Service Manual Panasonic RQ-DP7

The Service manual in this document is the Service manual for the Philips DCC130 Portable. The Panasonic RQ-DP7 is technically identical to the Philips DCC130. Therefore this Service manual can be used instead of the original, which we unfortunately don’t have available.

Portable digital compact cassette player DCC130

/00/05/10 /BK01

Service
Service
Service

DIGITAL dcc COMPACT CASSETTE

CONTENTS

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PHILIPS

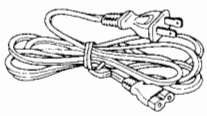
PHILIPS

■ ACCESSORIES

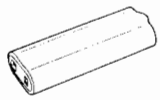
Stereo headphones with remote controller ..... 1 pc.
(SBC3327
Only USA/CANADA)

(SBC3311)

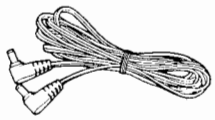
• Power cord ..... 1 pc.



Special rechargeable battery ..... 1 pack
(SBC6430)

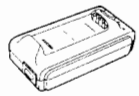


• DC cord ..... 1 pc.

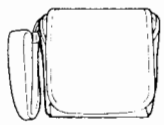


Line cable ..... 1 pc.

Battery charger/AC adaptor
• Main unit ..... 1 pc.
(SBC6630)



Carrying case ..... 1 pc.



■ SAFETY PRECAUTION (This "safety precaution" is applied only in U.S.A.)

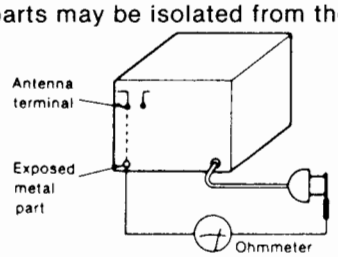
1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

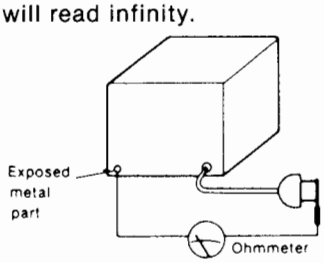
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.

(Fig A)
Resistance = 3MΩ—5.2MΩ



(Fig B)
Resistance = Approx ∞



4. If the measurement is outside the specified limits, there is a possibilty of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

■ SPECIFICATIONS

Digital format

Tape recording system	Digital compact cassette
Sampling frequencies	
For playback	48 kHz, 44.1 kHz, 32 kHz (automatically)
No. of quantizing bits	16-bit, linear
Data processing system	PASC
No. of channels	2-channel, stereo

DCC playback

Frequency response	
fs: 44.1 kHz	20 Hz – 20 kHz + 0.5 dB, – 1.5 dB
fs: 48 kHz	20 Hz – 22 kHz + 0.5 dB, – 1.5 dB
fs: 32 kHz	20 Hz – 14.5 kHz + 0.5 dB, – 1.5 dB
Dynamic range	90 dB or more (A-weighted)
S/N	90 dB or more (A-weighted)
Wow and flutter	Below measurable limit

ACC playback

Deck system	Stereo cassette player
Track system	4-track, 2-channel, stereo
Frequency response (Dolby NR off)	
Normal	20 Hz – 18 kHz
CrO_2	20 Hz – 18 kHz
Metal	20 Hz – 18 kHz

Terminals

Analog output (fixed)	
Output level	1.0 V (50 kΩ load)
Headphones output	
Output level (max.)	15 mW + 15 mW (16 Ω load) φ3.5
Digital output	Optical (only when AC adaptor is used)

Mechanism

Head	18 channel thin-film head × 1
Motor	Brushless motor × 1
Tape speed	4.76 cm/sec ($1^7/_8$ ips.)

General

Dimensions	120.0 × 35.5 × 118.0 mm
(W × H × D)	($4^3/_4$" × $1^3/_8$" × $4^5/_8$")
Weight (with battery)	490 g (1 lb. 1.3 oz.)
Power supply (Using AC adaptor/charger)	
	Input: For Canada: AC 60 Hz 120 V 25W
	For U.S.A.: AC 60 Hz 120 V 25 W
	For Foreign: AC 50/60 Hz
	100 – 240 V 25 W
	Output: Adaptor: DC 5.5 V 1.9 A
	Charger: DC 4.8 V 1.4 A
	Power consumption; 4.1 W

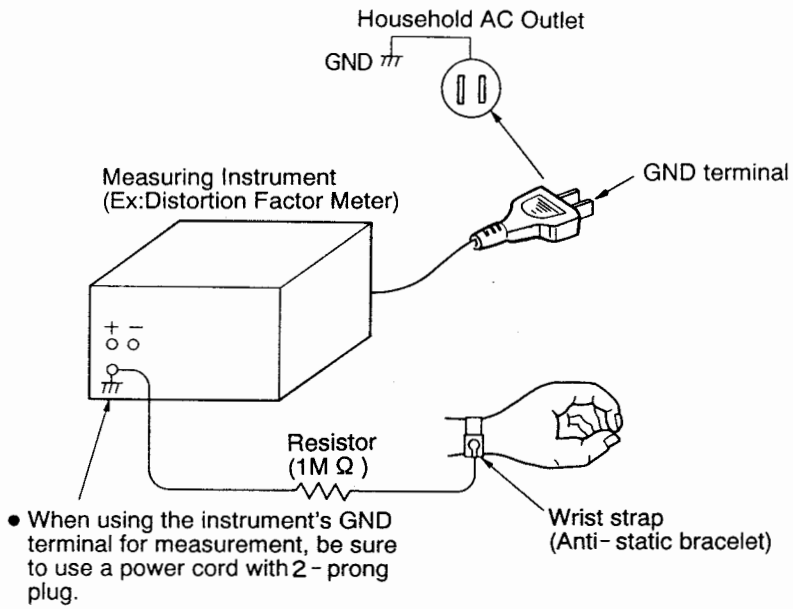
Note:

Design and specifications are subject to change without notice.
Weight and dimensions are approximate.

PCS 71 038

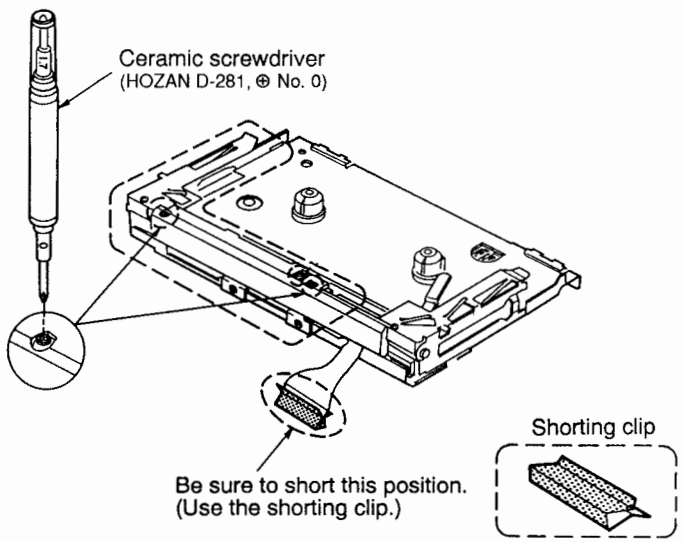
■ PRECAUTIONS FOR MECHANISM AND HEAD ASSEMBLY HANDLING

(1) Connect your wrist strap to the unit's GND or to the grounding post of a measuring instrument you are using.
To protect the head assembly from magnetic or electrostatic damage, be sure to wear the wrist strap whenever replacing the head assembly or handling the PC boards.



(2) When disconnecting the head FPC from the RF/Servo P.C.B., install a shorting clip on the FPC to protect it from magnetic or electrostatic damage.

(3) • Use a ceramic screwdriver for all head replacement and adjustment.
• Keep magnetized metallic screwdrivers away from the head assembly, as they may damage the head's magnetic properties.

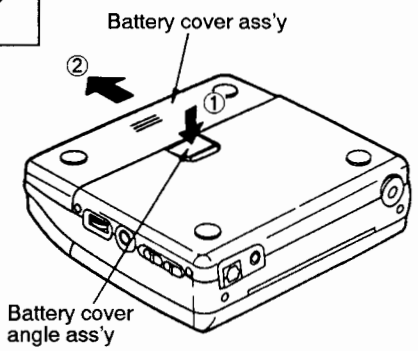


■ DISASSEMBLY INSTRUCTIONS

※ This unit is equipped with FPC boards, so handle them with care during disassembly and reassembly.

Ref.No. 1	Removal of the battery cover ass'y

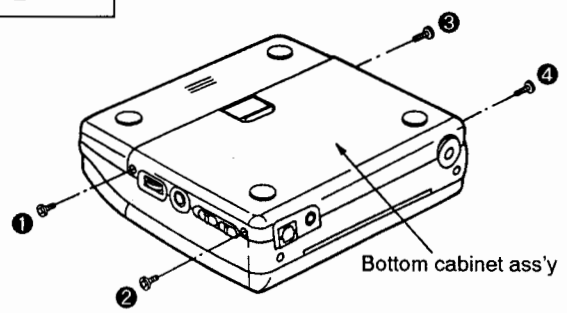
Procedure 1



- Push the battery cover angle ass'y in the direction of arrow ①, and then remove the battery cover ass'y in the direction of arrow ②.

Ref.No. 2	Removal of the bottom cabinet ass'y

Procedure 2

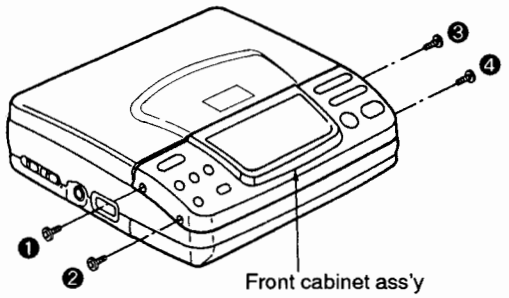


- Remove the 4 screws(❶~❹).

(4pcs.) M1.4 × 1.8

Ref.No. 3	Removal of the front cabinet ass'y

Procedure 3

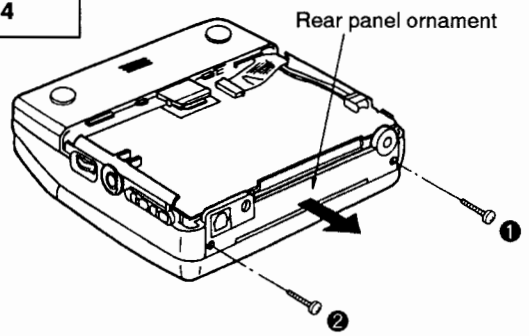


- Remove the 4 screws(❶~❹).

(4pcs.) M1.4 × 1.8

Ref.No. 4	Removal of the rear panel ornament

Procedure 2→4

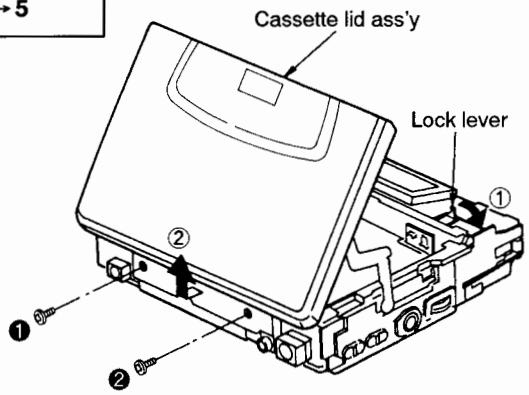


1. Remove the 2 screws(❶, ❷).
2. Remove the rear panel ornament in the direction of arrow.

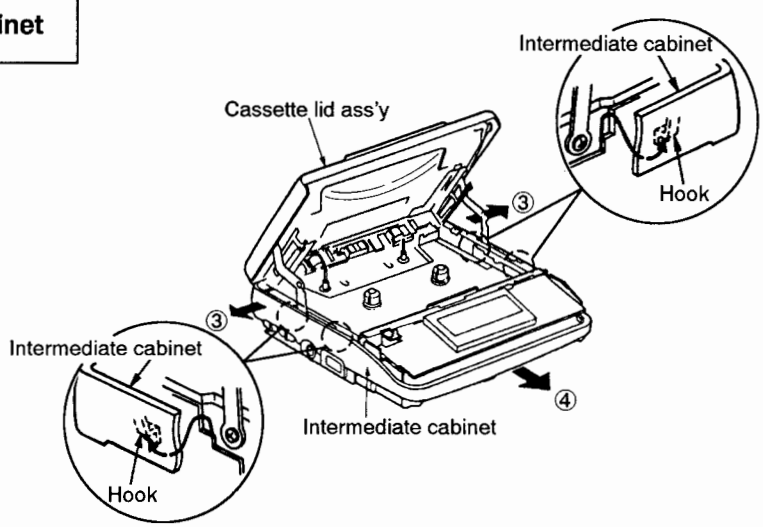
(2pcs.) M1.4 ×5. 5

Ref.No. 5	Removal of the intermediate cabinet

Procedure 1→2→3→4→5



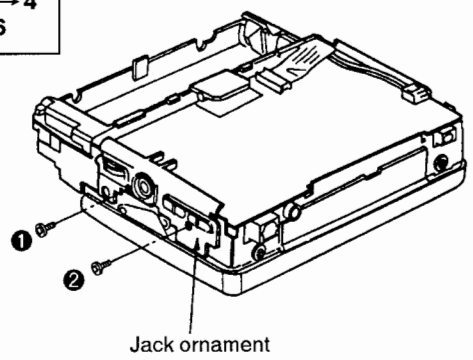
1. Push the lock lever in the direction of arrow ①, and then open the cassette lid ass'y.
2. Remove the 2 screws(❶, ❷), and then disengage the cassette lid ass'y in the direction of arrow ②.



3. Lift up the intermediate cabinet to release the 4 hooks, and stretch the intermediate cabinet in the direction of arrow ③.
4. While stretching the intermediate cabinet, remove it in the direction of arrow ④.

Ref.No. 6	Removal of the jack ornament

Procedure
1 → 2 → 3 → 4 → 5 → 6

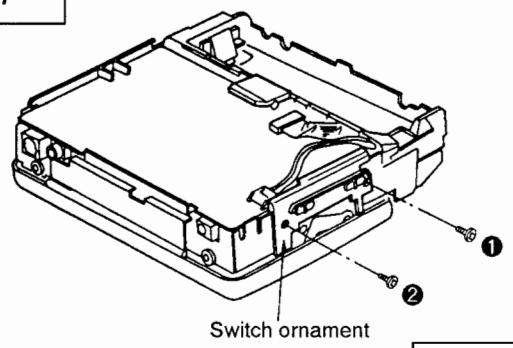


(2pcs.) M1.4 × 1.8

• Remove the 2 screws(❶, ❷).

Ref.No. 7	Removal of the switch ornament

Procedure
1 → 2 → 3 → 4 → 5 → 7

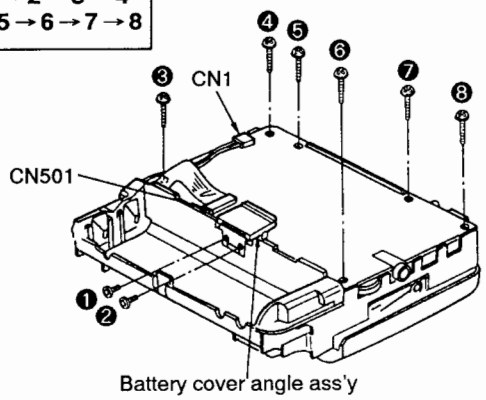


(2pcs.) M1.4 × 1.8

• Remove the 2 screws(❶, ❷).

Ref.No. 8	Removal of the digital P.C.B.

Procedure
1 → 2 → 3 → 4 → 5 → 6 → 7 → 8

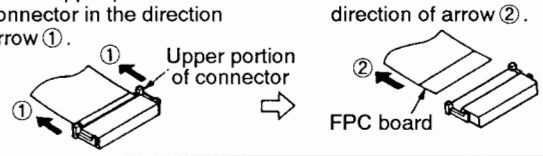


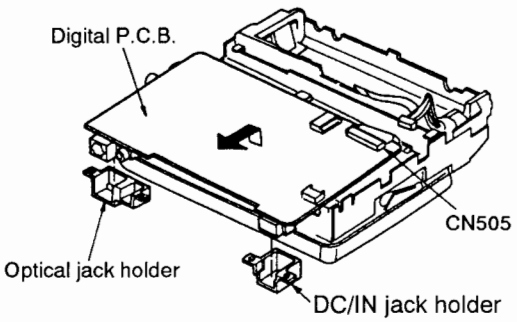
(2pcs.) ❶, ❷ M1.4 × 1.8
(6pcs.) ❸~❽ M1.4 × 4

1. Remove the 2 screws(❶, ❷), and then remove the battery cover angle ass'y.
2. Remove the 1 connector(CN1).
3. Remove the 1 FPC board(CN501).
4. Remove the 6 screws(❸ ~ ❽).

■ Removal of the FPC board

1. Push the upper portion of connector in the direction of arrow ①.
2. Pull the FPC board in the direction of arrow ②.



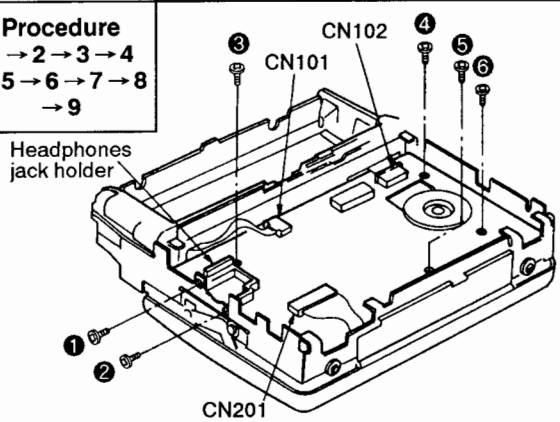


5. Lift up the digital P.C.B. in the direction of arrow, and then remove the 1 FPC board(CN505).

Note: When the digital P.C.B. is removed, the jack holders (Optical, DC/IN) will also removed.

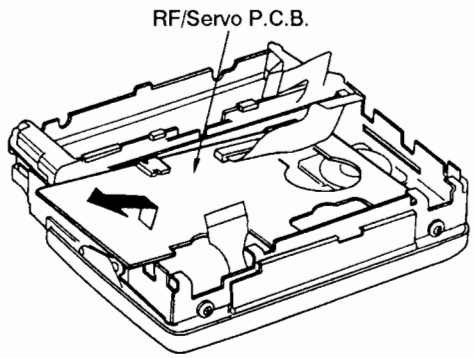
Ref.No. 9	Removal of the RF/Servo P.C.B.

Procedure
1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 → 9



(2pcs.) ❶, ❷ M1.4 × 3
(4pcs.) ❸~❻ Tapping1.4 × 3

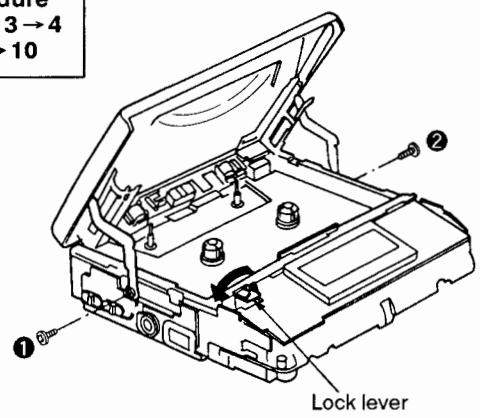
1. Remove the 2 screws(❶, ❷), and then remove the headphones jack holder.
2. Remove the 3 FPC boards(CN101, CN102, CN201).
3. Remove the 4 screws(❸ ~ ❻).



4. Remove the RF/Servo P.C.B. in the direction of arrow.

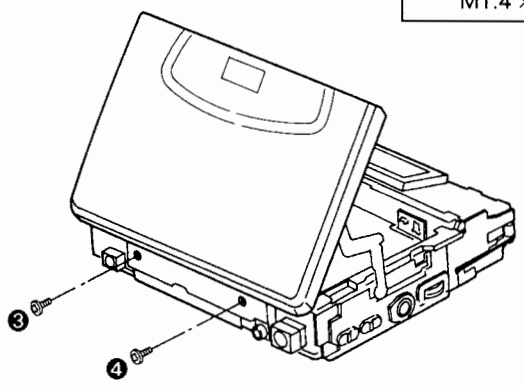
Ref.No. 10	Removal of the cassette lid ass'y

Procedure
1 → 2 → 3 → 4 → 5 → 10



1. Push the lock lever in the direction of arrow and open the cassette lid ass'y.
2. Remove the 2 screws(❶, ❷).

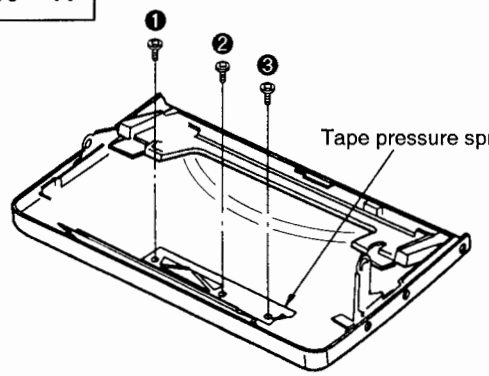
(2pcs.)❶, ❷ M1.4 × 1.8
(2pcs.)❸, ❹ M1.4 × 1.8



3. Remove the 2 screws(❸, ❹).

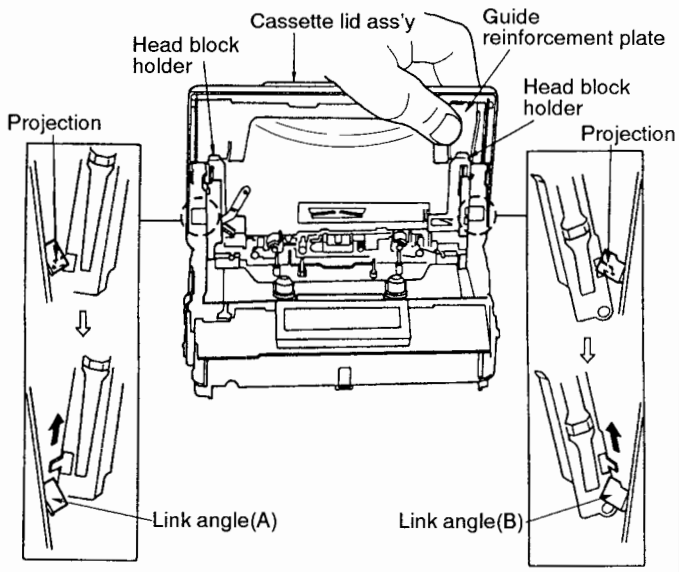
Ref.No. 11	Removal of the tape pressure spring

Procedure
1 → 2 → 3 → 4 → 5 → 10 → 11



(3pcs.) Tapping1.4 × 2

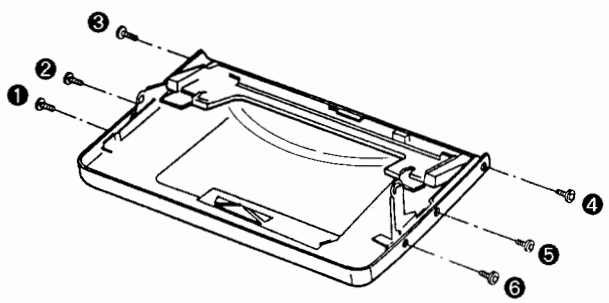
• Remove the 3 screws(❶ ~ ❸).



4. Holding the guide reinforcement plate, remove the projections of head block holder from link angles(A, B) in the direction of arrow.

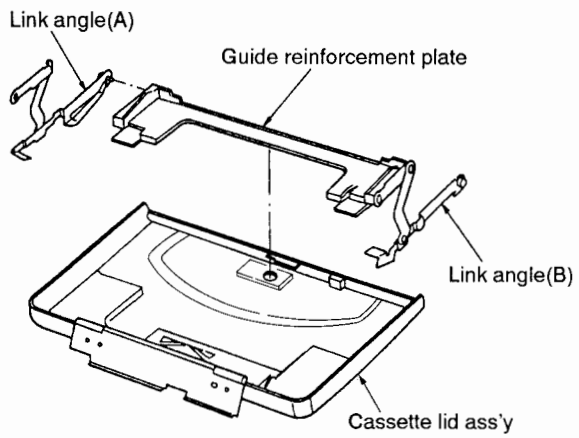
Ref.No. 12	Removal of the guide reinforcement plate, link angle(A) and link angle(B)

Procedure
1 → 2 → 3 → 4 → 5 → 10 → 12



(6pcs.) M1.4 × 1.8

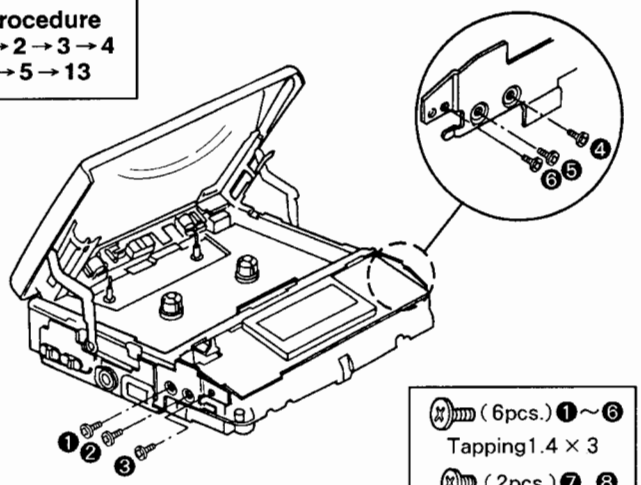
1. Remove the 6 screws(❶ ~ ❻).



2. Remove the guide reinforcement plate, link angle(A) and link angle(B).

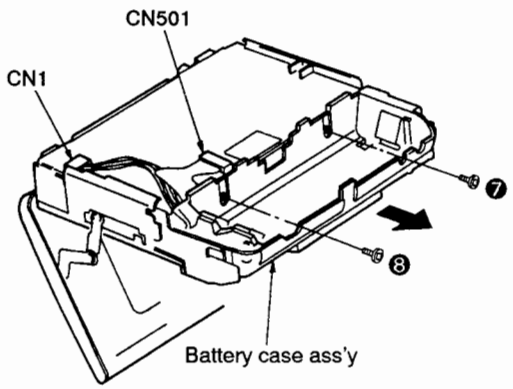
Ref.No. 13	Removal of the battery case ass'y

Procedure
1 → 2 → 3 → 4 → 5 → 13



(6pcs.) ❶~❻
Tapping1.4 × 3
(2pcs.) ❼, ❽
M1.4 × 1.8

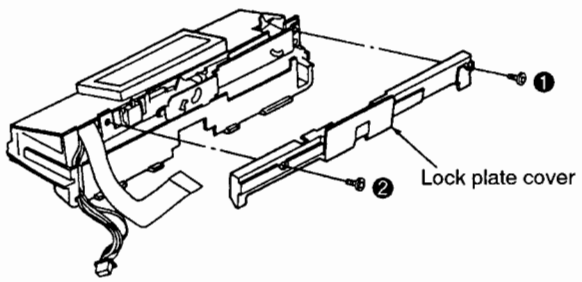
1. Remove the 6 screws(❶ ~ ❻).



2. Remove the 1 connector(CN1).
3. Remove the 1 FPC board(CN501).
4. Remove the 2 screws(❼, ❽).
5. Remove the battery case ass'y in the direction of arrow.

Ref.No. 14	Removal of the lock plate cover

Procedure
1 → 2 → 3 → 4 → 5 → 13 → 14

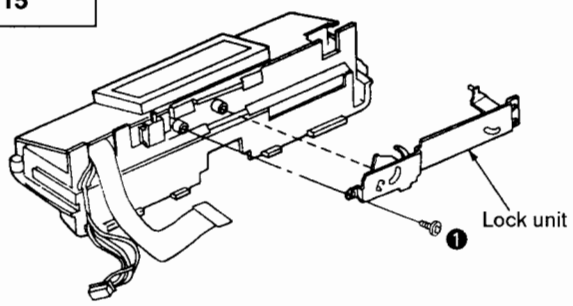


(2pcs.)
Tapping1.4 × 4.5

• Remove the 2 screws(❶, ❷).

Ref.No. 15	Removal of the lock unit

Procedure
1 → 2 → 3 → 4 → 5 → 13 → 14 → 15

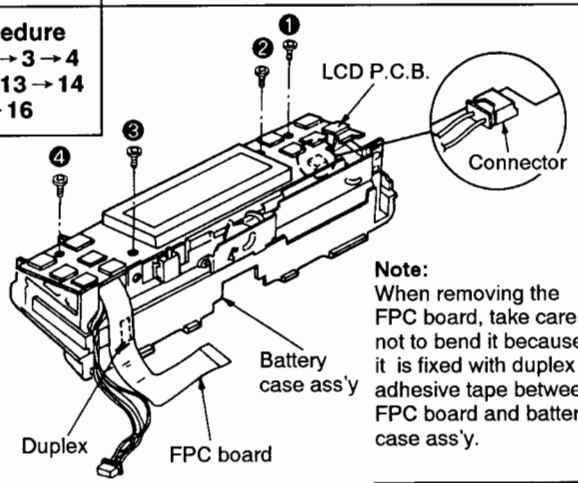


(1pc.)
Tapping1.4 × 3

• Remove the 1 screw(❶).

Ref.No. 16	Removal of the LCD P.C.B.

Procedure
1 → 2 → 3 → 4 → 5 → 13 → 14 → 16



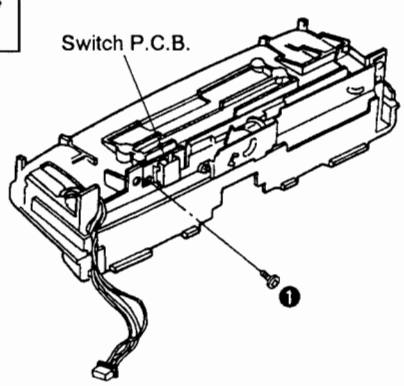
Note:
When removing the FPC board, take care not to bend it because it is fixed with duplex adhesive tape between FPC board and battery case ass'y.

(4pcs.)
Tapping1.4 ×2

1. Remove the 4 screws(❶ ~ ❹).
2. Remove the 1 connector.

Ref.No. 17	Removal of the switch P.C.B.

Procedure
1 → 2 → 3 → 4 → 5 → 13 → 14 → 16 → 17

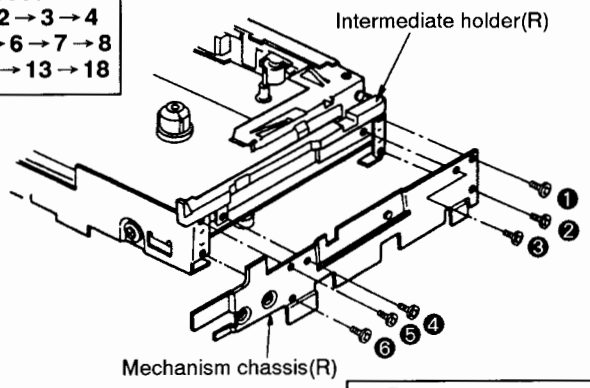


(1pc.)
Tapping1.4 × 3

• Remove the 1 screw(❶).

Ref.No. 18	Removal of the mechanism chassis(R) and intermediate holder(R)

Procedure
1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 → 10 → 13 → 18



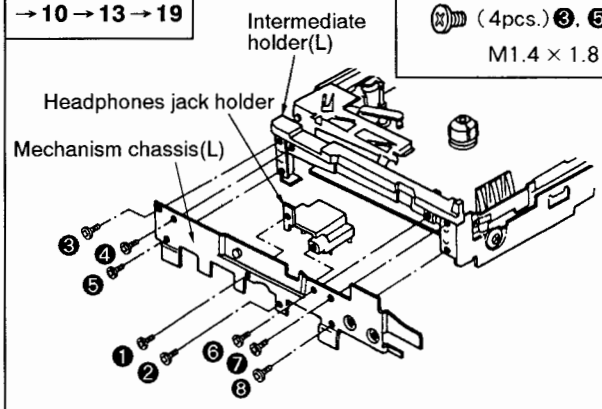
(2pcs.) ❸, ❹
Tapping 1.4 × 3
(4pcs.) ❶, ❷, ❺, ❻
M1.4 × 2

• Remove the 6 screws(❶ ~ ❻).

Ref.No. 19	Removal of the mechanism chassis(L) and intermediate holder(L)

Procedure
1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 → 10 → 13 → 19

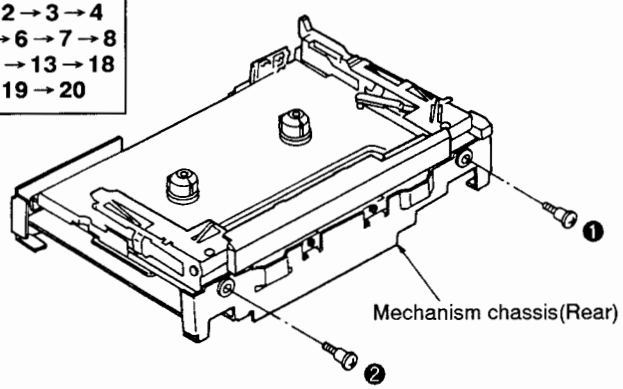
(4pcs.) ❶, ❷, ❹, ❻
Tapping 1.4 × 3
(4pcs.) ❸, ❺, ❼, ❽
M1.4 × 1.8



1. Remove the 2 screws(❶, ❷), and headphones jack holder.
2. Remove the 6 screws(❸ ~ ❽).

Ref.No. 20	Removal of the mechanism chassis (Rear)

Procedure
1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 → 10 → 13 → 18 → 19 → 20

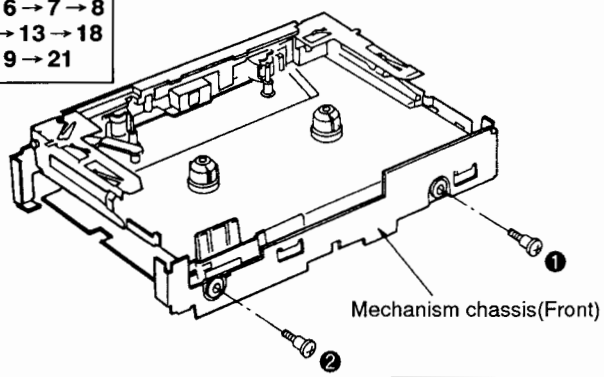


(2pcs.)
Double head screw

• Remove the 2 screws(❶, ❷).

Ref.No. 21	Removal of the mechanism chassis (Front)

Procedure
1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 → 10 → 13 → 18 → 19 → 21

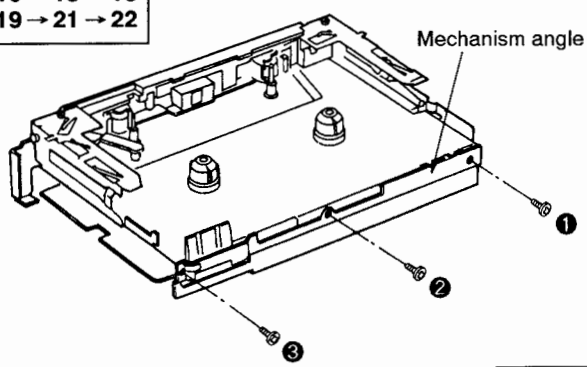


(2pcs.)
Double head screw

• Remove the 2 screws(❶, ❷).

Ref.No. 22	Removal of the mechanism angle

Procedure
1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 → 10 → 13 → 18 → 19 → 21 → 22



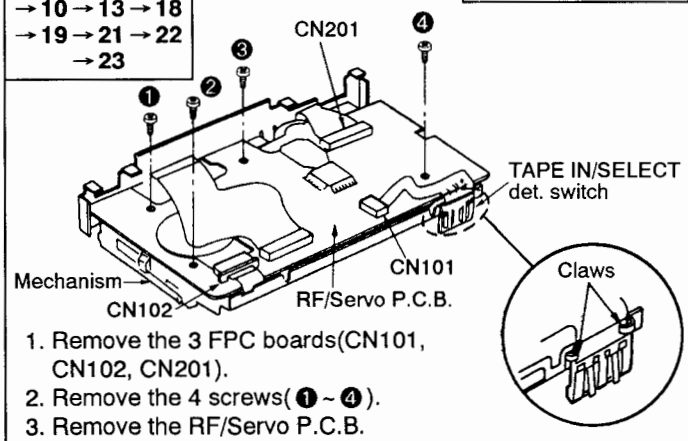
(3pcs.)
M1.4 × 1.8

• Remove the 3 screws(❶ ~ ❸).

Ref.No. 23	Removal of the mechanism and TAPE IN/SELECT det. switch

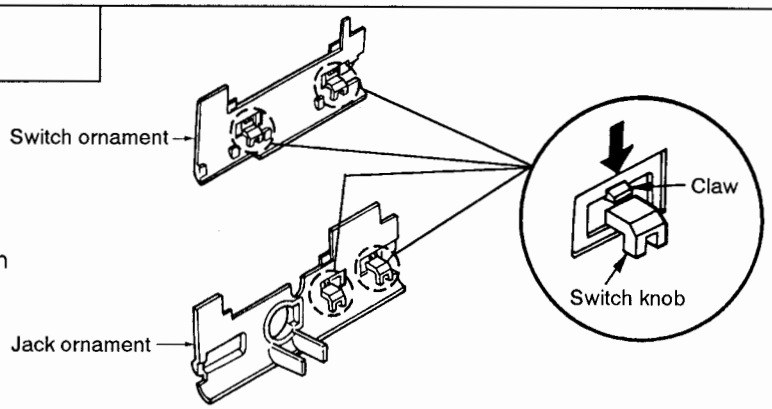
Procedure
1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 → 10 → 13 → 18 → 19 → 21 → 22 → 23

(4pcs.)
Tapping 1.4 × 3



1. Remove the 3 FPC boards(CN101, CN102, CN201).
2. Remove the 4 screws(❶ ~ ❹).
3. Remove the RF/Servo P.C.B.
4. Release the 2 claws of TAPE IN/SELECT det. switch.

Ref.No. 24	Removal of the switch knob
Procedure 1→2→3→4 →5→6→7 →24	

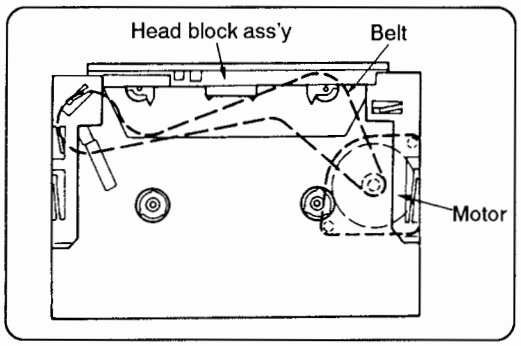


• Release the 1 claw in the direction of arrow, and then remove the switch knobs.

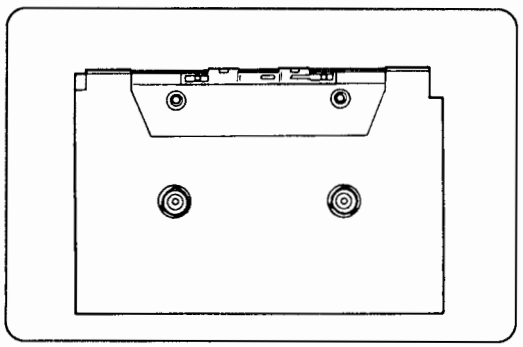
• How to replace the mechanism block

The mechanism block is supplied without other parts as a semi-assembly. The head block ass'y, motor and belt are supplied separately from the mechanism block.
If the mechanism block is exchanged as a replacement assembly, follow the preparation procedure below.

Preparation procedure
Remove the head block ass'y, motor and belt from the mechanism to be replaced and replace those parts to the new mechanism block. (Refer to Fig. 1 and 2.)
(Refer to the " PROCEDURES 23 FOR DISASSEMBLY OF THE MAIN PARTS ON THE MECHANISM AND TAPE IN/SELECT DET. SWITCH ".



Mechanism to be repaired
Fig. 1



Mechanism block
Fig. 2

• How to replace the head block ass'y

The head block is supplied as a head block ass'y. (Refer to Fig 3.)
The head and pinch roller arm(L)•(R) are supplied together in the head block ass'y.
The pinch roller arm(L)•(R) is also supplied separetely.

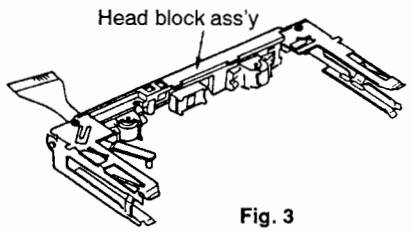


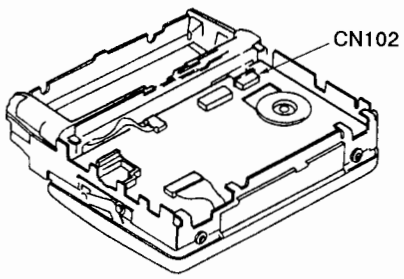
Fig. 3

• How to replace cam gear and solenoid

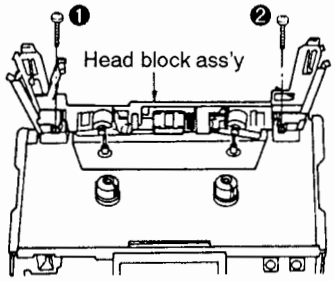
The cam gear and solenoid are included in the mechanism block. They are also supplied separately.

• How to remove the head block ass'y and pinch roller arm(L)•(R)

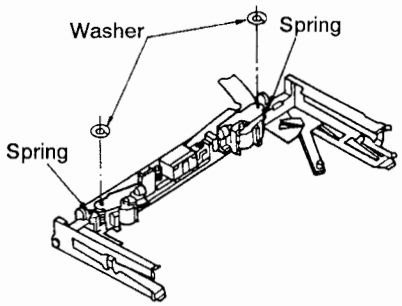
1. Follow the procedures in Ref. No. 1-8 in the Disassembly instructions. (Refer to pages 3 and 4.)



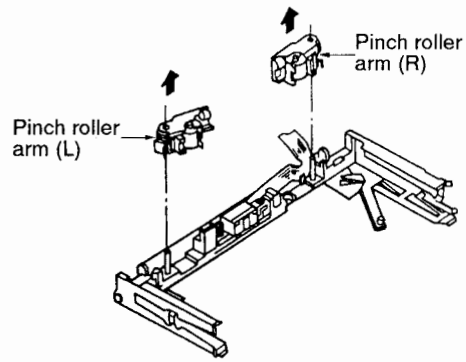
2. Remove the 1 connector(CN102).



3. Remove the 2 screws(❶, ❷) to remove the head block ass'y.



4. Remove the 2 washers.
5. Remove the springs from the hook.



6. Lift up the pinch roller arm(L)•(R) in the direction of arrow.

• Removal of the motor and belt

1. Follow the procedures in Ref. No. 1 - 10 in the Disassembly instructions. (Refer to pages 3 and 5.)
2. Remove the 2 screws(❶ , ❷).(Refer to Fig. 1.)
3. Remove the 2 screws(❸ , ❹) and the fixing plate.(Refer to Fig. 2.)
4. Unsolder the motor FPC(6 points).(Refer to Fig. 2.)
5. Remove the motor in the direction of arrow.(Refer to Fig. 2.)
6. Remove the belt from the motor.(Refer to Fig. 3.)

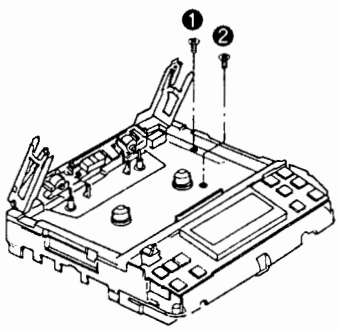


Fig. 1

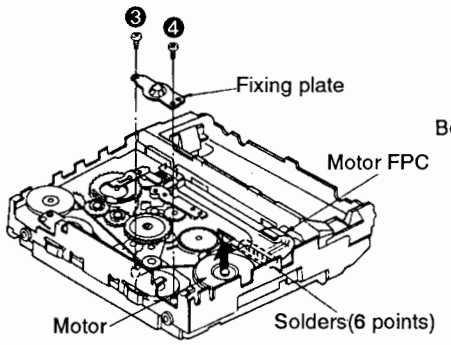


Fig. 2

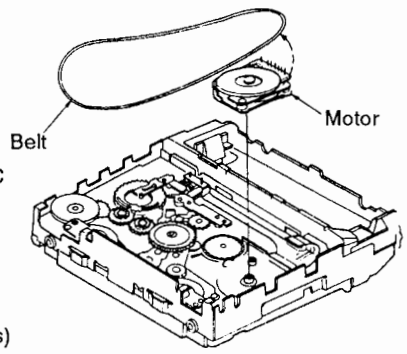


Fig. 3

• Befor installing the belt to the motor, insert the unmagnetized sheet to the clearance between chassis and lower portion of motor, and then push the upper portion of motor in the direction of arrow.
Put the belt into the clearance between upper portion of motor and coil P.C.B.
(Refer to Fig. 4 and 5.)

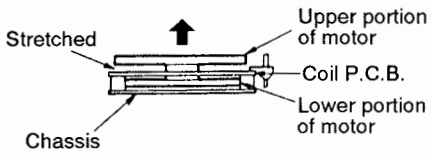


Fig. 4

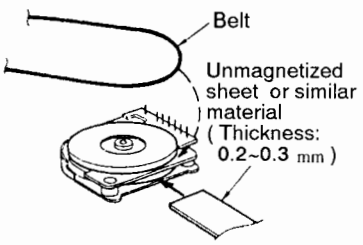
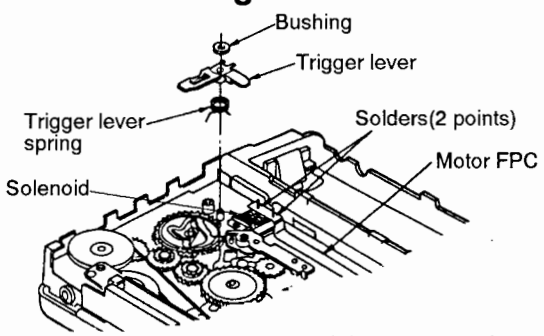


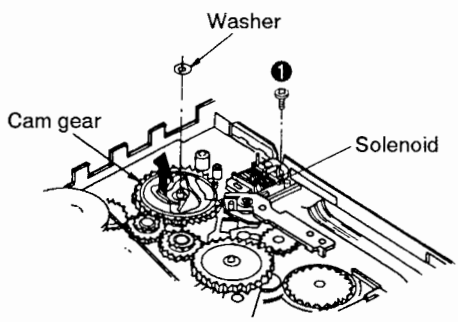
Fig. 5

• Removal of the cam gear and solenoid



1. Unsolder the motor FPC (2 points), and then remove the motor FPC from the solenoid.
2. Pull out the bushing.
3. Remove the trigger lever.

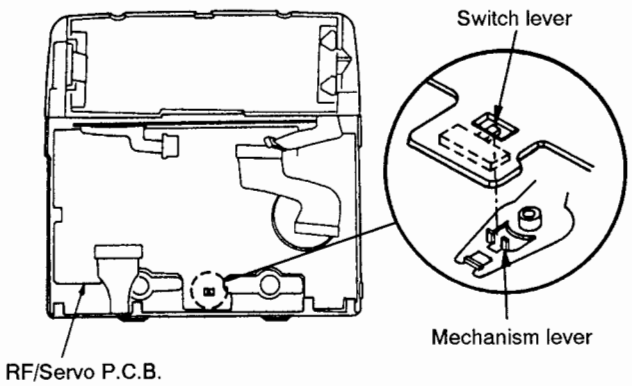
Note: Avoid missing the trigger lever spring when removing the trigger lever.



4. Remove the 1 screw(❶) and the solenoid.
5. Remove the washer.
6. Remove the cam gear in the direction of arrow.

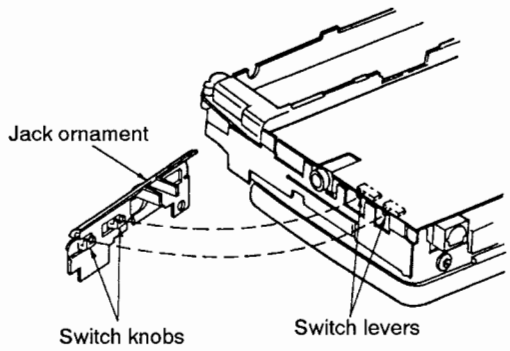
NOTE FOR ASSEMBLY

● Notice for assembling the RF/Servo P.C.B.



