

PDSM58000180K



Personal Computer **MZ-80K**

DC 6 PS

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FEATURES

- The MZ-80K is a full-fledged personal microcomputer equipped with 8-bit microprocessor (Z-80) and it can meet a variety of applications like hobbies, educations, office works, controls (of apparatus in every industrial field), etc.
- It is a compact desk-top type, itself a simplified unit including CPU board, CRT display, cassette tape recorder and keyboard all together.
- Speaker (3 octaves) and clock function are built in.
- Applicable Languages (BASIC, MACHINE LANGUAGE, ASSEMBLER etc.) are changed easily with variations of tape mode: a free selection of them is possible according to the purposes of users.
- Memory extension is allowed up to 48K bytes in the board.

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Caution in Service

- * Maintain the safety and protecting ability of the apparatus after service.
- * High voltage shall not be rised to excess voltage so as to prevent this apparatus from the extra X-ray radiation.

SPECIFICATIONS

■ General

CPU	Z-80	Clock Function:	Built in
Memory	Monitor ROM; 4K bytes RAM; 20K bytes (dynamic RAM) Memory extension; 48K bytes (max.)	Editor function	Cursor control; "up", "down", "right", "left", "home", "clear home" Edit key, Delete key
Display	10" CRT (black/white), 8 x 8 dot matrix, Characters; 1000 (40 characters x 25 lines)	Power supply	AC 220V $\pm 10\%$, 50 Hz AC 240V $\pm 10\%$, 50 Hz (for UK)
		Power consumption	Approx. 45W
Cassette	Standard audio cassette tape Data transfer speed; 1200 bits/sec. Data transfer system; SHARP PWM	Temperature	Operating temp.; 0°C to 35°C Storage temp.; -15°C to 60°C
		Humidity	Lower than 80° during operation
Sound output	400mW (max.)	Weight	Approx. 13 kg
Keys layout	Number; 78 keys ASCII standard (alphabet capital letter, figures), Small letter, Graphic	Dimensions	410(W) x 270(H) x 470(D)mm
		Music function	Built in


■ CPU Board Section (DCPU-0006PAZZ)

CPU	Z-80; 1 pc.	Programmable counter	1 pc.
ROM	Monitor; 1 pcs. (4K bytes) Character generator; 1 pcs. (2K bytes)		
RAM	Standard; 16K dynamic RAM; 8 pcs. (16K bytes) 4K dynamic RAM; 8 pcs. (4K bytes) Video RAM; 2 pcs. (1K bytes)	Programmable peripheral interface	1 pc.
		Other ICs	53 pcs.

■ Power Supply Section (DBOXD0004PAZZ), (DBOX0005PAZZ ----- for UK)

Input	AC 220V $\pm 10\%$, 50Hz AC 240V $\pm 10\%$, 50Hz (for UK)
Output	DC 12V, 1.6A max. DC 5V, 1.6A max. DC -5V, 0.2A max.

■ Display Section (DUTT0004PAZZ)

I. General specifications		II. Electrical specifications	
Size	10"	Video output	40Vp-p standard (35Vp-p limit)
Frequency	60Hz (vertical), 15.75kHz (horizontal) 15.75kHz (horizontal)	Resolution	Horizontal  These patterns must be clear-cut.
Power source	DC 12V, 1.1A ±10%	Non-linearity distortion	Horizontal; ±8% (±14% max.) Vertical; ±8% (±12% max.)
Picture tube	Quick start type (3 sec.) 240NB4; 10"90° deflection explosion proof type Heater; 12V, 75mA	Geometrical distortion	Pincushion dist.; 1% (2% max.) Barrel dist.; 1% (2% max.) Trapezoidal dist.; 1% (2% max.) Parallelogram dist.; 1° (2.5° max.)
IC	2 pcs.	High voltage	Zero beam; 11.0kV (10.0kV, min., 12.0kV, max.)
Transistor	5 pcs.	Power supply	DC12.0V, 1.05A (1.2A max.)
Diodes	9 pcs.	Working range	12V ±10%
Sound output	400mW max. (400 Hz) Speaker 8cm, round dynamic type (32Ω)	Scan size	Horizontal; 10% (15% max.) Vertical; 10% (15% max.)
Control knobs	Volume, V-Hold, Contrast, H-Hold, Brightness, Focus	Horizontal lock-in range	±300 Hz (±100Hz)
		Vertical lock-in range	-12 Hz (-6 Hz limit)
Working temperature	-10°C to 50°C	Audio frequency characteristic	400 Hz (0dB) -10dB ±4dB at 100 Hz -12dB ±4dB at 10kHz
		Sound maximum output	400mW at 400 Hz (350mW min.)

■ Cassette tape recorder Section (KTRC-0004PAZZ)

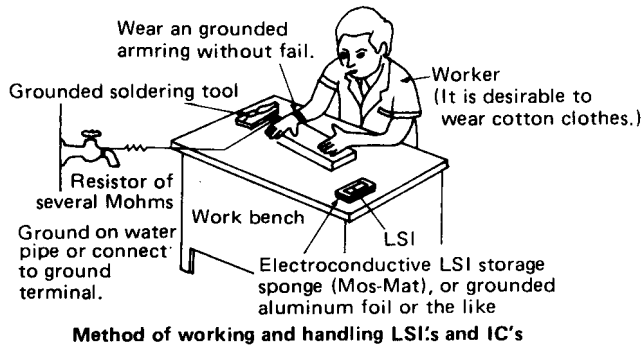
System	PWM recording	Biasing	DC system
Power source	5V ±0.25V (rated)	Erasing	DC system
Rated amperage	Wait; 2mA Record; 70mA (TEAC test tape) Playback; 7mA (TEAC test tape)	Playback sensitivity	1m sec. to 500μ sec. (standard)
		Input level	Below 0.4V ("L") Over 2.0V ("H")
Semiconductors	4 transistors 1 IC 4 diodes	Input impedance	Over 10kΩ (record jack)
		Output level	Below 0.4V ("L") Over 2.0V ("H")
Applied tape	From C30 to C120	Working temperature	-10°C to 50°C
Tape speed	4.75 cm/sec.		
Track	2-track monaural type	Storage temperature	-25°C to 70°C
Motor	Electronic governor motor (12V)		

* Specifications subject to change without prior notice.

Precautions on Handling LSI's and IC's

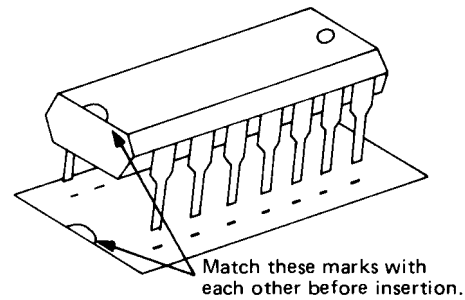
LSI's and IC's used in the MZ-80K are semiconductor integrated circuits whose basic element is MOS FET. The IC's, so poor in static electricity or leakage current from soldering tool, are liable to suffer breakdown. It is essential therefore to read the following instructions carefully and handle them properly.

- ① Ground your body before handling LSI's or IC's. Grounding must be made through a resistor of several Mohms for avoiding danger. Note that if possible, you wear cotton gloves and working clothes, but not chemical fiber ones easily charged with static electricity.



- ② When putting LSI's on a work bench during repair, lay grounded aluminum foil or the like superior in electric conductivity under them.
- ③ Use a grounded soldering tool free from leakage current. Even if current leaks out to the tip of soldering tool, gate insulation layer is protected by the action of protective diode. However, too much leakage current, which is caused by the tip in direct contact with power supply, for instance, may break the protective diode itself. Therefore, never fail to use a soldering tool free from leakage current. A low-voltage soldering tool (6V, 12W) is optimal.
- ④ When inserting LSI's or IC's into the printed wiring board, avoid touching their pins directly, but hold their black plastic packages.

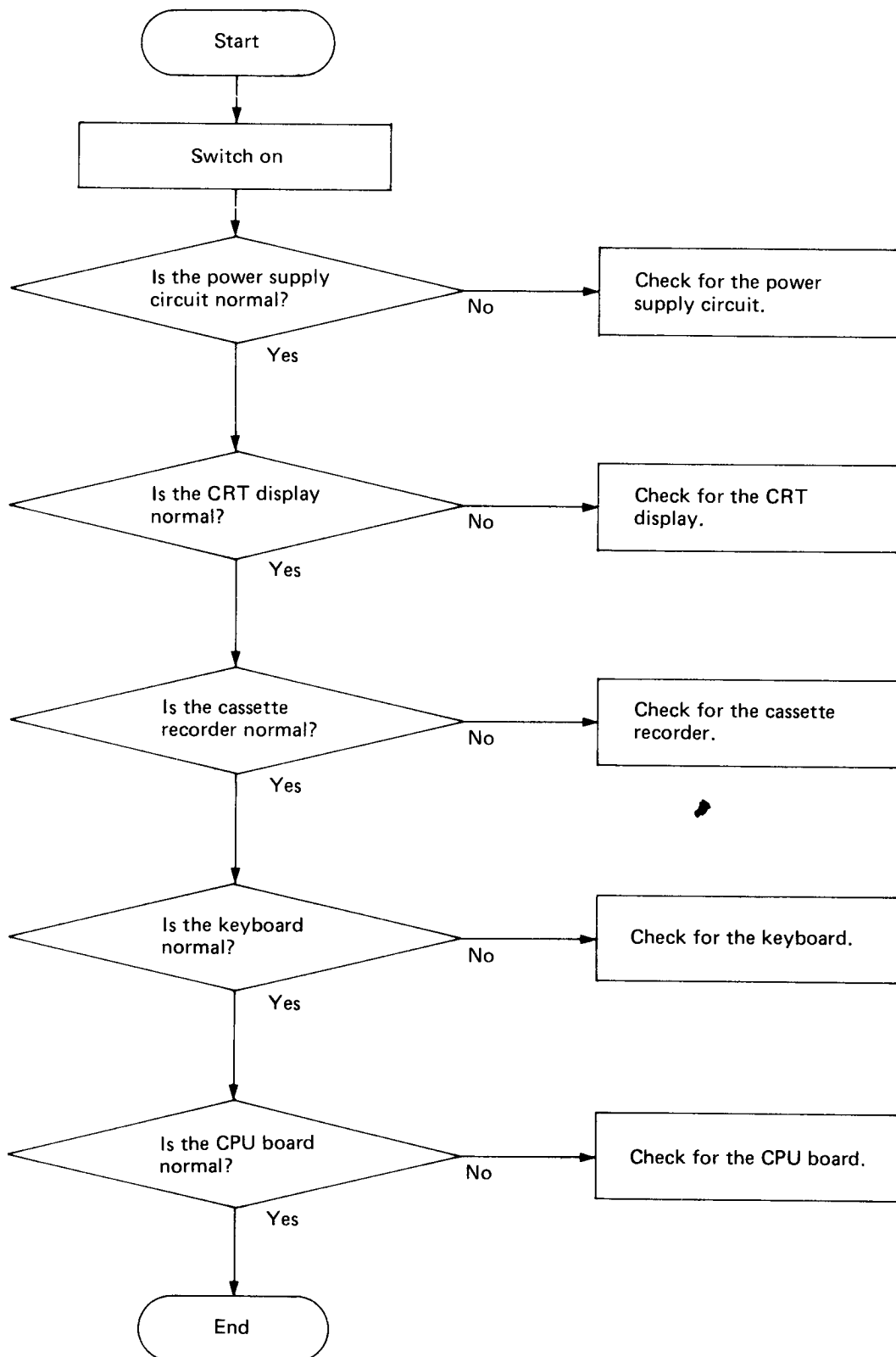
- ⑤ When inserting LSI's or IC's, don't mistake their inserting direction unconditionally. Reverse insertion damages them.



- ⑥ When storing and transporting an LSI or IC separately, wrap it with aluminum foil or insert into electroconductive sponge (Mos-Mat) to maintain terminals at the same potential.
- ⑦ Storage temperature of LSI is -20 to $+70^{\circ}\text{C}$, and that of IC -40 to $+125^{\circ}\text{C}$. It is recommended, however, to store them at a temperature near room temperature if possible. Avoid storing them on a place extremely high or low in humidity.
- ⑧ Be careful to refrain from giving an unreasonable mechanical impact to LSI's or IC's, or from giving an unreasonable force to lead wires.
- ⑨ Turn off the power switch without fail before detaching LSI's or IC's from the main body.
- ⑩ Solder LSI's or IC's in a short time so as to prevent an unseasonable thermal impact to them.

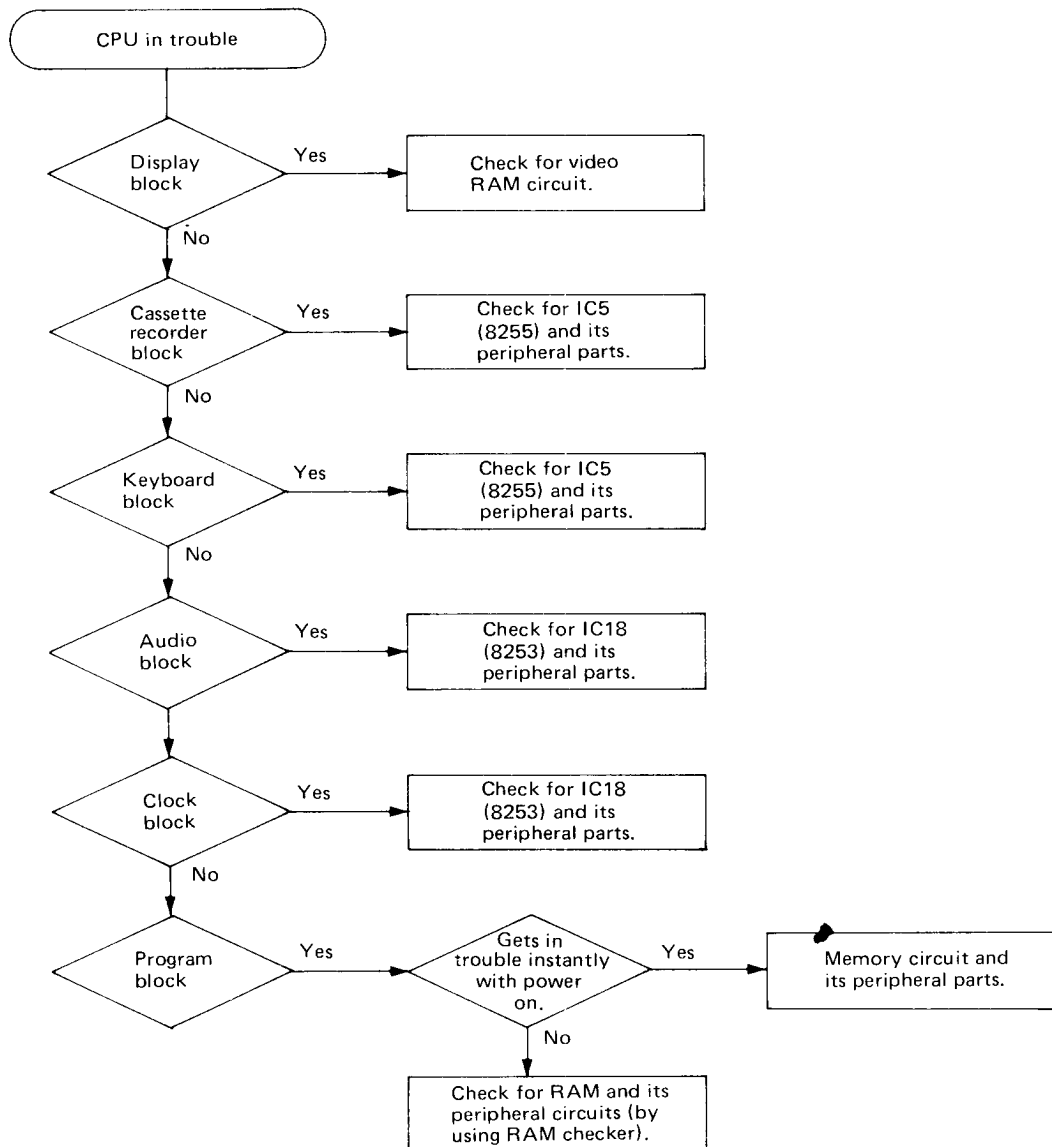
TROUBLE SHOOTING GUIDE

The machine comprises five main units, CPU board, display, cassette tape recorder, keyboard, and power supply circuits. For a quick solution to most operating difficulties, first consult the chart below to find which section of the machine is subjected to the trouble, and next to do the checkings according to more detailed instructions given in the succeeding pages.



CPU BOARD SECTION

The CPU board is composed of the following six blocks. When it gets in trouble, first locate which block is concerned with the trouble, and next try to check for its corresponding circuits; the wiring diagrams of every block will be shown separately.



■ Checking methods of each circuit

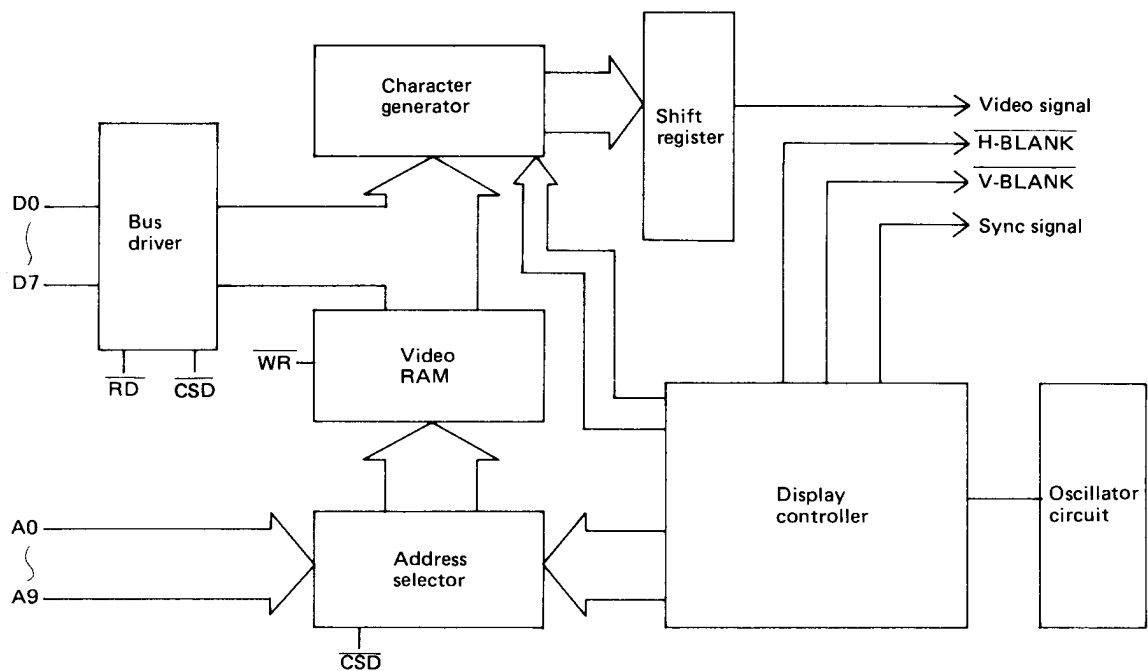
1. By touching IC insulating parts by fingers:

- If they seem too hot by heat generation; IC is defective, IC load is heavy or components are touching each other – ROM and V-RAM are exempted from this checking, however.
- If a circuitry state is changed to another; Soldering is poor, socket contact is improper, or printed-wiring is erroneous.

2. By using a synchroscope:

- If the relation between input and output of TTL IC is illogical, this means defective IC gate.
- Check if the voltage level of TTL IC is as specified: High level; over 2.4V, Low level; below 0.5V.

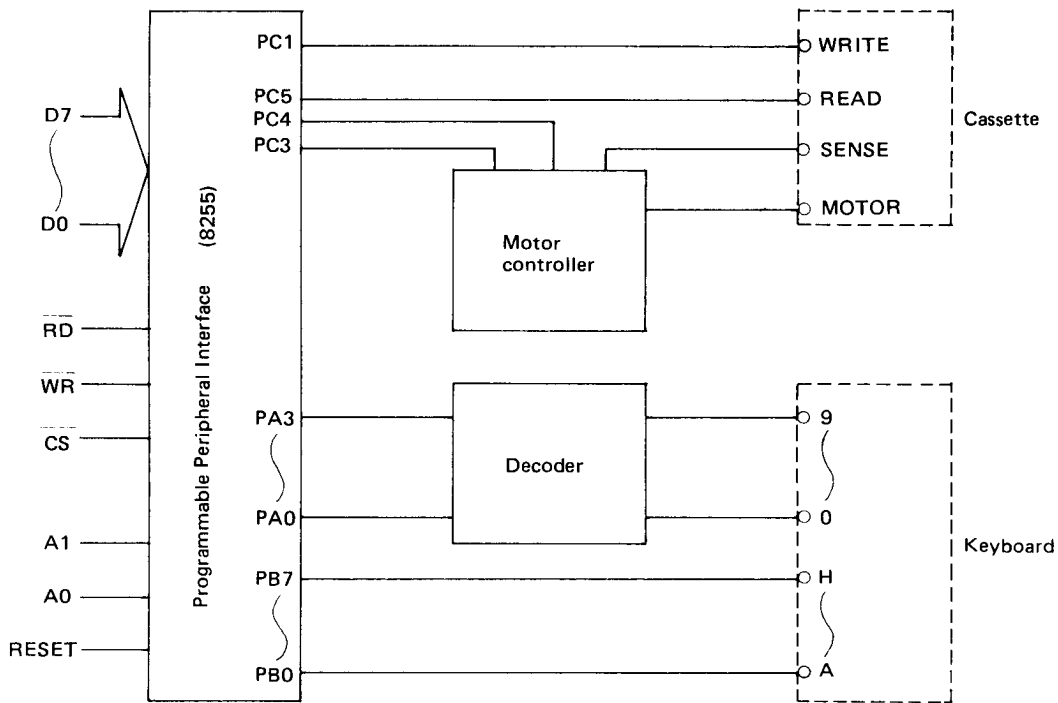
■ Display Block



Block Diagram of Parts around Video RAM

Problem	Check Point
1. Sync. signal is not produced.	Vertical sync. signal: Check for IC15 and IC16. Horizontal sync. signal: Check for IC10.
2. Video signal is not produced.	Is $\overline{V-GATE}$ signal present at pin ① of IC24? Yes; IC24 No; IC5 Is $\overline{V-BLANK}$ signal present at pin ② of IC24? Yes; IC24 No; IC20 Is $\overline{H-BLANK}$ signal present at pin ⑬ of IC17? Yes; IC17, IC3 No; IC15 Is output signal present at pin ② of IC17? Yes; IC17, IC3 No; IC29
3. Displayed character(s) is partly invisible.	Check for IC29 and CG.
4. The display is positionally deviated.	Check for sync. signal circuit.

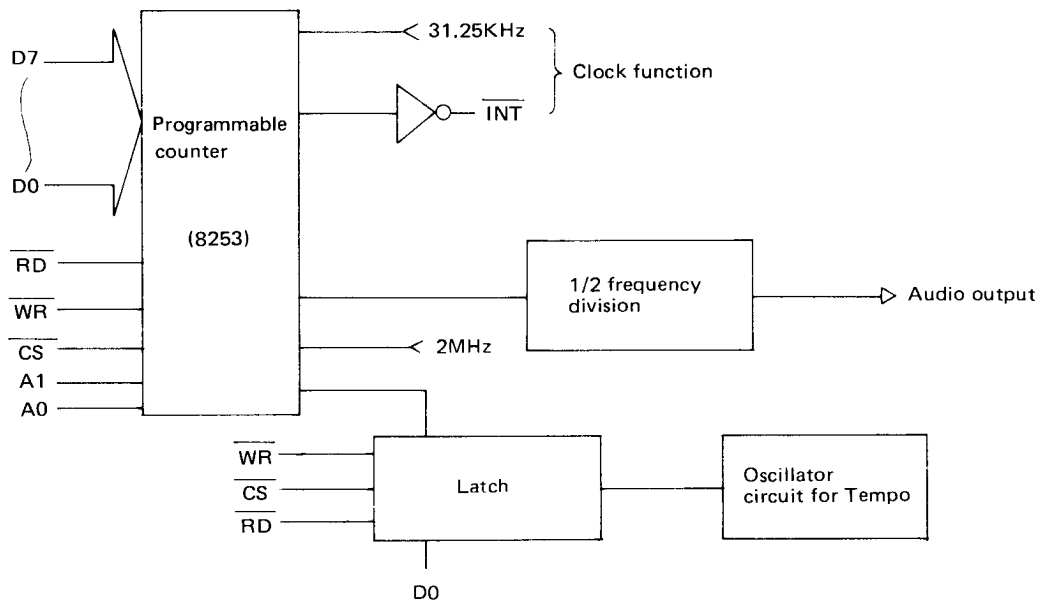
■ Cassette recorder/Keyboard Block



Block diagram of Parts around Cassette recorder/Keyboard.

