

Panasonic

SERVICE MANUAL

JD-700M/JD-800M Series

NO. 1

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1. INTRODUCTION

This manual describes necessary means and method for trouble-shooting of JD-700M/800M series.

2. OUTLINE

2.1 APPEARANCE

JD-700M/800M series consists, as shown in Fig. 2 - 1 DC power supply, keyboard, Monitor TV, floppy disk drive and control PCB which contains 8085A-2 microprocessor to control them.

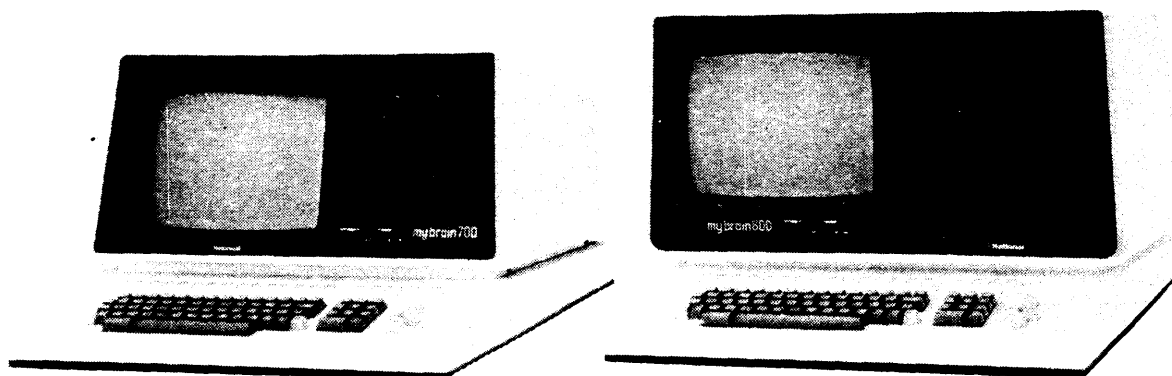


Fig. 2 - 1 JD-700M/800M SERIES EXTERNAL VIEW

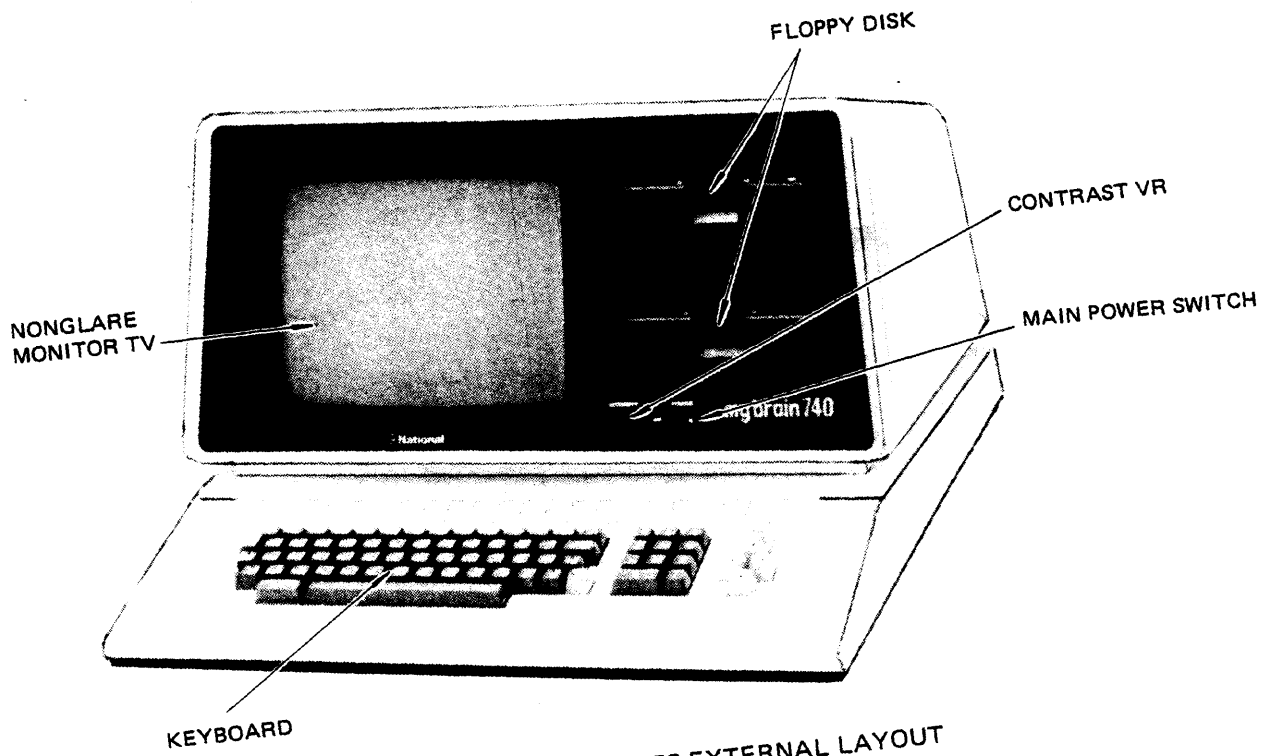


Fig. 2 - 2 JD-700M SERIES EXTERNAL LAYOUT

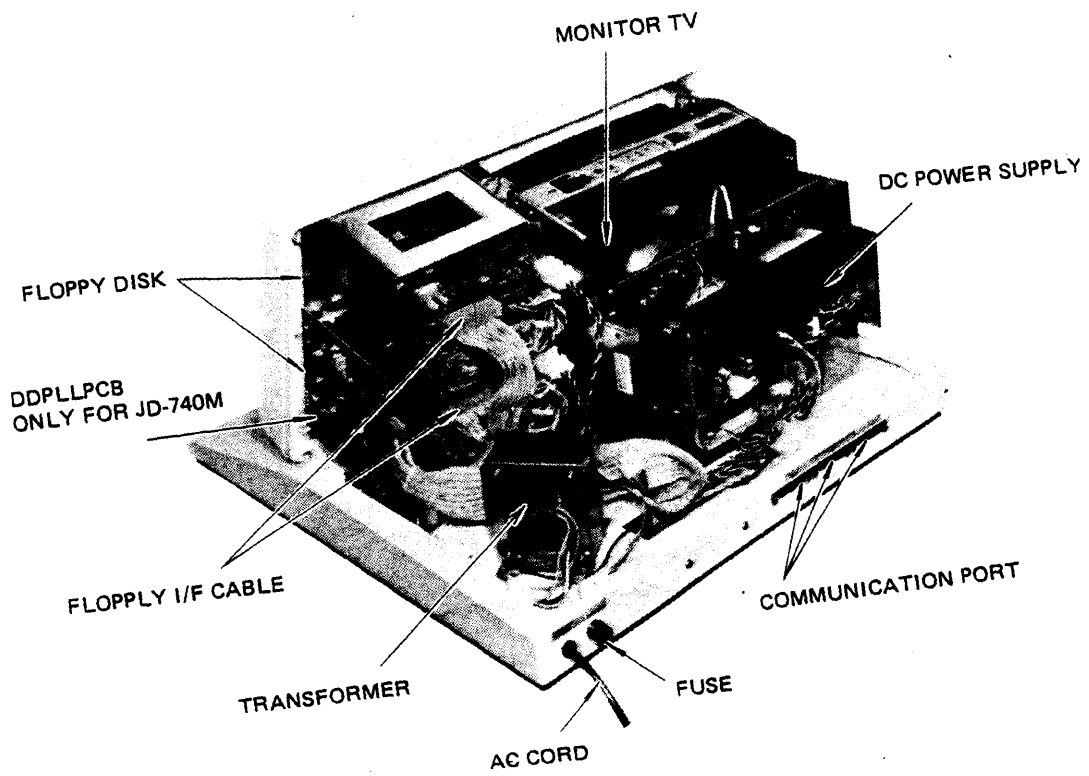