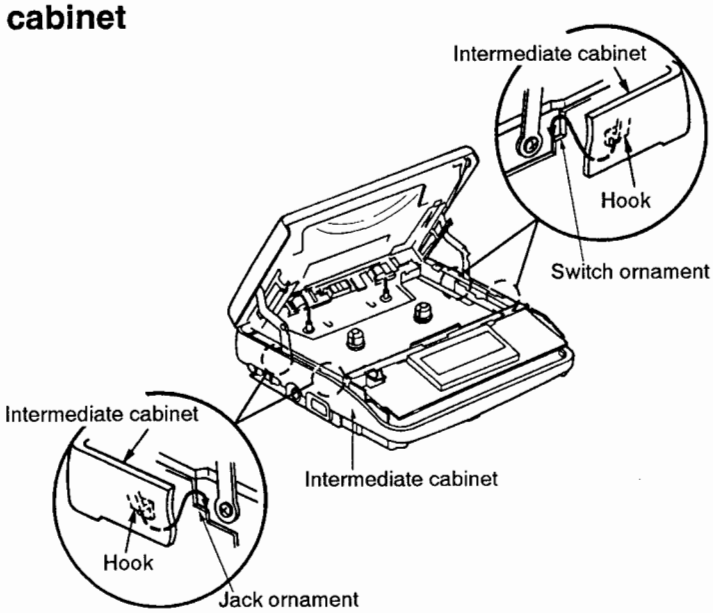
• Align the switch lever with mechanism lever when installing the RF/Servo P.C.B.

● Notice for assembling the jack ornament and switch ornament

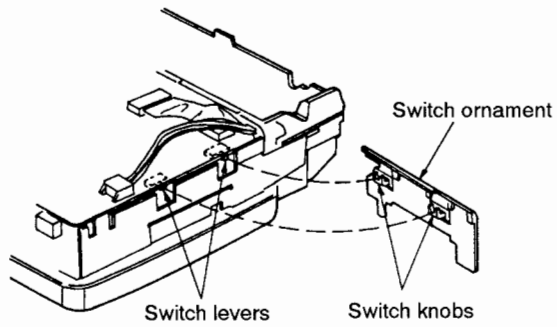


• Align the switch levers with switch knobs when installing the jack ornament.

● Notice for assembling the intermediate cabinet



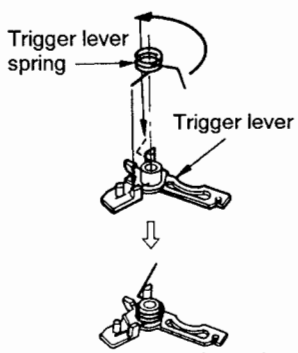
• Make sure the hooks inside the intermediate cabinet are joined to the jack ornament(Side L) and switch ornament(Side R) when installing the intermediate cabinet to unit.



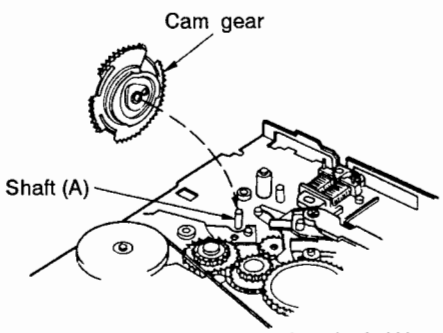
• Align the switch levers with switch knobs when installing the switch ornament.

Note: Before installing the switch knob, be sure to check the claws for defects that would render the claws unserviceable.
(If a white line like white wax on a claw is found, the claw may be broken when installing the switch knob.)

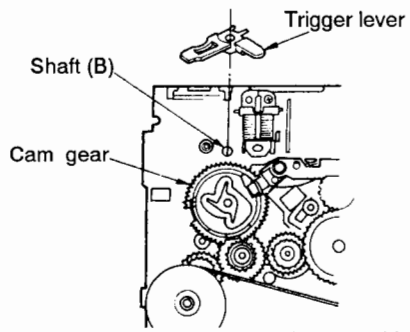
● Notice for assembling the cam gear



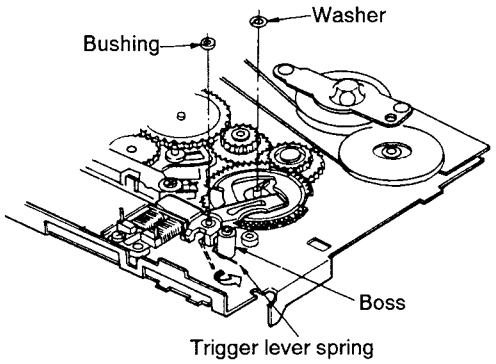
1. Temporarily install the trigger lever spring on trigger lever.



2. Install the cam gear to the shaft (A).

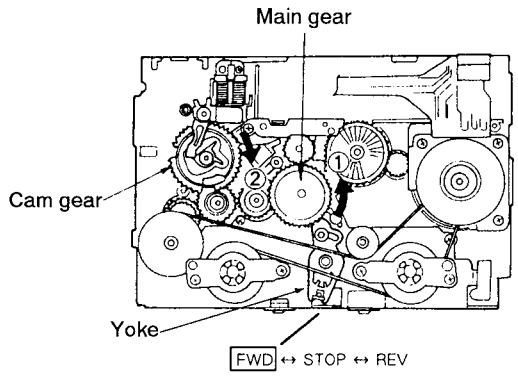


3. Rotate the cam gear toward the position as shown above.
4. Install the trigger lever to the shaft (B).

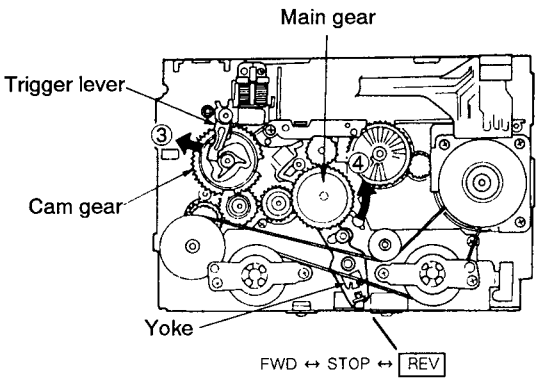


5. Latch the temporary attached trigger lever spring to the boss.
6. Install the bushing and washer.

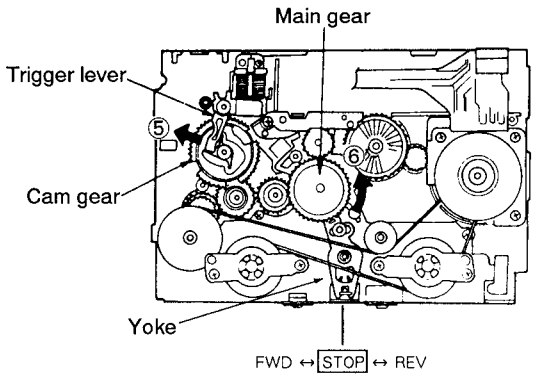
• Confirmation of cam gear operation



7. Rotate the main gear in the direction of arrow ①, and then the cam gear associates in the direcion of arrow ②.
8. Make sure the yoke is located at the posision "FWD" when the cam gear is ceased rotating.



9. Pull the trigger lever one time in the direction of arrow ③, and then rotate the main gear in the direction of arrow ④.
10. Make sure the yoke is located at the position "REV" when the cam gear is ceased rotating.



11. Further, pull the trigger lever one time in the direction of arrow ⑤, and then rotate the main gear in the direction of arrow ⑥.
12. Make sure the yoke is located at the position "STOP" when the cam gear is ceased rotating.

■ HOW TO CHECK OPERATIONS DURING DISASSEMBLY AND SERVICING

The following describes post−disassembly checking procedures for board and unit functions:

• Checking Digital P.C.B. Operations

1. Complete disassembly steps 1, "Removal of the battery cover ass'y" through 8, "Removal of the digital P.C.B." In step 8, remove the 8 screws (❶~❽) retaining the Digital P.C.B.
2. Set the HOLD switch (S502) to the OFF position (See Fig. 1).

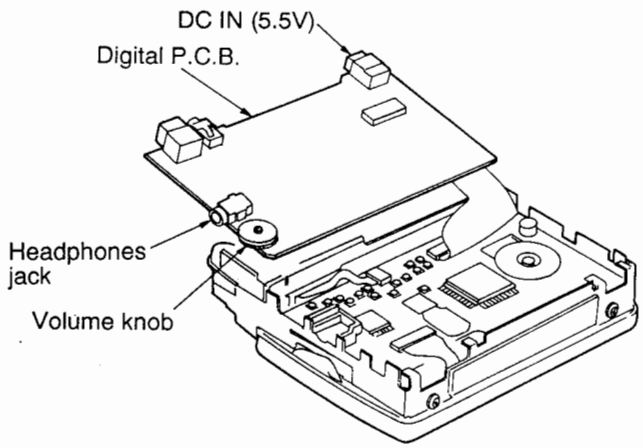


Fig. 1

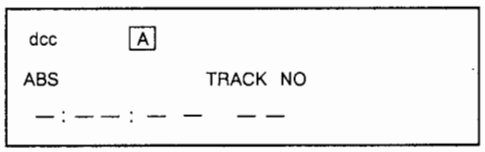
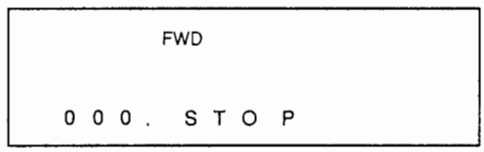
• Checking RF/Servo P.C.B. Operations

1. Complete disassembly steps 1, "Removal of the battery cover ass'y" through 9, "Removal of the RF/Servo P.C.B."
2. Remove the battery holder by following disassembly step 13, "Removal of the battery case ass'y."
3. Remove the LCD P.C.B. by completing step 16, "Removal of the LCD P.C.B." and step 17, "Removal of the switch P.C.B." then install the battery case ass'y.
4. Interconnect the LCD, Digital, and RF/Servo P.C.B.
5. Connect the RF/Servo P.C.B.'s connector (CN102) to the capstan motor FPC with the interconnection cable (RFKZ0043). (See Fig. 2).
6. Set the HOLD switch (S502) to the OFF position.
7. Condition in setting the Factory Mode
   Set the three switches as follows:

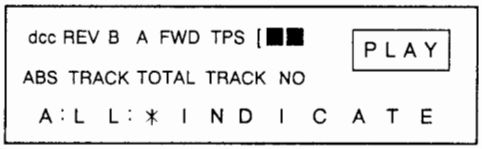
Sw No.	Sw Name	Condition	Setting Procedure
S503	Cassette Compartment Lid OPEN/CLOSE Detection Switch	CLOSE	Disconnect 3-pin connector lead wires (blue and white) between S503 and LCD P.C.B.
S101	ACC/DCC Tape Detection Switch	DCC tape loading: OFF	Demount RF/SERVO P.C.B. from Mechanism. (See Fig. 2)
		ACC tape loading: ON	Hold S101 by taping.
S102	TAPE IN Detection Switch	ACC/DCC tape loading: ON	Short by soldering Pins ② and ③ of Connector (CN101).

8. How to set the Factory Mode
(Follow the procedure of steps 1~4 below. Power source: AC)

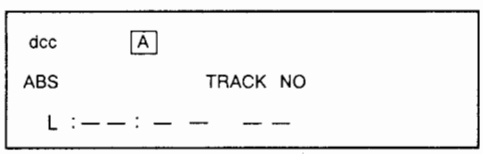
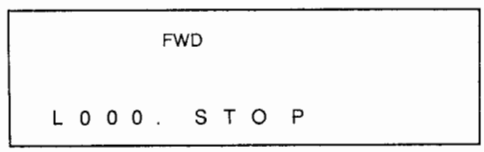
Step 1 From the ALL-OFF status, press the PLAY key while pressing the COUNTER RESET key. (Power source turns ON and the unit is then in the STOP 〈WAKE-UP〉 status.)

LCD Indication for WAKE-UP status	
DCC tape loading	ACC tape loading
	

Step 2 Press the FF key twice while pressing the COUNTER RESET key.

LCD Indication
ACC tape or DCC tape loading
FACTORY MODE ⇩ (1sec. later, all LCD's light up.)  (All LCD's light up.) (NOTE) If the unit is left in the mode for 4 minutes or longer, all LCD's are turned OFF.

Step 3 Press the COUNTER RESET key twice.

LCD Indication	
DCC tape loading	ACC tape loading
	
L means that the Factory Mode has been set.	

Step 4 Press the desired key out of the PLAY, FF, and REW keys.
(Indication at the tape leader part differs from indication at the music recording part.)

LCD Indication when DCC tape is loaded

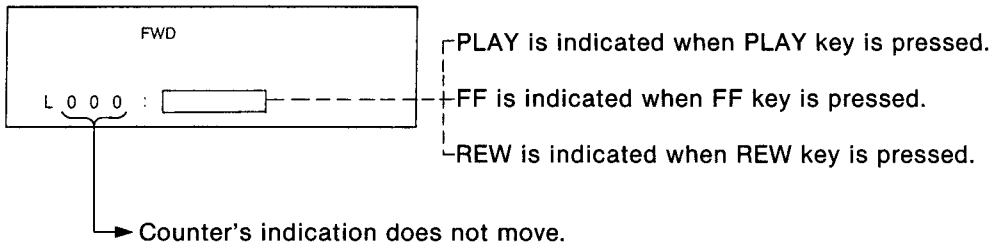
PLAY key is pressed	FF key is pressed	REW key is pressed
• Indication at the tape leader part during play dcc A ABS TRACK NO L :□□:□□:□ □	dcc A ABS TRACK NO L :□□:□□:□ □	dcc A ABS TRACK NO L :□□:□□:□ □
4 segments light up one by one sequentially.	4 segments light up one by one sequentially, and tape runs faster than in PLAY.	Segment lighting direction differs but lighting speed does not differ from the case of FF.

• Indication at the music recording part during play

dcc A
ABS TRACK NO
L :□□:□□:□□

Time and track No. indicated are ordinarily the same as during PLAY, FF or REW.

LCD Indication when ACC tape is loaded



Step 5 To cancel the Factory Mode, press the STOP key for the ALL-OFF status.
(To cancel it from the OPERATION status, press the STOP key twice, and to cancel it from the STOP status, press the STOP key once.)

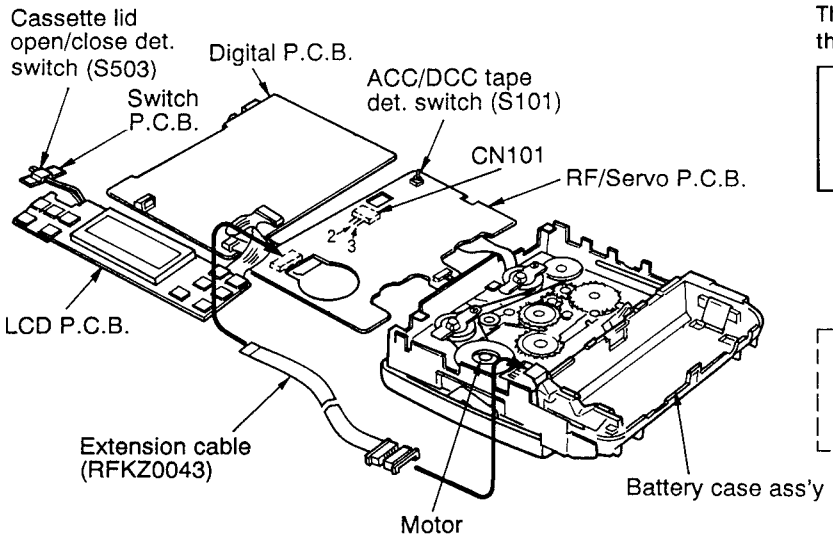
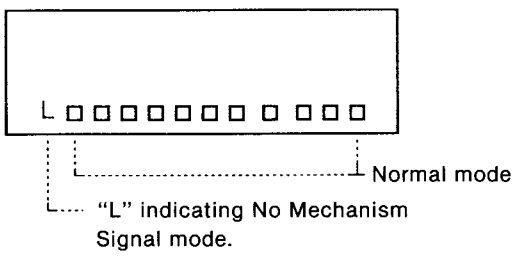


Fig. 2

The unit indicates "L" after entering the No Mechanism Signal mode.



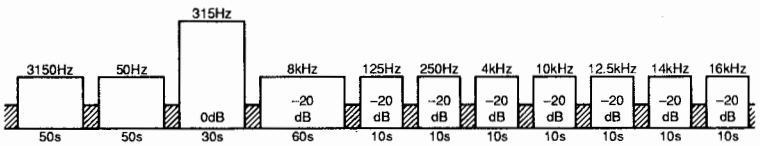
This mode is used to check boards with a Mechanism mode SW or boards with reel pulse mode. It senses the Mechanism mode, then controls the audio control signal.

Fig. 3

■ MEASUREMENTS AND ADJUSTMENTS

Required Jips, Test Tapes, and Measuring Instruments

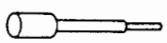
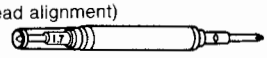
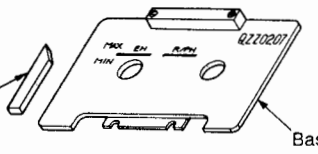
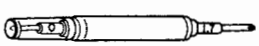
• Test tape

Part No.	Contents	Use
SBC420	315Hz: 0dB, 3150Hz: –10dB 125Hz~16kHz: –20dB 4.76cm/s 250nWb/m  time constant 3180μs and 120μs	Tape speed adjustment Distortion adjustment NF adjustment Frequency response adjustment
SBC438	Mirror tape	Tape transport adjustment

• Measuring instrument

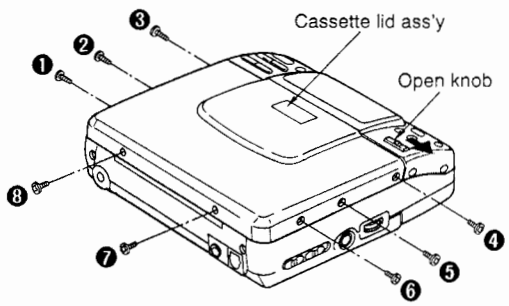
Oscilloscope	Distortion factor meter	Frequency counter	Electronic voltmeter (E.V.M.) (AC/DC)

• Jigs and Tools

(A) MECHANISM ADJUSTMENT	Head alignment adjusting screwdriver (RZZ0296)  Ceramic screwdriver (Head alignment) (HOZAN D-281, ⊕ No. 0)  Head adjusting jig (QZZ0207) 
(B) ELECTRICAL ADJUSTMENT	Ceramic screwdriver (HOZAN D-281, ⊕ No. 1.7) 

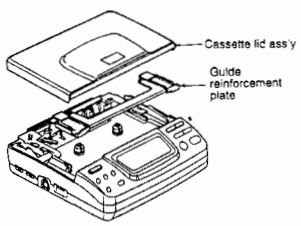
(A) MECHANISM ADJUSTMENT (HEAD POSITION ADJUSTMENT)

• Disassembly

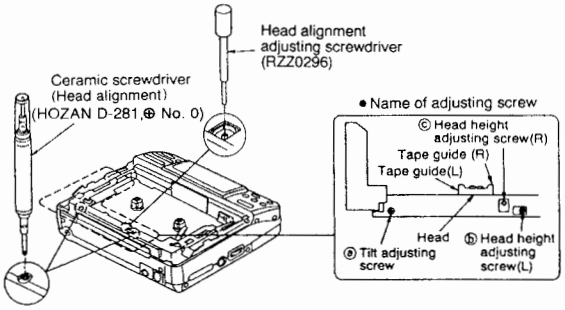


1. Push the OPEN knob in the direction of the arrow to open the cassette lid ass'y.
2. Remove the 8 screws (❶~❽).

4. Perform head position adjustment after disassembling the unit to the point shown on the right.

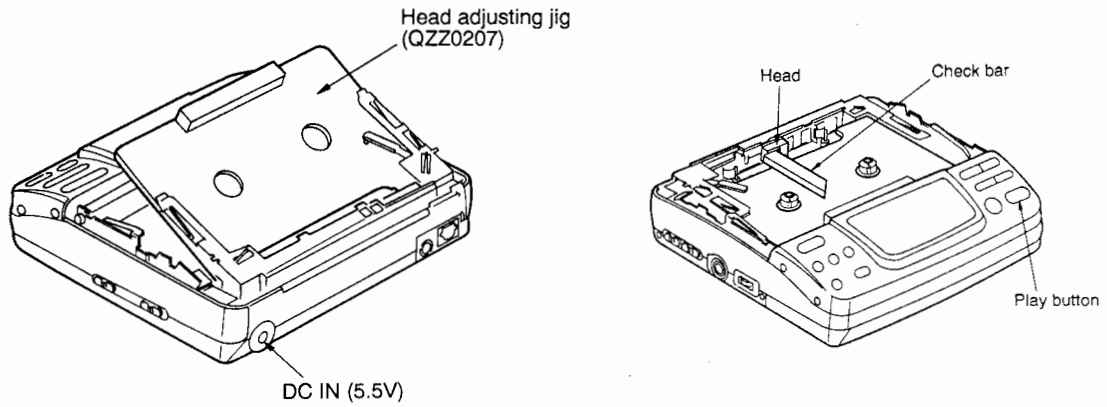


3. Remove the cassette lid ass'y and quide reinforcement plate.



• Loading Head Adjusting Jig (QZZ0207)

1. Load the head adjusting jig (QZZ0207) into the unit.

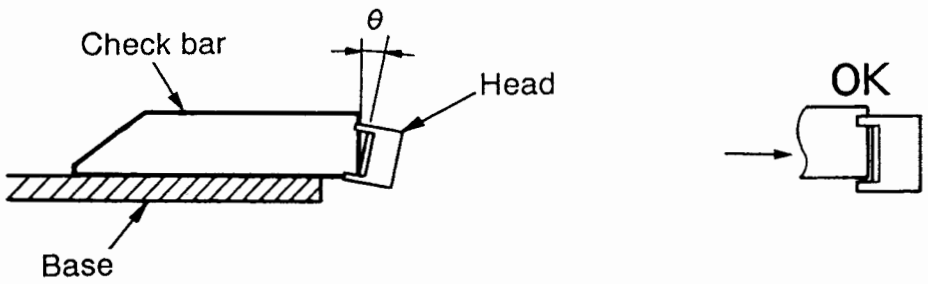


• Power Connection

1. Plug the accessory AC Adaptor (or other 5.5V DC power supply) into the unit's DC IN jack.
2. Press the PLAY button to enter PLAY mode.

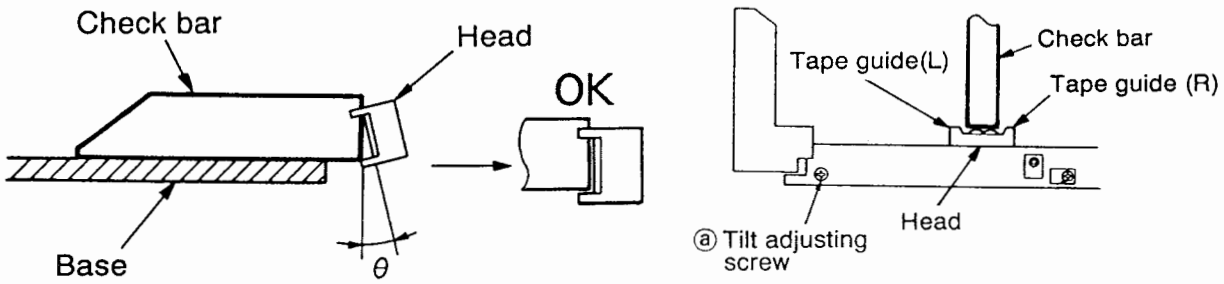
(1) Tilt Adjustment

• If the head tilts backward:



Turn the ⓐ tilt adjusting screw clockwise until the head surface is parallel with the end of the check bar (θ=within ±30′).

• If the head tilts forward:

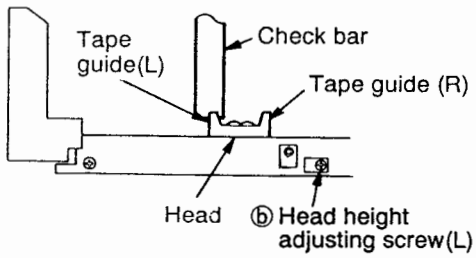


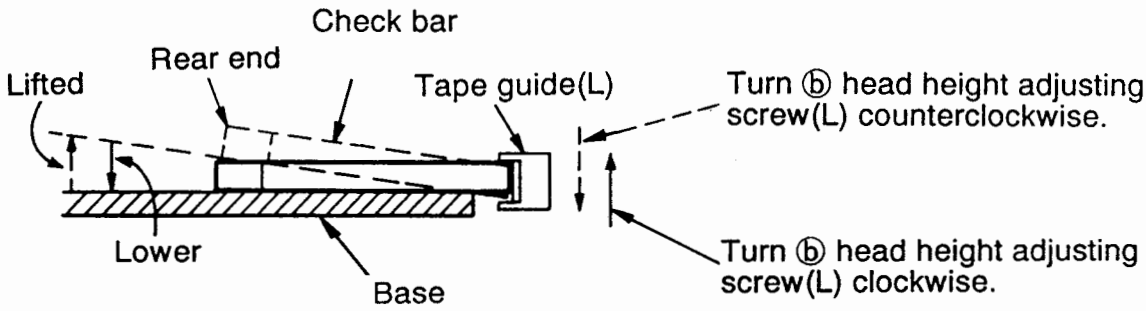
Turn ⓐ tilt adjusting screw counterclockwise until the head surface is parallel with the end of the check bar (θ=within ±30′).

(2) Guide Heights Adjustment

• Adjusting Guide (L)

Insert the check bar into tape guide (L) as shown below.

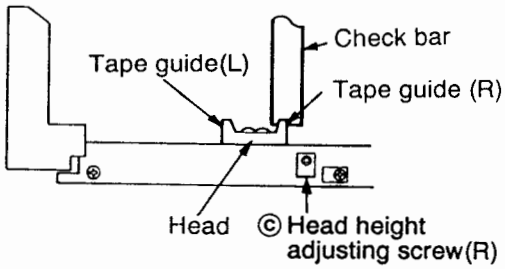


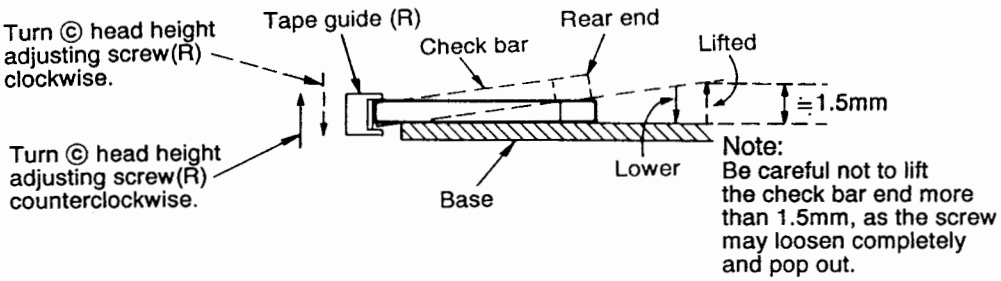


Turn ⓑ head height adjusting screw (L) counterclockwise to lift the rear end of the check bar off the base, then slowly turn the screw clockwise to lower the rear end until it is parallel and rests on the base.

• Adjusting Guide (R)

Insert the check bar into tape guide (R) as shown below.





Turn ⓒ head height adjusting screw (R) clockwise to lift the rear end of the check bar off the base, then slowly turn the screw counterclockwise to lower the rear end until it is parallel and rests on the base.

Note: The head arm has a slight amount of play. Make sure that the rear end of the check bar completely rests on the base after the screwdriver is removed.

(3) Tape Tr

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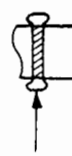
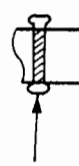


Tape hu

② If a curl
Turn ⓒ



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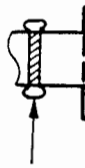
③ When th



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Note: Sinc
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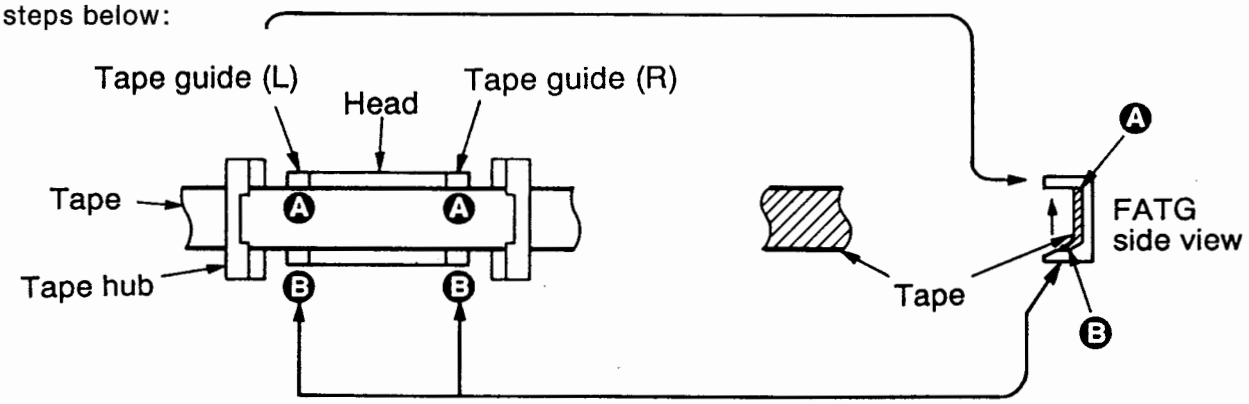
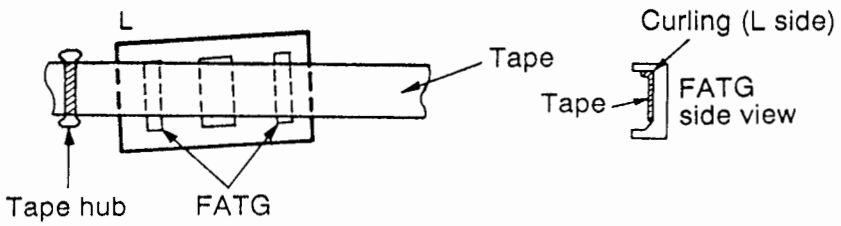
(3) Tape Transport Adjustment

- Load the mirror tape (SBC438) into the unit and check tape transport in PLAY mode, Check both forward and reverse directions. If the top edge of the tape is curled, remove the curl by following the steps below:



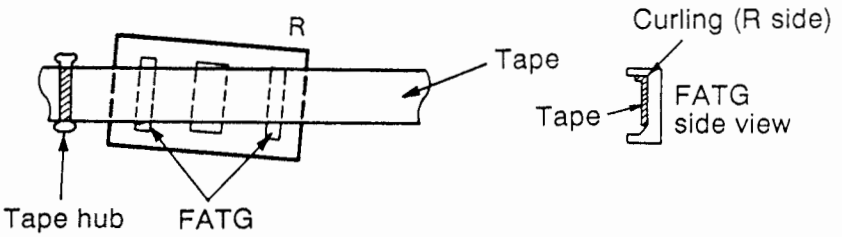
A curled tape edge will not occur at the bottom Ⓑ of the tape guide, as the tape is pushed up along a slope.
Check for a curled tape edge at the top Ⓐ of the tape guide.

① If a curled tape edge occurs on FATG (L):
Turn ⓒ head height adjusting screw (R) clockwise until the curl is removed.



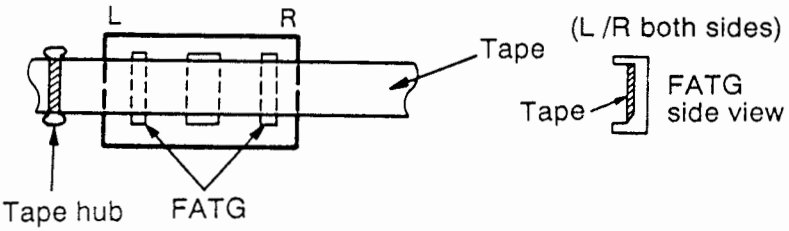
×
Adjustment needed

② If a curled tape edge occurs on FATG (R):
Turn ⓒ head height adjusting screw (R) counterclockwise until the curl is removed.



×
Adjustment needed

③ When the relative positioning of the tape hub and tape head (tape guides) is correct:



○
No adjustment needed

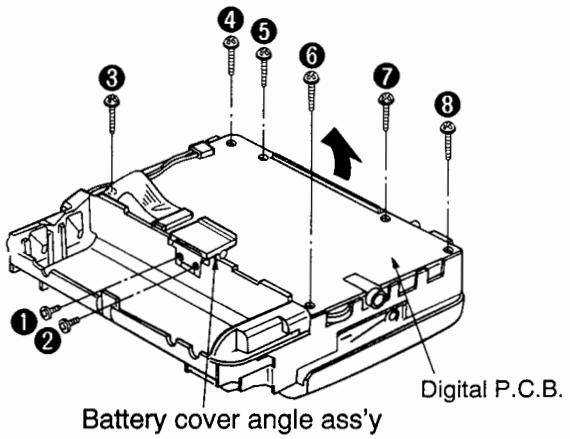
After completing the above adjustment, run the tape both forward and backward to check for a curled tape edge. If it still occurs, repeat step ① or ②.

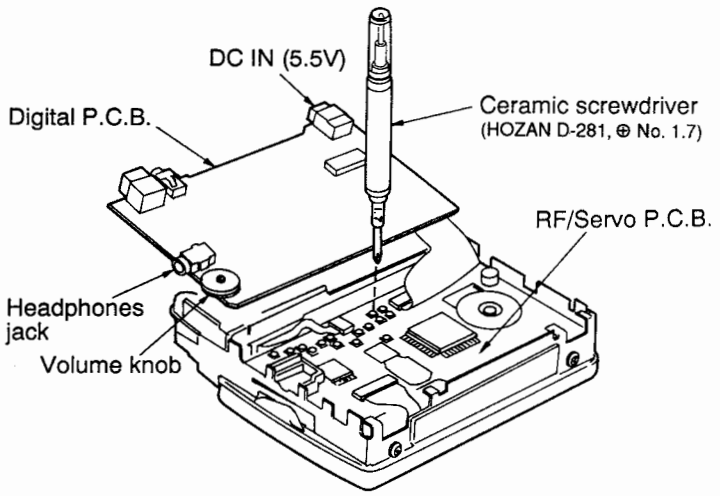
Note: Since the head arm has a slight amount of play, the degree to which the tape edge curls will differ before and after the adjustment screwdriver is removed. (Allow a sufficient adjustment margin.)

(B) ELECTRICAL ADJUSTMENT

• Disassembly

1. Complete disassembly steps 1, "Removal of the battery case ass'y" (page 3) through 7, "Removal of the switch ornament" (page 4).





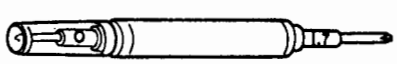
2. Remove the two screws (❶, ❷) and remove the battery cover angle ass'y.
3. Remove the 6 screws (❸~❽).
4. Swing open the Digital P.C.B. in the direction of the arrow.
5. With the unit disassembled as shown above, plug the accessory AC Adaptor (or other 5.5V DC power supply) into the unit's DC IN jack.
6. Connect a measuring instrument to the LINE OUT jack with the accessory line cable (4822 321 62146).

Note: Use the inside censor for audio monitoring.

• List of Adjustment VR

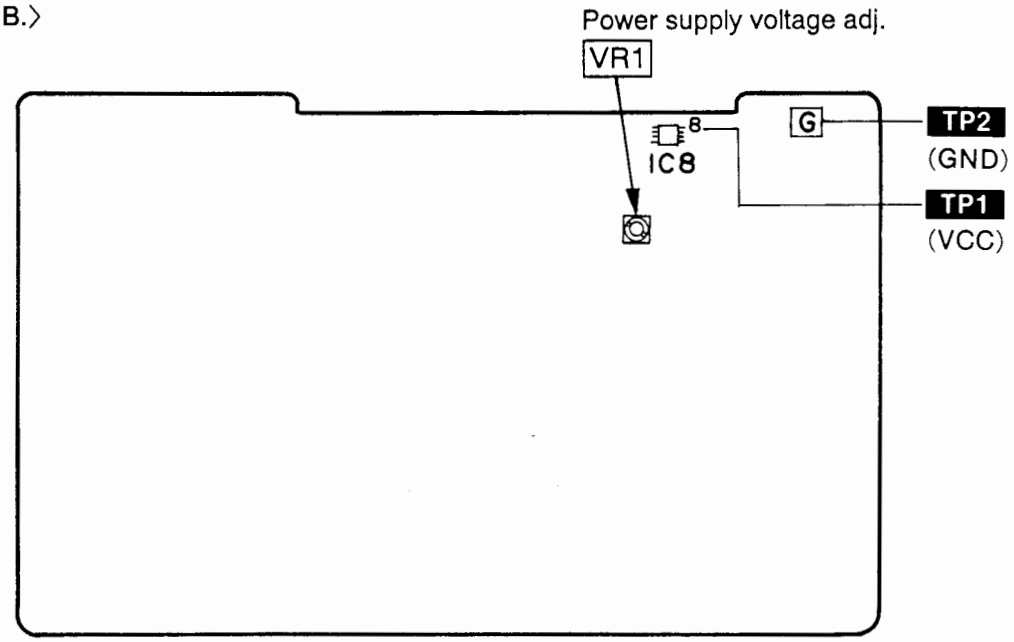
Adjustment Item	Adjustment VR				Test Tape	Measuring instrument
	FWD		REV			
	LCH	RCH	LCH	RCH		
Power supply voltage adjustment	VR1				—	E.V.M
Distortion adjustment	VR209	VR210	VR207	VR208	SBC420	Oscilloscope or Distortion factor meter
N.F adjustment	VR205	VR206	VR203	VR204	SBC420	E.V.M
High frequency response adjustment	VR213	VR214	VR211	VR212	SBC420	E.V.M
Playback sensitivity adjustment	VR221	VR222	VR219	VR220	SBC420	E.V.M
Tape speed adjustment	VR102		VR101		SBC420	Frequency counter

Caution: Use a ceramic screwdriver (HOZAN D-281 ⊕ No. 1.7) for all trimmer adjustments.

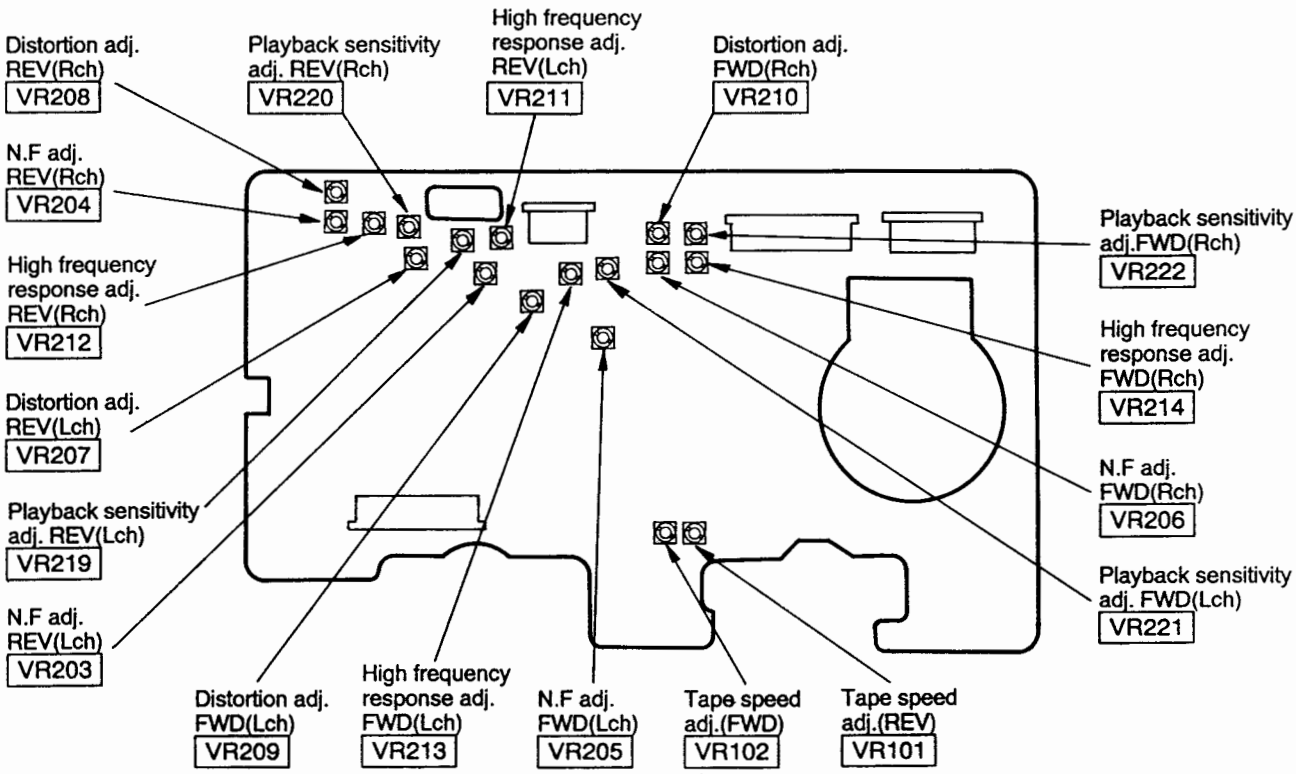


• Adjustment VR Layout

〈Digital P.C.B.〉



〈RF/Servo P.C.B.〉

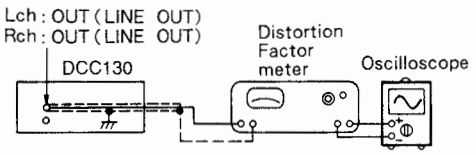


• Adjustment Procedures

(1) Power Supply Voltage Adjustment

1. Connect the DC voltmeter's positive lead to **TP1** (VCC) and the negative lead to **TP2** (GND) on the Digital P.C.B.
2. Plug the AC Adaptor into the unit's DC IN jack, then power up the unit by pressing the PLAY button. (When using a rechargeable battery instead of the AC Adaptor, make sure that the battery is fully charged.)
3. Adjust **VR1** on the Digital P.C.B. until the voltmeter reads **5.3±0.05V**.

(2) Distortion Adjustment

Preparation		Setup
Test tape and tool required	Measuring instruments required	
1. ACC test tape (SBC420) 2. Ceramic screwdriver (HOZAN D-281, ⊕ No. 1.7)	1. Oscilloscope 2. Distortion factor meter	

• Adjustment Procedure

Distortion Adjustment (Ⅰ) (Preliminary Alignment)

1. Play back the ACC Test Tape (SBC420: 315Hz, 0dB) forward.
2. Adjust **VR205** (L-ch.) and **VR206** (R-ch.) until the LINE OUT levels on both channels are maximized.
3. Reverse the direction of tape transport and perform the same adjustment with **VR203** and **VR204**.

FWD ┌ LCH: **VR205**
└ RCH: **VR206**　　REV ┌ LCH: **VR203**
└ RCH: **VR204**

Distortion Adjustment (Ⅱ)

1. Play back the ACC Test Tape (SBC420: 315Hz, 0dB) forward.
2. Adjust **VR209** (L-ch.) and **VR210** (R-ch.) until distortion on both channels is minimized.

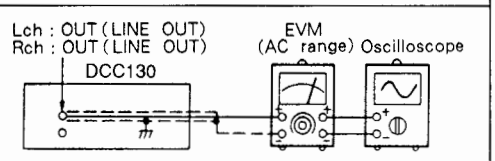
Adjustment Target: Less than **1.5**% THD

3. Reverse the direction of tape transport and perform the same adjustment with **VR207** and **VR208**.

FWD ┌ LCH: **VR209**
└ RCH: **VR210**　　REV ┌ LCH: **VR207**
└ RCH: **VR208**

(3) N.F. Adjustment

Note: This adjustment is not needed if the frequency response (described in the following item 4) falls within the specified limits after the head assembly is replaced.

Preparation		Setup
Test tape and tool required	Measuring instruments required	
1. ACC test tape (SBC420) 2. Ceramic screwdriver (HOZAN D-281, ⊕ NO. 1.7)	1. Oscilloscope 2. Electron voltmeter (EVM) (AC range)	

• Adjustment Procedure

1. Play back the ACC Test Tape (SBC420: 315Hz, 0dB) forward.
2. Adjust **VR205** (L-ch.) and **VR206** (R-ch.) until the LINE OUT levels on both channels are maximized. Use these levels as standards.
   Note: This adjustment is not needed if distortion adjustment (Ⅰ) has already been completed.
3. Adjust **VR205** (L-ch.) and **VR206** (R-ch.) until the LINE OUT levels on both channels are 10dB below the standard levels mentioned in step 2 above.

Adjustment Target: −10±0.5dB

4. Reverse the direction of tape transport and perform the same adjustment with **VR203** (L-ch.) and **VR204** (R-ch.).

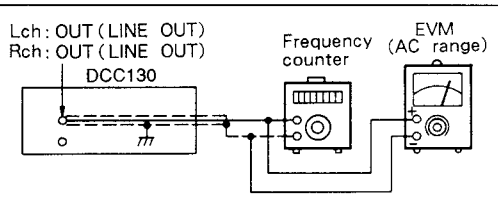
FWD ┌ LCH: **VR205**
└ RCH: **VR206**　　REV ┌ LCH: **VR203**
└ RCH: **VR204**

(4) High Frequency Response Check and Adjustment

Cautions:
- Be sure to check the frequency response after the head assembly is replaced.
- If the frequency response does not fall within the limits, perform the following adjustment.
- If it is still outside the limits after realignment, do the N.F. adjustment described in item (3).

Frequency Response Check

1. Play back 250Hz, –20dB and 12.5KHz, –20dB of the ACC Test Tape (SBC420) forward, and verify that the level difference between the two bands is within 0 ± 1dB.
2. Reverse the direction of tape transport and perform the same check.

Preparation		Setup
Test tape and tool required	Measuring instruments required	
1. ACC test tape (SBC420) 2. Ceramic screwdriver (HOZAN D-281, ⊕ No. 1.7)	1. Frequency counter 2. Electron voltmeter (EVM) (AC range)	

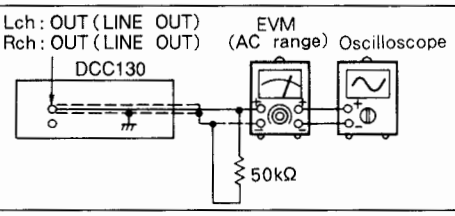
• Adjustment Procedure

1. While playing back 250Hz, –20dB of ACC Test Tape (SBC420) forward, measure the LINE OUT levels on both channels. Use these levels as standards.
2. Play back 12.5kHz, –20dB of the same test tape forward, and adjust **VR213** (L-ch.) and **VR214** (R-ch.) until the LINE OUT levels are identical to the standard levels obtained above.

   Adjustment Target: 0±0.5dB
3. Reverse the direction of tape transport and perform the same adjustment with **VR211** (L-ch. 12.5kHz) and **VR212** (R-ch. 12.5kHz).

   FWD ┌ LCH: **VR213** (12.5kHz)
└ RCH: **VR214** (12.5kHz) REV ┌ LCH: **VR211** (12.5kHz)
└ RCH: **VR212** (12.5kHz)

(5) Playback Sensitivity Adjustment

Preparation		Setup
Test tape and tool required	Measuring instruments required	
1. ACC test tape (SBC420) 2. Ceramic screwdriver (HOZAN D-281, ⊕ No. 1.7)	1. Oscilloscope 2. Electron voltmeter (EVM) (AC range)	

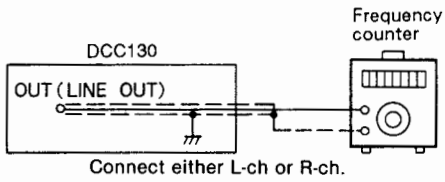
- **Adjustment Procedure**

1. Load the line outputs with 50kΩ resistors.
2. Play back the ACC Test Tape (SBC420: 315Hz, 0dB) forward.
3. Adjust **VR221** (L-ch.) and **VR222** (R-ch.) until the line output levels on both channels fall within the following limits:

   Adjustment Target: 360mV ±0.5 dB Load line outputs with 50kΩ resistors.
4. Reverse the direction of tape transport and perform the same adjustment with **VR219** (L-ch.) and **VR220** (R-ch.).

   FWD ┌ LCH: **VR221**
└ RCH: **VR222** REV ┌ LCH: **VR219**
└ RCH: **VR220**

(6) Tape Speed Adjustment

Preparation		Setup
Test tape and tool required	Measuring instruments required	
1. ACC test tape (SBC420) 2. Ceramic screwdriver (HOZAN D-281, ⊕ No. 1.7)	1. Frequency counter	

1. Press the STOP button twice to turn the unit OFF.
2. Short pins ⑭ and ⑮ of IC102. (Fig. 1)
3. Play back the ACC Test Tape (SBC420: 3150Hz, –10dB) forward.
4. Adjust **VR102** until the frequency counter reads 3150Hz

   Adjustment Target: 3150±15Hz
5. Reverse the direction of tape transport and perform the same adjustment with **VR101.**

   FWD: **VR102**

   REV: **VR101**

Note: After completing the adjustment, be sure to remove the shorting jumper from pins ⑭ and ⑮ of IC102.