Problem	Check Point
1. "LOAD" operation is impossible.	Is output signal present at pin ④ of IC4? Yes; IC5 No; IC4
2. "SAVE" operation is impossible.	Is output signal present at pin ⑮ of IC5? Yes; IC4 No; IC5
3. Motor doesn't rotate.	Is voltage at pin ⑥ of IC2 at "low" level? Yes; IC3, Q1, Q2 No; IC2, IC24, IC4, IC5
4. Motor doesn't stop.	Is voltage at pin ⑥ of IC2 at "high" level? Yes; IC3, Q1, Q2 No; IC2, IC24, IC4, IC5
5. Key input is ineffective.	Check for IC5 and IC6.

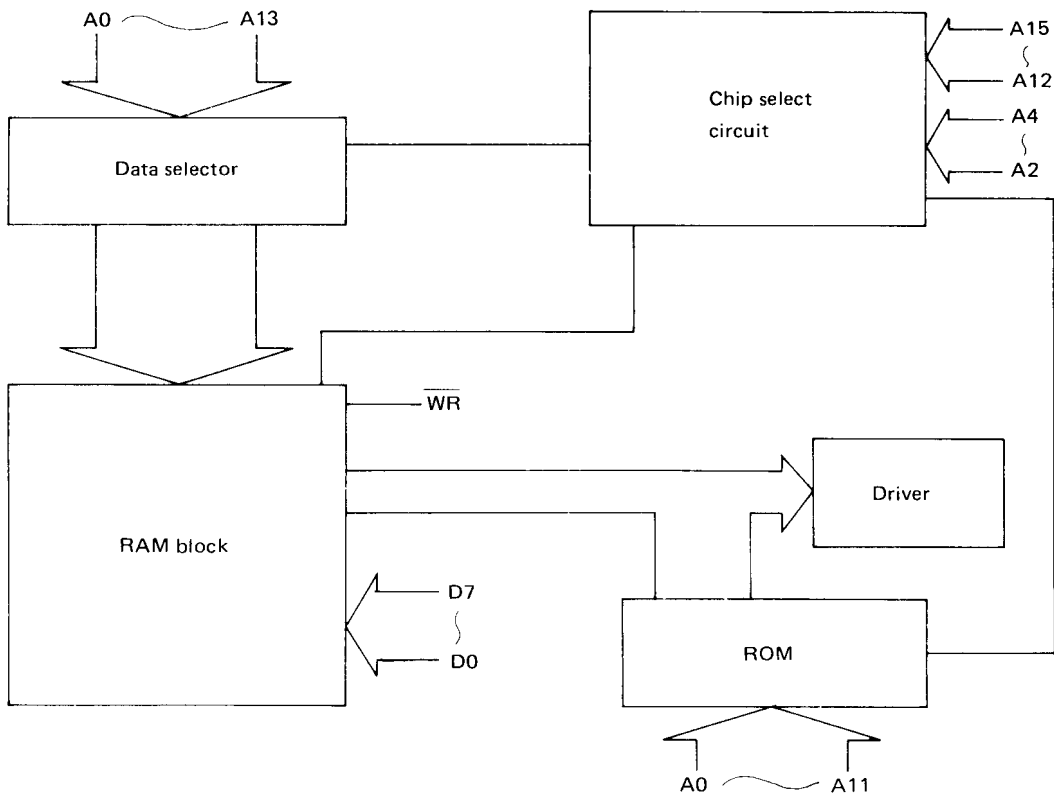
■ Audio/Clock Block



Block Diagram of Parts around Audio/Clock Block

Problem	Check
1. No sound is produced.	Is output signal present at pin ⑩ of IC18? Yes; IC12, IC3 No; IC18
2. Sound is distorted.	Check for IC12 and IC18.
3. Tempo is abnormal.	Check for IC13.
4. Clock function is abnormal.	Check for IC18.

■ Memory Circuit Block



Block Diagram of Parts around Memory Circuit

Problem	Check Point
1. Reproduced pictur shows "panic".	Check for the following: ROM, IC46, CG, IC43 Address bus line; A0 to A15 (IC44, IC45) Data bus line; D0 to D7 (IC36, IC37, IC50) Control line; IC35 RAM (by using RAM checker*), IC52, IC53, IC56
2. Error display or misoperation is caused as a result of program execution.	RAM
3. Cursol disappears.	IC46, IC1
4. Returns to "MONITOR SP-1002."	RAM
5. Error is caused after a long operation.	RAM

* How to Use RAM Checker

Remove monitor ROM from the socket ("M-ROM" marked on the PWB) and insert RAM checker into the socket and turn on the power switch (the picture gets "panic" for about 1 second): then the following RAM TEST-1 and RAM TEST-2 will be automatically carried out from the address \$1000 to the maximum address and the tested results will be displayed: the maximum address refers to \$5FFF in the case of the standard set.

The following is an example of the testing performed with the standard set (with RAMs being all normal).

Note: RAM (I) block, 16K bytes; RAM (II) block, 4K bytes

RAM TEST-1	1000-OK	2000-OK	3000-OK	4000-OK	5000-OK
	6000-ER	6000-00	7F		
RAM TEST-2	00	FF	00	FF	F0 OK

1) RAM TEST-1

In the range from the address \$1000 to the maximum address, data \$00 and \$FF are subjected to automatic write/read test; if error is caused, "ER" mark is indicated in the unit of 4K bytes.

In the above table,

3000-OK: this means write/read operation has been normal from the address \$3000 to \$3FFF.

6000-ER-6000-00, 7F: this means there exists error somewhere from the address \$6000 to \$6FFF; this error is because the standard set is provided with up to \$5FFF but with no more address, so it doesn't show a malfunction of RAM itself.

An example showing an error really caused:

2000-ER-235B-00, 01

An error is caused in the addresses \$2000s; namely, although data \$00 has been written in the address \$235B, its read-out data is \$01.

2) RAM TEST-2

Write/read test is carried out with the following data.

- Write-in data \$00 (from the address \$1000 to the maximum address)
- Write-in data \$FF (from the address \$1000 to the maximum address)
- Write-in data \$00 (from the maximum address to the address \$1000)
- Write-in data \$FF (from the maximum address to the address \$1000)
- Write-in data \$F0 and \$0F to be entered alternately (from the address \$1000 to the maximum address and vice versa).

The above table (RAM TEST-2) shows all the items (a) thru (e) are normal — the indications "00", "FF", "00", "FF" and "F0" correspond to (a) thru (e) respectively.

An example showing an error really caused:

RAM TEST-2	00	FF	00	ER-23FF-01
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From the above, it can be seen that the tests (a) and (b) are both normal and that although data \$00 in the test (c) has been written in the address \$23FF, its read-out data is \$01, which means that an error has been caused.

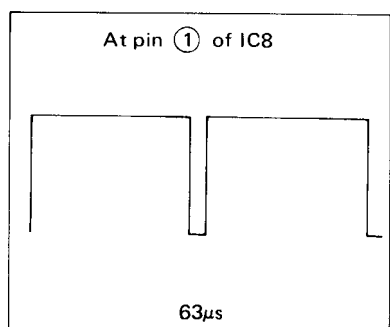
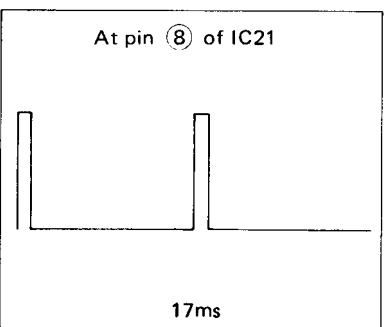
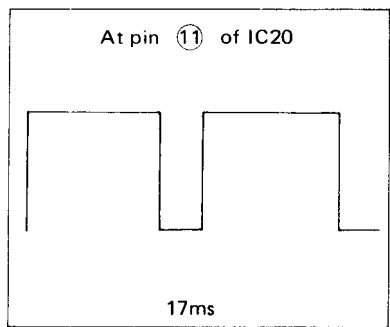
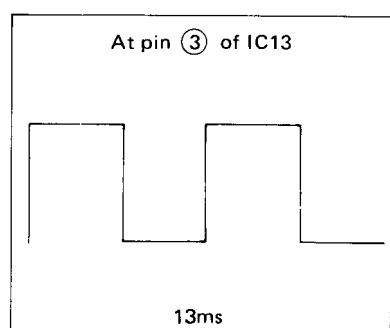
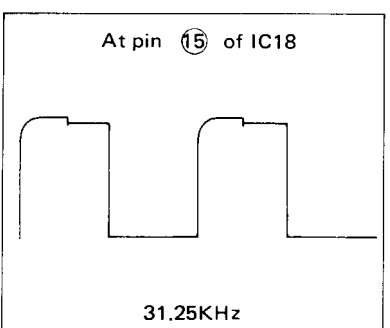
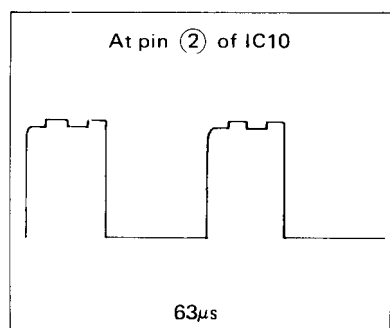
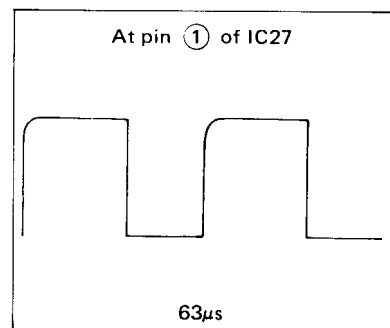
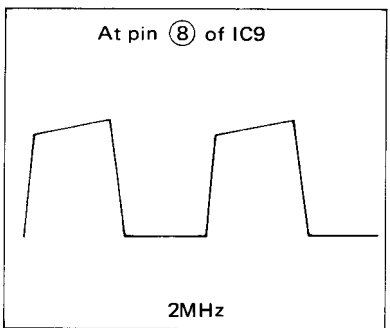
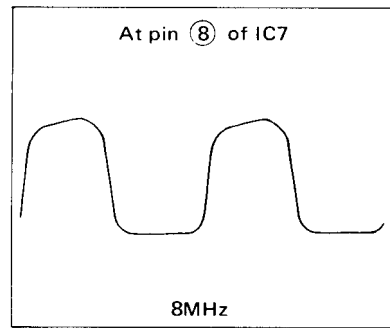
In this way, which RAM block (I, II or III) has been subjected to the error is first located, and then so does which RAM component having undergone the error, by the respective information given by the RAM tester. In the above example, the display of "\$23FF" means RAM (I) block is in trouble, and the display of read-out data "\$01" (with respect to write-in data "\$00") shows RAM 1 of the block (I) is defective.

	D7	D6	D5	D4	D3	D2	D1	D0	
Write-in data \$00	0	0	0	0	0	0	0	0	← Error to occur
Read-out data \$01	0	0	0	0	0	0	0	1	

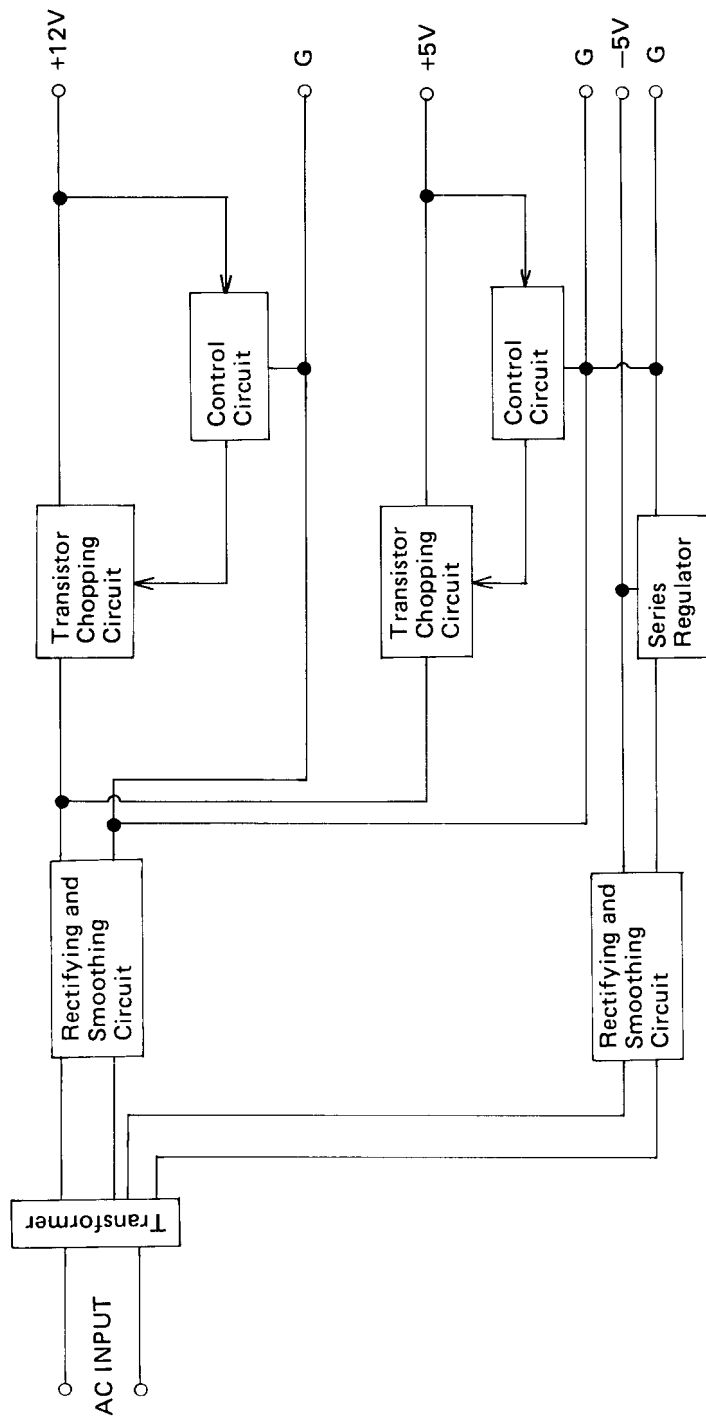
	RAM (II)	RAM (I)	RAM (I)
D0	17	9	1
D1	18	10	2
D2	19	11	3
D3	20	12	4
D4	21	13	5
D5	22	14	6
D6	23	15	7
D7	24	16	8

- RAM (I) \$1000 ~ \$4FFF (with 16KRAM)
- RAM (II) \$5000 ~ \$8FFF (with 16KRAM)
- \$5000 ~ \$5FFF (with 4KRAM)
- RAM (III) \$9000 ~ \$9FFF (RAM (II) 16KRAM)
- (RAM (III) 4KRAM)
- \$9000 ~ \$CFFF (RAM (II) 16KRAM)
- (RAM (III) 16KRAM)
- \$6000 ~ \$6FFF (RAM (II) 4KRAM)
- (RAM (III) 4KRAM)

■ Waveform of Each Pin of CPU Board



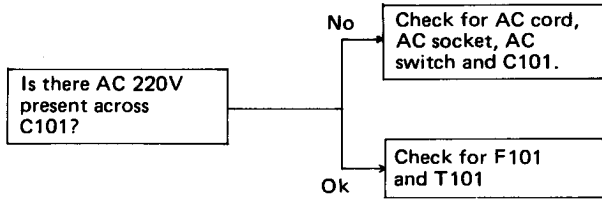
POWER SUPPLY SECTION



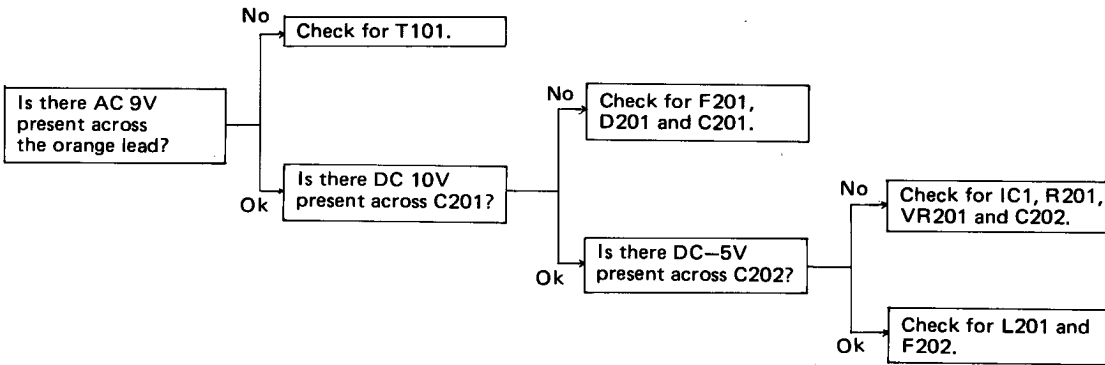
Block Diagram of Power Supply Section

■ Trouble Shooting Chart (DBOXD0004PAZZ)

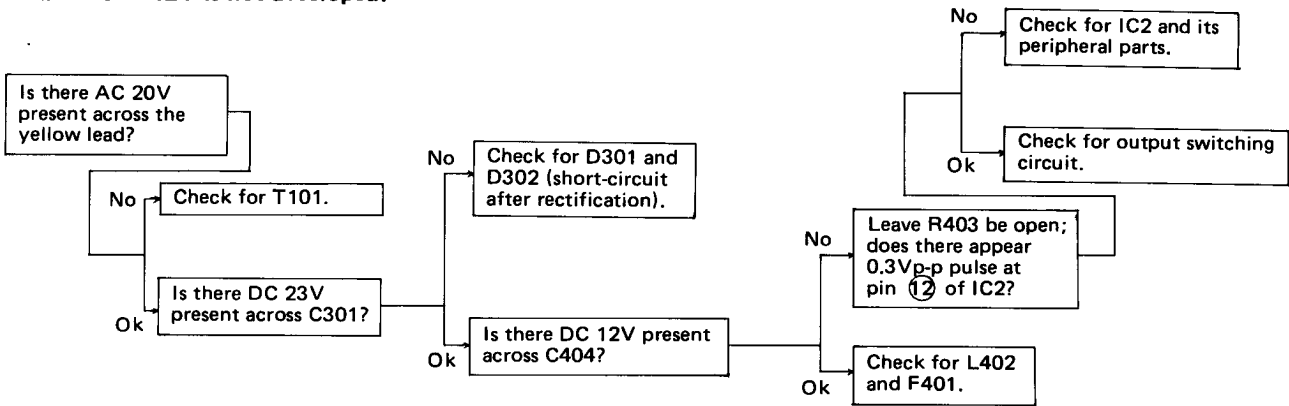
Problem 1: No voltage appears at any output terminal.



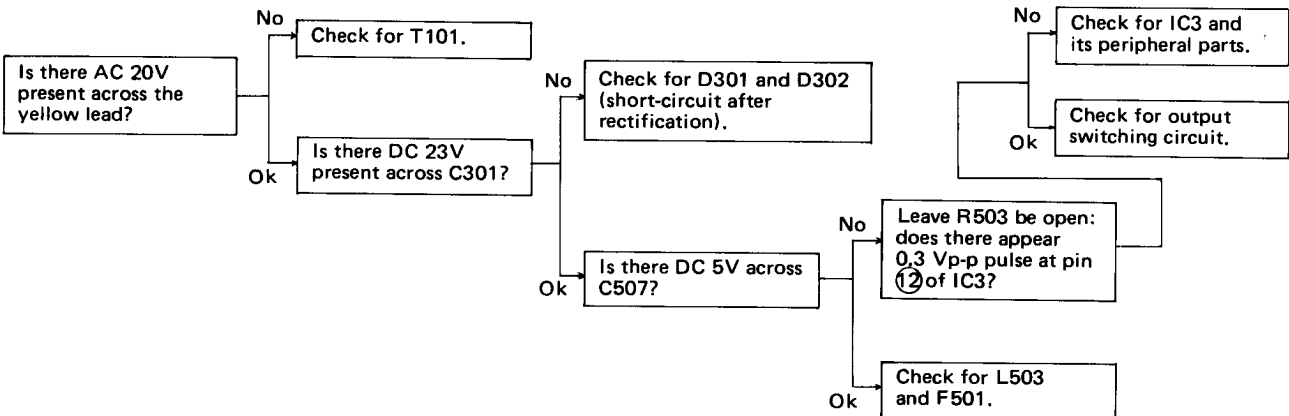
Problem 2: -5V is not developed.



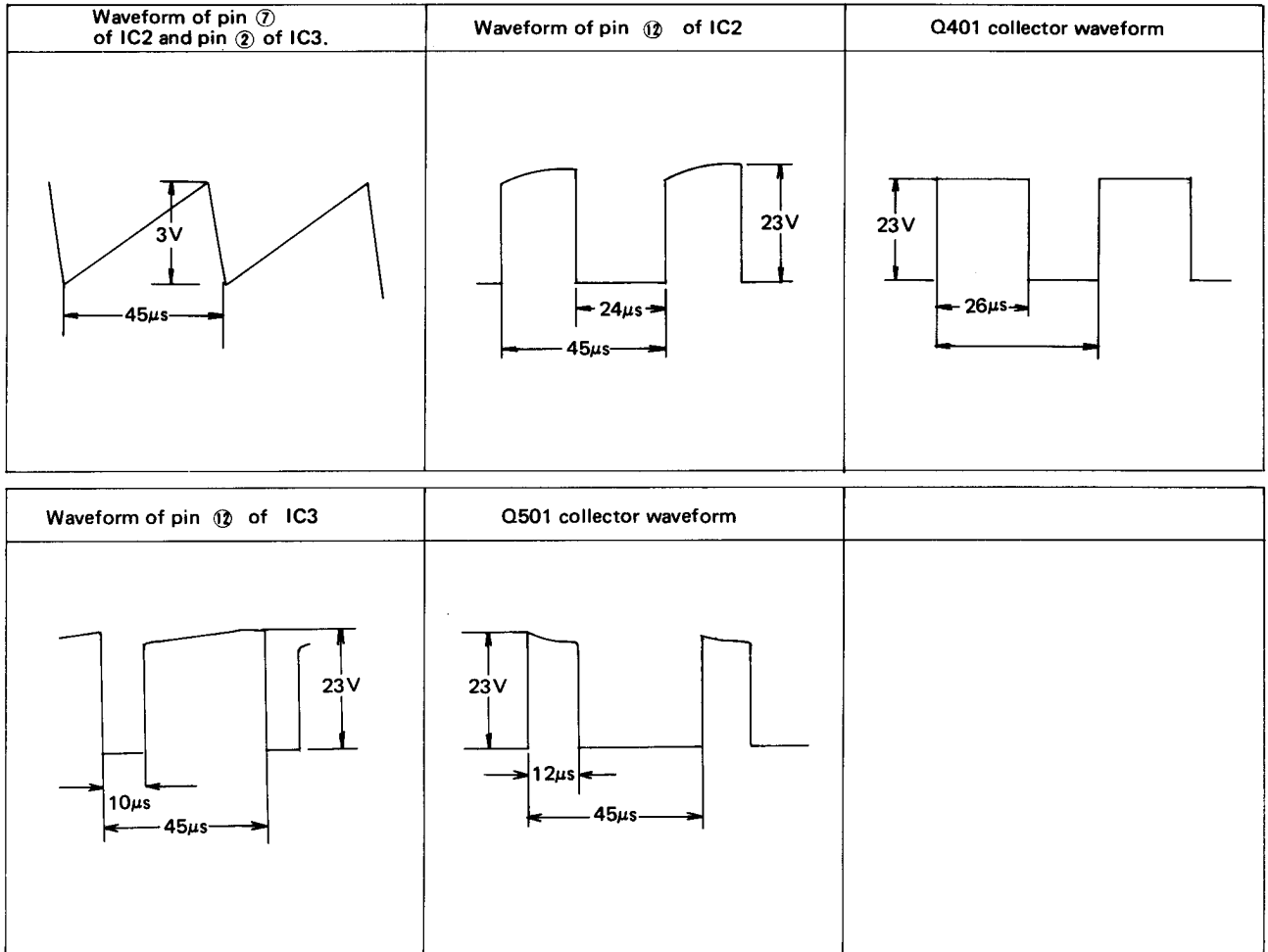
Problem 3: +12V is not developed.