Fig. 2 - 3 JD-700M SERIES INTERNAL LAYOUT

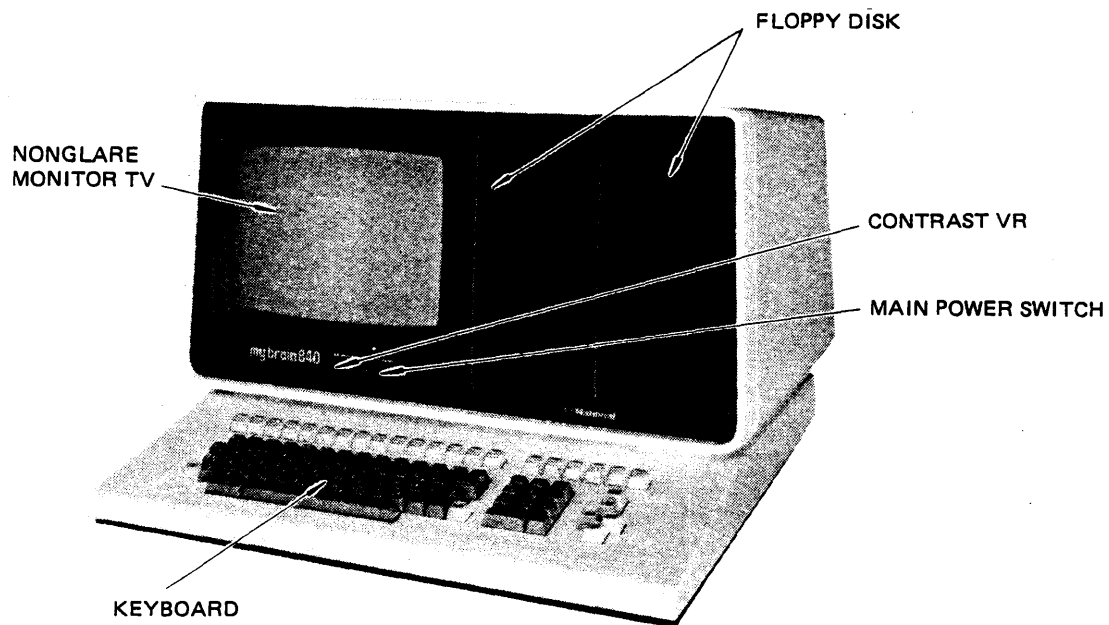


Fig. 2 - 4 JD-800M SERIES EXTERNAL LAYOUT

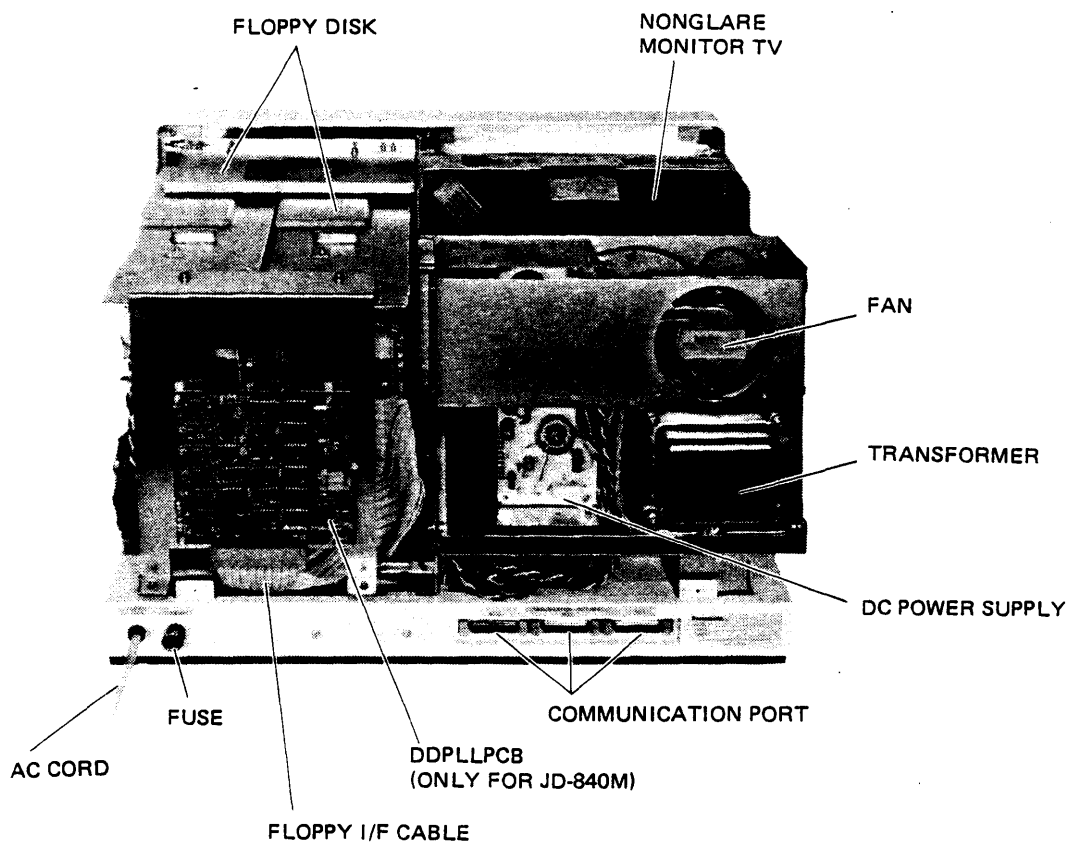


Fig. 2 - 5 JD-800M SERIES INTERNAL LAYOUT

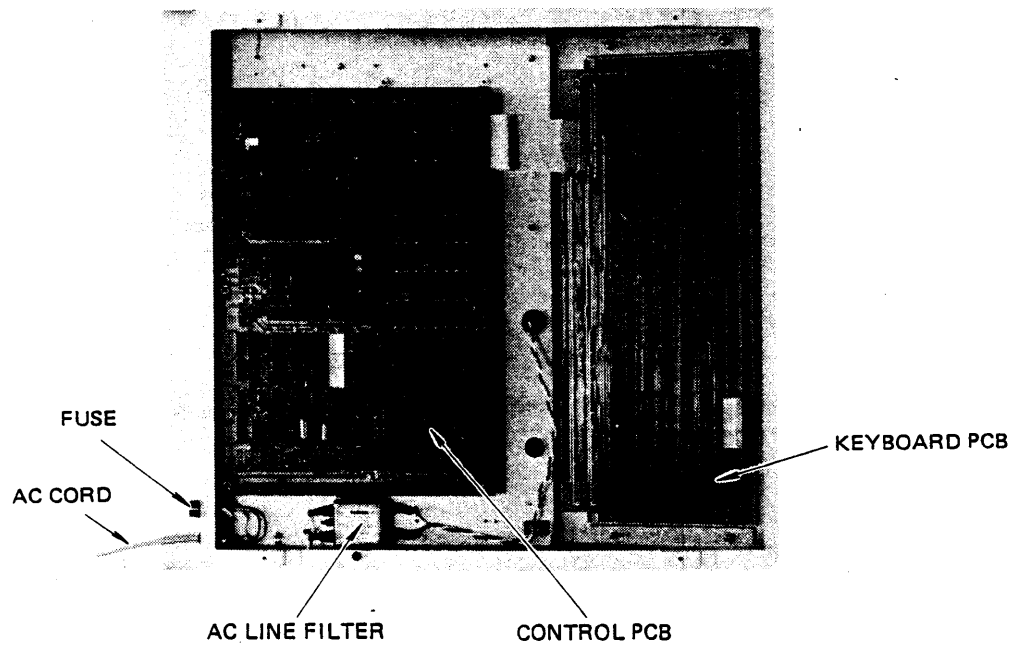


Fig. 2 - 6 JD-700M/740M/800M/840M
INTERNAL LAYOUT (FROM BOTTOM)