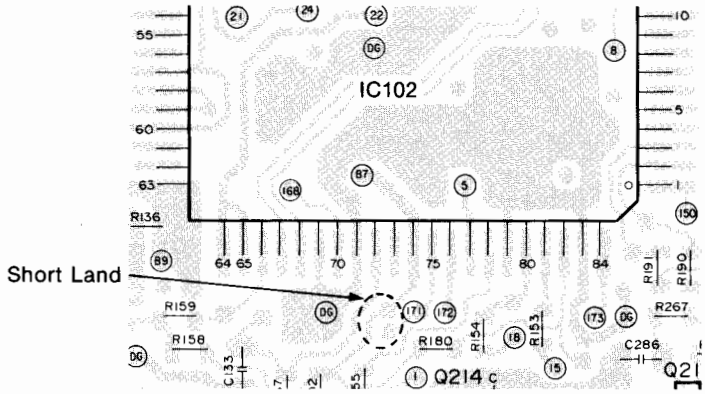


Fig. 1

■ TECHNICAL NOTE

Wake-Up (Power-On) Sequence

The unit has a Wake-Up feature which controls power on/off operations with CPU (system control) commands (IC500). To turn the unit power ON, the system microprocessor must be activated first. The unit will remain OFF unless the system microprocessor is active.

The CPU (system control) becomes active only if:

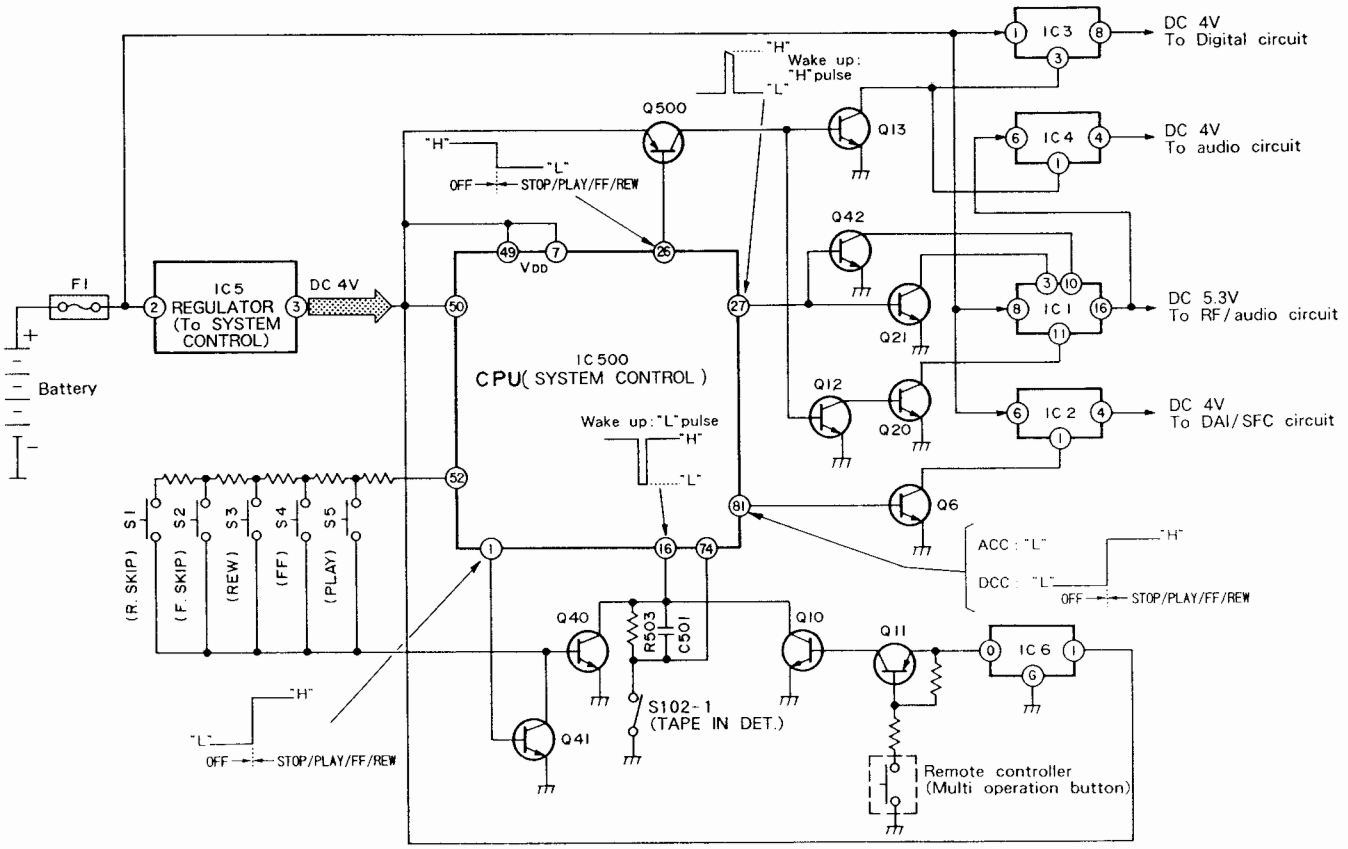
(1) A. VDD is supplied to pin ㊿ and VDD to pins ⑦ and ㊾.
(2) Pin ⑯ (WAKE UP) goes Low (negative edge).

Setting pin ⑯ to Low

Pin ⑯ of the CPU (system control) goes Low if any of the following three conditions is fulfilled:
a) Any one of the PLAY, FF, REW, F. SKIP, or R. SKIP buttons is pressed.
b) "TAPE IN" is detected (S102-1).
c) Button "1" (multi-function button) on the wired remote control is pressed.

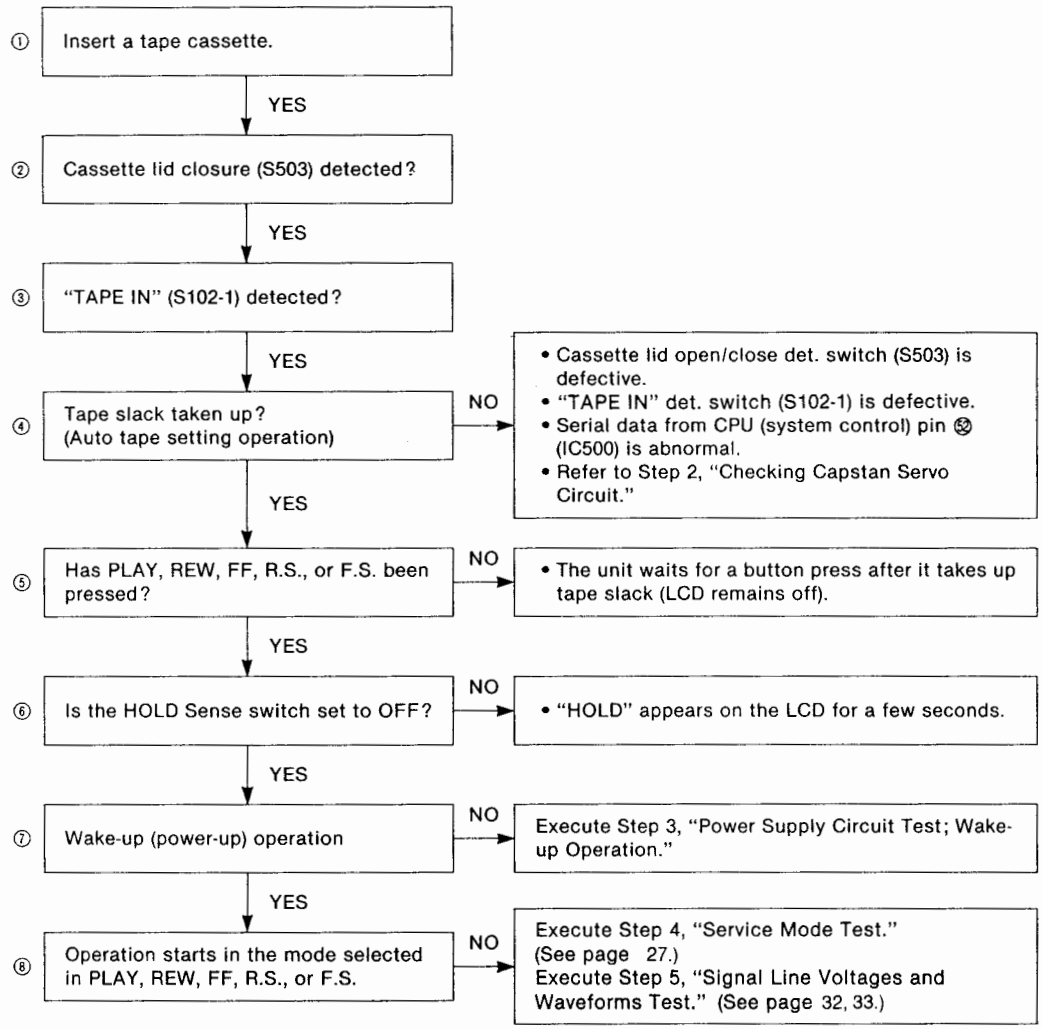
Case a): Q40 is turned ON, which switches processor pin ⑯ (IC500) from High to Low.
Case b): S102-1 is turned ON, which brings processor pin ⑯ Low via C501.
Case c): Q10 and Q11 are turned ON, which switches processor pin ⑯ from High to Low.

Once the unit wakes up, Q41 is turned ON, which pulls Q40's base to ground to allow the unit to read subsequent button entries correctly. CPU (system control) pins ㉖, ㉗, and ㉛ then control Q6, Q12, Q13, Q21, Q42, and Q500 to activate the outputs of voltage regulators IC1 through IC4 to supply DC power to the other circuits.



■TROUBLESHOOTING

Step 1. Checking Operations from Tape Insertion through Operation Start



Step 2. Checking Capstan Servo Circuit

• DCC Playback

1. Connect an oscilloscope to **IC503 pin ㉚** on the **digital P.C.B.**
2. Load a **DCC music tape** into the unit under test and put the unit **in PLAY mode.** When the capstan servo is locked, a **square wave with a duty ratio fluctuation of less than 0.5µs** will be observed on the scope (see Fig. 1). Unlock the servo and verify that the muting function is active.

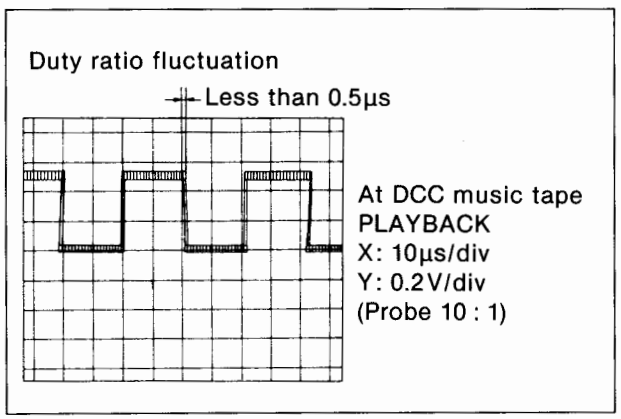


Fig. 1

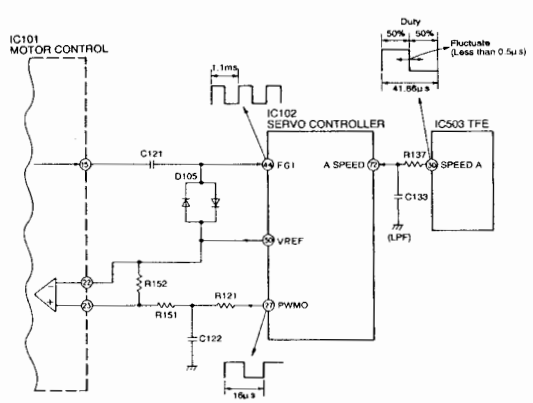
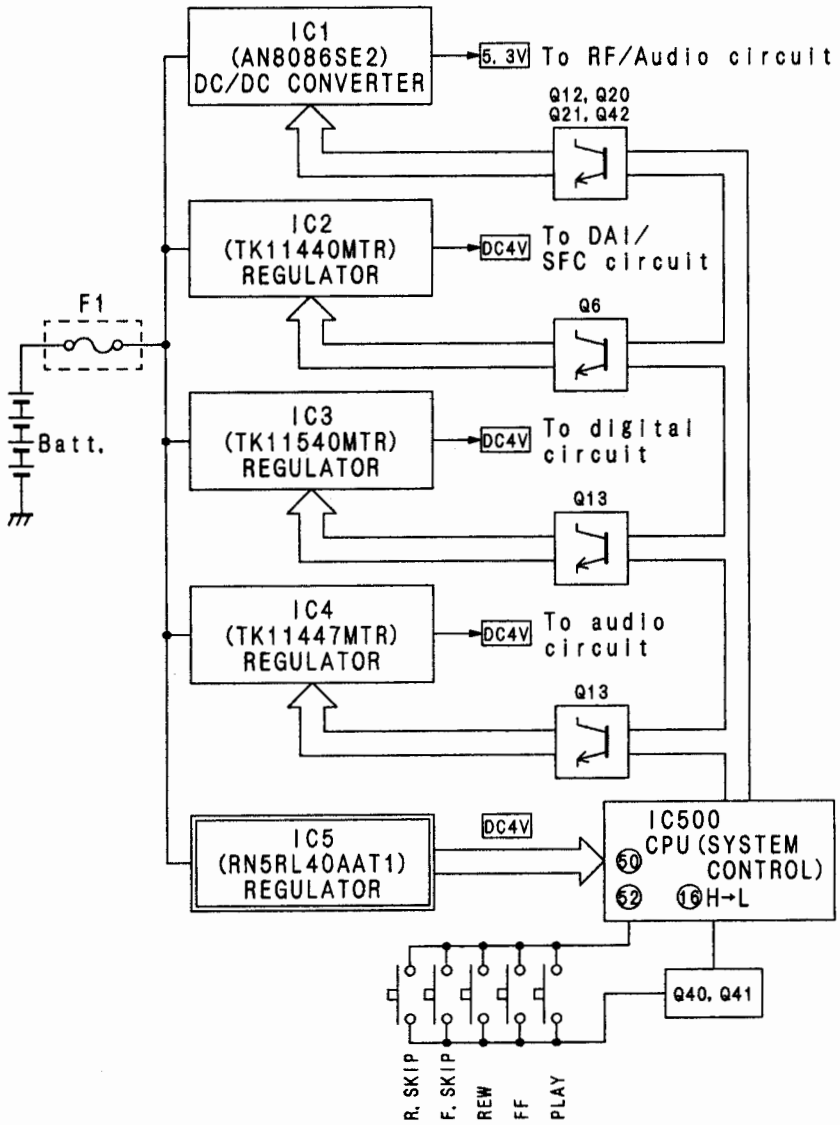


Fig. 2

Step 3. Power Supply Circuit Test; Wake-Up Operation (See the Technical Note on page 34.)



Does not wake up.

Is pin ③ of IC5 at 4V DC?
- NO → IC5 and F1 are defective.
- YES ↓

Is pin ㊾ of IC500 at 4V DC.
- NO → Pin ③ of IC5 and pin ㊾ of IC500 are floating.
- YES ↓

Does pin ⑯ of IC500 change from "H" to "L" when a button is pressed?
- NO → Q40 and Q41 are defective the LCD PC-board tact SW is defective.
- YES ↓

Does pin ⑧ of IC500 oscillate (f=6MHz) (Oscillates for 14 seconds after a button is pressed.)
- NO → IC500 is defective X500 (ceramic oscillator) is detective.
- YES ↓

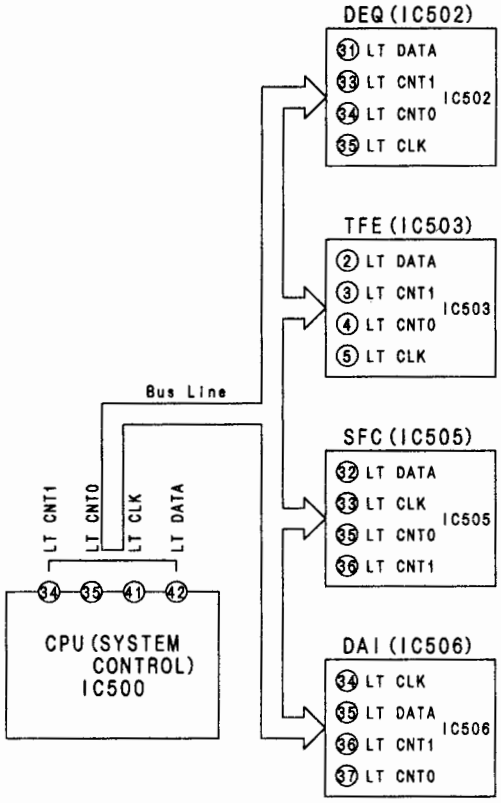
IC5 is at 4V DC. Output is normal.

IC1 (DC/DC CONV.) does not generate 5.3V DC. → Check output pin ㉗ of IC500. Also check Q12, Q20, Q21, Q42, IC1 and L4.

IC2 does not generate 4V DC. → Check output pin ㉛ of IC500, Q5 and IC2 are defective.

IC3 and IC4 do not generate 4V DC. → Check output pin ㉖ of IC500, Q500 and Q13 are defective.

Step 4. CPU ↔ IC's Communication (Bus Line) test [Self Diagnostic (Service Mode)]



In Service mode, the CPU (system control) checks for circuit integrity and displays the test results on the LCD. Use this mode for quick fault isolation.

How To Enter Service Mode

- With the unit in STOP mode, press the PLAY button twice while holding down the COUNTER RESET button. "SERVICE MODE" appears on the LCD.
- The following test modes are sequentially selected each time the COUNTER RESET button is pressed:

	COUNTER RESET button operation count	Test item	LCD message	Remarks
LSI Communication test	1	LSI communication test	LT OK or LT NG	See communication Test on pages 28 ~29.
	2	DEQ communication test	DEQ OK or DEQ NG	
	3	TFE communication test	TFE OK ot TFE NG	
	4	SFC communication test	SFC OK or SFC NG	
Data error test	5	SYS INFO data error	ERR SYS 000	
	6	AUX data error	ERR AUX 000	
	7	MAIN data error	ERR MAIN 0CH 000	
	8 (Overall error test for items 5, 6 and 7 above.)	Total error rate	Displays the number of occurrences in which any one of SYSFLC, AUXFLO, and STRGL is set to "1" in four seconds, 100 segments.	See Digital Error Rate Display.

• Digital Error Rate Display

00 00000000
→Indicates main data error.
→Indicates AUX data error.
→Indicates SYS INFO data

•Meaning of LCD data error codes

00 00000000 ┐ EX:
00 00101000 ┘ OK

01 00000000 (AUX data error)
10 00000000 (SYS INFO data error)
00 01101000
11 11111111
99 99999999
⌇
AA AAAAAAAA
⌇
FF FFFFFFFF
Main data error

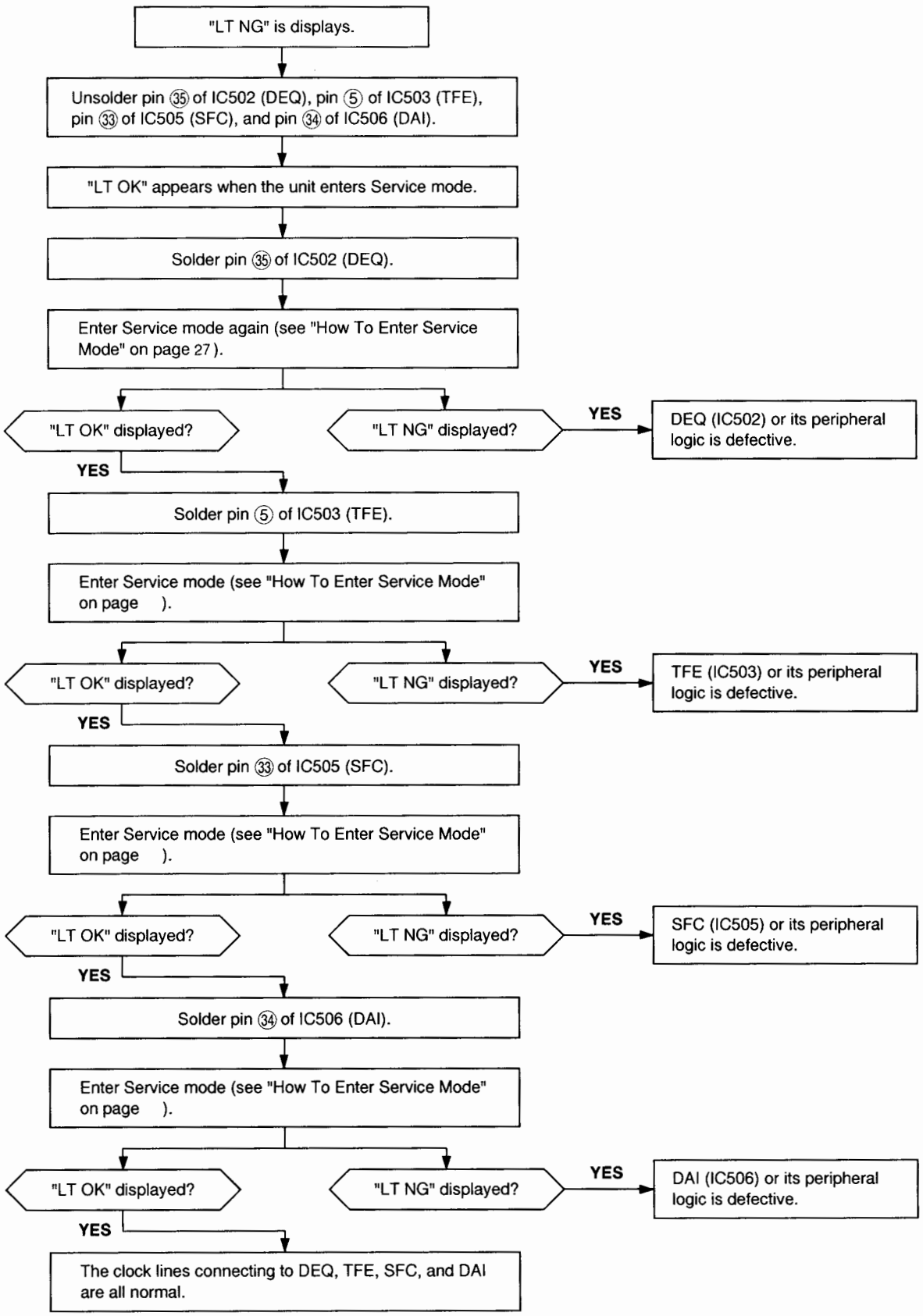
EX: NG

•If the data error code is "NG", check test points step 5. Ⓑ-1, Ⓑ-2 and the waveform at Ⓒ.

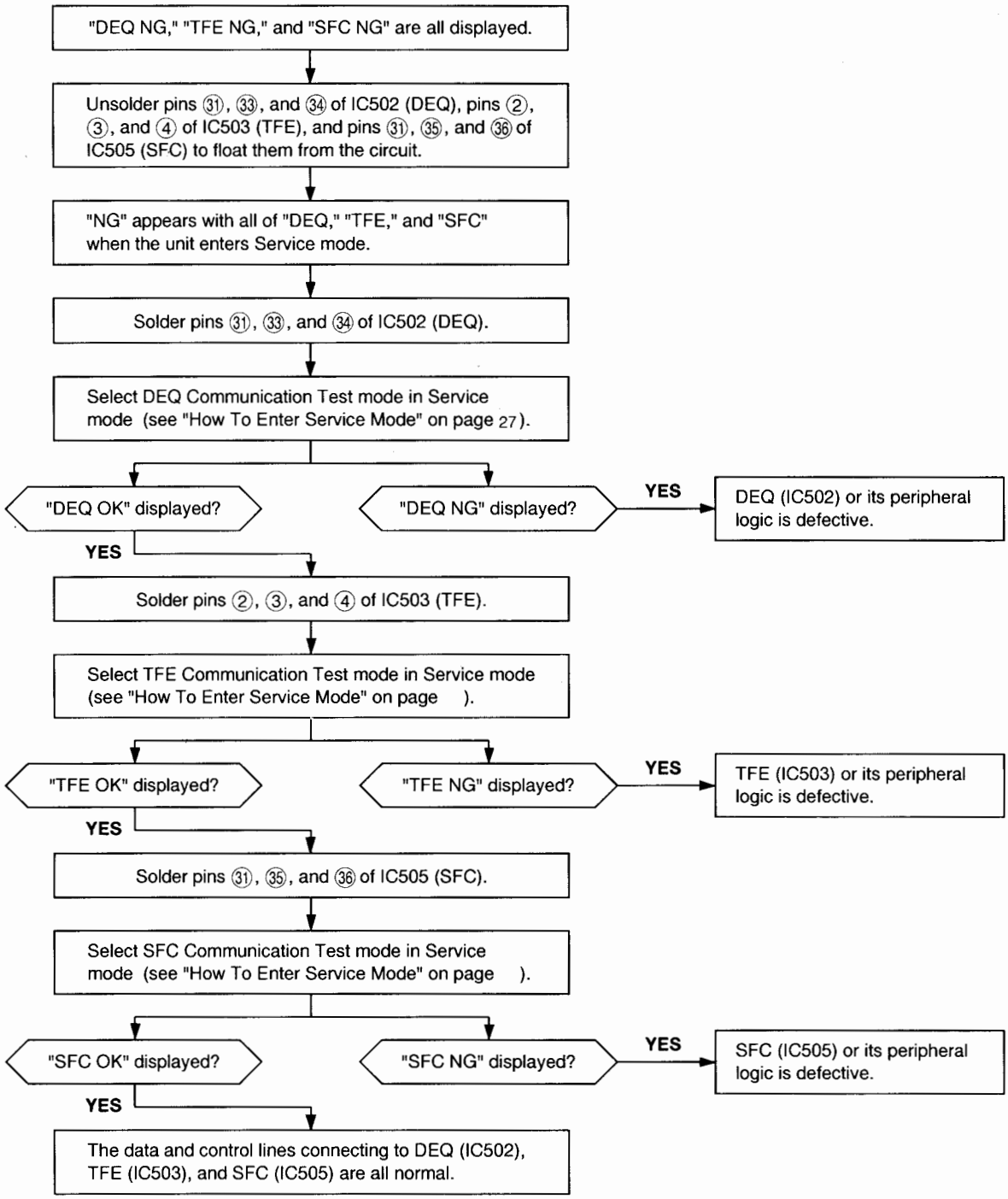
• LSI, DEQ, TFE and SFC Communication Test

The CPU (system control) is connected to its peripheral ICs (DEQ, TFE, SFC, DAI) via a parallel bus consisting of clock, data, and control lines. If an "NG" message is displayed on the LCD as a result of self diagnostics in Service mode, it is necessary to determins which IC out of DEQ, TFE, SFC, and DAI (including their peripheral components) is defective. The flowcharts on the following pages provide a quick troubleshooting guide to locate the defective IC(s).

(1) Locating the defective division of LSI communication test (Clock Line: "LT NG")



(2) Locating the defective division of DEQ, TFE and SFC communication (Data and Control Line: "DEQ/TFE/SFC NG")



Notes:

- If an IC or its peripheral component is found to be defective, leave its pin(s) unsoldered or replace it with a functioning component.
- If a defective IC or peripheral is left soldered, an "NG" message will reappear when another IC is tested.
- ICs or peripherals found to be normal may be resoldered.
- More than one IC or peripheral may be defective at a time. Carry out all the troubleshooting steps even if a defective IC or component is discovered before you complete all the steps.
- The data and control lines connecting to the DAI are not testable.
- The unit turns off if no button is operated for 4 minutes after entering Service mode.
- The unit will not be stopped automatically with the Service mode.
- Use a normal (new) tape for troubleshooting.
- To exit Service mode, press the STOP button.

FACTORY MODE

The following shows the entire contents of the LCD, the state of the switching mechanism, etc. Refer to these when servicing the cassette recorder.

Factory Mode ON/OFF

ON: While holding down the COUNTER RESET button, press the PLAY button once, Factory mode wakes up in the same way as the regular STOP mode. Then, while holding down the COUNTER RESET button, press the FF button twice.

OFF: Press the STOP/POWER OFF button.

Notes:

(1) The power turns OFF unless a button is pressed within 4 minutes while in the Factory mode (the same as for normal operation).

(2) When Factory mode is OFF, operation is the same as that of Power-OFF mode.

(3) Both the ACC and DCC switch contacts must be closed to enter this mode. (Closing only the DCC switch contacts accesses the Service mode.)

Items: In Factory mode, use the COUNTER RESET button to sequentially select modes.

When the factory mode is entered, "FACTORY MODE" is displayed for 1 second before entering mode 1.

In Factory mode, set the 4 minute Power-OFF timer to 5 second.

LCD →

F A C T O R Y □ M O D E

1. Activate the entire LCD (Press the COUNTER RESET button to enter mode 2.)

LCD →

dcc REV B A FWD TPS [■■ PLAY

ABS TRACK TOTAL TRACK NO

A;L L:✳ I N D I C A T E

2. Check each switch input (Press the COUNTER RESET button to enter mode 3.)

Deactivate the entire LCD and read the status of each switch on the display. Display the reading results in the following position.

LCD →

dcc

6 □ C □ □ □ N □ B □ B □

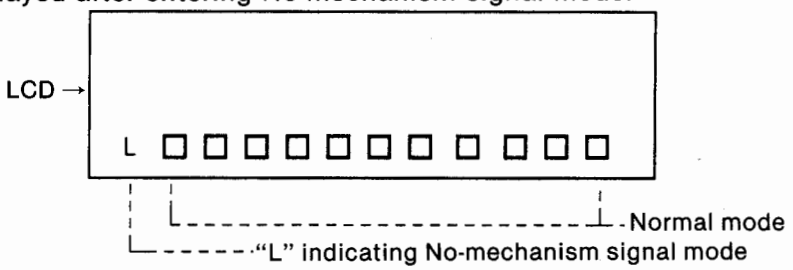
- B :DOLBY OUT / H :DOLBY IN
- B : ⮌ / R : ⟲
- H :HOLD ON / N :HOLD OFF
- C : NO KEY / 7 : DIR / 8 : COUNTER MODE / 9 : TEXT SCROLL / A : TEXT MODE
- 6 : NO KEY / 5 : R.SKIP / 4 : F.SKIP / 3 : REW / 2 : FF / 1 : PLAY / 0 : STOP

After checking all the above switch positions, activate the entire LCD again.

Notes:

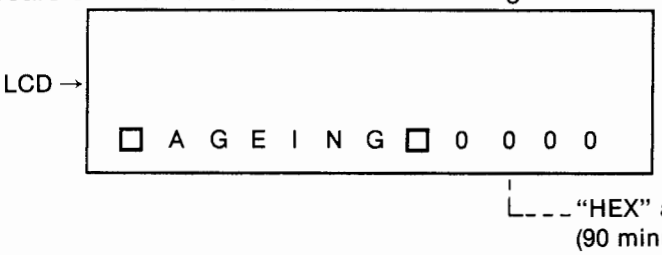
(1) Regarding the DCC/ACC switches and REW mode switch, the entire LCD is activated on the condition that both modes are checked.
(2) Check the HOLD switch with the Factory mode OFF. (Special care must be taken when this check is made.)
(3) In modes other than the Switch check mode, normal operation is possible, but the Factory mode is given priority on the display.

mechanism signal mode (Press the COUNTER RESET button to enter mode 4.)
is displayed after entering No-mechanism signal mode.



This mode is used to check boards with a Mechanism mode SW or a reel pulse mode. It senses the Mechanism mode and then activates the audio control signal. (The internal timer is active for mode switches.)

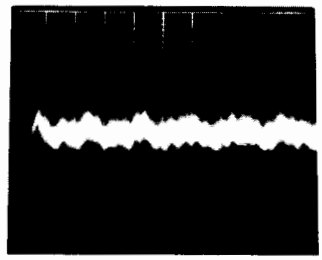
ng mode (Press the COUNTER RESET button to enter mode 4.)
g 0" appears on the LCD and then the following modes are repeated sequentially.



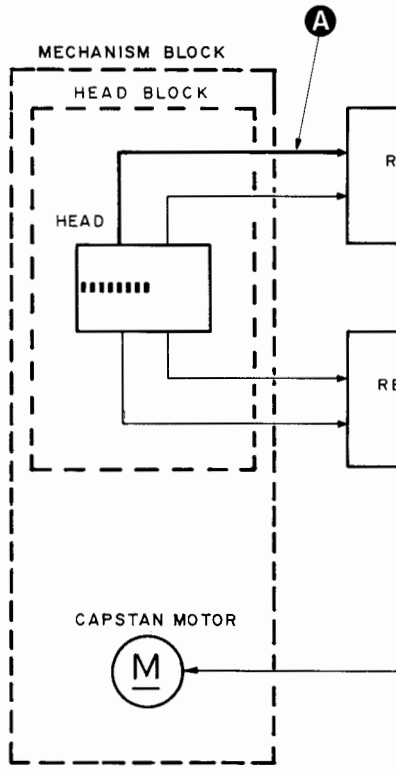
. FF (Up to the end of side A)
. REW (Rewinding from the end of side A to the beginning of side A)
. +10 skip operations
Repeat the + SKIP operation 10 times per song from the beginning of side A.
Each time a piece of music is skipped, it is entered in the replay mode, and then skipped to the next piece for a play operation again. This cycle is repeated 10 times.
. −10 skip operations
When the repeat + skip operations on side A are completed, − skip operations can be performed.
Repeat the − skip operation 10 times per song to return to the first piece.
. Side A replay (Played up to the end of side A and reversed.)
. Side B replay (Played up to the end of side B and reversed.)

Step 5. Signal line voltages

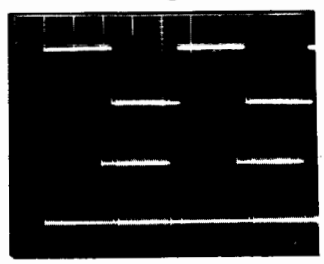
Ⓐ IC201、202 Pin ⑫~⑳
EYE MONITOR



Y : 2mV × 10
X : 0.1μs



Ⓔ-2 IC505 Pin ⑳ SWS (CH1)
IC505 Pin ㉑ SDA (CH2)

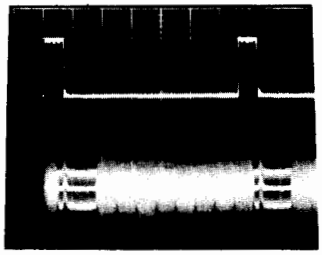


CH1 Y : 0.2V × 10
X : 5μs
CH2 Y : 0.2V × 10
X : 5μs

nal line voltages and waveforms test, and motor driving voltage test

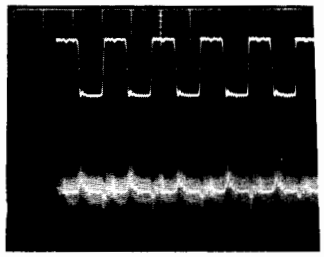
n ⑫~⑳
R

Ⓑ-1 IC201、202 Pin ㊶ RDSYNC (CH1)
IC201、202 Pin ① RDMUX (CH2)



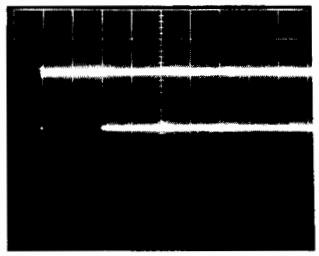
CH1 Y : 0.2V × 10
X : 0.5μs
CH2 Y : 50mV × 10
X : 0.5μs

Ⓑ-2 IC201、202 Pin ㊵ RDCLK (CH1)
IC201、202 Pin ① RDMUX (CH2)



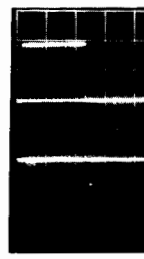
CH1 Y : 0.2V × 10
X : 0.2μs
CH2 Y : 50mV × 10
X : 0.2μs

Ⓒ IC502 Pin ㉓~㉙ (TCH1~7)

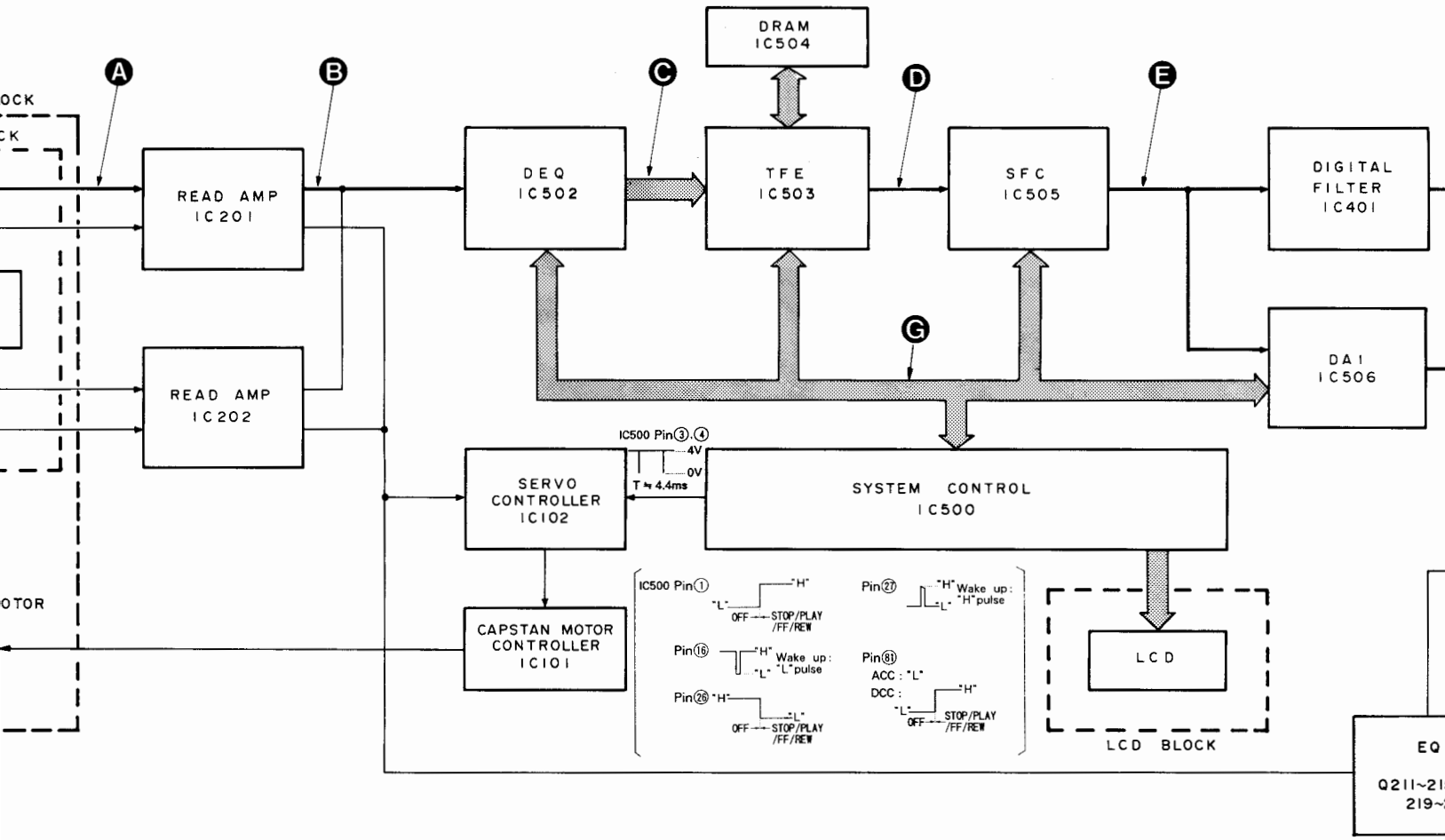


Y : 0.2V × 10
X : 5μs

Ⓓ IC503 Pin
IC503 Pin



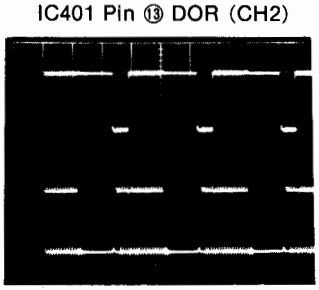
CH1 Y : 0.2V
X : 10μs
CH2 Y : 0.2V
X : 10μs



SWS (CH1)
SDA (CH2)

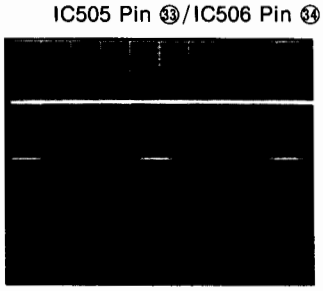
0
0

Ⓕ IC401 Pin ⑮ WCKO (CH1)
IC401 Pin ⑬ DOR (CH2)



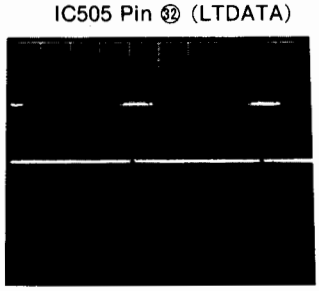
CH1 Y : 0.2V × 10
X : 1μs
CH2 Y : 0.2V × 10
X : 1μs

Ⓖ-1 IC502 Pin ㉟/IC503 Pin ⑤/
IC505 Pin ㉝/IC506 Pin ㉞ (LTCLK)



Y : 0.2V × 10
X : 10ms

Ⓖ-2 IC502 Pin ㉛/IC503 Pin ②/
IC505 Pin ㉜ (LTDATA)



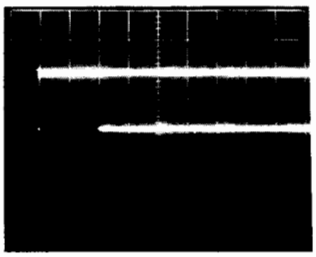
Y : 0.2V × 10
X : 10ms

Ⓖ-3 IC502 Pi
IC505 Pi

Y : 0.2V × 1
X : 10ms

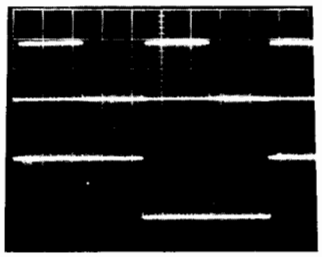
RDCLK (CH1)
RDMUX (CH2)

Ⓒ IC502 Pin ㉓~㉙ (TCH1~7)



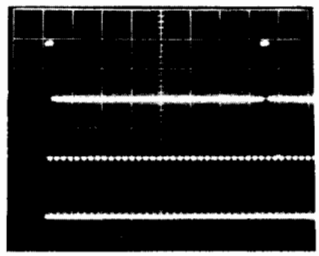
Y : 0.2V × 10
X : 5μs

Ⓓ IC503 Pin ㊷ SBDA (CH1)
IC503 Pin ㊵ SBWS (CH2)

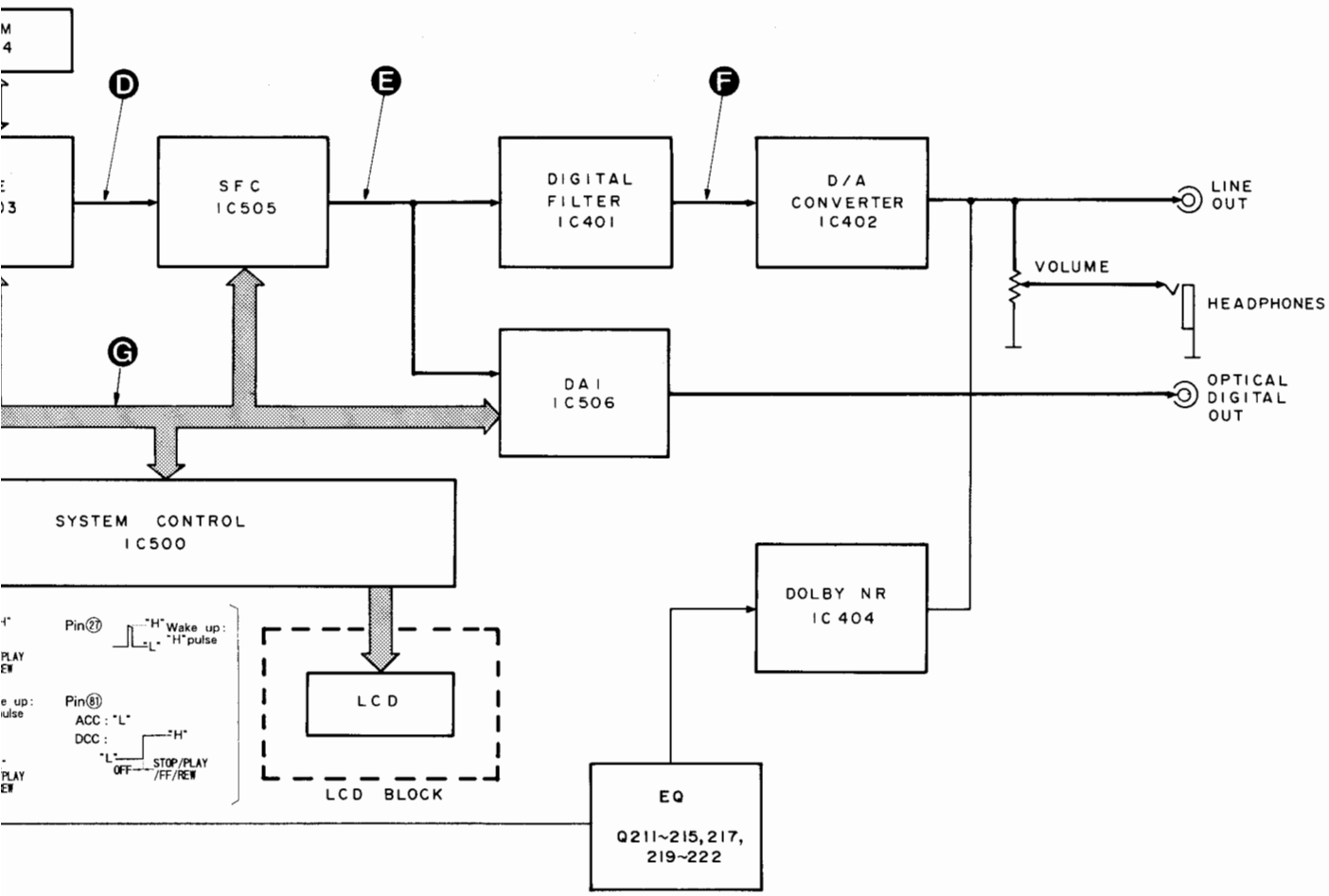


CH1 Y : 0.2V × 10
X : 10μs
CH2 Y : 0.2V × 10
X : 10μs

Ⓔ-1 IC505 Pin ⑯ FSYNC (CH1)
IC505 Pin ㉑ SDA (CH2)

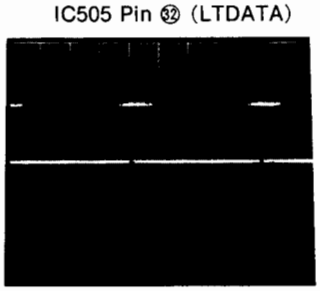


CH1 Y : 0.2V × 10
X : 0.1ms
CH2 Y : 0.2V × 10
X : 0.1ms



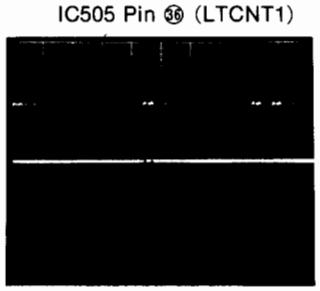
Pin ⑤/
Pin ㉞ (LTCLK)

Ⓖ-2 IC502 Pin ㉛/IC503 Pin ②/
IC505 Pin ㉜ (LTDATA)



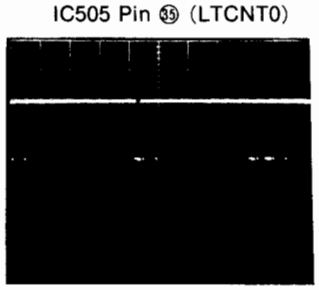
Y : 0.2V × 10
X : 10ms

Ⓖ-3 IC502 Pin ㉝/IC503 Pin ③/
IC505 Pin ㊱ (LTCNT1)



