

Service Manual

PIONEER



ORDER NO.
VRT-024-0

COMPACT DISC PLAYER

P-D70 HEM, HB, KU, S, S/G

MODEL P-D70 COMES IN FIVE VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
HEM	AC220V, 240V (switchable)	European model
HB	AC220V, 240V (switchable)	United Kingdom model
KU	AC120V only	U.S.A. model
S	AC110V, 120V, 220V, 240V (switchable)	General export model
S/G	AC110V, 120V, 220V, 240V (switchable)	U.S.A. military model

- This service manual is applicable to the HEM type.

The HB, KU, S and S/G types are the same as the HEM type with the exception of the following sections.

Contrast of Miscellaneous Parts

Mark	Symbol & description	Part No.				
		HEM	HB	KU	S	S/G
	Power transformer	VTT-038	VTT-038	VTT-041	VTT-042	VTT-042
	Fuse	VEK-012	VEK-012	VEK-016	VEK-013	VEK-013
	Voltage selector	VSU-001	VSU-001	NO	VSU-002	VSU-002
	Power cord	VDG-019	VDG-021	VDG-020	VDG-013	VDG-013
	Power cord stopper	VEC-152	VEC-152	VEC-147	VEC-147	VEC-147
	FUSE	VWR-047	VWR-047	VWR-042	VWR-054	VWR-054
	L1	VTL-003	VTL-003	VTL-004	VTL-004	VTL-004
	Fuse holder	VKR-002	VKR-002	VKR-001	VKR-001	VKR-001
	Packing case	VHG-070	VHG-076	VHG-075	VHG-077	VHG-084
	Operating instructions	VRD-003	VRB-027	VRB-027	VRB-027	VRB-027
	Pick up	VWY-061	VWY-061	VWY-063	VWY-061	VWY-061

For servicing of the other types, please refer to the Additional Service Manual.

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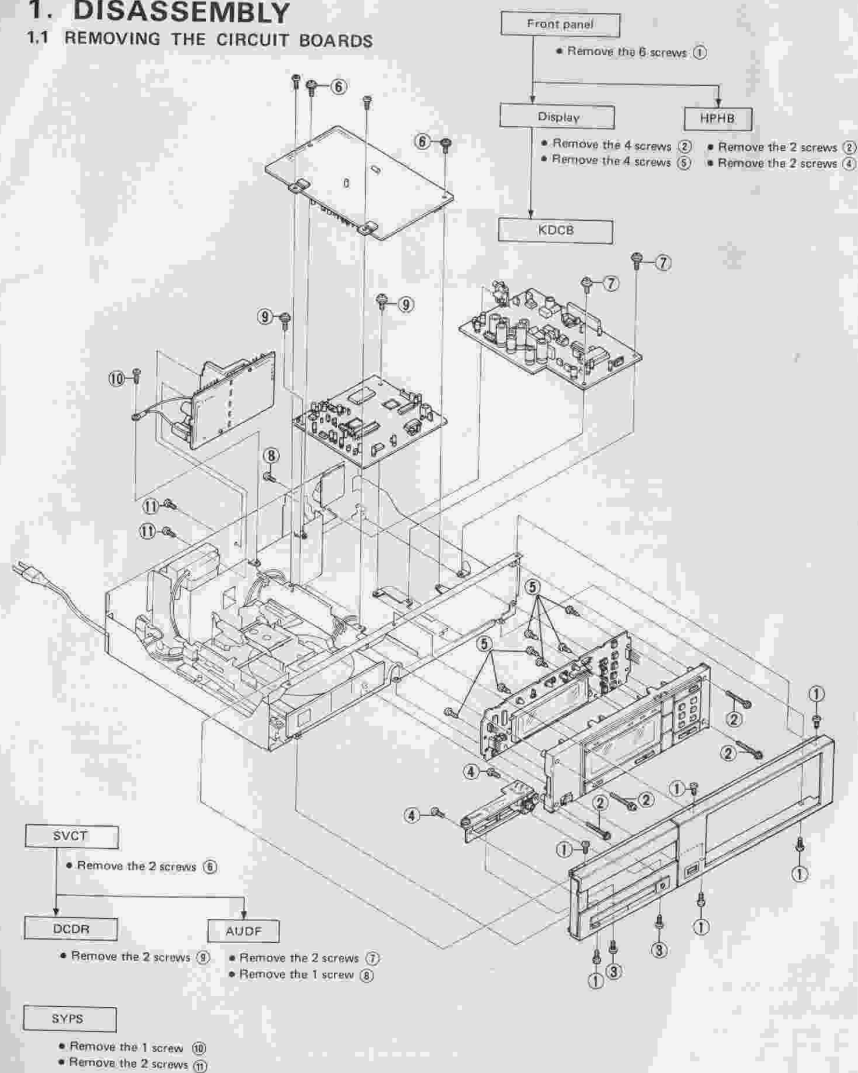
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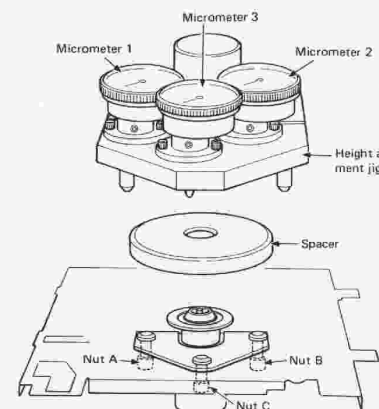
1. DISASSEMBLY

1.1 REMOVING THE CIRCUIT BOARDS

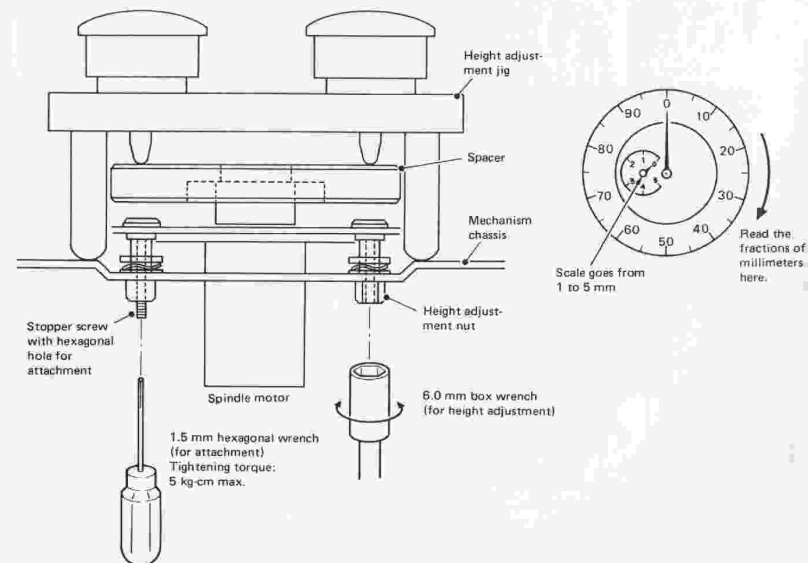


2. MECHANICAL ADJUSTMENT

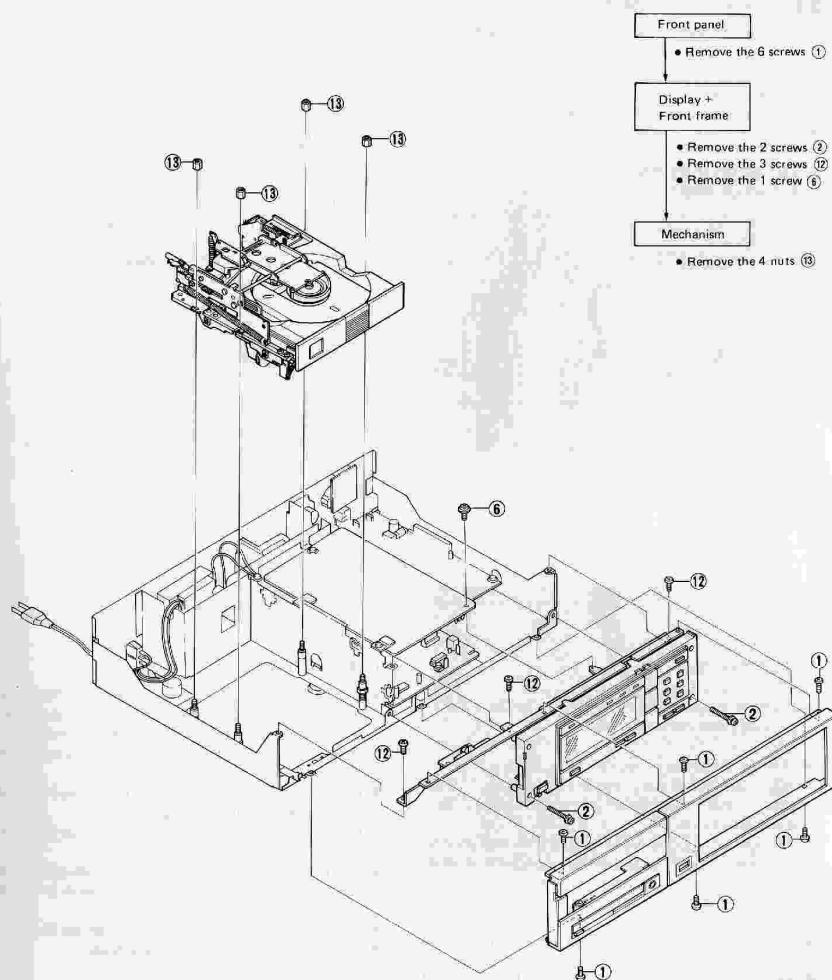
2.1 SPINDLE MOTOR HEIGHT ADJUSTMENT



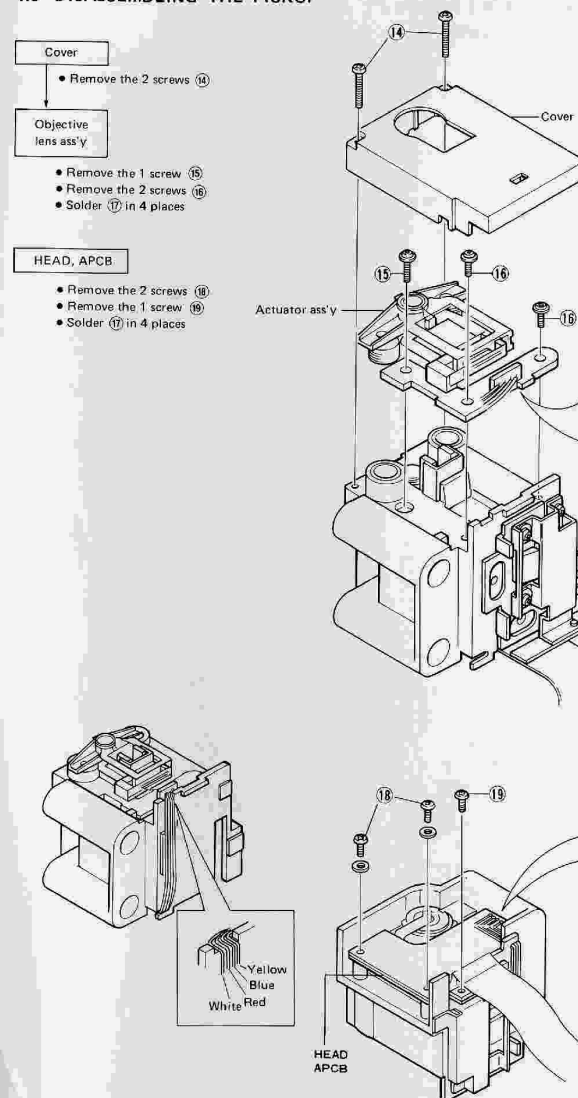
- 1) If height readjustment or motor replacement is to be performed, first loosen the stopper screws with hexagonal holes.
- 2) Tightening and loosening of height adjustment screws A, B and C should be performed little by little in order, A, B and C.
- 3) Set the height adjustment jig in place as shown.
- 4) Adjust height adjustment screw A until micrometer 1 reads 2.0 mm.
- 5) Adjust height adjustment screw B until micrometer 2 reads 2.0 mm.
- 6) Adjust height adjustment screw C until micrometer 3 reads 2.0 mm.
- 7) Tighten the three hexagonal bolts to hold height adjustment screws A, B and C in place. Then confirm that the micrometer reading is within the following tolerances:
Micrometers 1, 2 and 3: $2.0 \text{ mm} \pm 0.05 \text{ mm}$
- 8) Apply screw lock to all screws.



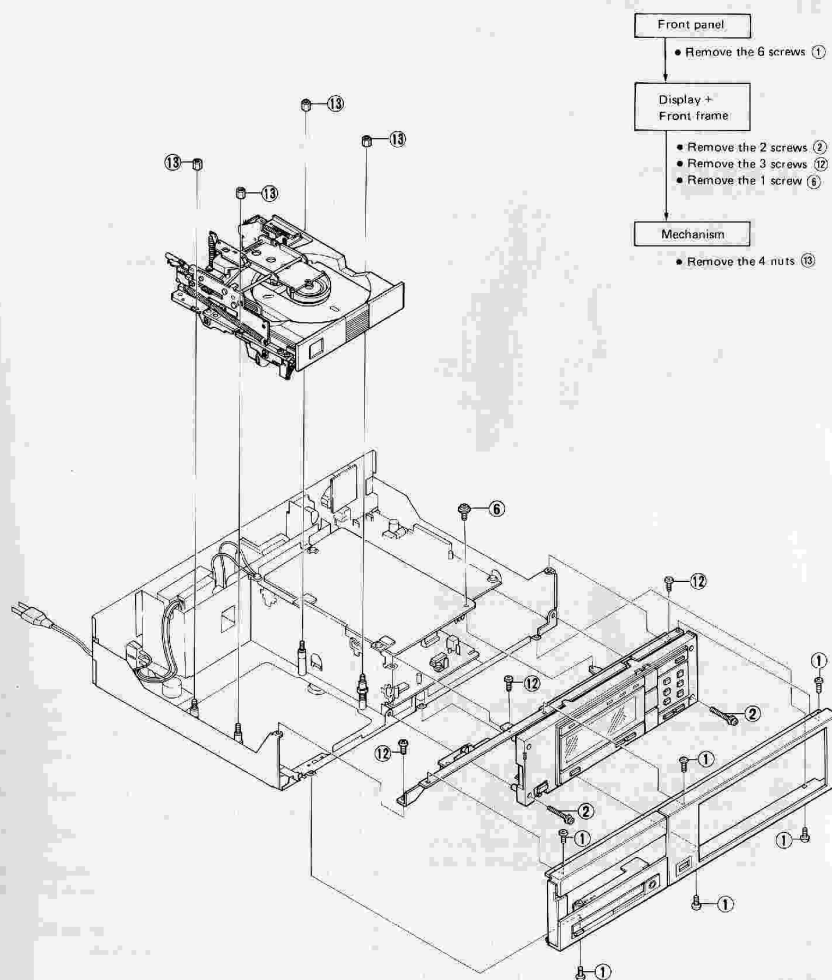
1.2 REMOVING THE MECHANISM



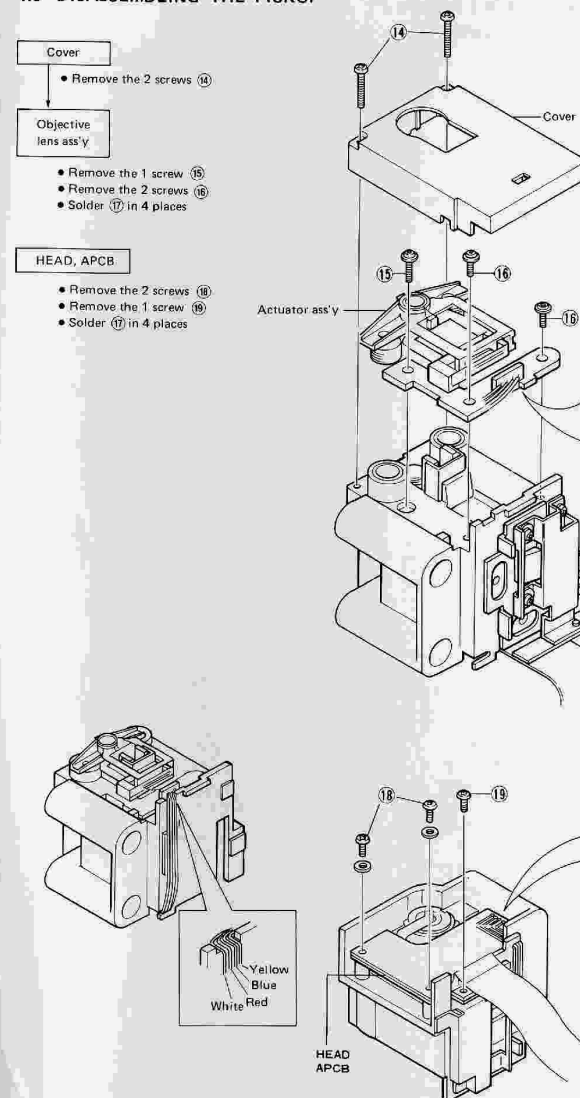
1.3 DISASSEMBLING THE PICKUP



1.2 REMOVING THE MECHANISM



1.3 DISASSEMBLING THE PICKUP

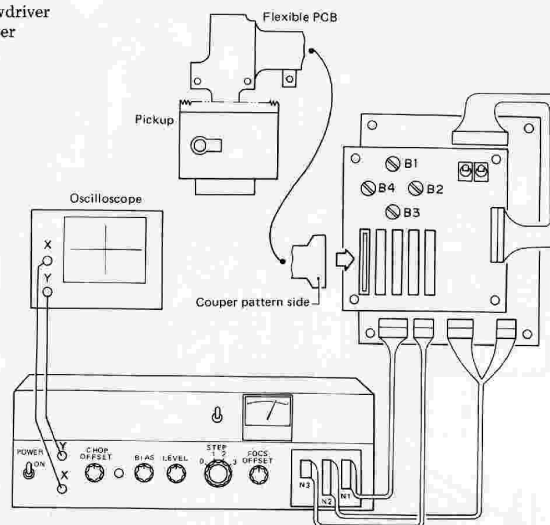


2.2 PICKUP ADJUSTMENTS

Connections Diagram for Pickup Adjustments

Instruments, Tools and Equipment:

- Dual trace oscilloscope (DC—35 MHz)
- Dynamic jig
- Grating adjustment screwdriver
- PD adjustment screwdriver
- Conductive mat
- Conductive wristband
- Reflection mirror jig



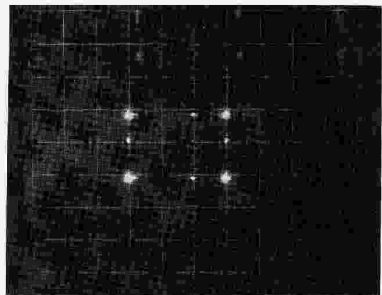
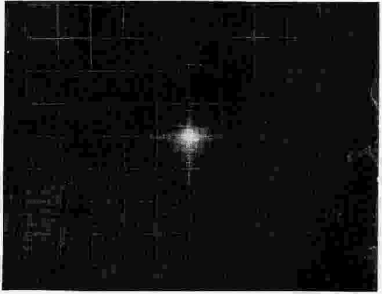
PRECAUTIONS

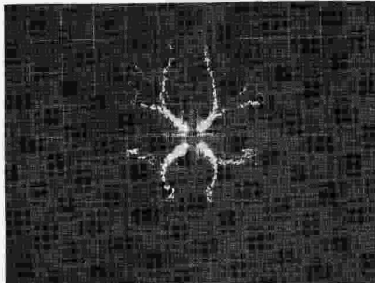
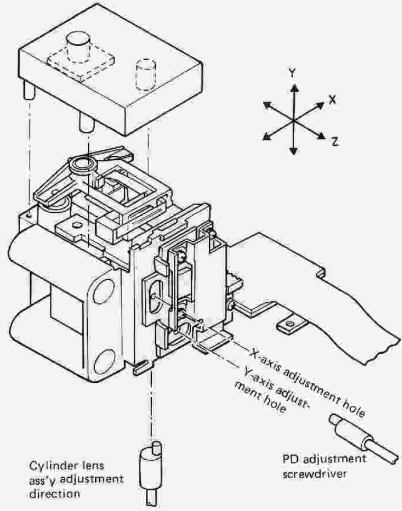
Strictly observe precautions to protect the pickup from static electricity.

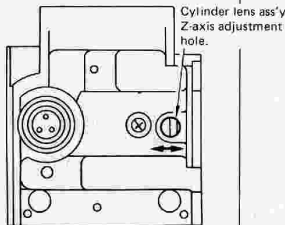
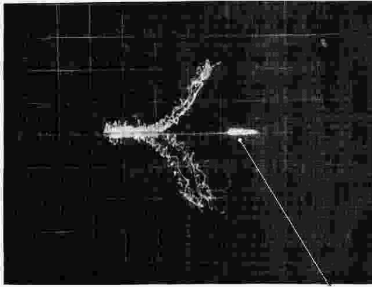
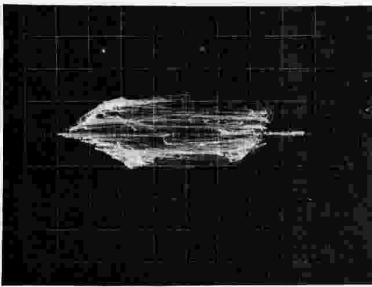
- Place a conductive mat on the work bench.
- All workers should cover the ends of their sleeves with conductive covers connected to a conductive mat.
- Use a battery-powered soldering iron and ground the tip of the iron on the conductive mat. (AC 120V soldering irons with an earth connection must not be connected to the conductive mat.)
- Perform pickup replacement and adjustments only after completing the above preparations.
- Store the pickup in a conductive bag wrapped by itself.
- Do not inadvertently look at the objective lens when the laser is on.