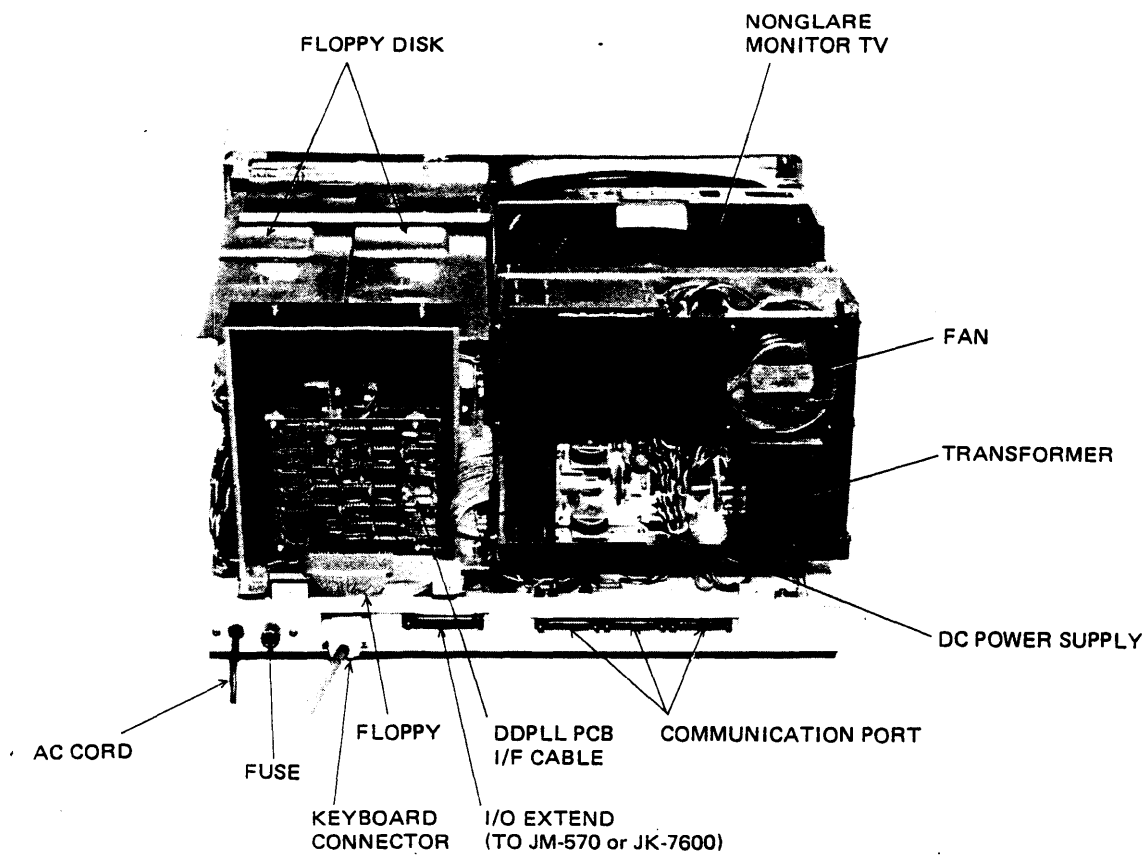


Fig. 2 - 7 JD-850M INTERNAL LAYOUT

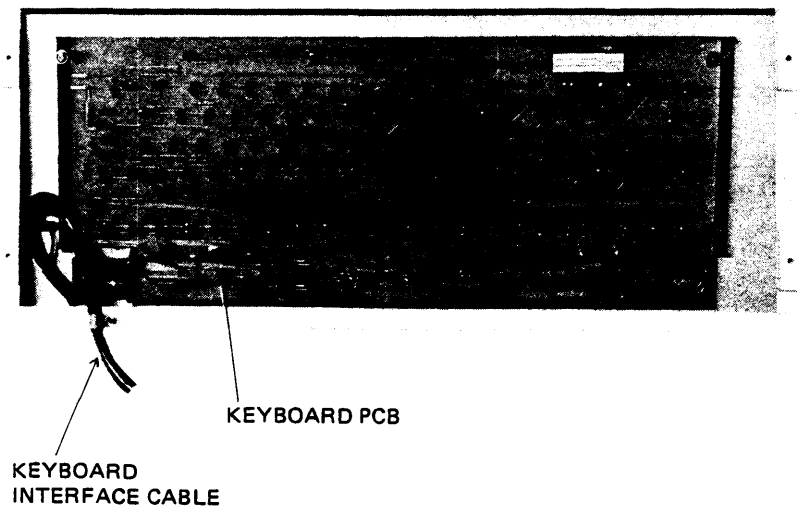
