J	CERAMIC 220PF J		
CN1			E40-4245-05	PIN ASSY		
CN2			E40-4942-05	FLAT CABLE CONNECTOR		
⚠ F2 F1			F05-~~5016~~-05 8013	FUSE (SEMKO) (250V T~~500M~~A) 800mA		
			J19-5690-03	HOLDER		
CN3 ,4			J13-0075-05	FUSE CLIP		
L1			L79-0733-05	LINE FILTER		
⚠ S1			S40-1153-05	PUSH SWITCH		
⚠ S2			S62-0001-05	SLIDE SWITCH	M	
S4 -24			S70-0031-05	TACT SWITCH		
S25			S31-1036-05	SLIDE SWITCH		
S3			T99-0537-05	ROTARY ENCODER		
D1			HSS104	DIODE		
D1			1SS133	DIODE		
D2			HZS7.5S(B)	ZENER DIODE		
D2			RD7.5JS(B)	ZENER DIODE		
ED1			FIP12XM1FA	INDICATOR TUBE		
IC1			LC75710NE	MOS-IC		
Q1 -5			2SC2458(Y,GR)	TRANSISTOR		
Q1 -5			2SC3311A(Q,R)	TRANSISTOR		
A1			W02-2551-05	ELECTRIC CIRCUIT MODULE		
				POWER (X25-5770-01)		
C3 -6			CK73FB1H103K	CHIP C 0.010UF K		
C7			CE04KW1H101M	ELECTRO 100UF 50WV		
C8 ,9			CE04KW1H100M	ELECTRO 10UF 50WV		
C10			CE04KW1C472M	ELECTRO 4700UF 16WV		
C11			CE04KW1C221M	ELECTRO 220UF 16WV		
C12			CE04KW1C220M	ELECTRO 22UF 16WV		
C13			CE04KW1A101M	ELECTRO 100UF 10WV		
C14			CF92FV1H334J	MF-C 0.33UF J		
C15			C90-3542-05	SUPER-C 1.0F 5.5WV		
C16			CE04HW1H2R2M	NP-ELEC 2.2UF 50WV		
C17			CE04KW1A102M	ELECTRO 1000UF 10WV		
C18			CE04KW1H100M	ELECTRO 10UF 50WV		
C19			CE04KW0J471M	ELECTRO 470UF 6.3WV		
C20			CE04KW1A101M	ELECTRO 100UF 10WV		
C21 ,22			CE04KW1C471M	ELECTRO 470UF 16WV		

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Ref. No	Add-ress	New Parts	Parts No.	Description	Desti-nation	Re-marks
C25 ,26			CE04KW1A101M	ELECTRO 100UF 10WV		
C27			CK73FB1E104K	CHIP C 0.10UF K		
C28			CK73FB1H103K	CHIP C 0.010UF K		
C31			CE04KW1A101M	ELECTRO 100UF 10WV		
C32 ,33			CK73FB1E104K	CHIP C 0.10UF K		
C34			CE04KW1A101M	ELECTRO 100UF 10WV		
C35 ,36			CE04KW1H220M	ELECTRO 22UF 50WV		
C37			CE04KW1A470M	ELECTRO 47UF 10WV		
C38			CK73FB1E104K	CHIP C 0.10UF K		
C43 ,44			CQ93FMG1H392J	MYLAR 3900PF J		
C45 ,46			CQ93FMG1H681J	MYLAR 680PF J		
C47 ,48			CE04KW1H220M	ELECTRO 22UF 50WV		
C49 ,50			CQ93FMG1H471J	MYLAR 470PF J		
C51 ,52			CE04KW1C220M	ELECTRO 22UF 16WV		
C53 -56			CF92FV1H101K	MF-C 100PF K		
C57			CQ93FMG1H103J	MYLAR 0.010UF J		
C59 ,60			CF92FV1H101K	MF-C 100PF K		
C61 ,62			CQ93FMG1H121K	MYLAR 120PF K		
C63 ,64			CQ93FMG1H331K	MYLAR 330PF K		
C65 -68			CE04KW1C220M	ELECTRO 22UF 16WV		
C69 ,70			CQ93FMG1H332J	MYLAR 3300PF J		
C71 -74			CC45FSL1H101J	CERAMIC 100PF J		
C75 ,76			CE04KW1A101M	ELECTRO 100UF 10WV		
C77 ,78			CK73FB1E104K	CHIP C 0.10UF K		
C79			CE04KW1C220M	ELECTRO 22UF 16WV		
C80			CK73FB1E104K	CHIP C 0.10UF K		
C81			CE04KW0J331M	ELECTRO 330UF 6.3WV		
C82			CK73FB1H103K	CHIP C 0.010UF K		
C83			CK73FB1E104K	CHIP C 0.10UF K		
C84			CK73FB1H103K	CHIP C 0.010UF K		
C85 -88			CC73FSL1H101J	CHIP C 100PF J		
C89			CE04KW0J331M	ELECTRO 330UF 6.3WV		
C90			CE04KW1A101M	ELECTRO 100UF 10WV		
C91			CC73FCH1H270J	CHIP C 27PF J		
C92			CC73FCH1H180J	CHIP C 18PF J		
C93			CC73FSL1H102J	CHIP C 1000PF J		
C94			CE04KW0J331M	ELECTRO 330UF 6.3WV		
C95			CK73FB1E104K	CHIP C 0.10UF K		
C96			CC73FSL1H220J	CHIP C 22PF J		
C98			CK73FB1C224K	CHIP C 0.22UF K		
C100			CC73FSL1H220J	CHIP C 22PF J		
C101			CE04KW1A470M	ELECTRO 47UF 10WV		
C102			CK73FB1H103K	CHIP C 0.010UF K		
C103			CK73FB1E104K	CHIP C 0.10UF K		
C104			CE04KW1A470M	ELECTRO 47UF 10WV		
C105			CK73FB1E104K	CHIP C 0.10UF K		
C106			CK73FB1H103K	CHIP C 0.010UF K		
C107			CE04KW1A101M	ELECTRO 100UF 10WV		
C108			CK73FB1E104K	CHIP C 0.10UF K		
C109			CK73FB1H103K	CHIP C 0.010UF K		
C110-112			CK73FB1E104K	CHIP C 0.10UF K		
C115			CQ93FMG1H103J	MYLAR 0.010UF J		
C123-126			CE04KW1C220M	ELECTRO 22UF 16WV		
C127,128			CC73FSL1H471J	CHIP C 470PF J		
C129,130			CK73FB1E104K	CHIP C 0.10UF K		