Problem 4: +5V is not developed.

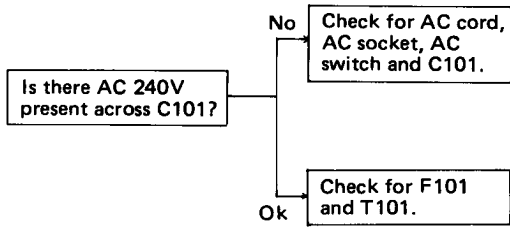


■ Waveforms of Each Parts

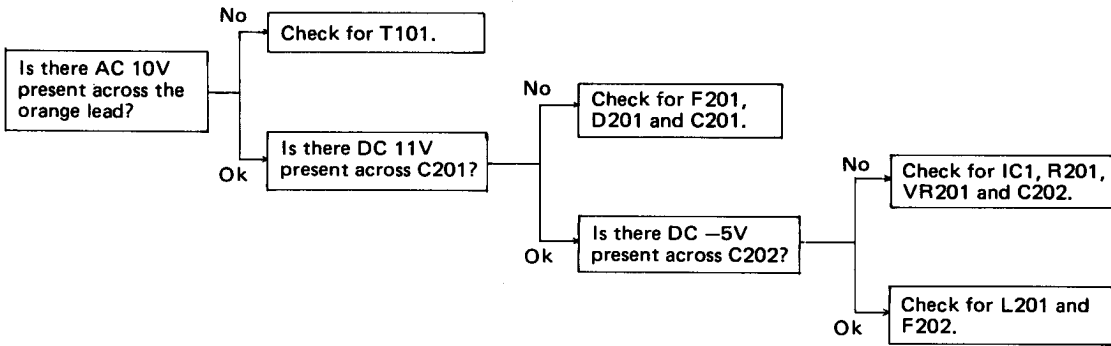


■ Trouble Shooting Chart (DBOXD0005PAZZ ----- for UK)

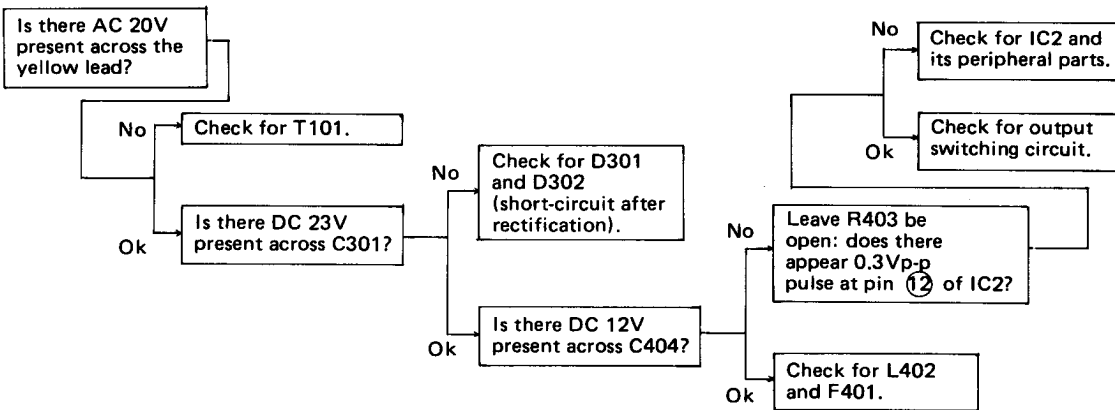
Problem 1: No voltage appears at any output terminal.



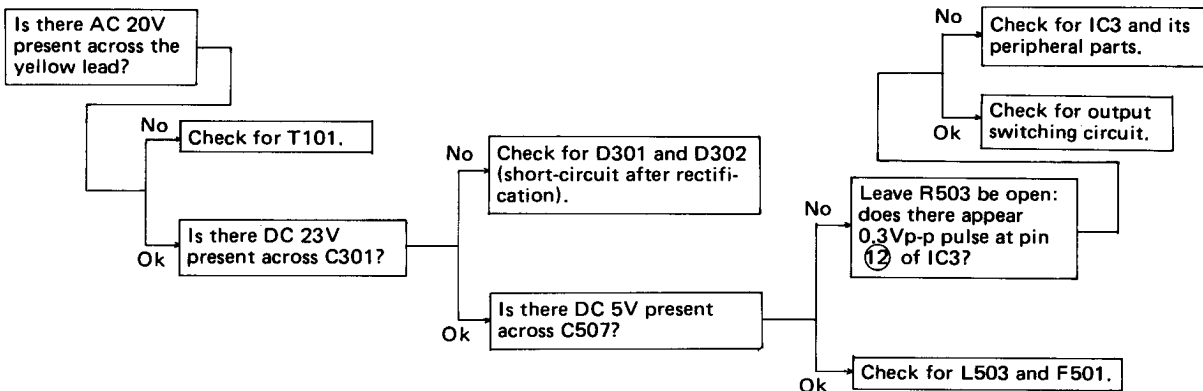
Problem 2: -5V is not developed.



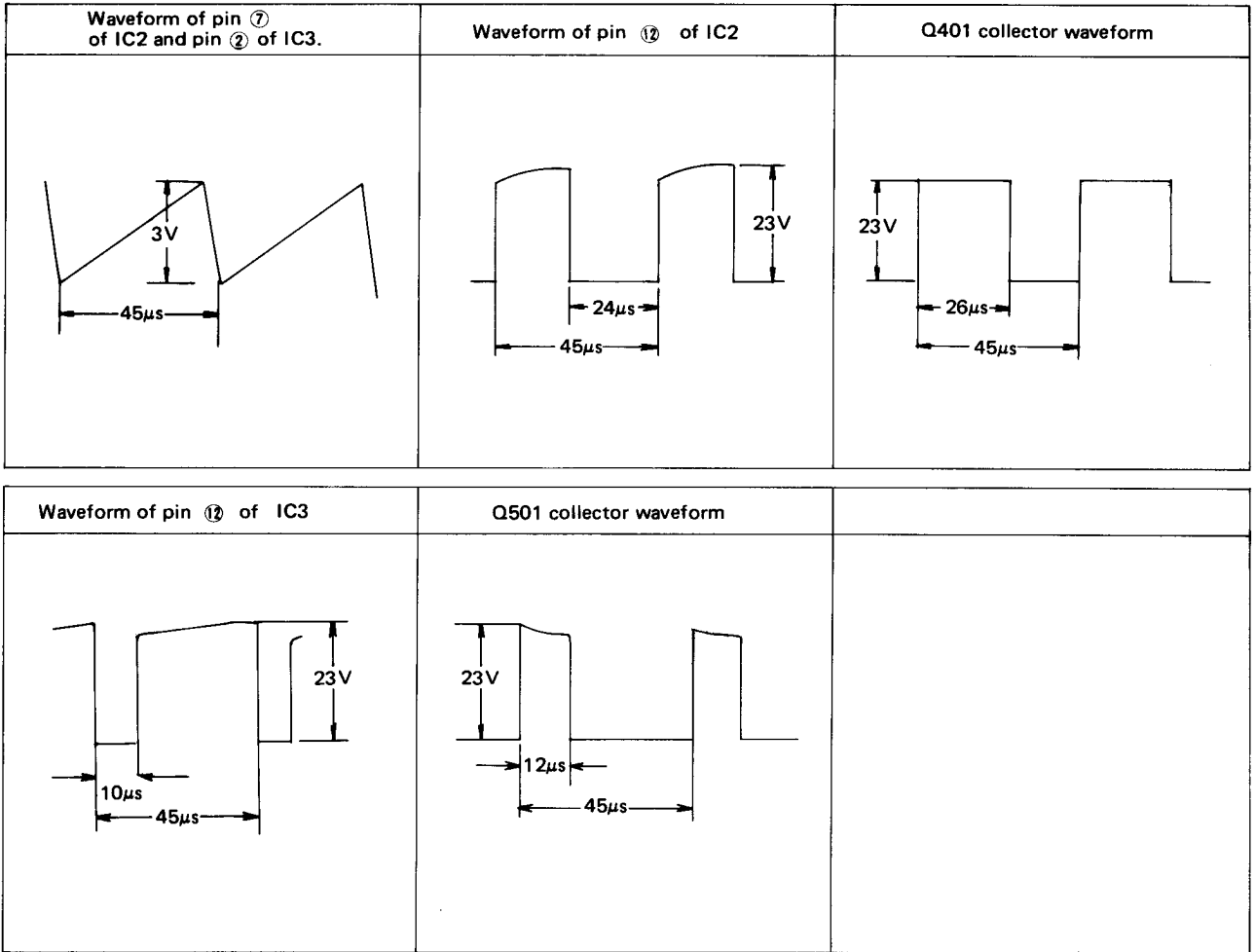
Problem 3: +12V is not developed.



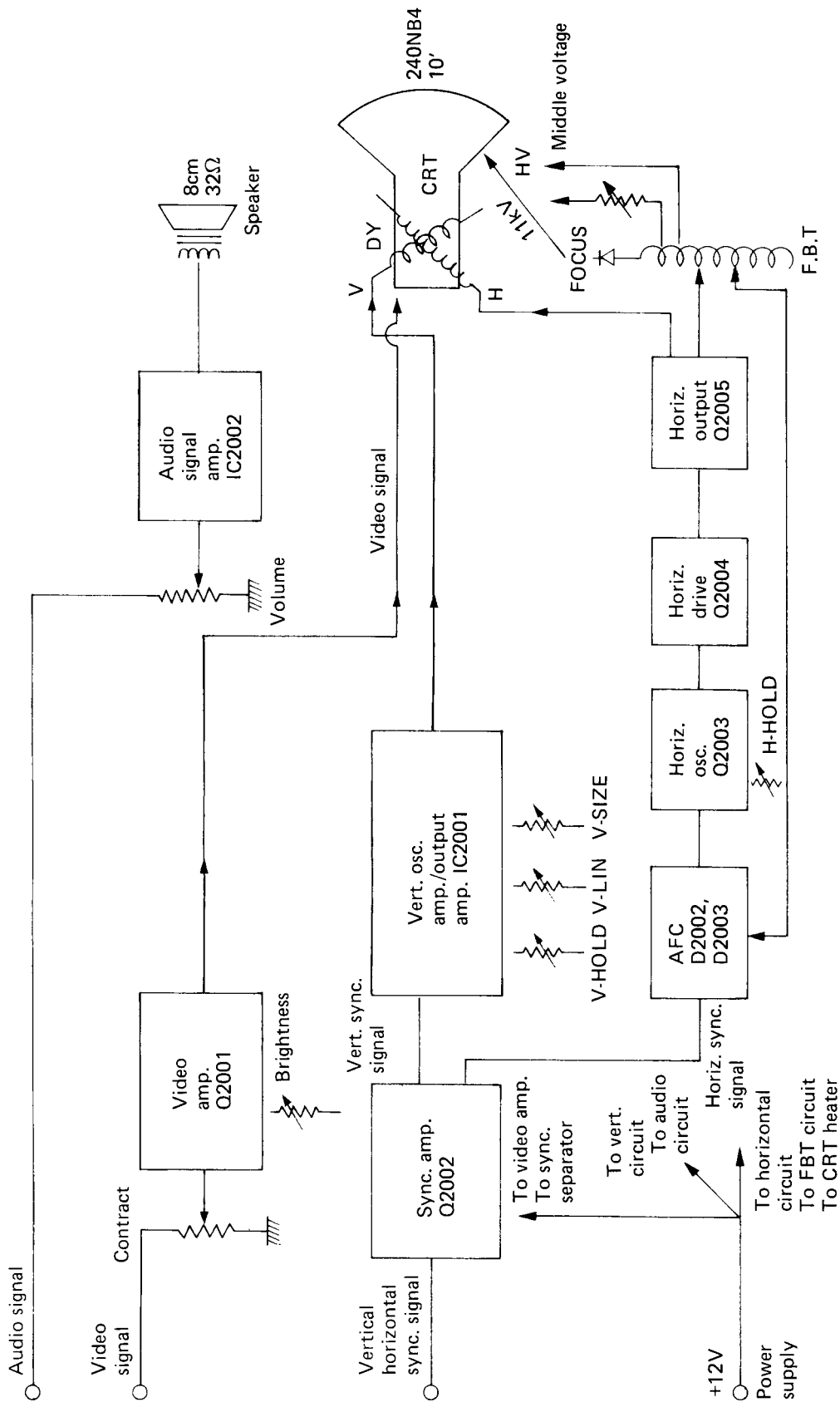
Problem 4: +5V is not developed.



■ Waveforms of Each Parts



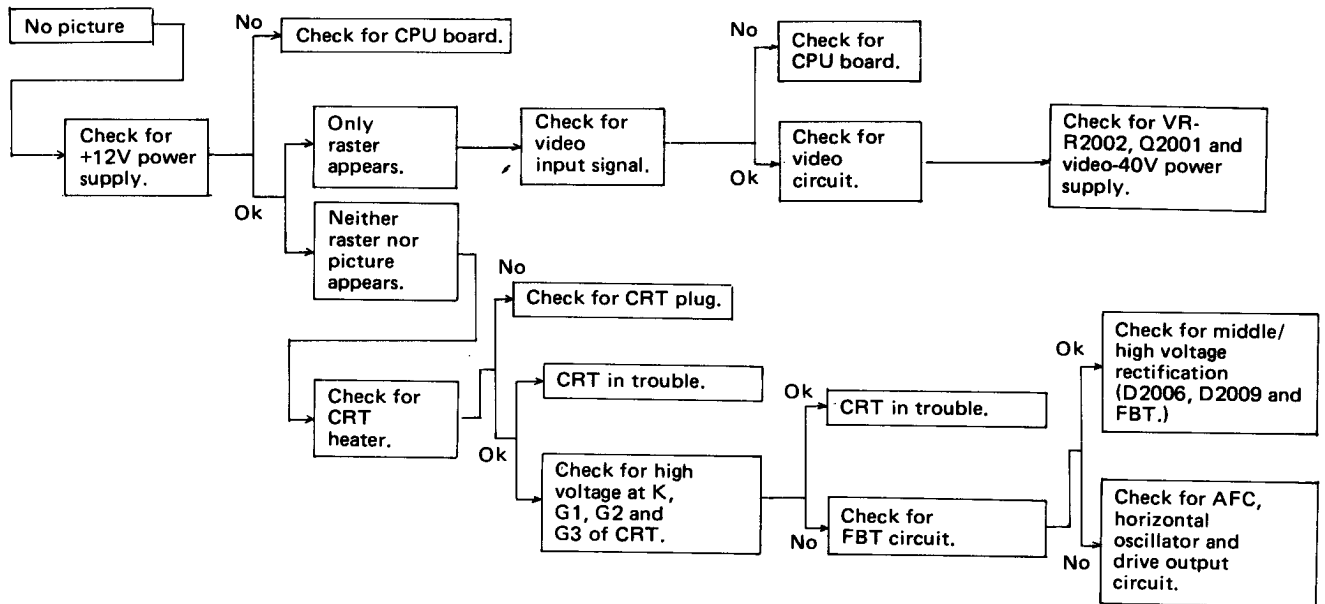
DISPLAY SECTION



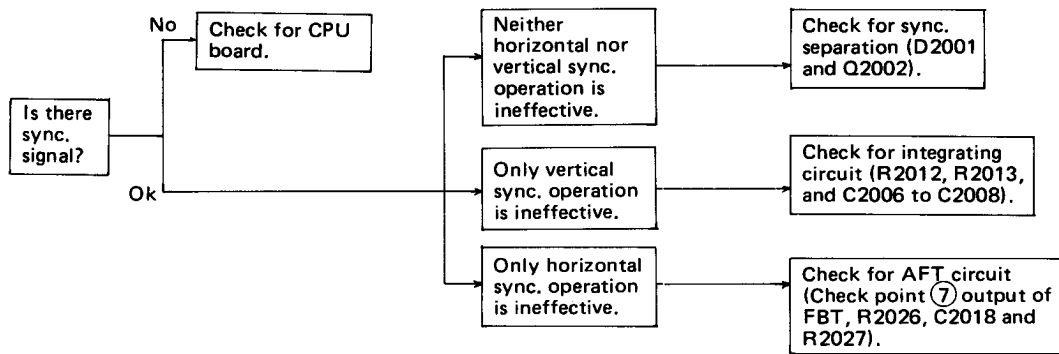
Block Diagram of Display Section

■ Trouble Shooting Chart

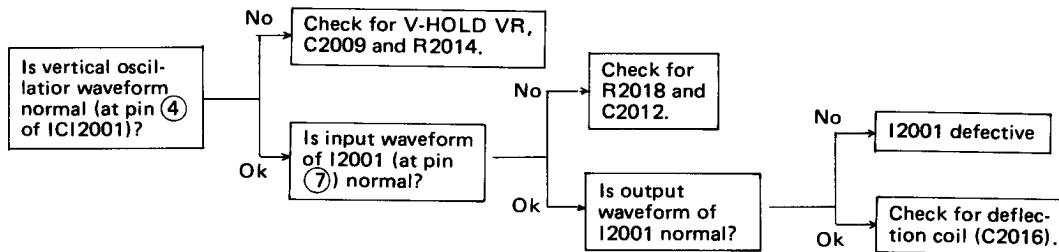
Problem 1: No picture appears.



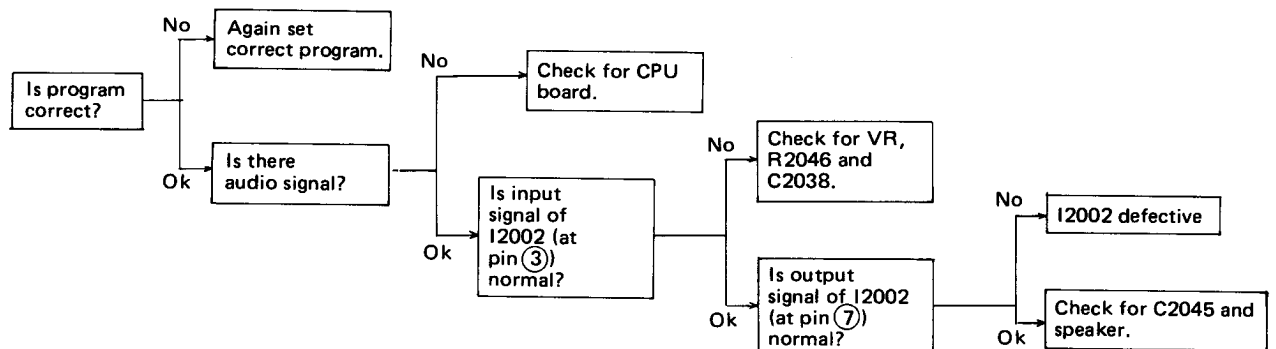
Problem 2: Sync operation remains ineffective.



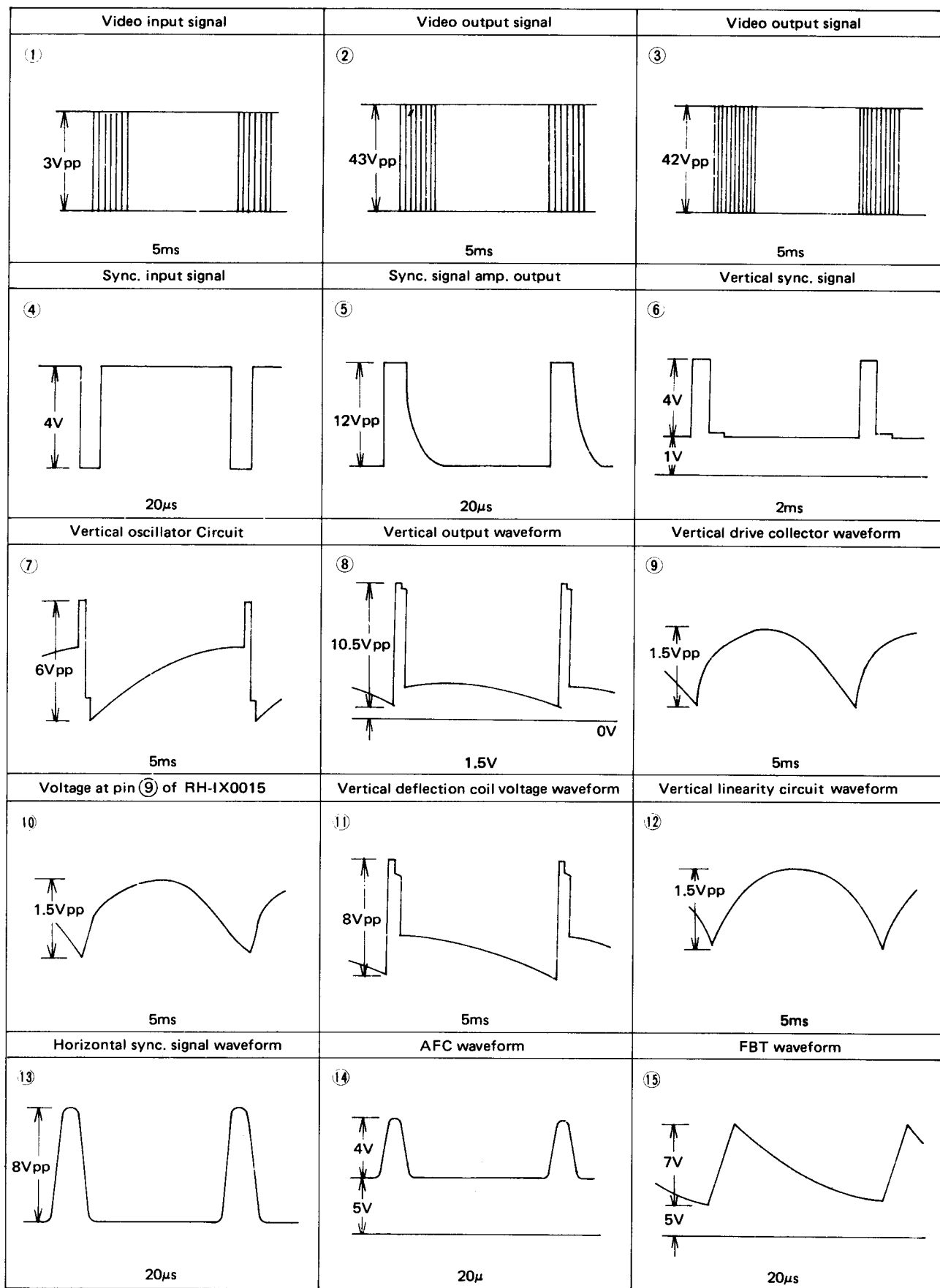
Problem 3: Raster is too narrow.