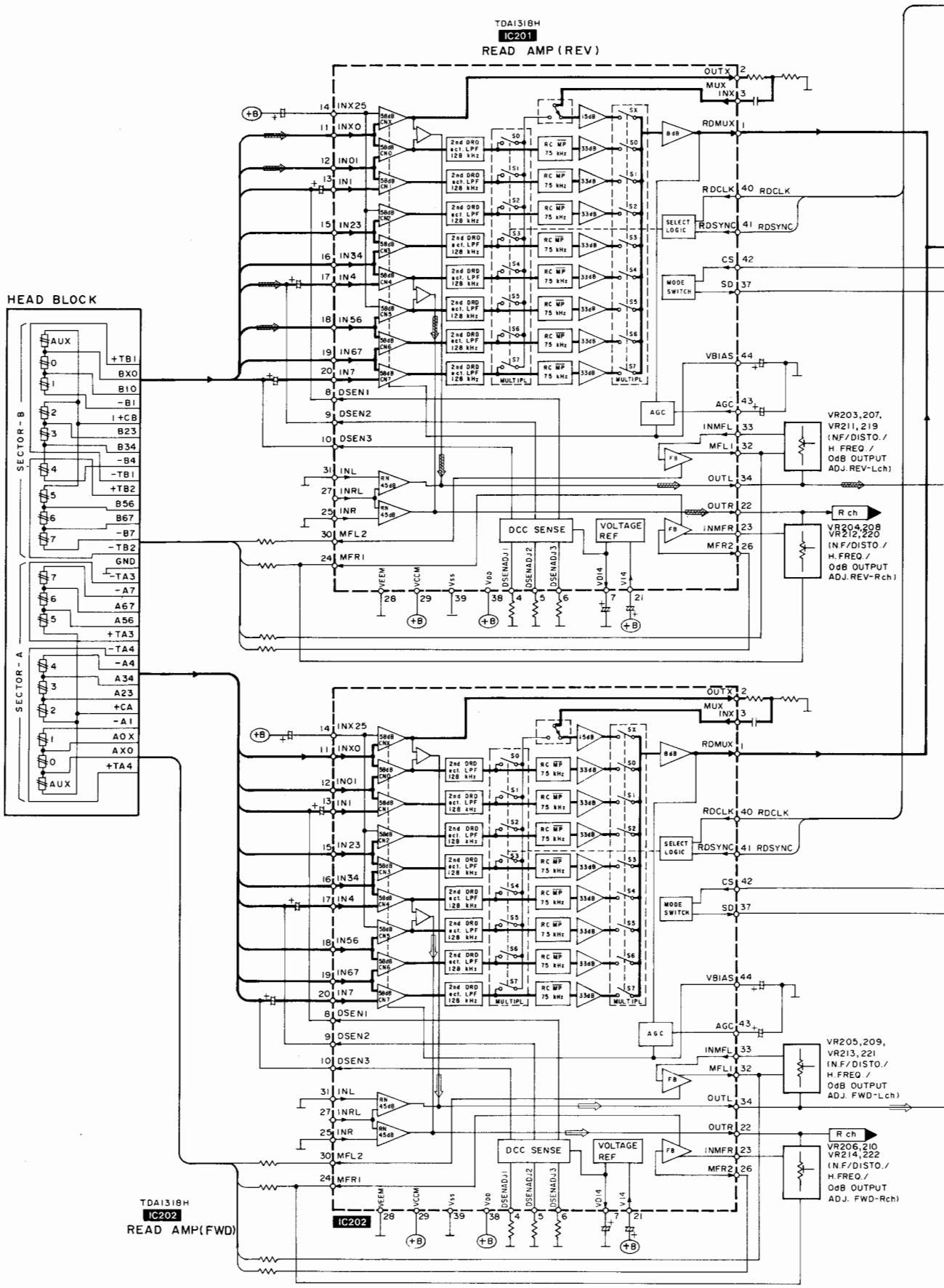
Y : 0.2V × 10
X : 10ms

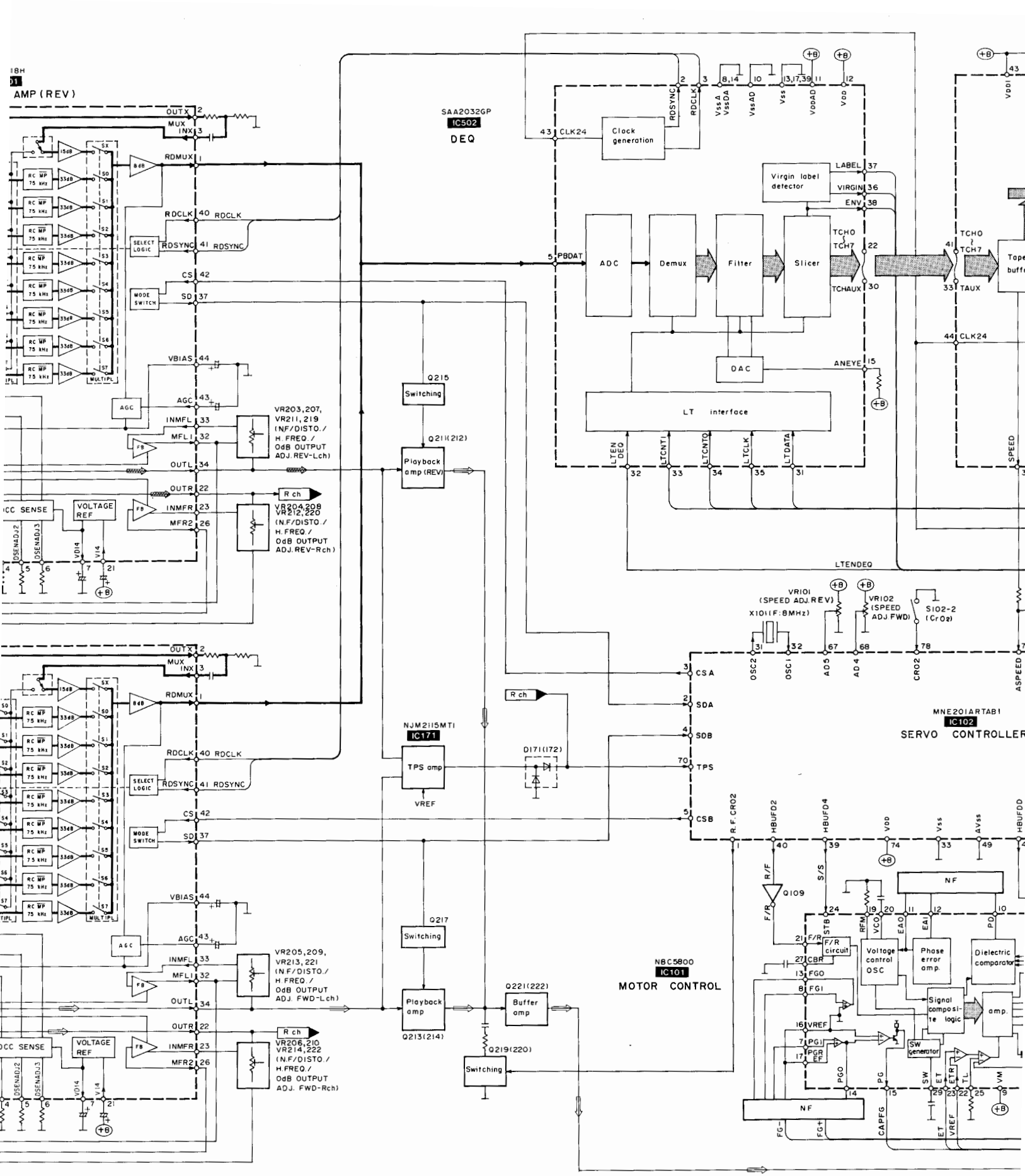
Ⓖ-4 IC502 Pin ㉞/IC503 Pin ④/
IC505 Pin ㉟ (LTCNT0)

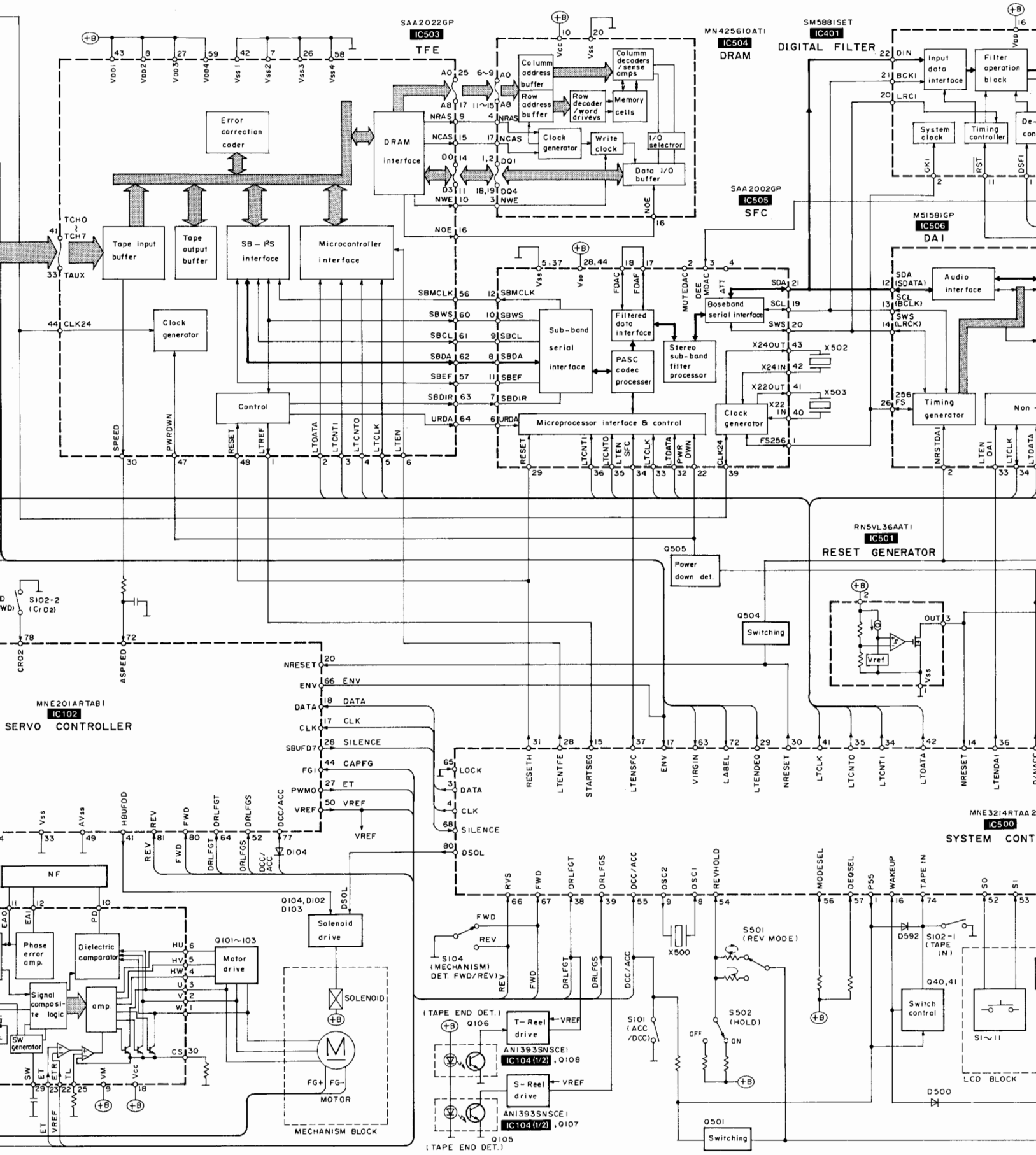


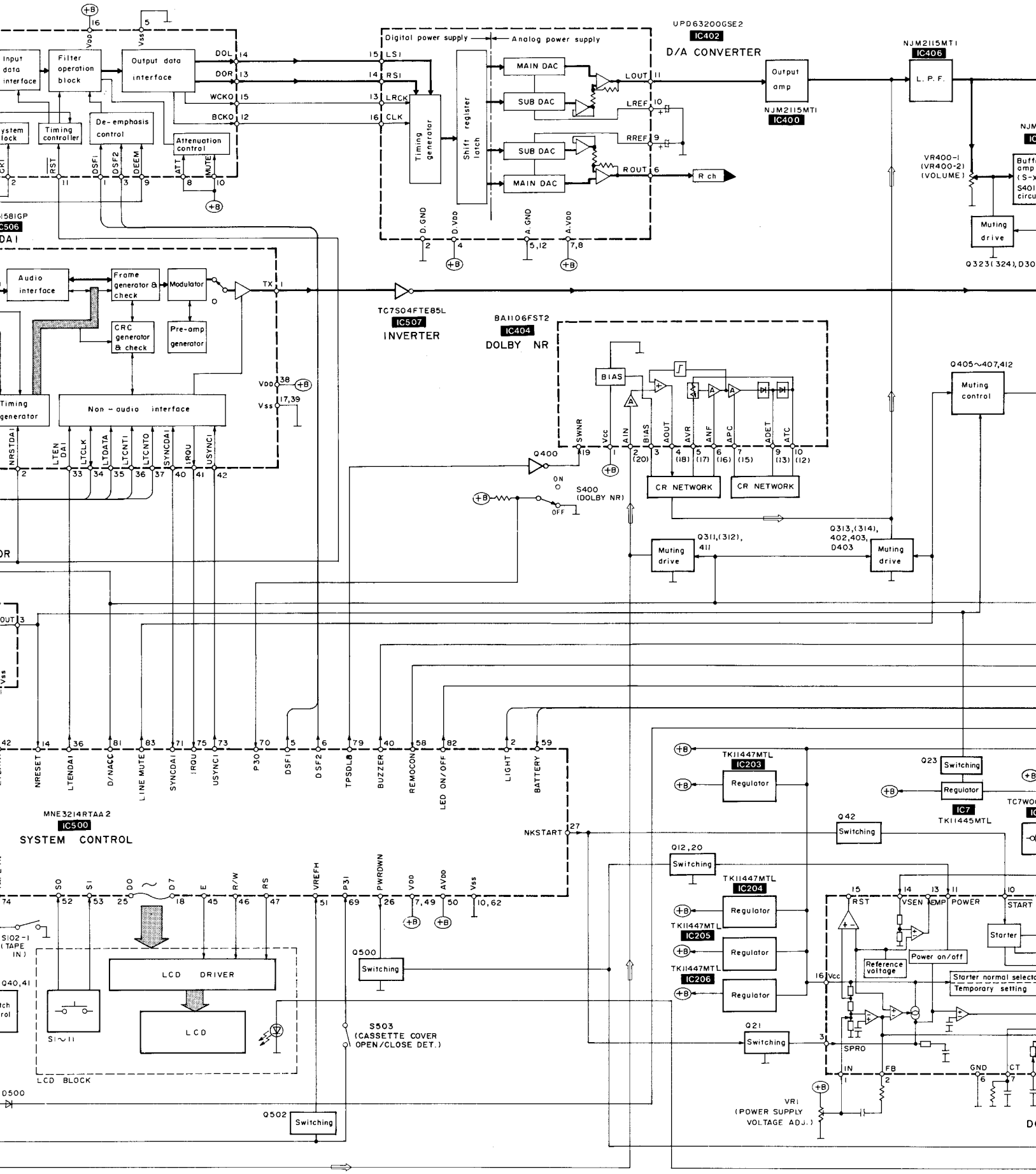
Y : 0.2V × 10
X : 10ms

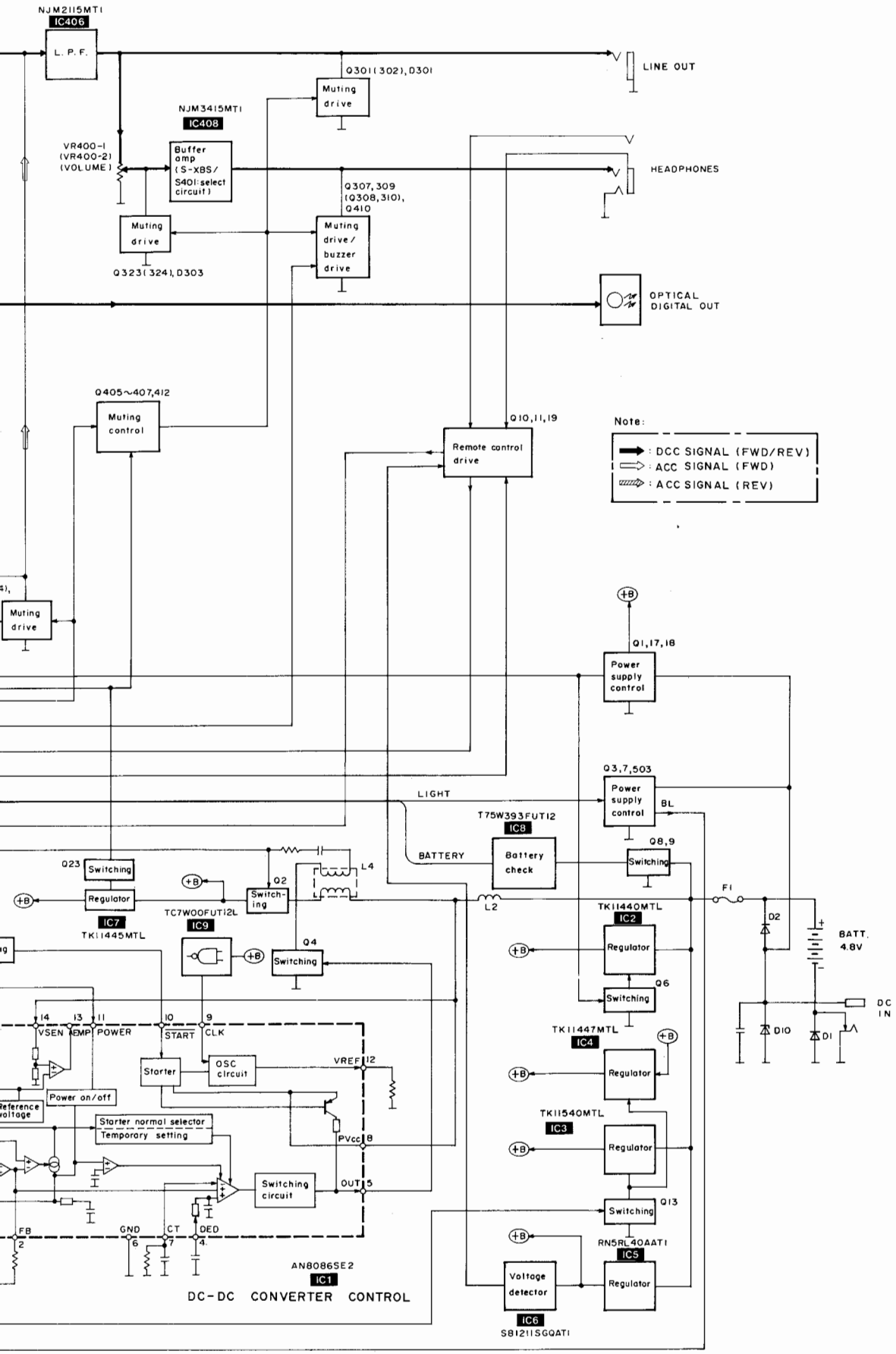
■ BLOCK DIAGRAM




AMP (REV)
SAA2032GP
IC502
DEQ
Clock generation
CLK24
RDSYNC
RDCLK
Virgin label detector
LABEL
VIRGIN
ENV
PBDAT
ADC
Demux
Filter
Slicer
TCHO
TCH7
TCHAUX
TAUX
DAC
ANEYE
LT interface
LTEN DEQ
LTCNTI
LTCNTO
LTCLK
LTDATA
LTENDEQ
VR101 (SPEED ADJ.REV)
VR102 (SPEED ADJ.FWD)
S102-2 (CrO2)
X101(F:8MHz)
OSC2
OSC1
AD5
AD4
CRO2
ASPEED
MNE201ARTAB1
IC102
SERVO CONTROLLER
CSA
SDA
SDB
TPS
CSB
R.F.CRO2
HBUFO2
HBUFO4
VDD
Vss
AVss
HBUFOD
R/F
S/S
Q109
NF
STB
RFM
VCO
EAO
EAI
PO
F/R circuit
Voltage control OSC
Phase error amp.
Dielectric comparator
CBR
FGO
FGI
VREF
PGI
PGR
PGO
PG
SW
ET
ETR
TL
VM
Signal composite logic
amp.
SW generator
CAPFG
FG-
FG+
NJM2115MTI
IC171
TPS amp
VREF
D171(172)
NBC5800
IC101
MOTOR CONTROL
Q215
Switching
Q211(212)
Playback amp (REV)
Q217
Switching
Playback amp
Q213(214)
Q221(222)
Buffer amp
Q219(220)
Switching
R ch
VR203,207, VR211,219 (NF/DISTO./ H.FREQ./ 0dB OUTPUT ADJ.REV-Lch)
VR204,208 VR212,220 (N.F/DISTO./ H.FREQ./ 0dB OUTPUT ADJ.REV-Rch)
VR205,209, VR213,221 (N.F/DISTO./ H.FREQ./ 0dB OUTPUT ADJ. FWD-Lch)
VR206,210 VR214,222 (N.F/DISTO./ H.FREQ./ 0dB OUTPUT ADJ. FWD-Rch)
VOLTAGE REF
ICC SENSE
MUX
RDMUX
SELECT LOGIC
MODE SWITCH
AGC
MULTIPL
OUTX
INX
OUTL
OUTR
INMFL
MFL1
INMFR
MFR2
VBIAS
CS
SD
RDCLK
RDSYNC


SAA2022GP
IC503
TFE
MN4256IOATI
IC504
DRAM
SM5881SET
IC401
DIGITAL FILTER
SAA2002GP
IC505
SFC
M5158IGP
IC506
DAI
RN5VL36AATI
IC501
RESET GENERATOR
MNE201ARTAB1
IC102
SERVO CONTROLLER
MNE3214RTAA2
IC500
SYSTEM CONT
Error correction coder
DRAM interface
Column address buffer
Row address buffer
Column decoders / sense amps
Row decoder / word drivevs
Memory cells
Clock generator
Write clock
I/O selectror
Data I/O buffer
Tape input buffer
Tape output buffer
SB – I²S interface
Microcontroller interface
Clock generator
Control
Sub-band serial interface
Filtered data interface
PASC codec processer
Stereo sub-band filter processor
Boseband serial interface
Microprocessor interface & control
Clock generator
Input data interface
Filter operation block
System clock
Timing controller
Audio interface
Timing generator
Power down det.
Switching
Vref
Phase error amp.
Dielectric comparator
Signal composite logic
amp.
SW generator
Motor drive
Solenoid drive
SOLENOID
MOTOR
MECHANISM BLOCK
FWD
REV
S104 (MECHANISM) DET. FWD/REV)
(TAPE END DET.) Q106
T-Reel drive
S-Reel drive
AN1393SNSCE1
IC104 (1/2), Q108
IC104 (1/2), Q107
Q105 (TAPE END DET.)
S501 (REV MODE)
S502 (HOLD)
S101 (ACC /DCC)
X500
D592
S102-1 (TAPE IN)
Q40,41
Switch control
LCD BLOCK
D500
Q501
Switching
S102-2 (CrO2)
Q104, D102 D103
D104


UPD63200GSE2
IC402
D/A CONVERTER
Digital power supply
Analog power supply
MAIN DAC
SUB DAC
SUB DAC
MAIN DAC
LOUT
LREF
RREF
ROUT
R ch
Timing generator
Shift register latch
Output amp
NJM2115MTI
IC400
NJM2115MTI
IC406
L. P. F.
VR400-1
(VR400-2)
(VOLUME)
Muting drive
Q323(324),D30
Filter operation block
Output data interface
Timing controller
De-emphasis control
Attenuation control
DOL
DOR
WCKO
BCKO
LSI
RSI
LRCK
CLK
D.GND
D.VDD
A.GND
A.VDD
Audio interface
Frame generator & check
Modulator
CRC generator & check
Pre-amp generator
Non - audio interface
TX
TC7S04FTE85L
IC507
INVERTER
BA1106FST2
IC404
DOLBY NR
BIAS
SWNR
Vcc
AIN
BIAS
AOUT
AVR
ANF
APC
ADET
ATC
Q400
S400
(DOLBY NR)
ON
OFF
CR NETWORK
CR NETWORK
Muting control
Q405~407,412
Muting drive
Q311,(312),411
Muting drive
Q313,(314),402,403,D403
NRSTDAI
LTEN DAI
LTCLK
LTDATA
LTCNTI
LTCNTO
SYNCDAI
IRQU
USYNCI
NRESET
LTENDAI
D/NACC
LINE MUTE
SYNCDAI
IRQU
USYNCI
P30
DSF1
DSF2
TPSDLB
BUZZER
REMOCON
LED ON/OFF
LIGHT
BATTERY
MNE3214RTAA2
IC500
SYSTEM CONTROL
NKSTART
SO
SI
DO
D7
E
R/W
RS
VREFH
P31
PWRDWN
VDD
AVDD
Vss
LCD DRIVER
LCD
LCD BLOCK
S102-1
(TAPE IN)
S1~11
Q40,41
D500
Q500
Switching
S503
(CASSETTE COVER OPEN/CLOSE DET.)
Q502
Switching
TK11447MTL
IC203
Regulator
TK11447MTL
IC204
Regulator
TK11447MTL
IC205
Regulator
TK11447MTL
IC206
Regulator
Q12,20
Switching
Q42
Switching
Q23
Switching
Regulator
IC7
TK11445MTL
Q21
Switching
RST
VSEN
TEMP
POWER
START
Starter
Power on/off
Reference voltage
Starter normal selecto
Temporary setting
Vcc
SPRO
IN
FB
GND
CT
VR1
(POWER SUPPLY VOLTAGE ADJ.)

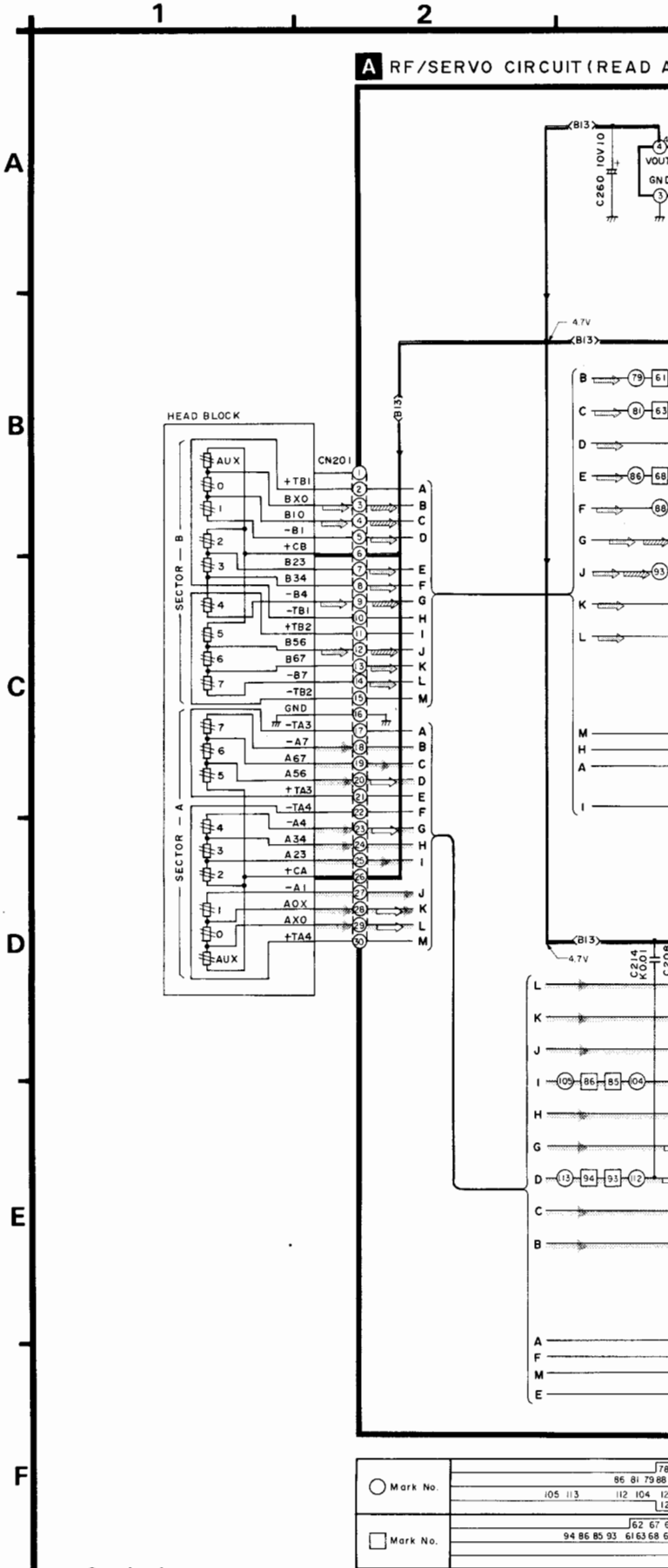

NJM2115MTI
IC406
L. P. F.
LINE OUT
Q301(302), D301
Muting drive
NJM3415MTI
IC408
VR400-1 (VR400-2) (VOLUME)
Buffer amp (S-xBS/ S401:select circuit)
HEADPHONES
Q307, 309 (Q308, 310), Q410
Muting drive
Muting drive / buzzer drive
Q323(324), D303
OPTICAL DIGITAL OUT
Q405~407,412
Muting control
Q10,11,19
Remote control drive
Note:
: DCC SIGNAL (FWD/REV)
: ACC SIGNAL (FWD)
: ACC SIGNAL (REV)
Muting drive
Q1,17,18
Power supply control
Q3,7,503
Power supply control
LIGHT
BL
T75W393FUTI2
IC8
BATTERY
Battery check
Q8,9
Switching
Q23
Switching
Regulator
IC7
TK11445MTL
Q2
Switch-ing
L4
L2
F1
TK11440MTL
IC2
D2
BATT. 4.8V
TC7WOOFUTI2L
IC9
Q4
Switching
Regulator
Q6
Switching
DC IN
D10
D1
TK11447MTL
IC4
Regulator
TK11540MTL
IC3
Regulator
Regulator
Q13
Switching
RN5RL40AATI
IC5
Regulator
Voltage detector
IC6
S81211SGQATI
VSEN
TEMP
POWER
START
CLK
Starter
OSC circuit
VREF
Power on/off
Reference voltage
Starter normal selector
Temporary setting
PVcc
Switching circuit
OUT
FB
GND
CT
DED
AN8086SE2
IC1
DC-DC CONVERTER CONTROL

■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with development of new technology.)

Note 1:

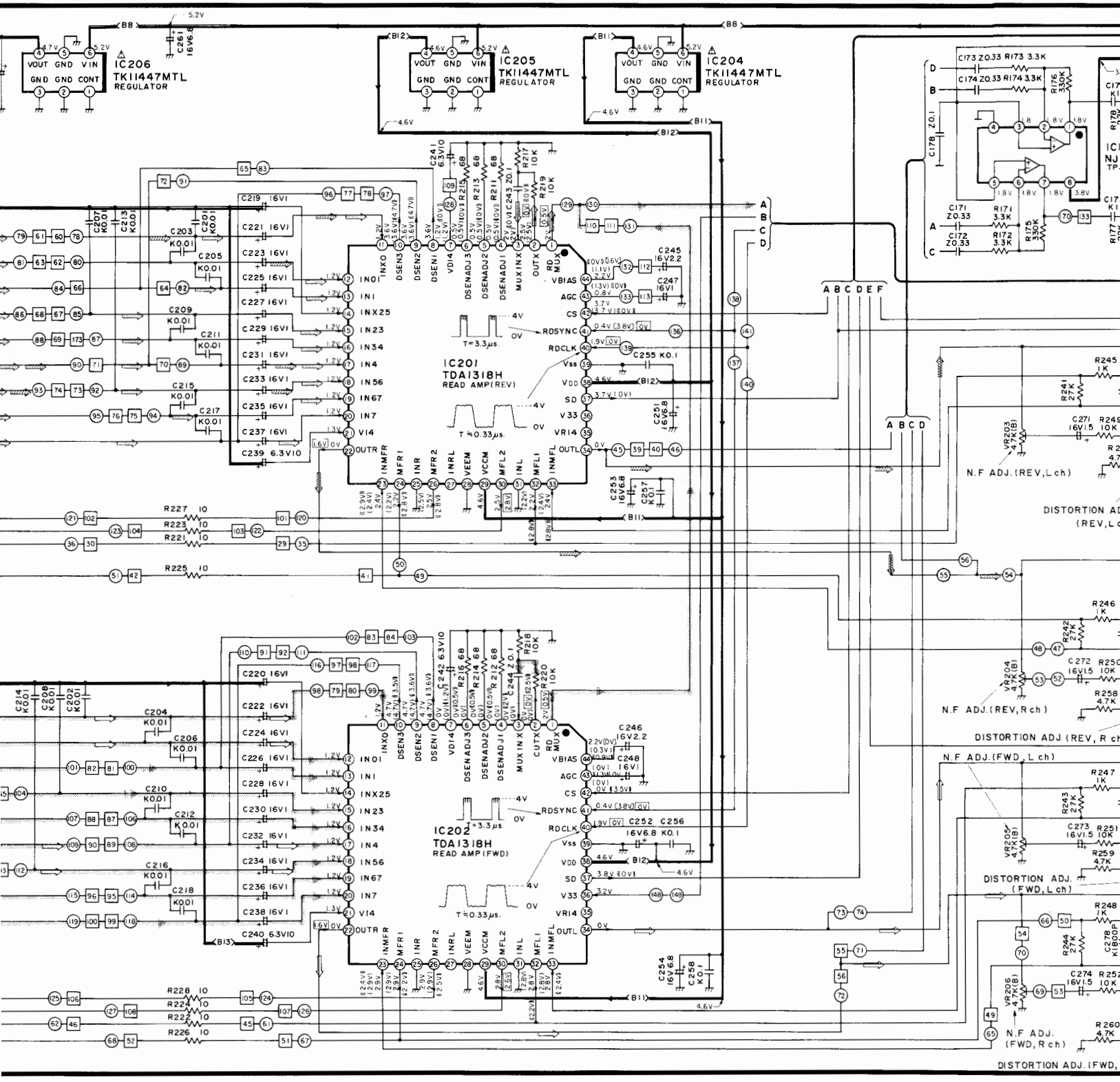
- **S1** : Tape side selector (DIRECTION) switch.
- **S2** : Counter display selector (COUNTER MODE) switch.
- **S3** : Text scroll (TEXT SCROLL) switch.
- **S4** : Text display selector (TEXT MODE) switch.
- **S5** : Counter reset (COUNTER RESET) switch.
- **S6** : Stop/Power off (STOP/POWER OFF) switch.
- **S7** : Play (PLAY) switch.
- **S8, 9** : Rewind/Fast forwrd (REW/FF) switches. (S8: FF, S9: REW)
- **S10, 11** : Skip (SKIP/[TPS]) switches. (S10: F. SKIP, S11: R. SKIP) (R. SKIP —[TPS]— F. SKIP)
- **S101** : ACC/DCC tape detection switch.
- **S102-1** : TAPE IN detection switch.
- **S102-2** : TAPE SELECT (CrO_2) switch.
- **S104** : Mechanism detection (FWD/REV) switch in "FWD" position.
- **S400** : Dobly noise reduction knob (DOLBY NR) switch in "OFF" position.
- **S401** : Deep-bass control (S-XBS) switch in "OFF" position. (OFF-MID-MAX)
- **S501** : Reverse mode selector (REV MODE) switch in "⇄" position.
- **S502** : Hold (HOLD) switch in "ON" position.
- **S503** : Open/close detection switch.
- The voltage value and waveforms are the reference voltage of this measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of GND terminal (DC IN Jack). Accordingly, there may arise some errors in the voltage values and waveforms depending upon the internal impedance of the tester or measuring unit.
  No mark: STOP
  [ ]: ACC tape
  ( ): PLAY (side A) [DCC tape]
  PLAY (REV) [ACC tape]
  (( )): PLAY (side B) [DCC tape]
  PLAY (FWD) [ACC tape]
  [ ]: FF/REW
  ⌜ ⌟: REW
- Signal line
  : DCC signal (FWD)
  : ACC signal (FWD)
  : ACC signal (REV)
  : DCC signal (REV)
  : Positive voltage lines
- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
- "(NO)" and "[NO]" appearing on the schematic diagrams correspond to through-hole numbers on the 4-layer PC board diagrams.
- "—(NO)—" indicates through-hole numbers on the 1st layer of the printed circuit board diagrams.
- "—[NO]—" indicates through-hole numbers on the 4th layer of the printed circuit board diagrams.
  (Examples) "—(100)—[50]—" indicates that through-hole "(100)" on the 1st layer is connected to "[50]" on the 4th layer.
  "—(80)—[120]—(20)—[60]—" indicates that through-hole "(80)" and "(20)" on the 1st layer are connected to "[120]" and "[60]" on the 4th layer.
  Note: Lines without numbers indicate connections only on one side of the P.C.B.



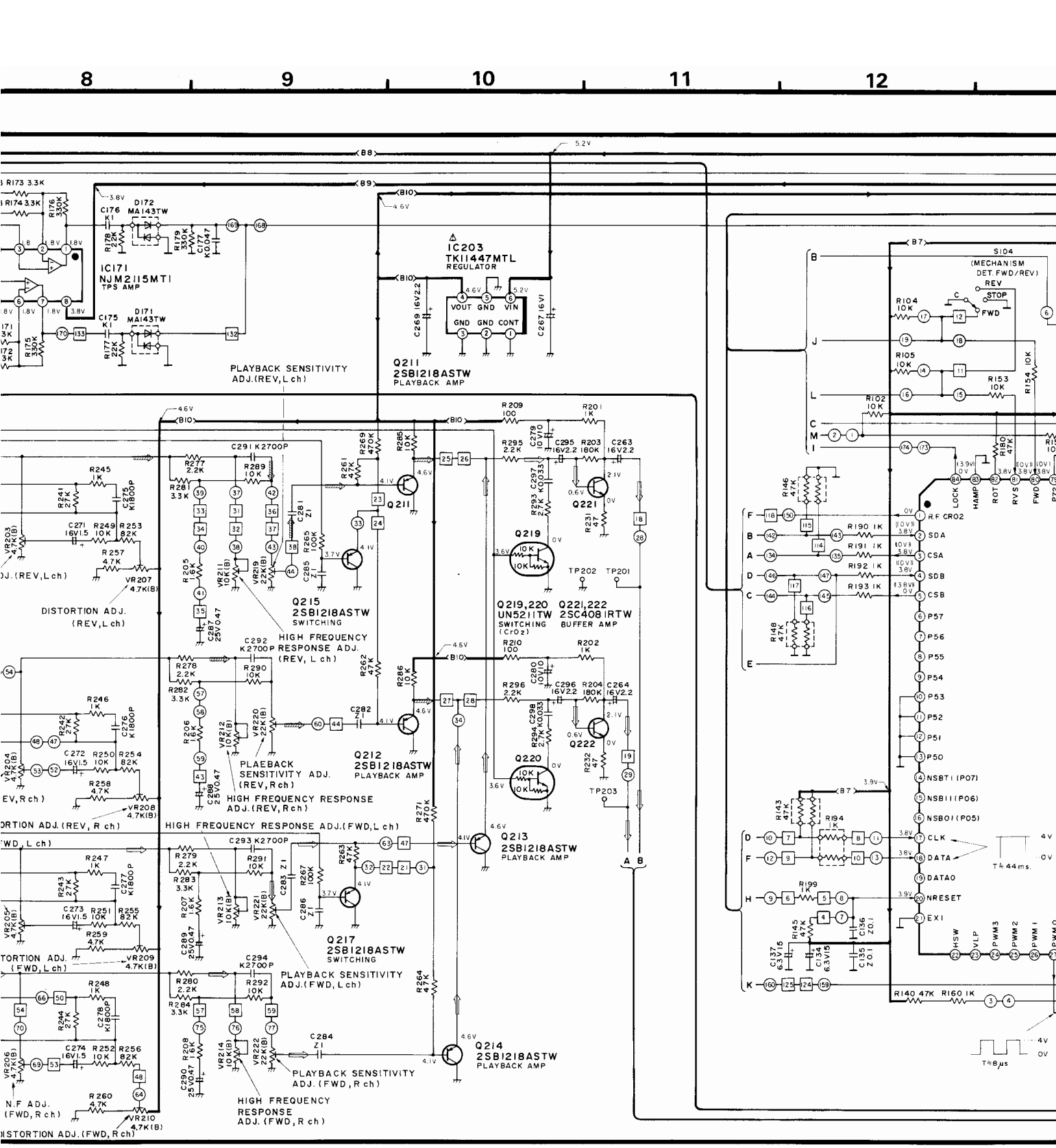
Caution!

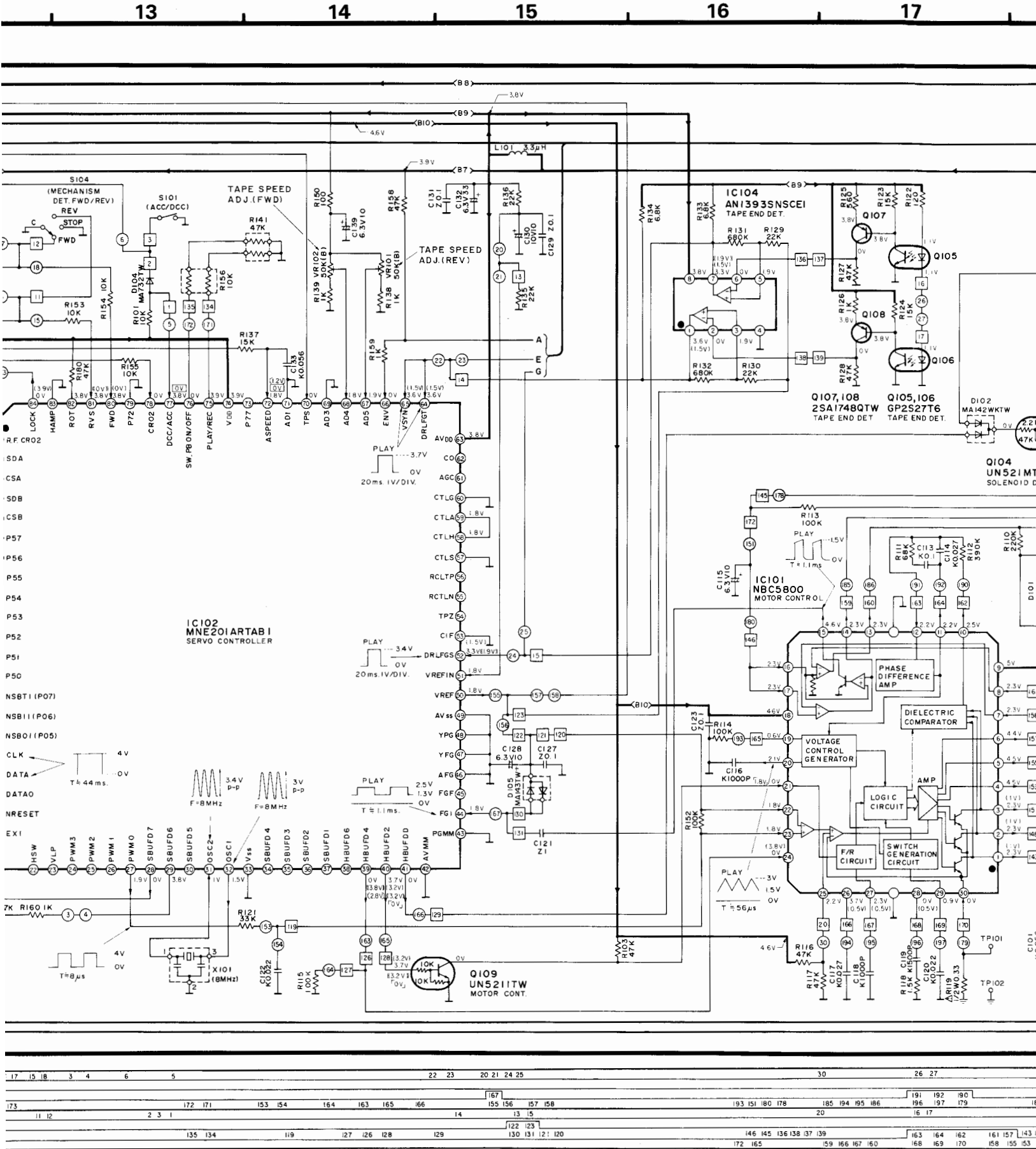
IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair
- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the pins of IC or LSI with fingers directly.

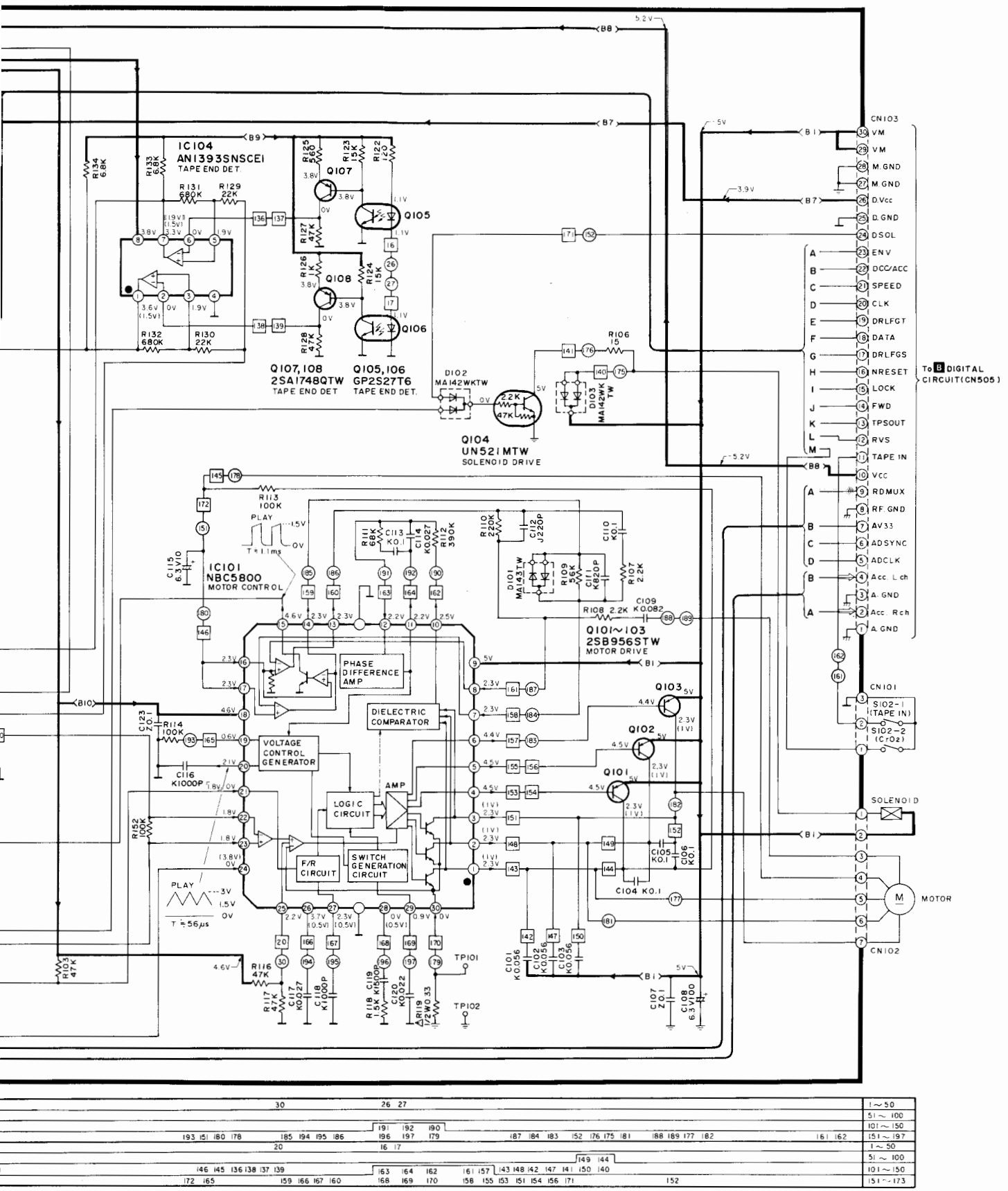
EAD AMP/SERVO CONTROL/MOTOR DRIVE/TPS AMP/REGULATOR)



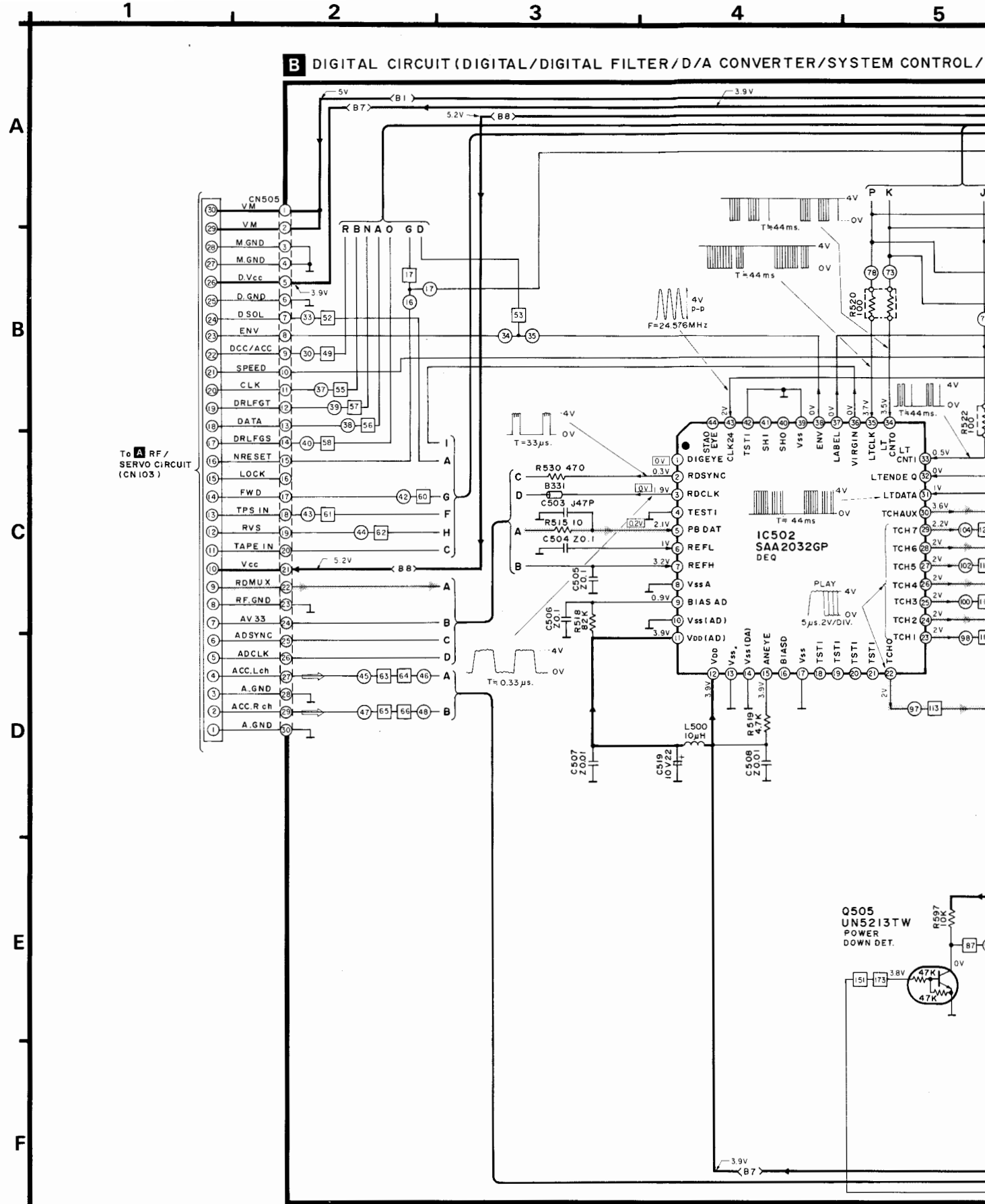
repair.
oil.