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C131			CC73FSL1H100J	CHIP C 10PF J		
C132			CK73FB1H103K	CHIP C 0.010UF K		
C133			CE04KW1A101M	ELECTRO 100UF 10WV		
C134			CE04KW1H100M	ELECTRO 10UF 50WV		
C139			CC73FSL1H050C	CHIP C 5.0PF C		
C140			CE04KW1C472M	ELECTRO 4700UF 16WV		
C141			CC73FSL1H102J	CHIP C 1000PF J		
C142			CK73FB1E104K	CHIP C 0.10UF K		
C143			CK73FB1H103K	CHIP C 0.010UF K		
C144			CC73FSL1H101J	CHIP C 100PF J		
C149-152			CC45FSL1H101J	CERAMIC 100PF J		
C157			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C158			CE04KW1H100M	ELECTRO 10UF 50WV		
C159-165			CK73FB1H103K	CHIP C 0.010UF K		
C167-172			CK73FB1H103K	CHIP C 0.010UF K		
C173,174			CC73FSL1H101J	CHIP C 100PF J		
C175,176			CK73FB1H103K	CHIP C 0.010UF K		
C177,178			CC45FSL1H101J	CERAMIC 100PF J		
C179,180			CC73FSL1H101J	CHIP C 100PF J		
C181			CK73FB1H103K	CHIP C 0.010UF K		
C182			CC73FSL1H101J	CHIP C 100PF J		
C187			CC73FSL1H470J	CHIP C 47PF J		
C188-190			CC73FSL1H101J	CHIP C 100PF J		
C191,192			CC73FSL1H221J	CHIP C 220PF J		
C193,194			CC73FSL1H101J	CHIP C 100PF J		
C195			CK73FB1H103K	CHIP C 0.010UF K		
C197			CC73FSL1H100J	CHIP C 10PF J		
C198			CC73FSL1H470J	CHIP C 47PF J		
C199			CK73FB1H103K	CHIP C 0.010UF K		
C200			CK73FB1E104K	CHIP C 0.10UF K		
C201			CE04KW1H100M	ELECTRO 10UF 50WV		
C202			CK73FB1E104K	CHIP C 0.10UF K		
C203			CQ93FMG1H103J	MYLAR 0.010UF J		
C204			CQ93FMG1H391K	MYLAR 390PF K		
C205			CK73FB1E104K	CHIP C 0.10UF K		
CN2			E40-4910-05	FLAT CABLE CONNECTOR		
CN6			E40-4298-05	FLAT CABLE CONNECTOR		
J1			E63-0121-05	PHONO JACK		
J2			E63-0174-05	PHONO JACK		
J4			E11-0188-05	MINIATURE PHONE JACK(2P)		
J6			E11-0190-05	PHONE JACK (3P)		
WH2		＊	E35-0677-05	WIRING HARNESS		
WH8		＊	E35-1630-05	WIRING HARNESS		
E5			J11-0808-05	WIRE CLAMPER		
L2			L40-1001-17	SMALL FIXED INDUCTOR(10UH,K)		
L3 ,4			L92-0131-05	FERRITE CORE		
L5 ,6			L79-1216-05	LINE FILTER		
L7 -9			L92-0131-05	FERRITE CORE		
X1			L77-1124-05	CRYSTAL RESONATOR		
R1			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R2			RK73FB2A182J	CHIP R 1.8K J 1/10W		
R3			RK73FB2A681J	CHIP R 680 J 1/10W		
R4			RK73FB2A101J	CHIP R 100 J 1/10W		
R5			RK73FB2A911J	CHIP R 910 J 1/10W		