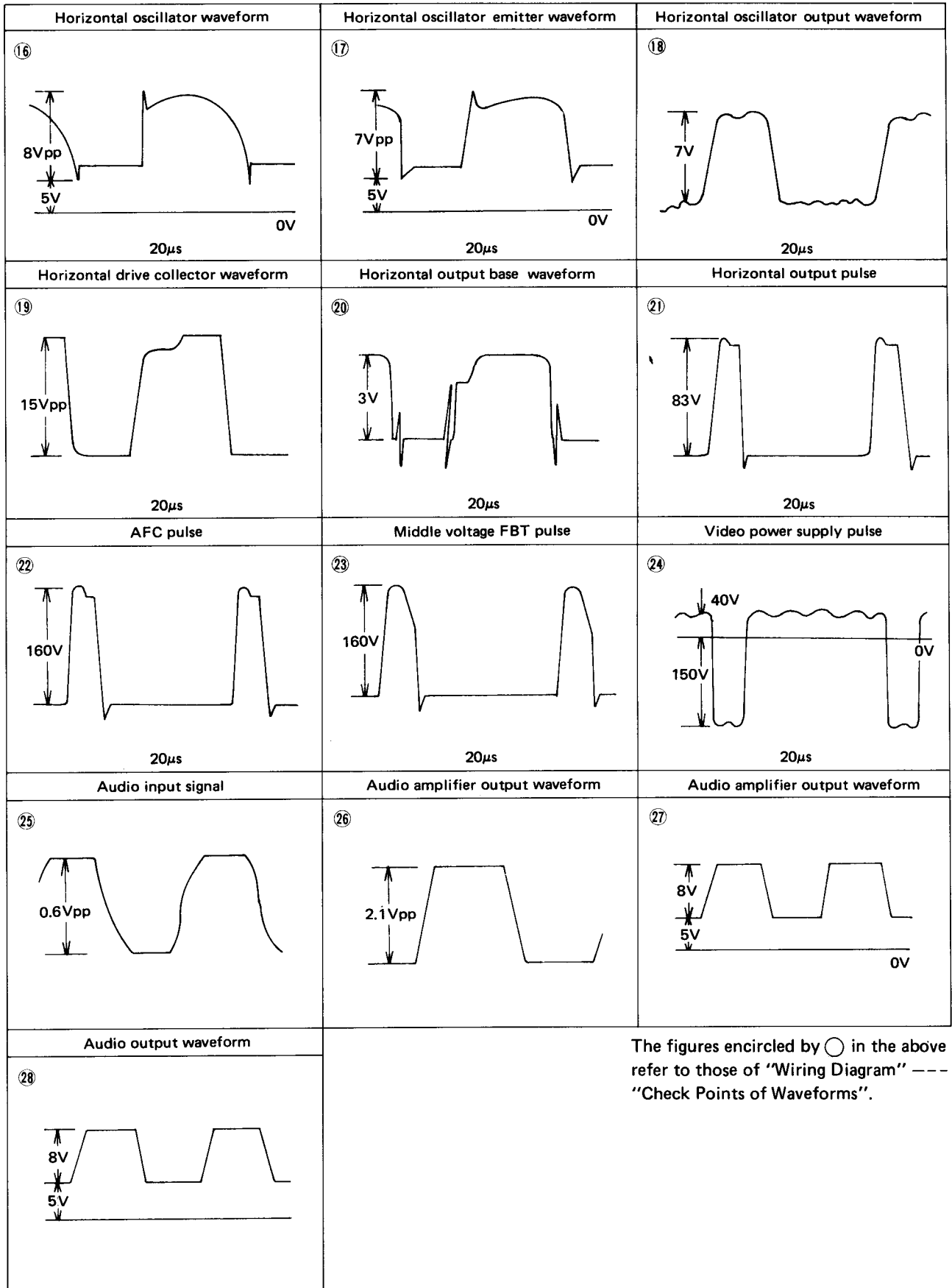


Problem 4: No sound comes out.

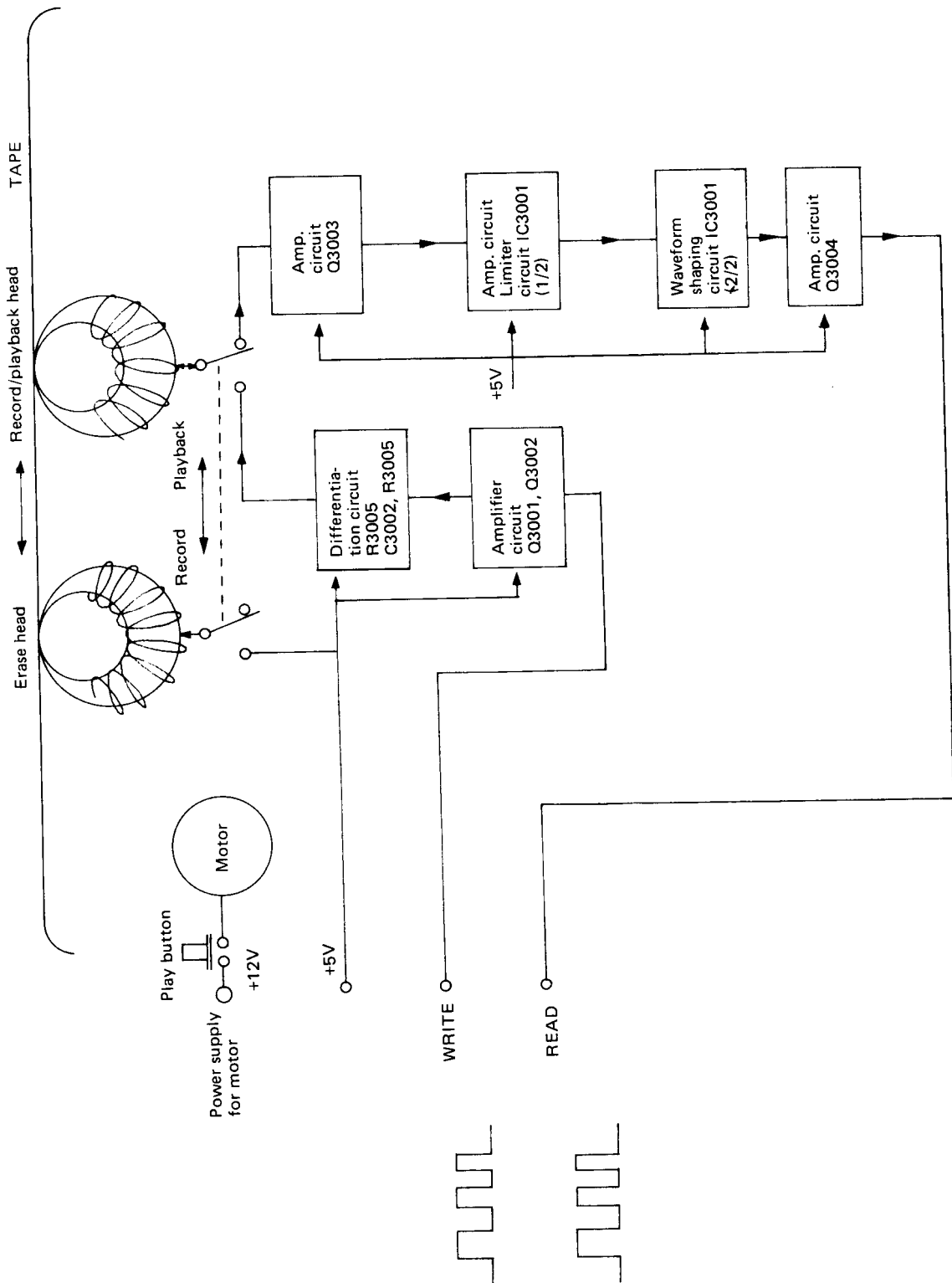


Waveforms of Display Section





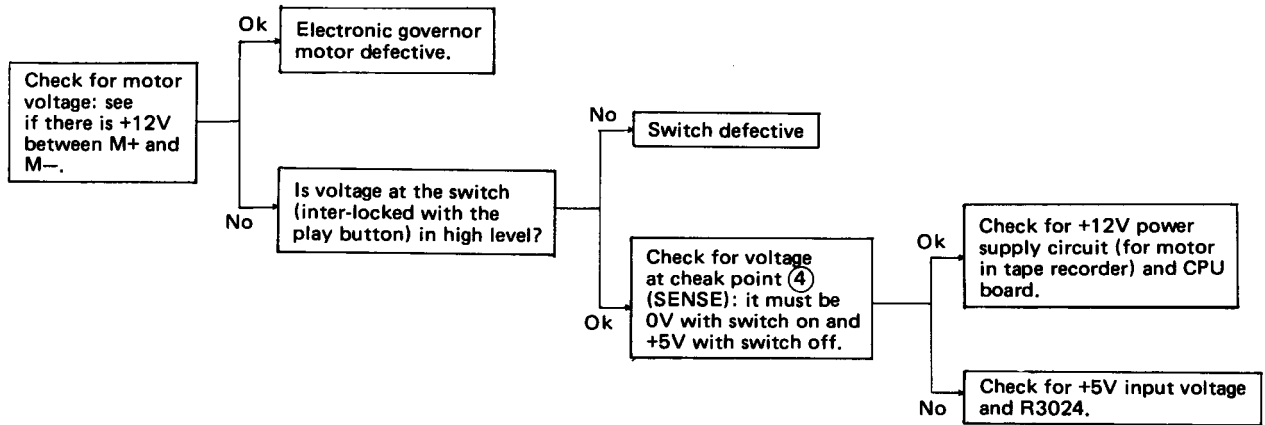
CASSETTE TAPE RECORDER SECTION



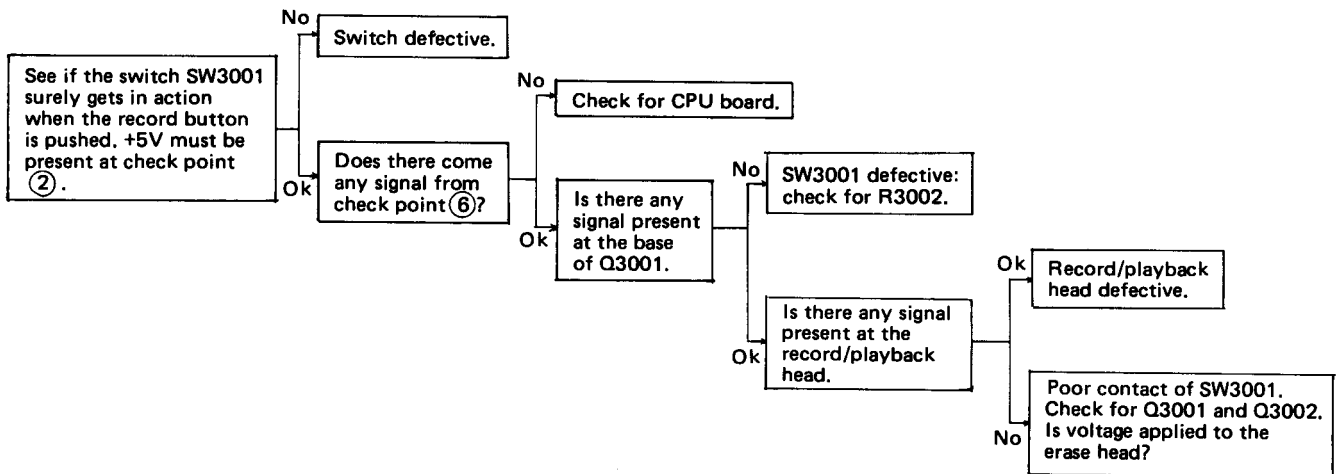
Block Diagram of Cassette Tape Recorder

■ Trouble Shooting Chart

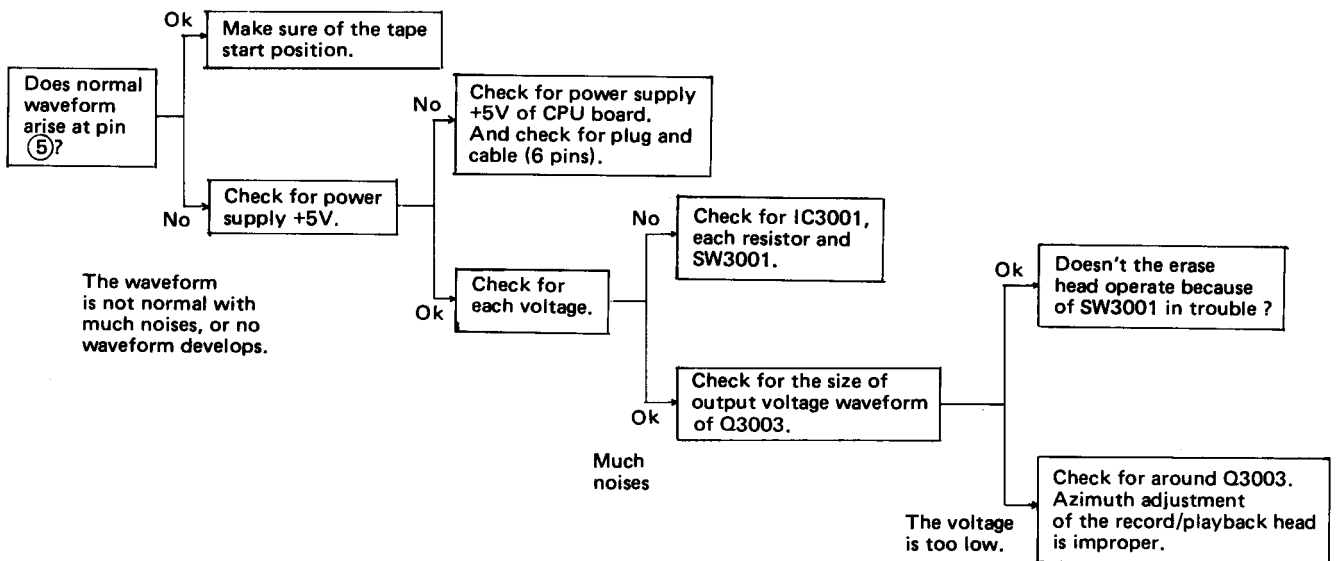
Problem 1: Even if the play button is pushed, neither motor rotates nor tape moves.



Problem 2: Record (SAVE) operation of program is impossible.



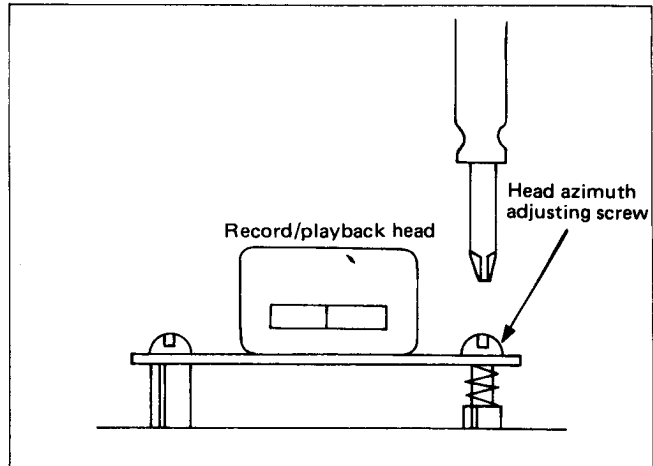
Problem 3: Playback (LOAD) of program is impossible, or error is caused.



■ Azimuth Adjustment and Head Cleaning

* Azimuth adjustment of record/playback head

1. Connect a synchroscope to the collector of Q3003.
2. Load a test tape (TEAC, 3kHz-signal recorded) and play it back.
3. Rotate the azimuth adjusting screw so that the waveform on a synchroscope will be the maximum.



Head cleaning

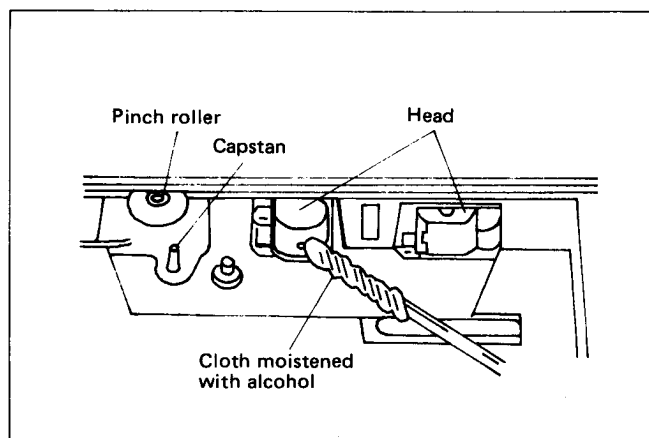
Clean the heads, capstan and pinch roller often, to remove dust and tape residue. Foreign material on them impairs the sound quality of both recording and playback.

Open the cassette holder, remove the tape, push the play button and clean them with a soft cloth moistened in alcohol.

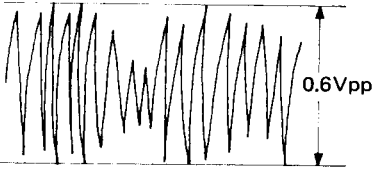

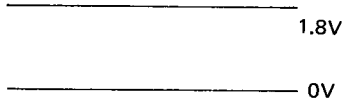
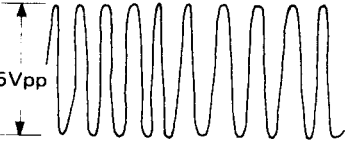
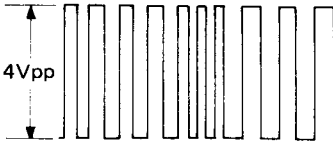
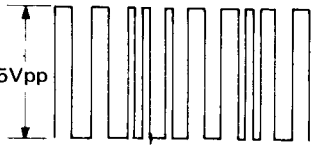
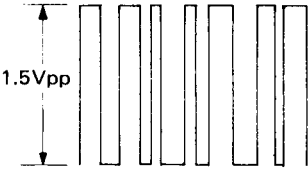
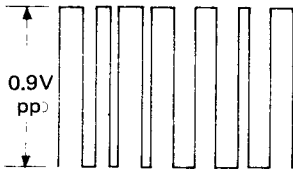
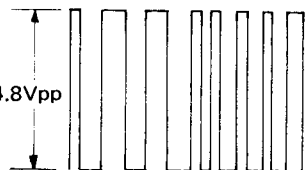

Erase protection

To protect a cassette tape from being accidentally erased it was designed with two removable tabs. When the tabs are removed, it is impossible to push the record button.

When no cassette is inside the machine, no pushing of the record button is allowed, either. Nevertheless, pushing the button strongly may cause a trouble.



Waveforms of Cassette Tape Recorder

1st stage amp. output waveform ① 	Operational amp. input waveform ② 	Operational amp. input waveform ③ 
Operational amp. input waveform ④ 	Operational amp. output waveform ⑤ 	Output waveform ⑥ 
Record input waveform ⑦ 	Record amp. waveform ⑧ 	Record amp. waveform ⑨ 
Head input waveform ⑩ 		

The figures encircled by ○ correspond to those of "Wiring Diagram" – "Check Points of Waveforms".

KEYBOARD SECTION

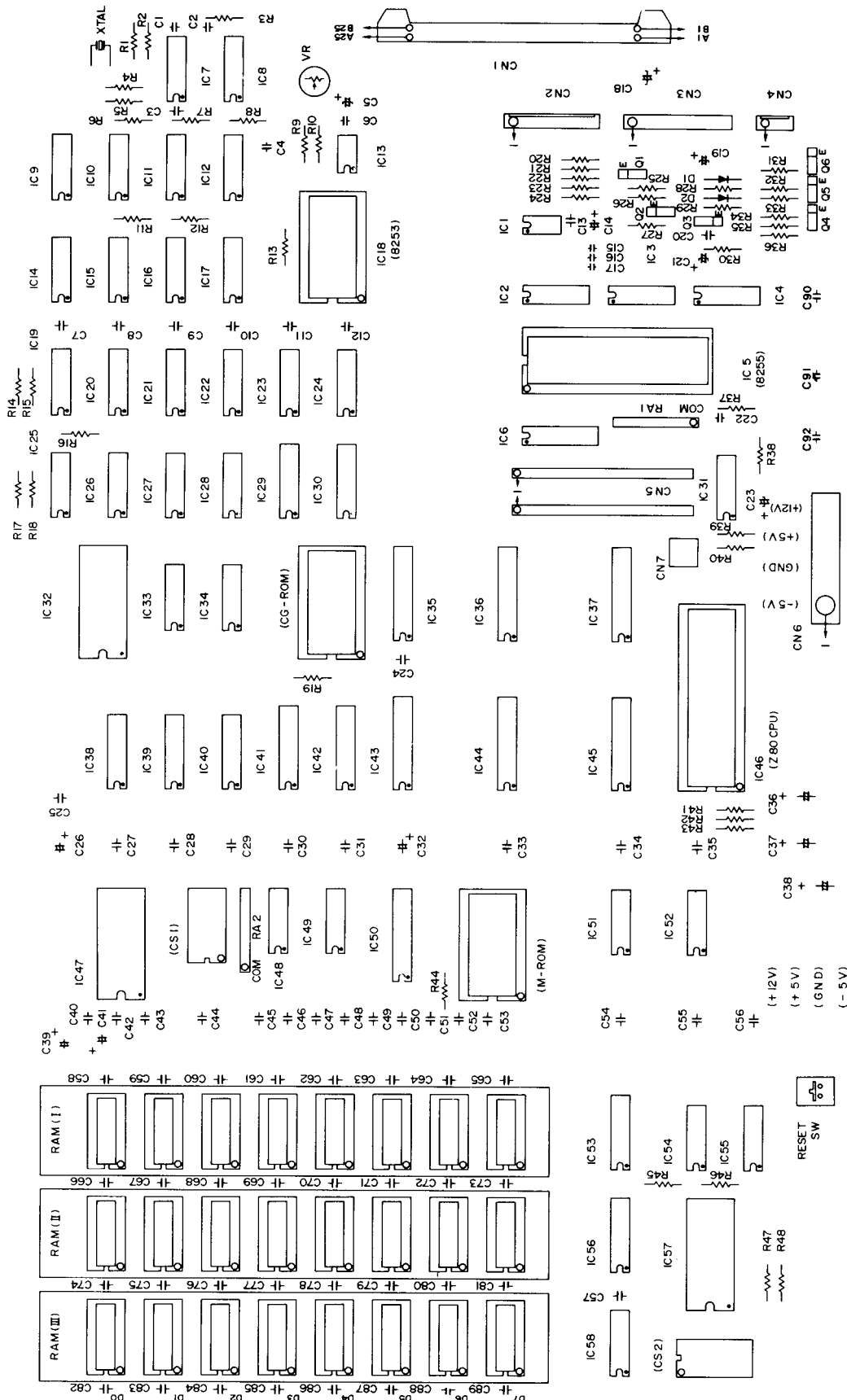
Problem 1: A character isn't displayed even if a key is pushed.

- (1) Poor soldering
- (2) Mechanical key defective
- (3) Printed line broken

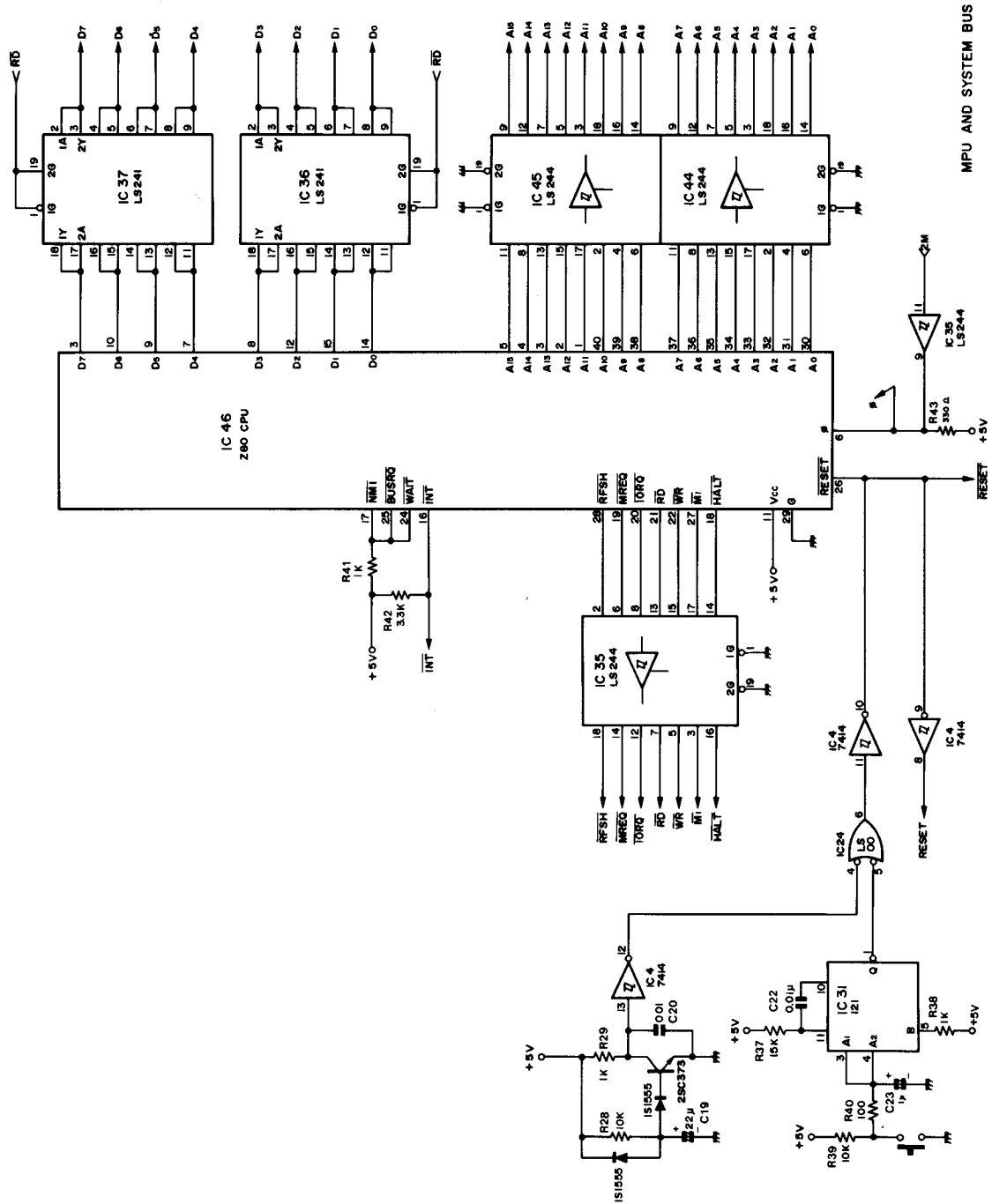
If there is nothing abnormal in the above checks, proceed with the checkings of "CPU Board Section".