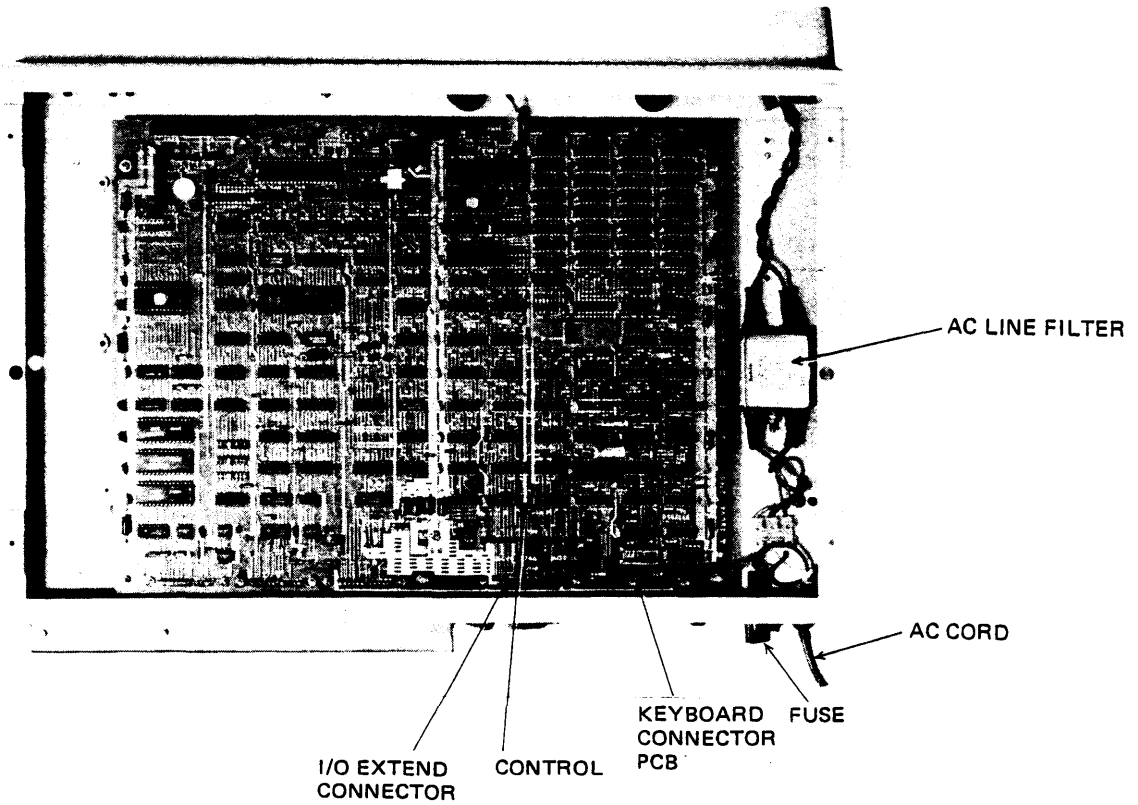
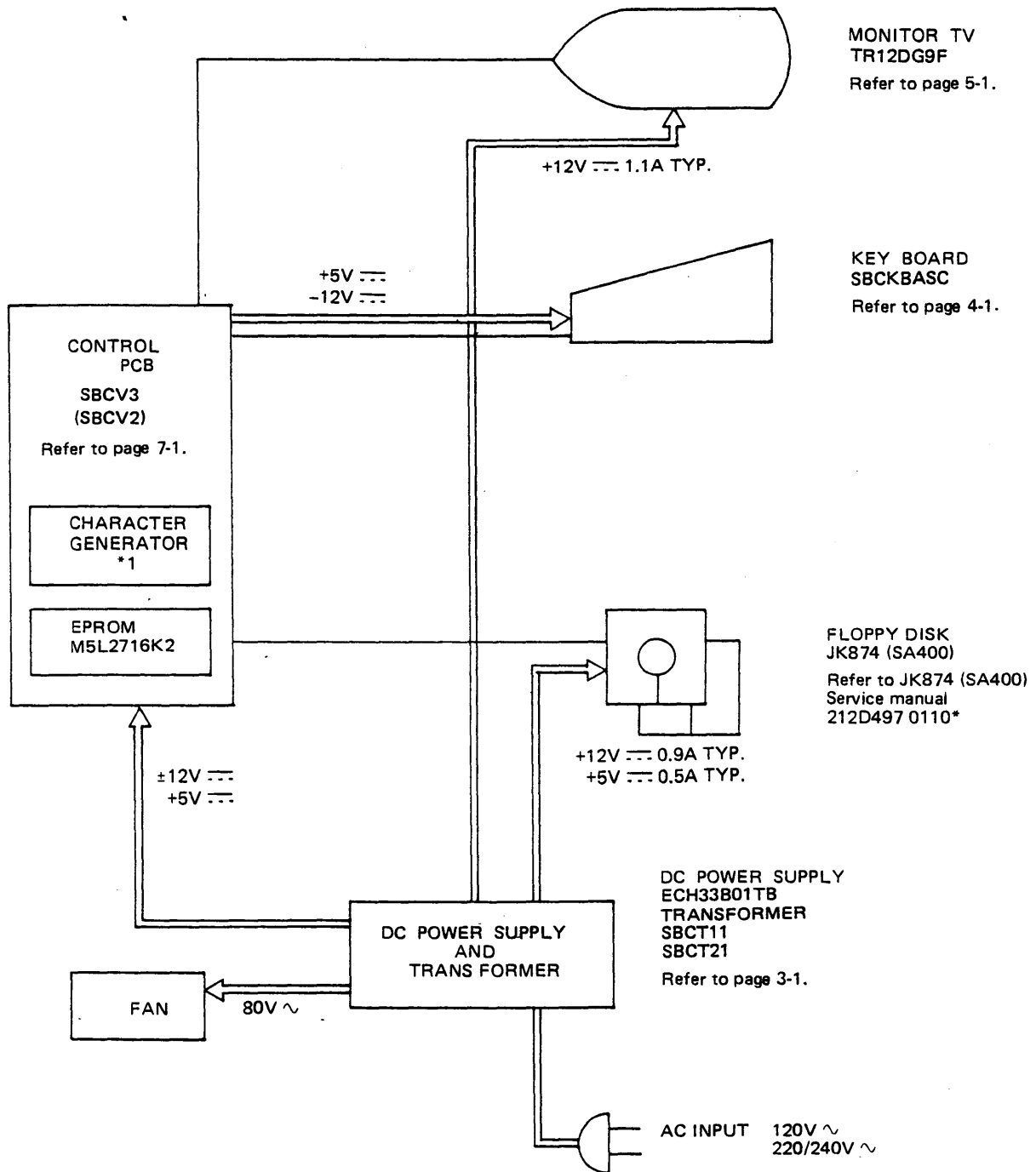