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R6			RK73FB2A101J	CHIP R 100 J 1/10W		
R7			RK73FB2A221J	CHIP R 220 J 1/10W		
R8			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R9			RK73FB2A123J	CHIP R 12K J 1/10W		
R10			RK73FB2A392J	CHIP R 3.9K J 1/10W		
R12			RK73FB2A101J	CHIP R 100 J 1/10W		
R13			RN14BK2C1621F	RN 1.62K F 1/6W		
R14			RN14BK2C1501F	RN 1.50K F 1/6W		
R15 ,16			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R17 ,18			RS14KB3A1R0J	FL-PROOF RS 1 J 1W		
R19 ,20			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R21			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R22			RK73FB2A105J	CHIP R 1.0M J 1/10W		
R51 ,52			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R73			RK73FB2A103J	CHIP R 10K J 1/10W		
R74 -76			RK73FB2A100J	CHIP R 10 J 1/10W		
R77			RK73FB2A391J	CHIP R 390 J 1/10W		
R78 ,79			RK73FB2A103J	CHIP R 10K J 1/10W		
R80			RK73FB2A681J	CHIP R 680 J 1/10W		
R81 ,82			RK73FB2A104J	CHIP R 100K J 1/10W		
R83			RK73FB2A103J	CHIP R 10K J 1/10W		
R84			RK73FB2A331J	CHIP R 330 J 1/10W		
R85 ,86			RK73FB2A151J	CHIP R 150 J 1/10W		
R87			RK73FB2A150J	CHIP R 15 J 1/10W		
R88			RK73FB2A221J	CHIP R 220 J 1/10W		
R89 ,90			RK73FB2A151J	CHIP R 150 J 1/10W		
R116			RK73FB2A100J	CHIP R 10 J 1/10W		
R131			RK73FB2A101J	CHIP R 100 J 1/10W		
R138			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R151			RK73FB2A152J	CHIP R 1.5K J 1/10W		
R152			RK73FB2A471J	CHIP R 470 J 1/10W		
R153,154			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R155			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R158			RK73FB2A391J	CHIP R 390 J 1/10W		
R159			RK73FB2A100J	CHIP R 10 J 1/10W		
R160,161			RK73FB2A104J	CHIP R 100K J 1/10W		
R162			RK73FB2A162J	CHIP R 1.6K J 1/10W		
R163			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R164			RK73FB2A101J	CHIP R 100 J 1/10W		
R165			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R166			RK73FB2A622J	CHIP R 6.2K J 1/10W		
R167			RK73FB2A104J	CHIP R 100K J 1/10W		
R168			RK73FB2A103J	CHIP R 10K J 1/10W		
R169			RK73FB2A220J	CHIP R 22 J 1/10W		
R170			RK73FB2A272J	CHIP R 2.7K J 1/10W		
R171			RK73FB2A223J	CHIP R 22K J 1/10W		
R172			RK73FB2A103J	CHIP R 10K J 1/10W		
VR2 ,3			R10-4049-05	POTENTIOMETER		
D1			S5688B	DIODE		
D1			1SR139-100	DIODE		
D2			HZS18N(B)	ZENER DIODE		
D2			RD18ES(B)	ZENER DIODE		
⚠ D3			D3SBA20F03	DIODE		
⚠ D3			RBV-402LFA	DIODE		
⚠ D4 ,5			S5688B	DIODE		

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⚠ D4 ,5			1SR139-100	DIODE		
D6			DTZ2.7(B)	ZENER DIODE		
D7			HSS104	DIODE		
D7			1SS133	DIODE		
D8			HZS5.6N(B2)	ZENER DIODE		
D8			RD5.6ES(B2)	ZENER DIODE		
D9 -12			HSS104	DIODE		
D9 -12			1SS133	DIODE		
⚠ D13 -16			S5688B	DIODE		
⚠ D13 -16			1SR139-100	DIODE		
D17 -20			HSS104	DIODE		
D17 -20			1SS133	DIODE		
D23			HZS5.1S(B2)	ZENER DIODE		
D23			RD5.1JS(B2)	ZENER DIODE		
D24 ,25			HSS104	DIODE		
D24 ,25			1SS133	DIODE		
D28 -32			HSS104	DIODE		
D28 -32			1SS133	DIODE		
D33			HZS15N(B2)	ZENER DIODE		
D33			RD15ES(B2)	ZENER DIODE		
D34			HZS5.1S(B2)	ZENER DIODE		
D34			RD5.1JS(B2)	ZENER DIODE		
D35 -37			HSS104	DIODE		
D35 -37			1SS133	DIODE		
D38			S5688B	DIODE		
D38			1SR139-100	DIODE		
D39			HZS6.2N(B2)	ZENER DIODE		
D39			RD6.2ES(B2)	ZENER DIODE		
IC1		＊	AK5340-VS*1	MOS-IC		
IC2		＊	AK4320-VM	MOS-IC		
IC3			NJM4558M	IC(OP AMP X2)		
IC4			PST993D-T	ANALOGUE IC		
IC5			M62005L	MOS-IC		
IC6			M5237L	ANALOGUE IC		
IC7			TL431CLP	MOS-IC		
IC8			TC74HCU04AF	IC(HEX INVERTER SMD)		
IC9 -12			NJM4565M	IC(OP AMP X2)		
IC14			NJM4580E	ANALOGUE IC		
IC15			TC74HC74AF	IC(DUAL D-TYPE FLIP FLOP)		
Q1			2SD2012	TRANSISTOR		
Q1			2SD2061	TRANSISTOR		
Q2			2SB1370	TRANSISTOR		
Q2			2SB1375	TRANSISTOR		
Q3			2SD2012	TRANSISTOR		
Q3			2SD2061	TRANSISTOR		
Q4			2SK246(Y,GR)	FET		
Q5			2SD2012	TRANSISTOR		
Q5			2SD2061	TRANSISTOR		
Q6			2SB772	TRANSISTOR		
Q9 ,10			2SD1450(S,T)	TRANSISTOR		
Q11			DTA143TS	DIGITAL TRANSISTOR		
Q11			UN4116	DIGITAL TRANSISTOR		
Q12			2SC1923(R,O)	TRANSISTOR		
Q13			DTC113ZS	DIGITAL TRANSISTOR		
Q13			UN4219	DIGITAL TRANSISTOR		