CIRCUIT DIAGRAM OF MZ-80K

■ Symbols of CPU Section

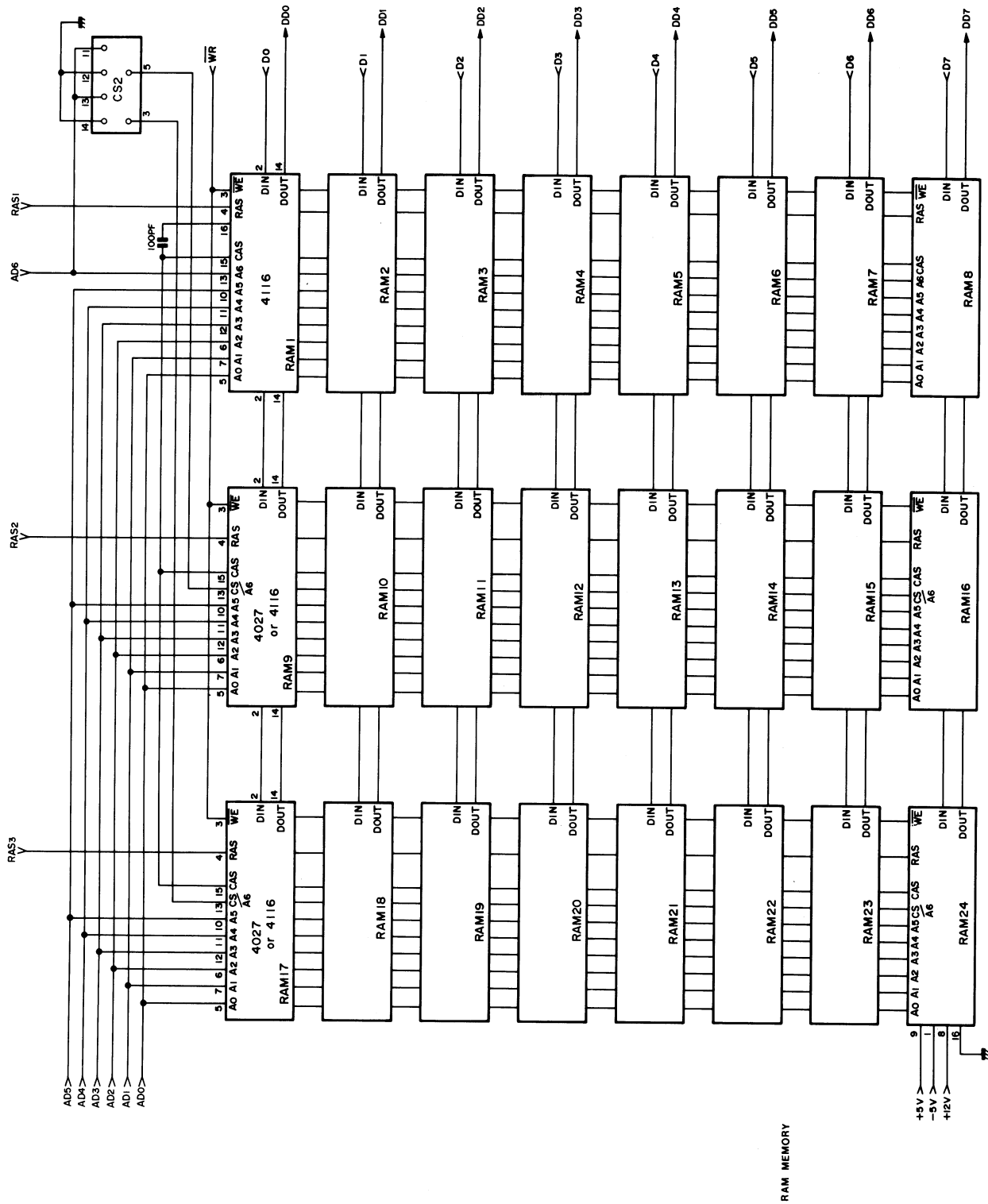


■ Circuit Diagram (1) of CPU Board Section

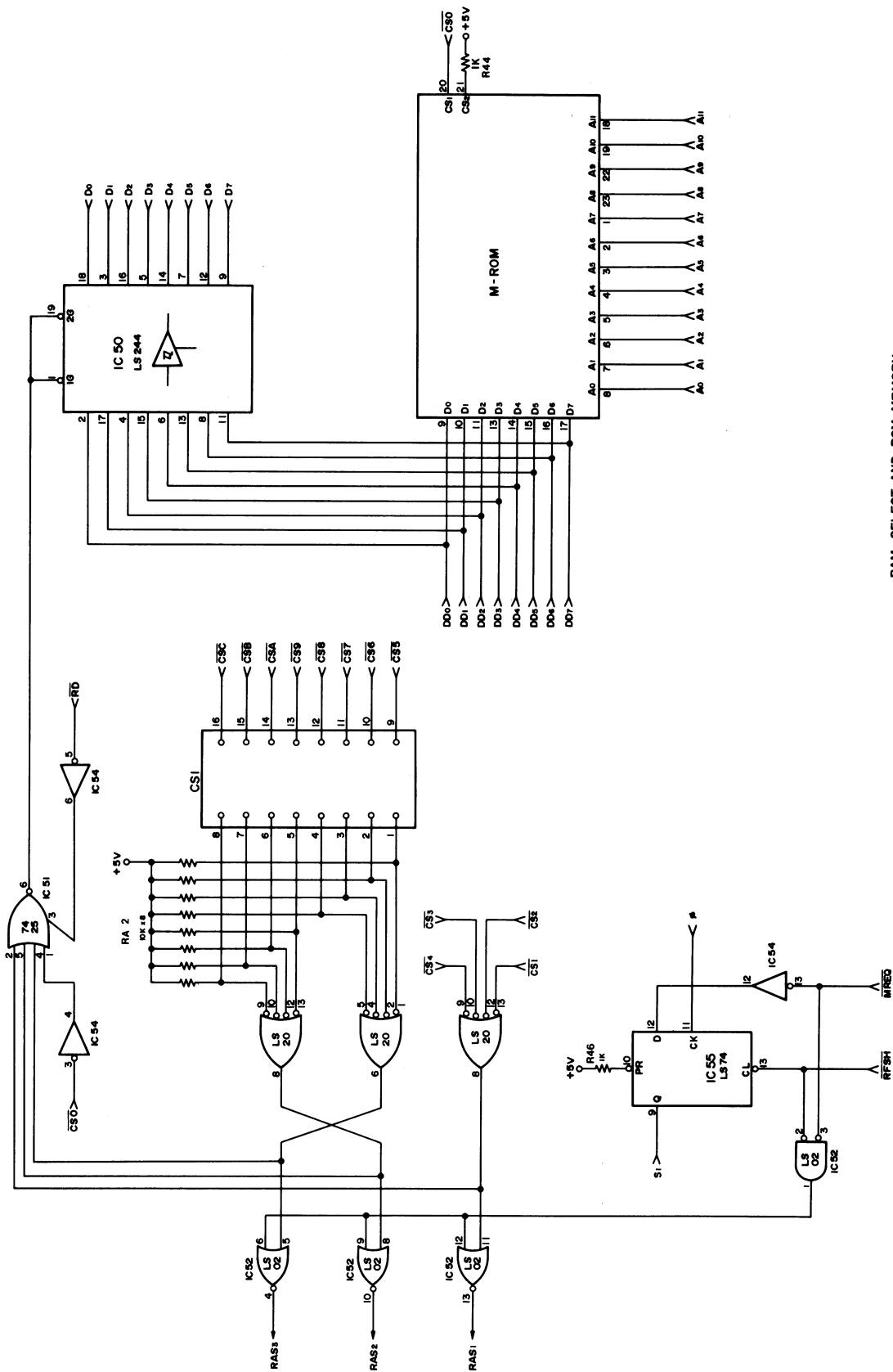


MPU AND SYSTEM BUS

■ Circuit Diagram (2) of CPU Board Section

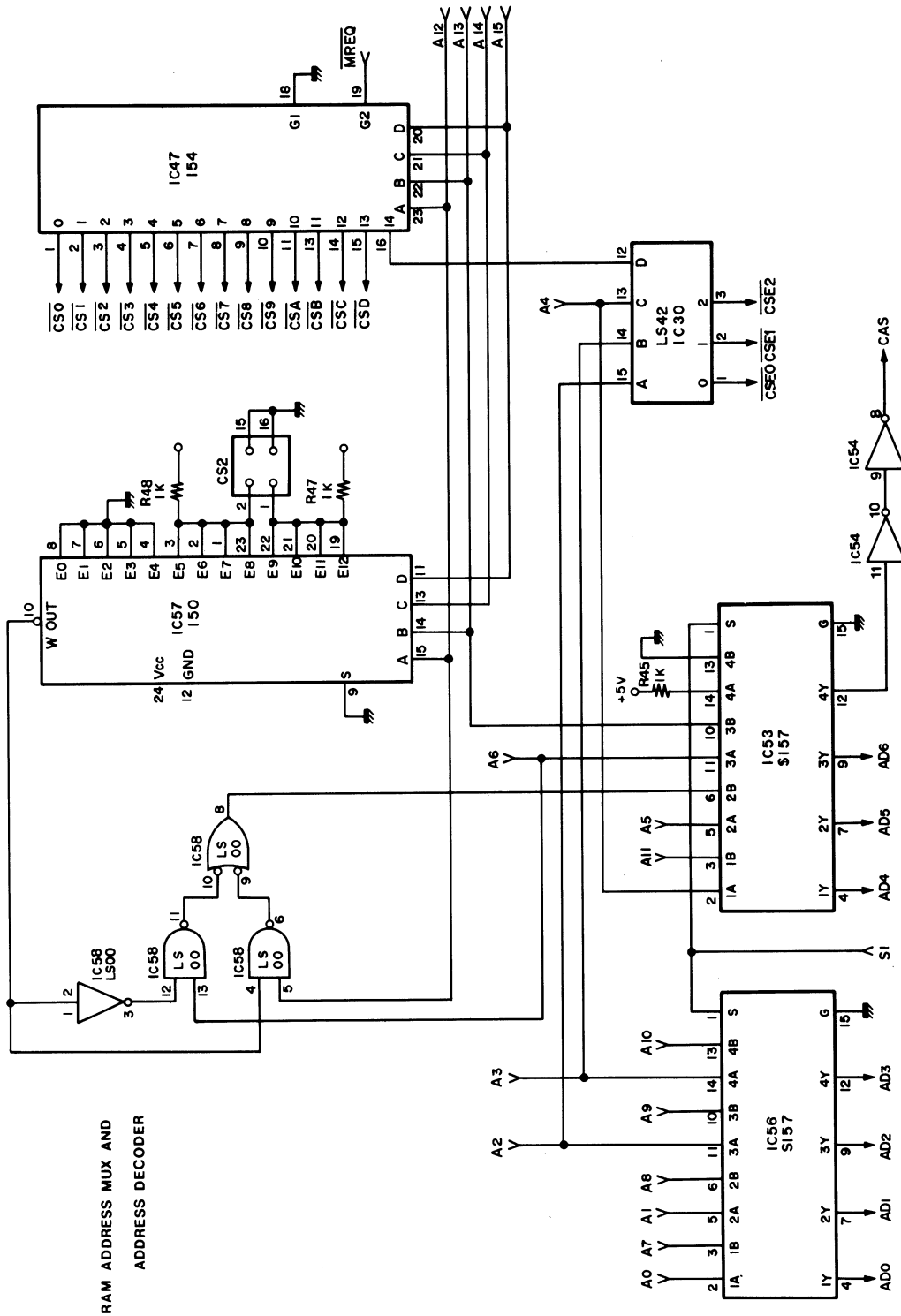


■ Circuit Diagram (3) of CPU Board Section

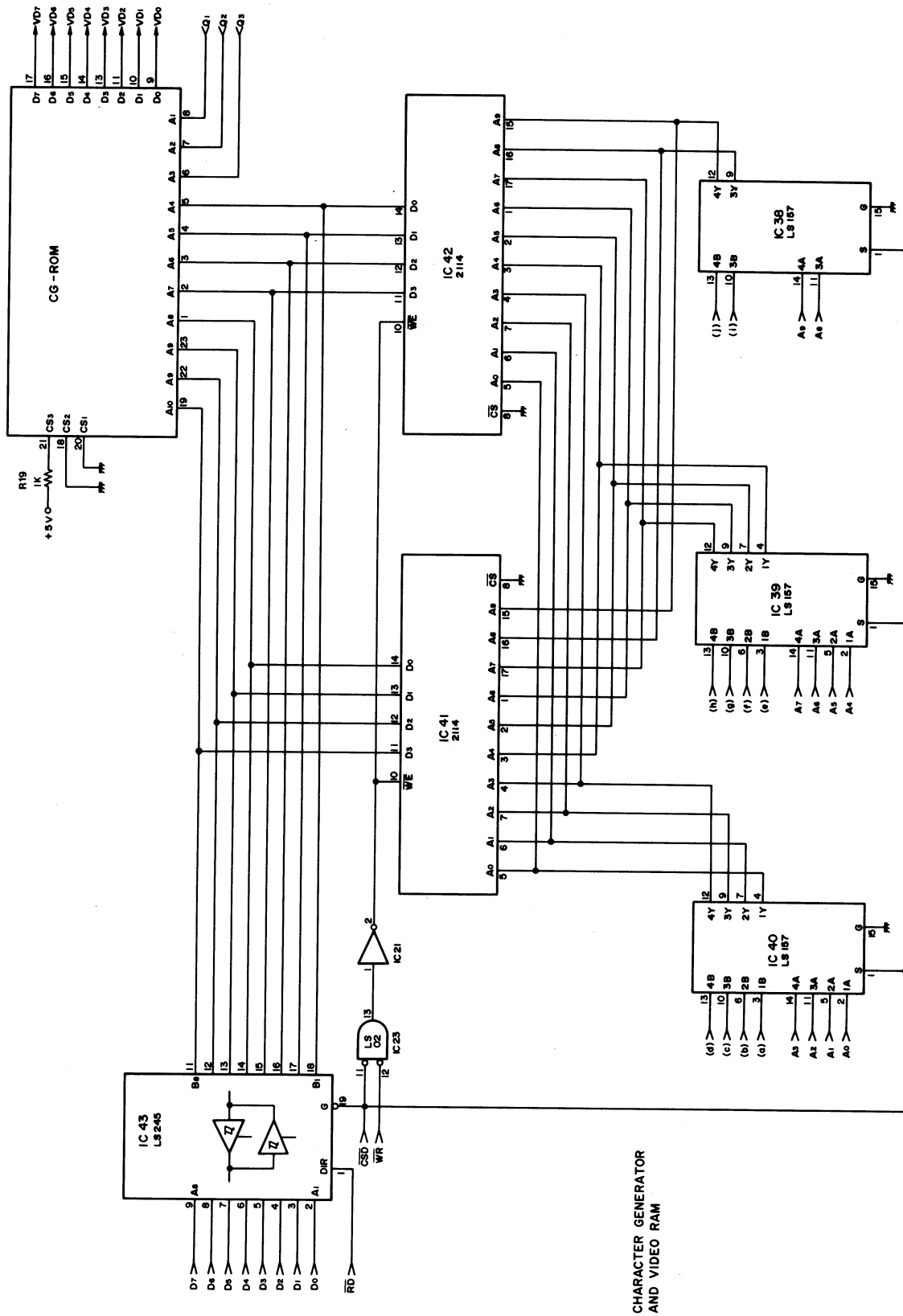


RAM SELECT AND ROM MEMORY

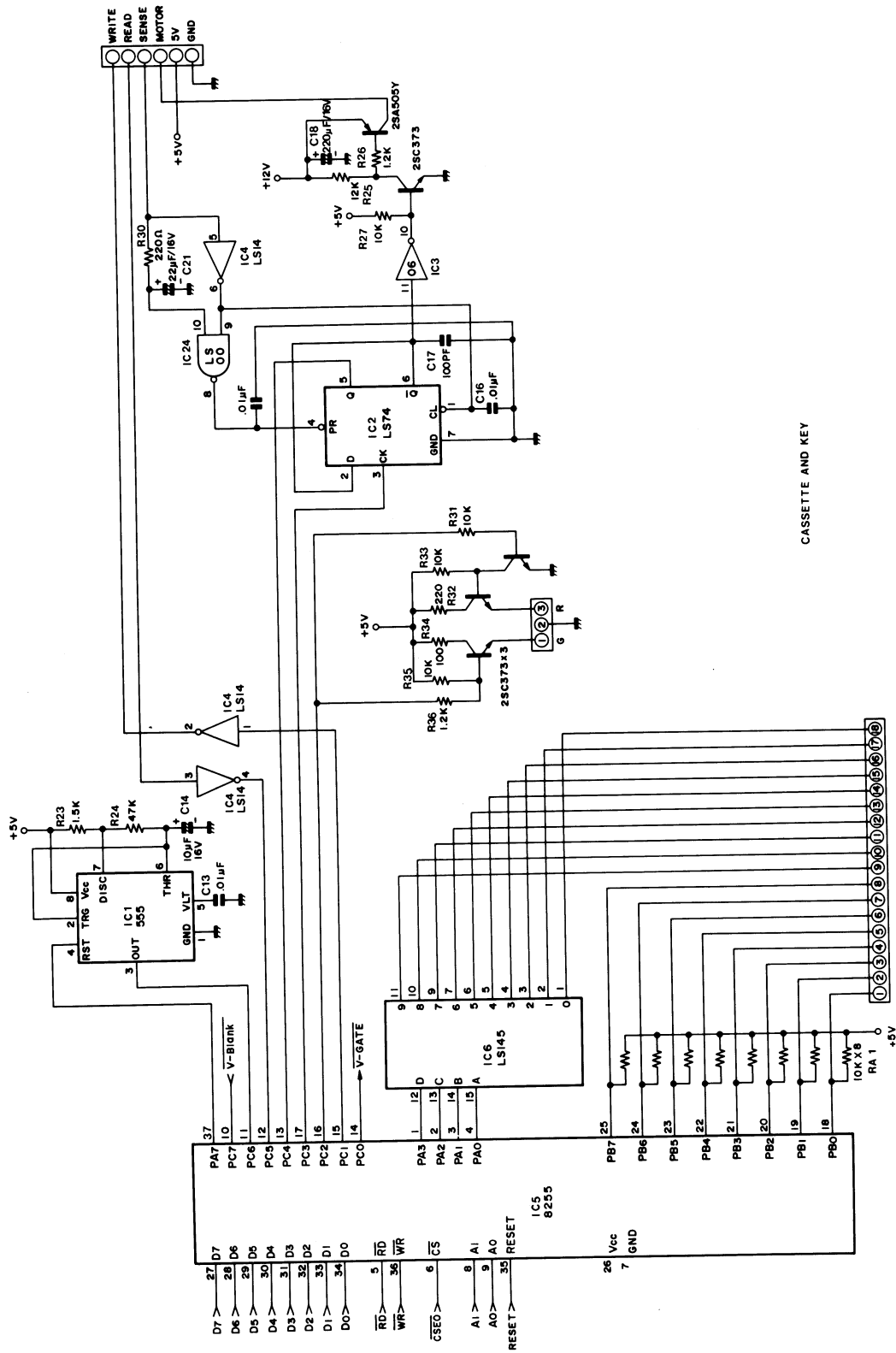
■ Circuit Diagram (4) of CPU Board Section