PREPARATIONS

- To perform the Z-axis adjustment of the cylinder lens ass'y, first remove the actuator ass'y wiring and the HEAD/APCB ass'y screws, turn the unit upside-down and then reattach the wiring.
- Connect the dynamic jig (DY jig) and oscilloscope as shown in the diagram.
- Connect the pickup's flexible PCB to the connector of the DY jig.
- Set the oscilloscope to the X-Y mode and adjust so that the beam spot GND position is in the center of the screen.
- Turn on the DY jig power and turn on the laser.
- Turn the DY jig vibration switch on.

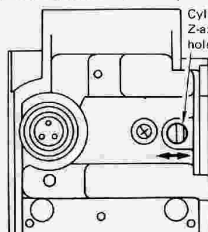
Step No.	DY jig Step SW	Oscilloscope range		Test point	Adjustment point	Adjustment procedure
		X	Y			
1	0	0.2V/div	0.2V/div			ROUGH ADJUSTMENT OF PD • Set the step of the dynamic jig to 0. • Using the dynamic jig CHOP OFFSET and B1, B2, B3 and B4 offset controls, bring the four beam spots on the oscilloscope screen into the center as shown.  

Step No.	DY jig Step SW	Oscilloscope range		Test point	Adjustment point	Adjustment procedure
		X	Y			
	0	0.2V/div	0.2V/div			- Place the reflection mirror device on the pickup as shown in the diagram. - Using the PD adjustment screwdriver, adjust the position of PD until the waveform on the oscilloscope screen is the same as in the picture below. - If no waveform appears, adjust the mirror device's BIAS and LEVEL controls.
 PD adjustment location  Cylinder lens ass'y adjustment direction PD adjustment screwdriver						

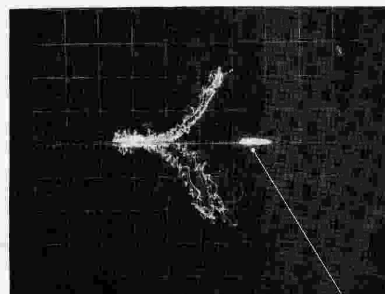
Step No.	DY jig Step SW	Oscilloscope range		Test point	Adjustment point	Adjustment procedure
		X	Y			
2	1	0.2V/div	0.2V/div			CYLINDER LENS Z-AXIS POSITION ADJUSTMENT - Set the step of the dynamic device to 1. - Using the dynamic device FCS offset control, align the lissajous' waveform on the oscilloscope screen with the grand marker (vertically) as shown in the picture.
Cylinder lens adjustment point  Cylinder lens ass'y Z axis adjustment hole.						
	2	0.2V/div	0.2V/div			- Set the step of the dynamic jig to 2. - Confirm that the amplitude (RF level) in the horizontal direction at the grand marker (vertically) of the lissajous' waveform is at its maximum level. - If the amplitude is not acceptable, adjust the position of the cylinder lens in the Z-axis. - Loosen the cylinder lens attachment screw a little (do not remove the screw). - Using the grating adjustment screwdriver, adjust the position of the cylinder so that the amplitude of the RF signal (horizontally) at the marker point (vertically) is at its maximum point. - After finishing the adjustment, tighten the screw and confirm that there is no change in the waveform.
 Grand marker 						

Step No.	DY jig Step SW	Oscilloscope range		Test point	Adjustment point	Adjustment procedure
		X	Y			
2	1	0.2V/div	0.2V/div			CYLINDER LENS Z-AXIS POSITION ADJUSTMENT - Set the step of the dynamic device to 1. - Using the dynamic device FCS offset control, align the lissajous' waveform on the oscilloscope screen with the grand marker (vertically) as shown in the picture.
	2	0.2V/div	0.2V/div			CYLINDER LENS Z-AXIS POSITION ADJUSTMENT - Set the step of the dynamic jig to 2. - Confirm that the amplitude (RF level) in the horizontal direction at the grand marker (vertically) of the lissajous' waveform is at its maximum level. - If the amplitude is not acceptable, adjust the position of the cylinder lens in the Z-axis. - Loosen the cylinder lens attachment screw a little (do not remove the screw). - Using the grating adjustment screwdriver, adjust the position of the cylinder so that the amplitude of the RF signal (horizontally) at the marker point (vertically) is at its maximum point. - After finishing the adjustment, tighten the screw and confirm that there is no change in the waveform.

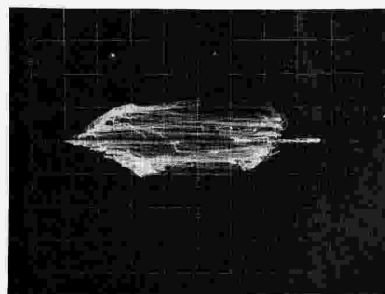
Cylinder lens adjustment point



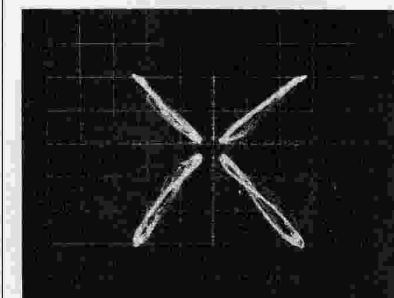
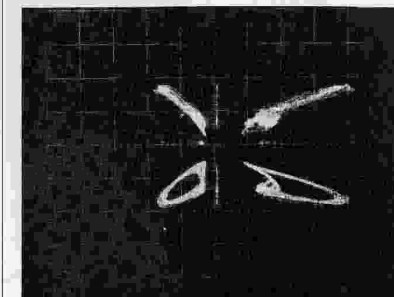
Cylinder lens ass'y Z-axis adjustment hole.



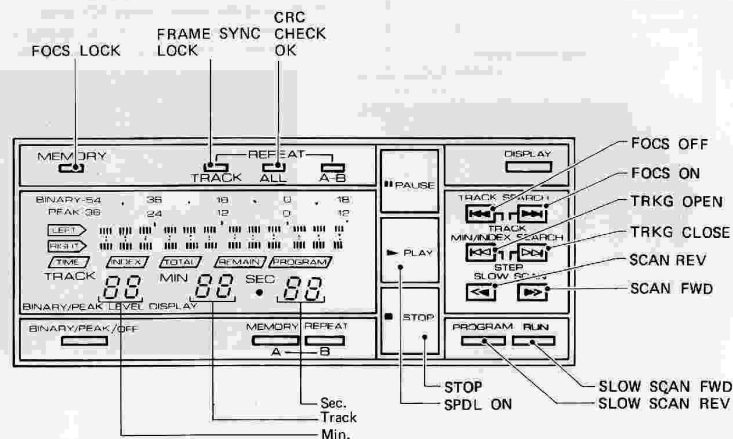
Grand marker



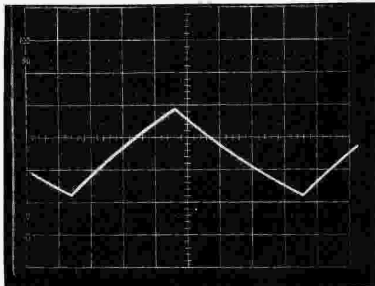
Step No.	DY jig Step SW	Oscilloscope range		Test point	Adjustment point	Adjustment procedure
		X	Y			
3	3	0.2V/div	0.2V/div			PD FINE ADJUSTMENT - Set the step of the dynamic device to 3. - Finely adjust the position of PD so that the lissajous' waveform is angled diagonally and so that each of the diagonal waveforms is of about the same size. - After finishing the adjustment, tighten the screw.

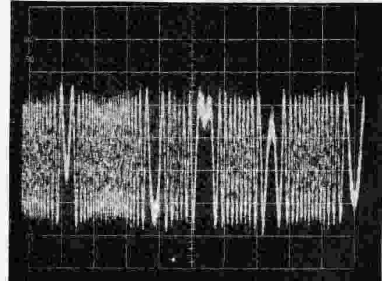
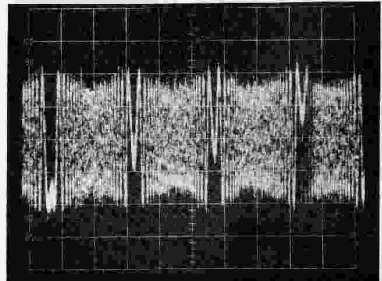


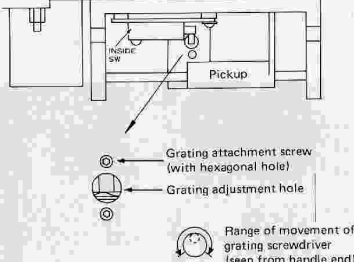
KEY FUNCTIONS WHEN TEST CPU IS ATTACHED

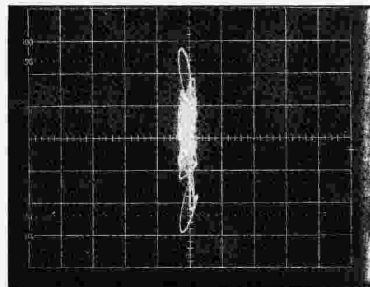
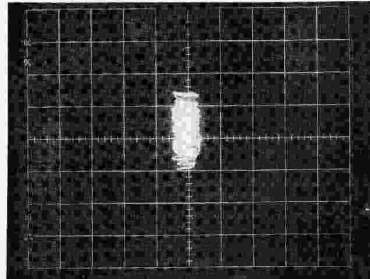


Step No.	Oscilloscope range	Test point	Adjustment point	Check points/Adjustment specifications	Adjustment procedure								
					INSTRUMENTS AND DEVICES USED • Dual trace oscilloscope with time delay sweep • Light power meter • Test disc YEDS-7 and Demonstration disc • FTG adjuster • Test CPU • Post (for mechanism ass'y hold) • Grating screwdriver • 2-shaft screwdriver (for adjustment of wire connection angle) PRECAUTIONS • A 1:1 probe should be used with the oscilloscope. • All waveform photos are on a 35 MHz band oscilloscope. • Do not look at the objective lens when the laser is on. • TP is on SVCT board unless otherwise specified. • VR is on PREB board unless otherwise specified. • The spindle motor height should be adjusted beforehand. • The adjustment specifications listed here assume the use of a test CPU. When the test CPU is used instead of the standard CPU (PD3007 or PD3014), the player functions differ as follows. <table><tr><th>With test CPU</th><th>With standard CPU</th></tr><tr><td>FOCUS ON, SPDL ON</td><td>—</td></tr><tr><td>FOCUS ON, SPDL ON (TRKG OPEN)</td><td>SVCT TP3 is connected to -5V when play is started</td></tr><tr><td>FOCUS ON, SPDL ON TRKG CLOSE</td><td>Play on</td></tr></table> • Steps 4, 5, 6 and 7 are performed with the TRKG loop open. • Steps 8, 9, 10, 11, 12, 13 and 14 are performed with the TRKG loop closed. PREPARATIONS • Remove the top cover and bottom panel. • Replace the CPU (Z8) on the SVCT with the test CPU. • Remove the connectors between the mechanism ass'y PREB and the DCDR and SVCT. • Remove the mechanism from the unit (remove the four nuts) and put the four posts in place. Refer to the mechanism ass'y removal procedure for details. • Replace the connectors as they were before. Follow directions in the chart to the left and be sure each connector is firmly inserted.	With test CPU	With standard CPU	FOCUS ON, SPDL ON	—	FOCUS ON, SPDL ON (TRKG OPEN)	SVCT TP3 is connected to -5V when play is started	FOCUS ON, SPDL ON TRKG CLOSE	Play on
With test CPU	With standard CPU												
FOCUS ON, SPDL ON	—												
FOCUS ON, SPDL ON (TRKG OPEN)	SVCT TP3 is connected to -5V when play is started												
FOCUS ON, SPDL ON TRKG CLOSE	Play on												
	</												

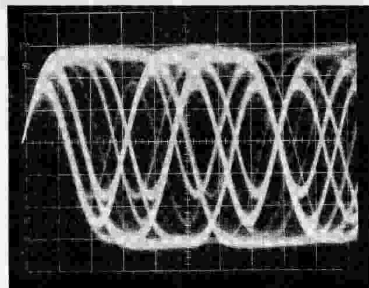
Step No.	Oscilloscope		Test point	Adjustment point	Check points/Adjustment specifications	Adjustment procedure
1	0.1V/div	1mS/div	N13-2	Unless otherwise specified, TP is on SVCT	Unless otherwise specified, VR is on PREB	GENERAL ADJUSTMENTS CHECK OF FOCUS, TRKG RETURN VOLTAGE - Turn on the power and confirm that the focus return voltage is $0V \pm 100mV$ and that the tracking return voltage is $0V \pm 10mV$. - If the tracking return voltage is not acceptable, correct by adjusting SVCT VR1 (tracking offset). - If the focus return voltage is not acceptable, check SVCT Z1, Z2, Q2 and Q3. Note: If the return voltage is not within the acceptable range, correct promptly because it could cause the actuator coil to fail.
	10mV/div		N13-4	SVCT	(F return) $0V \pm 100mV$ (T return) $0V \pm 10mV$ VR1	
2	0.1V/div	1mS/div	N15-7	VR2	$0V \pm 0.1V$	CHECK OF RAMP WAVEFORM Press FOCUS ON (▶▶) and confirm that the objective lens goes up and down. (Ramp waveform at N13-2) 
	0.5V/div	0.2S/div	N13-2	—	Ramp waveform	
3	—	—	—	APCB VR1	$0.26mW \pm 0.02mW$	CHECK OF LD POWER - Place the light power meter sensor directly over the objective lens and confirm that the LD power is acceptable. - If the power is not acceptable, correct by adjusting the VR of APCB.

Step No.	Oscilloscope range		Test point	Adjustment point	Check points/Adjustment specifications	Adjustment procedure
4	1V/div	0.2S/div	N13-2			CHECK OF FOCUS AND SPINDLE LOCKS - Press the stop button and load the demonstration disc. - Press FOCUS ON (▶▶) and confirm that one Ramp waveform cycle is generated at N13-2 and that a negative voltage is generated at SVCT Z3 25 (focus lock). - Press SPDL ON (▶) and confirm that the disc spins and that the disc does not begin to spin out of control.
	2V/div		SVCT Z3 25		Ramp waveform FOCUS LOCK	
5	0.5V/div	5mS/div	TP-2	VR4 (TRKG BAL)	$ A - B < 0.1V$	TRACKING BALANCE Measure the tracking error at TP-2 and adjust to eliminate any DC element.  ↓ 

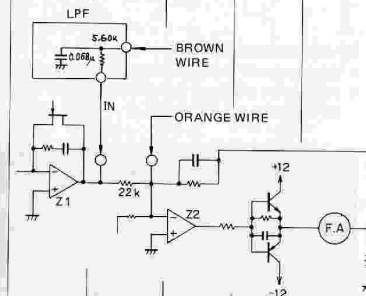
Step No.	Oscilloscope range		Test point	Adjustment point	Check points/Adjustment specifications	Adjustment procedure
6						GRATING ADJUSTMENT - Use the disc "38DC15", SONY. - Press SCAN FWD (▶▶) to move the pickup toward the outer edge of the disc and stop the pickup at a point where the pickup grating adjustment hole is slightly beyond the inside limit switch. - Roughly adjust VR5 (tracking gain) so that the tracking error is 2.0Vp-p. - Confirm that there is no DC element in the tracking error. If DC exists, fine adjust VR4. - Loosen the grating attachment screws. - Insert the grating screwdriver in the grating hole with the cam section of the tip pointing upward. - Rotate the grating screwdriver to the point where the tracking error is at its minimum level and the envelope is as clean as possible (null point). If it is difficult to find the null point, check by inserting an LPF (cutoff: about 4 kHz) between TP-2 and the probe. Note: The grating screwdriver can only be rotated over a range of about 300°. Do not try to forcibly rotate it any farther.
	0.2V/div	5mS/div	TP-2	VR5	2.0Vp-p	
	0.2V/div	5mS/div	TP-2	VR4	A - B < 0.1V	
	0.2V/div	5mS/div	TP-2	Grating	Null point	
						
	0.2V/div	5mS/div	TP-2	Grating	Max. amplitude	- Now rotate the screwdriver clockwise from its present position to the point where the tracking error amplitude is at its highest point. - While measuring the tracking error, tighten the attachment screws. After tightening the screws, confirm that the tracking error amplitude is still at its maximum level.

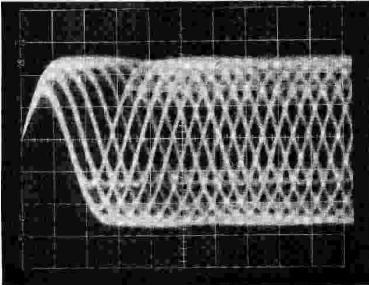
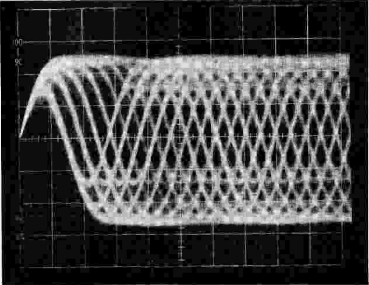
Step No.	Oscilloscope range		Test point	Adjustment point	Check points/Adjustment specifications	Adjustment procedure
	X: 0.1V/div Y: 20mV/div		X: TP-2 Y: TP-1	Grating	Min. on Y-axis	- Set the oscilloscope to the X-Y mode, perform AC coupling and observe the TRKG SUM and TRKG VAL lissajous' waveforms. - Fine adjust the grating so that the lissajous' waveform amplitude in the vertical direction is at its lowest level. - Next, press SCAN REV (◀◀) to move the pickup toward the center of the disc to the point just before the pickup pushes against the inside switch. - Check the lissajous' waveform. If it is not the same as the lissajous' waveform for the outer edge of the disc, adjust the position of the spindle motor.
			X: TP-2 Y: TP-1	SPDL Motor holder	Min. on Y-axis	
						
						

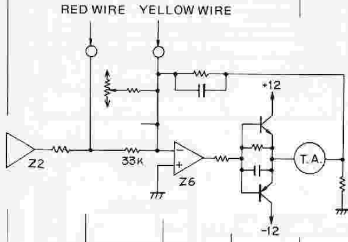
Step No.	Oscilloscope range	Test point	Adjustment point	Check points/Adjustment specifications	Adjustment procedure
7	X: 0.1V/div Y: 20mV/div	X: TP-2 Y: TP-1	SPDL Motor position adjustment hole	Min. on Y-axis	SPINDLE MOTOR POSITION ADJUSTMENT - Remove spindle motor attachment screw C (mechanism adjustment point in section 3-1) and insert the spindle motor position adjustment screwdriver in the screw hole. - Rotate the screwdriver to the point where the lissajous' waveform is at its lowest level in the vertical direction. - Check the waveforms at the inner and outer tracks of the disc. If either is not correct, repeat the spindle motor position adjustment. - After finishing the adjustment, replace the screw and apply screw lock.
8	50mV/div 0.5μs/div	DCDR C1 ⊕ DCDR C1 ⊕	Angle adjustment hexagonal bolt	Flatten the tops of the RF waveform Maximum eye pattern	SPINDLE MOTOR HORIZONTAL ADJUSTMENT IN TANGENTIAL DIRECTION - Press the stop button once and attach the 2-shaft screwdriver. - Press the FOCUS ON (▶▶), SPDL ON (▶) and TRKG CLOSE (◀▶) buttons in succession. - Roughly adjust VR2 (FOCUS OFFSET) so that the RF waveform eye pattern is at its highest level. - Rotate the 2-shaft screwdriver to the point where the tops of the peaks of the RF waveform are flat at the innermost tracks of the disc. - After finishing the adjustment, observe the RF waveform for between-songs tracks in the center and outer section of the disc to confirm that the peaks at these locations are also flat.