8
9
10
11
12
IC171
NJM2115MTI
TPS AMP
IC203
TK11447MTL
REGULATOR
Q211
2SB1218ASTW
PLAYBACK AMP
PLAYBACK SENSITIVITY ADJ.(REV,Lch)
DISTORTION ADJ. (REV,Lch)
HIGH FREQUENCY RESPONSE ADJ. (REV, Lch)
Q215
2SB1218ASTW
SWITCHING
Q219,220
UN5211TW
SWITCHING
Q221,222
2SC4081RTW
BUFFER AMP
Q212
2SB1218ASTW
PLAYBACK AMP
PLAEBACK SENSITIVITY ADJ. (REV,Rch)
HIGH FREQUENCY RESPONSE ADJ.(REV,Rch)
HIGH FREQUENCY RESPONSE ADJ.(FWD,Lch)
Q213
2SB1218ASTW
PLAYBACK AMP
Q217
2SB1218ASTW
SWITCHING
PLAYBACK SENSITIVITY ADJ.(FWD,Lch)
Q214
2SB1218ASTW
PLAYBACK AMP
PLAYBACK SENSITIVITY ADJ. (FWD,Rch)
HIGH FREQUENCY RESPONSE ADJ. (FWD,Rch)
S104
(MECHANISM DET.FWD/REV)
REV
STOP
FWD
R.F. CRO2
SDA
CSA
SDB
CSB
P57
P56
P55
P54
P53
P52
P51
P50
NSBT1 (P07)
NSB11 (P06)
NSB01 (P05)
CLK
DATA
DATA0
NRESET
EXI
T=44ms.
T=8μs
TP202
TP201
TP203
A B


13
14
15
16
17
IC102
MNE201ARTAB1
SERVO CONTROLLER
IC104
AN1393SNSCEI
TAPE END DET.
IC101
NBC5800
MOTOR CONTROL
Q109
UN5211TW
MOTOR CONT.
Q107, 108
2SA1748QTW
TAPE END DET
Q105, 106
GP2S27T6
TAPE END DET.
Q104
UN521MT
SOLENOID D
S104
(MECHANISM
DET. FWD/REV)
S101
(ACC/DCC)
TAPE SPEED
ADJ.(FWD)
TAPE SPEED
ADJ.(REV)
PHASE
DIFFERENCE
AMP
VOLTAGE
CONTROL
GENERATOR
DIELECTRIC
COMPARATOR
LOGIC
CIRCUIT
AMP
F/R
CIRCUIT
SWITCH
GENERATION
CIRCUIT
X101
(8MHz)
TPI01
TPI02



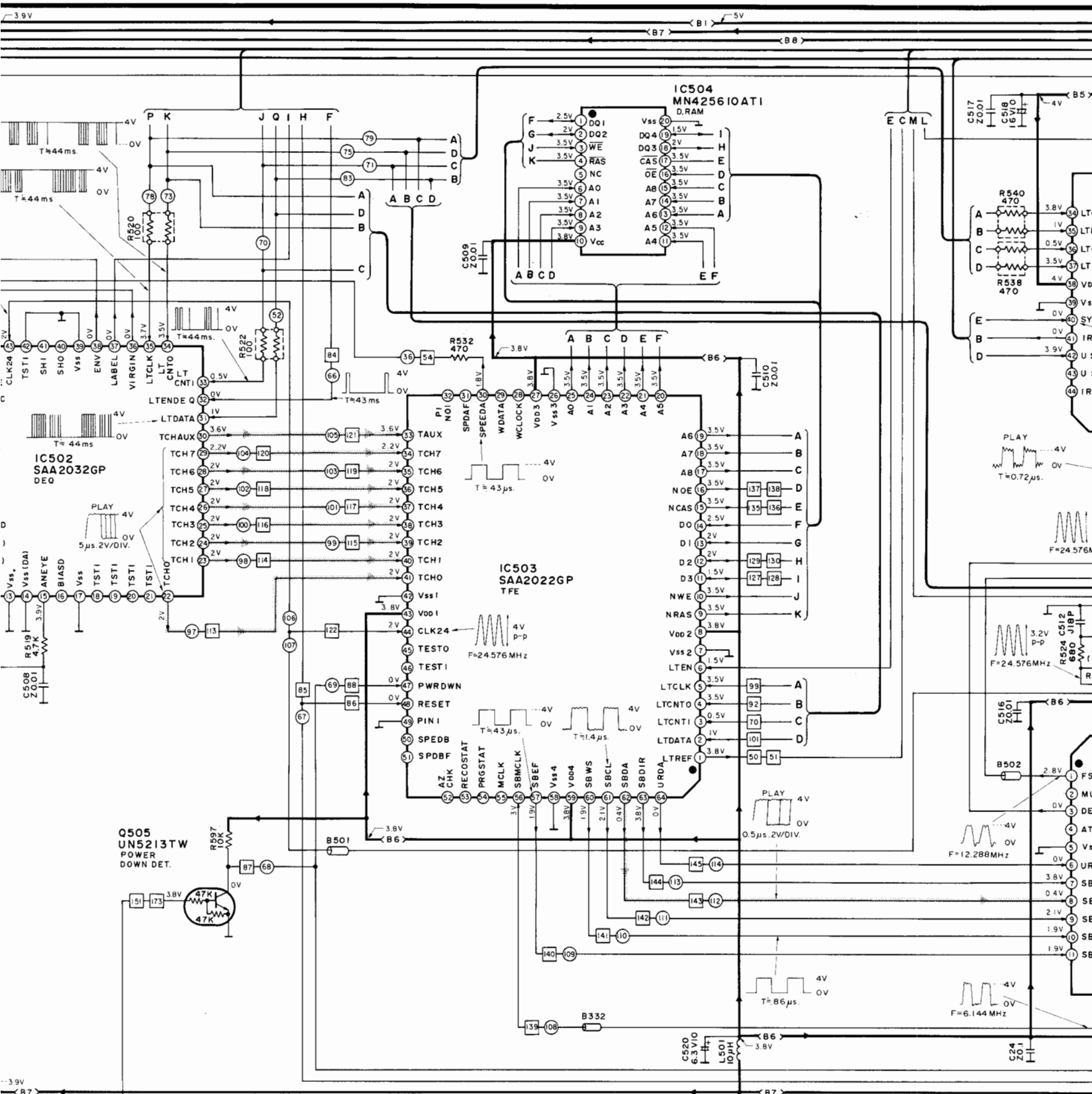
30 26 27	1~50
	51~100
191 192 190	101~150
193 151 180 178 185 194 195 186 196 197 179 187 184 183 152 176 175 181 188 189 177 182 161 162	151~197
20 16 17	1~50
149 144	51~100
146 145 136 138 137 139 163 164 162 161 157 143 148 142 147 141 150 140	101~150
172 165 159 166 167 160 168 169 170 158 155 153 151 154 156 171 152	151~173



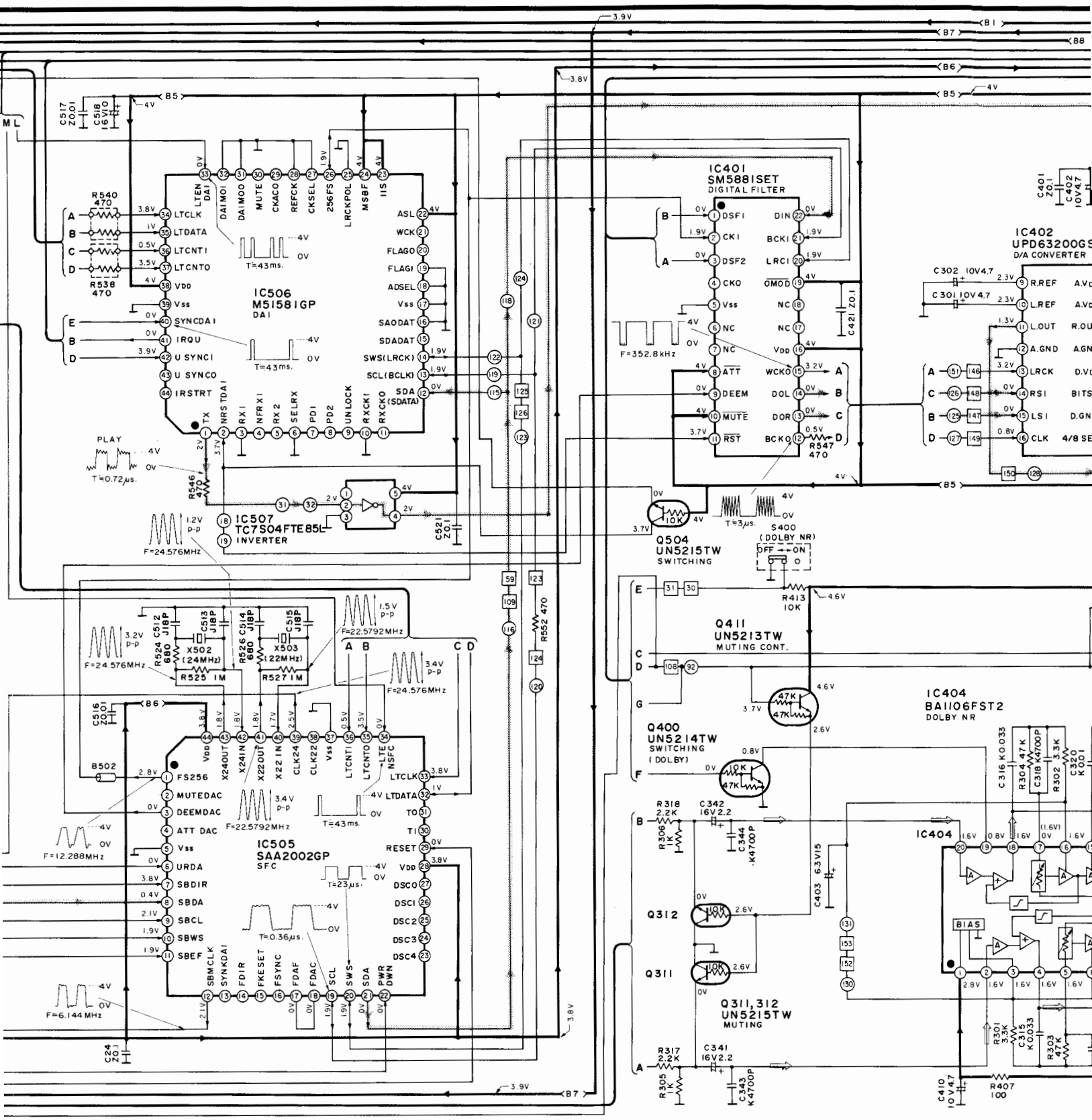
Mark No. 33 40 37 38 45 42 16 17 34 35 78 73 97 98 100 104 102
30 43 39 44 47 46 48

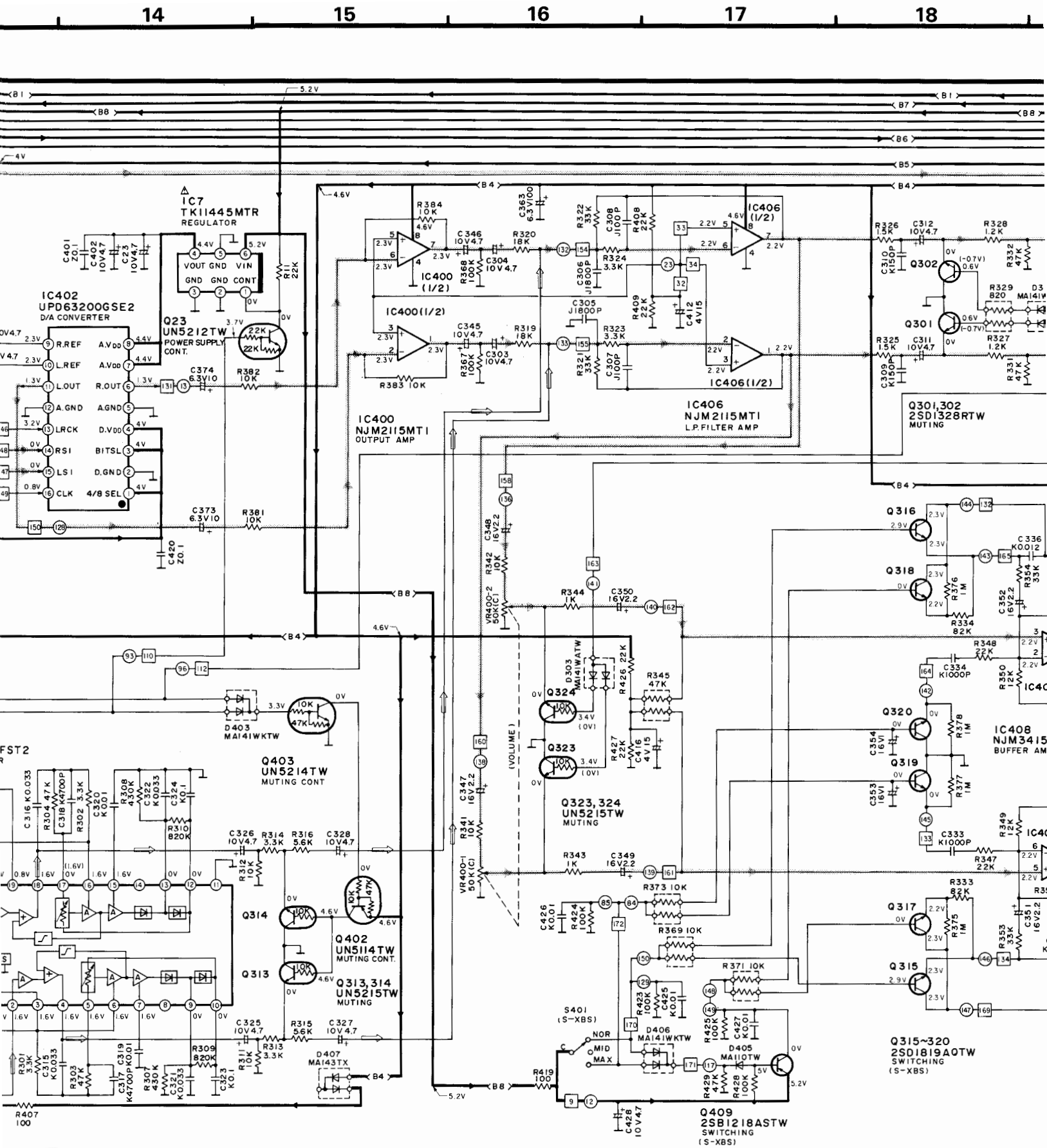
Mark No. 49 17 52 55 57 56 62 64 60 53 87 113
58 61 63 65 66 151 173

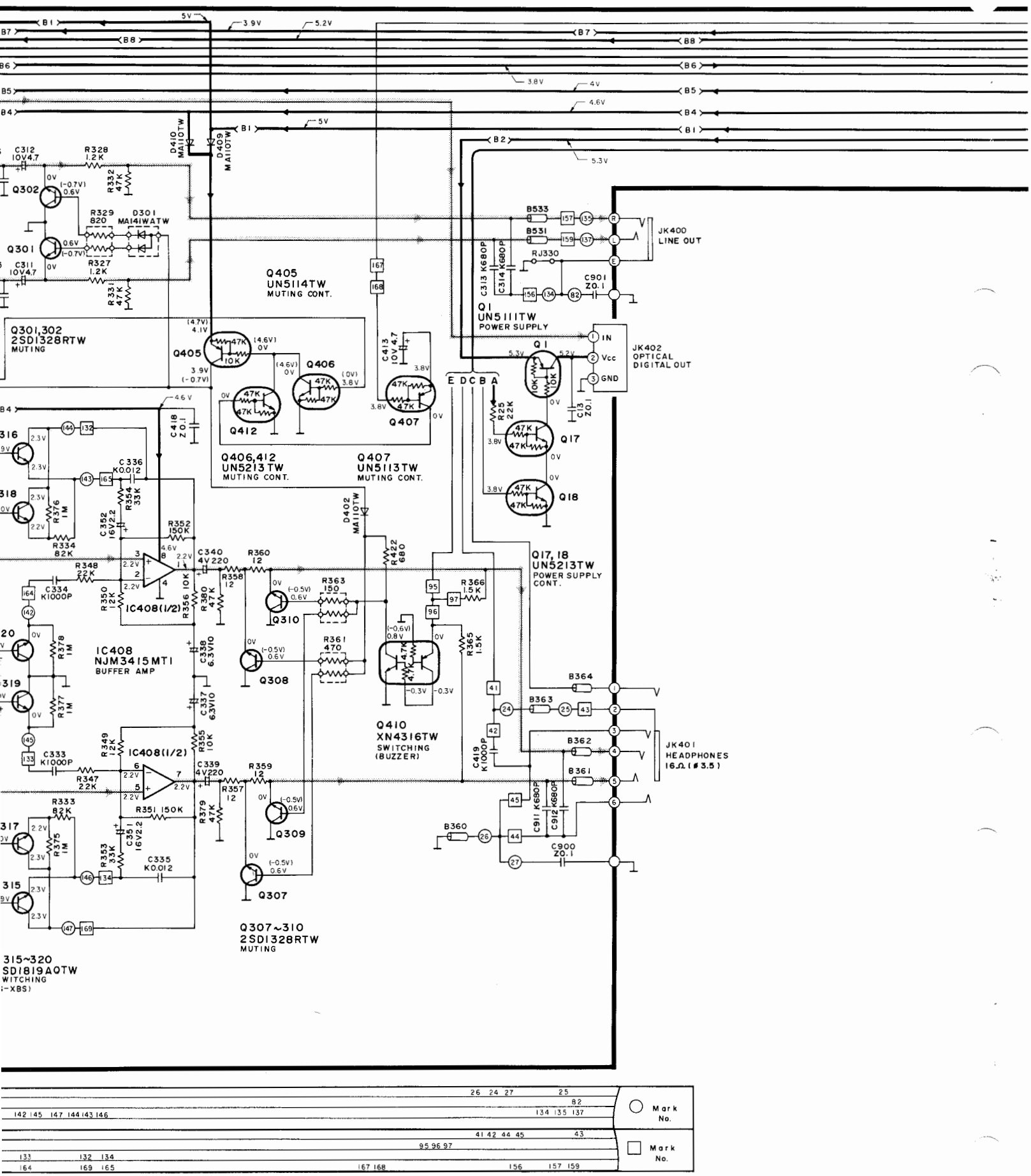
CONVERTER/SYSTEM CONTROL/FILTER AMP/DOLBY NR/BUFFER AMP/RESET/DC-DC CONVERTER/REGULATOR)

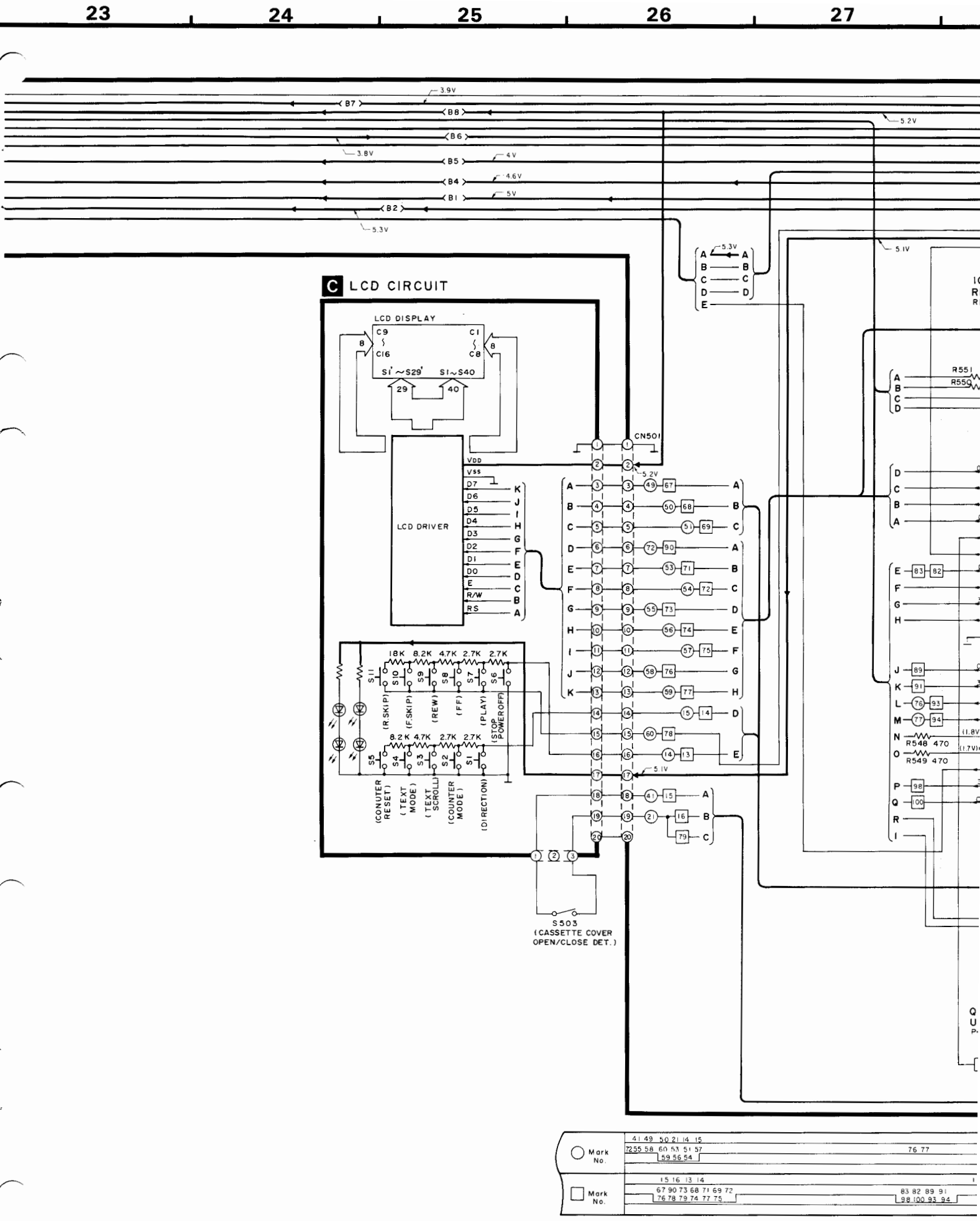


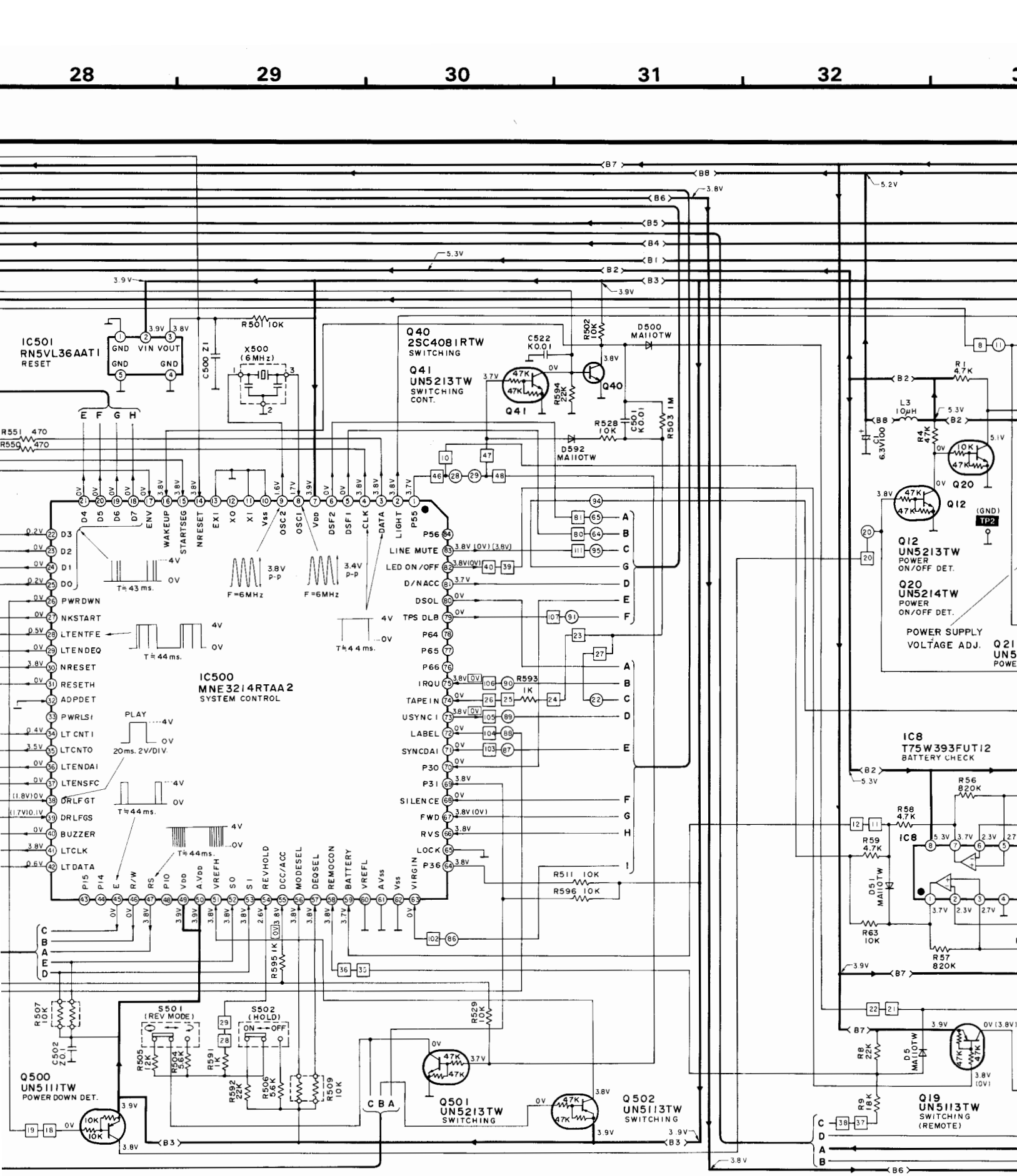
TOR)

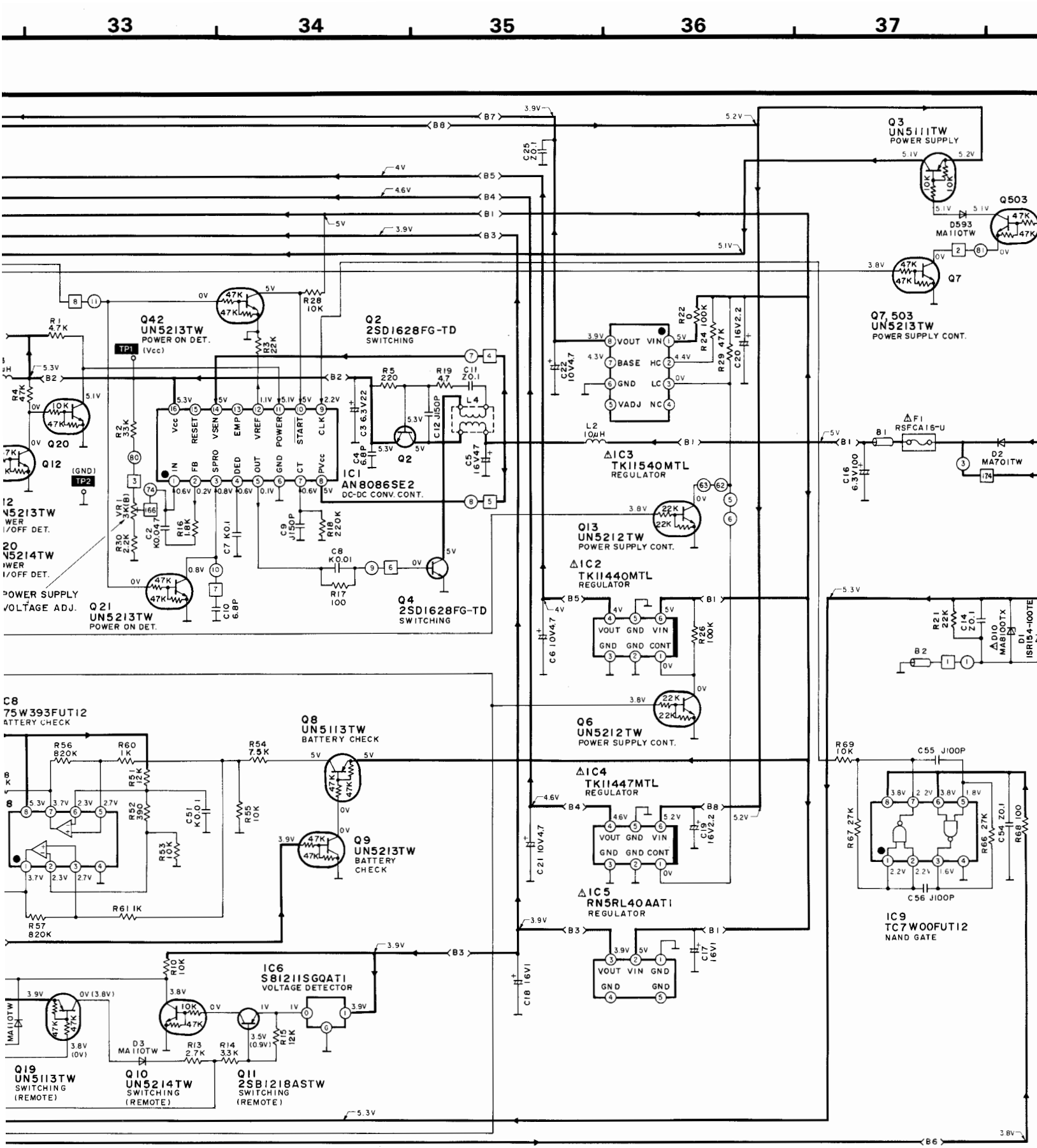

IC506
M51581GP
DAI
IC507
TC7S04FTE85L
INVERTER
IC505
SAA2002GP
SFC
IC401
SM5881SET
DIGITAL FILTER
IC402
UPD63200GS
D/A CONVERTER
IC404
BA1106FST2
DOLBY NR
Q504
UN5215TW
SWITCHING
Q411
UN5213TW
MUTING CONT.
Q400
UN5214TW
SWITCHING
(DOLBY)
Q312
Q311
Q311,312
UN5215TW
MUTING
S400
(DOLBY NR)
OFF ON
X502
(24MHz)
X503
(22MHz)
PLAY
T=0.72μs.
T=43ms.
T=3μs.
T=23μs.
T=0.36μs.
F=24.576MHz
F=22.5792MHz
F=12.288MHz
F=6.144MHz
F=352.8kHz
B502
R540 470
R538 470
R546 470
R547 470
R552 470
R525 1M
R527 1M
R413 10K
C517 Z0.01
C518 16V10
C516 Z0.01
C24 Z0.1
C521 Z0.1
C401 Z0.1
C402 10V4.7
C421 Z0.1
C302 10V4.7
C301 10V4.7
C316 K0.033
C318 K4700P
C320 K0.01
C344 K4700P
C343 K4700P
C315 K0.033
C303 47K
C410 10V4.7
C403 6.3V15
R407 100
R306 1K
R305 1K
R318 2.2K
R317 2.2K
R301 1K
R302 3.3K
R304 47K
C342 16V2.2
C341 16V2.2
BIAS

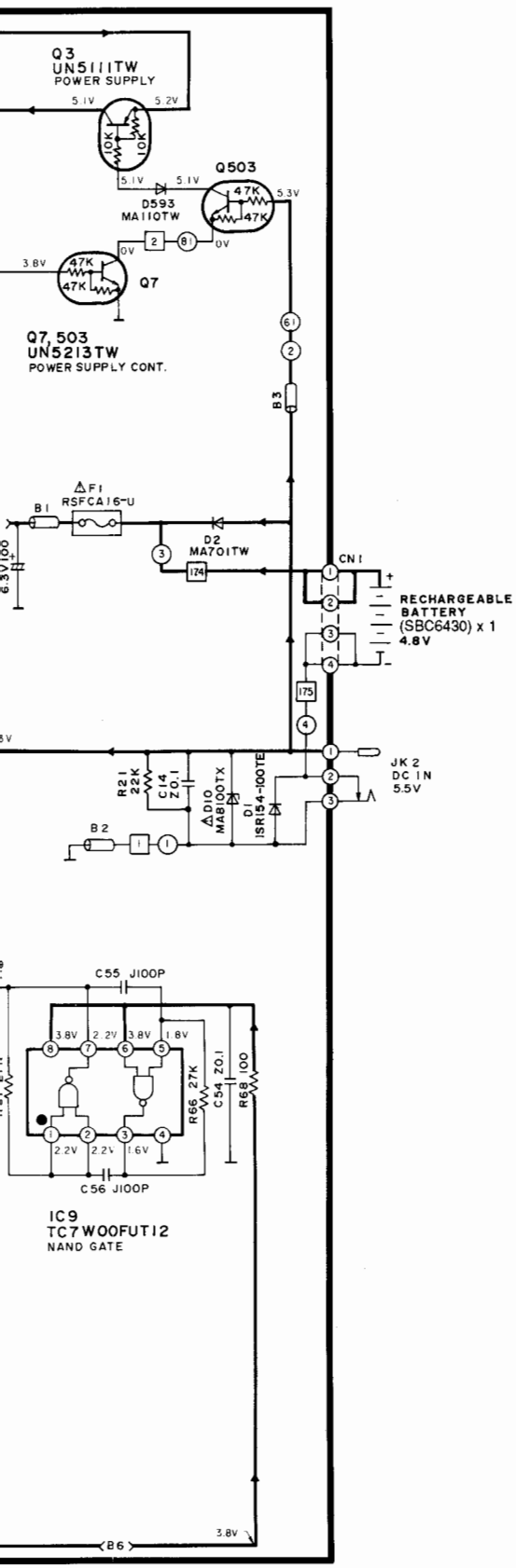

14
15
16
17
18
IC7
TK11445MTR
REGULATOR
IC402
UPD63200GSE2
D/A CONVERTER
Q23
UN5212TW
POWER SUPPLY CONT.
IC400
NJM2115MT1
OUTPUT AMP
IC400 (1/2)
IC406 (1/2)
IC406
NJM2115MT1
L.P.FILTER AMP
Q301,302
2SD1328RTW
MUTING
Q403
UN5214TW
MUTING CONT
Q402
UN5114TW
MUTING CONT.
Q313,314
UN5215TW
MUTING
Q323,324
UN5215TW
MUTING
Q315~320
2SD1819A0TW
SWITCHING
(S-XBS)
Q409
2SB1218ASTW
SWITCHING
(S-XBS)
IC408
NJM3415
BUFFER AM
S401
(S-XBS)
(VOLUME)
D403
MA141WKTW
D407
MA143TX
D406
MA141WKTW
D405
MA110TW
D303
MA141WATW


18
19
20
21
22
Q405
UN5114TW
MUTING CONT.
Q301,302
2SD1328RTW
MUTING
Q406,412
UN5213TW
MUTING CONT.
Q407
UN5113TW
MUTING CONT.
Q1
UN5111TW
POWER SUPPLY
Q17, 18
UN5213TW
POWER SUPPLY
CONT.
IC408
NJM3415MTI
BUFFER AMP
IC408(1/2)
IC408(1/2)
Q410
XN4316TW
SWITCHING
(BUZZER)
Q307~310
2SD1328RTW
MUTING
JK400
LINE OUT
JK402
OPTICAL
DIGITAL OUT
JK401
HEADPHONES
16Ω (ø3.5)
Mark No.
Mark No.


23
24
25
26
27
3.9V
B7
B8
B6
3.8V
B5
4V
B4
4.6V
B1
5V
B2
5.3V
5.2V
5.1V
C LCD CIRCUIT
LCD DISPLAY
C9
C16
C1
C8
S1'~S29'
S1~S40
29
40
LCD DRIVER
VDD
VSS
D7
D6
D5
D4
D3
D2
D1
D0
E
R/W
RS
CN501
18K
8.2K
4.7K
2.7K
2.7K
S11
S10
S9
S8
S7
S6
(R.SKIP)
(F.SKIP)
(REW)
(FF)
(PLAY)
(STOP POWER OFF)
8.2K
4.7K
2.7K
2.7K
S5
S4
S3
S2
S1
(CONUTER RESET)
(TEXT MODE)
(TEXT SCROLL)
(COUNTER MODE)
(DIRECTION)
S503
(CASSETTE COVER OPEN/CLOSE DET.)
R551
R550
R548 470
R549 470
Mark No.
Mark No.


28
29
30
31
32
IC501
RN5VL36AATI
RESET
R501 10K
C500 Z1
X500
(6MHz)
Q40
2SC4081RTW
SWITCHING
Q41
UN5213TW
SWITCHING
CONT.
C522
K0.01
R502
10K
D500
MA110TW
R594
22K
R528
10K
C501
K0.01
R503 1M
D592
MA110TW
R551 470
R550 470
IC500
MNE3214RTAA2
SYSTEM CONTROL
D4
D5
D6
D7
ENV
WAKEUP
STARTSEG
NRESET
EXI
XO
XI
Vss
OSC2
OSC1
VDD
DSF2
DSF1
CLK
DATA
LIGHT
P55
P56
LINE MUTE
LED ON/OFF
D/NACC
DSOL
TPS DLB
P64
P65
P66
IRQU
TAPEIN
USYNCI
LABEL
SYNCDAI
P30
P31
SILENCE
FWD
RVS
LOCK
P36
D3
D2
D1
D0
PWRDWN
NKSTART
LTENTFE
LTENDEQ
NRESET
RESETH
ADPDET
PWRLSI
LTCNTI
LTCNTO
LTENDAI
LTENSFC
DRLFGT
DRLFGS
BUZZER
LTCLK
LTDATA
P15
P14
E
R/W
RS
P10
VDD
AVDD
VREFH
SO
SI
REVHOLD
DCC/ACC
MODESEL
DEQSEL
REMOCON
BATTERY
VREFL
AVss
Vss
VIRGIN
T≒43 ms.
F=6MHz
3.8V p-p
3.4V p-p
T≒44 ms.
PLAY
20ms. 2V/DIV.
R595 1K
R596 10K
R511 10K
R593 1K
S501
(REV MODE)
S502
(HOLD)
ON ↔ OFF
R505 12K
R504 5.6K
R591 1K
R592 22K
R506 5.6K
R509 10K
R507 10K
C502 Z01
R529 10K
Q500
UN5111TW
POWER DOWN DET.
Q501
UN5213TW
SWITCHING
Q502
UN5113TW
SWITCHING
Q19
UN5113TW
SWITCHING
(REMOTE)
IC8
T75W393FUT12
BATTERY CHECK
R56
820K
R58
4.7K
R59
4.7K
R63
10K
R57
820K
D51
MA110TW
R8
22K
D5
MA110TW
R9
18K
R1
4.7K
L3
10μH
R4
4.7K
Q20
Q12
UN5213TW
POWER
ON/OFF DET.
Q20
UN5214TW
POWER
ON/OFF DET.
POWER SUPPLY
VOLTAGE ADJ.
Q21
UN5
POWE
TP2
(GND)
B1
B2
B3
B4
B5
B6
B7
B8
3.9V
5.3V
3.8V
5.2V
6.3V 100


33
34
35
36
37
Q42
UN5213TW
POWER ON DET.
Q2
2SD1628FG-TD
SWITCHING
Q3
UN5111TW
POWER SUPPLY
Q503
D593
MA110TW
Q7
Q7,503
UN5213TW
POWER SUPPLY CONT.
IC1
AN8086SE2
DC-DC CONV. CONT.
IC3
TK11540MTL
REGULATOR
F1
RSFCA16-U
D2
MA701TW
Q13
UN5212TW
POWER SUPPLY CONT.
IC2
TK11440MTL
REGULATOR
Q4
2SD1628FG-TD
SWITCHING
Q21
UN5213TW
POWER ON DET.
POWER SUPPLY
VOLTAGE ADJ.
Q20
Q12
UN5214TW
UN5213TW
Q6
UN5212TW
POWER SUPPLY CONT.
IC4
TK11447MTL
REGULATOR
IC5
RN5RL40AATI
REGULATOR
IC9
TC7W00FUT12
NAND GATE
Q8
UN5113TW
BATTERY CHECK
Q9
UN5213TW
BATTERY CHECK
IC8
75W393FUT12
BATTERY CHECK
IC6
S81211SGQATI
VOLTAGE DETECTOR
Q19
UN5113TW
SWITCHING
(REMOTE)
Q10
UN5214TW
SWITCHING
(REMOTE)
Q11
2SB1218ASTW
SWITCHING
(REMOTE)
D3
MA110TW
TP1
(Vcc)
TP2
(GND)
VR1
3K(B)
B1
B2
B3
B4
B5
B6
B7
B8
3.9V
5.2V
4V
4.6V
5V
5.1V
5.3V
3.8V
0V
11
80
74
10
9
7 8
5 6
3 1
63 62
81
8
3
7
6
4 5
1 2
166
174



3 1	2 4	1~50
81	61	51~100
		101~151
		—
1 2		1~50
		51~100
		101~150
174	175	151~175

Note 2:

The supply part number is described alone in the replacement parts.

Part No.	Production Part No.	Supply part No.
IC408	NJM3415MT1	NJM3415M

Note 3:

CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH SAME TYPE 1.6A 60V FUSE.

RISK OF FIRE-REPLACE FUSE AS MARKED.

FUSE CAUTION

This symbol located near the fuse indicates that the fuse used is fast operating type. For continued protection against fire hazard, replace with same type fuse. For fuse rating, refer to the marking adjacent to the symbol.

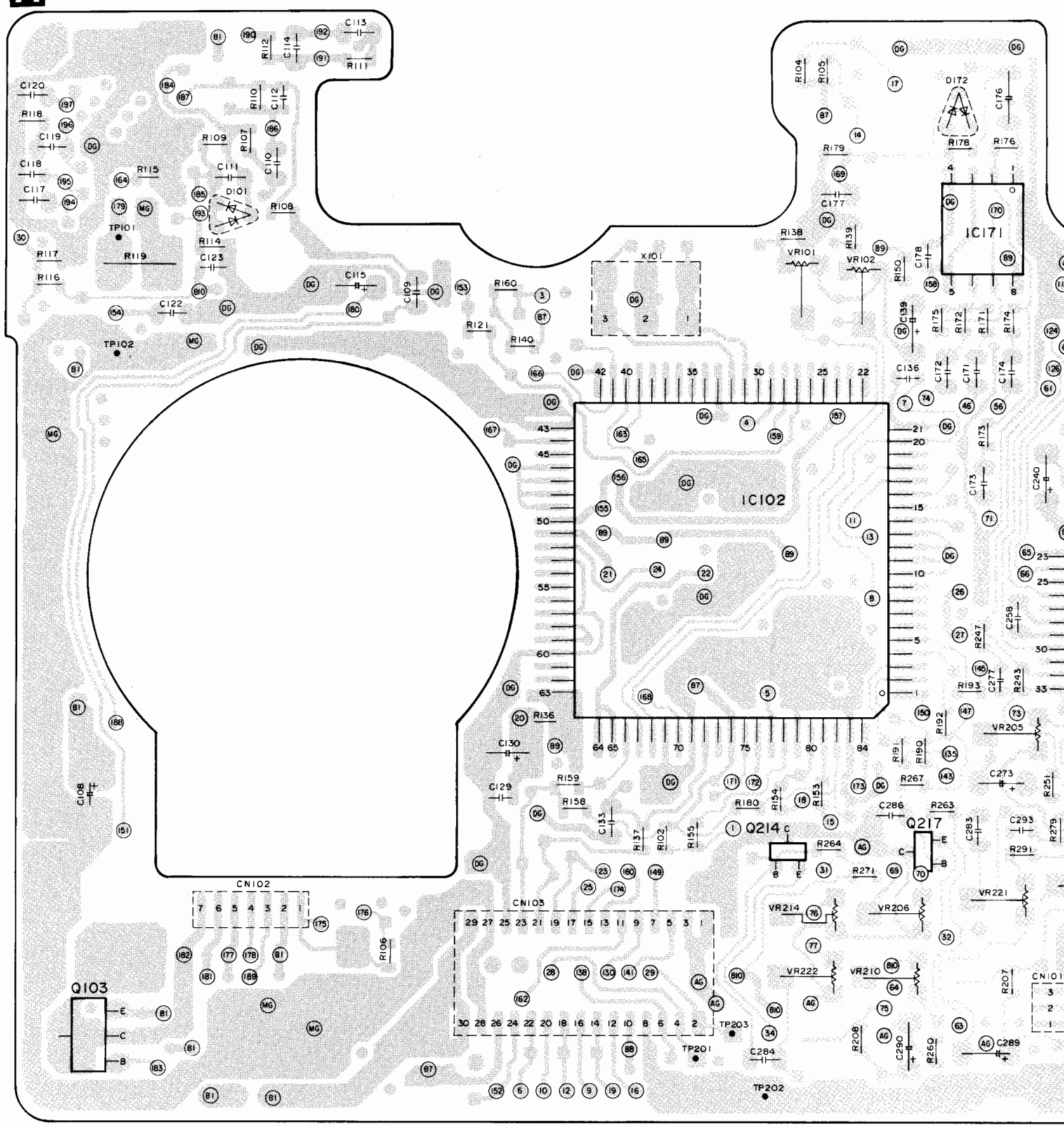
Ce symbole indique que le fusible utilisé est à rapide. Pour une protection permanente, n' utiliser que des fusibles de même type. Ce dernier est indiqué là qù le présent symbole est apposé.