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R6			RK73FB2A101J	CHIP R 100 J 1/10W		
R7			RK73FB2A221J	CHIP R 220 J 1/10W		
R8			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R9			RK73FB2A123J	CHIP R 12K J 1/10W		
R10			RK73FB2A392J	CHIP R 3.9K J 1/10W		
R12			RK73FB2A101J	CHIP R 100 J 1/10W		
R13			RN14BK2C1621F	RN 1.62K F 1/6W		
R14			RN14BK2C1501F	RN 1.50K F 1/6W		
R15 ,16			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R17 ,18			RS14KB3A1R0J	FL-PROOF RS 1 J 1W		
R19 ,20			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R21			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R22			RK73FB2A105J	CHIP R 1.0M J 1/10W		
R51 ,52			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R73			RK73FB2A103J	CHIP R 10K J 1/10W		
R74 -76			RK73FB2A100J	CHIP R 10 J 1/10W		
R77			RK73FB2A391J	CHIP R 390 J 1/10W		
R78 ,79			RK73FB2A103J	CHIP R 10K J 1/10W		
R80			RK73FB2A681J	CHIP R 680 J 1/10W		
R81 ,82			RK73FB2A104J	CHIP R 100K J 1/10W		
R83			RK73FB2A103J	CHIP R 10K J 1/10W		
R84			RK73FB2A331J	CHIP R 330 J 1/10W		
R85 ,86			RK73FB2A151J	CHIP R 150 J 1/10W		
R87			RK73FB2A150J	CHIP R 15 J 1/10W		
R88			RK73FB2A221J	CHIP R 220 J 1/10W		
R89 ,90			RK73FB2A151J	CHIP R 150 J 1/10W		
R116			RK73FB2A100J	CHIP R 10 J 1/10W		
R131			RK73FB2A101J	CHIP R 100 J 1/10W		
R138			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R151			RK73FB2A152J	CHIP R 1.5K J 1/10W		
R152			RK73FB2A471J	CHIP R 470 J 1/10W		
R153,154			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R155			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R158			RK73FB2A391J	CHIP R 390 J 1/10W		
R159			RK73FB2A100J	CHIP R 10 J 1/10W		
R160,161			RK73FB2A104J	CHIP R 100K J 1/10W		
R162			RK73FB2A162J	CHIP R 1.6K J 1/10W		
R163			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R164			RK73FB2A101J	CHIP R 100 J 1/10W		
R165			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R166			RK73FB2A622J	CHIP R 6.2K J 1/10W		
R167			RK73FB2A104J	CHIP R 100K J 1/10W		
R168			RK73FB2A103J	CHIP R 10K J 1/10W		
R169			RK73FB2A220J	CHIP R 22 J 1/10W		
R170			RK73FB2A272J	CHIP R 2.7K J 1/10W		
R171			RK73FB2A223J	CHIP R 22K J 1/10W		
R172			RK73FB2A103J	CHIP R 10K J 1/10W		
VR2 ,3			R10-4049-05	POTENTIOMETER		
D1			S5688B	DIODE		
D1			1SR139-100	DIODE		
D2			HZS18N(B)	ZENER DIODE		
D2			RD18ES(B)	ZENER DIODE		
⚠ D3			D3SBA20F03	DIODE		
⚠ D3			RBV-402LFA	DIODE		
⚠ D4 ,5			S5688B	DIODE		

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⚠ D4 ,5			1SR139-100	DIODE		
D6			DTZ2.7(B)	ZENER DIODE		
D7			HSS104	DIODE		
D7			1SS133	DIODE		
D8			HZS5.6N(B2)	ZENER DIODE		
D8			RD5.6ES(B2)	ZENER DIODE		
D9 -12			HSS104	DIODE		
D9 -12			1SS133	DIODE		
⚠ D13 -16			S5688B	DIODE		
⚠ D13 -16			1SR139-100	DIODE		
D17 -20			HSS104	DIODE		
D17 -20			1SS133	DIODE		
D23			HZS5.1S(B2)	ZENER DIODE		
D23			RD5.1JS(B2)	ZENER DIODE		
D24 ,25			HSS104	DIODE		
D24 ,25			1SS133	DIODE		
D28 -32			HSS104	DIODE		
D28 -32			1SS133	DIODE		
D33			HZS15N(B2)	ZENER DIODE		
D33			RD15ES(B2)	ZENER DIODE		
D34			HZS5.1S(B2)	ZENER DIODE		
D34			RD5.1JS(B2)	ZENER DIODE		
D35 -37			HSS104	DIODE		
D35 -37			1SS133	DIODE		
D38			S5688B	DIODE		
D38			1SR139-100	DIODE		
D39			HZS6.2N(B2)	ZENER DIODE		
D39			RD6.2ES(B2)	ZENER DIODE		
IC1		＊	AK5340-VS*1	MOS-IC		
IC2		＊	AK4320-VM	MOS-IC		
IC3			NJM4558M	IC(OP AMP X2)		
IC4			PST993D-T	ANALOGUE IC		
IC5			M62005L	MOS-IC		
IC6			M5237L	ANALOGUE IC		
IC7			TL431CLP	MOS-IC		
IC8			TC74HCU04AF	IC(HEX INVERTER SMD)		
IC9 -12			NJM4565M	IC(OP AMP X2)		
IC14			NJM4580E	ANALOGUE IC		
IC15			TC74HC74AF	IC(DUAL D-TYPE FLIP FLOP)		
Q1			2SD2012	TRANSISTOR		
Q1			2SD2061	TRANSISTOR		
Q2			2SB1370	TRANSISTOR		
Q2			2SB1375	TRANSISTOR		
Q3			2SD2012	TRANSISTOR		
Q3			2SD2061	TRANSISTOR		
Q4			2SK246(Y,GR)	FET		
Q5			2SD2012	TRANSISTOR		
Q5			2SD2061	TRANSISTOR		
Q6			2SB772	TRANSISTOR		
Q9 ,10			2SD1450(S,T)	TRANSISTOR		
Q11			DTA143TS	DIGITAL TRANSISTOR		
Q11			UN4116	DIGITAL TRANSISTOR		
Q12			2SC1923(R,O)	TRANSISTOR		
Q13			DTC113ZS	DIGITAL TRANSISTOR		
Q13			UN4219	DIGITAL TRANSISTOR		