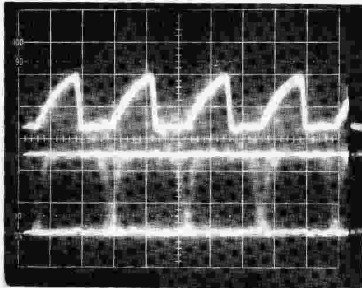
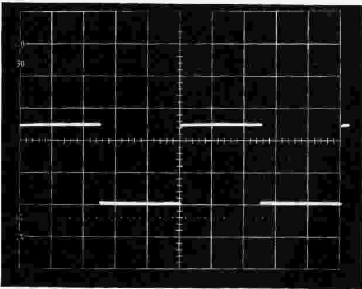
Step No.	Oscilloscope range	Test point	Adjustment point	Check points/Adjustment specifications	Adjustment procedure
9					INSIDE LIMIT SWITCH POSITION ADJUSTMENT - Stop the player and load test disc YEDS-7. - Press SCAN FWD (▶▶) to move the pickup toward the outer edge of the disc, then press stop and wait until the pickup stops returning. Finally, press FOCUS ON (▶▶), SPDL ON (▶) and TRKG C/L (◀▶) in succession. - Confirm that the display reads track 0, 4 min. 10 sec. ±10 sec. If the display is not correct, press stop and readjust the position of the inside switch.
10	X: 10mV/div Y: 20mV/div	Z2 2 Z1 7	VR3	Track 0 4 min. 10 sec. J-LED ON	FOCUS GAIN ADJUSTMENT - Set frequency of the FTG adjuster at 500 Hz with Frequency-VR1. - Set the gain of the FTG adjuster at 50mVp-p with Gain-VR1. Oscillator's output is available from Orange wire by turning the Switch to 1. - Connect the Orange wire of the FTG adjuster as shown in the diagram. - Connect the LPF (5.60 k/0.068μF) between Z1 output and the brown wire of the FTG adjuster. - Adjust VR3 to turn on the green j (JUST) LED. - Disconnect the FTG adjuster.

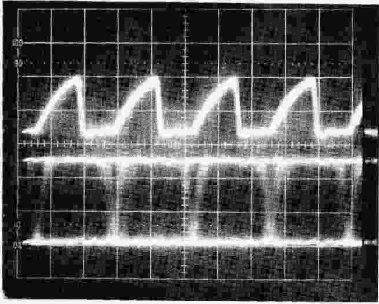
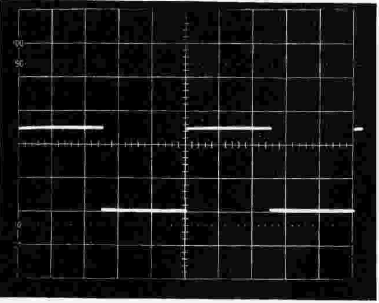


Step No.	Oscilloscope range		Test point	Adjustment point	Check points/Adjustment specifications	Adjustment procedure
11	0.1V/div	0.5 μ s/div	DCDR C1 ⊕	VR2	Max. eye pattern	FOCUS OFFSET ADJUSTMENT - Observe the RF waveform during the second track. - Fine adjust VR2 (FOCUS OFFSET) so that the eye pattern aperture is at its maximum. 
	0.1V/div	0.5 μ s/div	N15-7	VR2	Within ± 0.1 V	Press stop and confirm that the DC voltage at N15-7 is 0V $\pm$ 0.1 V. If the voltage is not correct, fine adjust VR2 to bring to either +0.1 V or -0.1 V, whichever is closest.
12	0.1V/div	0.5 μ s/div	DCDR C1 ⊕	VR1	0.5V $\pm$ 0.05 V	RF LEVEL ADJUSTMENT - Observe the RF waveform during the second track. - Adjust VR1 (RF level) so that the amplitude of the RF waveform is 0.5V $\pm$ 0.05 V. 

Step No.	Oscilloscope range		Test point	Adjustment point	Check points/Adjustment specifications	Adjustment procedure
13	X: 20mV/div Y: 0.2V/div		Z6 ② Z2 ⑦	VR5	J-LED ON	TRACKING GAIN ADJUSTMENT - Set the frequency of the FTG adjuster at 1.35 kHz with Frequency-VR2. - Set the gain of the FTG adjuster at 30 mVp-p with Gain-VR2. Oscillator's output is available from Yellow wire by turning the Switch to 2. - Connect the Yellow wire of the FTG adjuster as shown in the diagram. - Connect red wire of the FTG adjuster as shown in the diagram. - Adjust VR5 to turn J-LED on. 

Step No.	Oscilloscope range		Test point	Adjustment point	Check point/Adjustment specifications	Adjustment procedure
14	50mV/div	1mS/div	N13-2	SPDL motor height adjustment bolt	DC -200mV ±100mV	SPINDLE MOTOR RADIAL ANGLE CONFIRMATION - Perform DC coupling for channel 1 of the oscilloscope and AC coupling for channel 2, reverse the polarity and set both channels 1 and 2 to ADD. - Connect both channels 1 and 2 to N13-2. - Check the DC voltage at the innermost and outermost tracks of the disc. Correct value: -200 mV ± 100 mV - The difference between the two DC voltages obtained in the above step should not be more than 50mV. - If the difference is larger, readjust the spindle motor height (angle). After completing all of the above steps: - Replace the test CPU with the original PD3007, or PD3014 type. - Replace the mechanism ass'y in the player.

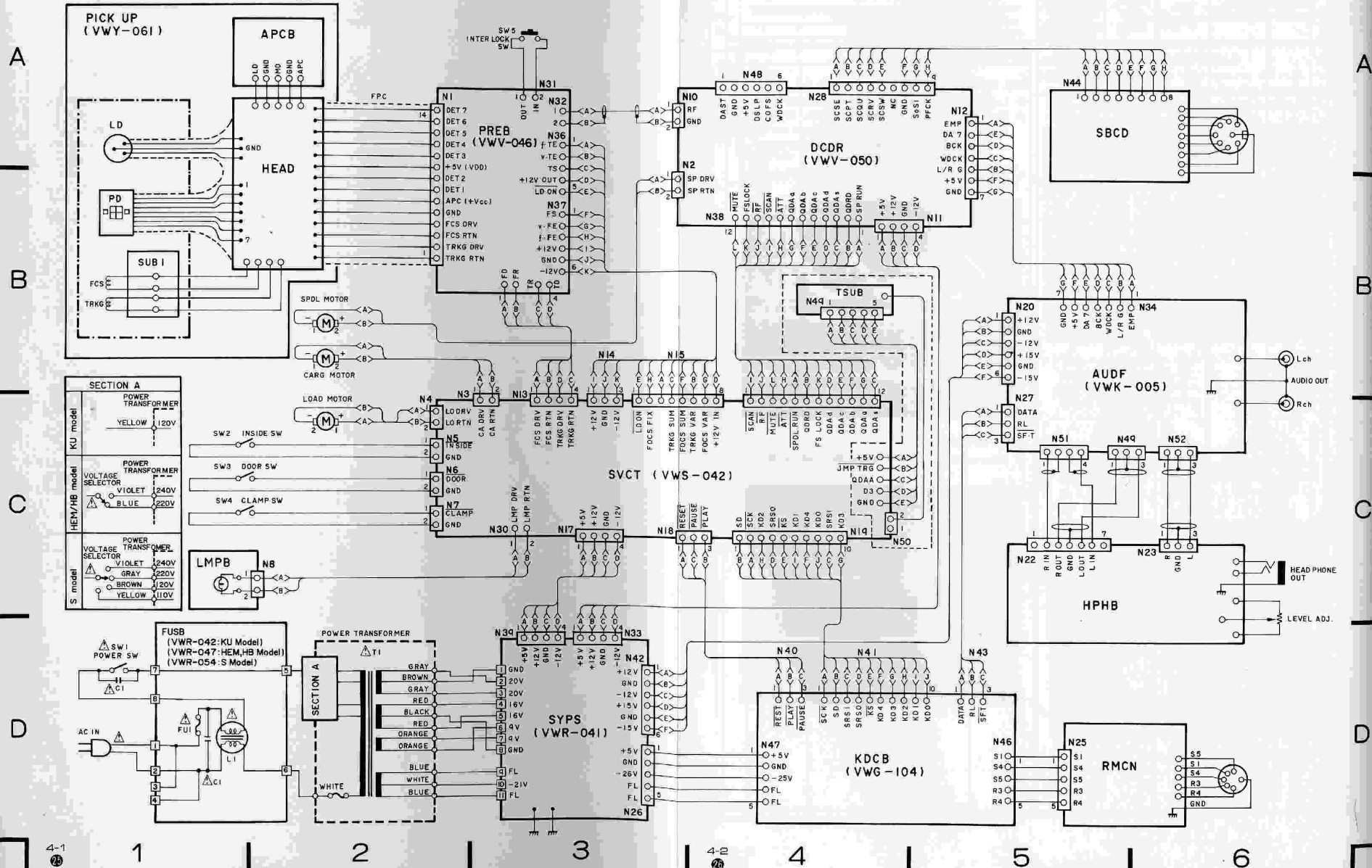
Step No.	Oscilloscope range		Test point	Adjustment point	Check points/Adjustment specifications	Adjustment procedure
	2V/div 2V/div	0.1 μs/div	DCDR Z3 ② (PLCK) Z3 ④ (EFM2)	DCDR VR1	See photo	DCDR PANEL PLL OFFSET - Load the YEDS-7 test disc and press the play button. - Observe the PLCK and EFM2 waveforms. (Apply the trigger for PLCK.) (The upper photo shows the PLCK waveform and the lower photo shows the EFM2.) - Align the edge of the PLCK rise with the EFM2 jitter.  SPDL OFFSET - Observe APCO and adjust so the duty ratio is 50%. 
	2V/div	20 μs/div	DCDR Z1 ⑥ (APCO)	DCDR VR2	Duty 50%	

Step No.	Oscilloscope range		Test point	Adjustment point	Check points/Adjustment specifications	Adjustment procedure
	2V/div 2V/div	0.1 μ S/div	DCDR Z3 ⑫ (PLCK) Z3 ⑭ (EFM2)	DCDR VR1	See photo	DCDR PANEL PLL OFFSET - Load the YEDS-7 test disc and press the play button. - Observe the PLCK and EFM2 waveforms. (Apply the trigger for PLCK.) (The upper photo shows the PLCK waveform and the lower photo shows the EFM2.) - Align the edge of the PLCK rise with the EFM2 jitter.  SPDL OFFSET - Observe APCO and adjust so the duty ratio is 50%. 
	2V/div	20 μ S/div	DCDR Z1 ⑩ (APCO)	DCDR VR2	Duty 50%	

Step No.	Oscilloscope range		Test point	Adjustment point	Check points/Adjustment specifications	Adjustment procedure
	2V/div	1mS/div	DCDR R42/C17	VL1	5V $\pm$ 0.2V	BRAKE PULSE ADJUSTMENT - Load the demonstration disc and press the play button. - Press the stop button while playing the first track and measure the time required for the disc to come to a full stop on its own in the clockwise direction. - Press the stop button while playing the last track and measure the time required for the disc to come to a full stop on its own in the counterclockwise direction. - The stopping time should be about the same for both the first and last tracks. - If the stopping times differ significantly, adjust VR3. VCO ADJUSTMENT - While playing a disc, measure the DC voltage at the point between DCDR R42 and C17 to confirm that it is 5V $\pm$ 0.2V. - If the voltage is not acceptable, adjust VL1.
	10mV/div 10mV/div	1mS/div 1mS/div	SVCT TP-7 TP-6	SVCT VR2	0.3 $\pm$ 0.05V	SVCT PANEL LOADING STOP ADJUSTMENT - Press the OPEN/CLOSE button to eject the disc. - Press the OPEN/CLOSE button again and, while the loading motor is rotating (while the disc table is closing), adjust VR2 so that the voltage drop between TP-7 and TP-6 is 0.3V $\pm$ 0.05V. - After finishing adjustments, block the disc table loading movement (when the table is moving inward) and confirm that the loading motor stops rotating. AUDF PANEL OFFSET ADJUSTMENT - Turn on the power and adjust so that the DC voltage at TP-1 is 0V $\pm$ 10 mV. - Adjust so that the DC voltage at TP-2 is 0V $\pm$ 10 mV.
	10mV/div 10mV/div	1mS/div 1mS/div	AUDF TP-1 TP-2	AUDF VR1 VR2	0V $\pm$ 10mV 0V $\pm$ 10mV	

4. SCHEMATIC DIAGRAM, PCB PATTERNS, & PARTS LIST

4.1 OVERALL CONNECTION DIAGRAM



Miscellaneous Parts List

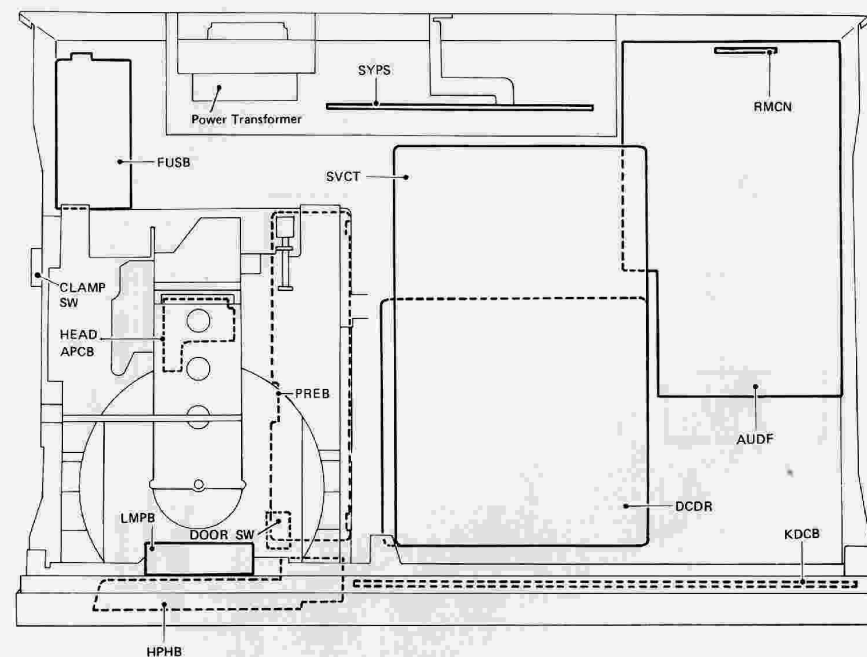
NOTES:

- Parts without part number cannot be supplied.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

P-D70/HEM Parts list 1
 (MK)(Part No.) (IT)(REF Nos. & DESCRIPTIONS)

VWR-041	SYPS
VWR-047	FUSB
VUV-046	PREB
VVS-042	SVCT
VWV-058	DCDR
VWK-005	AUDF
VWG-104	KDCB
	TSUB
	HPHB
VWY-047	LMPB
	INTB
	RMCN
Δ VUY-061	Pickup
Δ VTT-038	Power transformer
Δ VSA-006	SW 1 Power switch
Δ VCG-018	Capacitor
VEK-012	FU1 250mA
VSF-009	SW2-4
VXM-032	CARG Motor
VXM-033	SPDL Motor
VXM-034	Loading motor
VSA-001	Voltage selector
Δ VDG-019	Power cord

4.2 LOCATION OF PCBS



Abbreviation List

FUSB	Fuse board	DCDR	Decoder board
SYPS	System power supply	AUDF	Audio & filter board
HEAD	Head amp.	HPHB	Headphone board
APCB	Automatic laser power control board	LMPB	Lamp board
PREB	Pre-processing board	KDCB	Key, display, & control board
SVCT	Servo & control board	RMCN	Remote control board

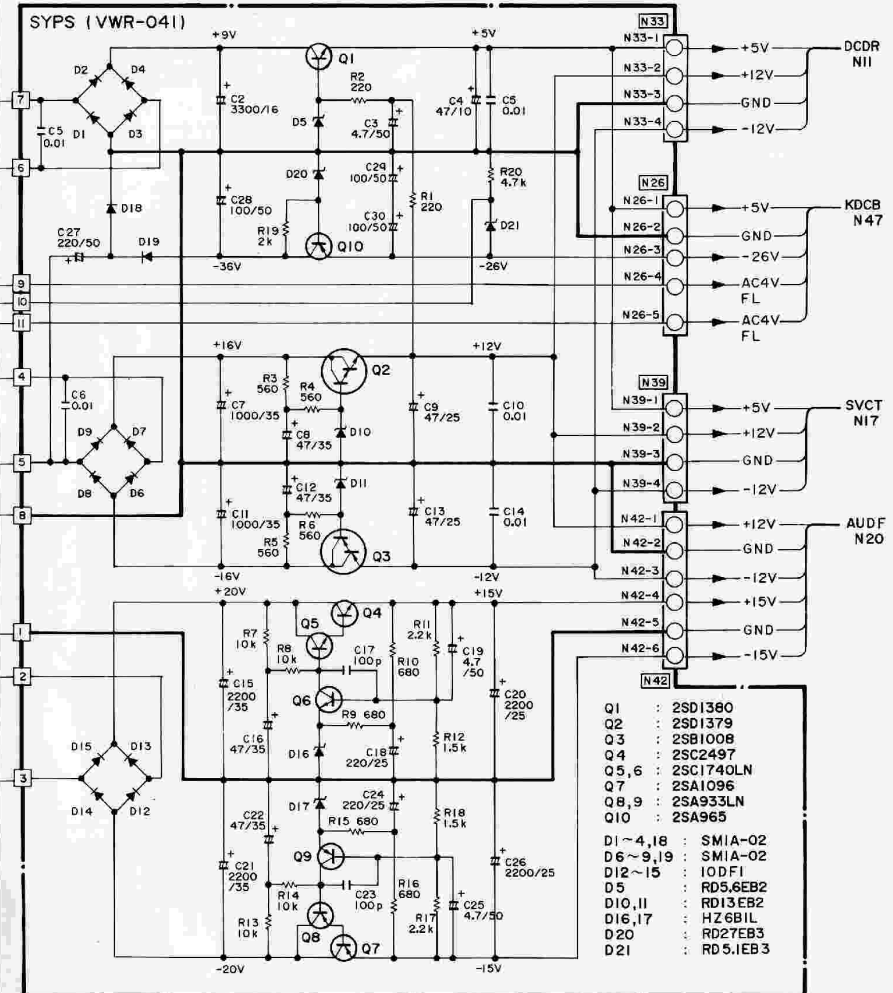
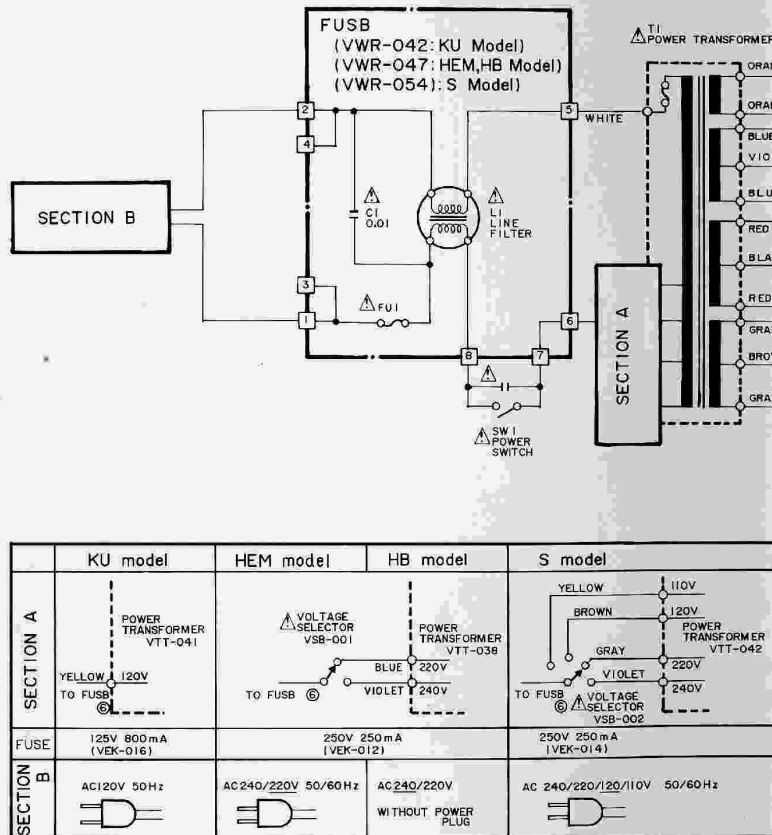
4.3 FUSB, SYPS