■ PRINTED CIRCUIT BOARDS DIAGRAM

Notes:

- **Layer 1 pattern diagram**

A RF/SERVO P.C.B. (REP1666A)

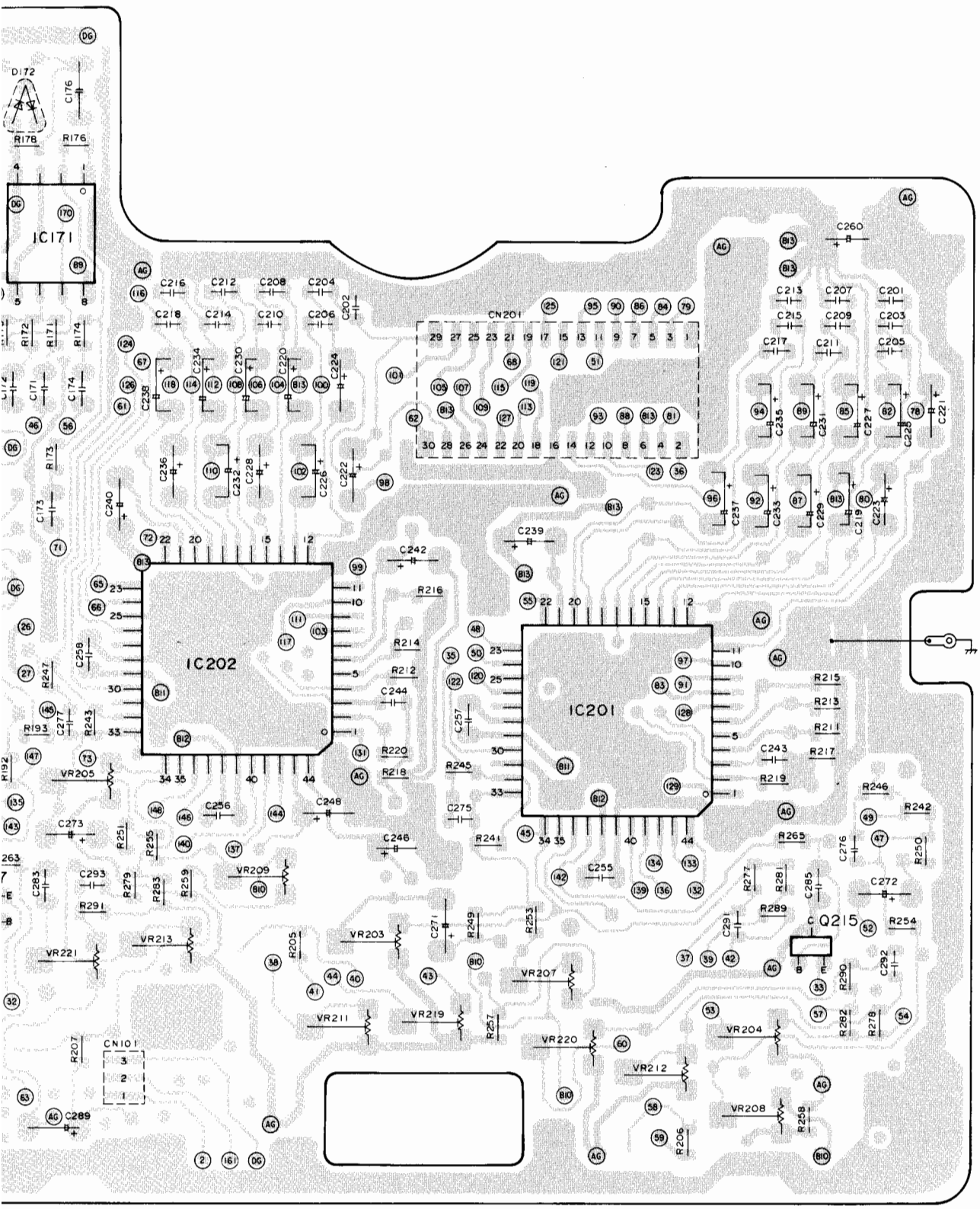


PCS 71 063

Notes:
- The printed circuit board diagram used for the RF/Servo and Digital P.C.B. consist of 4 layers.
- Printed circuit board diagrams only show the foil patterns on the 1st and 4th layers. They do not include the patterns on the 2nd and 3rd layers.
- "(NO)" appearing on the printed circuit board diagrams indica a through-hole connection between the 1st and another laye
- "[NO]" appearing on the printed circuit board diagrams indica a through-hole connection between the 4th and another laye

• Layer 4

A RF



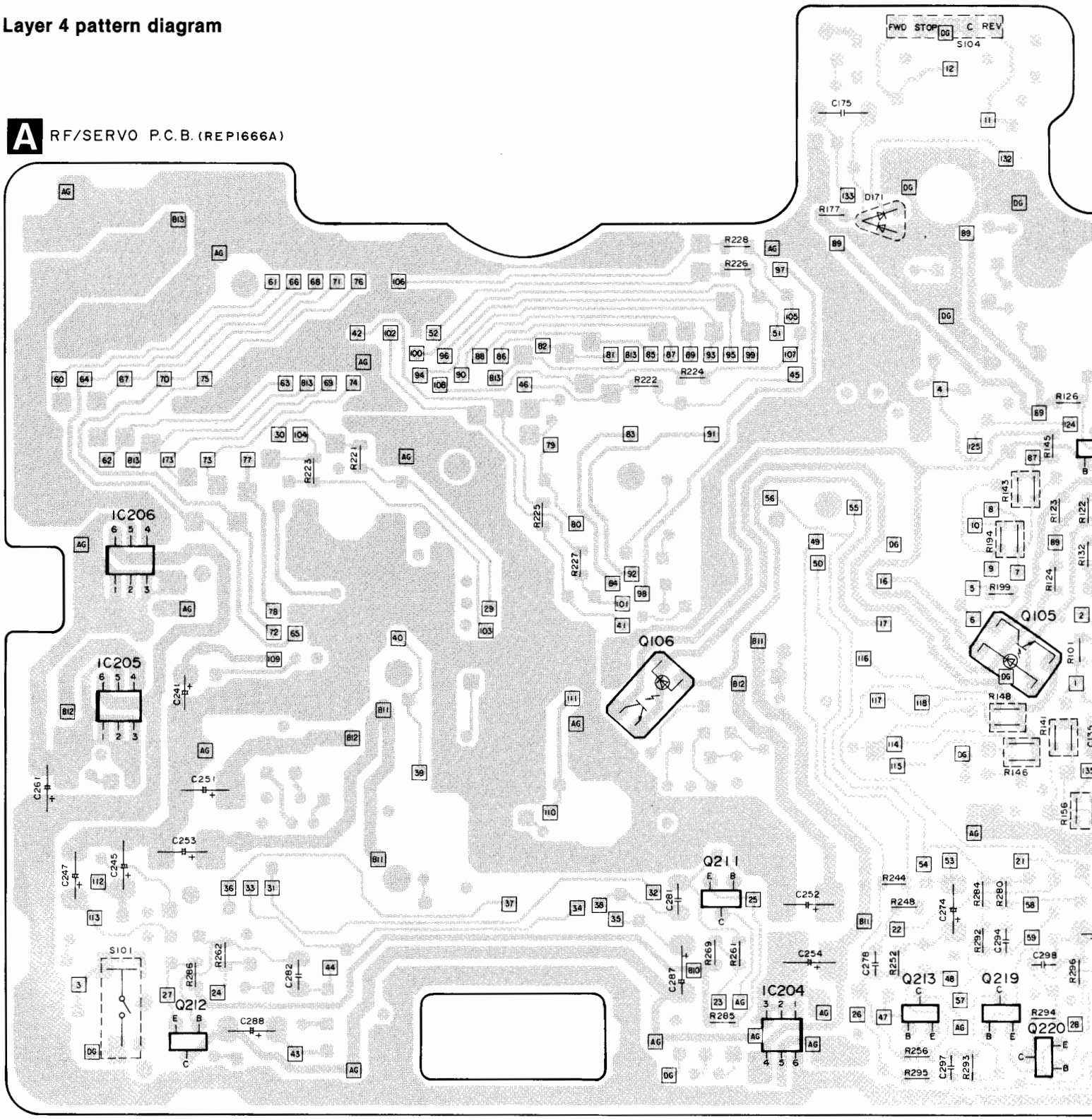
32 26 27 46 2 38 41 44 40 43 35 48 50 45 36 37 39 42 33 49 47	1 ~ 50
63 71 56 73 66 65 61 67 72 100 99 98 62 68 55 95 51 93 90 60 88 86 83 58 84 59 81 97 79 91 53 96 92 94 87 89 57 85 80 52 54 82 78	51 ~ 100
43 135 147 145 124 126 116 148 118 146 140 114 110 112 137 108 106 104 144 117 111 102 103 131 101 105 122 107 120 109 115 127 113 119 125 121 142 139 134 123 136 128 129 133 132	101 ~ 150
170 161	151 ~ 197

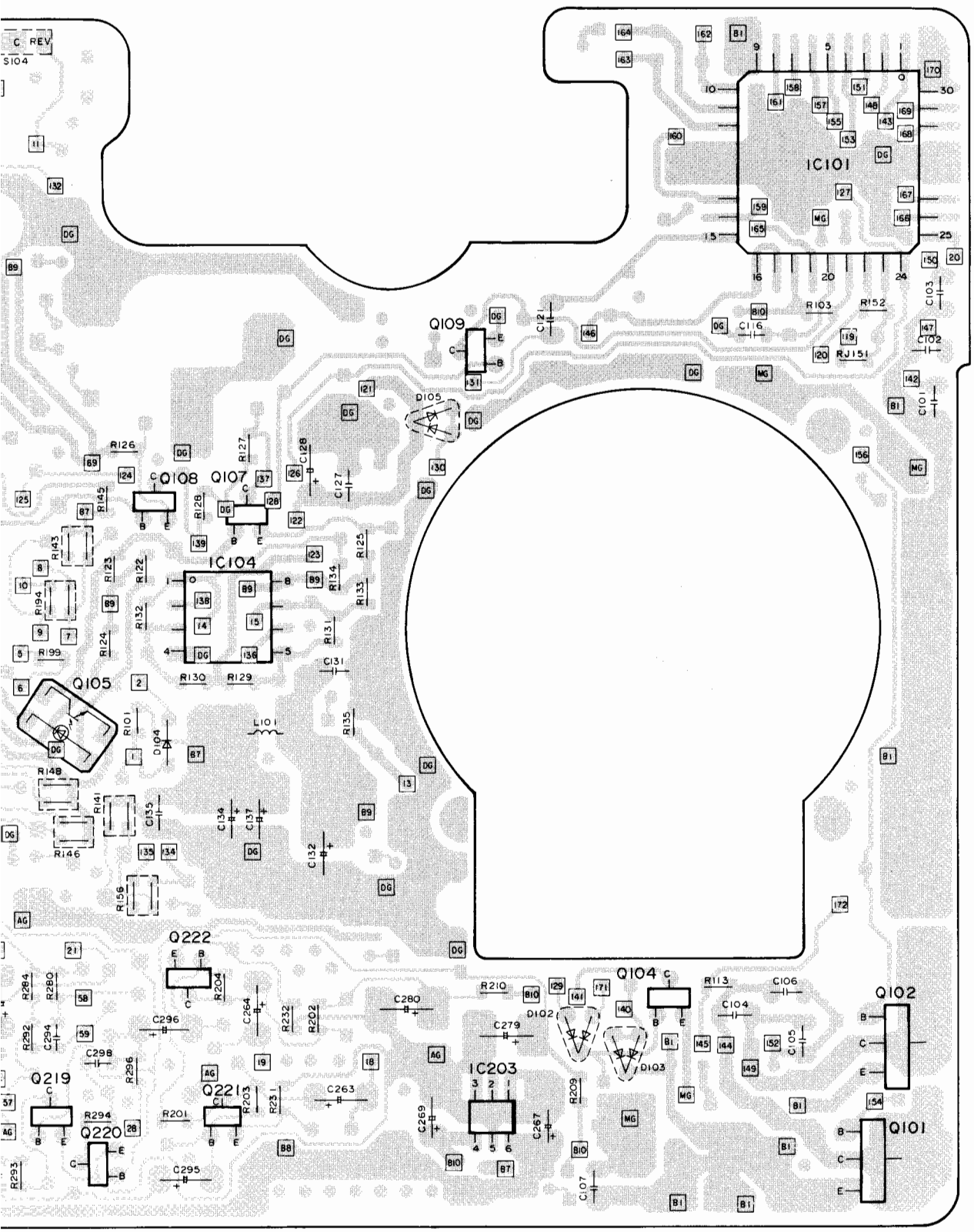
d diagrams indicates
t and another layer.
d diagrams indicates
n and another layer.

- Numbers appearing on signal lines on schematic diagram correspond to through-hole numbers given on the printed circuit board diagrams.
- These printed circuit boards diagram may be modified at any time with the development of new technology.

• Layer 4 pattern diagram

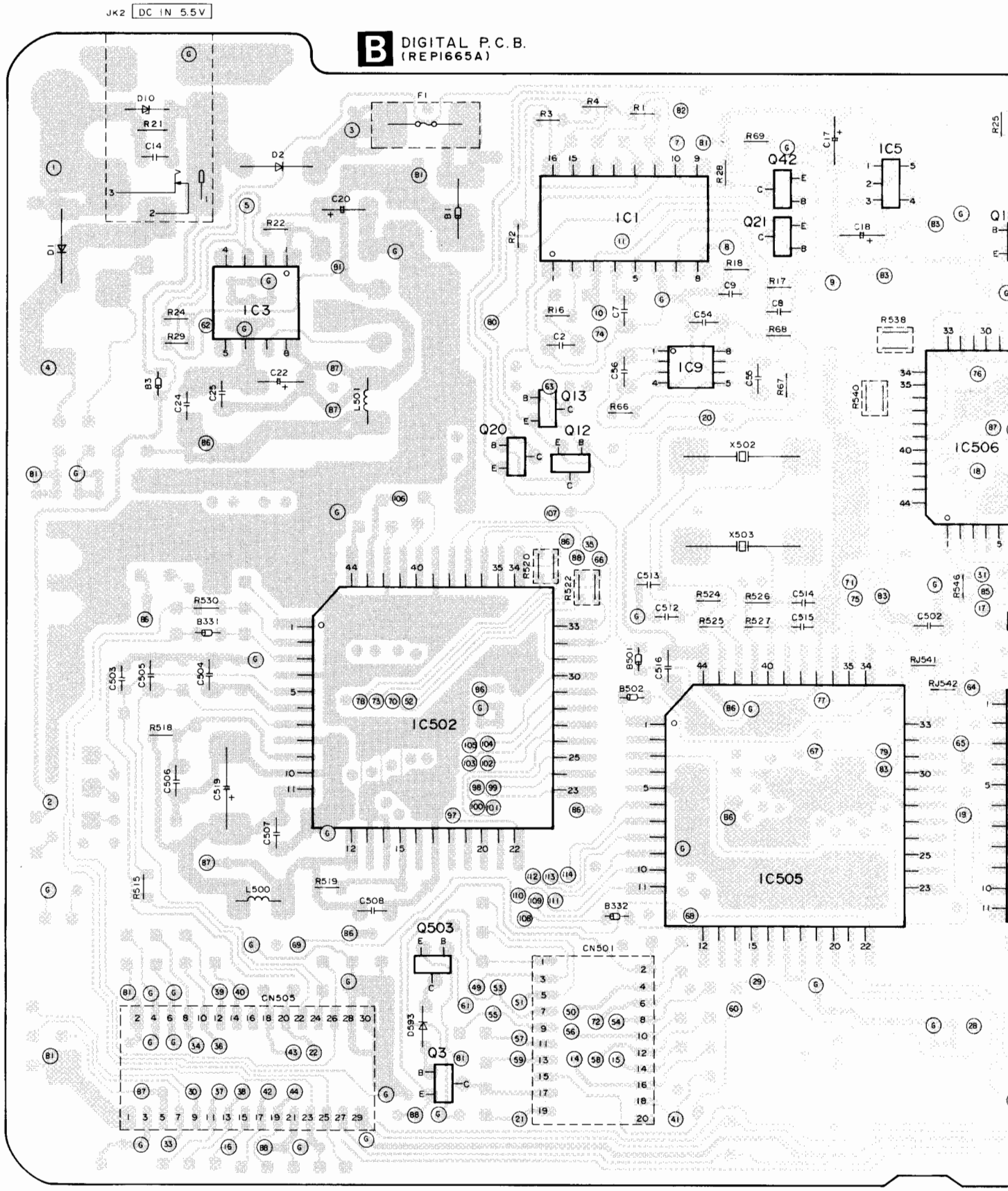
A RF/SERVO P.C.B. (RE-P1666A)

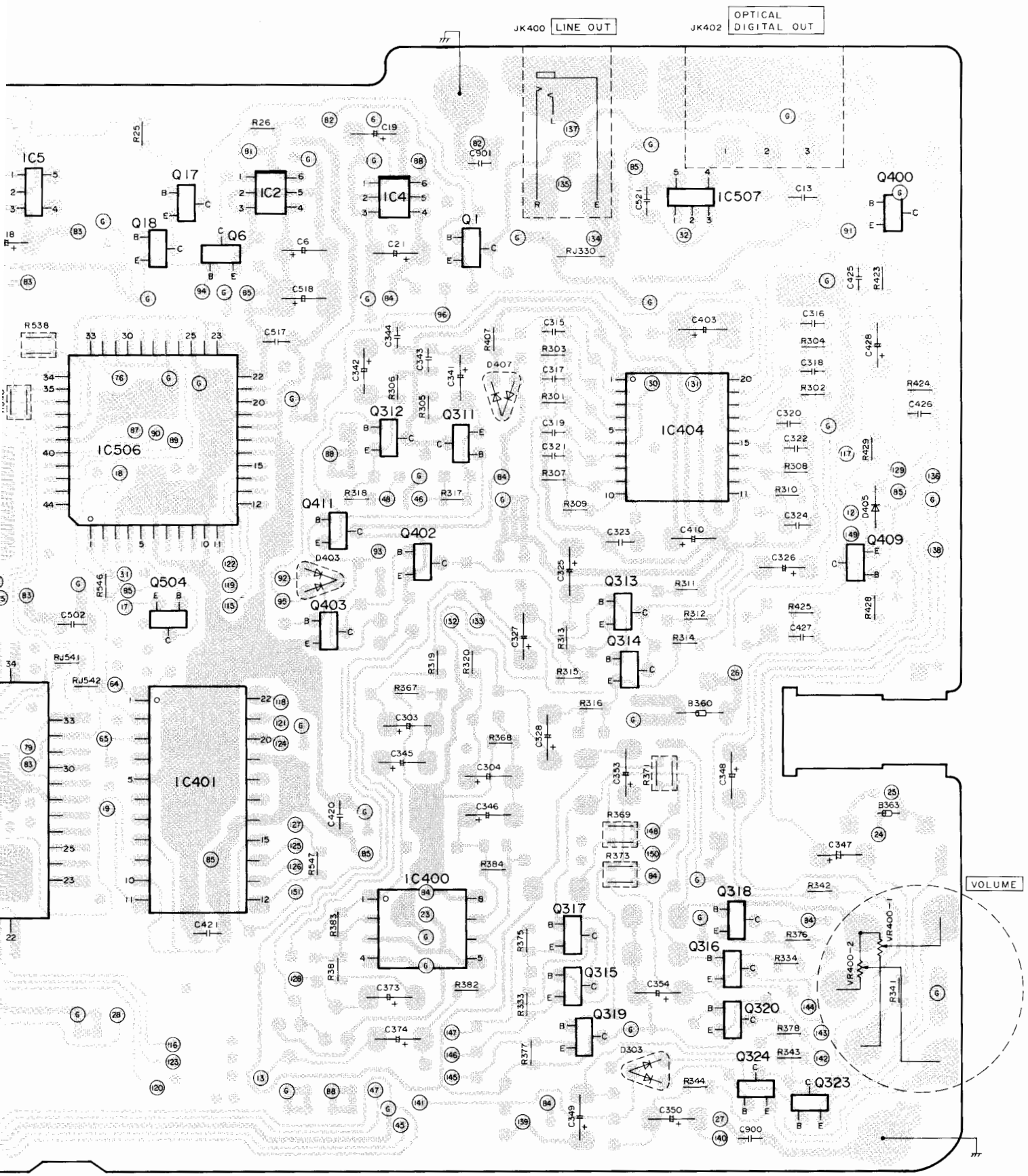




3 6 10 5 8 9 11 7 21 28 1 2 14 15 19 18 13 20	1 ~ 50
57 58 59	51 ~ 100
125 132 124 135 134 139 138 136 137 128 126 122 123 121 130 131 129 141 146 140 145 144 149 120 119 127 148 143 142 147 150	101 ~ 150
171 163 164 160 162 165 159 152 161 158 157 155 172 153 151 156 166 154 167 168 169 170	151 ~ 173

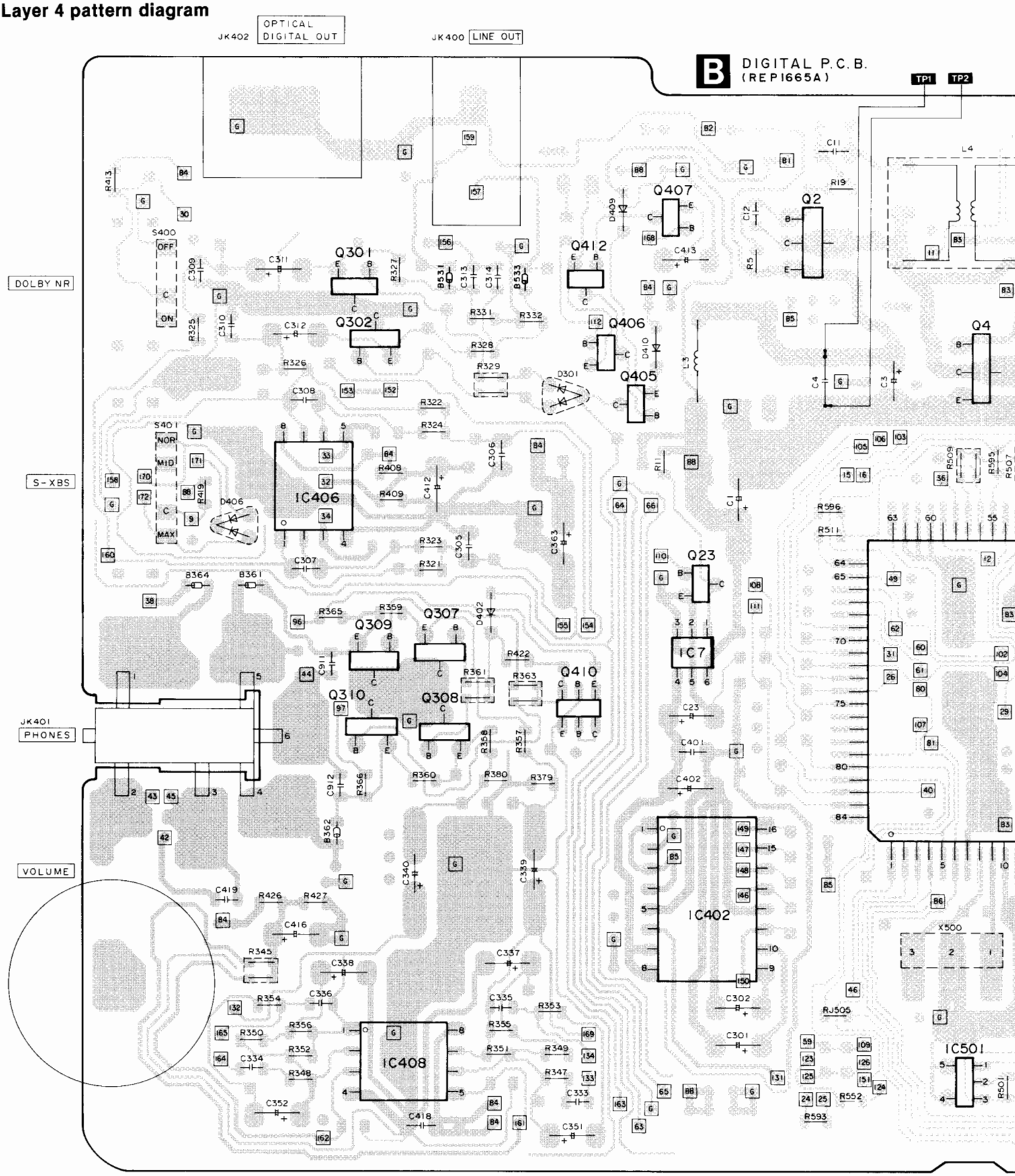
• Layer 1 pattern diagram

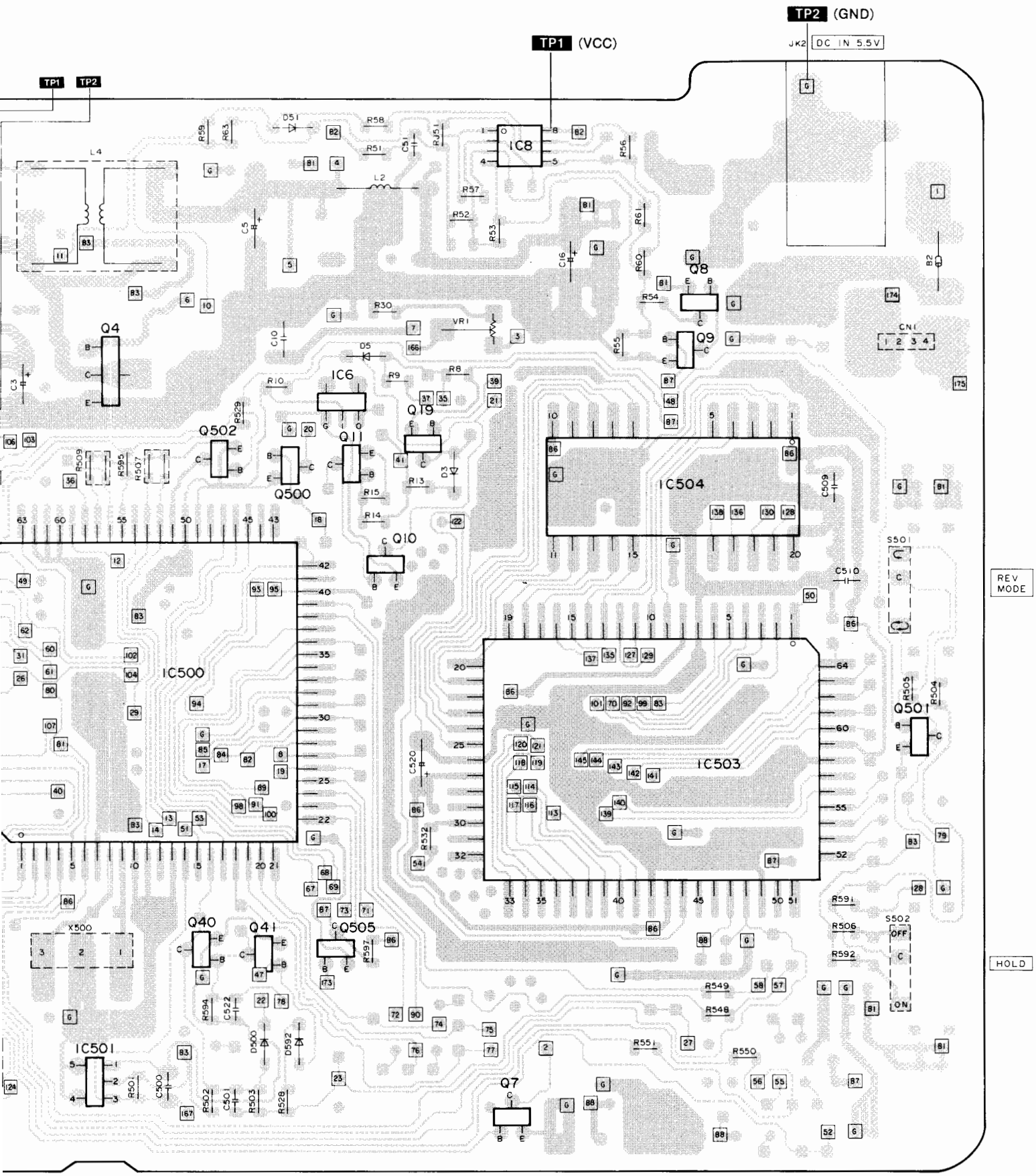




19 28 18 17 31 13 47 6 48 45 46 23 32 27 26 12 24 25		1 ~ 50
75 79 83 65 64 76 87 90 89 94 92 95 93 96 82 84 91 85		51 ~ 100
120 116 123 122 119 115 118 121 151 128 127 125 126 124 141 147 132 146 145 133 139 135 137 134 130 148 150 131 140 149 144 143 142 117 129 136 138		101 ~ 151

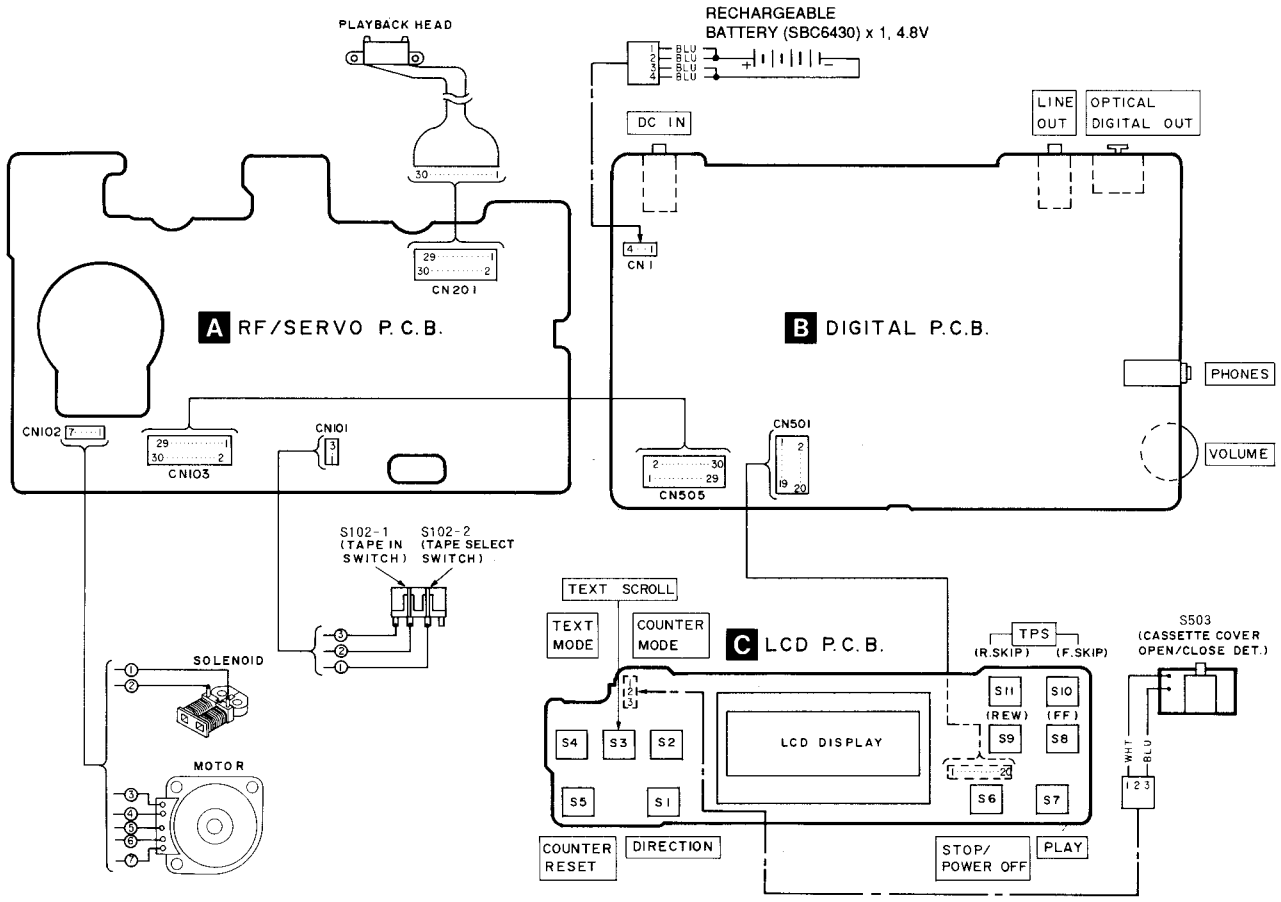
• Layer 4 pattern diagram



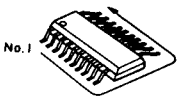


26 49 31 40 11 36	2 29 14 13 6 10 17 47 22 19 5 8 20 18 4 23 41 7 37 35 21 39 3 2 48 27 50 28 1	1 ~ 50
62 60 61 80 81 86	51 85 94 84 53 98 82 91 93 95 89 100 69 78 67 87 68 73 71 72 54 76 90 74 75 77 70 92 99 83 88 58 56 55 57 52 79	51 ~ 100
106 124 103 107	102 104 122 115 117 118 120 114 116 119 121 113 145 144 137 101 135 139 143 140 127 142 141 138 136 130 128 129	101 ~ 150
1 167 173 166 174 175		151 ~ 175

■ WIRING CONNECTION DIAGARAM



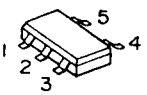
• Terminal guide of IC's, transistors and diodes



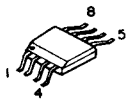
AN1393SNSCE1	8 Pin	AN8086SE2	16 Pin
NJM2115MT1	8 Pin	UPD63200GSE2	16 Pin
NJM3415MT1	8 Pin	BA1106FST2	20 Pin
T75W393FUT12	8 Pin	SM5881SET	22 Pin
TC7W00FUT12L	8 Pin		

S81211SGQAT1

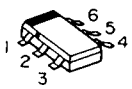
RN5VL36AAT1
RN5RL40AAT1
TC7S04FTE85L



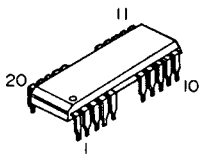
TK11540MTL

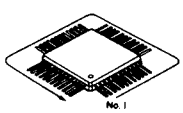


TK11440MTL
TK11445MTL
TK11447MTL



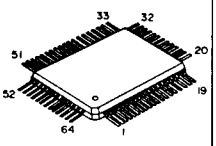
MN425610AT1



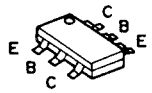


M51581GP	44 Pin
SAA2002GP	44 Pin
SAA2032GP	44 Pin
TDA1318H	44 Pin
MNE201ARTAB1	84 Pin
MNE3214RTAA2	84 Pin

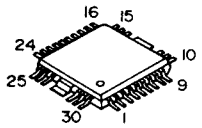
SAA2022GP

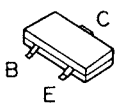


XN4316TW



NBC5800

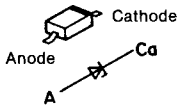




UN5111TW
UN5113TW
UN5114TW
UN521MTW
UN5211TW
UN5212TW
UN5213TW
UN5214TW

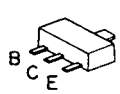
UN5215TW
2SA1748QTW
2SB1218ASTW
2SC4081RTW
2SD1328RTW
2SD1819AQTW

MA8100TX

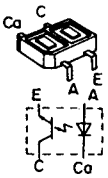


MA701TW
1SR154-100TE

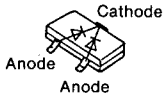
2SB956STW
2SD1628FG-TD



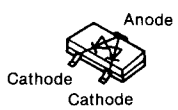
GP2S27T6



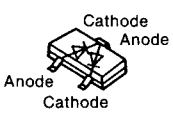
MA141WKTW
MA142WKTW



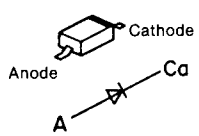
MA141WATW



MA143TW
MA143TX



MA110TW
MA732TW



■ SCHEMATIC DIAGRAM

Note 1:

- The voltage value and waveforms are the reference voltage of this (connect the AC adaptor and portable DC player) measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of GND terminal (DC IN Jack).
  Accordingly, there may arise some errors in the voltage values and waveforms depending upon the internal impedance of the tester or measuring unit.
- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

Note 2:

CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH SAME TYPE 2.0A 250V FUSE.

RISK OF FIRE-REPLACE FUSE AS MARKED.

FUSE CAUTION

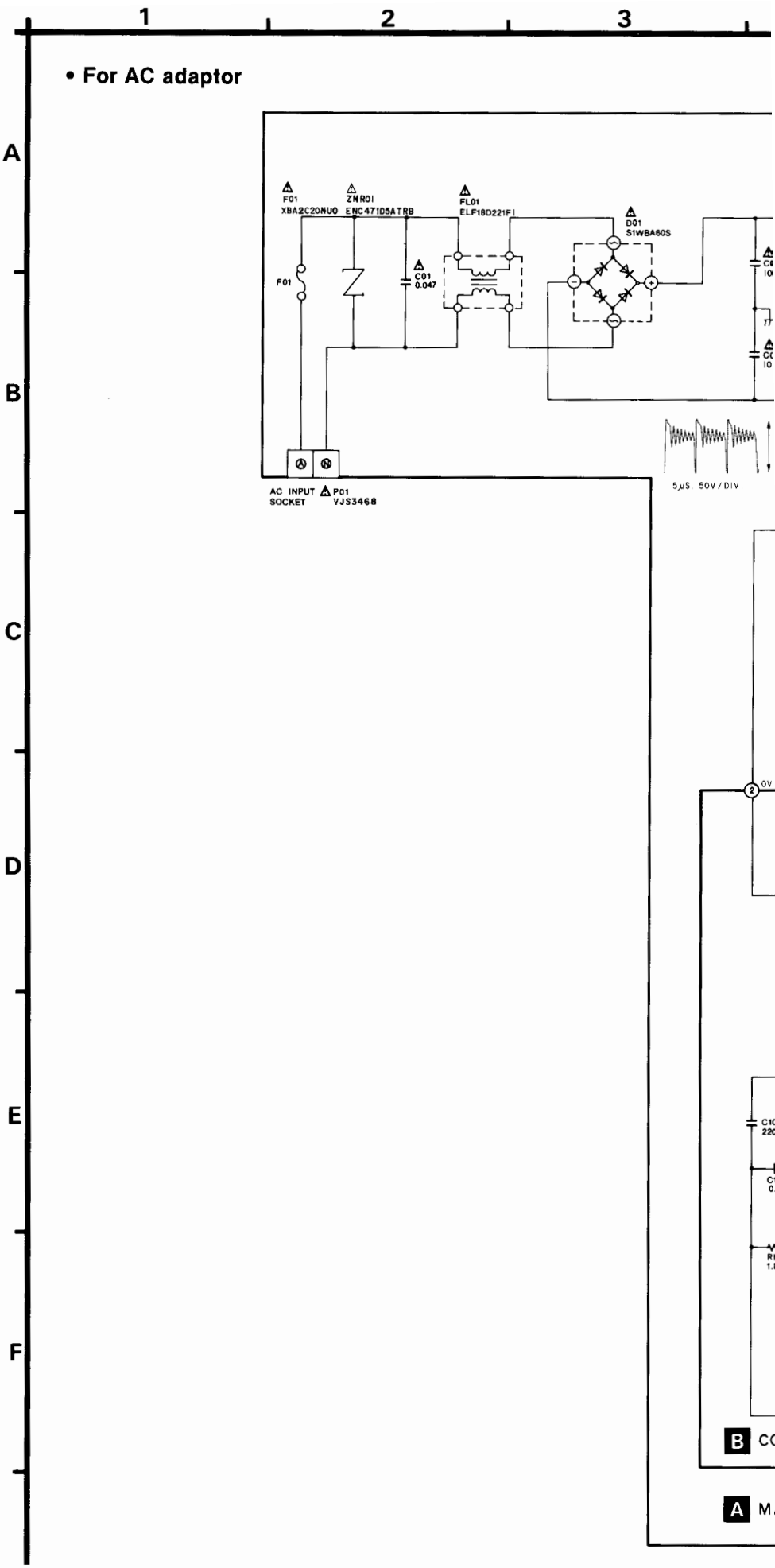
This symbol located near the fuse indicates that the fuse used is fast operating type. For continued protection against fire hazard, replace with same type fuse. For fuse rating, refer to the marking adjacent to the symbol.

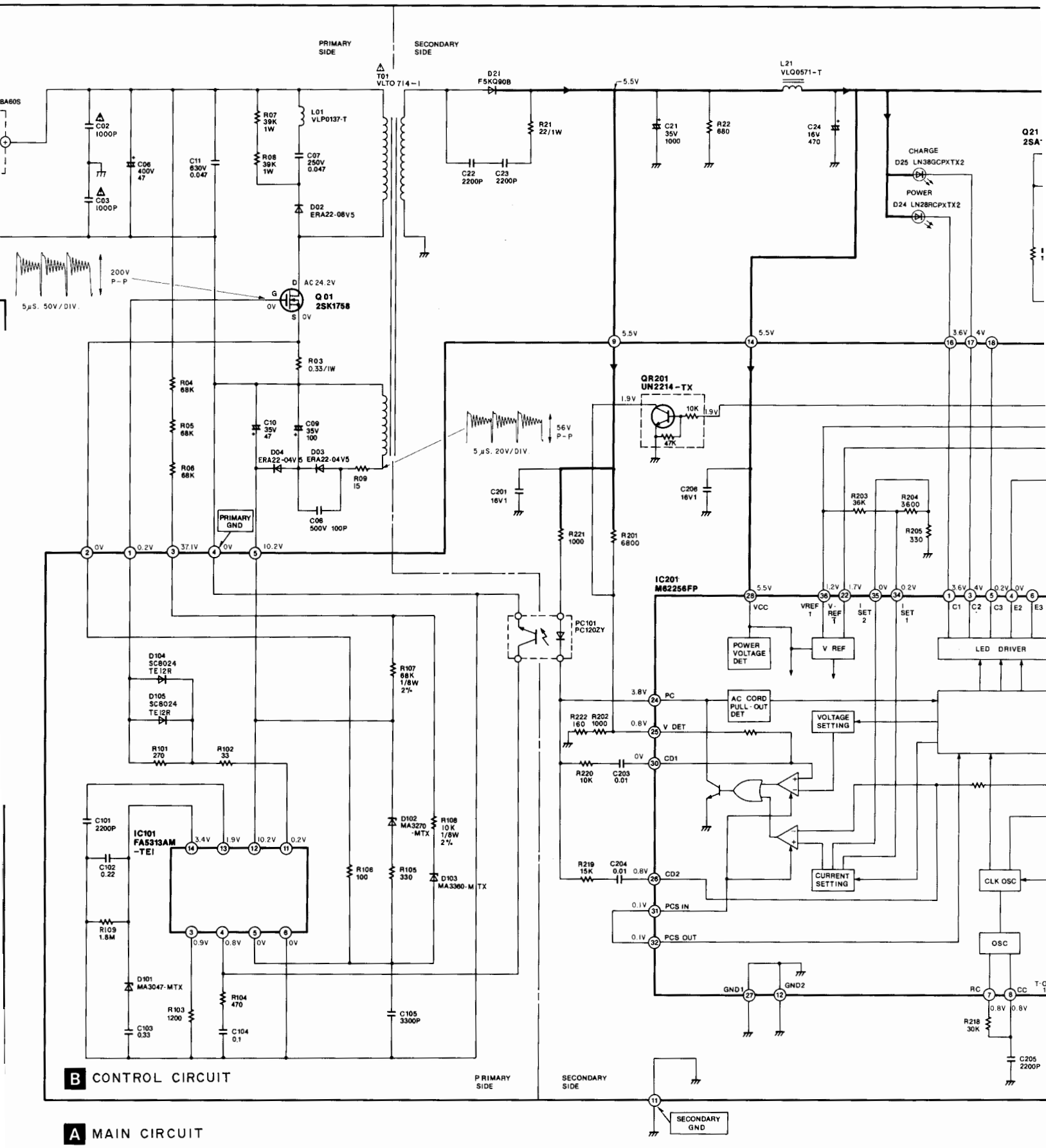
Ce symbole indique que le fusible utilisé est à rapide. Pour une protection permanente, n' utiliser que des fusibles de même type. Ce dernier est indiqué là qù le présent symbole est apposé.

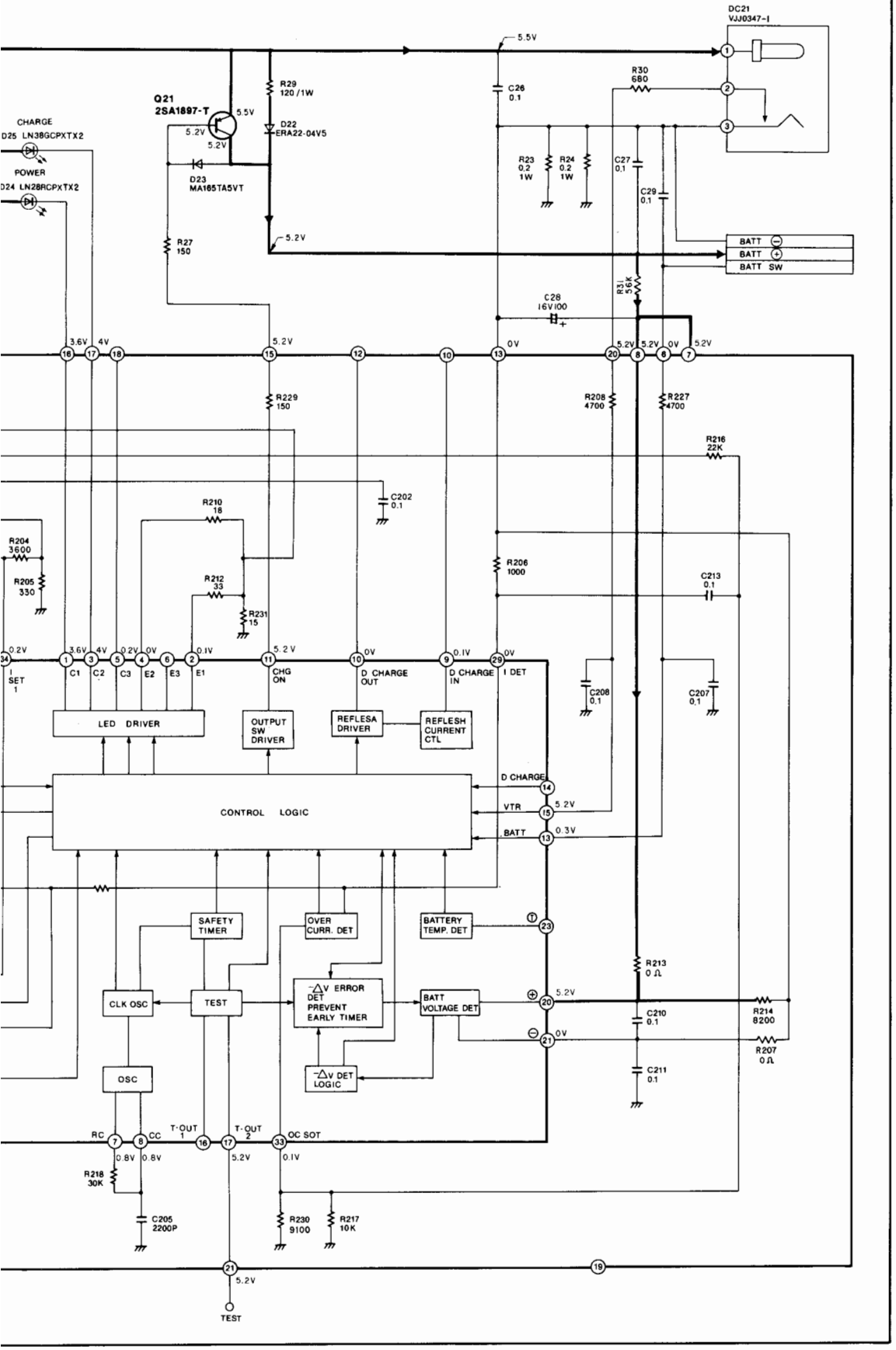
Caution!

IC and LSI are sensitive to static ellectricity.
Secondary trouble can be prevented by taking care during repair.

- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the pins of IC or LSI with fingers directly.




PRIMARY SIDE
SECONDARY SIDE
T01 VLTO 714-I
D21 F5KQ90B
L21 VLQ0571-T
5.5V
C02 1000P
C03 1000P
C06 400V 47
C11 630V 0.047
R07 39K 1W
R08 39K 1W
L01 VLP0137-T
C07 250V 0.047
D02 ERA22-08V5
R21 22/1W
C22 2200P
C23 2200P
C21 35V 1000
R22 680
C24 16V 470
CHARGE
D25 LN38GCPXTX2
POWER
D24 LN28RCPXTX2
Q21 2SA
200V P-P
5μS. 50V/DIV.
D
G
S
AC 24.2V
0V
Q01 2SK1758
R03 0.33/1W
R04 68K
R05 68K
R06 68K
C10 35V 47
C09 35V 100
D04 ERA22-04V5
D03 ERA22-04V5
R09 15
C08 500V 100P
PRIMARY GND
56V P-P
5μS. 20V/DIV.
QR201 UN2214-TX
1.9V
10K
47K
C201 16V1
C208 16V1
R221 1000
R201 6800
R203 36K
R204 3600
R205 330
IC201 M62256FP
VCC
VREF 1
V-REF
I SET 2
I SET 1
C1
C2
C3
E2
E3
POWER VOLTAGE DET
V REF
LED DRIVER
PC101 PC120ZY
D104 SC8024 TE12R
D105 SC8024 TE12R
R107 68K 1/8W 2%
R101 270
R102 33
PC
AC CORD PULL-OUT DET
R222 160
R202 1000
V DET
VOLTAGE SETTING
CD1
R220 10K
C203 0.01
C101 2200P
IC101 FA5313AM -TEI
C102 0.22
R109 1.8M
D102 MA3270-MTX
R108 10K 1/8W 2%
R106 100
R105 330
D103 MA3360-MTX
R219 15K
C204 0.01
CD2
CURRENT SETTING
CLK OSC
PCS IN
PCS OUT
OSC
GND1
GND2
RC
CC
R218 30K
C205 2200P
D101 MA3047-MTX
R103 1200
R104 470
C103 0.33
C104 0.1
C105 3300P
B CONTROL CIRCUIT
PRIMARY SIDE
SECONDARY SIDE
SECONDARY GND
A MAIN CIRCUIT

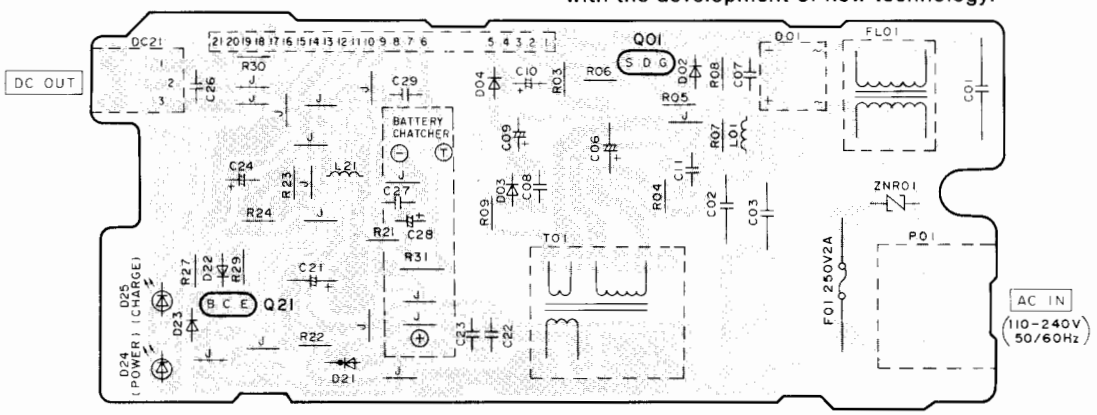

DC21
VJJ0347-I
5.5V
R30
680
C26
0.1
Q21
2SA1897-T
R29
120/1W
D22
ERA22-04V5
D23
MA165TA5VT
CHARGE
D25 LN38GCPXTX2
POWER
D24 LN28RCPXTX2
R23
0.2
1W
R24
0.2
1W
C27
0.1
C29
0.1
R27
150
BATT ⊖
BATT ⊕
BATT SW
R31
56K
C28
16V100
R229
150
R208
4700
R227
4700
R216
22K
C202
0.1
R210
18
R204
3600
R205
330
R212
33
R231
15
R206
1000
C213
0.1
C208
0.1
C207
0.1
I SET 1
C1
C2
C3
E2
E3
E1
CHG ON
D CHARGE OUT
D CHARGE IN
I DET
LED DRIVER
OUTPUT SW DRIVER
REFLESA DRIVER
REFLESH CURRENT CTL
CONTROL LOGIC
D CHARGE
VTR
BATT
SAFETY TIMER
OVER CURR. DET
BATTERY TEMP. DET
R213
0Ω
CLK OSC
TEST
-△V ERROR DET PREVENT EARLY TIMER
BATT VOLTAGE DET
C210
0.1
R214
8200
R207
0Ω
C211
0.1
OSC
-△V DET LOGIC
RC
CC
T-OUT 1
T-OUT 2
OC SOT
R218
30K
C205
2200P
R230
9100
R217
10K
TEST

■ PRINTED CIRCUIT BOARDS

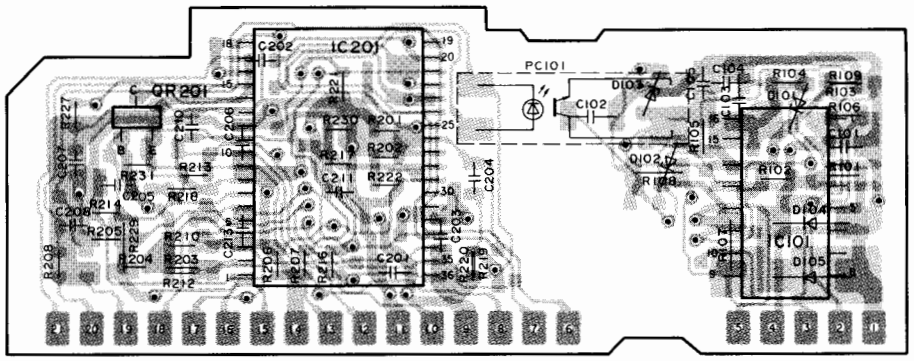
Notes:

- In this printed circuit board diagram, the parts and foil patterns on the board facing toward you are printed in black. The opposite side is printed in Red.
- The "●" mark denotes the connection points of double-faced foil patterns (through holes) on both sides of the printed circuit board.
- This printed circuit board diagram may be modified at any time with the development of new technology.