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PARTS LIST

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Ref. No	Add-ress	New Parts	Parts No.	Description	Desti-nation	Re-marks
⚠ Q14			2SA954(L,K)	TRANSISTOR		
Q15 ,16			2SD1450(S,T)	TRANSISTOR		
⚠ Q20			2SC1845(F,E)	TRANSISTOR		
Q23			2SA1048(Y,GR)	TRANSISTOR		
Q23			2SA1309A(Q,R)	TRANSISTOR		
Q24			DTC124ES	DIGITAL TRANSISTOR		
Q24			UN4212	DIGITAL TRANSISTOR		
A2			W02-1181-05	OPTIC RECEIVING MODULE		
A3			W02-1114-05	OSCILLATING MODULE		
			CONTROL (X33-1030-22)			
C1			CK73FB1H102K	CHIP C 1000PF K		
C2			CK73FF1E104Z	CHIP C 0.10UF Z		
C3			CQ93FMG1H103J	MYLAR 0.010UF J		
C4 -6			CC73FSL1H470J	CHIP C 47PF J		
C7			CC73FSL1H220J	CHIP C 22PF J		
C8			CC73FSL1H070D	CHIP C 7.0PF D		
C9			CK73FF1E104Z	CHIP C 0.10UF Z		
C11 ,12			CK73FF1E104Z	CHIP C 0.10UF Z		
C13			CE04KW1A101M	ELECTRO 100UF 10WV		
C14			CE04KW1A470M	ELECTRO 47UF 10WV		
C15 -17			CK73FF1E104Z	CHIP C 0.10UF Z		
C18			CK73FB1H103K	CHIP C 0.010UF K		
C19			CE04KW1A470M	ELECTRO 47UF 10WV		
C20			CK73FB1H103K	CHIP C 0.010UF K		
C21			CE04KW1A470M	ELECTRO 47UF 10WV		
C22 ,23			CK73FB1H102K	CHIP C 1000PF K		
C24			CC73FSL1H070D	CHIP C 7.0PF D		
C25 -27			CK73FB1H103K	CHIP C 0.010UF K		
C28			CK73FB1H102K	CHIP C 1000PF K		
C29			CK73FB1H103K	CHIP C 0.010UF K		
C30			CQ93FMG1H102J	MYLAR 1000PF J		
C31			CK73FB1H103K	CHIP C 0.010UF K		
C32			CE04KW0J331M	ELECTRO 330UF 6.3WV		
C33			CK73FF1E104Z	CHIP C 0.10UF Z		
C34			CK73FB1H103K	CHIP C 0.010UF K		
C35			CK73FF1E104Z	CHIP C 0.10UF Z		
C36			CK73FB1H103K	CHIP C 0.010UF K		
C37			CK73FF1E104Z	CHIP C 0.10UF Z		
C38			CK73FB1H103K	CHIP C 0.010UF K		
C39			CE04KW0J331M	ELECTRO 330UF 6.3WV		
C41 -45			CC73FSL1H101J	CHIP C 100PF J		
C46			CK73FB1H103K	CHIP C 0.010UF K		
C47			CK73FF1E104Z	CHIP C 0.10UF Z		
C48			CE04KW1A101M	ELECTRO 100UF 10WV		
C49 ,50			CK73FB1H103K	CHIP C 0.010UF K		
C51 ,52			CK73FB1H102K	CHIP C 1000PF K		
C53			CC73FSL1H050C	CHIP C 5.0PF C		
C55			CK73FB1H103K	CHIP C 0.010UF K		
C56 -58			CK73FB1H102K	CHIP C 1000PF K		
C59			CK73FF1E104Z	CHIP C 0.10UF Z		
C61 -64			CC73FSL1H470J	CHIP C 47PF J		
C65			CC73FSL1H050C	CHIP C 5.0PF C		
C66			CK73FB1H103K	CHIP C 0.010UF K		