A

B

C

D

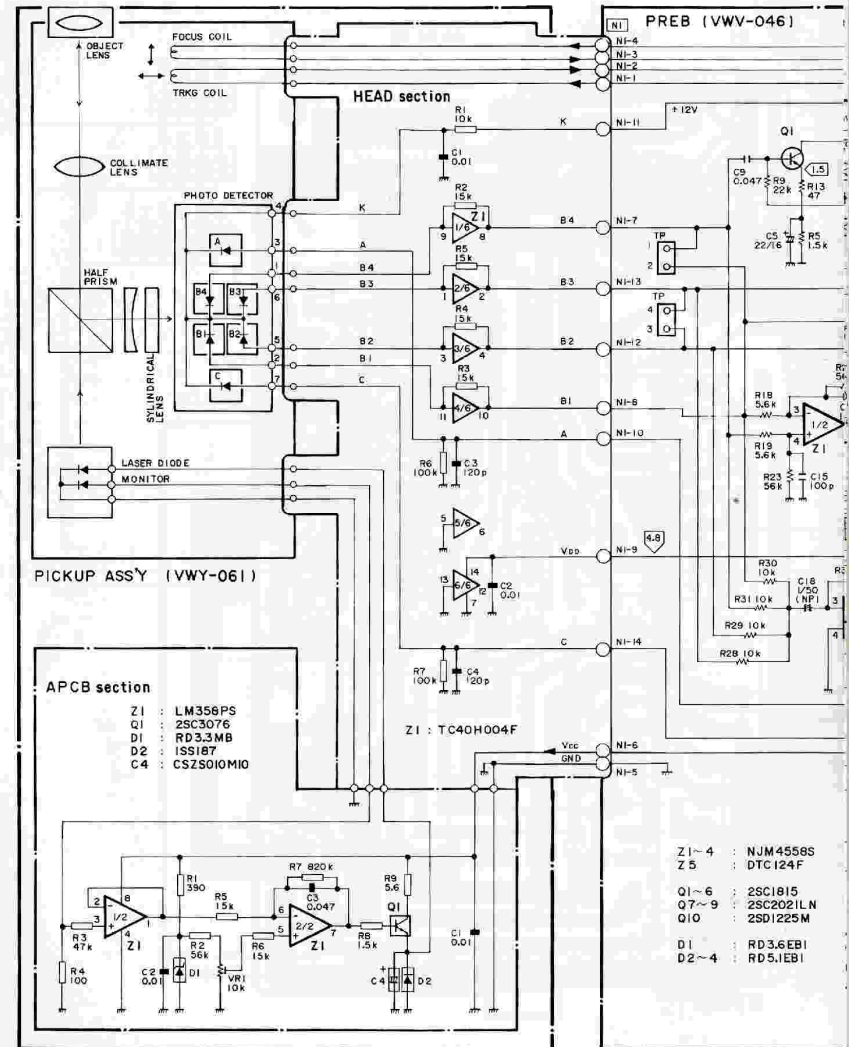
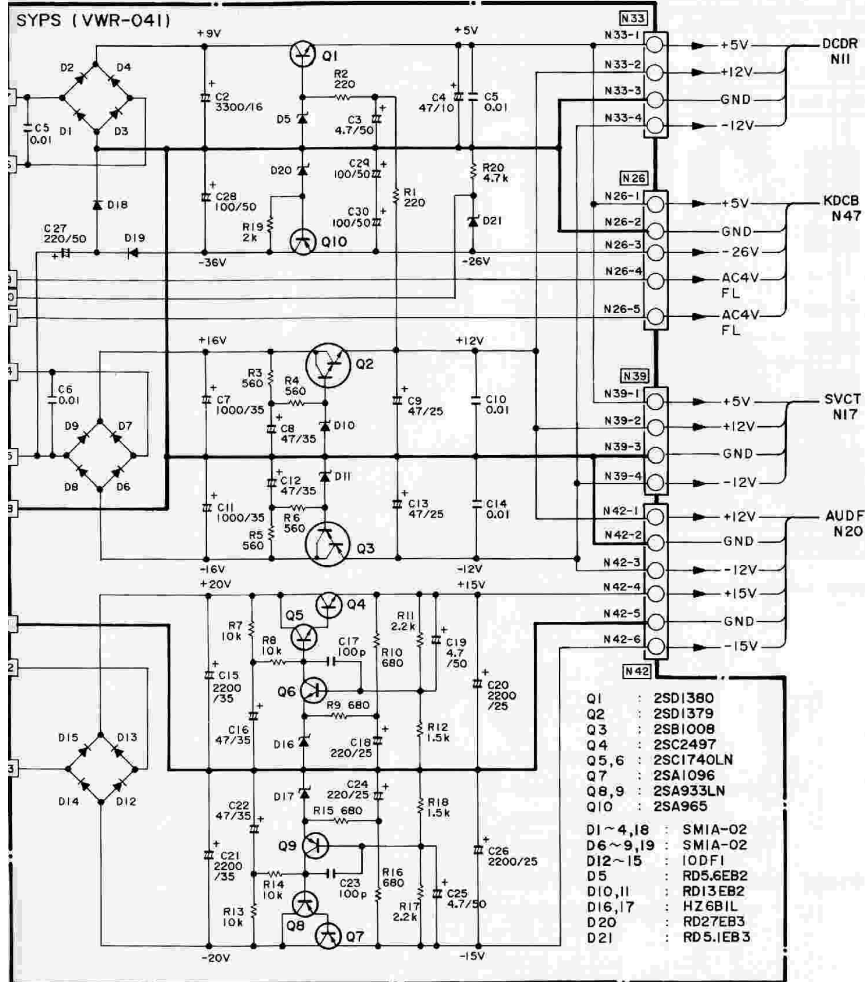


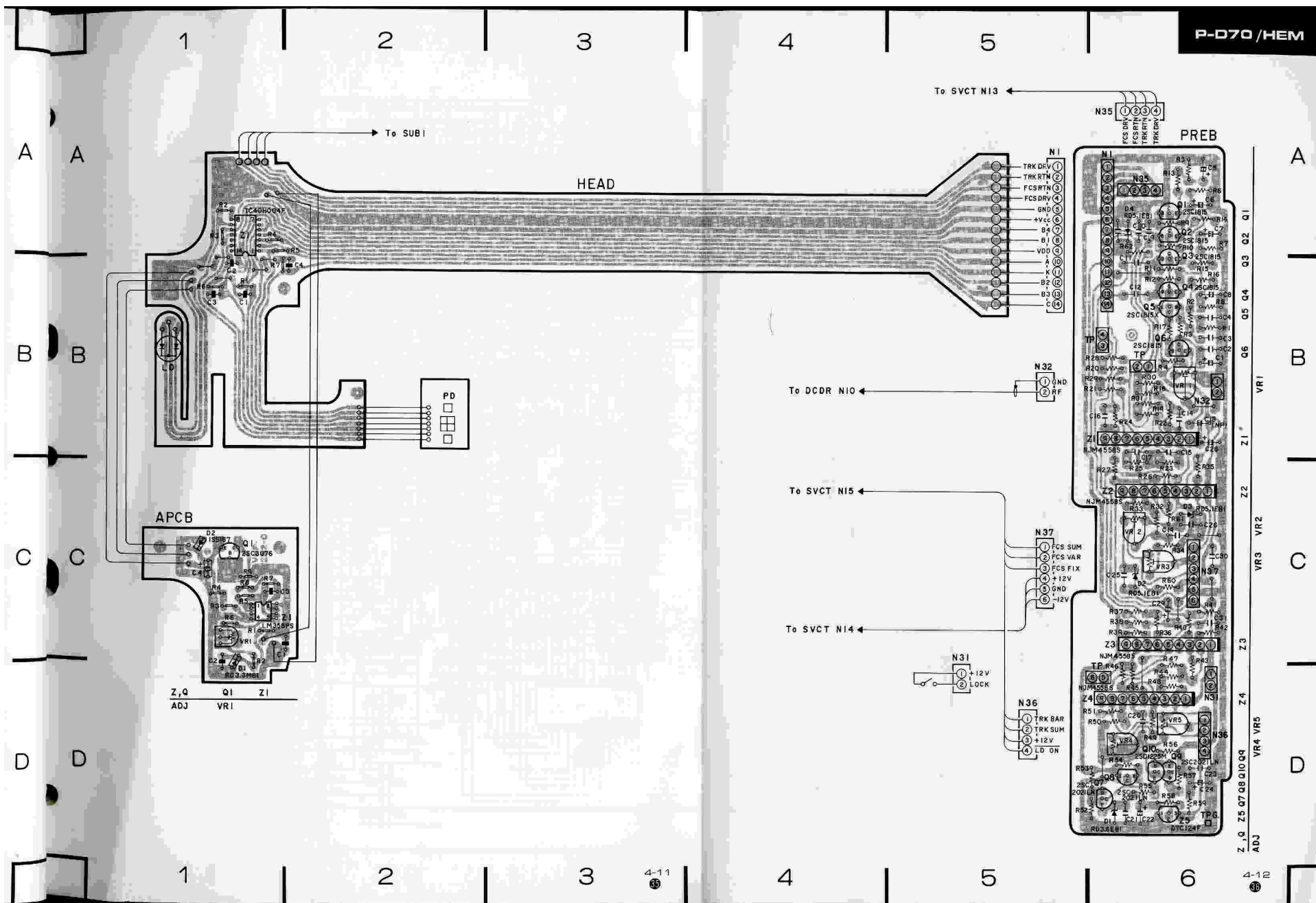
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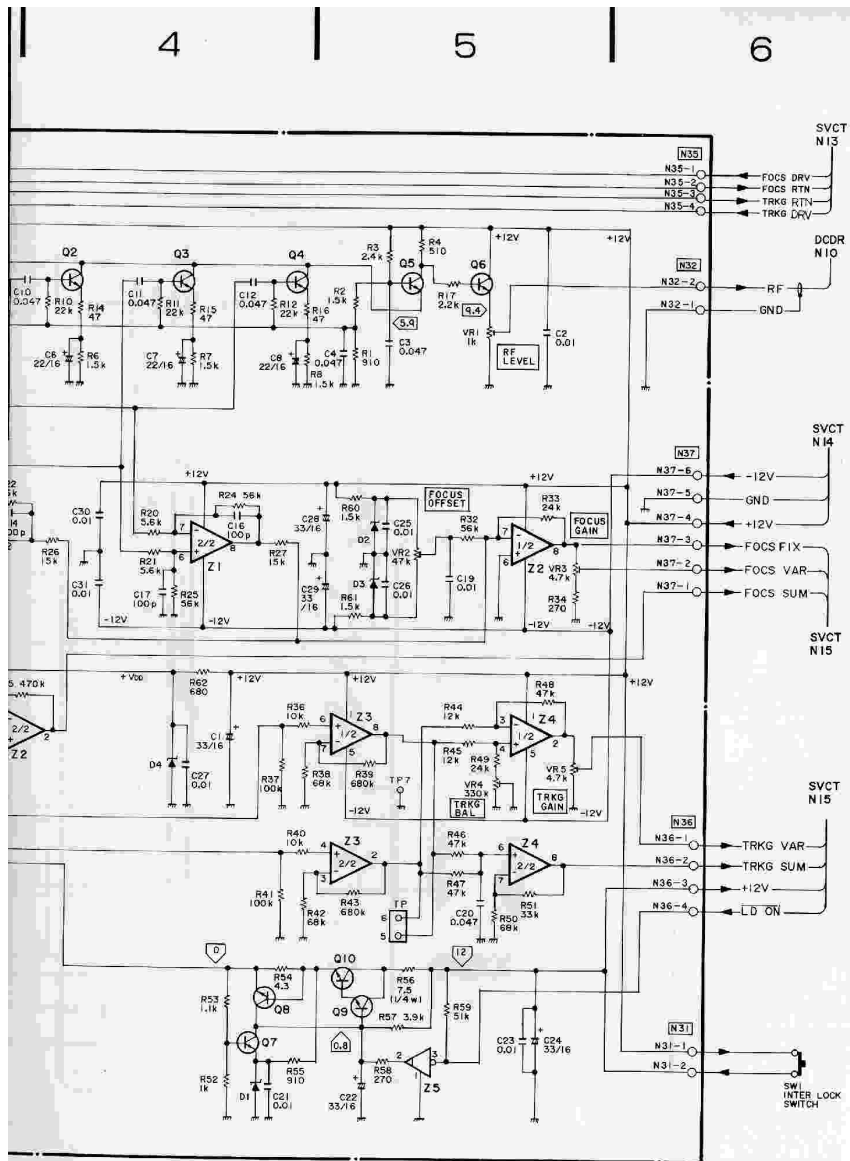
B

C

D





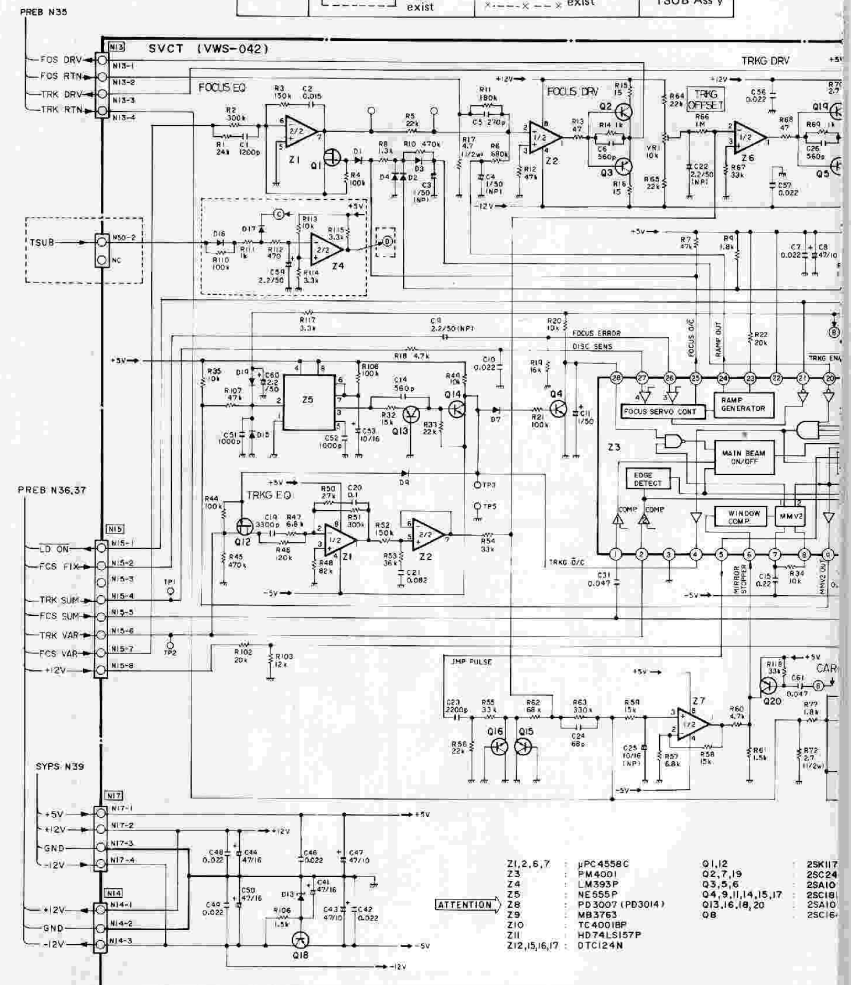


P-D70/HEM

4.5 SVCT, LMPB

CPU Z8			
PD3007	exist	not exist	with TSUB ass'y
PD3014	not exist	exist	without TSUB Ass'y

DCDR

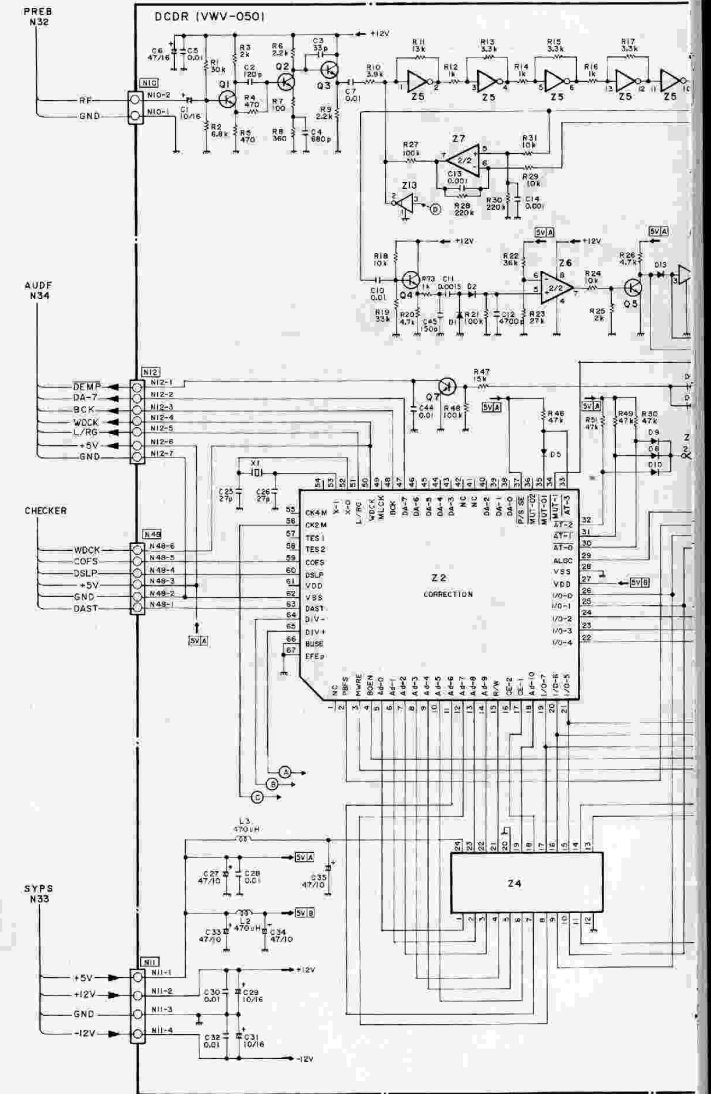
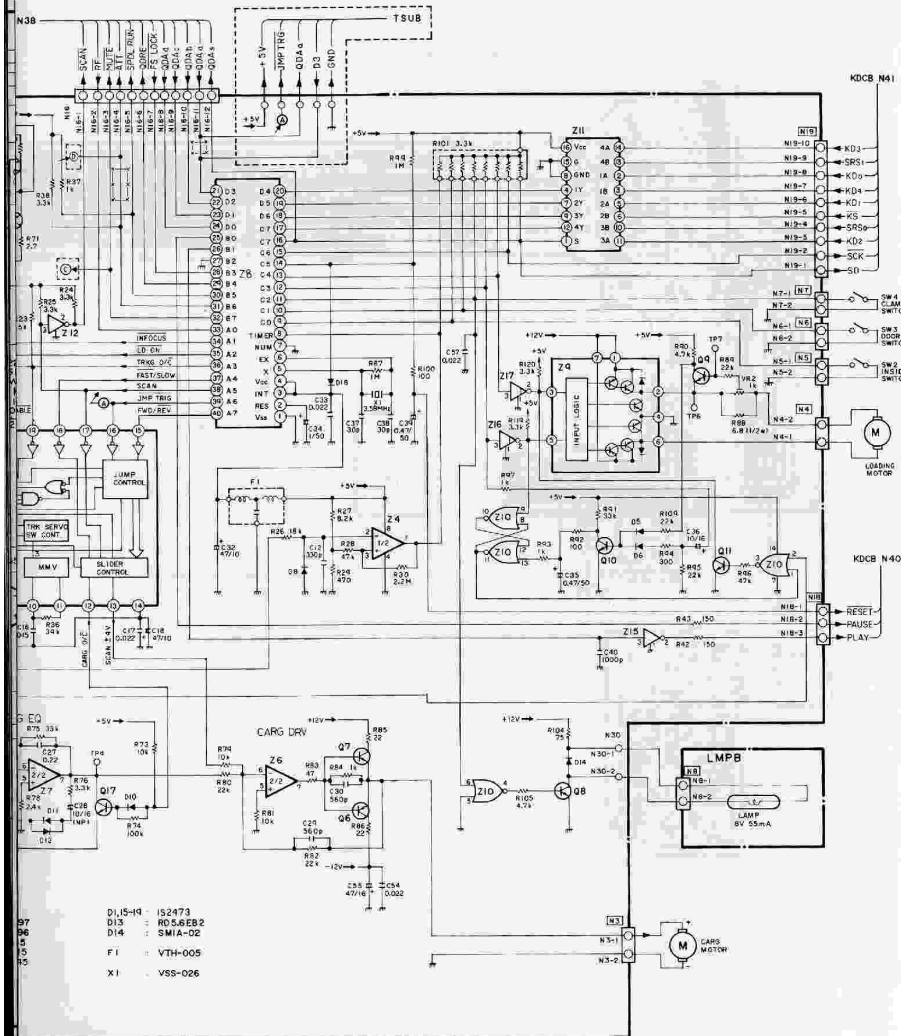