Fig. 2 - 8 JD-850M INTERNAL LAYOUT
(FROM BOTTOM)

2.2 SYSTEM CONFIGURATION

2.2.1 JD-700M SYSTEM CONFIGURATION

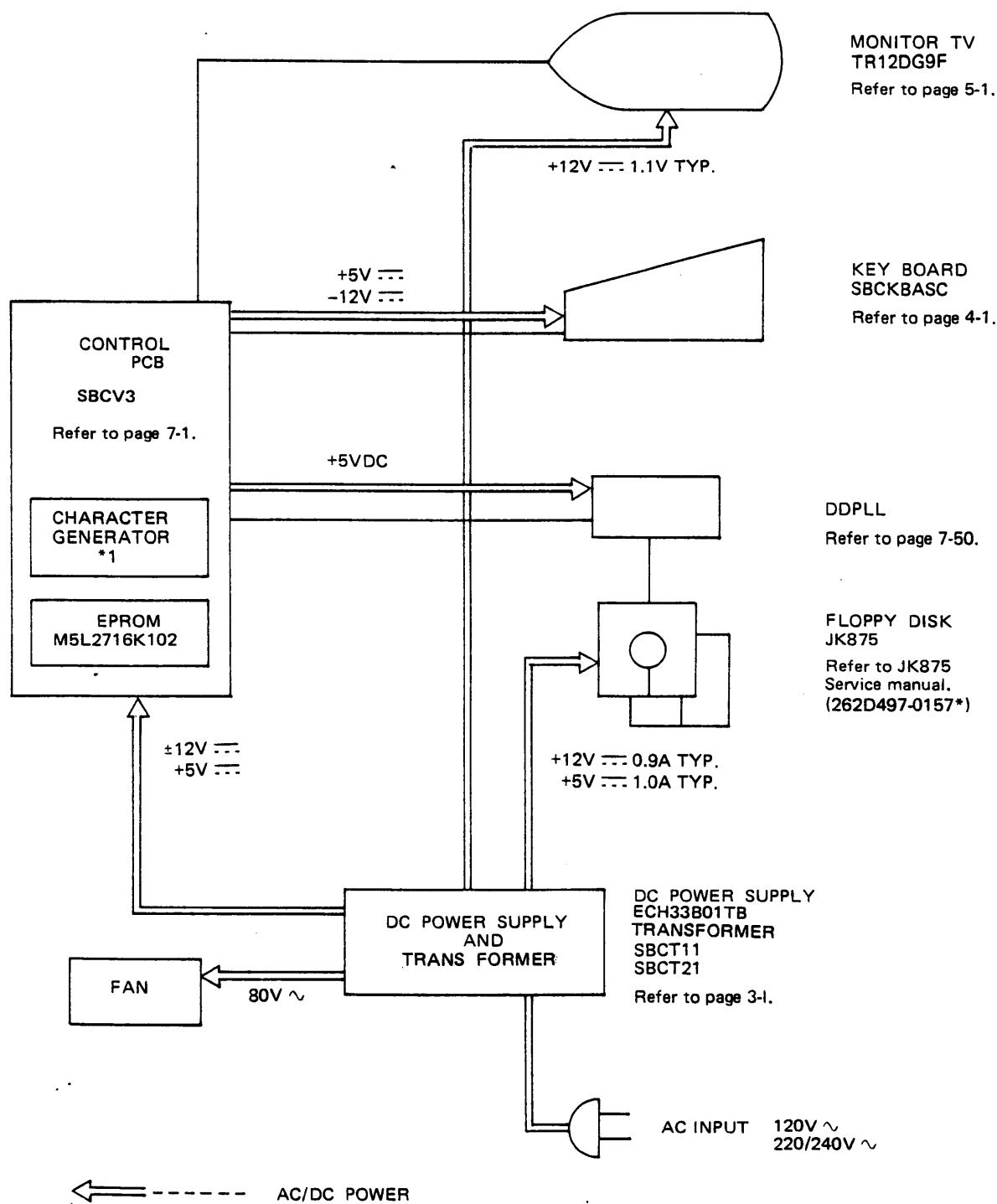


*1	
ASCII	MCM66740
British	MCM66760
French	MCM66780
German	MCM66770

	KEY BOARD	KEY TOP
ASCII	SBCKBASC	—
British	SBCKBASC	SBCKTPBRI
French	SBCKBASC	SBCKTPFRE
German	SBCKBGER	—