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CN1			E40-3259-05	PIN ASSY		
CN2			E40-4910-05	FLAT CABLE CONNECTOR		
CN3			E40-4904-05	FLAT CABLE CONNECTOR		
CN4			E40-3250-05	PIN ASSY		
CN5			E40-9915-05	FLAT CABLE CONNECTOR		
CN6			E40-9914-05	FLAT CABLE CONNECTOR		
L1			L40-2291-31	SMALL FIXED INDUCTOR		
X1			L78-0659-05	RESONATOR (20M)		
X2			L77-2179-05	CRYSTAL RESONATOR(52MHZ,3RD)		
R1			RK73FB2A104J	CHIP R 100K J 1/10W		
R2 -5			RK73FB2A221J	CHIP R 220 J 1/10W		
R6 -10			RK73FB2A104J	CHIP R 100K J 1/10W		
R11 -13			RK73FB2A101J	CHIP R 100 J 1/10W		
R14 -16			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R17 -19			RK73FB2A101J	CHIP R 100 J 1/10W		
R20 -22			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R23			RK73FB2A123J	CHIP R 12K J 1/10W		
R24			RK73FB2A113J	CHIP R 11K J 1/10W		
R25			RK73FB2A153J	CHIP R 15K J 1/10W		
R27 -29			RK73FB2A104J	CHIP R 100K J 1/10W		
R30			RK73FB2A331J	CHIP R 330 J 1/10W		
R31			RK73FB2A104J	CHIP R 100K J 1/10W		
R32			RK73FB2A331J	CHIP R 330 J 1/10W		
R33 -38			RK73FB2A101J	CHIP R 100 J 1/10W		
R39 ,40			RK73FB2A104J	CHIP R 100K J 1/10W		
R41			RK73FB2A101J	CHIP R 100 J 1/10W		
R42			RK73FB2A221J	CHIP R 220 J 1/10W		
R44			RK73FB2A104J	CHIP R 100K J 1/10W		
R45 -49			RK73FB2A101J	CHIP R 100 J 1/10W		
R50 -54			RK73FB2A103J	CHIP R 10K J 1/10W		
R55			RK73FB2A151J	CHIP R 150 J 1/10W		
R56 ,57			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R58			RK73FB2A243J	CHIP R 24K J 1/10W		
R59			RK73FB2A104J	CHIP R 100K J 1/10W		
R60			RK73FB2A333J	CHIP R 33K J 1/10W		
R61 -69			RK73FB2A221J	CHIP R 220 J 1/10W		
R71			RK73FB2A221J	CHIP R 220 J 1/10W		
R72			RK73FB2A101J	CHIP R 100 J 1/10W		
R73 -76			RK73FB2A221J	CHIP R 220 J 1/10W		
R77 ,78			RK73FB2A101J	CHIP R 100 J 1/10W		
R79			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R80 ,81			RK73FB2A104J	CHIP R 100K J 1/10W		
R82 ,83			RK73FB2A101J	CHIP R 100 J 1/10W		
R84 ,85			RK73FB2A104J	CHIP R 100K J 1/10W		
R86 -92			RK73FB2A101J	CHIP R 100 J 1/10W		
R93 -100			RK73FB2A104J	CHIP R 100K J 1/10W		
R101,102			RK73FB2A101J	CHIP R 100 J 1/10W		
R103-109			RK73FB2A104J	CHIP R 100K J 1/10W		
R110			RK73FB2A101J	CHIP R 100 J 1/10W		
R111-114			RK73FB2A104J	CHIP R 100K J 1/10W		
R115			RK73FB2A101J	CHIP R 100 J 1/10W		
R116			RK73FB2A104J	CHIP R 100K J 1/10W		
R117-121			RK73FB2A221J	CHIP R 220 J 1/10W		
D1 ,2			MA111	DIODE		

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Ref. No	Address	New Parts	Parts No.	Description	Destination	Remarks
D1 ,2			1SS355	DIODE		
D3 ,4			DA204U	DIODE		
D3 ,4			1SS302	DIODE		
IC1			CXD2536AR	MOS-IC		
IC2			HM514400CLS-8	MEMORY IC		
IC2			M5M44400CJ-7	MEMORY IC		
IC2			TC514400ASJ-80	MEMORY IC		
IC3			UPD784026GC501	MI-COM IC		
IC4			TC74HC165AF	IC(8BIT SHIFT REGISTER)		
IC5			TC74HC4094AF	MOS-IC		
IC6			TC74HC373AF	IC(8 bit LATCH)		
IC7			HM62256BLFP12T	MEMORY IC		
IC8			TA8409S	MOS-IC		
IC9			LC8904Q	MOS-IC		
IC10			TC74HC157AF	MOS-IC		
IC11			KAN03	CUSTOM IC		
IC12			SM5844AF	MOS-IC		
Q1			DTC124EU	DIGITAL TRANSISTOR		
Q1			UN5212	DIGITAL TRANSISTOR		
Q2			DTA124EU	DIGITAL TRANSISTOR		
Q2			UN5112	DIGITAL TRANSISTOR		

RF (MBU-2)

Ref. No	Address	New Parts	Parts No.	Description	Destination	Remarks
C101			C92-0132-08	TANTAL 10UF		
C102			CK73FF1E104Z	CHIP C 0.10UF Z		
C103,104			C92-0132-08	TANTAL 10UF		
C105			CK73FB1H103K	CHIP C 0.010UF K		
C106			CC73FCH1H102J	CHIP C 1000PF J		
C107,108			CK73FB1H103K	CHIP C 0.010UF K		
C109			CK73FB1E223K	CHIP C 0.022UF K		
C111			CK73FB1E104K	CHIP C 0.10UF K		
C112			CK73FB1H103K	CHIP C 0.010UF K		
C113			CK73EB1C105K	CHIP C 1.0UF K		
C114			CK73FF1E104Z	CHIP C 0.10UF Z		
C115			CK73EB1C105K	CHIP C 1.0UF K		
C116			CK73FB1H682K	CHIP C 6800PF K		
C117			CK73FB1E104K	CHIP C 0.10UF K		
C119			C92-0132-08	TANTAL 10UF		
C121			C92-0038-05	CHIP-ELE 22UF 16WV		
C122			CK73FB1H103K	CHIP C 0.010UF K		
C123,124			CK73FF1E104Z	CHIP C 0.10UF Z		
C125			CK73FB1H473K	CHIP C 0.047UF K		
C126			CK73EB1C105K	CHIP C 1.0UF K		
C127			CK73FF1E104Z	CHIP C 0.10UF Z		
C128			CK73FB1H103K	CHIP C 0.010UF K		
C129			CK73FF1C474Z	CHIP C 0.47UF Z		
C130			CC73FSL1H101J	CHIP C 100PF J		
C131			CK73FB1H473K	CHIP C 0.047UF K		
C132			CK73EB1C105K	CHIP C 1.0UF K		
C133			CK73FB1H472K	CHIP C 4700PF K		
C134,135			CK73FF1E104Z	CHIP C 0.10UF Z		
C136			C92-0048-05	ELECTRO 100UF 6.3WV		
C141			CK73FF1E104Z	CHIP C 0.10UF Z		
C142-144			CC73FSL1H101J	CHIP C 100PF J		
C146			CK73FF1E104Z	CHIP C 0.10UF Z		