ATTENTION

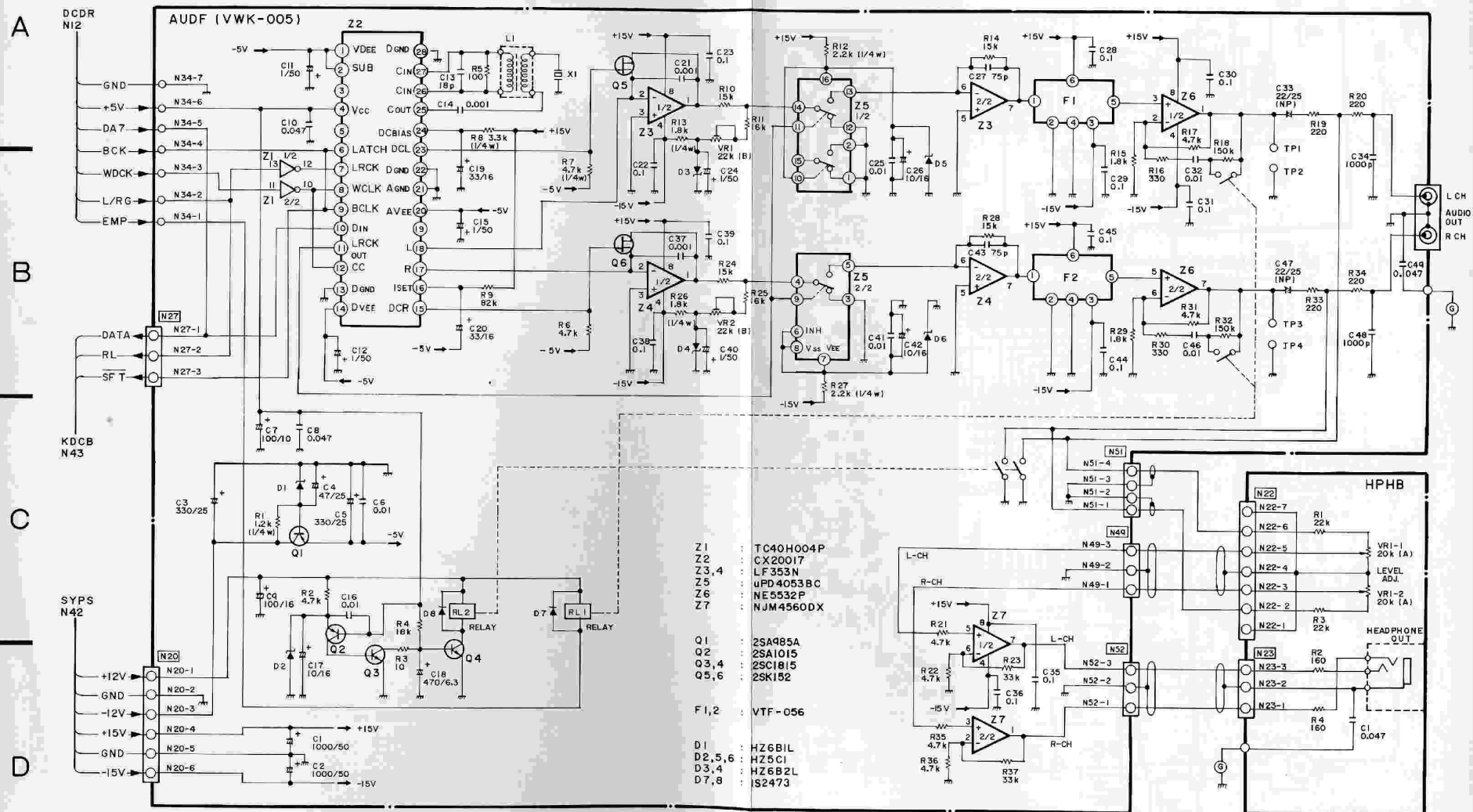
- Z1,2,5,7 : μ PC4558C
- Z3 : FWA001
- Z4 : LM393P
- Z5 : NE555P
- Z6 : PD3007 (PD3014)
- Z9 : MC3763
- Z10 : TC4001BP
- Z11 : HD74LS167P
- Z12,15,16,17 : DTC124N
- Q1,12 : 2SK117
- Q2,7,19 : 2SC24
- Q3,5,16 : 2SA10
- Q4,9,11,14,15,17 : 2SC181
- Q13,16,18,20 : 2SA10
- Q8 : 2SC16

P-D70/HEM

4.6 DCDR

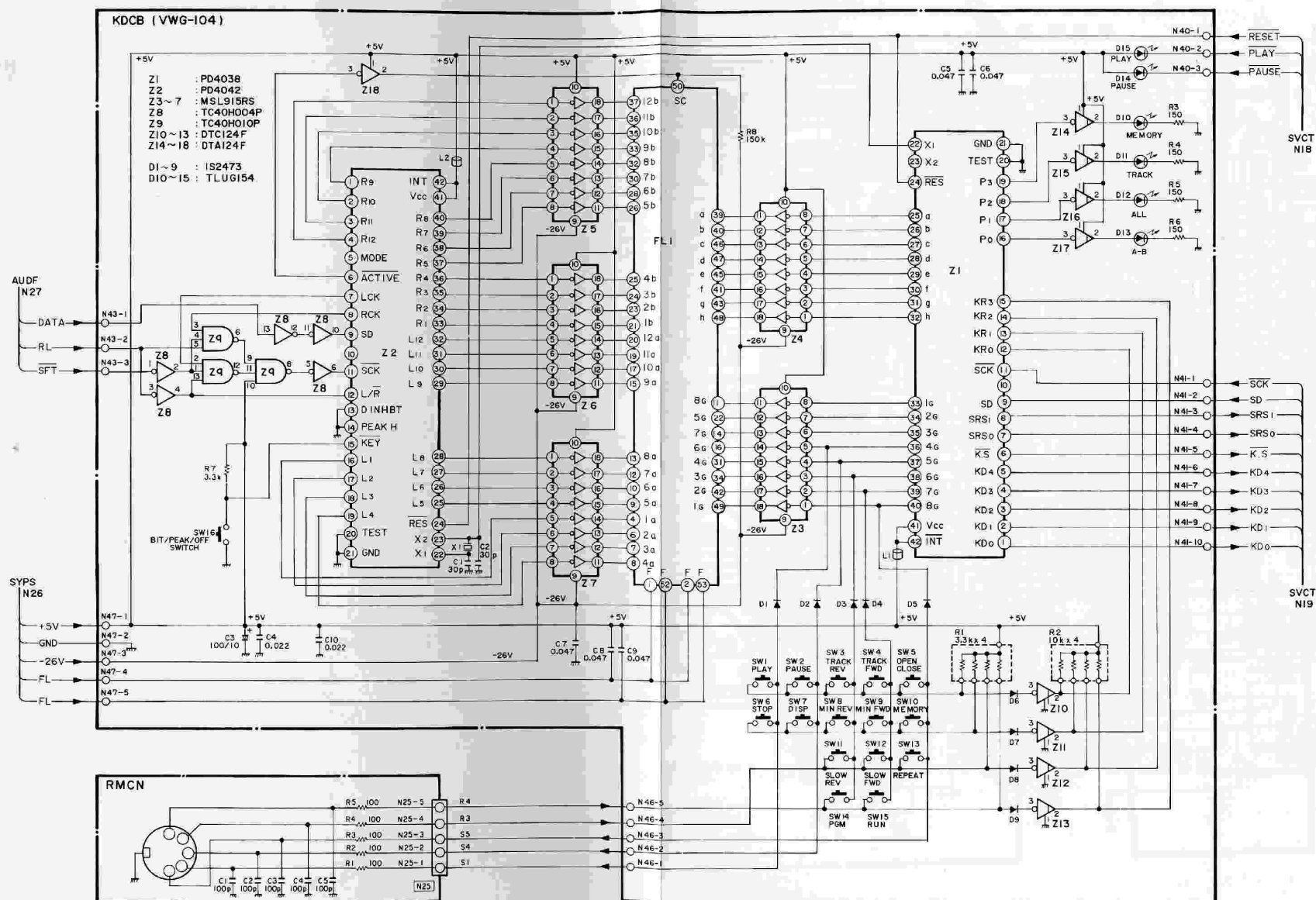


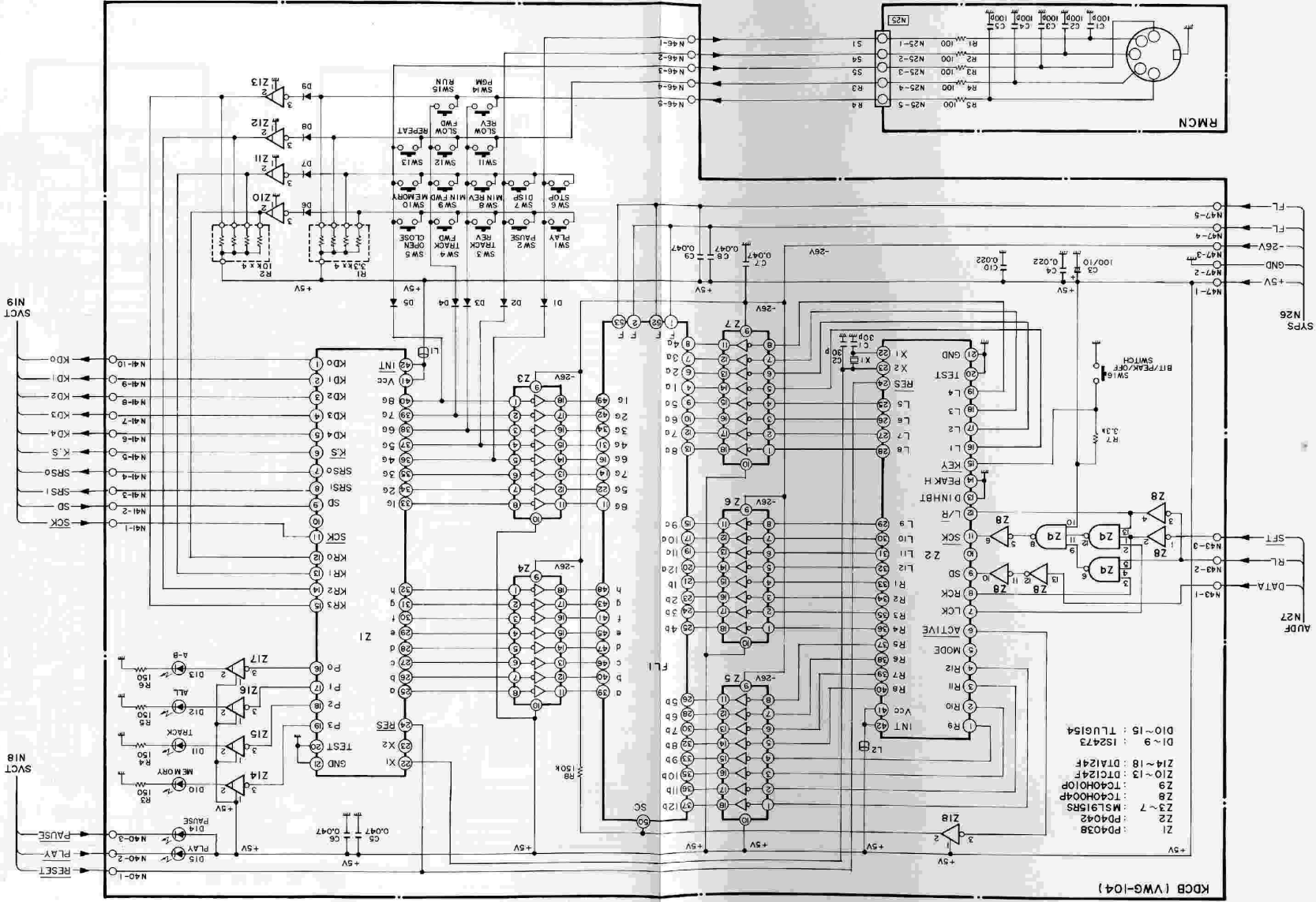




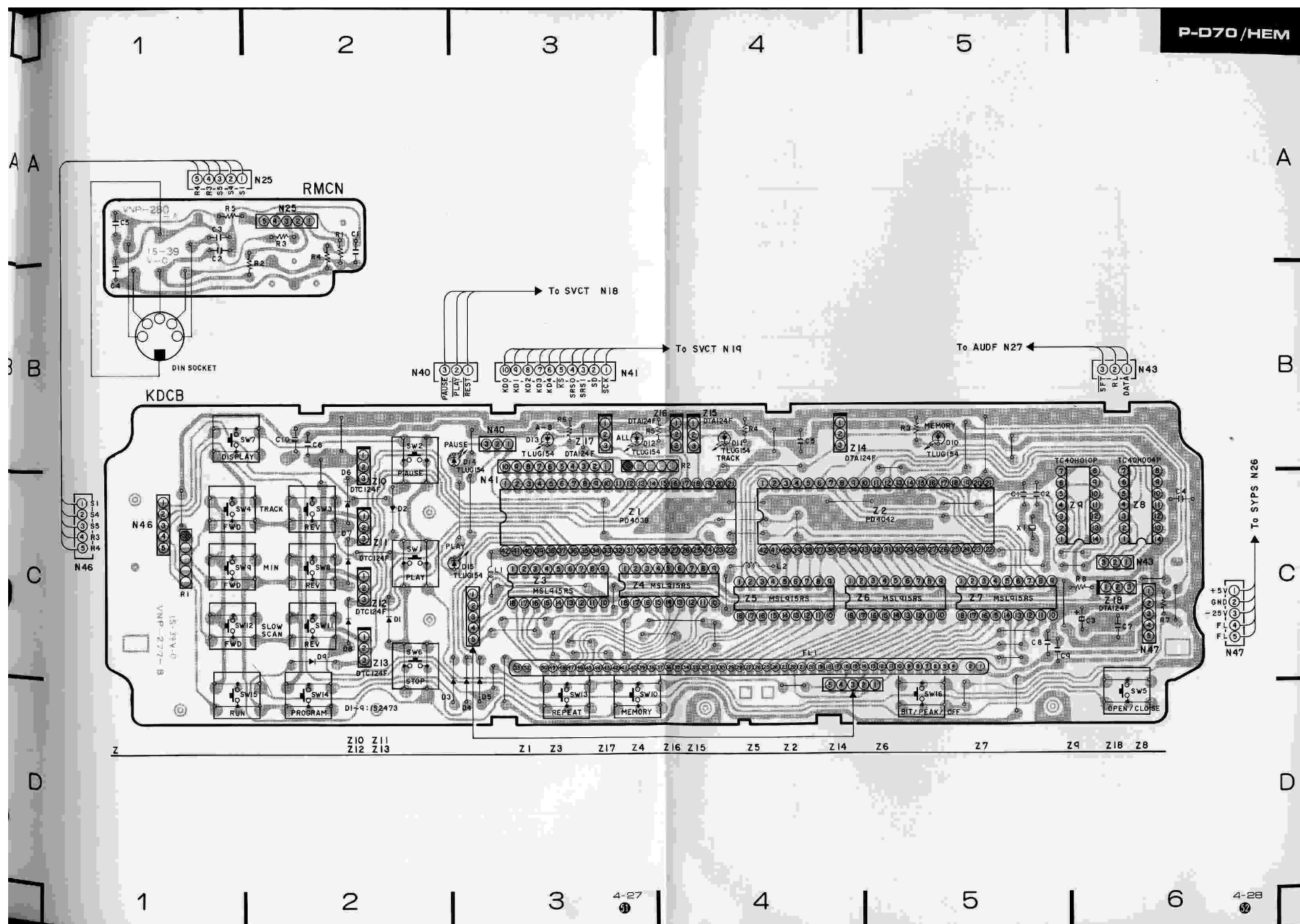


4.8 KDCB, RMCN



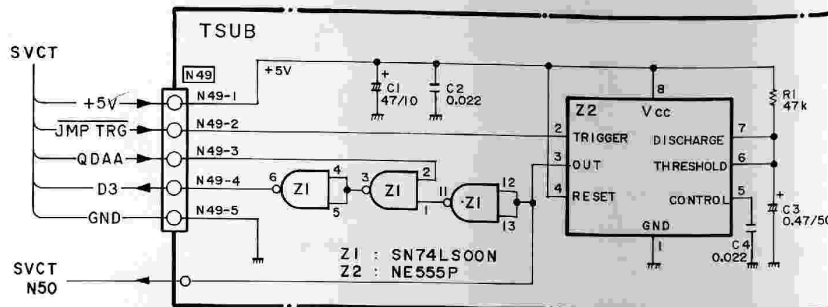


1 2 3 4 5 6 4-25 50 4-25 1 2 3 4 5 6



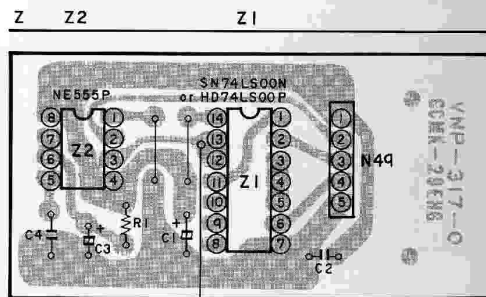
4.9 TSUB

A



B

C



D

To SVCT N50

4.10 PARTS LIST

NOTES:

- Parts without part number cannot be supplied.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

SYSP(VVR-041) Parts list

1

(MK)(Part No.) (IT)(REF Nos. & DESCRIPTIONS)

2SD1390	Q	1
2SD1379	Q	2
2SB1008	Q	3
2SC2497	Q	4
2SC1740LN	Q	5, 6
2SA1096	Q	7
2SA933LN	Q	8, 9
2SA965	Q	10
SM1A-02	D	1- 4, 6- 9, 18, 19
RD5.6EB2	D	5
RD13EB2	D	10, 11
10DF1	D	12- 15
HZ6B1L	D	16, 17
RD27EB3	D	20
RD5.1EB3	D	21
RD1/6PS000J	R	1- 20
CKDYF103Z50	C	1, 5, 6, 10, 14
VCH-021	C	2, 3300/16
CEA47M50	C	3, 19, 25
CEA470M10	C	4
VCH-013	C	7, 11 1000/35
CEA470M35	C	8, 12, 16, 22
CEA470M25	C	9, 13
VCH-019	C	15, 21
VCF-001	C	17, 23
CEYA221M25	C	18, 24
CEYA222M25	C	20, 26
CEA221M50	C	27
CEA101M50	C	28- 30
VBF-003		Ceramic tube
VBA-003		Screw
VEC-072		Spacer

FUSB(VVR-047) Parts list

1

(MK)(Part No.) (IT)(REF Nos. & DESCRIPTIONS)

Δ VCG-018	C	1	Capacitor
Δ VTL-003	L	1	Line filter
Δ VEK-012	FU	1	Fuse
VKR-002			Fuse holder

PRES(VVR-046) Parts list

1

(MK)(Part No.) (IT)(REF Nos. & DESCRIPTIONS)

NJM4558S	Z	1- 4
DTC124F	Z	5
2SC1815	Q	1- 6
2SC2021LN	Q	7- 9
2SD1225M	Q	10
RD3.6EB1	D	1
RD5.1EB1	D	2- 4
RD1/6PS000J	R	1- 55, 57- 62
RD1/4PM000J	R	56
VCP-070	VR	1 1k
VCP-080	VR	2 47k
VCP-074	VR	3, 5 4.7k
VCP-085	VR	4 330k
CEA330M16	C	1, 22, 24, 28, 29
CKDYF103Z50	C	2, 19, 21, 23, 25- 27, 31
VCG-003	C	3, 4, 9- 12, 20 0.047
CEA220M16	C	5- 8
CCDSL101J50	C	14- 17
CEA010M50NP	C	18

C

D

4.10 PARTS LIST

NOTES:

- Parts without part number cannot be supplied.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

SYPS(VWR-041) Parts list 1
(MK)(Part No.) (IT)(REF Nos. & DESCRIPTIONS)

2SD1380	Q	1
2SD1379	Q	2
2SB1008	Q	3
2SC2497	Q	4
2SC1740LN	Q	5, 6
2SA1096	Q	7
2SA933LN	Q	8, 9
2SA965	Q	10
SM1A-02	D	1- 4, 6- 9, 18, 19
RD5.6EB2	D	5
RD13EB2	D	10, 11
18DF1	D	12- 15
HZ6B1L	D	16, 17
RD27EB3	D	20
RD5.1EB3	D	21
RD1/6PS000J	R	1- 20
CKDYF103Z50	C	1, 5, 6, 10, 14
VCH-021	C	2 3300/16
CEA4R7M50	C	3, 19, 25
CEA470M10	C	4
VCH-013	C	7, 11 1000/35
CEA470M35	C	8, 12, 16, 22
CEA470M25	C	9, 13
VCH-019	C	15, 21
VCF-001	C	17, 23
CEYA221M25	C	18, 24
CEYA222M25	C	20, 26
CEA221M50	C	27
CEA101M50	C	28- 30
VBF-003		Ceramic tube
VBA-003		Screw
VEC-072		Spacer

FUSB(VWR-047) Parts list 1
(MK)(Part No.) (IT)(REF Nos. & DESCRIPTIONS)

Δ VCG-010	C	1	Capacitor
Δ VTL-003	L	1	Line filter
Δ VEK-012	FU	1	Fuse
VKR-002			Fuse holder

PREB(VWV-046) Parts list 1
(MK)(Part No.) (IT)(REF Nos. & DESCRIPTIONS)

NJM4558S	Z	1- 4
DTC124F	Z	5
2SC1815	Q	1- 6
2SC2021LN	Q	7- 9
2SD1225M	Q	10
RD3.6EB1	D	1
RD5.1EB1	D	2- 4
RD1/6PS000J	R	1- 55, 57- 62
RD1/4PM000J	R	56
VCP-070	VR	1 1k
VCP-080	VR	2 47k
VCP-074	VR	3, 5 4.7k
VCP-085	VR	4 330k
CEA330M16	C	1, 22, 24, 28, 29
CKDYF103Z50	C	2, 19, 21, 23, 25- 27, 31
VCG-003	C	3, 4, 9- 12, 20 0.047
CEA220M16	C	5- 8
CCDSL101J50	C	14- 17
CEA010M50NP	C	18

NOTES:

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SVCT(VUS-042) Parts list 1
(MK)(Part No.) (IT)(REF Nos. & DESCRIPTIONS)