A MAIN P.C.B. (VEP61113A)



B CONTROL P.C.B. (VEP60295C-A)



• Terminal guide of IC's, transistors and diodes

FA5313AM-TE1 16 Pin M62256FP 36 Pin No.1		PC120ZY	2SK1758	2SA1897-T
UN2214TX	MA165	ERA22-04V5 ERA22-08V5	F5KQ90B	SC8024TE12R
	MA3047-MTX MA3270-MTX MA3360-MTX	S1WBA60S	LN28RCPXTX2 LN38GCPXTX2	

■ TERMINAL FUNCTION OF IC'S

• IC1 (AN8086SE2): DC-DC converter control

Pin No.	Mark	I/O Division	Function
1	IN	I	Error amp input
2	FB	O	Error amp output
3	SPRO	I	Short protect input
4	DED	I	Dead time input
5	OUT	O	Switching output
6	GND	—	Ground terminal
7	CT	I	Triangular wave oscillator capacitor input
8	PVCC	I	Power supply terminal

Pin No.	Mark	I/O Division	Function
9	CLK	I	Clock signal input (f=88.2kHz)
10	$\overline{\text{START}}$	I	Start detection input
11	POWER	I	Power ON/OFF detection terminal
12	VREF	O	Reference voltage output
13	EMP	O	Empty detection output
14	VSEN	I	Empty detection input
15	RESET	O	Reset signal output
16	VCC	I	Power supply terminal

• IC101 (NBC5800): Capstan motor control

Pin No.	Mark	I/O Division	Function
1	W	O	W phase output terminal
2	V	O	V phase output terminal
3	U	O	U phase output terminal
4	HW	O	W phase pre-drive output
5	HV	O	V phase pre-drive output
6	HU	O	U phase pre-drive output
7	PGI	I	PG amp input
8	FGI	I	FG amp input
9	VM	I	Motor power supply terminal
10	PD	O	Phase det. terminal
11	EAO	O	Error amp output
12	EAI	I	Error amp input
13	FGOUT	O	FG amp output
14	PGOUT	O	PG amp output
15	PG	O	PG comparator output
16	VREF	I	Reference voltage terminal

Pin No.	Mark	I/O Division	Function
17	PGREF	I	PG amp non-inversion input
18	VCC	I	Power supply terminal
19	RFM	—	Low frequency setting terminal
20	VCO	O	Voltage control OSC terminal
21	F/R	I	FWD/REV select terminal
22	ETR	I	Torque command voltage input
23	ET	I	Torque command input
24	STB	I	Standby input terminal
25	TL	I	Torque limit terminal
26	PCI	—	Phase compensating of current feedback terminal
27	CBR	—	Condition det. terminal
28	PCV	—	Phase compensating of voltage feedback terminal
29	SW	—	Slope OSC terminal
30	CS	I	Current det. input

• IC102 (MNE201ARTAB1): Servo controller

Pin No.	Mark	I/O Division	Function
1	R64 (RFCR02)	O	Tape select output terminal
2	P63 (SDA)	I	DCC part select input
3	P62 (CSA)	O	Chip select input
4	P61 (SDB)	I	DCC part select outptu
5	P60 (CSB)	O	Chip Select
6	P57	—	Not connection
7	P56	—	Not connection
8	P55	—	Not connection
9	P54	—	Not connection
10	P53	—	Not used, connected to GND
11	P52	—	Not used, connected to GND
12	P51	—	Not used, connected to GND
13	P50	—	Not used, connected to GND
14	NSBT1 (P07)	—	Test terminal
15	NSBI1 (P06)	—	Test terminal
16	NSBO1 (P05)	—	Test terminal
17	NSBT0 (CLK)	I	Serial clock input
18	NSBI0 (DATA)	I	Serial data input
19	NSBO0 (DATAO)	—	Not connection
20	NRST (NRESET)	I	Reset signal input
21	EXI	—	Not used, connected to GND
22	HSW	—	Not connection
23	VLP	—	Not connection
24	PWM3	—	Not connection
25	PWM2	—	Not connection
26	PWM1	—	Not connection
27	PWM0	O	Torque command output
28	SBUFD7 (TPS OUT)	O	TPS signal output
29	SBUFD6 (SYS/MECA)	—	Connected to resistor and capacitor
30	SBFUD5	—	Not connection
31	OSC2	I	Crystal OSC terminal (f=6MHz)
32	OSC1	O	
33	VSS	—	GND terminal

Pin No.	Mark	I/O Division	Function
34	SBFD4	—	Not connection
35	SBFD3	—	Not connection
36	SBFD2	—	Not connection
37	SBFD1	—	Not connection
38	HBFD6	—	Not connection
39	HBFD4 (S/S)	O	Standby output
40	HBFD2 (R/F)	O	REV/FWD select terminal
41	HBFDD (S06)	O	Plunger control terminal
42	AVMM	—	Not connection
43	PGMM	—	Not used, connected to GND
44	FGI (CAPFG)	I	Motor FG signal input
45	FGF	—	Not connection
46	AFG	—	Not used, connected to GND
47	YFG	—	Not connection
48	YPG	—	Not used, connected to GND
49	AVSS	—	GND terminal
50	VRO (VREF)	O	Servo reference voltage output
51	VRI (VREF IN)	I	Servo reference voltage input
52	CIR (DRLFGS)	I	Supply reel FG input
53	CIF	—	Not connection
54	TPZ	—	Not connection
55	RCTLN	—	Not connection
56	RCLTP	—	Not connection
57	CTLS	—	Not connection
58	CTLH	—	Connected to IC102 ㊾ pin
59	CTLA	—	Connected to IC102 ㊽ pin
60	CTLG	—	Not connection
61	AGC	—	Not connection
62	CO	—	Not connection
63	AVDD	I	Power supply terminal
64	VSYNC (DRLFGT)	I	Take-up reel FG input
65	AD7 (VSYN)	I	Take-up reel FG input
66	AD6 (ENV)	I	Auxiliary search mode det. input
67	AF5 (RSPEED)	I	RVS speed adjustment terminal

Pin No.	Mark	I/O Division	Function
68	AD4 (FSPEED)	I	FWD speed adjustmetn terminal
69	AD3	—	Not used, connected to GND
70	AD2 (TPS)	I	Analog TPS signal input
71	AD1	—	Not used, connected to GND
72	AD0 (ASPEED)	I	Capstan phase information input
73	P77	—	Not connection
74	VDD	I	Power supply terminal
75	P76 (PLAY/REC)	—	Test terminal
76	P75 (SW. PBON/OFF)	—	Test terminal

Pin No.	Mark	I/O Division	Function
77	P74 (DCC/ACC)	I	DCC/ACC tape det. terminal
78	P73 (CRO2)	I	Tape det. (CrO_2) input
79	P72	—	Not used, connected to GND
80	P71 (FWD)	I	Mechanism mode (FWD) det. terminal
81	P70 (RVS)	I	Mechanism mode (RVS) det. terminal
82	ROT	—	Not used, connected to GND
83	HAMP	—	Not used, connected to GND
84	DEW (LOCK)	O	Lock signal output

• IC201, 202 (TDA1318H): Read amp

Pin No.	Mark	I/O Division	Function
1	RDMUX	O	Output of sampled and multiplexed auxiliary and data signals
2	OUTX	O	Auxiliary channel preamplifier output
3	MUXINX	I	Auxiliary channel multiplexer input
4	DSENADJ1	—	Adjust pin for DCC sense current 1
5	DSENADJ2	—	Adjust pin for DCC sense current 2
6	DSENADJ3	—	Adjust pin for DCC sense current 3
7	VD14	O	Reference voltage output DCC sense
8	DSEN1	O	DCC sense current output 1
9	DSEN2	O	DCC sense current output 2
10	DSEN3	O	DCC sense current output 3
11	INX0	I	Auxiliary channel input/channel 0 inpnut
12	IN01	I	Channel 0/1 input
13	IN1	I	Channel 1 input
14	INX25	I	Channel Aux/2/5 input
15	IN23	I	Channel 2/3 input
16	IN34	I	Channel 3/4 input
17	IN4	I	Channel 4 input
18	IN56	I	Channel 5/6 input
19	IN67	I	Channel 6/7 input
20	IN7	I	Channel 7 input
21	V14	O	Reference voltage output for DCC/analog inputs
22	OUTR	O	Right channel analog output
23	INMFR	I	Right channel feedback amplifier input

Pin No.	Mark	I/O Division	Function
24	MFR1	O	Right channel feedback amplifier outpt 1
25	INR	I	Right channel analog input
26	MFR2	O	Right channel feedback amplifier output 2
27	INRL	I	Right/left channel analog input
28	VEEM	—	Ground for feedback amplifiers
29	VCCM	I	Positive supply for feedback amplifiers
30	MFL2	O	Left channel feedback amplifier output 2
31	INL	I	Left channel analog input
32	MFL/	O	Left channel feedback amplifier output 1
33	INMFL	I	Left channel feedback amplifier input
34	OUTL	I	Left channel analog output
35	VR14	O	Reference voltage output CC sense
36	V33	O	ADC Reference voltage output
37	SD	I	Select DCC-part input
38	VDD	I	General positive supply
39	VSS	—	General ground
40	RDCLK	I	Read Clock input
41	RDSYNC	I	Read Sync pulse input
42	CS	I	Chip select input
43	AGC	I	AGC time constant
44	VBIAS	—	DCC preamplifier control voltage

• IC401 (SM5881SET): Digital filter

Pin No.	Mark	I/O Division	Function
1	DSF1	I	de-emphasis input terminal Pin Setting: DSF1 / DSF2 / fs(Hz); DEEM: H / L; Etc.: Noise Shaper L / L / 44.1K / ON / OFF / ON L / H / 48.0K / ON / OFF / ON H / H / 32.0K / ON / OFF / ON H / L / OFF (test mode) / OFF
2	CKI	I	System clock input terminal
3	DSF2	I	De-emphasis select terminal
4	CKO	O	System clock output terminal
5	VSS	—	GND terminal
6	NC	—	Not connection
7	NC	—	Not connection
8	$\overline{ATT}$	I	Attenuation signal input ["H": OFF (−12dB), "L": ON (−12dB)]
9	DEEM	I	De-emphasis ON/OFF control terminal ("L": OFF, "H": ON)
10	$\overline{MUTE}$	I	Muting signal input ("H": Soft mute OFF, "L": Soft mute ON)

Pin No.	Mark	I/O Division	Function
11	$\overline{RST}$	I	System reset (initialize)
12	BCKO	O	Bit clock output
13	DOR	O	Rch data output with "$\overline{OMOD}$: "H" LR clock output with "$\overline{OMOD}$: "L"
14	DOL	O	Lch data output with "$\overline{OMOD}$: "H" L/Rch data output with "$\overline{OMOD}$: "L"
15	WCKO	O	Word clock (8fs) output
16	VDD	I	Power supply terminal
17	NC	—	Not connection
18	NC	—	Not connection
19	$\overline{OMOD}$	I	Output mode select terminal ("H": 18 bit, "L": 16 bit)
20	LRCI	I	Data sample rate (fs) clock input
21	BCKI	I	Bit clock (64fs) input
22	DIN	I	Data (fs•18 bit) input

• IC402 (UPD63200GSE2): D/A converter

Pin No.	Mark	I/O Division	Function
1	4/8 SEL	I	L/Rch data input from "LSI" with "L" or open. Lch data input from "LSI" and Rch data input from "RSI" with "H"
2	DGND	—	Digital GND terminal
3	BITSL	I	16 bit data mode with "L" or open. 18 bit data mode with "H"
4	DVDD	I	Power supply terminal
5	AGND	—	Analog GND terminal
6	ROUT	O	Rch analog signal output
7	AVDD	I	Analog power supply terminal
8	AVDD	I	
9	RREF	—	Reference voltage terminal (Connected to GND by capacitor)
10	LREF	—	
11	LOUT	O	Lch analog signal output

Pin No.	Mark	I/O Division	Function
12	AGND	—	Analog GND terminal
13	LRCK	I	L/Rch discrimination signal when "4/8 SEL" is "L" or open word discrimination signal when "4/8 SEL" is "H".
14	RSI	I	L/Rch polarity select signal when "4/8 SEL" is "L" or open Lch data input (LRCK: "H" and RSI: "L"/LRCH: "L" and RSI: "H") Rch serial data input (4/8 SEL: "H")
15	LSI	I	Serial data input of alternate Lch and Rch when "4/8 SEL" is "L" or open Serial data input of Lch when "4/8 SEL" is "H"
16	CLK	I	Read clock signal of serial input data

• IC500 (MNE3214RTAA2): System Control

Pin No.	Port	I/O	Port Name	HPS Use	OFF	STOP	PLAY	FF/REW	SKIP	Remarks
1	P55	O	ADON	: "H" with AD input	L	H	H	H		
2	P54	O	LIGHT	: LCD back light ON/OFF (H=ON)	L	H	H	H		
3	P53	O	DATA	: SDA, SCA, SDB, SCB, FWD/RVS	L	"H" or "L" with data				
4	P52	O	CLOCK	: MSPEED, MOTORON, REC/PL	L	Transfer clock				
5	P51	O	DSF1	: Frequency select output (1) of digital filter	L	de-emphasis OFF (ACC)		de-emphasis ON		
								32.0	44.1	48.0
						L		H	L	L
6	P50	O	DSF2	: Frequency select output (2) of digital filter	L	L		H	L	H
7	VDD	I	Power supply terminal: 3.5~5.5V		OFF	STOP	PLAY	FF/REW	SKIP	
					4V	4V	4V	4V	4V	
8	OSC1	I	Crystal OSC terminal (f=6MHz)		L	OSC	OSC	OSC	OSC	
9	OSC2	O			L	OSC	OSC	OSC	OSC	
10	VSS	—	GND terminal		GND					
11	XI (P23)	I	System OSC input terminal (Not used)		L	L	L	L	L	
12	XO	I	System OSC input terminal (Not used)		L	L	L	L	L	
13	EX2	I	Operation mode select terminal		L	L	L	L	L	
14	NRESET	I	Reset input terminal		H	H	H	H	H	
15	P26 (IRQ2)	I	STARTSEG	:	L	Pulse input				
16	P25 (IRQ1)	I	WAKEUP	: Starting (H→L) from power OFF	H	H	H	H	H	
17	P24 (IRQ0)	I	AENV	: AUX envelope input from DEQ	L	L	L	Envelope waveform		
18	P77	O	D7	Parallel transfer data of LCD	"H" or "L" with transfer data 					
19	P76	O	D6							
20	P75	O	D5							
21	P74	O	D4							
22	P73	O	D3							
23	P72	O	D2							
24	P71	O	D1							
25	P70	O	D0							
26	P47	O	PWRDWN	: DC/DC converter operation stop output	H	L	L	L	L	
27	P46 (SIFIN)	O	NKSTART	: DC/DC converter start indication output	L	L	L	L	L	Stand up "H" pulse
28	P45 (PWM2−)	O	LTenTFE	: LT bus enable line of TFE	L	"H" or "L" signal with LT line data				
29	P44 (PWM2+)	O	LTenDEQ	: LT bus enable line of DEQ	L					
30	P97	O	NRESETO	: Reset output of SERVO/DAI/DF	L	H	H	H	H	
31	P96	O	RESETH	: SFC, TFE reset output	L	L	L	L	L	"H" with reset
32	P95 (KEY5)	I	ADPDET	: AC adaptor det. input	L	L	L	L	L	
33	P94 (KEY4)	O	PWRLSI	: Power down output of TFE/SFC	L	*	*	*	*	*: "H" with ACC
34	P43 (PWM1−)	O	LTCNT1	: LT bus control line (1)		"H" or "L" signal with LT bus control				
35	P42 (PWM1+)	O	LTCNT0	: LT bus control line (2)						
36	P41 (PWM0−)	O	LTenDAI	: LT bus enable line of DAI						
37	P40 (PWM0+)	O	LTenSFC	: LT bus enable line of SFC						
38	P22 (TCI04)	I	DRLFGT	: Take-up reel pulse input	L	L	Reel pulse waveform input			
39	P21 (TCI02)	I	DRLFGS	: Supply reel pulse input	L	L				
40	P20 (TCI01)	O	BUZZER	: Buzzer output of remote control	L	Pulse output with remote control operation				
41	P17 (SBT2)	O	LTCLK	: LT bus clock line	L	"H" or "L" singal with LT bus control				
42	P16 (SBD2)	I/O	LTDATA	: LT bus data line	L					

Pin No.	Port	I/O	Port Name	HPS Use	OFF	STOP	PLAY	FF/REW	SKIP	Remarks
43	P15 (TRXC)	*		: (Not used)	L	L	L	L	L	
44	P14 (RXD)	*		: (Not used)	L	L	L	L	L	
45	P13 (TXD)	O	E	: LCD driver data R/W starting output	L	"H" or "L" signal with indication data transfer				"L" with read
46	P12 (/SBT1)	O	R/W	: LCD driver data R/W select output	L					
47	P11 (/SBI1)	O	RS	: LCD driver IR/DR select output	L					
48	P10 (/SB01)	*		: (Not used)	L	L	L	L	L	
49	VDD	I		: Power supply terminal	4V	4V	4V	4V	4V	
50	AVDD	I		: Power supply terminal	4V	4V	4V	4V	4V	
51	VREFH	I		: Power supply terminal	4V	4V	4V	4V	4V	
52	P87 (AD7)	I	S0	: Mechanism key input (1)	4V	Voltage change with key input (Normanl: 4V)				
53	P86 (AD6)	I	S1	: Mechanism key input (2)	4V					
54	P85 (AD5)	I	REVHOLD	: Reverse mode/HOLD SW input	4V	Voltage change with SW position				
55	P84 (AD4)	I	DCC/ACC	: ACC/DCC det. input	L	*	*	*	*	*: "H" with DCC
56	P83 (AD3)	I	MODESEL	:	H	H	H	H	H	
57	P82 (AD2)	I	DEQSEL	:	H	H	H	H	H	
58	P81 (AD1)	I	REMCON	: Remote control input	L	Volage output with key input				
59	P80 (AD0)	I	BATTERY	: Battery voltage check input	L	Voltage output with battery det.				
60	VREFL	—		: GND terminal	GND					
61	AVSS	—		: GND terminal	GND					
62	VSS			: GND terminal	GND					
63	P37 (SD7)	I	VIRGIN	: Virgin det. terminal	L	L	L	L	* (DCC)	"H" with virgin det.
64	P36 (SD6)	I	RSTSEL	: Reset start select input	H	H	H	H	H	
65	P35 (SD5)	I	LOCK	: Not used	L	L	L	L	L	
66	P34 (SD4)	I	RVS	: Mechanism mode (RVS) det. SW input		STOP		A side Play	B side Play	
						H		H	L	
67	P33 (SD3)	I	FWD	: Mechanism mode (FWD) det. SW input		H		L	H	
68	P32 (SD2)	I	SILENCE	: Schedule of analog music det. signal	L	L	"H" with play signal			ACC only
69	P31 (SD1)	I	OPENDET	: Cassette lid open/close det. input	H	"H" with cassette lid close				
70	P30 (SD0)	I	DLBIN	: Dolby NR det. terminal	L	"H" with dolby in				ACC only
71	P67	O	SYNCDAI	: DAI mode setting timing output	L	Pulse output				DCC only
72	P93 (KEY3)	I	LABEL	: Label input	L	L	L	L	* (DDC)	*: "H" with label det.
73	P92 (KEY2)	O	USYNCI	: U bit output with DAI	L	H	H	H	H	DCC only
74	P91 (KEY1)	I	TAPEIN	: Wake-up and tape det. terminal	"H" with no tape					
75	P90 (KEYO)	I	IRQU	: Buffer werflow det. input of DAI	L	H	H	H	H	DCC only
76	P66	*	Not used							
77	P65	*								
78	P64	*								
79	P63 (TPS DLB)	O	DLBOUT	: Dolby ON/OFF select with TPS	L	Dolby in: "H"				ACC only
80	P62	O	DSOL	: Mode select solenoid suction output	L	"H" with planger suction				
81	P61	O	D/nACC	: Digital/analog select output	L	"L" with ACC, "H" with DCC				
82	P60	O	LEDON/OFF	: LED ON/OFF control output	L	H	L	"H" or "L" signal		
83	P57	O	LINEMUTE	: Line out mute output	L	H	L	H	H	
84	P56	*	Not used							

• IC502 (SAA2032GP): DEQ

Pin No.	Mark	I/O Division	Function
1	DIGEYE	O	Serial data output for eye pattern
2	RDSYMC	O	SYNC data for Read Amplifier (push-pull output)
3	RDCLK	O	Data Clock for Read Amplifier (push-pull output)
4	TESTI	—	Connect to V_{SS}
5	PBDAT	I	Analog time multiplexed input from Read Amplifier
6	REFL	I	Lower reference voltage (+1V) for ADC
7	REFH	I	Upper reference voltage (+3.1V) for ADC
8	VSSA	—	Analog substrate (0V)
9	BIASAD	—	Bias current for A-D converter (sinks current from VDD via 12kΩ)
10	VSS (AD)	—	Supply ground (0V) for ADC
11	VDD (AD)	I	Positive supply (+5V) for ADC
12	VDD	I	Positive supply (+5V)
13	VSS	—	Supply ground (0V)
14	VSS (DA)	—	Supply ground (0V)
15	ANEYE	O	Analog eye voltage output
16	BIASD	—	Do not connect
17	VSS	—	Supply ground (0V)
18	TSTI	—	Do not connect
19	TSTI	—	Do not connect
20	TSTI	—	Do not connect
21	TSTI	—	Do not connect
22	TCH0	O	Channel 0 output for SAA2022 (DCC Drive Signal Processing) (push-pull output)
23	TCH1	O	Channel 1 output for SAA2022 (push-pull output)
24	TCH2	O	Channel 2 output for SAA2022 (push-pull output)
25	TCH3	O	Channel 3 output for SAA2022 (push-pull output)
26	TCH4	O	Channel 4 output for SAA2022 (push-pull output)
27	TCH5	O	Channel 5 output for SAA2022 (push-pull output)
28	TCH6	O	Channel 6 output for SAA2022 (push-pull output)
29	TCH7	O	Channel 7 output for SAA2022 (push-pull output)
30	TCHAUX	O	Aux channel output for SAA2022 (push-pull output)
31	LTDATA	I/O	Microcontroller I/O data interface (3 state push-pull output and input: CMOS levels)
32	LTEMDEQ	I	Microcontroller interface enabling (CMOS input levels)
33	LTCNT1	I	Microcontroller interface; mode control 1 (CMOS input levels)
34	LTCNT0	I	Microcontroller interface; mode control 0 (CMOS input levels)
35	LTCLK	I	Microcontroller bit-clock interface (CMOS input levels)
36	VIRGIN	O	Search mode virgin detection output
37	LABEL	O	Search mode label detection output
38	ENV	O	Search mode auxiliary detection output
39	VSS	—	Supply ground (0V)
40	SH0	I	Test input connected to VSS
41	SH1	I	Test input connected to VSS
42	TST1	I	Test input to be connected to VSS
43	CLK24	I	Clock input; typical frequency 24.576MHz (CMOS input)
44	STAOEYE	O	Synchronization output for DIGEYE

• IC504 (MN425610AT1): DRAM

Pin No.	Mark	I/O Division	Function
1	DQ1	I/O	Data input/output terminal
2	DQ2	I/O	Data input/output terminal
3	$\overline{WE}$	I	Write enable input
4	$\overline{RAS}$	I	Low address strobe terminal
5	NC	—	Not connection
6 ∫ 9	A0 ∫ A3	I	Address input terminal
10	VCC	I	Power supply terminal
11 ∫ 15	A4 ∫ A8	I	Address input terminal
16	$\overline{OE}$	I	Ouptput enable input
17	$\overline{CAS}$	I	Column address strobe terminal
18	DQ3	I/O	Data input/output terminal
19	DQ4	I/O	Data input/output terminal
20	VSS	—	GND terminal

• IC503 (SAA2022GP): TFE

Pin No.	Mark	I/O Division	Function
1	LTREF	O	Timing reference terminal of microcomputer interface
2	LTDATA	I	Data input terminal of microcomputer interface
3	LTCNT1	I	Control input terminal of microcomputer interface
4	LTCNT0		
5	LTCLK	I	Bit clock input of microcomputer interface
6	LTEN	I	Enable terminal of microcomputer interface
7	VSS2	—	GND terminal
8	VDD2	—	Power supply terminal
9	NRAS	O	Low address strobe terminal of DRAM
10	NWE	O	Write enable terminal of DRAM
11 ∫ 14	D3 ∫ D0	I/O	Data input/output terminal of DRAM
15	NCAS	O	Column address strobe terminal of DRAM
16	NOE	O	Output enable terminal of DRAM
17 ∫ 25	A8 ∫ A0	O	Address terminal of DRAM
26	VSS3	—	GND terminal
27	VDD3	I	Power supply terminal
28	WCLOK	O	Clock output of write amp. transfer
29	WDATA	O	Serial data output of write amp.
30	SPEEDA	O	Capstan phase information output
31	SPDAF	O	Capstan frequency information output
32	PINO1	O	Output terminal of expander
33	TAUX	I	Aux channel input
34	TCH7	I	Main data channel (7) input
35	TCH6	I	Main data channel (6) input
36	TCH5	I	Main data channel (5) input

Pin No.	Mark	I/O Division	Function
37	TCH4	I	Main data channel (4) input
38	TCH3	I	Main data channel (3) input
39	TCH2	I	Main data channel (2) input
40	TCH1	I	Main data channel (1) input
41	TCH0	I	Main data channel (0) input
42	VSS1	—	GND terminal
43	VDD1	I	Power supply terminal
44	CLK24	I	Clock (f=24.576MHz) input
45	TEST0	—	Test terminal
46	TEST1	—	Test terminal
47	PWRDWN	I	Standby mode select termianl
48	RESET	I	Reset input terminal
49	PINI	I	Input terminal of expander
50	SPEEDB	O	Output terminal of expander
51	SPDBF	O	Output terminal of expander
52	AZCHK	O	Azimuth check (ch0, 7) terminal
53	ERCOSTAT	O	Not connection
54	PRCSTAT	O	Not connection
55	MCLK	O	Master clock (f=6.144MHz) output
56	SBMCLK	I	Sub-band I²S master clock input
57	SBEF	O	Sub-band I²S byte error output
58	VSS4	—	GND terminal
59	VDD4	I	Power supply terminal
60	SBWS	I/O	Sub-band I²S word select input/output terminal
61	SBCL	I/O	Sub-band I²S bit clock input/output terminal
62	SBDA	I/O	Sub-band I²S data input/output terminal
63	SBDIR	O	Sub-band I²S command output
64	URDA	O	Sub-band I²S needless data treatment terminal

• IC505 (SAA2002GP): SFC

Pin No.	Mark	I/O Division	Function
1	FS256	O	(Filtered)-I²S clock; 256 × sample frequency. 12mA, 3-state output + CMOS input with pull-down
2	MUTEDAC	O	DAC control/output expander
3	DEEMDAC	O	DAC control/output expander
4	ATTDAC	O	DAC control/ouptut expander
5	VSS	—	Supply ground (0V)
6	URDA	I	Unreliable drive processing data; CMOS level
7	SBDIR	I	Sub-band I²S direction (SWBS, SBCL); CMOS level
8	SBDA	I	Sub-band I²S data; 4mA, 3-state output + CMOS input with pull-down
9	SBCL	I	Sub-band I²S bit clock; 4mA, 3-state output + CMOS input with pull-down
10	SBWS	I	Sub-band I²S word select; 4mA, 3-state output + CMOS input with pull-down
11	SBEF	I	Sub-band I²S byte error flag; CMOS level
12	SBMCLK	O	Sub-band I²S clock, 6.144MHz locked to FS256; 8mA, 3-state output + CMOS input with pull-down
13	SYNCDAI	O	DAI synchronization pulse
14	FDIR	O	(Filtered)-I²S direction: (FDAC, FDAF, SDA);
15	FKESET	O	Reset signal for SAA2012
16	FSYNC	O	Filtered-I²S sync signal for SAA2012
17	FDAF	I/O	Filtered-I²S sub-band filter data; 4mA, 3-state output + CMOS input with pull-down
18	FDAC	I/O	Filtered-I²S sub-band codac data; 4mA, 3-state output + CMOS input with pull-down
19	SCL	I/O	I²S bit clock; 4mA, 3-state output + CMOS input with pull-down

Pin No.	Mark	I/O Division	Function
20	SWS	I/O	I²S-word select; 4mA, 3-state output + CMOS input with pull-dwon
21	SDA	I/O	I²S baseband data filter; 4mA, 3-state output + CMOS input with pull-down
22	PWRDWN	I	Power-down mode; CMOS level
23	DSC4	—	Test pin
24	DSC3	—	Test pin
25	DSC2	—	Test pin
26	DSC1	—	Test pin
27	DSC0	—	Test pin
28	VDD	I	Positive supply voltage (+5V)
29	RESET	I	System reset; CMOS level with pull-down and hysteresis
30	T1	—	Test pin; do not connect
31	T0	—	Test pin; do not connect
32	LTDATA	I/O	LT interface data; 4mA, 3-state output + CMOS input with pull-down
33	LTCLK	I	LT interface bit clock; CMOS level
34	LTENSFC	I	LT interface enable; CMOS level
35	LTCNT0	I	LT interface control; CMOS level
36	LTCNT1		
37	VSS	—	Supply ground (0V)
38	CLK22	O	22.5792MHz buffered output
39	CLK24	O	24.576MHz buffered output
40	X22IN	I	22.5792MHz crystal input
41	X22OUT	O	22.5792MHz crystal output
42	X24IN	I	24.576MHz crystal input
43	X24OUT	O	24.576MHz crystal output
44	VDD	I	Positive supply voltage (+5V)

• IC506 (M51581GP): DAI

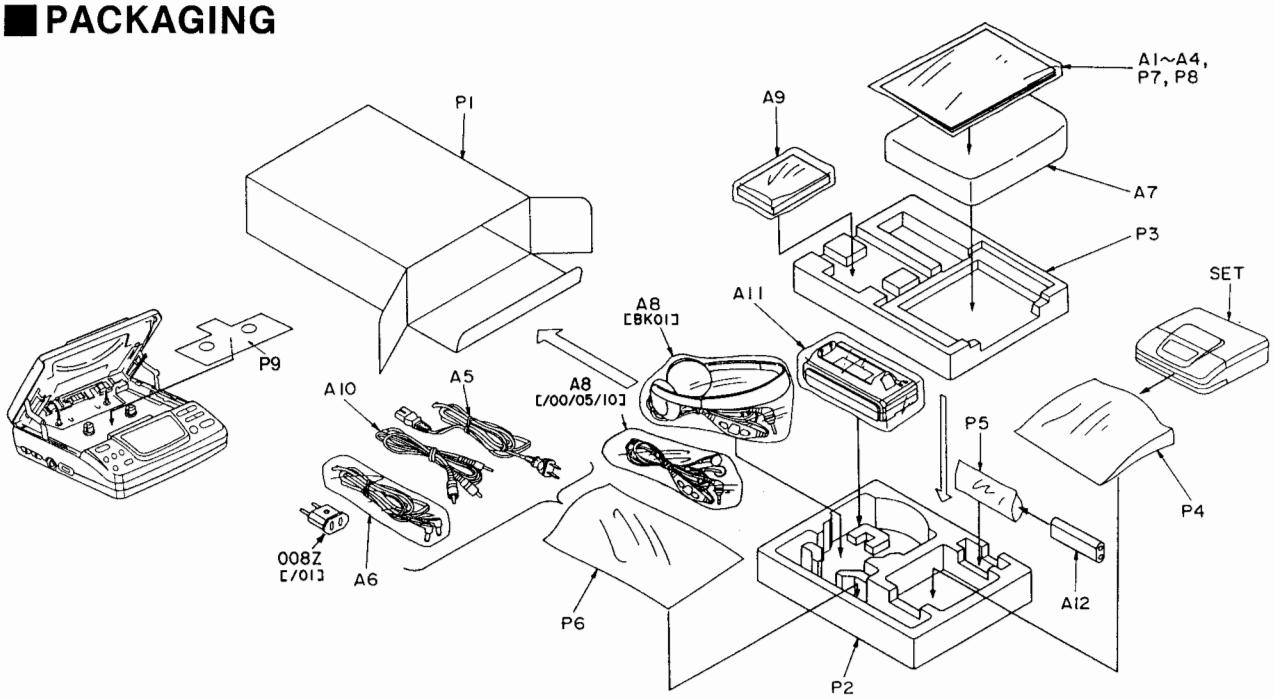
Pin No.	Mark	I/O Division	Function
1	TX	O	Digital audio interface format output
2	NRSTDAL	I	Rest terminal: "0" reset (Microcomputer mode: transmission mode, fs=48kHz, TX disable)
3	RX1	I	EIAJ format digital audio data input (1): coaxial cable
4	NFRX1	O	RX1 level converter output
5	RX2	I	EIAJ format digital audio data input (2): optical cable
6	SELRX	I	RX input select ("1": RX1, "0" RX2) Microcomputer mode: SELRX polarity select
7	PD1	O	Phase comparator output of charge pump VCO
8	PD2	O	
9	UNLOCK	O	Unlock det. output ("1": unlock)
10	RXCKI	I	VCO clock input (256fs)
11	RXCKO	O	VCO clock output ($\overline{\text{RXCKI}}$)
12	SDA (SDATA)	I	Serial audio data input terminal (Input exclusive except I²S format)
13	SCL (BCLK)	I/O	Audio data bit clock input/output terminal
14	SWS (LRCK)	I/O	Audio data word select input/ output terminal
15	SDADAT	I	Serial audio data output
16	SAODAT	I	AD converter serial audio input
17	VSS	—	GND terminal
18	ADSEL	I	Serial audio data source select terminal ["1": analog (AD converter), "0": digital (RX), microcomputer mode: ADSEL polarity slelect]
19	FLAGI	I	Error flag input
20	FLAGO	O	Error flag output
21	WCK	O	Word clock output (Received: 2fs)
22	ASL	I	Audio data sample length select terminal ("1": 24 bit, "0": I bit)
23	IIS	I	Audio data format select terminal ("1": I²S, "0": except I²S)
24	MSBF	I	MSB select terminal ("1": MSB first, "0": LSB first)

Pin No.	Mark	I/O Division	Function
25	LRCKPOL	I	LRCK polarity select terminal ("1": Lch→1, "0": Lch→0)
26	256FS	I/O	Moster clock input/output terminal
27	CKSEL	I	Master clock frequency select terminal ("0": 256fs, "1": 128fs)
28	REFCK	I	Reference clock input to check sampling frequency accuracy
29	CKACO	O	Checking terminal of sampling frequency accuracy
30	MUTE	I	Muting control terminal ("1": mute, microcomputer mode: muting control polarity select)
31	DAIM00	I	Mode select terminal
32	DAIM01	I	
33	LTENDAI	I	LT interface enable terminal ("1": enable)
34	LTCLK	I	LT interface data bit clock input
35	LTDATA	I	LT interface data input
36	LTCNT1	I	LT interface control terminal
37	LTCNT0	I	
38	VDD	I	Power supply terminal
39	VSS	—	GND terminal
40	SYNCDAI	I	Setting latch clock input
41	IRQU	O	U bit data information indicator output
42	USYNCI	I	U bit data unit indicator input (transmission)
43	USYNCO	O	U bit data unit indicator output (reception)
44	IRSTRT	O	U bit data message start indicator output

M00	M01	Mode
0	0	Microcomputer
0	1	Easy
1	0	Full transparent
1	1	Test

CNT1	CNT0	Mode
0	0	C bit data
0	1	U bit data
1	0	Setting
1	1	Status

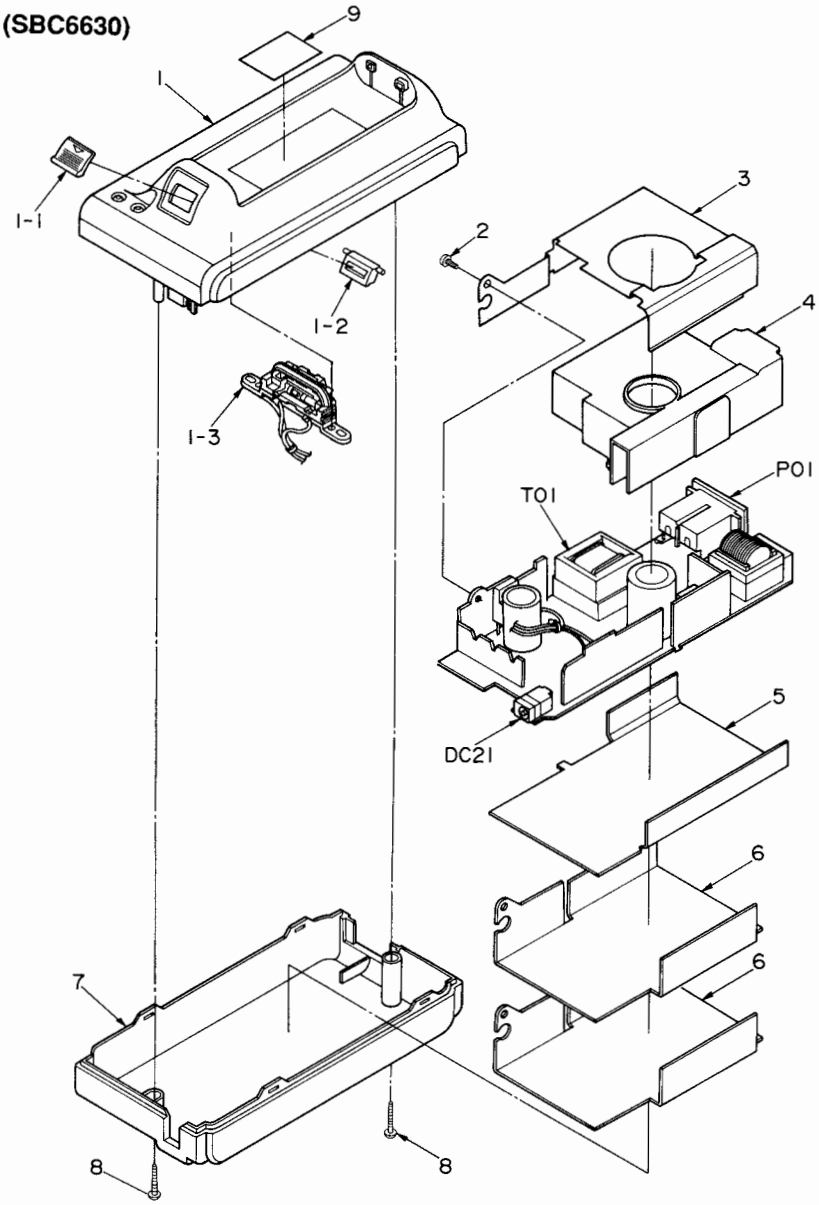
■ PACKAGING



REF. DESIG.	PART NO.	DESCRIPTION
		PACKING
A1	4822 736 21833	USER'S MANUAL [/00/01/05/10]
A1	4822 736 21832	USER'S MANUAL [BK01]
A5	4822 321 11016	AC CORD [/10]
A5	4822 321 11015	AC CORD [/00/01]
A5	4822 321 11014	AC CORD [/05]
A5	4822 321 11013	AC CORD [BK01]
A6	4822 321 11017	DC CORD
A7	4822 600 70731	CARRYING CASE
A8	4822 242 50079	HEAD PHONE, IN EAR [/00/01/05/10] SBC3311
A8	4822 242 50081	HEAD PHONE, BAND [BK01] SBC3327
A10	4822 321 62146	PIN PLUG, LINE CORD
A11	4822 272 10359	AC ADAPTOR [/10] SBC6630
A11	4822 272 10357	AC ADAPTOR [/05] SBC6630
A11	4822 272 10358	AC ADAPTOR [/00] SBC6630
A11	4822 272 10356	AC ADAPTOR [BK01] SBC6630
A12	4822 138 10537	BATTERY PACK, Ni-Cd DC4.8V 1300mA SBC6430
008Z	4822 267 31133	AC PLUG ADAPTOR [/01]

■ CABINET PARTS LOCATION

• **For AC adaptor (SBC6630)**

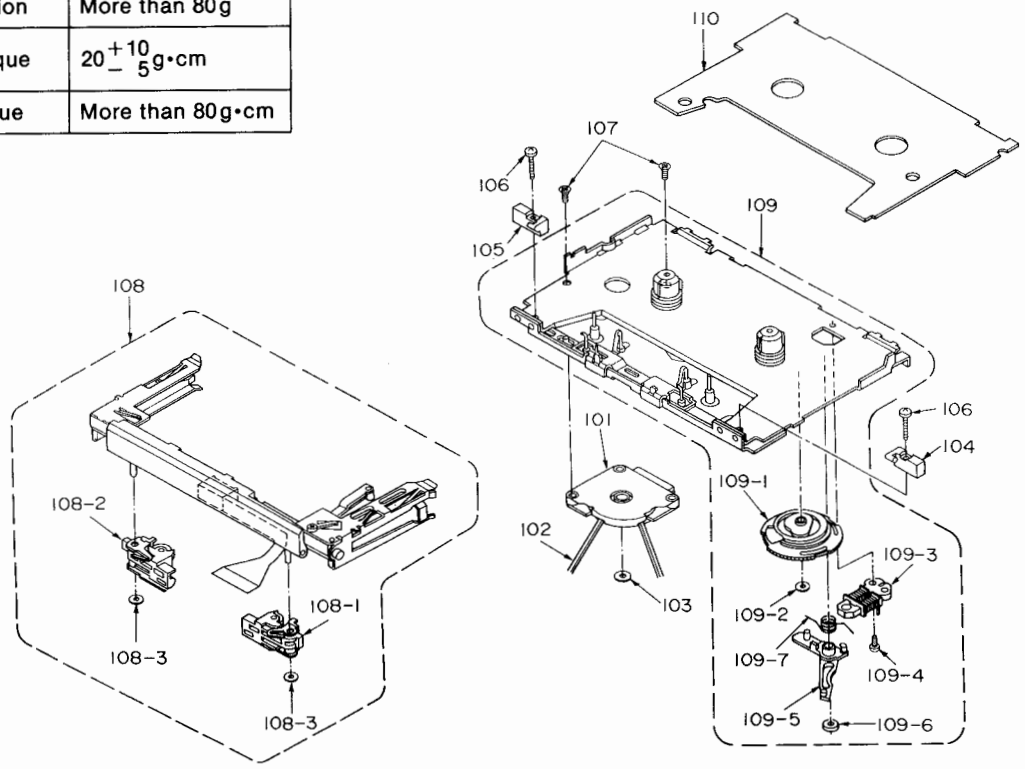


REF. DESIG.	PART NO.	DESCRIPTION
1		CASE, TOP
1-1		KNOB, LOCK
1-2		CONTROL BOARD, SLIDE PIECE
1-3		LOCK, BATTERY CATCHER
2		SCREW
3		SHIELD
4		INSULATOR
5		INSULATOR
6		SHIELD
7		CASE, BOTTOM
8		SCREW

■MECHANISM PARTS LOCATION

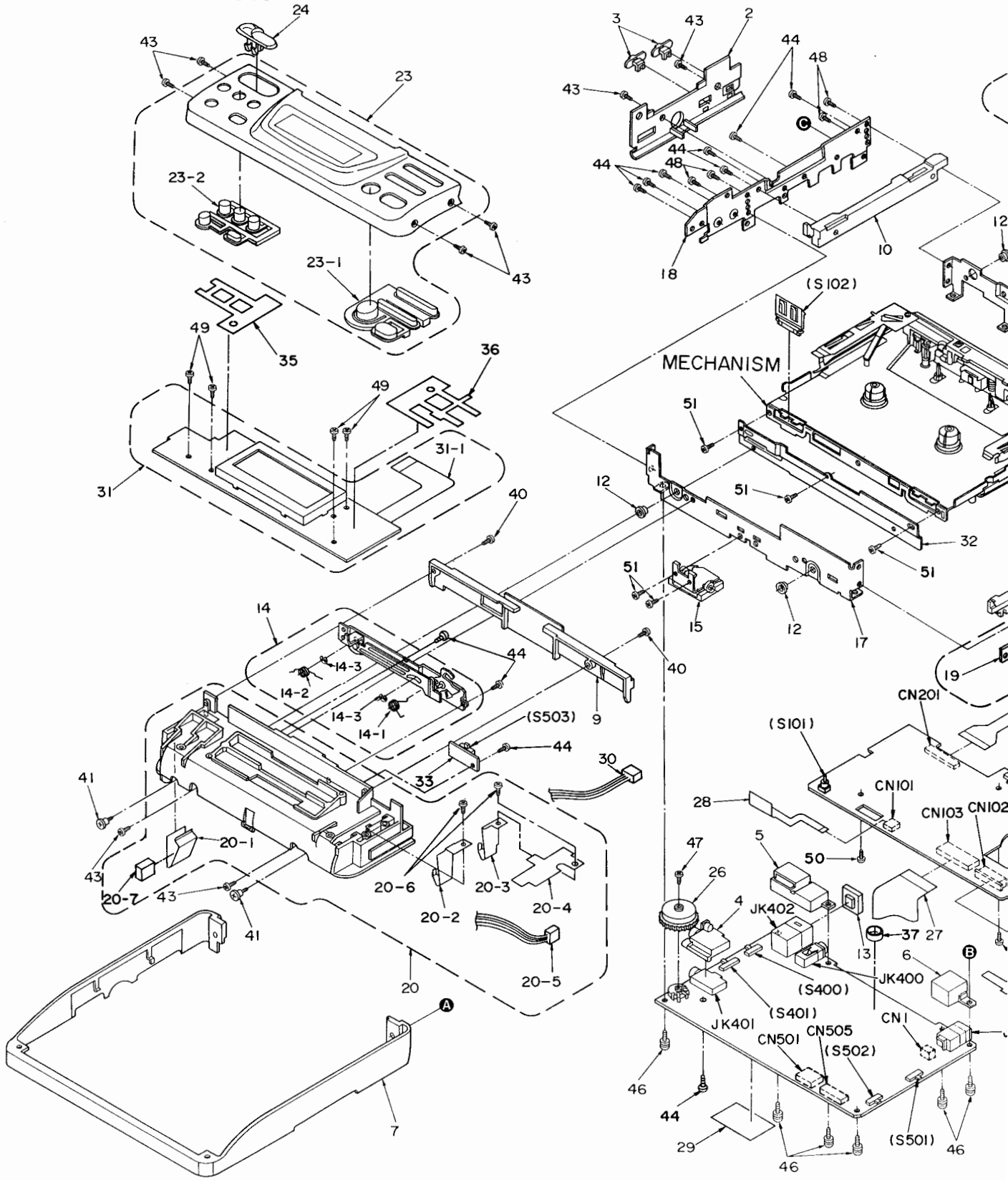
	FWD & REV mode
Wow and flutter	0.3% (WRMS) with ACC
Pressure of pinch roller	250±20g
Take-up tension	More than 80g
Playback torque	20^{+10}_{-5}g•cm
FF/REW torque	More than 80g•cm

The parts enclosed in the dotted boxes are supplied as a block assembly. Therefore, they are not supplied separately except parts indicated with Ref. No.