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Ref. No	Address	New Parts	Parts No.	Description	Destination	Remarks
C151			C92-0132-08	TANTAL 10UF		
C152			CK73FF1E104Z	CHIP C 0.10UF Z		
C155			C92-0133-08	TANTAL 6.8UF		
C160,161			C92-0041-05	CHIP-ELE 10UF 10WV		
C163,164			CK73FB1H103K	CHIP C 0.010UF K		
C166			CC73FCH1H102J	CHIP C 1000PF J		
C167,168			CK73FF1E104Z	CHIP C 0.10UF Z		
C169,170			C92-0132-08	TANTAL 10UF		
C171			CK73FF1E104Z	CHIP C 0.10UF Z		
C175			CK73FF1E104Z	CHIP C 0.10UF Z		
C176,177			CC73FSL1H100J	CHIP C 10PF J		
C178			CK73FF1E104Z	CHIP C 0.10UF Z		
C181			C92-0132-08	TANTAL 10UF		
C182,183			CK73FF1E104Z	CHIP C 0.10UF Z		
C184			C92-0134-08	CHIP-ELE 22UF		
C185			C91-1529-08	CHIP C 1000PF		
C186			CK73FF1E104Z	CHIP C 0.10UF Z		
C191			C92-0038-05	CHIP-ELE 22UF 16WV		
C192			CK73FF1E104Z	CHIP C 0.10UF Z		
C193			CK73FF1C105Z	CHIP C 1.0UF Z		
C194			C92-0048-05	ELECTRO 100UF 6.3WV		
CN101	3D		E40-9818-08	FLAT CABLE CONNECTOR(22P)		
CN102	3D		E40-4968-05	FLAT CABLE CONNECTOR(30P)		
CN103	3D		E40-4967-05	FLAT CABLE CONNECTOR(18P)		
CN104	3D		E40-9819-08	FLAT CABLE CONNECTOR(4P)		
L101-103			L92-0048-08	CHIP FERRITE		
L106			L92-0048-08	CHIP FERRITE		
L110			R92-0670-05	CHIP R 0 OHM		
L121			L92-0048-08	CHIP FERRITE		
L122			L33-0511-08	SMALL FIXED INDUCTOR(100UH)		
L151,152			L33-0512-08	SMALL FIXED INDUCTOR(10UH)		
L153,154			L33-0511-08	SMALL FIXED INDUCTOR(100UH)		
L155			L33-0400-08	SMALL FIXED INDUCTOR(1000UH)		
L161,162			L92-0048-08	CHIP FERRITE		
L195			L92-0047-08	CHIP FERRITE		
R101			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R102			RK73FB2A103J	CHIP R 10K J 1/10W		
R103			RK73FB2A1002D	CHIP R 10.0K D 1/10W		
R104			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R105			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R106			RK73FB2A335J	CHIP R 3.3M J 1/10W		
R107			RK73FB2A474J	CHIP R 470K J 1/10W		
R114			RK73FB2A101J	CHIP R 100 J 1/10W		
R116			RK73FB2A682J	CHIP R 6.8K J 1/10W		
R117			RK73FB2A474J	CHIP R 470K J 1/10W		
R120			RK73FB2A101J	CHIP R 100 J 1/10W		
R121			RK73FB2A104J	CHIP R 100K J 1/10W		
R122			R92-0670-05	CHIP R 0 OHM		
R123			RK73FB2A331J	CHIP R 330 J 1/10W		
R124,125			RK73FB2A101J	CHIP R 100 J 1/10W		
R128			RK73FB2A152J	CHIP R 1.5K J 1/10W		
R129			RK73FB2A331J	CHIP R 330 J 1/10W		
R130			RK73FB2A471J	CHIP R 470 J 1/10W		
R131			RK73FB2A103J	CHIP R 10K J 1/10W		