JPC4558C	Z	1, 2, 6, 7
(NJM4558D)		
PM4001	Z	3
LM393P	Z	4
(JPC393C)		
NE555P	Z	5
PD3007	Z	8
MB3763	Z	9
TC4001BP	Z	10
(M8B4001BM)		
SN74LS157N	Z	11
(HD74LS157P)		
DTC124N	Z	12, 15- 17
2SK117	Q	1, 12
2SC2497	Q	2, 7, 19
2SA1096	Q	3, 5, 6
2SC1815	Q	4, 9- 11, 14, 15, 17
2SC1645	Q	8
2SA1015	Q	13, 16, 18, 20
1S2473	D	1- 12, 15- 19
RD5.6EB2	D	13
SM1A-02	D	14
RD1/6PS000J	R	1- 14, 18, 19, 21- 29, 32- 42, 44- 69, 73- 84, 87, 89- 100, 102- 107, 109
RD1/4PM000J	R	15, 16, 43, 70, 71, 85, 86
RD1/2PS000J	R	17, 72, 85, 86
RD1/4VM000J	R	20, 23, 30, 34, 108, 116- 120
RD1/2VS6RB3	R	88
VCH-070	R	101 8P 3.3k
VCP-076	VR	1 10k
VCP-070	VR	2 1k
CQMA122J50	C	1
CQMA393J50	C	2
CEA010M50NP	C	3, 4
CCDSL271J50	C	5
CCDSL561J50	C	6, 14, 26, 29, 30
CKDYF223Z50	C	7, 10, 17, 33, 42, 46, 48, 49, 54, 56- 58
CEA470M10	C	8, 18, 32, 43, 47
CEA2R2M50NP	C	9, 22
CEA010M50	C	11, 34
CCDSL331J50	C	12
CQMA224J50	C	15, 27
CQMA153J50	C	16
CQMA332J50	C	19
CQMA104J50	C	20
CQMA823J50	C	21
CQMA222J50	C	23
CCDSL680J50	C	24
CEA100M16NP	C	25, 28
CQMA473J50	C	31, 61
CEA47M50	C	35, 39
CEA100M16	C	36, 53
CCDSL300J50	C	37, 38
CEA470M16	C	41, 44, 50, 55
CQMA102J50	C	51, 52
CEA2R2M50	C	59, 60

SVCT(VUS-042) Parts list 2
(MK)(Part No.) (IT)(REF Nos. & DESCRIPTIONS)

VTH-005	F	1
VSS-026	X	1 3.58MHz
VKH-012		IC 40P socket

LMPB(VWY-044) Parts list 1
(MK)(Part No.) (IT)(REF Nos. & DESCRIPTIONS)

VEL-003		Lamp
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NOTES:

- Parts without part number cannot be supplied.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

AUDF(VWK-005) Parts list 1 (MK)(Part No.) (IT)(REF Nos. & DESCRIPTIONS)

TC40H004P	Z	1	
CX20017	Z	2	D/A
LF353N	Z	3, 4	
uPD4053BC	Z	5	
NE5532P	Z	6	
NJM4560DX	Z	7	
2SA985A	Q	1	
2SA1015	Q	2	
2SC1815	Q	3, 4	
2SK152-3	Q	5, 6	
HZ6B1L	D	1	
HZ5C1	D	2, 5, 6	
HZ6B2L	D	3, 4	
1S2473	D	7, 8	
RD1/0PM000J	R	1, 7, 9, 12, 27	
RD1/6PS000J	R	2- 6, 21- 23, 35- 37	
VCN-117	R	9	82.0k
VCN-118	R	10, 14, 24, 28	15.0k
VCN-123	R	11, 25	16.0k
RD1/4VM000J	R	13, 26	
VCN-121	R	15, 29	1.80k
VCN-120	R	16, 30	330
VCN-079	R	17, 31	4.70k
VCN-122	R	18, 32	150k
VCN-115	R	19, 20, 33, 34	220
VCR-028	VR	1, 2	22k
CEYA102M50	C	1, 2	
CEYA331M25	C	3, 5	
CEYA470M25	C	4	
VCE-020	C	6, 25, 41	
CEA101M18	C	7	
VCG-025	C	8, 10, 49	
CEA101M16	C	9	
CEA010M50	C	11, 12, 15, 24, 48	
CCDCH100J50	C	13	
CKDYB102K50	C	14	
CKDYF103Z50	C	16	
CEA100M16	C	17, 26, 42	
CEA471M6R3	C	18	
CEA330M16	C	19	
CEYA330M25	C	20	
VCE-017	C	21, 37	1000p
VCE-019	C	22, 23, 28- 31, 35, 36, 38,	
	C	39, 44, 45	
VCF-004	C	27, 43	75p
VCE-018	C	32, 46	8.01
CEXANP220M25	C	33, 47	
CKDYF223Z50	C	50	
VTL-156	L	1	
VTF-056	F	1, 2	L.P.F
VSS-030	X	1	35.002MHz
VSR-006	RL	1	Reed relay
VSR-005	RL	2	12V

DCDR(VUV-050) Parts list 1 (MK)(Part No.) (IT)(REF Nos. & DESCRIPTIONS)

TC9178F	Z	1	
TC9179F	Z	2	
TD6315P	Z	3	
HM6116P-4	Z	4	
TC40H004P	Z	5	
TL882CP	Z	6	
uPC4550C	Z	7, 8	
(NJM4558D)			
DTC124F	Z	9- 13	
2SC1815	Q	1- 7	
2SA1015	Q	8	
2SC2060	Q	9	
2SA1096	Q	10	
2SK30ATM	Q	11	
1S2473	D	1, 2, 4- 13	
KV1226VBR	D	3	
RD1/6PS000J	R	1- 8, 10- 33, 35- 38, 40-	
RD1/4VM000J	R	66, 70- 72	
RD1/2VS000J	R	9, 34, 73	
	R	67- 69	
VCP-070	VR	1	1K
VCP-008	VR	2, 3	47k
CEA100M16	C	1, 23, 24, 29, 31	
CCDCH121J50	C	2	
CCDCH330J50	C	3	
CCDSL681J50	C	4	
CKDYF103Z50	C	5, 7, 8, 10, 15, 19, 22,	
	C	28, 30, 32, 42, 44	
CEA470M16	C	6	
CEA470M18	C	9, 27, 33- 35	
CQMA152J50	C	11	
CQMA104J50	C	12	
CQMA102J50	C	13, 14	
CQMA333J50	C	16	
CQMA822J50	C	17	
CCDRH221J50	C	18, 21	
CCDRH121J50	C	20	
CCDCH270J50	C	25, 26	
CQMA103J50	C	36, 38	
CQMA472J50	C	37, 39	
CEANL100M16NP	C	40	
CEANL100M16	C	41	
CCDSL561J50	C	43	
CCDSL151J50	C	45	
VTL-043	L	1- 3	470u
VTF-054	VL	1	
VSS-025	X	1	8.4672MHz

NOTES:

- Parts without part number cannot be supplied.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

HPHB(VUV-043) Parts list 1 (MK)(Part No.) (IT)(REF Nos. & DESCRIPTIONS)

RD1/6PS000J	R	1- 4	
VCS-012	VR	1	
VCG-025	C	1	
VKN-143			Headphone jack

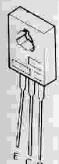
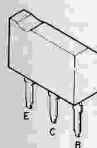
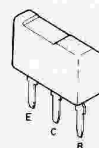
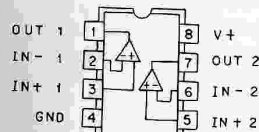
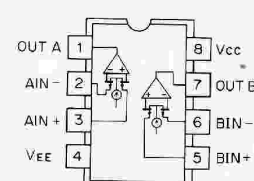
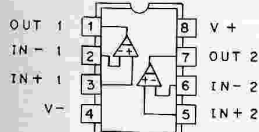
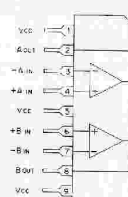
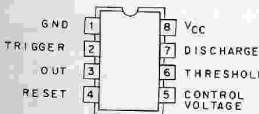
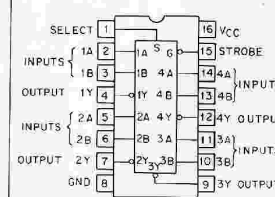
KDCB(VUG-104) Parts list 1 (MK)(Part No.) (IT)(REF Nos. & DESCRIPTIONS)

PD4038	Z	1	
PD4842	Z	2	
MSL915RS	Z	3- 7	
TC40H004P	Z	8	
TC40H010P	Z	9	
DTC124F	Z	10- 13	
DTA124F	Z	14- 18	
1S2473	D	1- 9	
TLUG154	D	10- 15	
VCN-102	R	1	4P 3.3k
VCN-101	R	2	4P 10k
RD1/6PS000J	R	3- 6	
RD1/4VM000J	R	7, 8	
CCDSL300J50	C	1, 2	
CEA101M10	C	3	
CKDYF223Z50	C	4, 10	
CKDYF473Z50	C	5- 9	
VTH-004	L	1, 2	Ferrite bead
VSS-026	X	1	3.58MHz
VSG-014	SW	1- 16	
VAW-001			FL display

RMCN(VUY-048) Parts list 1 (MK)(Part No.) (IT)(REF Nos. & DESCRIPTIONS)

RD1/6PS101J	R	1- 5	
CCDSL101J50	C	1- 5	
VKN-140			DIN Socket 5P

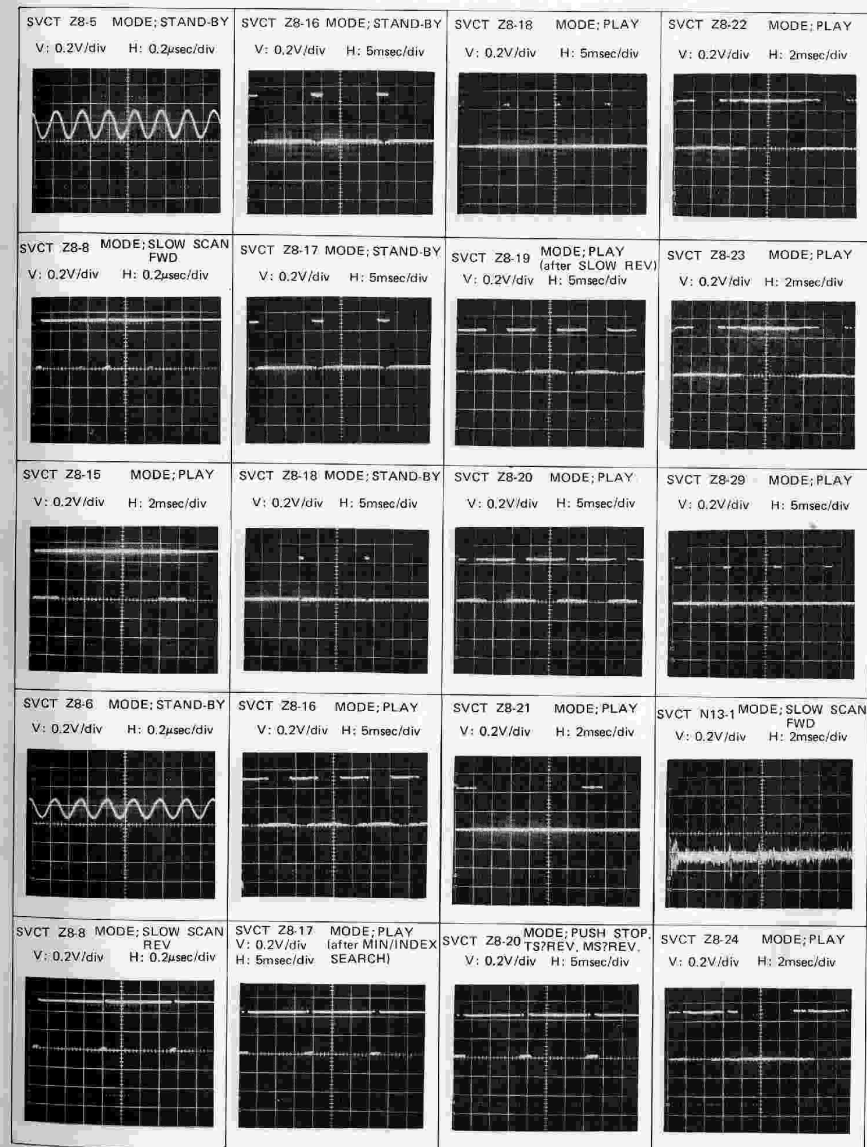
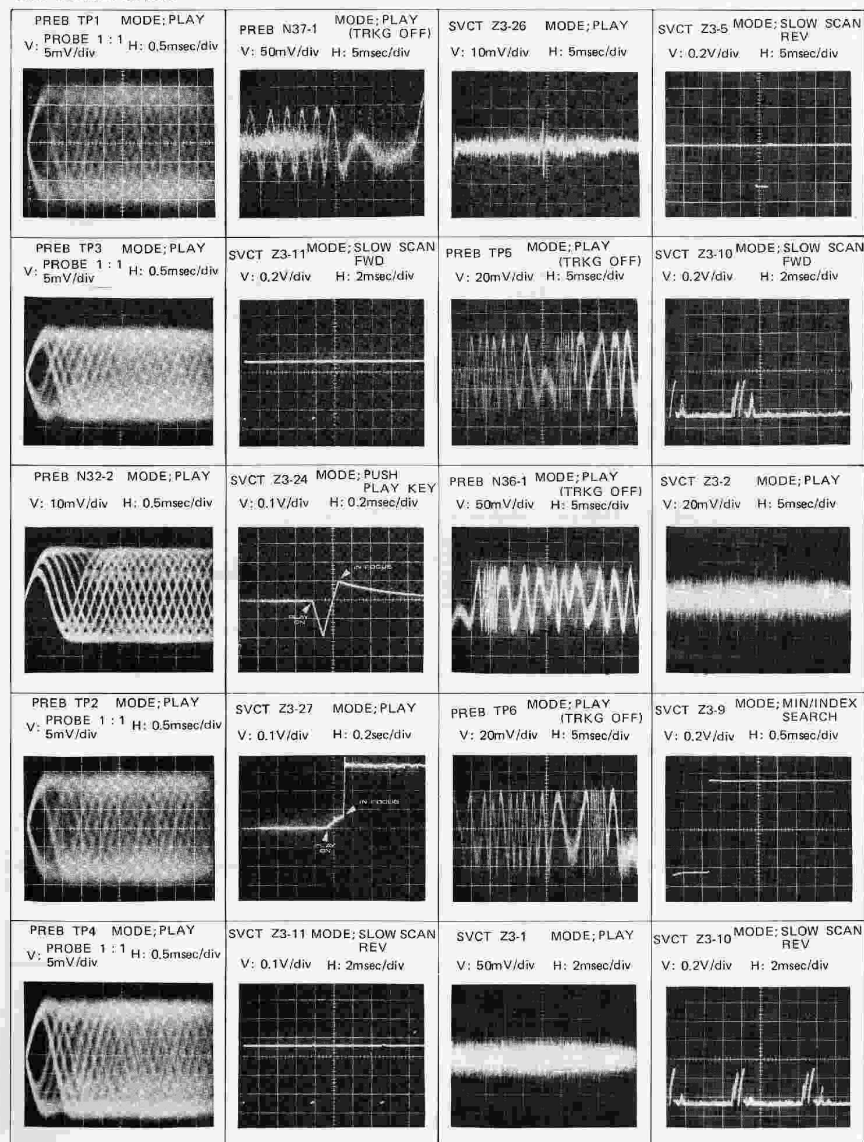
4.11 TR & ICs

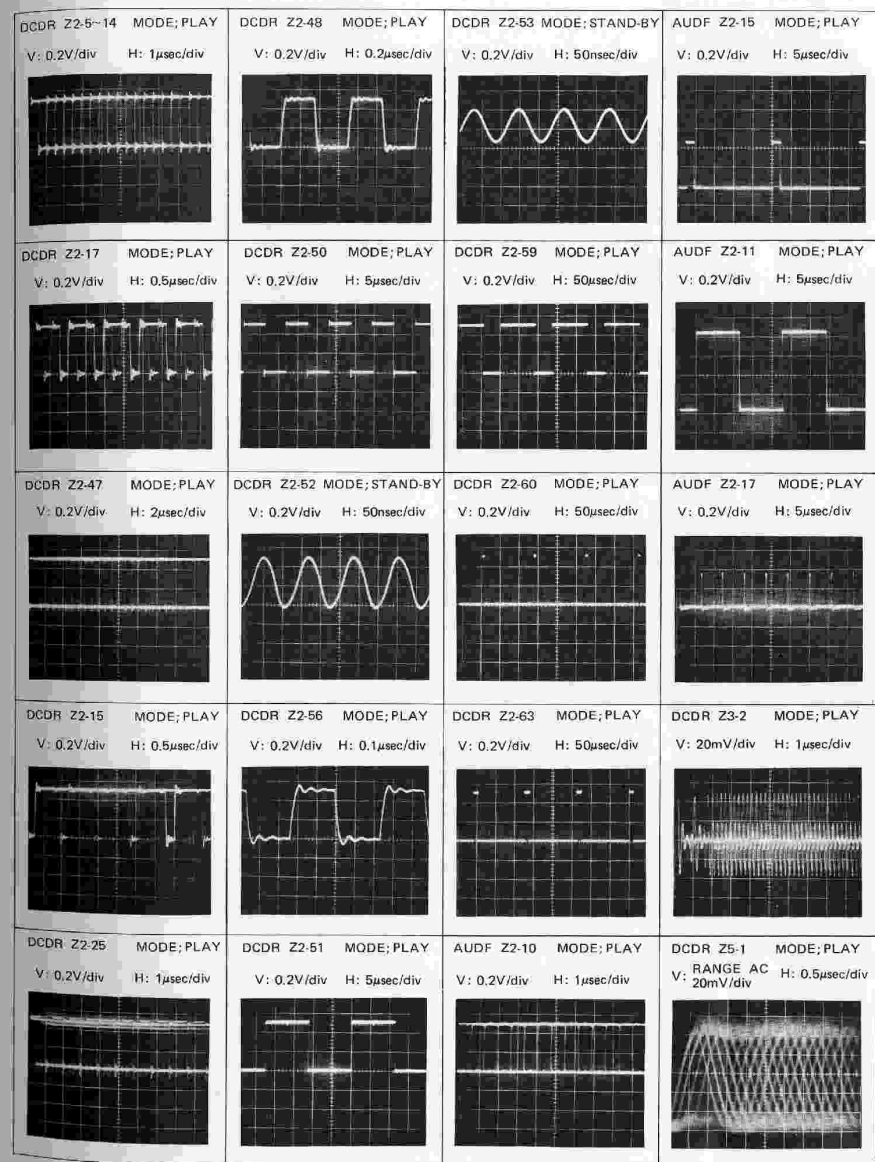
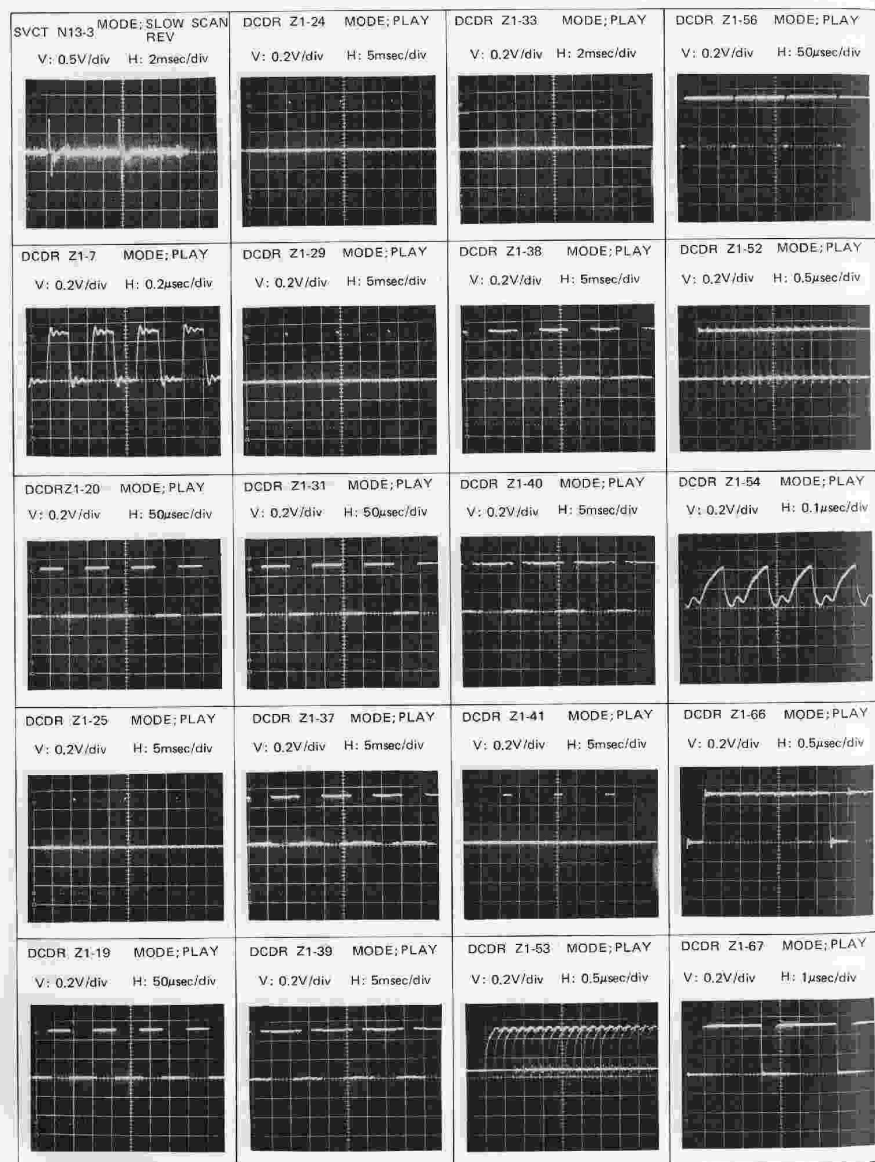
2SA1096 2SB1008 2SC2497 2SD1379 2SD1380		2SA817 2SA933LN 2SA1015 2SC1627 2SC1645 2SC1740LN 2SC1815		2SA965 2SC2060	
2SC2021LN		2SD1225M		2SK117	
μPC4558C TL082CP NE5532P NJM4560DX		LF353N			
LM393P		NJM4558S			
NE555P		SN74LS157N			