■ Circuit Diagram (6) of CPU Board Section

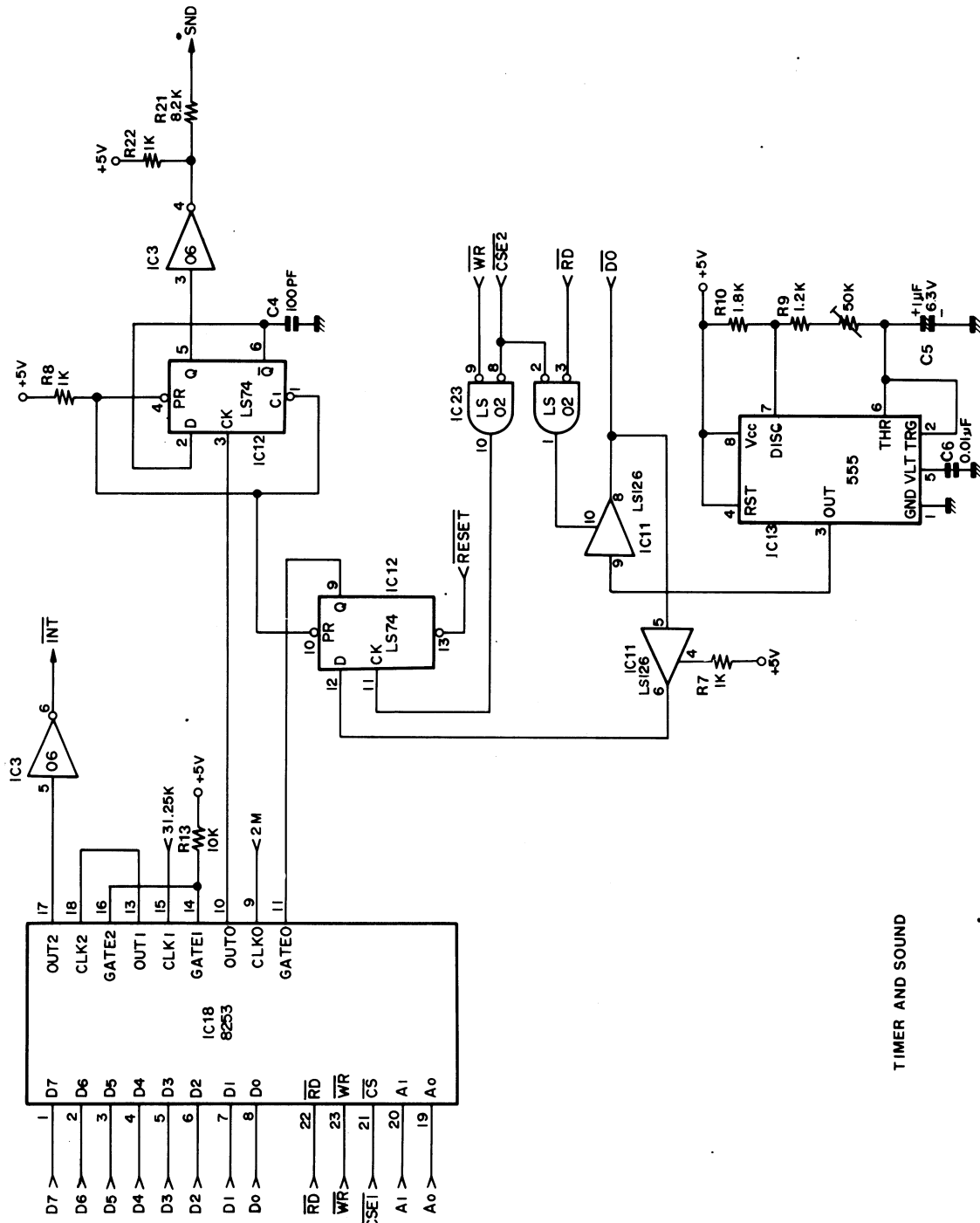


■ Circuit Diagram (8) of CPU Board Section



CASSETTE AND KEY

■ Circuit Diagram (9) of CPU Board Section



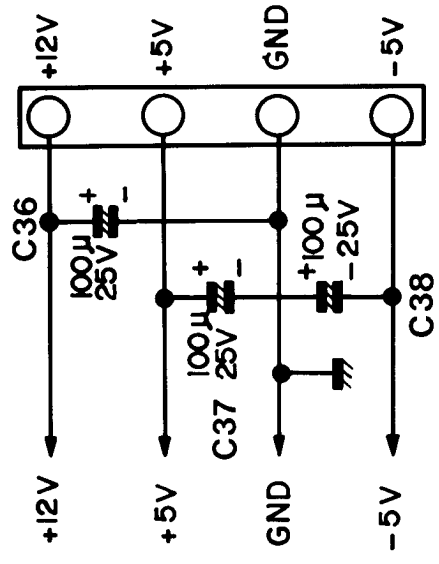
TIMER AND SOUND

■ Circuit Diagram (10) of CPU Board Section

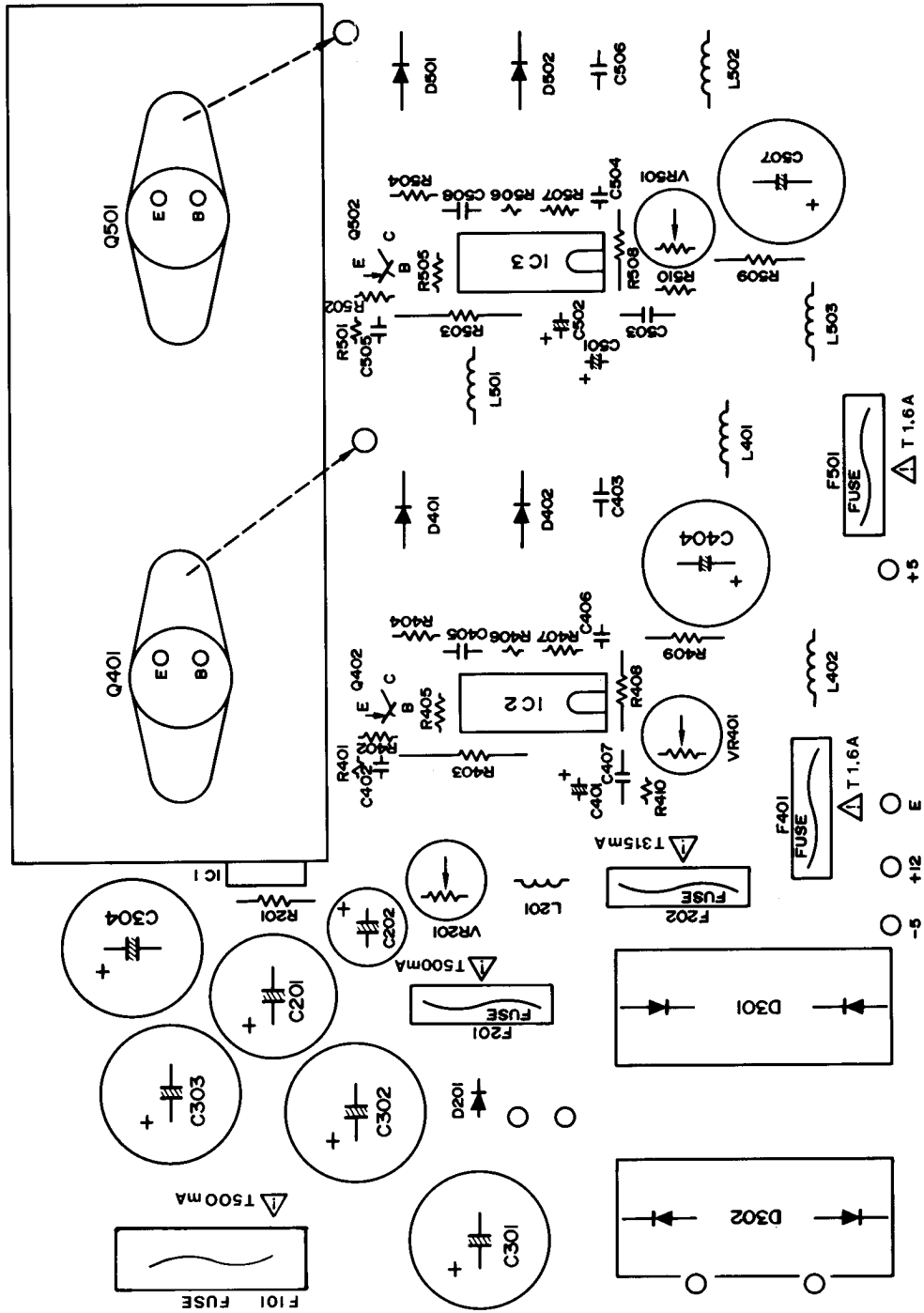
A	B
A15	1 G
A14	2 INT
A13	3 G
A12	4 MREQ
A11	5 G
A10	6 IORQ
A9	7 G
A8	8 RD
A7	9 G
A6	10 WR
A5	11 G
A4	12 MI
A3	13 G
A2	14 HALT
A1	15 G
A0	16 RESET
G	17 G
D7	18 G
D6	19 G
D5	20 G
D4	21 G
D3	22 G
D2	23 G
D1	24 G
D0	25 G

▷ (MARK)

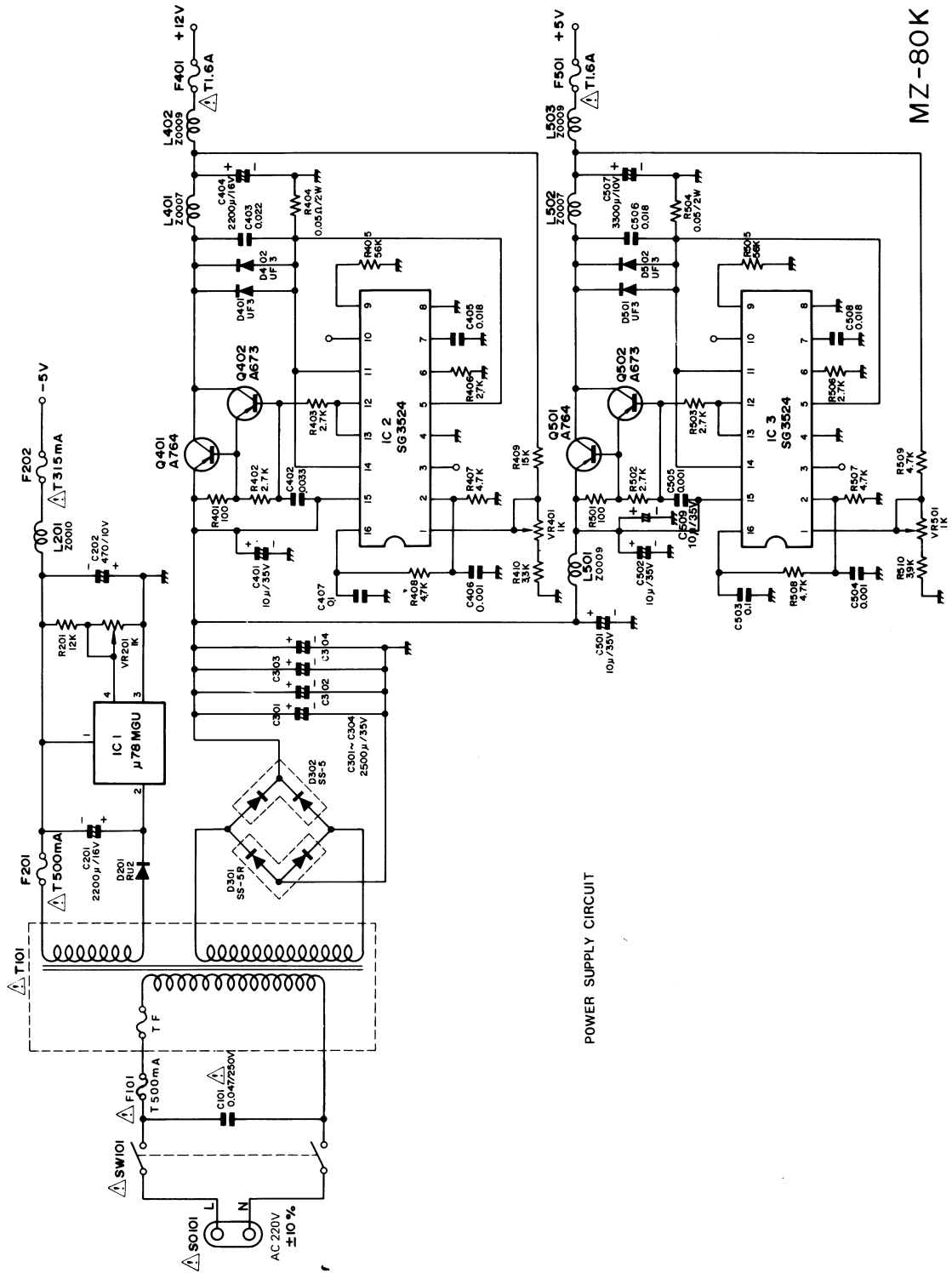
BUS CONNECTOR DETAIL



■ Symbols of Power Supply Section



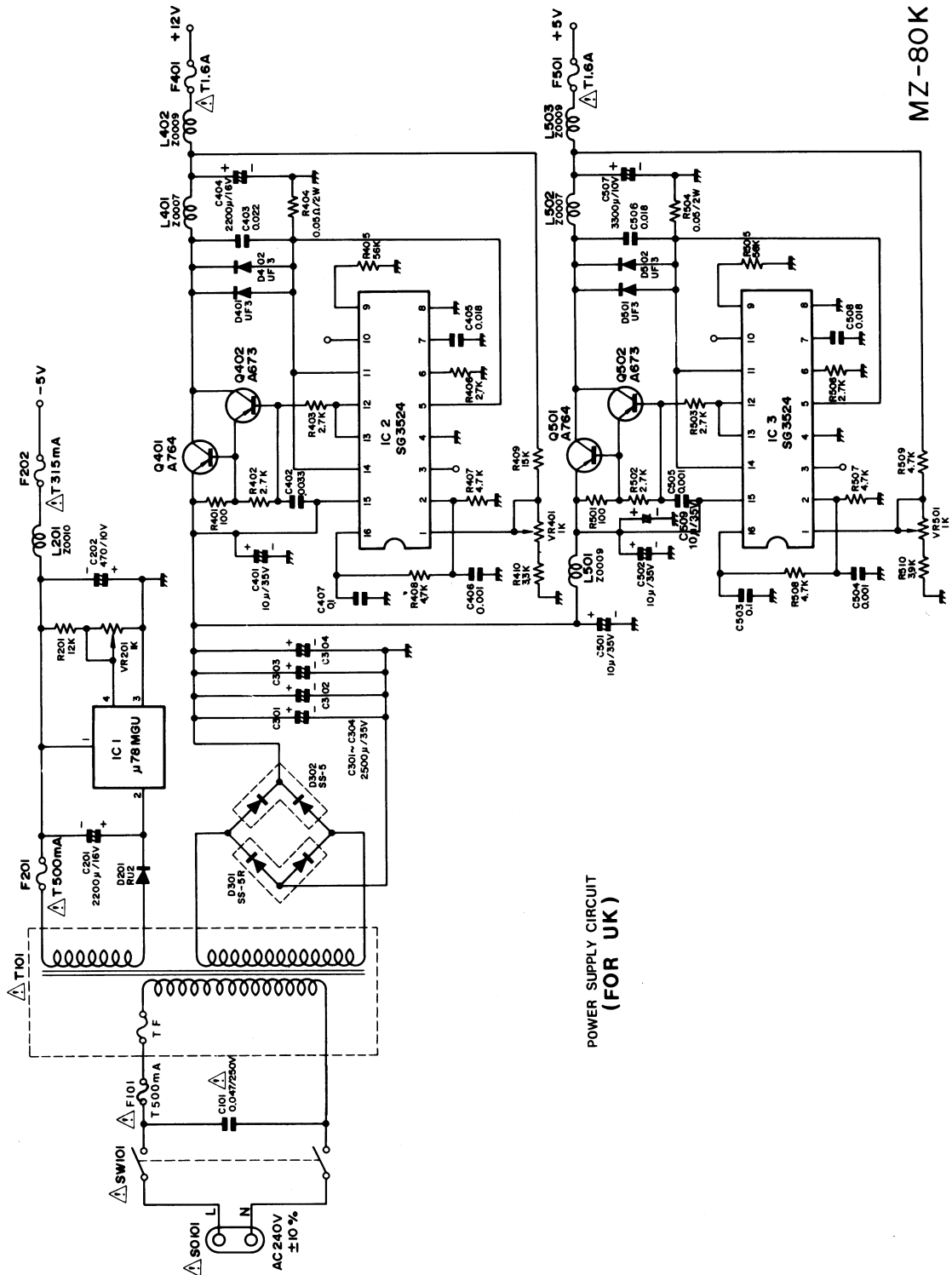
■ Wiring Diagram of Power Supply Section



MZ-80K

POWER SUPPLY CIRCUIT

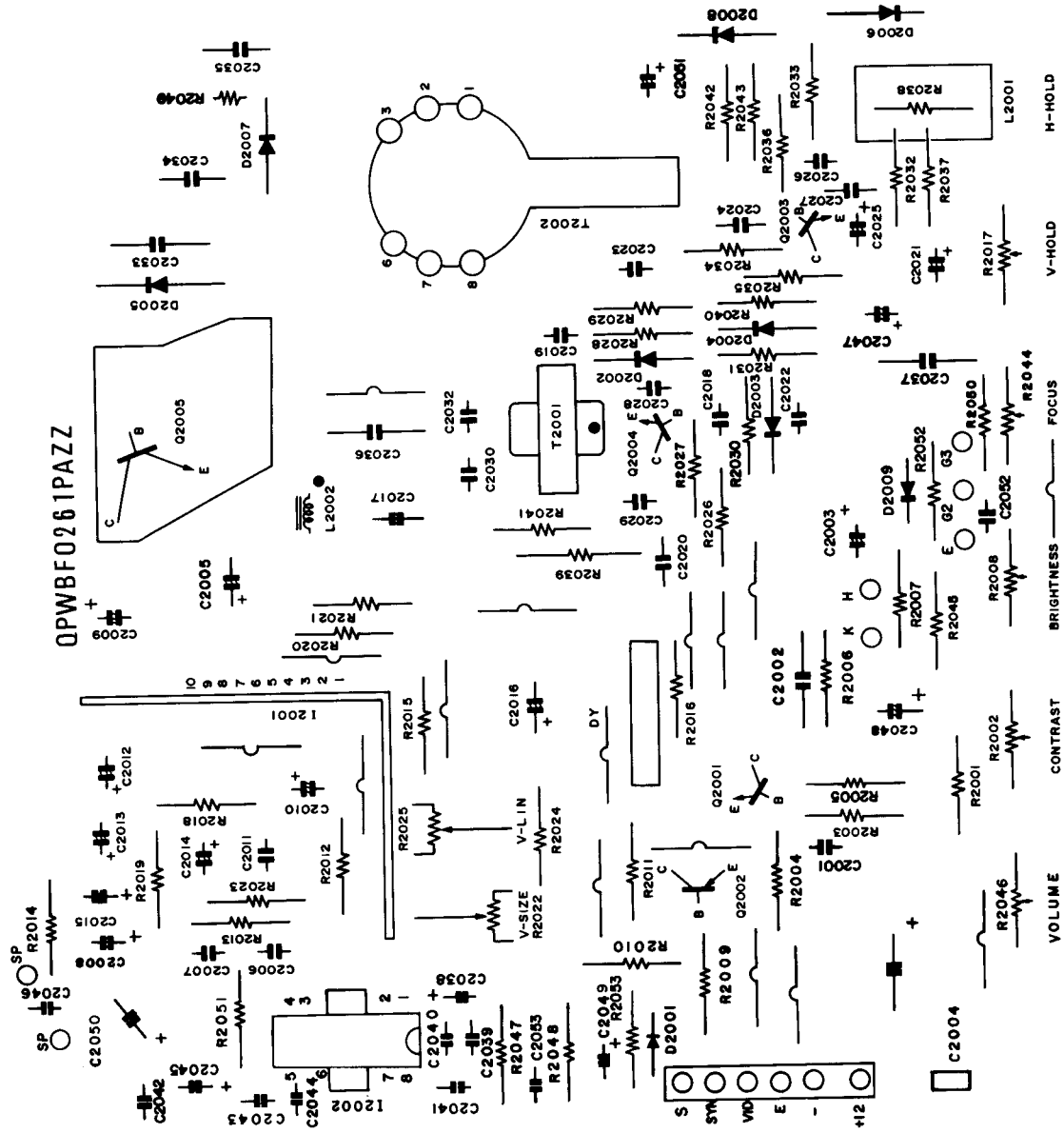
Wiring Diagram of Power Supply Section (for UK)



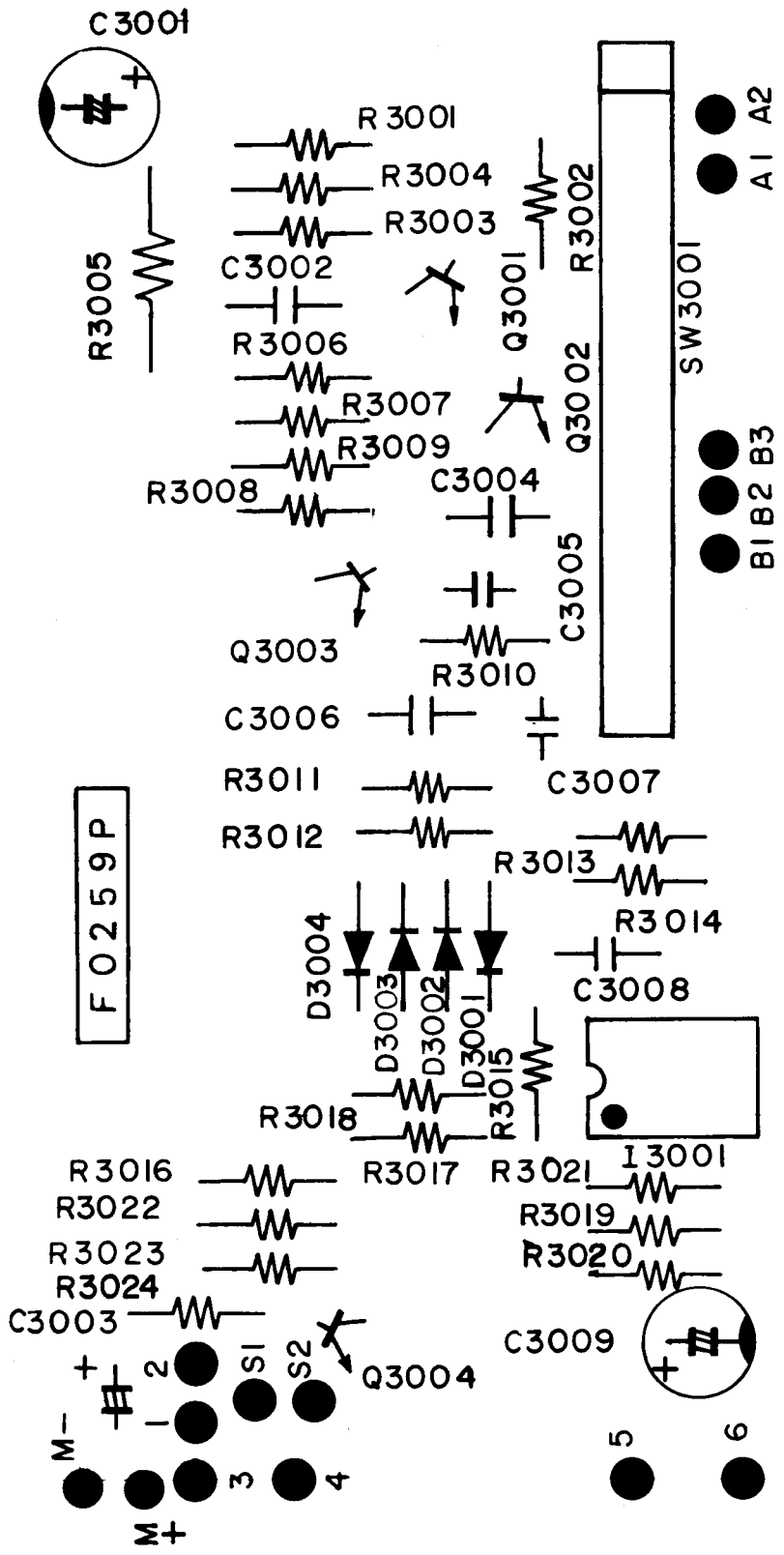
MZ-80K

POWER SUPPLY CIRCUIT (FOR UK)

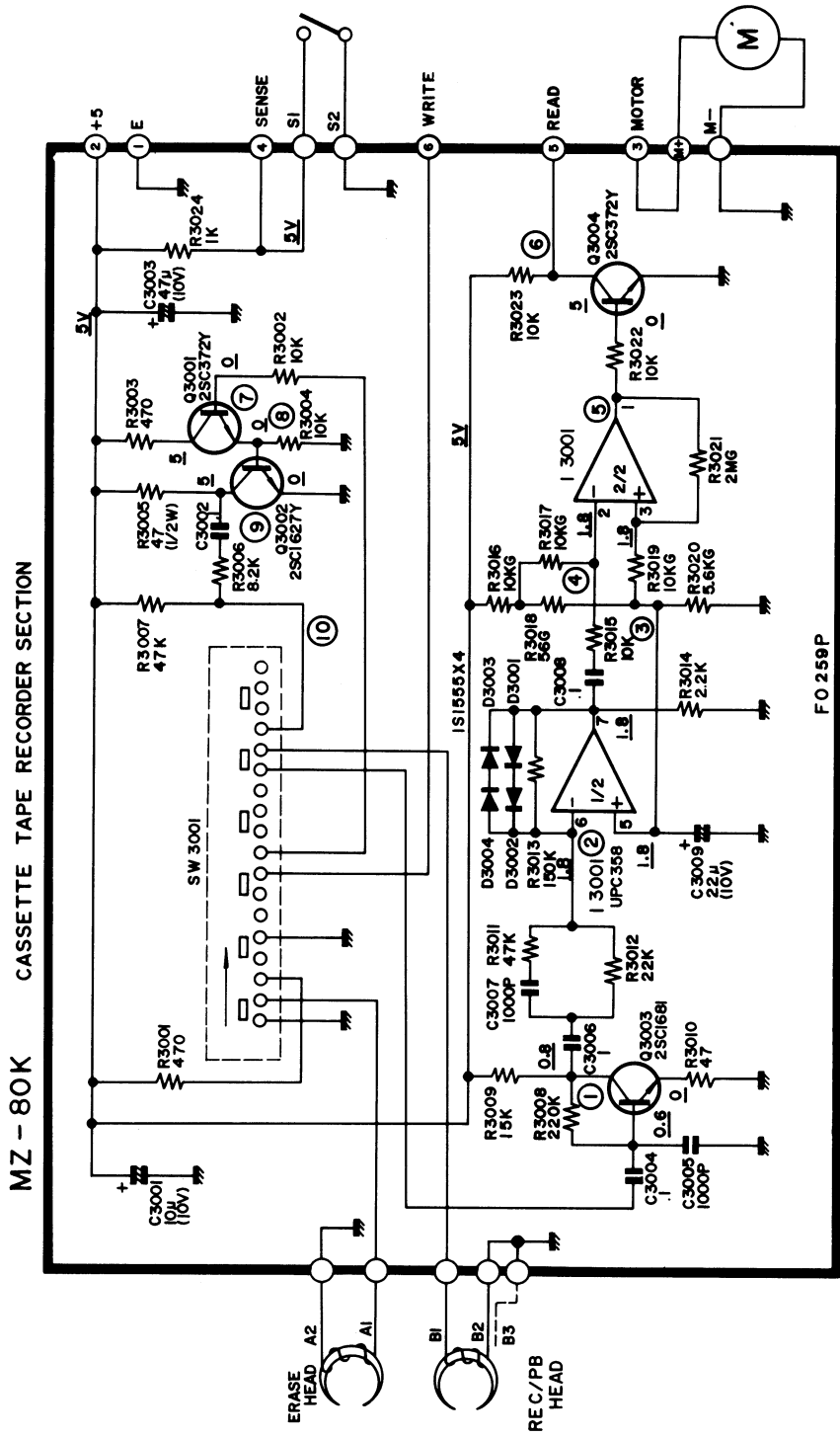
■ Symbols of Display Section



■ Symbols of Cassette Section



■ Wiring Diagram of Cassette Section



REPLACEMENT PARTS LIST

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NAME
2. REF. NO.
3. PART NO.
4. DESCRIPTION