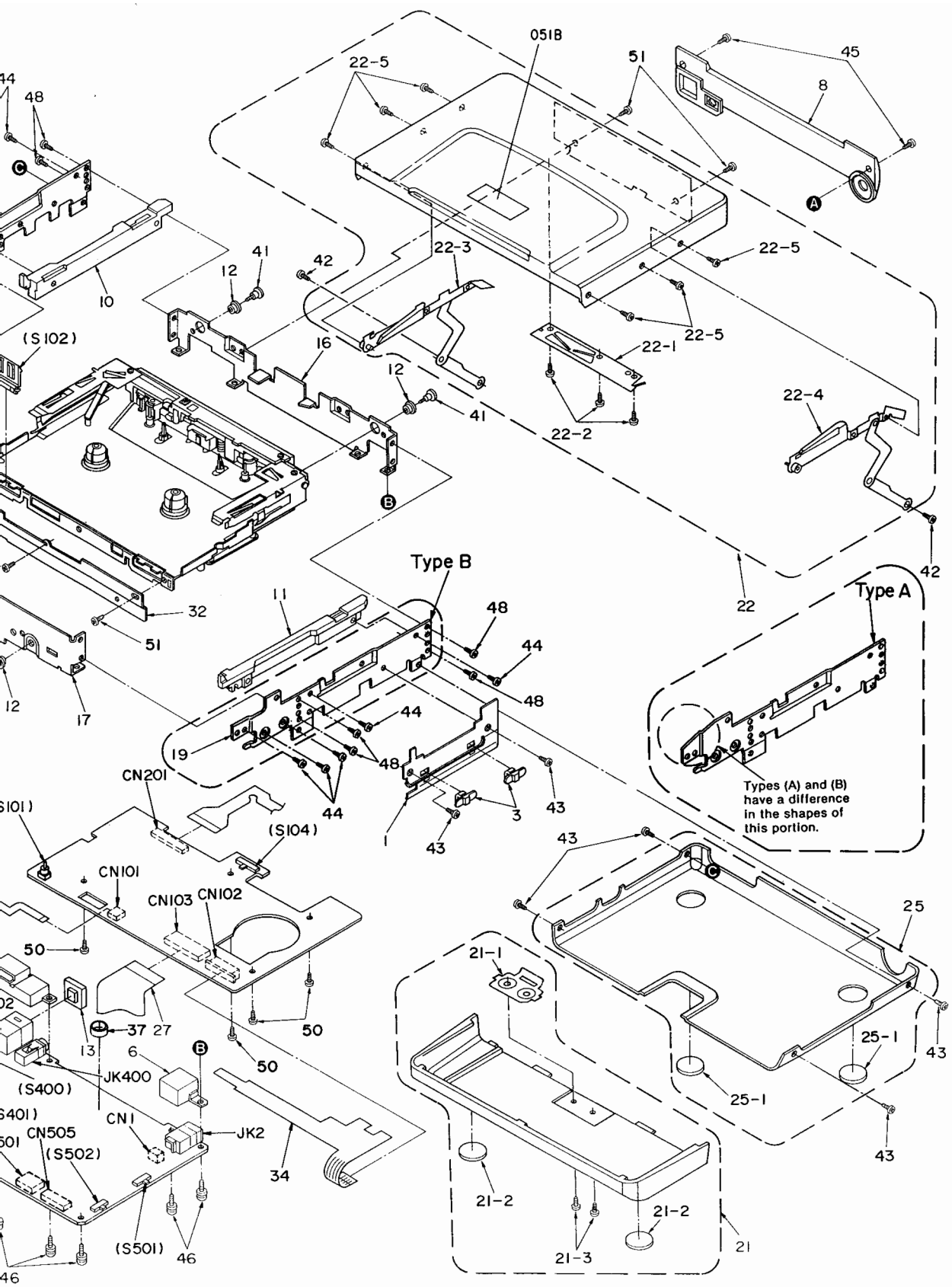
REF. DESIG.	PART NO.	DESCRIPTION
101	4822 361 21654	D.C.MOTOR HPX26NB5AT
102	4822 358 31272	BELT, CP
103		WASHER
104		SUPPORT, HOLD PIECE R
105		SUPPORT, HOLD PIECE L
106		SCREW
107		SCREW
108	4822 403 70978	MECHANISM, HEAD BLOCK UNIT
108-1	4822 528 70833	ROLLER, ARM R UNIT
108-2	4822 528 70834	ROLLER, ARM L UNIT
108-3		WASHER, NYLON
109	4822 464 50984	CHASSIS, BLOCK UNIT
109-1		GEAR, CAM
109-2		WASHER
109-3	4822 281 50183	SOLENOID COIL
109-4		SCREW
109-5		LEVER, TRIGGER
109-6		WASHER
109-7		SPRING
110		ESCUTCHEON, MECHA

■ CABINET PARTS LOCATION



There are two types of mechanism chassis (R), namely Type A and Type B. These two types are not interchangeable with each other. For replacement, take the following procedure:

■ When replacing the front cabinet ass'y, n
the mechanism chassis (R). (See illustrati
- If the mechanism chassis (R) is type A, tl
which is encased with the front cabinet
to be replaced together.
- If the mechanism chassis (R) is type E
(R) encased with the front cabinet ass'
be replaced. Disuse it.



g the front cabinet ass'y, make sure of the shape of
chassis (R). (See illustration.)
ism chassis (R) is type A, the mechanism chassis (R),
ased with the front cabinet ass'y , has
d together.
nism chassis (R) is type B, the mechanism chassis
with the front cabinet ass'y need not
Disuse it.

■ When replacing the mechanism chassis (R).
- The front cabinet ass'y need not be replaced.
- Replace the mechanism chassis (R) only.

REF. DESIG.	PART NO.	DESCRIPTION
1	4822 454 21093	ESCUTCHEON, SWITCH
2	4822 454 21094	ESCUTCHEON, JACK
3	4822 411 61938	KNOB, SLIDE
4	4822 256 92092	HOLDER, HP JACK
5	4822 256 92091	HOLDER, OPT JACK
6		HOLDER, DC IN JACK
7	4822 464 50985	FRAME, CENTER CABINET
8	4822 464 50979	FRAME, INNER CABINET A
9	4822 443 64007	COVER, LOCK
10		INNER HOLDER (L)
11		INNER HOLDER (R)
12		DAMPER
13		CAP, OPT CONNECTOR
14	4822 466 83029	LOCK, PLATE UNIT
14-1		SPRING, LOCK
14-2		SPRING, RETURN
14-3		WASHER
15		LOCK, BATTERY
16	4822 464 50975	CHASSIS, INNER A REAR
17	4822 464 50978	CHASSIS, FRONT
18	4822 464 50976	CHASSIS, INNER B L
19	4822 464 50977	CHASSIS, INNER C R
20	4822 443 64008	CASE, BATTERY
20-1		LEAF SPRING
20-2		CONTACTOR (+)
20-3		CONTACTOR (–)
20-4		SHEET
20-5		CONNECTIVE CORD
20-6		SCREW
21	4822 443 64027	LID, BATTERY
21-1		LOCK, PIECE
21-2		LEG
21-3		SCREW
22	4822 443 41287	CASE, TOP
22-1	4822 492 71395	LEAF SPRING, CASSETTE
22-2		SCREW
22-3		LINK, ANGLE (A) L
22-4		LINK, ANGLE (B) R
22-5		SCREW
23	4822 443 64032	CASE, FRONT
23-1	4822 410 62774	BUTTON, OPERATING A PLAY ETC
23-2	4822 410 62775	BUTTON, OPERATING B
24	4822 413 31767	KNOB, OPEN
25	4822 443 51247	CASE, BOTTOM [/10]
	4822 443 51246	CASE, BOTTOM [/01]
	4822 443 51245	CASE, BOTTOM [/00]
	4822 443 51244	CASE, BOTTOM [/05]
	4822 443 51243	CASE, BOTTOM [BK01]
25-1	4822 462 42047	LEG
26		KNOB, VR
27		FLEXIBLE P.W.B.
28		FLEXIBLE P.W.B.
29		INSULATOR
30		CONNECTIVE CORD 3P
31	4822 130 91268	LCD KIT
31-1		FLEXIBLE P.W.B.
32	4822 403 70974	BRACKET, MECHA
34		FLEXIBLE P.W.B.
40		SCREW
41		SCREW
42		SCREW
43		SCREW
44		SCREW
45		SCREW
46		SCREW
47		SCREW
48		SCREW
49		SCREW
051B	4822 459 11151	BADGE, DCC

REF. DESIG.	PART NO.	DESCRIPTION
S102	4822 276 13446	PUSH SWITCH
S503	4822 277 21713	SLIDE SWITCH

■ ELECTRICAL PARTS LIST

REF. DESIG.	PART NO.	DESCRIPTION
		P101-RF/SERVO CIRCUIT BOARD
	⊣⊢	**P101-CAPACITORS(ALL CHIP)**
C101 ~ C103	4822 126 12844	CERAMIC 0.056μF ± 10%
C104 ~ C106	4822 126 12061	CERAMIC 0.1μF ± 10%
C107	4822 126 12838	CERAMIC 0.1μF +80%-20%
C108	4822 124 10772	TANTALUM 100μF 6V
C109	4822 126 12843	CERAMIC 0.082μF ± 10%
C110	4822 126 12061	CERAMIC 0.1μF ± 10%
C111	4822 126 12845	CERAMIC 820PF ± 10%
C112	4822 126 11668	CERAMIC 220PF ± 5%
C113	4822 126 12061	CERAMIC 0.1μF ± 10%
C114	4822 126 12841	CERAMIC 0.027μF ± 10%
C115	4822 124 11383	TANTALUM 10μF 6.3V
C116	4822 126 11681	CERAMIC 1000PF ± 10%
C117	4822 126 12841	CERAMIC 0.027μF ± 10%
C118	4822 126 11681	CERAMIC 1000PF ± 10%
C119	4822 122 32922	CERAMIC 1500PF ± 10%
C120	4822 126 12839	CERAMIC 0.022μF ± 10%
C121	4822 126 11678	CERAMIC 1μF +80%-20%
C122	4822 126 12839	CERAMIC 0.022μF ± 10%
C123	4822 126 11687	CERAMIC 0.1μF +80%-20%
C127	4822 126 12838	CERAMIC 0.1μF +80%-20%
C128	4822 124 11383	TANTALUM 10μF 6.3V
C129	4822 126 11687	CERAMIC 0.1μF +80%-20%
C130	4822 124 11384	TANTALUM 10μF 10V
C131	4822 126 12838	CERAMIC 0.1μF +80%-20%
C132	4822 124 11392	TANTALUM 33μF 6.3V
C133	4822 126 12844	CERAMIC 0.056μF ± 10%
C134	4822 124 11392	TANTALUM 33μF 6.3V
C135	4822 126 12838	CERAMIC 0.1μF +80%-20%
C136	4822 126 12838	CERAMIC 0.1μF +80%-20%
C137	4822 124 11405	TANTALUM 15μF 6.3V
C139	4822 124 11383	TANTALUM 10μF 6.3V
C171 ~ C174	4822 126 12842	CERAMIC 0.33μF +80%-20%
C175	4822 126 12836	CERAMIC 1μF ± 10%
C176	4822 126 12836	CERAMIC 1μF ± 10%
C177	4822 126 12076	CERAMIC 0.047μF ± 10%
C178	4822 126 11687	CERAMIC 0.1μF +80%-20%
C201 ~ C218	4822 126 11565	CERAMIC 0.01μF ± 10%
C219 ~ C238	4822 124 11382	TANTALUM 1μF 16V
C239 ~ C242	4822 124 11383	TANTALUM 10μF 6.3V
C243	4822 126 11687	CERAMIC 0.1μF +80%-20%
C244	4822 126 11687	CERAMIC 0.1μF +80%-20%
C245	4822 124 11389	TANTALUM 2.2μF 16V
C246	4822 124 11389	TANTALUM 2.2μF 16V
C247	4822 124 11382	TANTALUM 1μF 16V
C248	4822 124 11382	TANTALUM 1μF 16V
C251 ~ C254	4822 124 11395	TANTALUM 6.8μF 16V
C255 ~ C258	4822 126 12061	CERAMIC 0.1μF ± 10%
C260	4822 124 11384	TANTALUM 10μF 10V
C261	4822 124 11395	TANTALUM 6.8μF 16V
C263	4822 124 11389	TANTALUM 2.2μF 16V
C264	4822 124 11389	TANTALUM 2.2μF 16V
C267	4822 124 11382	TANTALUM 1μF 16V
C269	4822 124 11389	TANTALUM 2.2μF 16V
C271 ~ C274	4822 124 11386	TANTALUM 1.5μF 16V
C275 ~ C278	4822 126 12501	CERAMIC 1800PF ± 10%
C279	4822 124 11384	TANTALUM 10μF 10V
C280	4822 124 11384	TANTALUM 10μF 10V
C281 ~ C286	4822 126 11678	CERAMIC 1μF +80%-20%
C287 ~ C290	4822 124 11393	TANTALUM0.47μF 25V
C291 ~ C294	4822 126 12847	CERAMIC 2700PF ± 10%
C295	4822 124 11389	TANTALUM 2.2μF 16V
C296	4822 124 11389	TANTALUM 2.2μF 16V
C297	4822 126 12848	CERAMIC 0.033μF ± 10%
C298	4822 126 12848	CERAMIC 0.033μF ± 10%
	⊣□⊢	**P101-RESISTORS (ALL CHIP)**
R101	4822 051 30103	10KΩ ± 5% 1/16W
R102	4822 051 30103	10KΩ ± 5% 1/16W
R103	4822 051 30473	47KΩ ± 5% 1/16W
R104	4822 051 30103	10KΩ ± 5% 1/16W
R105	4822 051 30103	10KΩ ± 5% 1/16W
R106	4822 051 30159	15Ω ± 5% 1/16W
R107	4822 051 30222	2.2KΩ ± 5% 1/16W
R108	4822 051 30222	2.2KΩ ± 5% 1/16W
R109	4822 116 83216	56KΩ ± 5% 1/16W
R110	4822 051 30224	220KΩ ± 5% 1/16W
R111	4822 051 30683	68KΩ ± 5% 1/16W
R112	4822 051 30394	390KΩ ± 2% 1/16W
R113	4822 051 30104	100KΩ ± 5% 1/16W
R114	4822 051 30104	100KΩ ± 5% 1/16W
R115	4822 051 30104	100KΩ ± 5% 1/16W
R116	4822 051 30473	47KΩ ± 5% 1/16W
R117	4822 051 30473	47KΩ ± 5% 1/16W
R118	4822 051 30152	1.5KΩ ± 5% 1/16W
R119	4822 117 10472	0.33Ω ± 5% 1/2W
R121	4822 051 30333	33KΩ ± 5% 1/16W
R122	4822 116 83206	120Ω ± 5% 1/16W
R123	4822 051 30153	15KΩ ± 5% 1/16W
R124	4822 051 30153	15KΩ ± 5% 1/16W
R125	4822 051 30561	560Ω ± 5% 1/16W
R126	4822 051 30102	1KΩ ± 5% 1/16W
R127	4822 051 30473	47KΩ ± 5% 1/16W
R128	4822 051 30473	47KΩ ± 5% 1/16W
R129	4822 051 30223	22KΩ ± 5% 1/16W
R130	4822 051 30223	22KΩ ± 5% 1/16W
R131	4822 051 30684	680KΩ ± 5% 1/16W
R132	4822 051 30684	680KΩ ± 5% 1/16W
R133	4822 051 30682	6.8KΩ ± 5% 1/16W
R134	4822 051 30682	6.8KΩ ± 5% 1/16W
R135	4822 051 30223	22KΩ ± 5% 1/16W
R136	4822 051 30153	15KΩ ± 5% 1/16W
R137	4822 117 10459	15KΩ ± 0.5% 1/16W
R138	4822 051 30102	1KΩ ± 5% 1/16W
R139	4822 051 30102	1KΩ ± 5% 1/16W
R140	4822 051 30473	47KΩ ± 5% 1/16W
R141	4822 111 92162	COMPO. 47KΩ x 2 ± 5% 1/32W
R143	4822 111 92162	COMPO. 47KΩ x 2 ± 5% 1/32W
R145	4822 051 30473	47KΩ ± 5% 1/16W
R146	4822 111 92162	COMPO. 47KΩ x 2 ± 5% 1/32W
R148	4822 111 92162	COMPO. 47KΩ x 2 ± 5% 1/32W
R150	4822 051 30101	100Ω ± 5% 1/16W

REF. DESIG.	PART NO.	DESCRIPTION
R151	4822 051 30223	22KΩ ± 5% 1/16W
R152	4822 051 30104	100KΩ ± 5% 1/16W
R153 ≀ R155	4822 051 30103	10KΩ ± 5% 1/16W
R156	4822 111 92159	COMPO. 10KΩ x 2 ± 5% 1/32W
R158	4822 051 30473	47KΩ ± 5% 1/16W
R159	4822 051 30102	1KΩ ± 5% 1/16W
R160	4822 051 30102	1KΩ ± 5% 1/16W
R171 ≀ R174	4822 051 30332	3.3KΩ ± 5% 1/16W
R175	4822 051 30334	330KΩ ± 5% 1/16W
R176	4822 051 30334	330KΩ ± 5% 1/16W
R177	4822 051 30223	22KΩ ± 5% 1/16W
R178	4822 051 30223	22KΩ ± 5% 1/16W
R179	4822 051 30334	330KΩ ± 5% 1/16W
R180	4822 051 30473	47KΩ ± 5% 1/16W
R190 ≀ R193	4822 051 30102	1KΩ ± 5% 1/16W
R194	4822 111 92158	COMPO. 1KΩ x 2 ± 5% 1/32W
R199	4822 051 30102	1KΩ ± 5% 1/16W
R201	4822 051 30102	1KΩ ± 5% 1/16W
R202	4822 051 30102	1KΩ ± 5% 1/16W
R203	4822 051 30184	180KΩ ± 5% 1/16W
R204	4822 051 30184	180KΩ ± 5% 1/16W
R205 ≀ R208	4822 117 10478	1.6KΩ ± 5% 1/16W
R209	4822 051 30101	100Ω ± 5% 1/16W
R210	4822 051 30101	100Ω ± 5% 1/16W
R211 ≀ R216	4822 117 10469	68Ω ± 0.5% 1/16W
R217 ≀ R220	4822 051 30103	10KΩ ± 5% 1/16W
R221 ≀ R228	4822 051 30109	10Ω ± 5% 1/16W
R231	4822 051 30479	47Ω ± 5% 1/16W
R232	4822 051 30479	47Ω ± 5% 1/16W
R241 ≀ R244	4822 117 10465	27KΩ ± 0.5% 1/16W
R245 ≀ R248	4822 117 10456	1KΩ ± 0.5% 1/16W
R249 ≀ R252	4822 117 10457	10KΩ ±0.5% 1/16W
R253 ≀ R256	4822 116 83222	82KΩ ± 5% 1/16W
R257 ≀ R260	4822 051 30472	4.7KΩ ± 5% 1/16W
R261 ≀ R264	4822 051 30473	47KΩ ± 5% 1/16W
R265	4822 051 30104	100KΩ ± 5% 1/16W
R267	4822 051 30104	100KΩ ± 5% 1/16W
R269	4822 051 30474	470KΩ ± 5% 1/16W
R271	4822 051 30474	470KΩ ± 5% 1/16W
R277 ≀ R280	4822 117 10462	2.2KΩ ± 0.5% 1/16W

REF. DESIG.	PART NO.	DESCRIPTION
R281 ≀ R284	4822 117 10466	3.3KΩ ± 0.5% 1/16W
R285	4822 051 30103	10KΩ ± 5% 1/16W
R286	4822 051 30103	10KΩ ± 5% 1/16W
R289 ≀ R292	4822 117 10457	10KΩ ± 0.5% 1/16W
R293	4822 117 10464	2.7KΩ ± 0.5% 1/16W
R294	4822 117 10464	2.7KΩ ± 0.5% 1/16W
R295	4822 117 10462	2.2KΩ ± 0.5% 1/16W
R296	4822 117 10462	2.2KΩ ± 0.5% 1/16W
VR101	4822 100 12058	68KΩ (B) ± 25% 0.15W TRIMM.
VR102	4822 100 12058	68KΩ (B) ± 25% 0.15W TRIMM.
VR203 ≀ VR210	4822 100 12057	4.7KΩ (B) ± 25% 0.15W TRIMM.
VR211 ≀ VR214	4822 100 12054	10KΩ (B) ± 25% 0.15W TRIMM.
VR219 ≀ VR222	4822 100 12056	22KΩ (B) ± 25% 0.15W TRIMM.
		P101-SEMICONDUCTORS
D101	4822 130 83444	DIODE MA143TW
D102	4822 130 83446	DIODE MA142WKTW
D103	4822 130 83446	DIODE MA142WKTW
D104	4822 130 83452	DIODE MA732TW
D171	4822 130 83444	DIODE MA143TW
D172	4822 130 83444	DIODE MA143TW
IC101	4822 209 32621	IC, MOTOR CONTROL,NBC5800
IC102	4822 209 32614	MICROPROCESSOR, SERVO μ-COM MNE201ARTAB
IC104	4822 209 32596	IC AN1393SNSCE1
IC171	4822 209 32607	IC NJM2115MT1
IC201	4822 209 32618	IC, READ TDA1318H
IC202	4822 209 32618	IC, READ TDA1318H
IC203 ≀ IC206	4822 209 32611	IC TK11447MTR
Q101 ≀ Q103	4822 130 63403	TRANSISTOR 2SB956STW
Q104	4822 130 63394	DIGITAL TRANSISTOR, UN521MTW
Q105	4822 130 63399	PHOTO UNIT, GP2S27T6
Q106	4822 130 63399	PHOTO UNIT, GP2S27T6
Q107	4822 130 63401	TRANSISTOR 2SA1748QTW
Q108	4822 130 63401	TRANSISTOR 2SA1748QTW
Q109	4822 130 63395	DEGITAL TRANSISTOR, UN5211TW
Q211 ≀ Q215	4822 130 63404	TRANSISTOR 2SB1218ASTW
Q217	4822 130 63404	TRANSISTOR 2SB1218ASTW
Q219	4822 130 63395	DIGITAL TRANSISTOR, UN5211TW
Q220	4822 130 63395	DIGITAL TRANSISTOR, UN5211TW
Q221	4822 130 63405	TRANSISTOR 2SC4081RTW
Q222	4822 130 63405	TRANSISTOR 2SC4081RTW
		P101-COIL
L101	4822 157 70767	CHOKE COIL, 33μF ± 10%
		P101-MISCELLANEOUS
CN101	4822 265 31119	JACK, TO FPC
CN102	4822 265 31121	JACK, TO FPC
CN103	4822 265 31117	JACK, TO FPC
CN201	4822 265 31118	JACK, TO FPC
S101	4822 276 13438	PUSH SWITCH, ACC/DCC
S104	4822 277 21707	SLIDE SWITCH
X101	4822 242 81551	CERAMIC VIBRATOR. 8.00MHZ

REF. DESIG.	PART NO.	DESCRIPTION
		P401-DIGITAL CIRCUIT BOARD
	⊣⊢	**P401-CAPACITORS**
C1	4822 124 10772	TANTALUM 100µF 6V
C2	4822 126 12076	CERAMIC0.047µF ± 10%
C3	4822 124 11226	TANTALUM 22µF 6V
C4	4822 126 12837	CERAMIC 6.8µF +80%-20%
C5	4822 124 41842	TANTALUM 47µF 16V
C6	4822 124 11394	TANTALUM 4.7µF 10V
C7	4822 126 12061	CERAMIC 0.1µF ± 10%
C8	4822 126 11565	CERAMIC 0.01µF ± 10%
C9	4822 122 33753	CERAMIC 150PF ± 5%
C10	4822 126 12837	CERAMIC 6.8µF +80%-20%
C11	4822 126 12838	CERAMIC 0.1µF +80%-20%
C12	4822 122 33753	CERAMIC 150PF ± 5%
C13	4822 126 12838	CERAMIC 0.1µF +80%-20%
C14	4822 126 12838	CERAMIC 0.1µF +80%-20%
C16	4822 124 10772	TANTALUM 100µF 6V
C17	4822 124 11382	TANTALUM 1µF 16V
C18	4822 124 11382	TANTALUM 1µF 16V
C19	4822 124 11389	TANTALUM 2.2µF 16V
C20	4822 124 11389	TANTALUM 2.2µF 16V
C21 ≀ C23	4822 124 11394	TANTALUM 4.7µF 10V
C24	4822 126 12838	CERAMIC 0.1µF +80%-20%
C25	4822 126 12838	CERAMIC 0.1µF +80%-20%
C51	4822 126 11565	CERAMIC 0.01µF ± 10%
C54	4822 126 12838	CERAMIC 0.1µF +80%-20%
C55	4822 123 30388	MICA 100PF ± 5%
C56	4822 123 30388	MICA 100PF ± 5%
C301 ≀ C304	4822 124 11394	TANTALUM 4.7µF 10V
C305	4822 123 30389	MICA 1800PF ± 5%
C306	4822 123 30389	MICA 1800PF ± 5%
C307	4822 123 30388	MICA 100PF ± 5%
C308	4822 123 30388	MICA 100PF ± 5%
C309	4822 126 11566	CERAMIC 2200PF ± 10%
C310	4822 126 11566	CERAMIC 2200PF ± 10%
C311	4822 124 11394	TANTALUM 4.7µF 10V
C312	4822 124 11394	TANTALUM 4.7µF 10V
C313	4822 126 11702	CERAMIC 680PF ± 10%
C314	4822 126 11702	CERAMIC 680PF ± 10%
C315	4822 126 12848	CERAMIC 0.033µF ± 10%
C316	4822 126 12848	CERAMIC 0.033µF ± 10%
C317	4822 126 11685	CERAMIC 4700PF ± 10%
C318	4822 126 11685	CERAMIC 4700PF ± 10%
C319	4822 126 11565	CERAMIC 0.01µF ± 10%
C320	4822 126 11565	CERAMIC 0.01µF ± 10%
C321	4822 126 12848	CERAMIC 0.033µF ± 10%
C322	4822 126 12848	CERAMIC 0.033µF ± 10%
C323	4822 126 12061	CERAMIC 0.1µF ± 10%
C324	4822 126 12061	CERAMIC 0.1µF ± 10%
C325 ≀ C328	4822 124 11394	TANTALUM 4.7µF 10V
C333	4822 126 11681	CERAMIC 1000PF ± 10%
C334	4822 126 11681	CERAMIC 1000PF ± 10%
C335	4822 126 12846	CERAMIC 0.012µF ± 10%
C336	4822 126 12846	CERAMIC 0.012µF ± 10%
C337	4822 124 11383	TANTALUM 10µF 6.3V
C338	4822 124 11383	TANTALUM 10µF 6.3V
C339	4822 124 11396	TANTALUM 220µF 4V
C340	4822 124 11396	TANTALUM 220µF 4V
C341	4822 124 11389	TANTALUM 2.2µF 16V
C342	4822 123 11389	TANTALUM 2.2µF 16V
C343	4822 126 11685	CERAMIC 4700PF ± 10%
C344	4822 126 11685	CERAMIC 4700PF ± 10%
C345	4822 124 11394	TANTALUM 4.7µF 10V

REF. DESIG.	PART NO.	DESCRIPTION
C346	4822 124 11394	TANTALUM 4.7µF 10V
C347 ≀ C352	4822 124 11389	TANTALUM 2.2µF 16V
C353	4822 124 11382	TANTALUM 1µF 16V
C354	4822 124 11382	TANTALUM 1µF 16V
C363	4822 124 10772	TANTALUM 100µF 6V
C373	4822 124 11383	TANTALUM 10µF 6.3V
C374	4822 124 11383	TANTALUM 10µF 6.3V
C401	4822 126 12838	CERAMIC 0.1µF +80%-20%
C402	4822 124 11394	TANTALUM 4.7µF 10V
C403	4822 124 11388	TANTALUM 15µF 6.3V
C410	4822 124 11394	TANTALUM 4.7µF 10V
C412	4822 124 11387	TANTALUM 15µF 4V
C413	4822 124 11394	TANTALUM 4.7µF 10V
C416	4822 124 11387	TANTALUM 15µF 4V
C418	4822 126 12838	CERAMIC 0.1µF +80%-20%
C419	4822 126 11681	CERAMIC 1000PF ± 10%
C420	4822 126 12838	CERAMIC 0.1µF +80%-20%
C421	4822 126 12838	CERAMIC 0.1µF +80%-20%
C425 ≀ C427	4822 126 11565	CERAMIC 0.01µF ± 10%
C428	4822 124 11394	TANTALUM 4.7µF 10V
C500	4822 126 11678	CERAMIC 1µF +80%-20%
C501	4822 126 11565	CERAMIC 0.01µF ± 10%
C502	4822 126 12838	CERAMIC 0.1µF +80%-20%
C503	4822 122 33777	CERAMIC 47PF ± 5%
C504 ≀ C506	4822 126 12838	CERAMIC 0.1µF +80%-20%
C507 ≀ C510	4822 122 32667	CERAMIC 0.01µF +80%-20%
C512 ≀ C515	4822 126 11671	CERAMIC 33PF ± 5%
C516	4822 122 32667	CERAMIC 0.01µF +80%-20%
C517	4822 122 32667	CERAMIC 0.01µF +80%-20%
C518	4822 124 11385	TANTALUM 10µF 16V
C519	4822 124 11391	TANTALUM 22µF 10V
C520	4822 124 11383	TANTALUM 10µF 6.3V
C521	4822 126 12838	CERAMIC 0.1µF +80%-20%
C522	4822 126 11565	CERAMIC 0.01µF ± 10%
C900	4822 126 11702	CERAMIC 680PF ± 10%
C901	4822 126 11702	CERAMIC 680PF ± 10%
C911	4822 126 11702	CERAMIC 680PF ± 10%
C912	4822 126 11702	CERAMIC 680PF ± 10%
	⊣□⊢	**P401-RESITORS (ALL CHIP)**
R1	4822 051 30472	4.7KΩ ± 5% 1/16W
R2	4822 117 10467	33KΩ ± 0.5% 1/16W
R3	4822 117 10463	22KΩ ± 0.5% 1/16W
R4	4822 051 30473	47KΩ ± 5% 1/16W
R5	4822 051 30221	220Ω ± 5% 1/16W
R8	4822 051 30223	22KΩ ± 5% 1/16W
R9	4822 116 83212	18KΩ ± 5% 1/16W
R10	4822 051 30103	10KΩ ± 5% 1/16W
R11	4822 051 30223	22KΩ ± 5% 1/16W
R13	4822 051 30272	2.7KΩ ± 5% 1/16W
R14	4822 051 30333	33KΩ ± 5% 1/16W
R15	4822 051 30154	150KΩ ± 5% 1/16W
R16	4822 116 83211	1.8KΩ ± 5% 1/16W
R17	4822 051 30101	100Ω ± 5% 1/16W
R18	4822 051 30224	220KΩ ± 5% 1/16W
R19	4822 051 30478	4.7Ω ± 5% 1/16W
R22	4822 116 82487	0Ω ± 5% 1/16W
R24	4822 051 30104	100KΩ ± 5% 1/16W
R25	4822 051 30223	22KΩ ± 5% 1/16W

REF. DESIG.	PART NO.	DESCRIPTION
R26	4822 051 30104	100KΩ ± 5% 1/16W
R28	4822 051 30103	10KΩ ± 5% 1/16W
R29	4822 051 30473	47KΩ ± 5% 1/16W
R30	4822 117 10462	2.2KΩ ± 0.5% 1/16W
R51	4822 117 10458	12KΩ ± 0.5% 1/16W
R52	4822 117 10468	390Ω ± 0.5% 1/16W
R53	4822 117 10457	10KΩ ± 0.5% 1/16W
R54	4822 117 10471	8.2KΩ ±0.5% 1/16W
R55	4822 117 10457	10KΩ ± 0.5% 1/16W
R56	4822 051 30824	820KΩ ± 5% 1/16W
R57	4822 051 30824	820KΩ ± 5% 1/16W
R58	4822 051 30472	4.7KΩ ± 5% 1/16W
R59	4822 051 30472	4.7KΩ ± 5% 1/16W
R60	4822 051 30102	1KΩ ± 5% 1/16W
R61	4822 051 30102	1KΩ ± 5% 1/16W
R63	4822 051 30103	10KΩ ± 5% 1/16W
R66	4822 051 30273	27KΩ ± 5% 1/16W
R67	4822 051 30273	27KΩ ± 5% 1/16W
R68	4822 051 30101	100Ω ± 5% 1/16W
R69	4822 051 30103	10KΩ ± 5% 1/16W
R301	4822 051 30332	3.3KΩ ± 5% 1/16W
R302	4822 051 30332	3.3KΩ ± 5% 1/16W
R303	4822 051 30473	47KΩ ± 5% 1/16W
R304	4822 051 30473	47KΩ ± 5% 1/16W
R305	4822 051 30102	1KΩ ± 5% 1/16W
R306	4822 051 30102	1KΩ ± 5% 1/16W
R307	4822 361 30322	430KΩ ± 5% 1/16W
R308	4822 361 30322	430KΩ ± 5% 1/16W
R309	4822 051 30824	820KΩ ± 5% 1/16W
R310	4822 051 30824	820KΩ ± 5% 1/16W
R311	4822 051 30103	10KΩ ± 5% 1/16W
R312	4822 051 30103	10KΩ ± 5% 1/16W
R313	4822 051 30332	3.3KΩ ± 5% 1/16W
R314	4822 051 30332	3.3KΩ ± 5% 1/16W
R315	4822 116 83215	5.6KΩ ± 5% 1/16W
R316	4822 116 83215	5.6KΩ ± 5% 1/16W
R317	4822 051 30222	2.2KΩ ± 5% 1/16W
R318	4822 051 30222	2.2KΩ ± 5% 1/16W
R319	4822 117 10461	18KΩ ± 0.5% 1/16W
R320	4822 117 10461	18KΩ ± 0.5% 1/16W
R321	4822 117 10467	33KΩ ± 0.5% 1/16W
R322	4822 117 10467	33KΩ ± 0.5% 1/16W
R323	4822 117 10466	3.3KΩ ± 0.5% 1/16W
R324	4822 117 10466	3.3KΩ ± 0.5% 1/16W
R325	4822 051 30152	1.5KΩ ± 5% 1/16W
R326	4822 051 30152	1.5KΩ ± 5% 1/16W
R327	4822 116 83207	1.2KΩ ± 5% 1/16W
R328	4822 116 83207	1.2KΩ ± 5% 1/16W
R329	4822 111 92163	COMPO. 820Ω x 2 ± 5% 1/32W
R331	4822 051 30473	47KΩ ± 5% 1/16W
R332	4822 051 30473	47KΩ ± 5% 1/16W
R333	4822 116 83222	82KΩ ± 5% 1/16W
R334	4822 116 83222	82KΩ ± 5% 1/16W
R341	4822 051 30103	10KΩ ± 5% 1/16W
R342	4822 051 30103	10KΩ ± 5% 1/16W
R343	4822 051 30102	1KΩ ± 5% 1/16W
R344	4822 051 30102	1KΩ ± 5% 1/16W
R345	4822 111 92162	COMPO. 47KΩ x 2 ± 5% 1/32W
R347	4822 051 30223	22KΩ ± 5% 1/16W
R348	4822 051 30223	22KΩ ± 5% 1/16W
R349	4822 116 83208	12KΩ ± 5% 1/16W
R350	4822 116 83208	12KΩ ± 5% 1/16W
R351	4822 051 30154	150KΩ ± 5% 1/16W
R352	4822 051 30154	150KΩ ± 5% 1/16W
R353	4822 051 30333	33KΩ ± 5% 1/16W
R354	4822 051 30333	33KΩ ± 5% 1/16W
R355	4822 051 30103	10KΩ ± 5% 1/16W
R356	4822 051 30103	10KΩ ± 5% 1/16W
R357	4822 116 81046	12Ω ± 5% 1/16W
R358	4822 116 81046	12Ω ± 5% 1/16W

REF. DESIG.	PART NO.	DESCRIPTION
R359	4822 116 81046	12Ω ± 5% 1/16W
R360	4822 116 81046	12Ω ± 5% 1/16W
R361	4822 111 92164	COMPO. 470Ω x 2 ± 5% 1/32W
R363	4822 111 92161	COMPO. 150Ω x 2 ± 5% 1/32W
R365	4822 051 30152	1.5KΩ ± 5% 1/16W
R366	4822 051 30152	1.5KΩ ± 5% 1/16W
R367	4822 051 30104	100KΩ ± 5% 1/16W
R368	4822 051 30104	100KΩ ± 5% 1/16W
R369	4822 111 92159	COMPO. 10KΩ x 2 ± 5% 1/32W
R371	4822 111 92159	COMPO. 10KΩ x 2 ± 5% 1/32W
R373	4822 111 92159	COMPO. 10KΩ x 2 ± 5% 1/32W
R375 ≀ R378	4822 051 30105	1MΩ ± 5% 1/16W
R379	4822 051 30473	47KΩ ± 5% 1/16W
R380	4822 051 30473	47KΩ ± 5% 1/16W
R381 ≀ R384	4822 051 30103	10KΩ ± 5% 1/16W
R407	4822 051 30101	100Ω ± 5% 1/16W
R408	4822 051 30223	22KΩ ± 5% 1/16W
R409	4822 051 30223	22KΩ ± 5% 1/16W
R413	4822 051 30103	10KΩ ± 5% 1/16W
R419	4822 051 30101	100Ω ± 5% 1/16W
R422	4822 051 30684	680Ω ± 5% 1/16W
R423 ≀ R425	4822 051 30104	100KΩ ± 5% 1/16W
R426	4822 051 30223	22KΩ ± 5% 1/16W
R427	4822 051 30223	22KΩ ± 5% 1/16W
R428	4822 051 30104	100KΩ ± 5% 1/16W
R429	4822 051 30473	47KΩ ± 5% 1/16W
R501	4822 051 30103	10KΩ ± 5% 1/16W
R502	4822 051 30103	10KΩ ± 5% 1/16W
R503	4822 051 30105	1MΩ ± 5% 1/16W
R504	4822 116 83215	5.6KΩ ± 5% 1/16W
R505	4822 116 83208	12KΩ ± 5% 1/16W
R506	4822 116 83215	5.6KΩ ± 5% 1/16W
R507	4822 111 92159	COMPO. 10KΩ x 2 ± 5% 1/32W
R509	4822 111 92159	COMPO. 10KΩ x 2 ± 5% 1/32W
R511	4822 051 30103	10KΩ ± 5% 1/16W
R515	4822 051 30109	10Ω ± 5% 1/16W
R518	4822 116 83222	82KΩ ± 5% 1/16W
R519	4822 051 30472	4.7KΩ ± 5% 1/16W
R520	4822 111 92157	COMPO. 100Ω x 2 ± 5% 1/32W
R522	4822 111 92157	COMPO. 100Ω x 2 ± 5% 1/32W
R524	4822 051 30102	1KΩ ± 5% 1/16W
R525	4822 051 30105	1MΩ ± 5% 1/16W
R526	4822 051 30102	1KΩ ± 5% 1/16W
R527	4822 051 30105	1MΩ ± 5% 1/16W
R528	4822 051 30103	10KΩ ± 5% 1/16W
R529	4822 051 30103	10KΩ ± 5% 1/16W
R530 ≀ R533	4822 051 30471	470Ω ± 5% 1/16W
R538	4822 111 92164	COMPO. 470Ω x 2 ± 5% 1/32W
R540	4822 111 92164	COMPO. 470Ω x 2 ± 5% 1/32W
R546 ≀ R552	4822 051 30471	470Ω ± 5% 1/16W
R591	4822 051 30102	1KΩ ± 5% 1/16W
R592	4822 051 30223	22KΩ ± 5% 1/16W
R593	4822 051 30102	1KΩ ± 5% 1/16W
R594	4822 051 30223	22KΩ ± 5% 1/16W
R595	4822 051 30102	1KΩ ± 5% 1/16W
R596	4822 051 30103	10KΩ ± 5% 1/16W
R597	4822 051 30103	10KΩ ± 5% 1/16W
U51	4822 116 82487	0Ω 1/16W

REF. DESIG.	PART NO.	DESCRIPTION
U330		0Ω 1/8W
U505	4822 116 82487	0Ω 1/16W
U541	4822 116 82487	0Ω 1/16W
U542	4822 116 82487	0Ω 1/16W
VR1	4822 100 12059	3KΩ (B) ± 25% 0.15W TRIMM.
VR400	4822 101 30833	50KΩ (C) x 2 VARIABLE VOLUME
		P401-SEMICONDUCTORS
D1	4822 130 83471	DIODE 1SR154-100TE
D2	4822 130 83451	DIODE MA701TX
D3	4822 130 83449	DIODE MA110TW
D5	4822 130 83449	DIODE MA110TW
D10	4822 130 83453	ZENER DIODE MA8100TX 8.1V
D51	4822 130 83449	DIODE MA110TW
D105	4822 130 83444	DIODE MA143TW
D301	4822 130 83447	DIODE MA141WATW
D303	4822 130 83447	DIODE MA141WATW
D402	4822 130 83449	DIODE MA110TW
D403	4822 130 83448	DIODE MA141WKTW
D405	4822 130 83449	DIODE MA110TW
D406	4822 130 83448	DIODE MA141WKTW
D407	4822 130 83445	DIODE MA143TX
D409	4822 130 83449	DIODE MA110TW
D410	4822 130 83449	DIODE MA110TW
D500	4822 130 83449	DIODE MA110TW
D592	4822 130 83449	DIODE MA110TW
D593	4822 130 83449	DIODE MA110TW
IC1	4822 209 32599	IC, SUPPLY AN8086SE2
IC2	4822 209 32609	IC TK11440MTR
IC3	4822 209 32612	IC TK11540MTR
IC4	4822 209 32611	IC TK11447MTR
IC5	4822 209 32608	IC RN5RL40AAT1
IC6	4822 209 32604	IC, RESET S8121SGQAT1
IC7	4822 209 32613	IC TK11445MTR
IC8	4822 209 32605	IC, OP AMP T75W393FUT12
IC9	4822 209 32595	IC TC7W00FUT12L
IC400	4822 209 32607	IC NJM2115MT1
IC401	4822 209 32602	IC, D. FILTER SM5881S-ET
IC402	4822 209 32606	IC, DAC µPD63200GSE2
IC404	4822 209 32622	IC, DOLBY BA1106FST2
IC406	4822 209 32607	IC, L.P.F NJM2115MT1
IC408	4822 209 32598	IC NJM3415MT1
IC500	4822 209 32615	MICROPROCESSOR, µ-COM, MNE3214RTAA1
IC501	4822 209 32603	IC RN5VL36AAT1
IC502	4822 209 32619	IC, DEQ SAA2032GP
IC503	4822 209 32617	IC, TFE SAA2022GP
IC504	4822 209 32597	IC, DRAM MN425610AT1
IC505	4822 209 32616	IC, SFC SAA2002GP
IC506	4822 209 32601	IC, DAI M51581GP
IC507	4822 209 32594	IC, INVERTER TC7S04FTE85L
Q1	4822 130 63391	DIGITAL TRANSISTOR, UN5111TW
Q2	4822 130 63407	TRANSISTOR 2SD1628FG-TC
Q3	4822 130 63391	DIGITAL TRANSISTOR, UN5111TW
Q4	4822 130 63407	TRANSISTOR 2SD1628FG-TC
Q6	4822 130 63396	DIGITAL TRANSISTOR, UN5212TW
Q7	4822 130 61059	DIGITAL TRANSISTOR, NPN UN5213
Q8	4822 130 61057	DIGITAL TRANSISTOR, UN5113
Q9	4822 130 61057	DIGITAL TRANSISTOR, NPN UN5213
Q10	4822 130 63397	DIGITAL TRANSISTOR, UN5214TW
Q11	4822 130 63404	TRANSISTOR 2SB1218ASTW
Q12	4822 130 61059	DIGITAL TRANSISTOR, NPN UN5213
Q13	4822 130 63396	DIGITAL TRANSISTOR, UN5212TW
Q17	4822 130 61059	DIGITAL TRANSISTOR, NPN UN5213
Q18	4822 130 61059	DIGITAL TRANSISTOR, NPN UN5213
Q19	4822 130 61057	DIGITAL TRANSISTOR, UN5113
Q20	4822 130 63397	DIGITAL TRANSISTOR, UN5214TW
Q21	4822 130 61059	DIGITAL TRANSISTOR, NPN UN5213
Q23	4822 130 63396	DIGITAL TRANSISTOR, UN5212TW

REF. DESIG.	PART NO.	DESCRIPTION
Q40	4822 130 63405	TRANSISTOR 2SC4081RTW
Q41	4822 130 61059	DIGITAL TRANSISTOR, NPN UN5213
Q42	4822 130 61059	DIGITAL TRANSISTOR, NPN UN5213
Q301	4822 130 63406	TRANSISTOR 2SD1328RTW
Q302	4822 130 63406	TRANSISTOR 2SD1328RTW
Q307 ~ Q310	4822 130 63406	TRANSISTOR 2SD1328RTW
Q311 ~ Q314	4822 130 61061	DIGITAL TRANSISTOR, UN5215
Q315 ~ Q320	4822 130 63408	TRANSISTOR 2SD1819AQTW
Q323	4822 130 61061	DIGITAL TRANSISTOR, UN5215
Q324	4822 130 61061	DIGITAL TRANSISTOR, UN5215
Q400	4822 130 63397	DIGITAL TRANSISTOR, UN5214TW
Q402	4822 130 63392	DIGITAL TRANSISTOR, UN5114TW
Q403	4822 130 63397	DIGITAL TRANSISTOR, UN5214TW
Q405	4822 130 63392	DIGITAL TRANSISTOR, UN5114TW
Q406	4822 130 61059	DIGITAL TRANSISTOR, NPN UN5213
Q407	4822 130 61057	DIGITAL TRANASISTOR, UN5113
Q409	4822 130 63404	TRANSISTOR 2SB1218ASTW
Q410	4822 130 63398	DIGITAL TRANSISTOR, X4316TW
Q411	4822 130 61059	DIGITAL TRANSISTOR, NPN UN5213
Q412	4822 130 61059	DIGITAL TRANSISTOR, NPN UN5213
Q500	4822 130 63391	DIGITAL TRANSISTOR, UN5111TW
Q501	4822 130 61059	DIGITAL TRANSISTOR, NPN UN5213
Q502	4822 130 61057	DIGITAL TRANSISTOR, UN5113
Q503	4822 130 61059	DIGITAL TRANSISTOR, NPN UN5213
Q504	4822 130 61061	DIGITAL TRANSISTOR, UN5215
Q505	4822 130 61059	DIGITAL TRANSISTOR, NPN UN5213
		P401-COILS
B1	4822 158 10889	FERRITE CORE
B2	4822 158 10889	FERRITE CORE
B3	4822 158 10891	FERRITE CORE
B331	4822 158 10891	FERRITE CORE
B332	4822 158 10891	FERRITE CORE
B360	4822 158 10888	FERRITE CORE
B361 ~ B364	4822 158 10891	FERRITE CORE
B501	4822 158 10891	FERRITE CORE
B502	4822 158 10891	FERRITE CORE
L2	4822 157 70262	CHOKE COIL, 10µH
L3	4822 157 70262	CHOKE COIL, 10µH
L4	4822 157 70765	CHOKE COIL
L500	4822 157 70766	CHOKE COIL, 10µH ± 10%
L501	4822 157 70766	CHOKE COIL, 10µH ± 10%
		P401-MISCELLANEOUS
F1	4822 523 30439	FUSE, RSFCA16-U
CN1	4822 265 31126	JACK, P=1.25
CN501	4822 265 31122	JACK, TO FPC
CN505	4822 265 31117	JACK, TO FPC
JK2	4822 265 31125	JACK, DC IN
JK400	4822 265 31123	JACK
JK401	4822 265 31124	JACK, H.P
JK402	4822 265 31127	JACK, OPT. GP1F31T
S400	4822 277 21708	SLIDE SWITCH, 1-2 CLICK
S401	4822 277 21709	SLIDE SWITCH, 1-3 CLICK
S501	4822 277 21708	SLIDE SWITCH, 1-2 CLICK
S502	4822 277 21708	SLIDE SWITCH, 1-2 CLICK
X500	4822 242 81552	CERAMIC VIBRATOR. 6.00MHz
X502	4822 242 81554	X-TAL, RSXC24M5S02T
X503	4822 242 81553	X-TAL, RSXC22M5S03T

REF. DESIG.	PART NO.	DESCRIPTION
		K001-LCD CIRCUIT BOARD
		K001-MISCELLANEOUS
31	4822 130 91268	LCD KIT
S1 ≀ S11	4822 276 13447	PUSH SWITCH

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