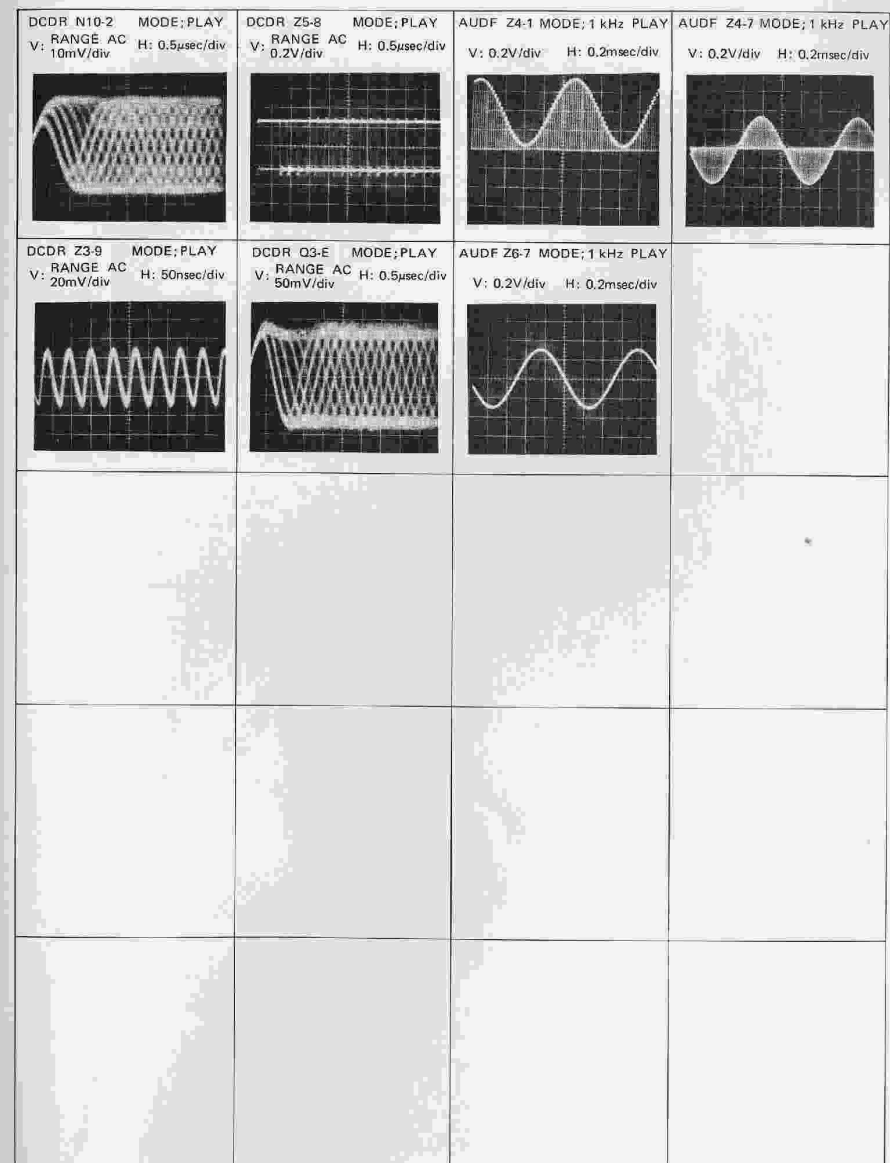
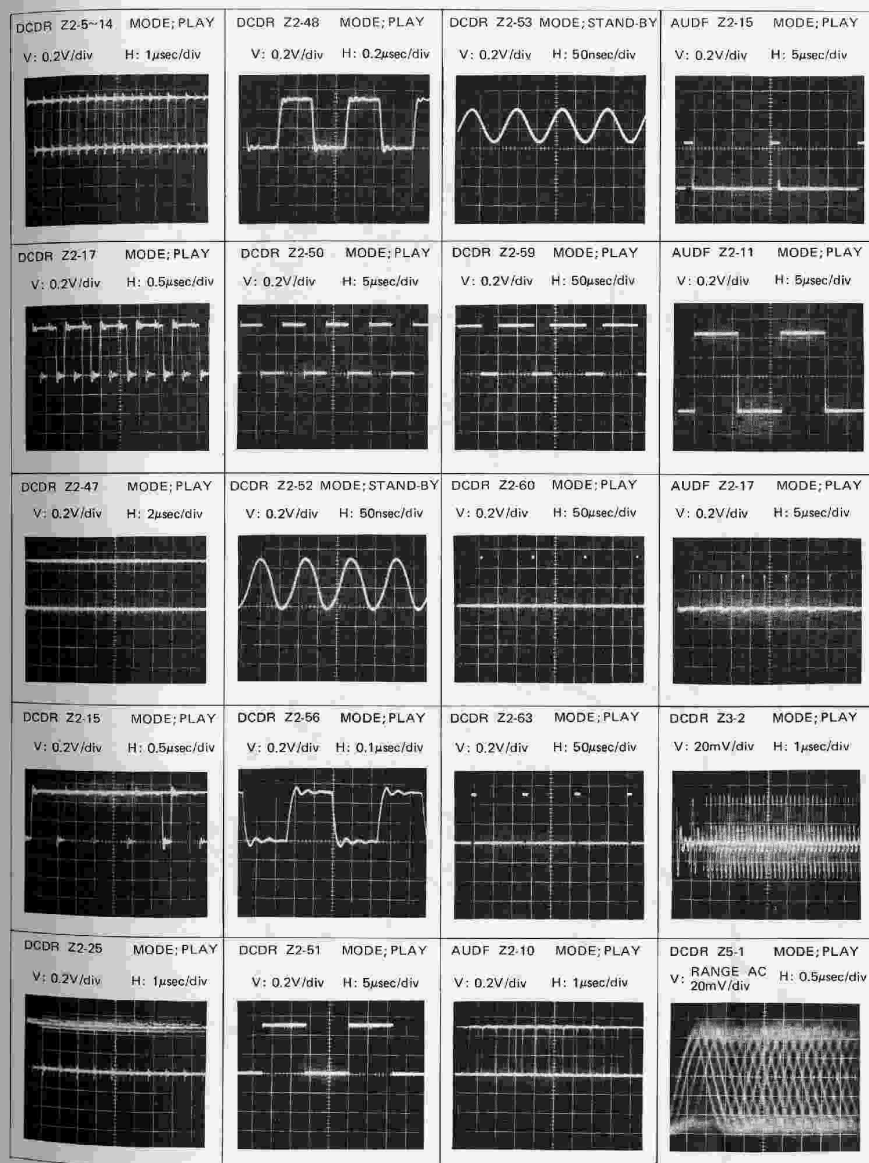
MB3716 		TC40H004P 	
MSL915RS 		TC4001BP 	
DTC124N DTA124N 		DTC124F DTA124F 	
DTC124N 		DTC124F 	
DTA124N 		DTA124F 	

TD6315P 		CX-20017 	
HM6116P-4 		PM4001 	
TC9178F 		PD4038 PD4042 	
TC9179F 		PD3007 	
μPD4053BC 			

4.12 WAVEFORMS

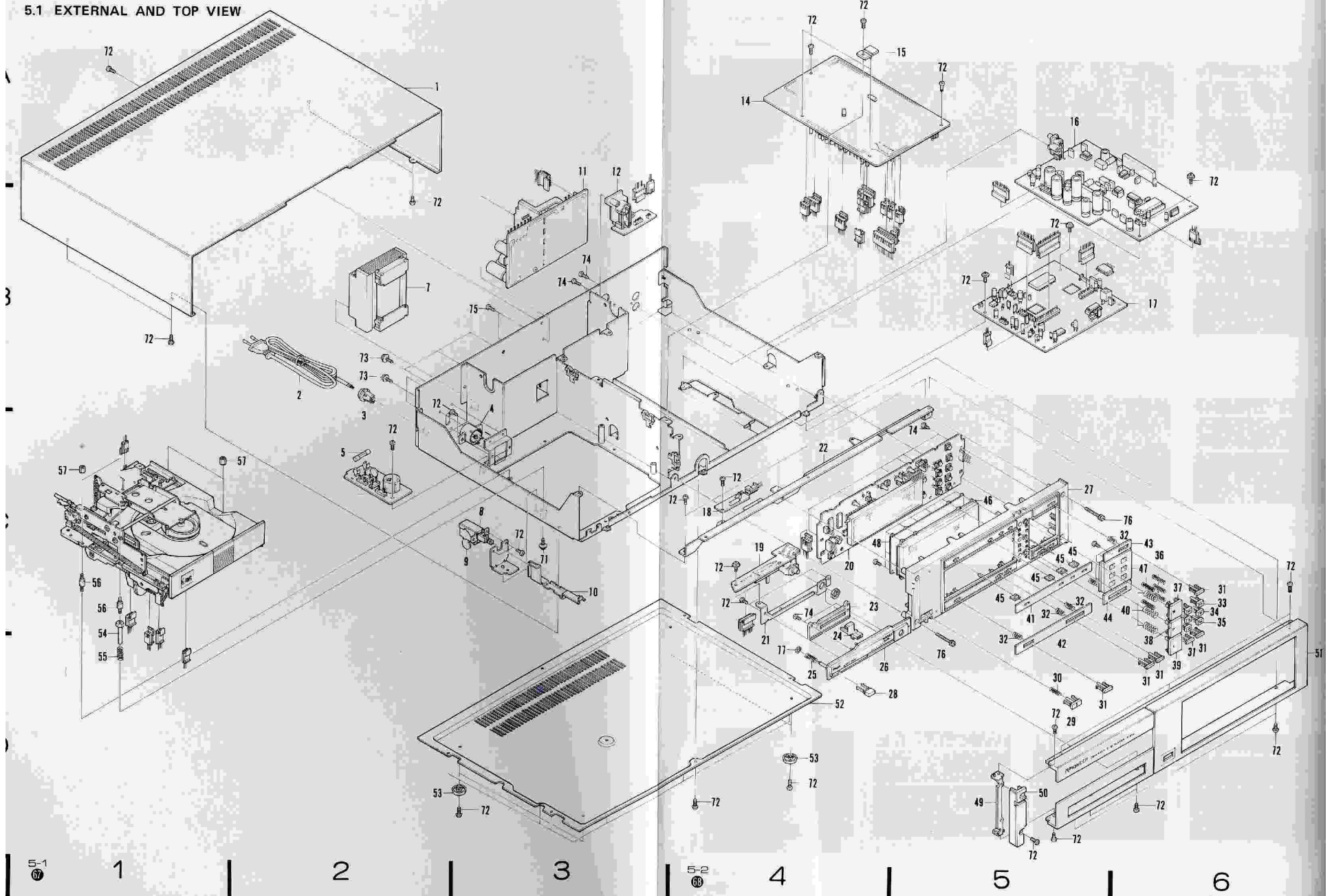






5. EXPLODED VIEW & PARTS LIST

5.1 EXTERNAL AND TOP VIEW



NOTES:

- Parts without part number cannot be supplied.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

P-D70/HEM(TOP) Parts list

1

(MK) (KY) (Part Number) (DESCRIPTION)

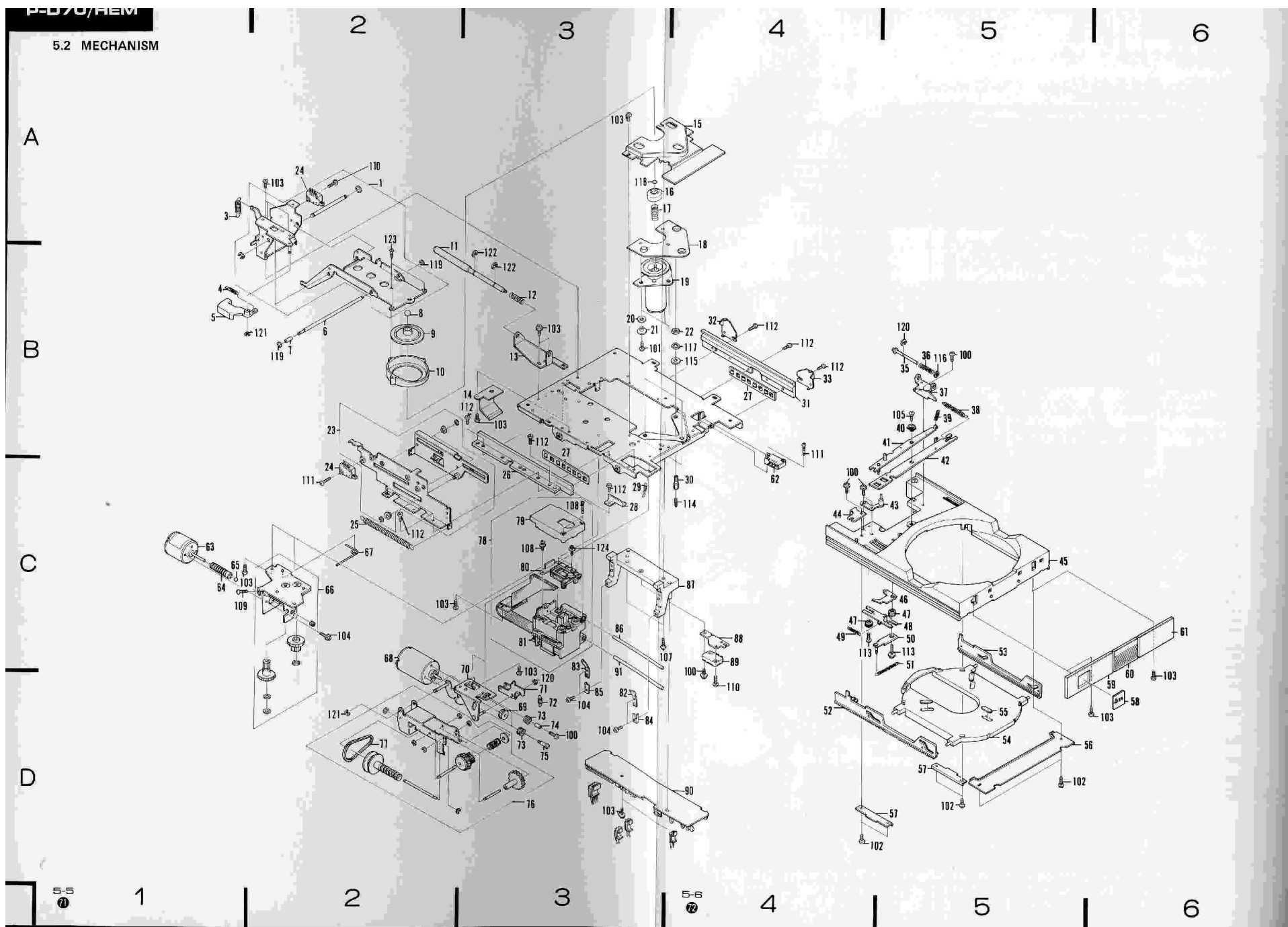
Δ	1	VXA-190	Bonnet
	2	VDG-019	Power cord
	3	VEC-152	Cord stopper
Δ	4	VSB-001	Voltage selector
Δ	5	VEK-012	Fuse 250mA
	6	VUR-047	FUSB
Δ	7	VTT-038	Power transformer
Δ	8	VSA-006	Power switch
Δ	9	VCG-018	Capacitor
	10		Joint
	11	VUR-041	SYPS
	12		RMCM
	13		
	14	VWS-042	SVCT
	15		PCB hinge
	16	VUK-005	AUDF
	17	VUV-050	DCDR
	18		LMPB
	19		HPHB
	20	VUG-104	KDCB
	21		Angle
	22		Front frame
	23	VNL-236	Holder
	24	VAC-222	Slide knob
	25	VBH-109	Spring
	26	VNK-181	PH panel
	27	VNK-212	Key panel
	28	VXA-167	Power button
	29	VXA-168	OPEN/CLOSE button
	30	VBH-113	Spring
	31	VAC-214	Button
	32	VBH-106	Spring
	33	VAC-229	TRACK button
	34	VAC-230	MIN button
	35	VAC-231	SCAN button
	36	VBH-107	Spring
	37	VXA-169	PAUSE button
	38	VXA-170	PLAY button
	39	VXA-171	STOP button
	40	VBH-108	Spring
	41	VAK-035	Aluminum panel A
	42	VAK-036	Aluminum panel B
	43	VAK-037	Aluminum panel C
	44	VAK-038	Aluminum panel D
	45	VNK-177	LED lens
	46	VNK-214	Acryl window
	47	VNK-215	Acryl key panel
	48		Filter
	49		Holder
	50	VNK-180	Side escutcheon
	51	VAH-044	Front panel
	52		Bottom cover
	53	VNL-218	Foot
	54	VLL-236	Shaft
	55	VBH-112	Spring

P-D70/HEM(TOP) Parts list

2

(MK) (KY) (Part Number) (DESCRIPTION)

56	VEB-061	Insulator
57	VLL-233	Nut
58		
59		
60		
61		
62		
63		
64		
65		
66		
67		
68		
69		
70		
71	AMZ30P100FMC	
72	BCZ30P060FZK	
73	PCZ30P060FZK	
74	VBZ30P060FZK	
75	VCZ30P060FMC	
76	VCZ30P200FMC	
77	YS24FBI	



NOTES:

- Parts without part number cannot be supplied.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

P-D70/HEM(MECH) Parts list 1

1	VXA-179	Clamper holder
2		
3	VBH-098	
4	VBH-097	Spring
5	VNT-025	Caddy lock
6	VLL-198	Clamper shaft
7	VLL-199	Roller
8	VNH-043	Steel ball
9	VNL-208	Clamper
10	VNL-209	Clamper guide
11		Caddy clamp shaft
12		Spring
13		Caddy clamp
14		PCB guide
15		Blind
16	VLL-210	Taper wheel
17	VBH-104	Spring
18		Motor holder
19	VXM-033	SPDL motor
20	VEF-023	Spring
21	VLL-211	Collar
22	VLA-061	MS nut
23	VXA-180	Slider holder
24	VSF-009	Micro switch
25	VBH-099	Spring
26	VNG-010	Rail B
27	VXA-178	Retainer ASS'Y
28	VNE-472	Retainer holder C
29	VBH-092	Spring
30	VLL-209	Hight adj. screw
31	VNG-009	Rail A
32	VNE-470	Retainer holder A
33	VNE-471	Retainer holder B
34		
35		Switch pin
36	VBH-091	Spring
37		Switch holder
38	VBH-094	Spring
39	VBH-114	Spring
40	VLL-195	Link spacer
41		Link B
42		Link A
43	VXA-149	Lock plate
44		Caddy clamp
45	VNT-032	Caddy
46		Spacer B
47	VLL-197	Spacer
48		Link holder A
49	VBH-096	Spring
50		Lack arm
51	VBH-101	Spring
52	VNL-210	Rack L
53	VNL-211	Rack R
54	VNK-211	Tray
55	VED-041	Disc guard

P-D70/HEM(MECH) Parts list 2

56		Rack holder A
57		Rack holder B
58	VNK-163	CD badge
59	VAH-045	Loading panel L
60	VNK-213	Loading window
61	VAH-046	Loading panel R
62	VSF-009	Micro switch
63	VXM-032	CARG motor
64	VNL-214	Carriage worm
65	VNH-026	Steel ball
66	VXA-183	Gear unit
67	VBH-105	Spring
68	VXM-034	Loading motor
69	VNL-207	Pulley
70		Motor holder
71		Clutch lever
72	VBH-102	Spring
73	VEB-050	Bushing
74	VEF-022	Spacer
75	VLL-183	Screw
76	VXA-177	Worm holder
77	VEB-050	Belt
78	VUY-061	Pick up
79	VNH-047	Cover
80	VGX-044	Actuator ASS'Y
81	VGX-045	CD body
82	VNE-558	Shaft holder A
83	VNE-559	Shaft holder B
84	VNE-494	Shaft holder C
85	VNE-495	Shaft holder D
86	VLL-251	Slider shaft
87		Slider base
88		Limitter SW holder
89	VSF-009	Micro-switch
90	VWV-046	PREB
91	VLL-252	Slider shaft B
92		
93		
94		
95		
96		
97		
98		
99		
100	ACZ30P060FMC	
101	AMZ30P060FMC	
102	BCZ30P040FZK	
103	BCZ30P060FZK	
104	BMZ26P040FMC	
105	CMZ30P060FMC	
106	PBZ30P080FMC	
107	PMA30P080FMC	
108	PMZ26P100FMC	
109	PMZ30P120FMC	
110	VCZ26P060FMC	