MODEL MZ-80K

REF. NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE
*** CPU BOARD UNIT SECTION ***							
	DCPU-0006PAZZ	Assembled CPU Board Unit	**	IC47	RH-IX0045PAZZ	SN74154N	AN
				IC51	RH-IX0177PAZZ	SN7425N	AF
				IC53 } IC56 }	RH-IX0148PAZZ	SN74S157Nor HD74S157	AQ
				IC57	RH-IX0147PAZZ	SN74150N	AM
				CG-ROM	DPR0M0001PAZZ	HN462716 or MB8156C	BS
				M-ROM	RH-IX0171PAZZ	μPD2332C	BL
				RAM	RH-IX0145PAZZ	16KRAM, ITT4116 or MB8116	BE
				RAM	RH-IX0121PAZZ	4KRAM, ITT4027 or MB8227	AV
INTEGRATED CIRCUIT							
IC1	RH-IX0134PAZZ	NE555P	AG				
IC2	RH-IX0079PAZZ	SN74LS74AN or HD74LS74	AG				
IC3	RH-IX0038PAZZ	SN7406N	AG				
IC4	RH-IX0131PAZZ	SN7414N	AM				
IC5	RH-IX0136PAZZ	μPD8255C	BA				
IC6	RH-IX0126PAZZ	SN74LS145N	AL				
IC7	RH-IX0074PAZZ	SN74LS04N or HD74LS04P	AE				
IC8	RH-IX0040PAZZ	SN74121N	AG				
IC9	RH-IX0125PAZZ	SN74LS93	AK				
IC10							
IC11	RH-IX0127PAZZ	SN74LS107AN or HD741S107	AG				
IC12	RH-IX0142PAZZ	SN74S126AN	AH				
IC13	RH-IX0076PAZZ	SN74LS10N or HD74LS10P	AE				
IC14	RH-IX0146PAZZ	μPD8253C	BC				
IC15	RH-IX0075PAZZ	SN74LS08N or HD74LS08P	AE				
IC16	RH-IX0070PAZZ	SN74LS00N or HD74LS00	AE				
IC17	RH-IX0071PAZZ	SN74LS02N or HD74LS02	AE				
IC18	RH-IX0132PAZZ	SN7486N	AF				
IC19	RH-IX0128PAZZ	SN74LS20N or HD74LS20	AE				
IC20	RH-IX0129PAZZ	SN74LS165N	AQ				
IC21	RH-IX0104PAZZ	SN74LS42N or HD74LS42	AH				
IC22	RH-IX0130PAZZ	SN74177N	AQ				
IC23	RH-IX0133PAZZ	SN74177N	AL				
IC24	RH-IX0123PAZZ	SN74LS244N	AS				
IC25	RH-IX0176PAZZ	SN74LS241N	AS				
IC26	RH-IX0083PAZZ	SN74LS157N or HD74LS157	AH				
IC27	RH-IX0122PAZZ	MB8114NC or HM472114P-3	AV				
IC28	RH-IX0124PAZZ	SN74LS245N	AR				
IC29	RH-IX0090PAZZ	Z80CPU	BF				
IC30							
IC31							
IC32							
IC33							
IC34							
IC35							
IC36							
IC37							
IC38							
IC39							
IC40							
IC41							
IC42							
IC43							
IC44							
IC45							
IC46							
TRANSISTORS AND DIODES							
				Q1	VS2SA505Y//1A	2SA505-Y	AF
				Q2			
				Q3			
				Q4	VS2SC373G//1E	2SC373	AC
				Q5			
				Q6			
				D1	VHD1S1555//1A	1S1555	AA
				D2			
RESISTORS							
				R1			
				R5	VRD-ST2EF221J	220 ohm	AA
				R30			
				R32			
				R2	VRD-ST2EE182J	1.8K ohm	AA
				R10			
				R3	VRD-ST2EF222J	2.2K ohm	AA
				R4	VRD-ST2EF561J	560 ohm	AA
				R6			
				R7			
				R8			
				R11			
				R12			
				R14			
				?			
				R19	VRD-ST2EF102J	1K ohm	AA
				R22			
				R29			
				R38			
				R41			
				R44			
				?			
				R48			
				R9			
				R26	VRD-ST2EF122J	1.2K ohm	AA
				R36			
				R13			
				R27			
				R28			
				R31	VRD-ST2EF103J	10K ohm	AA
				R33			
				R35			
				R39			

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE			
R20	VRD-ST2EF271J	270 ohm	AA	C36	VCEAAU1EW107Y	100MFD, 25V, Aluminum	AB			
R21	VRD-ST2EF822J	8.2K ohm	AA	C37						
R23	VRD-ST2EF152J	1.5K ohm	AA	C38						
R24	VRD-ST2EF473J	47K ohm	AA	C39	VCSACU1AE336K	33MFD, 10V, Tantalum	AD			
R25	VRD-ST2EF123J	12K ohm	AA	C41	VCSACU1VE106M	10MFD, 35V, Tantalum	AE			
R34 } R40 }	VRD-ST2EF101J	100 ohm	AA	C59	VCTYPU1ED104Z	0.1MFD, 25V, Ceramic	AB			
R37			VRD-ST2EF153J	15K ohm				AA	C61	
R42	VRD-ST2EF332J	3.3K ohm	AA	C63						
R43	VRD-ST2EF331J	330 ohm	AA	C65						
VR	RVR-M0019PAZZ	Variable Resistor 68K ohm	AC	C66						
RA1 }	RR-KZ0031PAZZ	Resistor Array 10K ohm x 8	AD	C68						
RA2 }			AD	C70						
CAPACITORS				C72						
C1	VCCCPR1H3101J	100PF, Ceramic	AA	C75						
C4				VCQYKU1HM332K				0.0033MFD, Film	AA	C77
C17					AA	C79				
C2	C81									
C3										
C7										
C12										
C24										
C25										
C27										
C31										
C33										
C34										
C35										
C40										
C42										
C58	VCTYPU1BD104Z	0.1MFD, 12V, Ceramic	AB	C82						
C60				C84						
C62				C86						
C64				C88						
C67										
C69										
C71										
C73										
C74										
C76										
C78										
C80										
C83										
C85										
C87										
C89										
C90										
C91										
C92										
C5	VCEAAU1CW105Y	1MFD, 16V, Aluminum	AB	C5						
C23				C6						
C6	VCKZPU1HF103P	0.01MFD, Ceramic	AA	C13						
C13				C15						
C15				C20						
C16				C14						
C20	VCEAAU1CW106Y	10MFD, 16V, Aluminum	AB	C18	VCEAAU1CW227Y	220MFD, 16V, Aluminum	AC			
C14	VCEAAU1CW226Y	22MFD, 16V, Aluminum	AB	C19	VCEAAU1CW226Y	22MFD, 16V, Aluminum	AC			
C18	VCQYKU1HM103K	0.01MFD, Film	AB	C21	VCQYKU1HM103K	0.01MFD, Film	AC			
C19	VCEAAU1CW107Y	100MFD, 16V, Aluminum	AB	C22	VCEAAU1CW107Y	100MFD, 16V, Aluminum	AM			
C21										
C22										
C26										
C32										
				MISCELLANEOUS						
				XTAL	RCRSA0009PAZZ	Crystal, 8.00MHz	AN			
					QSOCZ0012PAZZ	40-Pin socket	AH			
					QSOCZ0010PAZZ	24-Pin socket	AF			
					QSOCZ0009PAZZ	16-Pin socket	AE			
				CS1 }	QLUGP0001PAZZ	16-Pin Descreat platform	AC			
				CS2 }						
				CN1	QPLGZ0021PAZZ	50-Pin terminal (for Bus lines)	AW			
				CN2	QPLGZ0018PAZZ	6-Pin terminal (for TV)	AD			
				CN3	QPLGZ0006PAZZ	6-Pin terminal (for cassette)	AD			
				CN4	QPLGZ0020PAZZ	3-Pin terminal (for LED)	AD			
				CN5	QPLGZ0016PAZZ	18-Pin terminal (for Keyboard)	AF			
				CN6	QPLGN0403CEZZ	4-Pin terminal (for Power supply)	AB			
					QPWBN0024PAZZ	Printed Wiring Board	BS			
				*** MONITOR TV UNIT SECTION ***						
					DPWB-0176PAZZ	Assembled Monitor TV PWB	BS			
				INTEGRATED CIRCUIT						
				I2001	RH-IX0015TAZZ	μPC1031H, Vertical deflection Circuit	AM			
				I2002	RH-IX0016TAZZ	LA4030P, Power Amp.	AK			
				TRANSISTORS						
				Q2001	VS2SC1514-/1E	2SC1514	AF			
				Q2002	VS2SA673-C/1E	2SA673	AC			
				Q2003						
				Q2004	VS2SC1213-C1A	2SC1213	AC			
				Q2005	VS2SC681A-R1A	2SC681A-R	AM			

PARTS LIST

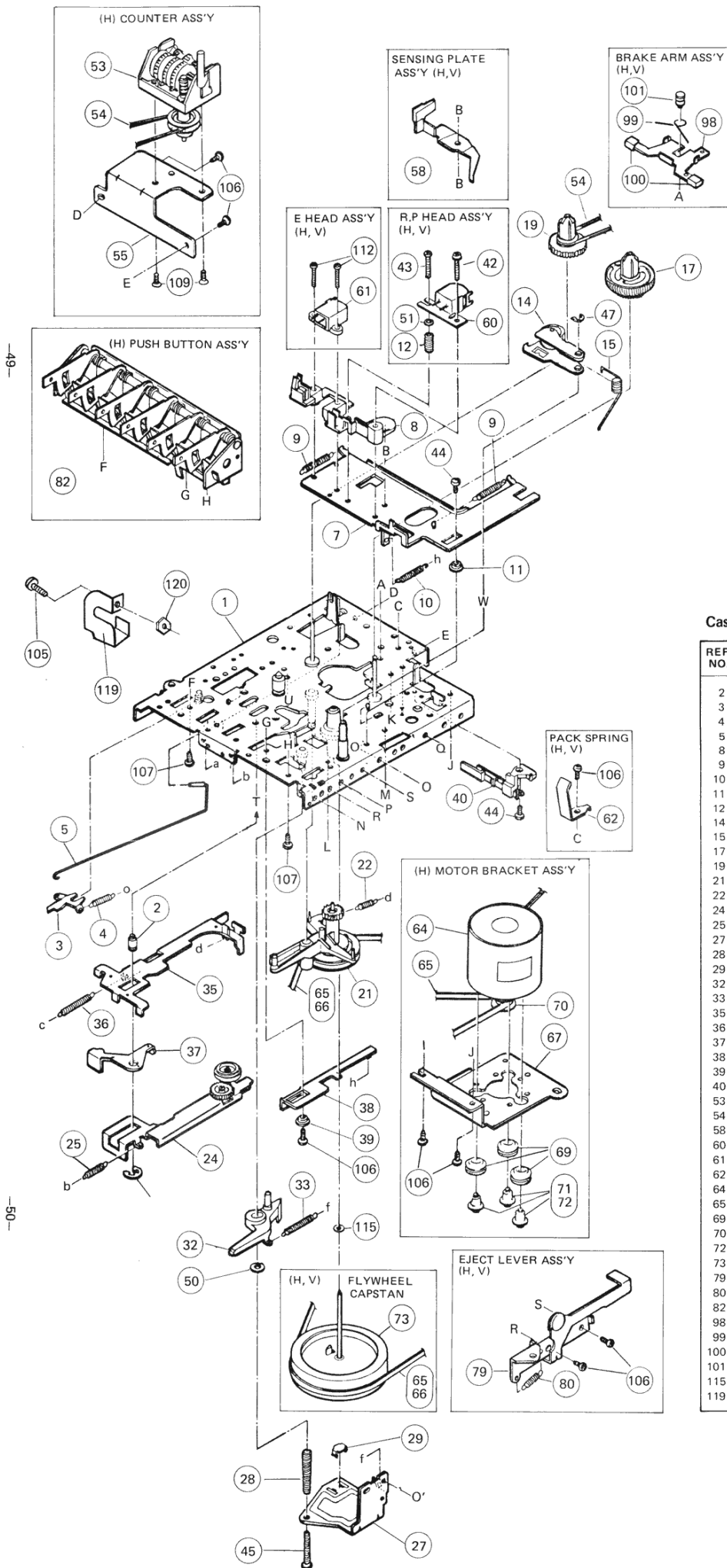
REF. NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE		
DIODES				R2046	RVR-B7032TAZZ	5K ohm, Variable Resistor for Volume	AD		
D2001	VHD02Z7R5A//A	7.5V Zener, 02Z75A	AC	R2047	VRD-ST2EF222J	2.2K ohm, 1/4W	AA		
D2002	VHD1N34A///-1	1N-34A	AB	R2048	VRD-ST2EF471J	470 ohm, 1/4W	AA		
D2003						R2049	VRD-ST2EF473J	47K ohm, 1/4W	AA
D2004	RH-DX0039TAZZ	SI-RECT208	AC	R2051	VRD-ST2EF120J	12 ohm, 1/4W	AA		
D2005						CAPACITORS			
D2008						C2001	VCQYKU1HM152K	0.0015MFD, Mylar	AA
D2006	RH-DX0043TAZZ	SIR60	AC	C2002	VCQPSC2DA104K	0.1MFD, 200V, Film	AC		
D2009									C2036
D2007	RH-DX0062CEZZ	RH1	AD	C2037					
RESISTORS				C2003	VCEAAU2CW106Y	10MFD, 160V, Aluminum	AE		
R2001	VRD-ST2EF470J	47 ohm, 1/4W	AA	C2004	VCEAAU1CW478Y	4700MFD, 16V, Aluminum	AH		
R2003						C2005	VCEAAU1CW108Y	1000MFD, 16V, Aluminum	AD
R2004						C2016			
R2002	RVR-B0015PAZZ	500 ohm, Variable Resistor for Contrast	AD	C2050	VCQYKU1HM332K	0.0033MFD, Mylar	AA		
R2005	VRC-MT2HG102J	1K ohm, 1/2W	AA	C2006					
R2006	VRD-ST2EF225J	2.2M ohm, 1/4W	AA	C2007	VCEAAU1EW475A	4.7MFD, 25V, Aluminum	AB		
R2007	VRD-ST2EF154J	150K ohm, 1/4W	AA	C2008					
R2050							C2012		
R2008	RVR-B7021TAZZ	250K ohm, Variable Resistor for Brightness	AD	C2009	VCSACU1VE105K	1MFD, 35V, Tantalum	AC		
R2009	VRD-ST2EF472J	4.7K ohm, 1/4W	AA	C2010	VCEAAU1CW226Y	22MFD, 16V, Aluminum	AC		
R2010	VRD-ST2EF473J	47K ohm, 1/4W	AA	C2011	VCQYKU1HM333K	0.033MFD, Mylar	AB		
R2011	VRD-ST2EF102J	1K ohm, 1/4W	AA	C2030	RC-EZ0029TAZZ	22MFD, 16V, Aluminum	AC		
R2024									C2013
R2027							C2014	VCEABA1CW226M	22MFD, 16V, Aluminum
R2037	VRD-ST2EF153J	15K ohm, 1/4W	AA	C2015	VCEAAU1AW107Y	100FMD, 10V, Aluminum	AB		
R2012							C2017	RC-EZ0024TAZZ	6.8MFD, 25V, Aluminum
R2013	VRD-ST2EF123J	12K ohm, 1/4W	AA	C2018	VCQYKU1HM153K	0.015MFD, Mylar	AB		
R2014	VRD-ST2EF272J	2.7K ohm, 1/4W	AA	C2019	VCQYKU1HM683K	0.068MFD, Mylar	AB		
R2015	VRC-MT2HG3R3J	3.3 ohm, 1/2W	AA	C2020	VCEAAU1CW107Y	100MFD, 16V, Aluminum	AB		
R2016	VRD-ST2EF273J	27K ohm, 1/4W	AA	C2021	VCQYKU1HM103K	0.01MFD, Mylar	AB		
R2017	RVR-B7029TAZZ	50K ohm, Variable Resistor for V-Hold	AD	C2022	VCQYKU1HM223K	0.022MFD, Mylar	AB		
R2018	VRD-ST2EF122J	1.2K ohm, 1/4W	AA	C2023	VCQYKU1HM473K	0.047MFD, Mylar	AB		
R2019	VRD-ST2EF103J	10K ohm, 1/4W	AA	C2024	VCEAAU1EW335A	3.3MFD, 25V, Aluminum	AB		
R2053	VRC-MT2HG1R5J	1.5 ohm, 1/2W	AA	C2025	VCQYKU1HM123J	0.012MFD, Mylar	AB		
R2020							C2026	VCQYKU1HM473J	0.047MFD, Mylar
R2021	RVR-M7052TAZZ	20K ohm, Variable Resistor for V-Size	AC	C2027	VCCSPU1H6101K	100PF, 50V, Ceramic	AA		
R2022							C2028		
R2023	VRD-ST2EF331J	330 ohm, 1/4W	AA	C2032					
R2026	RVR-B7004TAZZ	300 ohm, Variable Resistor for V-Line	AC	C2039					
R2025						C2040			
R2028							C2041	VCKZPR1HF103P	0.01MFD, Ceramic
R2029	VRD-ST2EF821J	820 ohm, 1/4W	AA	C2042					
R2029	VRD-ST2EF682J	6.8K ohm, 1/4W	AA	C2043					
R2030							C2044		
R2031	VRD-ST2EF822J	8.2K ohm, 1/4W	AA	C2046					
R2032	VRD-ST2EF392J	3.9K ohm, 1/4W	AA	C2033	VCQPSC2DA683K	0.068MFD, 200V, Film	AB		
R2036							C2034	VCQPSC2DA223K	0.022MFD, 200V, Film
R2033	VRD-ST2EF330J	33 ohm, 1/4W	AA	C2035	VCQPSC2DA153K	0.015MFD, 200V, Film	AB		
R2034	VRD-ST2EF332J	3.3K ohm, 1/4W	AA	C2038	VCEAAU1HW105A	1MFD, 50V, Aluminum	AB		
R2035							C2044	VCQYKU1HM472K	0.0047MFD, Mylar
R2038	VRD-ST2EF680J	68 ohm, 1/4W	AA	C2045					
R2039	VRS-PU3DB222J	2.2K ohm, 2W	AB	C2047	VCEAAU1CW227Y	220MFD, 16V, Aluminum	AB		
R2040	VRD-ST2F221J	220 ohm, 1/4W	AA	C2051					
R2041	VRC-MT2HG560J	56 ohm, 1/2W	AA	C2048	VCEAAU2AW227Y	220MFD, 100V, Aluminum	AF		
R2042	VRC-MT2HG330J	33 ohm, 1/2W	AA	C2049	VCEAAU1CW106Y	10MFD, 16V, Aluminum	AB		
R2043							C2052	VCKYPU2HE103P	0.01MFD, 500V, Ceramic
R2044	RVR-B7022TAZZ	1M ohm, Variable Resistor for Focus	AD	C2053	VCQYKU1HM104K	0.1MFD, Mylar	AB		
R2045	VRD-ST2EF564J	560K ohm, 1/4W	AA	TRANSFORMER AND COILS					
				T2001	RTRNT0017TAZZ	H-Drive Transformer	AF		
				T2002	CTRNF2072TA01	High Voltage Transformer	AY		
				1	RCILH4070TAZZ	Refraction Coil	AX		

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE	
L2001	RCILB0021TAZZ	H-Hold Variable Coil	AG	R404	VRW-KT3DDR05K	0.05 ohm, 2W, Cement	AC	
L2002	RCILZ0057TAZZ	H-Lin Coil	AG	R504				
				R405	VRD-ST2EF563J	56K ohm, 1/4W	AA	
				R505				
				R407				
				R408				
				R507	VRD-ST2EF472J	4.7K ohm, 1/4W	AA	
				R508				
				R509				
				R409	VRD-ST2EF153J	15K ohm, 1/4W	AA	
				R410	VRD-ST2EF332J	3.3K ohm, 1/4W	AA	
				R510	VRD-ST2EF392J	3.9K ohm, 1/4W	AA	
				VR201				
				VR401	RVR-M0010PAZZ	1K ohm, Variable Resistor	AC	
				VR501				
MISCELLANEOUS				CAPACITORS				
	△ QPWF0261PAZZ	Printed Wiring Board	AM	C101	△ RC-CZ0174PAZZ	0.047MFD, 250V, Mylar	AK	
	PRDAF0147TAZZ	Radiator	AB	C201	VCEAAU1CM228Y	2200MFD, 16V, Aluminum	AF	
	PRDAF0107TAZZ	Radiator	AB	C404				
2	QSOCV0701SEZZ	CRT Socket	AC	C202	VCEAAU1AM477M	470MFD, 10V, Aluminum	AD	
	OPLGN0404CEZZ	4-Pin Plug	AB	C301				
	QSOCN0077PAZZ	Lead Wire with 6-Pin Socket	AH	C302	VCEAAU1VM258Y	2500MFD, 35V, Aluminum	AG	
	QCWNW-0009PAZZ	Lead Wire with 2-Pin Socket (to Speaker)	AD	C303				
3	GCABC8004PASC	TV Cabinet	BC	C304				
4	GWAKP0001PASC	Front Frame	AS	C401				
5	GCOVZ0005PAZZ	Front Panel	AN	C501	VCSACU1VE106M	10MFD, 35V, Tantalum	AE	
6	LANGB0002PAZZ	Support Angle A	AE	C502				
7	LANGB0003PAZZ	Support Angle B	AF	C402	VCQYKU1HM332K	0.0033MFD, 50V, Film	AA	
8	DDAI-0004PAZZ	PWB Mounting Plate	AR	C403	VCQYKU1HM223K	0.022MFD, 50V, Film	AB	
9	PSHEF0007PAZZ	Guard Net for Speaker	AB	C405				
10	LANGQ0005PAZZ	Display PWB Fixing Angle	AB	C506	VCQYKU1HM183K	0.018MFD, 50V, Film	AB	
11	LANGS0003PAZZ	Speaker mounting Plate	AD	C508				
12	LANGS0013CEZZ	Speaker Holder	AB	C406				
13	△ VB240NB4//K1E	CRT	BM	C504	VCQYKU1HM102K	0.001MFD, 50V, Film	AA	
14	VSP0080P-16YA	Speaker	AQ	C505				
15	PFTA-0001PASC	Back Panel	AH	C407	VCKYPU1NB104Z	0.1MFD, 12V, Ceramic	AB	
	HINDP0005PASA	Indicator Panel of Control Knob	AE	C503				
16	MSPRT0011PAZZ	Spring	AB	C507	VCEAAU1AM338Y	3300MFD, 10V, Aluminum	AF	
*** POWER SUPPLY UNIT SECTION ***				COILS AND TRANSFORMER				
	DBOXD0004PAZZ	Assembled Power Supply Unit	**	L201	RTRNZ0010PAZZ	Filter Coil	AH	
	DOBXD0005PAZZ	Assembled Power Supply Unit (for UK)	**	L401	RTRNZ0007PAZZ	Choke Coil	AP	
				L502				
				L402				
				L501	RTRNZ0009PAZZ	Filter Coil	AL	
				L503				
				T101	△ RTRNP0018PAZZ	Power Supply Transformer 220V	BF	
				T101	△ RTRNP0019PAZZ	Power Supply Transformer 240V (for UK)	BF	
INTEGRATED CIRCUIT				MISCELLANEOUS				
IC1	RH-IX0178PAZZ	Regulator, μ A78MGU	AR	△ QPWF0260PAZZ	Printed Wiring Board	AM		
IC2	RH-IX0151PAZZ	Switching Regulator, SG3524	AT	F101	△ QFS-C0002PAZZ	Fuse, T500mA	AD	
IC3					F201	△ QFS-C0001PAZZ	Fuse, T315mA	AD
TRANSISTORS					F401	△ QFS-C0003PAZZ	Fuse, T1.6A	AD
Q401	VS2SA764///-1	2SA764	AN		QFSHC0001PAZZ	Fuse Holder	AD	
Q501						QFSHA0001PAZZ	Fuse Holder	AA
Q402	VS2SA673-C/1E	2SA673	AC		17	△ QSOCA0001PAZZ	A.C. Socket	AD
Q502						18	△ QSW-C0003PAZZ	A.C. Switch
DIODES					17	△ QSOCA0002PAZZ	A.C. Socket (for UK)	AG
D201	VHDRU2/////1	RU2	AE					
D301	VHDSS5R/////1	SS-5R	AT					
D302	VHDSS5/////1	SS-5	AT					
D401	VHDUF3/////1	UF3	AK					
D402								
D501								
D502								
RESISTORS								
R201	VRD-ST2EF123J	12K ohm, 1/4W	AA					
R401	VRD-ST2EF101J	100 ohm, 1/4W	AA					
R501								
R402								
R403								
R406	VRD-ST2EF272J	2.7K ohm, 1/4W	AA					
R502								
R503								
R506								