Swedish	SBCKBSWE	—

Fig. 2 - 9 BLOCK DIAGRAM JD-700M

2.2.2 JD-740M SYSTEM CONFIGURATION

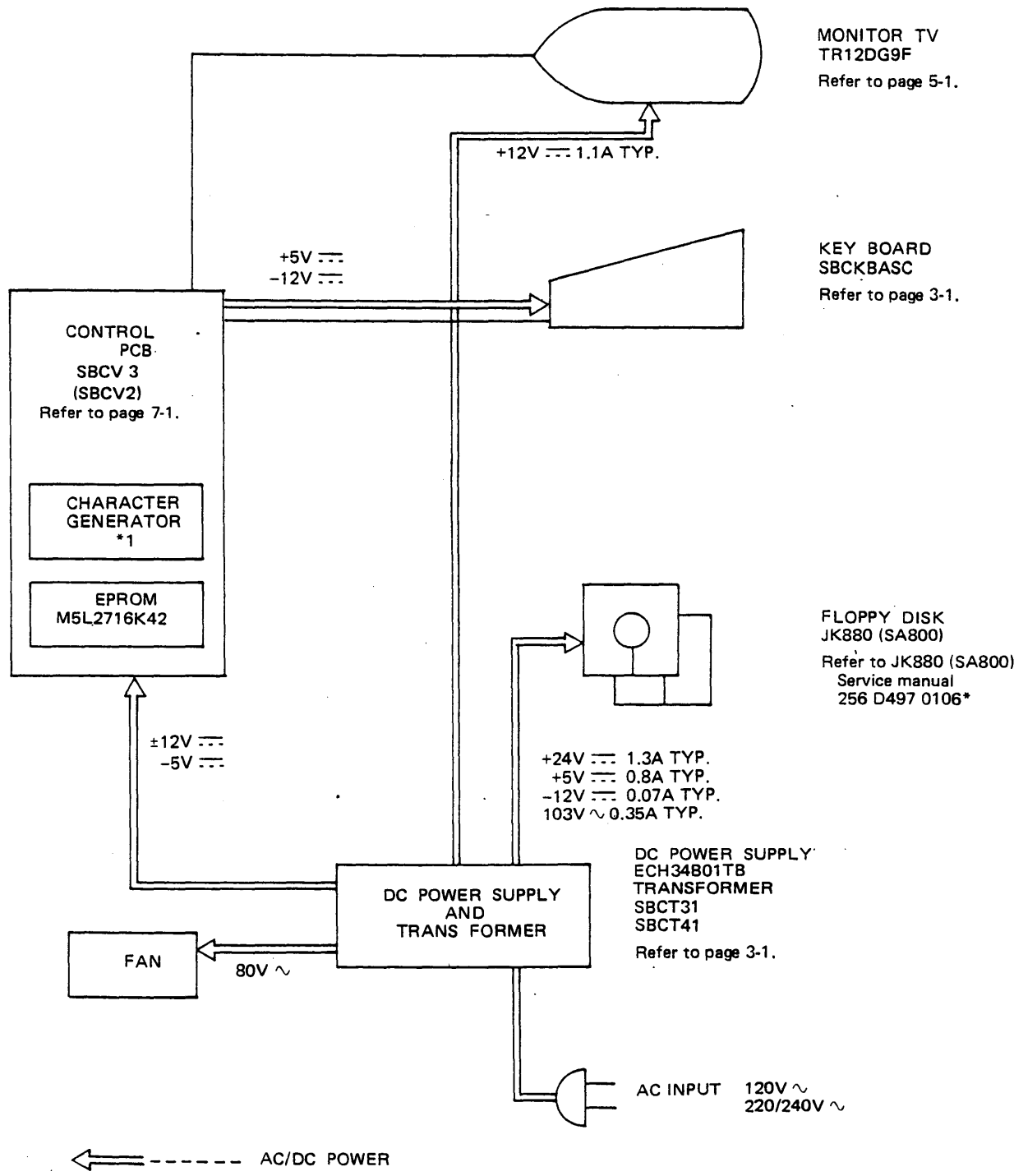


*1	
ASCII	MCM66740
British	MCM66760
French	MCM66780
German	MCM66770

	KEY BOARD	KEY TOP
ASCII	SBCKBASC	—
British	SBCKBASC	SBCKTPBRI
French	SBCKBASC	SBCKTPFRE
German	SBCKBGER	—
Swedish	SBCKBSWE	—