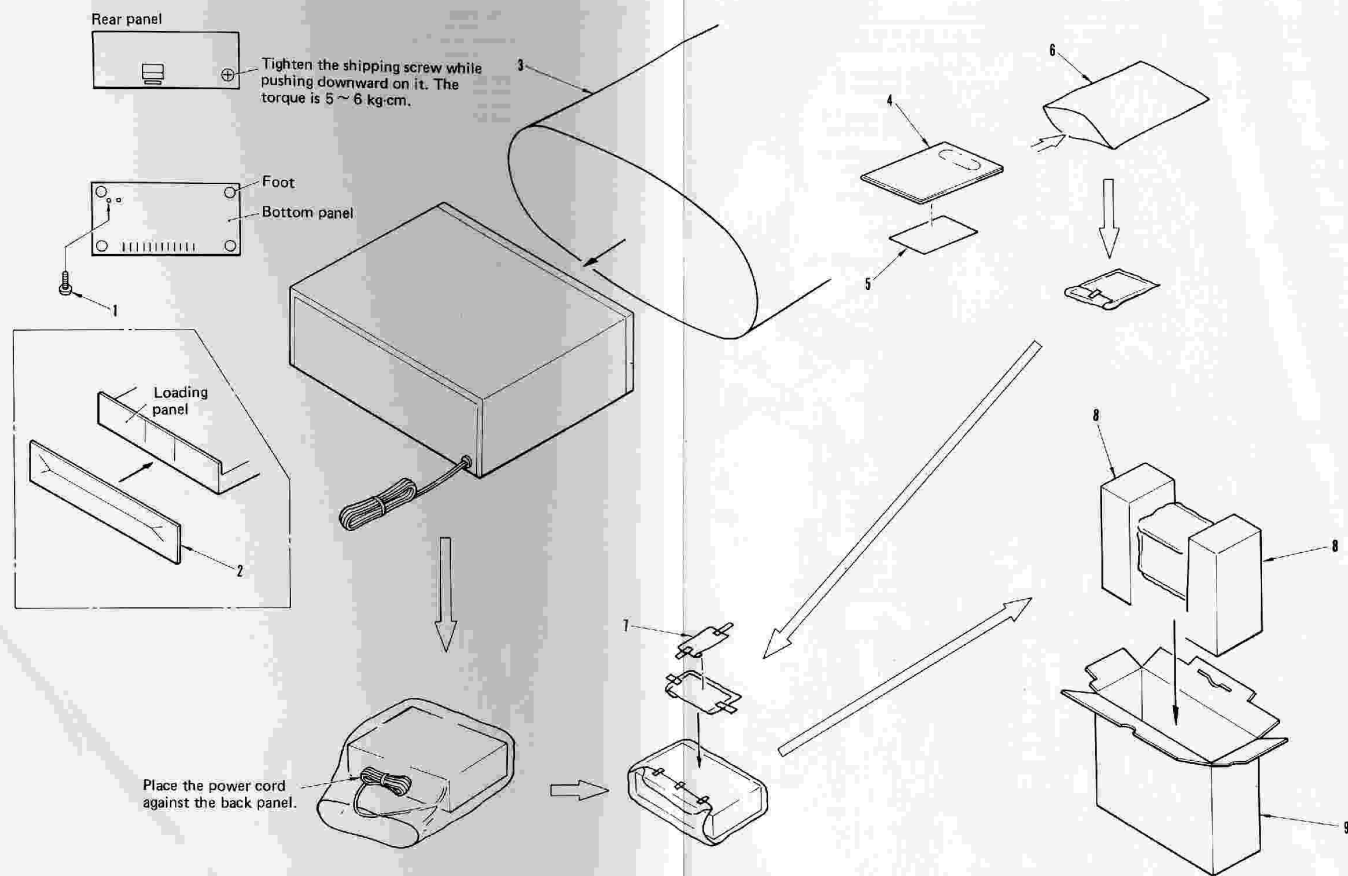
NOTES:

- Parts without part number cannot be supplied.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

P-D70/HEM(MECH) Parts list 3

111	VCZ26P100FMC
112	VCZ30P080FZK
113	VCZ30P100FMC
114	ZMD30H200FBT
115	WB50FMC
116	WC30FMC
117	WW50FBT
118	YC25FBT
119	YE15FUC
120	YE20FUC
121	YE25FUC
122	YE40FUC
123	PBZ20P060FZK
124	PMB20P060FMC

5.3 PACKING MATERIALS



NOTES:

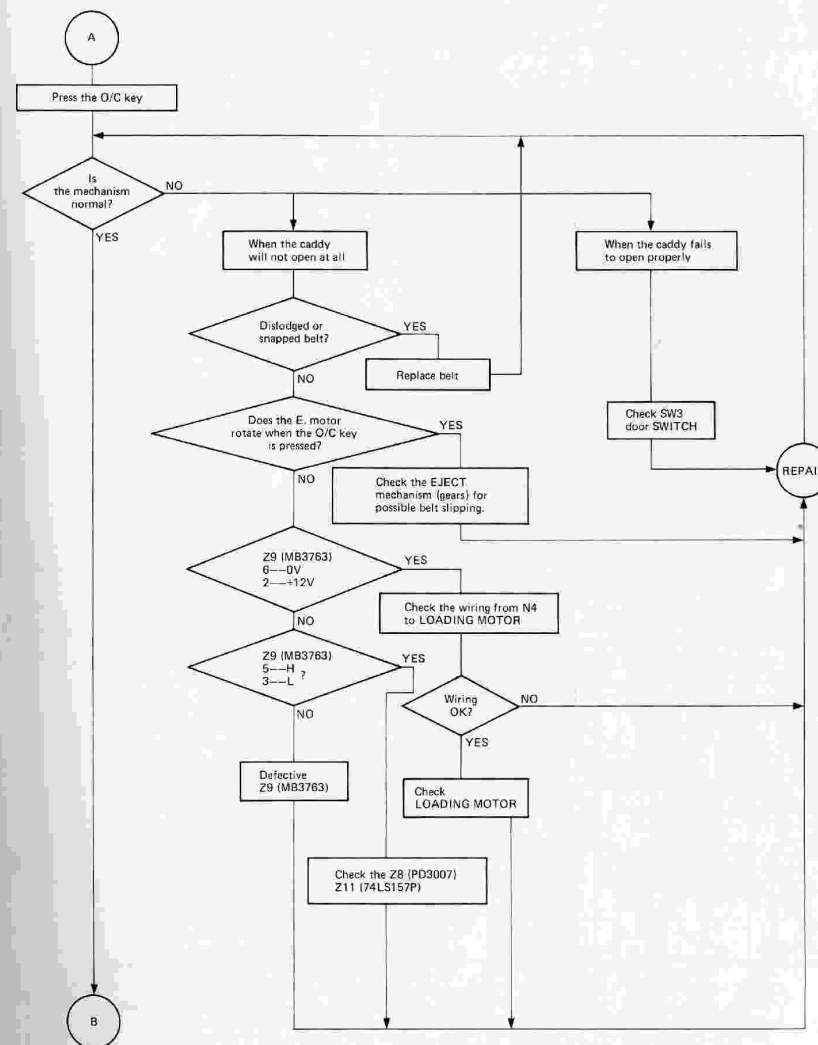
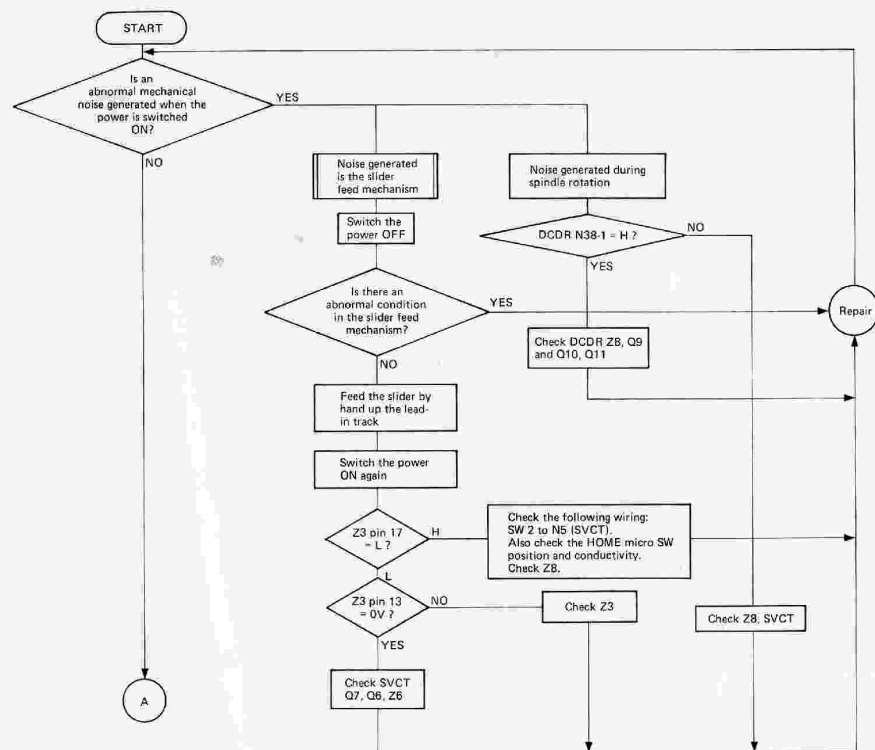
- Parts without part number cannot be supplied.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

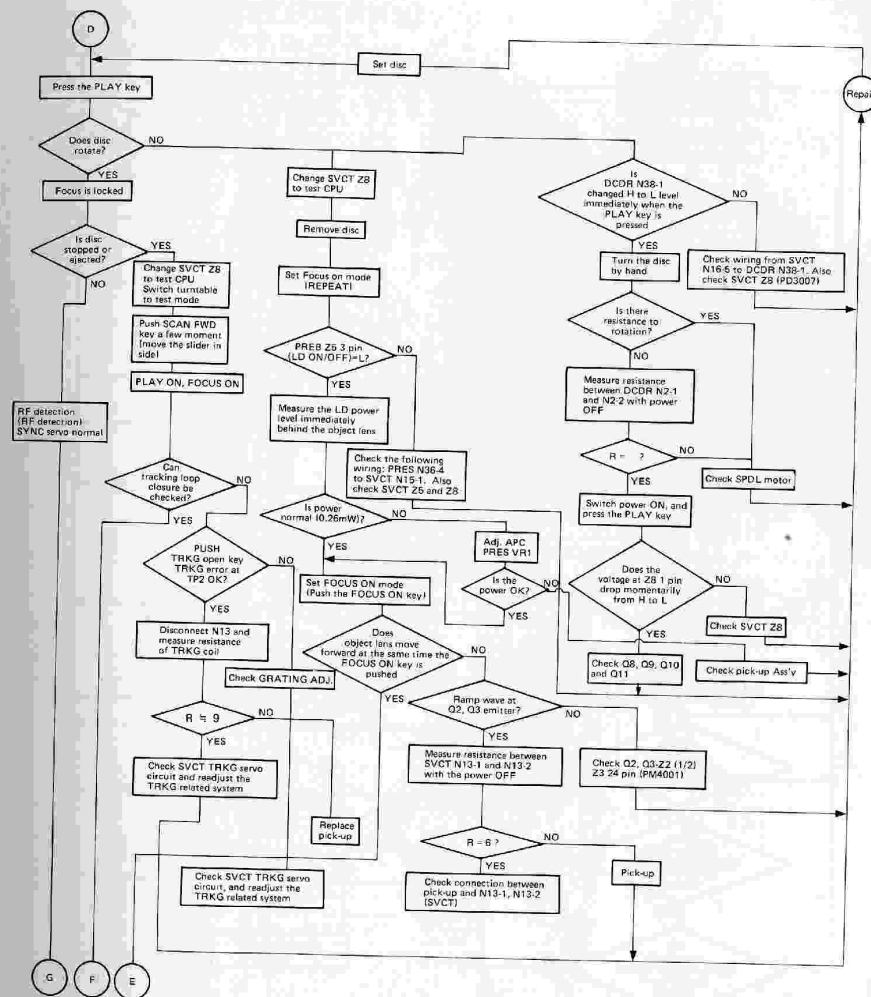
P-D70 /HEM(PACKING) Parts list 1

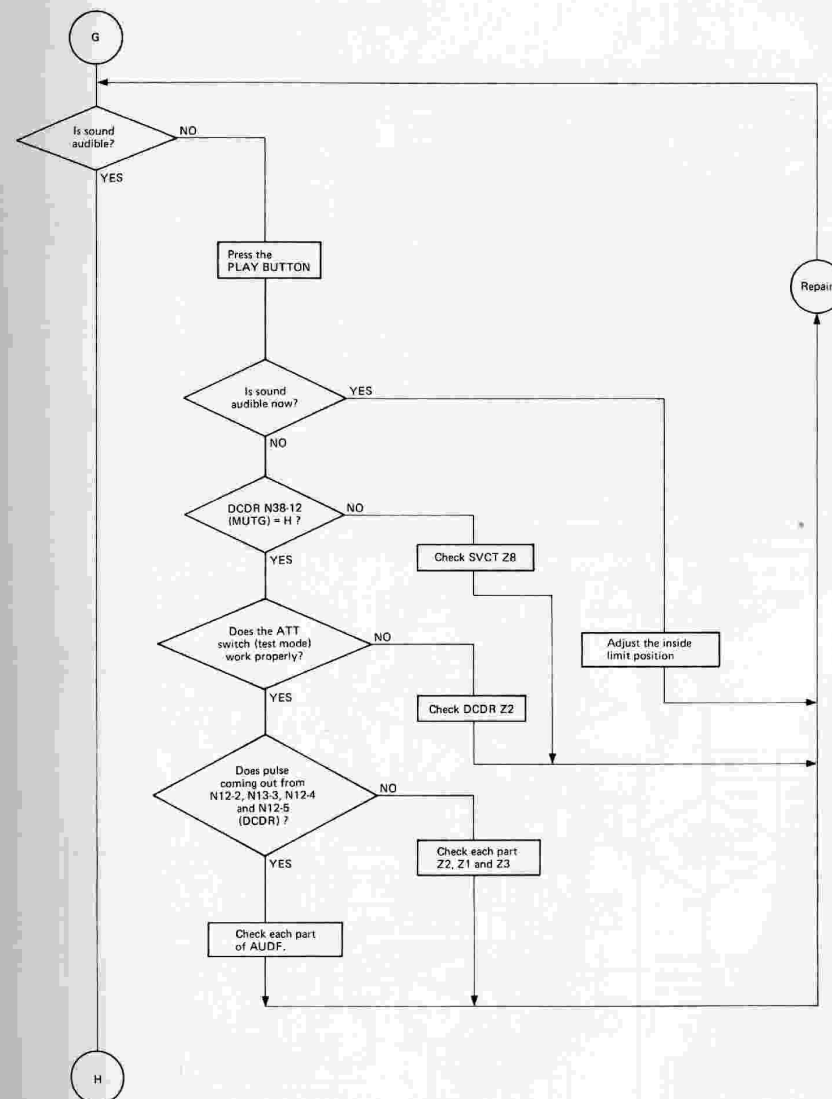
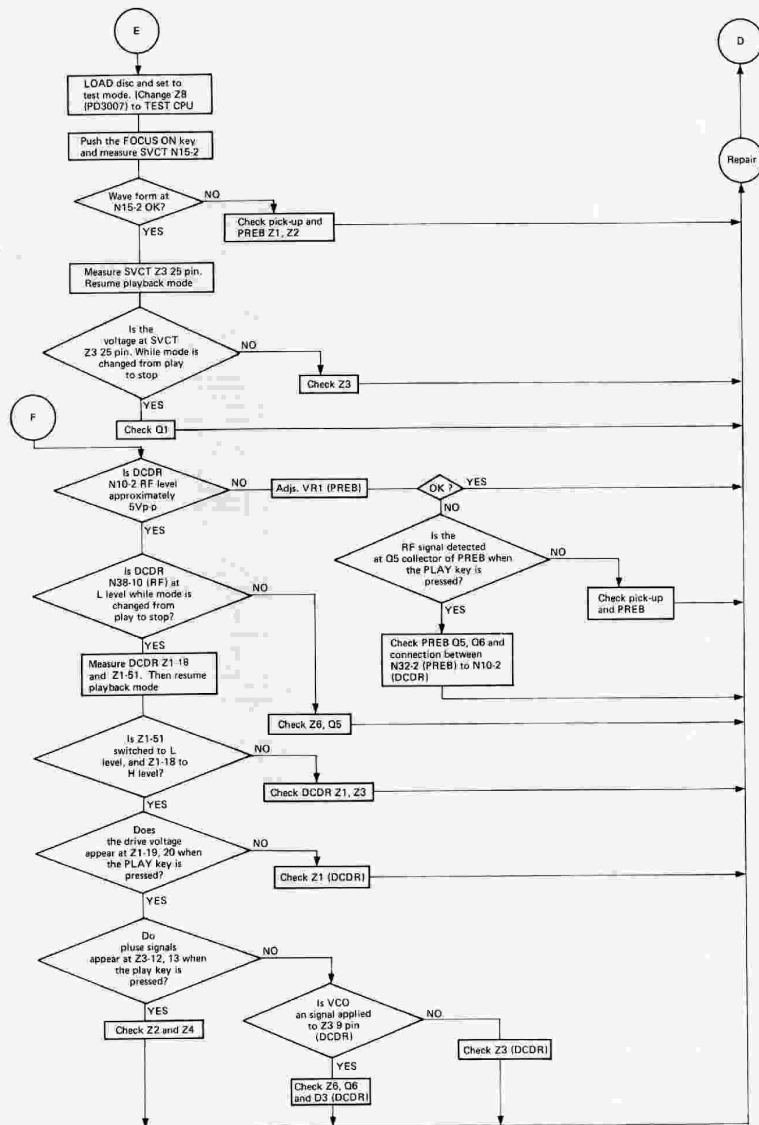
(MK)	(KY)	(Part Number)	(D E S C R I P T I O N)
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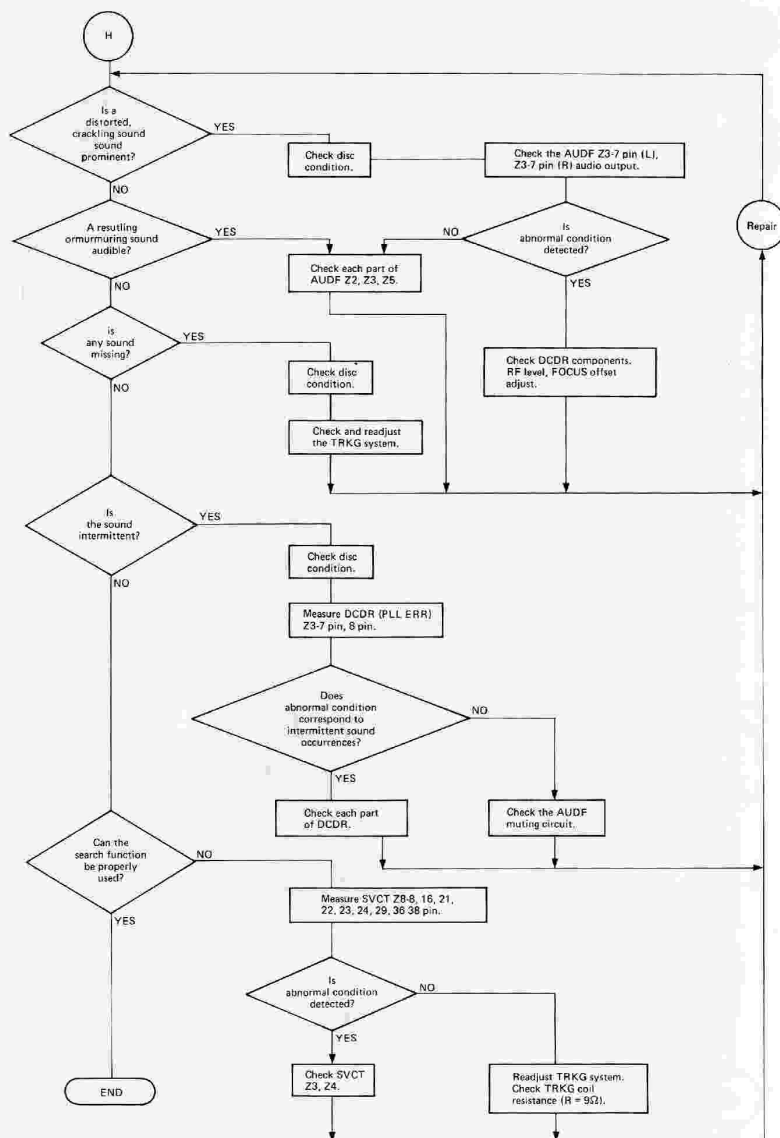
1	BCZ30Y160FGN		
2	VHA-007	Panel cushion	
3	VHA-043	Bag	
4	VRD-003	Operating instructions	
5			
6	VHL-014	Polyethylene bag	
7	VDE-032	Connecting cord	
8	VHA-004	Side pad	
9	VHG-070	Packing case	

6. TROUBLE SHOOTING









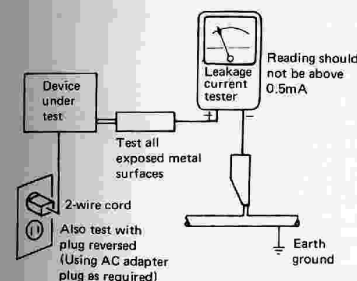
7. SAFETY INFORMATION

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a symbol on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.