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE		
19	GCABA8018PASA	Cabinet	AK	CAPACITORS					
20	GCABB8018PASA	Cabinet	AT	C3001	VCEAAU1AW476Y	47MFD, 10V, Aluminum	AB		
	GCABB8019PASA	Cabinet (for UK)		C3002	VCQYKU1HM104K	0.1MFD, Mylar	AB		
	PRDAR0010PAZZ	Radiator	AQ	C3004					
21	DSOCN0016PAZZ	Lead Wire with 4-pin Socket	AF	C3006					
				C3008					
22	LBSHC0003PAZZ	Rubber Bush	AB	C3003	VCEAAU1AW106Y	10MFD, 10V, Aluminum	AB		
23	△ PSPAY0001PAZZ	Insulating Sheet	AF	C3005	VCQYKU1HM102K	1000PF, Mylar	AA		
				C3007					
				C3009	VCEAAU1AW226Y	22 MFD, 10V, Aluminum	AB		
				MISCELLANEOUS					
					QPWBF0259PAZZ	Printed Wiring Board	AF		
				SW3001	QSW-S0011VAZZ	Slide Switch (2 contacts)	AG		
				24	KMECA0001PAZZ	Cassette Tape Recorder Machinical Unit (Refer to other table for detailed parts)	BG		
*** CASSETTE TAPE RECORDER SECTION ***				25	GCABE8004PASA	Cabinet	AP		
	KTRC-0004PAZZ	Assembled Cassette Tape Recorder Unit	BT	26	JKNBR0002PASA	Button	AC		
INTEGRATED CIRCUIT				27	GFTAC0001PASA	Flap	AN		
I3001	RH-IX0150PAZZ	OP Amp. μ PC358C	AK	28	HINDM0006PASA	Indicator Plate of Function Buttons	AG		
TRANSISTORS				29	HDECB0010PASA	Plate	AC		
Q3001	VS2SC372-Y/1E	2SC372Y	AC	30	MSPRP0089AGFW	Crossarm Brace	AB		
Q3004						31	MSPRB0029PAFJ	Spring	AA
Q3002	VS2SC1627-Y-A	2SC1627Y	AD	32	QSOCN0078PAZZ	Lead Wire with 6-Pin Socket	AH		
Q3003	VS2SC1681//-1	2SC1681	AD						
DIODES				*** KEY BOARD UNIT SECTION ***					
D3001	VHD1S1555//1A	1S1555	AA	DKEY-0005PAZZ			Assembled Key Board Unit	BX	
D3002									
D3003									
D3004									
RESISTORS				MISCELLANEOUS					
R3001	VRD-ST2EF471J	470 ohm, 1/4W	AA	33	QPWBF0167PAZZ	Printed Wiring Board	AN		
R3003						34	LANGQ0003PAZZ	Mechanical Key-Mounting Plate	AN
R3002						35	QSW-K0001PAZZ	Mechanical Key Switch	AD
R3004						36	QSW-K0009PAZZ	Key Top (small)	AB
R3015	VRD-ST2EF103J	10K ohm, 1/4W	AA	37	QSW-K0010PAZZ	Key Cover (small)	AB		
R3022				38	QSW-K0011PAZZ	Key Top (double size)	AC		
R3023				39	QSW-K0012PAZZ	Key Cover (double size)	AC		
R3005	VRC-MT2HG470J	47 ohm, 1/2W	AA	40	QSOCN0079PAZZ	Lead Wire with 18-pin Socket	AM		
R3006	VRD-ST2EF822J	8.2K ohm, 1/4W	AA	41	HINDP0009PASA	Key Seal	AK		
R3007	VRD-ST2EF473J	47K ohm, 1/4W	AA						
R3011									
R3008	VRD-ST2EF224J	220K ohm, 1/4W	AA						
R3009	VRD-ST2EF153J	15K ohm, 1/4W	AA						
R3010	VRD-ST2EF470J	47 ohm, 1/4W	AA						
R3012	VRD-ST2EF223J	22K ohm, 1/4W	AA						
R3013	VRD-ST2EF154J	150K ohm, 1/4W	AA						
R3014	VRD-ST2EF222J	2.2K ohm, 1/4W	AA						
R3016									
R3017	VRD-ST2EF103G	10K ohm, 1/4W	AA						
R3019									
R3018	VRD-ST2EF560G	56 ohm, 1/4W	AA						
R3020	VRD-ST2EF562G	5.6K ohm, 1/4W	AA						
R3021	VRD-ST2EF205G	2M ohm, 1/4W	AA						
R3024	VRD-ST2EF102J	1K ohm, 1/4W	AA						
				**** OTHER SECTION ****					
				DIODES					
				42	RH-PX0031PAZZ	LED, GL-53RG	AF		



Cassette tape recorder mechanical parts

REF. NO.	PART NO.	DESCRIPTION	CODE
2	94R00280KCTRM	Main Boss	AB
3	94R00380KCTRM	Record Safety Lever	AC
4	94R00480KCTRM	Spring	AB
5	94R00580KCTRM	Record Safety Spoke Ass'y	AD
8	94R00880KCTRM	Head Block	AD
9	94R00980KCTRM	Spring	AB
10	94R01080KCTRM	Spring	AB
11	94R01180KCTRM	Coller	AA
12	94R01280KCTRM	R.P. Head Spring	AB
14	94R01480KCTRM	Pinch Roller Ass'y	AH
15	94R01580KCTRM	Spring	AB
17	94R01780KCTRM	Take-up Reel Ass'y	AK
19	94R01980KCTRM	Supply Reel Ass'y	AF
21	94R02180KCTRM	RF Clutch Ass'y	AN
22	94R02280KCTRM	Spring	AB
24	94R02480KCTRM	F.F. Idler Arm Ass'y	AL
25	94R02580KCTRM	Spring	AB
27	94R02780KCTRM	Flywheel Holder	AF
28	94R02880KCTRM	Thrust Spring	AB
29	94R02980KCTRM	Flywheel Bearing	AA
32	94R03280KCTRM	Auto-Stop Lever	AD
33	94R03380KCTRM	Spring	AB
35	94R03580KCTRM	Main Plate	AF
36	94R03680KCTRM	Spring	AB
37	94R03780KCTRM	Rewind Arm	AC
38	94R03880KCTRM	Play Slide Lever	AC
39	94R03980KCTRM	Coller	AA
40	94R04080KCTRM	Leaf Switch	AG
53	94R05380KCTRM	Counter	AM
54	94R05480KCTRM	Counter Belt	AF
58	94R05880KCTRM	Sensing Plate Ass'y	AF
60	94R06080KCTRM	R/P Head	AM
61	94R06180KCTRM	Erase Head	AG
62	94R06280KCTRM	Pack Spring	AD
64	94R06480KCTRM	Motor	AV
65	94R06580KCTRM	Main Belt	AH
69	94R06980KCTRM	Motor Rubber	AA
70	94R07080KCTRM	Motor Pulley	AD
72	94R07280KCTRM	Coller Screw(s)	AB
73	94R07380KCTRM	Flywheel Capstan	AP
79	94R07980KCTRM	Eject Lever Ass'y	AK
80	94R08080KCTRM	Spring	AB
82	94R08280KCTRM	Push Button Ass'y	AW
98	94R09880KCTRM	Brake Arm	AD
99	94R09980KCTRM	Spring	AB
100	94R10080KCTRM	Brake Shoe	AB
101	94R10180KCTRM	Brake Arm Shaft	AB
115	94R11580KCTRM	Nylon Washer 2.2 x 7 x 0.5	AA
119	94R11980KCTRM	REC Push Plate	AC

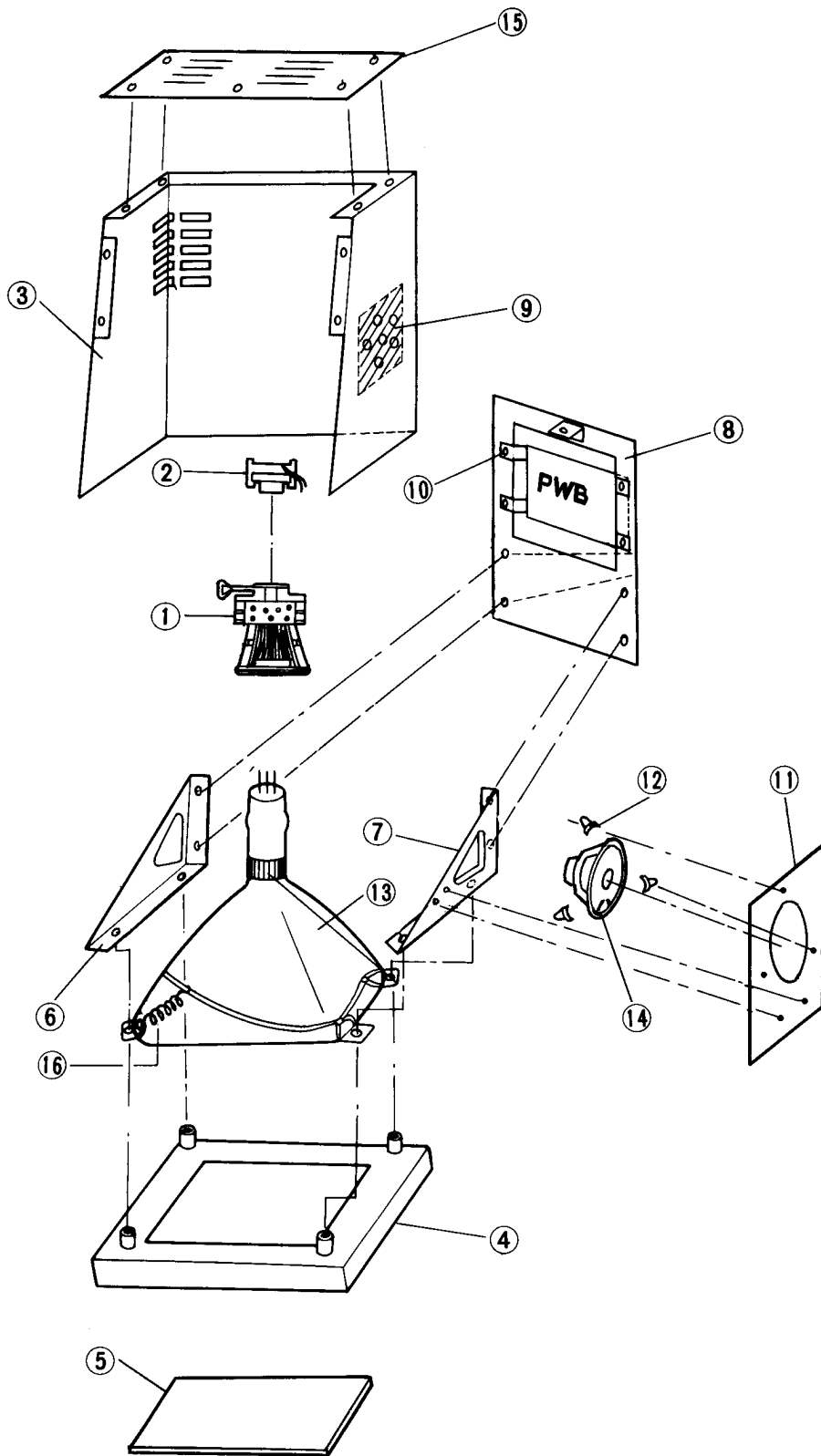


Fig. Display Section

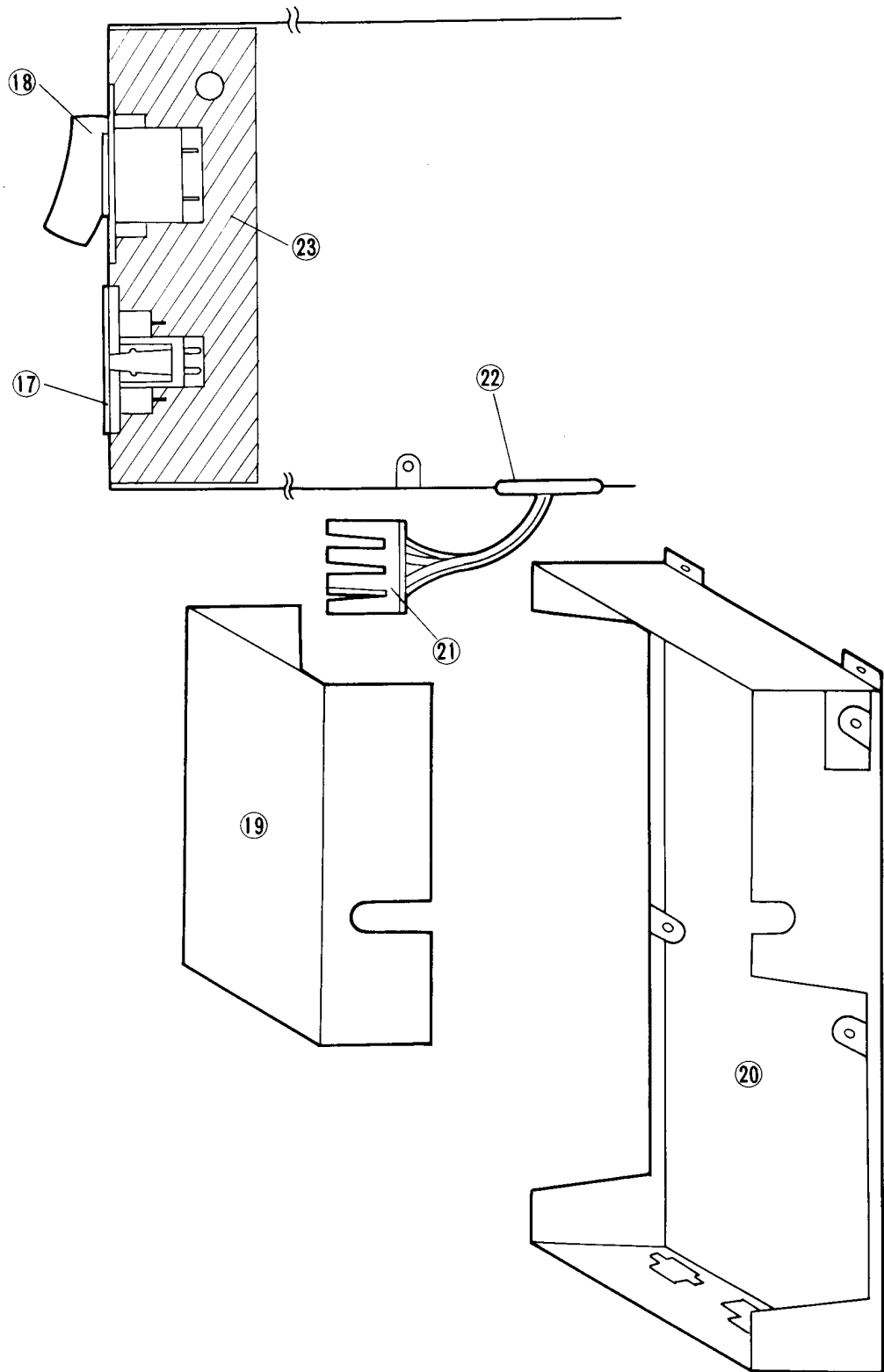


Fig. Power Supply Section

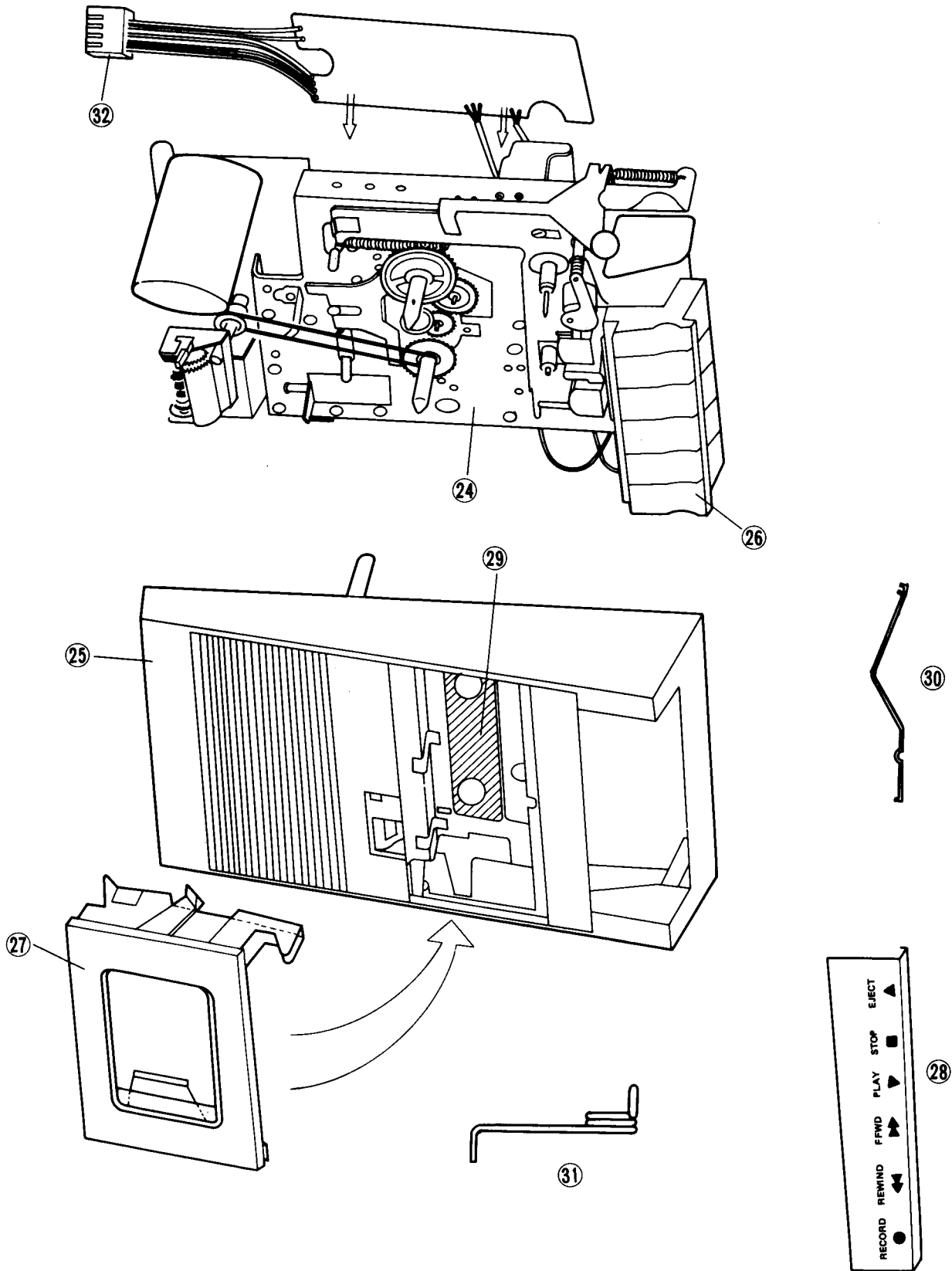


Fig. Cassette Tape Recorder Section

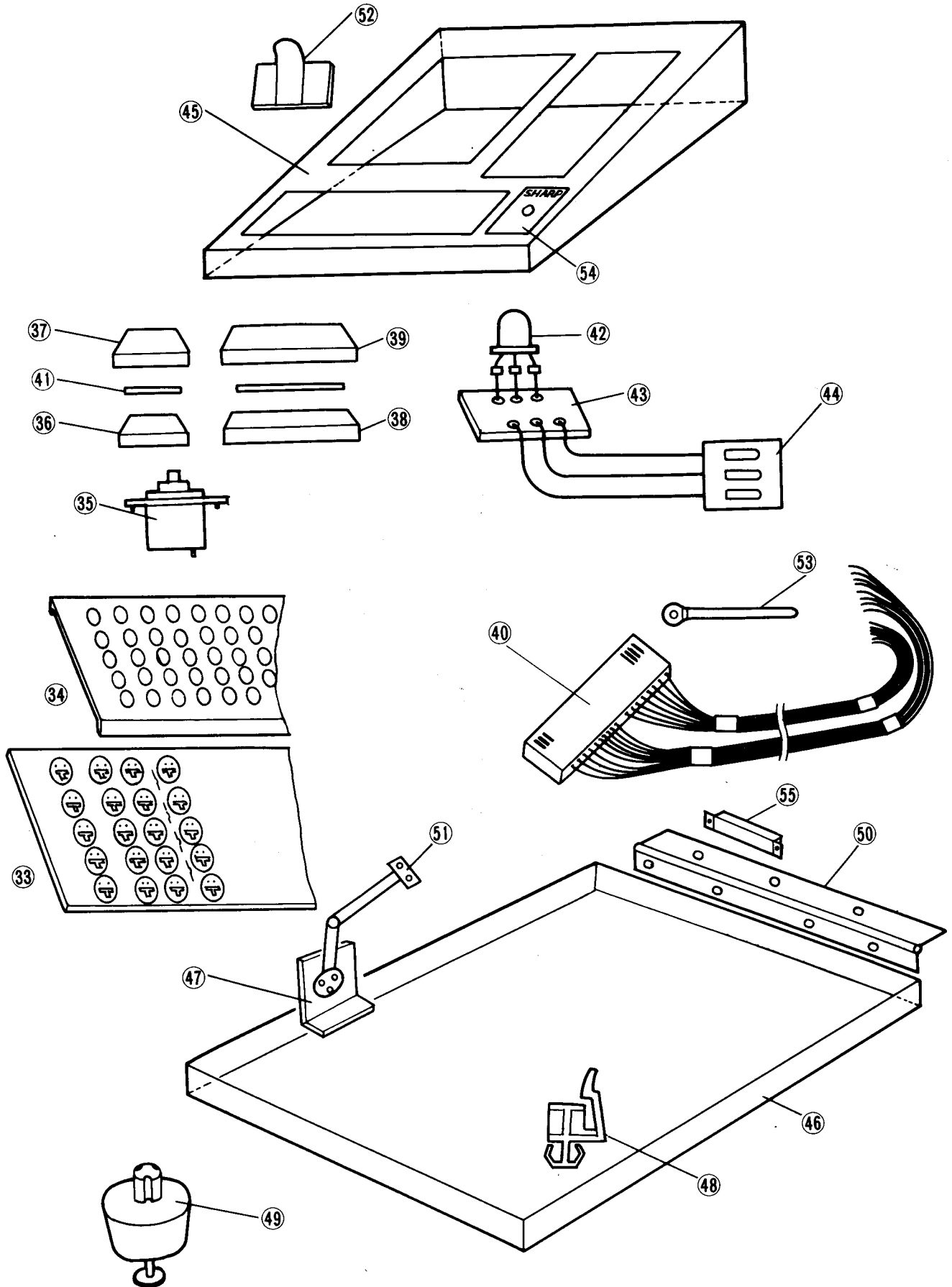


Fig. Key Board Section and Others