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R132			RK73FB2A104J	CHIP R 100K J 1/10W		
R133			RK73FB2A335J	CHIP R 3.3M J 1/10W		
R134			RK73FB2A331J	CHIP R 330 J 1/10W		
R135			RK73FB2A152J	CHIP R 1.5K J 1/10W		
R136			RK73FB2A471J	CHIP R 470 J 1/10W		
R137			RK73FB2A101J	CHIP R 100 J 1/10W		
R139,140			RK73FB2A470J	CHIP R 47 J 1/10W		
R142,143			RK73FB2A103J	CHIP R 10K J 1/10W		
R144			RK73FB2A101J	CHIP R 100 J 1/10W		
R145			RK73FB2A105J	CHIP R 1.0M J 1/10W		
R146			RK73FB2A331J	CHIP R 330 J 1/10W		
R147			RK73FB2A101J	CHIP R 100 J 1/10W		
R148			RK73FB2A681J	CHIP R 680 J 1/10W		
R149			RK73FB2A101J	CHIP R 100 J 1/10W		
R151			RK73FB2A104J	CHIP R 100K J 1/10W		
R152,153			R92-0670-05	CHIP R 0 OHM		
R154,155			R92-1827-08	METAL GLAZE RESISTOR 150 1/4W		
R161-163			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R164			RK73FB2A681J	CHIP R 680 J 1/10W		
R165			RK73FB2A104J	CHIP R 100K J 1/10W		
R166			R92-1826-08	METAL GLAZE RESISTOR 10 1/2W		
R167			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R168			R92-1825-08	METAL GLAZE RESISTOR 1 1/4W		
R170,171			RK73FB2A103J	CHIP R 10K J 1/10W		
R172			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R174			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R176			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R178			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R181			RK73FB2A103J	CHIP R 10K J 1/10W		
R182,183			RK73FB2A473J	CHIP R 47K J 1/10W		
R184			R92-0679-05	CHIP R 0 OHM		
R186			R92-0679-05	CHIP R 0 OHM		
R195			R92-0670-05	CHIP R 0 OHM		
R261			RK73FB2A101J	CHIP R 100 J 1/10W		
VR101			R32-0021-08	SEMI FIXED VARIABLE R(47K)		
VR102			R12-3168-05	SEMI FIXED VARIABLE R(22K)		
VR105			R12-3167-05	SEMI FIXED VARIABLE R(10K)		
S101			S68-0053-08	PUSH SWITCH		
D101			1SS355	DIODE		
D155			SB007-03Q-TL	DIODE		
D161			MA8027-L	DIODE		
D181			F1P2STP	DIODE		
D183			F1P2STP	DIODE		
IC101			CXA1981AR	IC(RF AMP)		
IC102			TC7SU04F	IC(INVERTER)		
IC121			CXD2535BR	IC(DSSP&DSP)		
IC122			TC7SU04F	IC(INVERTER)		
IC123			TC7SU04FU-TE85L	IC(COMS CONVERTOR)		
IC151			MPC17A38VMEL	IC(MOTOR DRIVER)		
IC171			X24C01S	IC(EEPROM)		
IC172			UPC842G2	IC(BUFFER)		
IC181			TC74ACT540FS	IC(OVER WRITE HEAD DRIVE)		
IC182			TC7SU04F	IC(INVERTER)		
IC191			L88MS05T-FA	IC(POWER SUPPLY)		

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∗ New Parts
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

Ref. No	Address	New Parts	Parts No.	Description	Destination	Remarks
Q101			DTA144EU	TRANSISTOR		
Q151			DTC144EU	TRANSISTOR		
Q162			2SB798-DL	TRANSISTOR		
Q163			DTA144EU	TRANSISTOR		
Q164			DTA123JU	TRANSISTOR		
Q181			2SJ278MY	TRANSISTOR		
Q182			2SK1764KY	TRANSISTOR		

MECHANISM

Ref. No	Address	New Parts	Parts No.	Description	Destination	Remarks
1	2A		A10-3231-03	CHASSIS ASSY		
3	1B		A11-1074-02	SUB CHASSIS ASSY		
DM	2D		A10-3258-08	CHASSIS ASSY		
12	3B		D10-3593-04	ARM (EJECT)		
13	3B		D10-3594-04	ARM (PLAY)		
14	2B		D10-3595-04	ARM (REC)		
15	1B		D10-3596-12	SLIDER (LIFT)		
16	2B		D13-1712-04	GEAR (PULLEY)		
17	2B		D13-1714-04	GEAR (INNER)		
18	2B		D13-1715-04	GEAR (F)		
19	1B		D13-1716-04	GEAR (IDLER)		
20	1C		D13-1721-08	GEAR (SL-A)		
21	2D		D13-1722-08	GEAR (SL-B)		
22	2D		D13-1723-08	GEAR (SL-C)		
25	2B		D15-0386-04	PULLEY (MOTOR)		
26	2B		D16-0390-03	BELT		
28	2D		D21-1822-08	SHAFT		
30	1D		E35-1312-08	FLAT CABLE(4P) (MBU-2 CN104)		
31	2B		E40-3264-05	PIN ASSY(6P) (MECHA LD)		
45	2C		G02-1082-08	FLAT SPRING (OP)		
50	1B		J19-5602-12	HOLDER ASSY (CARTRIDGE)		
51	3D		J26-0031-08	PRINTED WIRING BOARD ASSY		
55	2A,3B		J90-0837-04	GUIDE (SLIDER)		
AE	1B,2B		N19-0891-04	FLAT WASHER		
60	1C		S68-0054-08	PUSH SWITCH		
S1 -3	2B		S40-1139-05	PUSH SWITCH		
FM	2C		T42-0819-08	MOTOR ASSY (FEED)		
LM	2B		T42-0811-05	DC MOTOR		
⚠ PU	2D		T25-0046-08	OPTICAL PICKUP HEAD (KSM-210A)		
RH	1D		T30-0011-08	RECORD HEAD (RF322-74A)		

L : Scandinavia **K** : USA **P** : Canada **R** : Mexico
Y : PX(Far East, Hawaii) **T** : Europe **E** : Europe **G** : Germany
Y : AAFES(Europe) **X** : Australia **M** : Other Areas

⚠ indicates safety critical components.