Fig. 2 - 10 BLOCK DIAGRAM JD-740M

2.2.3 JD-800M SYSTEM CONFIGURATION

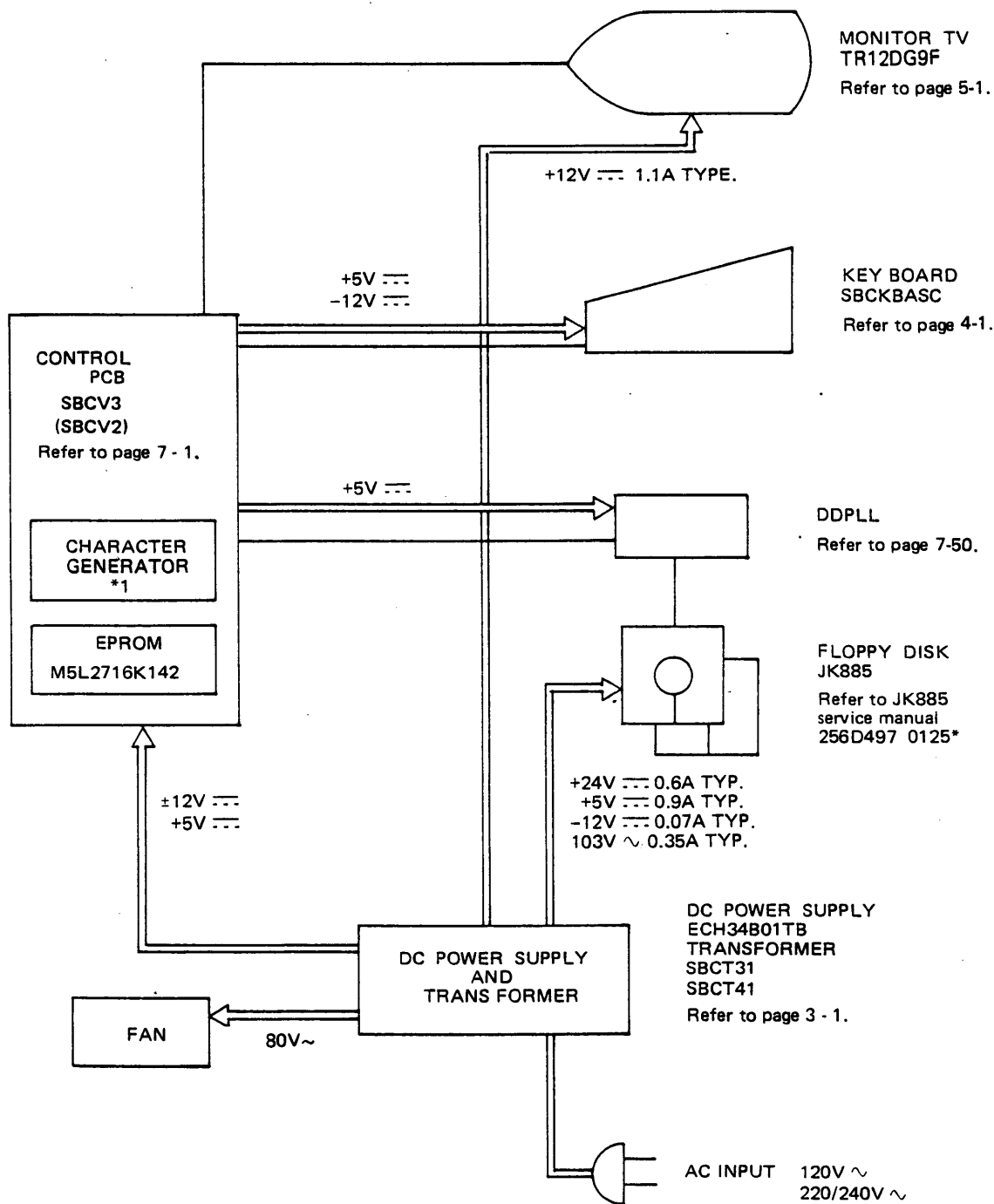


*1	
ASCII	MCM66740
British	MCM66760
French	MCM66780
German	MCM66770

	KEY BOARD	KEY TOP
ASCII	SBCKBASC	- -
British	SBCKBASC	SBCKTPBRI
French	SBCKBASC	SBCKTPFRE
German	SBCKBGER	-
Swedish	SBCKBSWE	-

Fig. 2 - 11 BLOCK DIAGRAM JD-800M

2.2.4 JD-840M SYSTEM CONFIGURATION



←----- AC/DC POWER

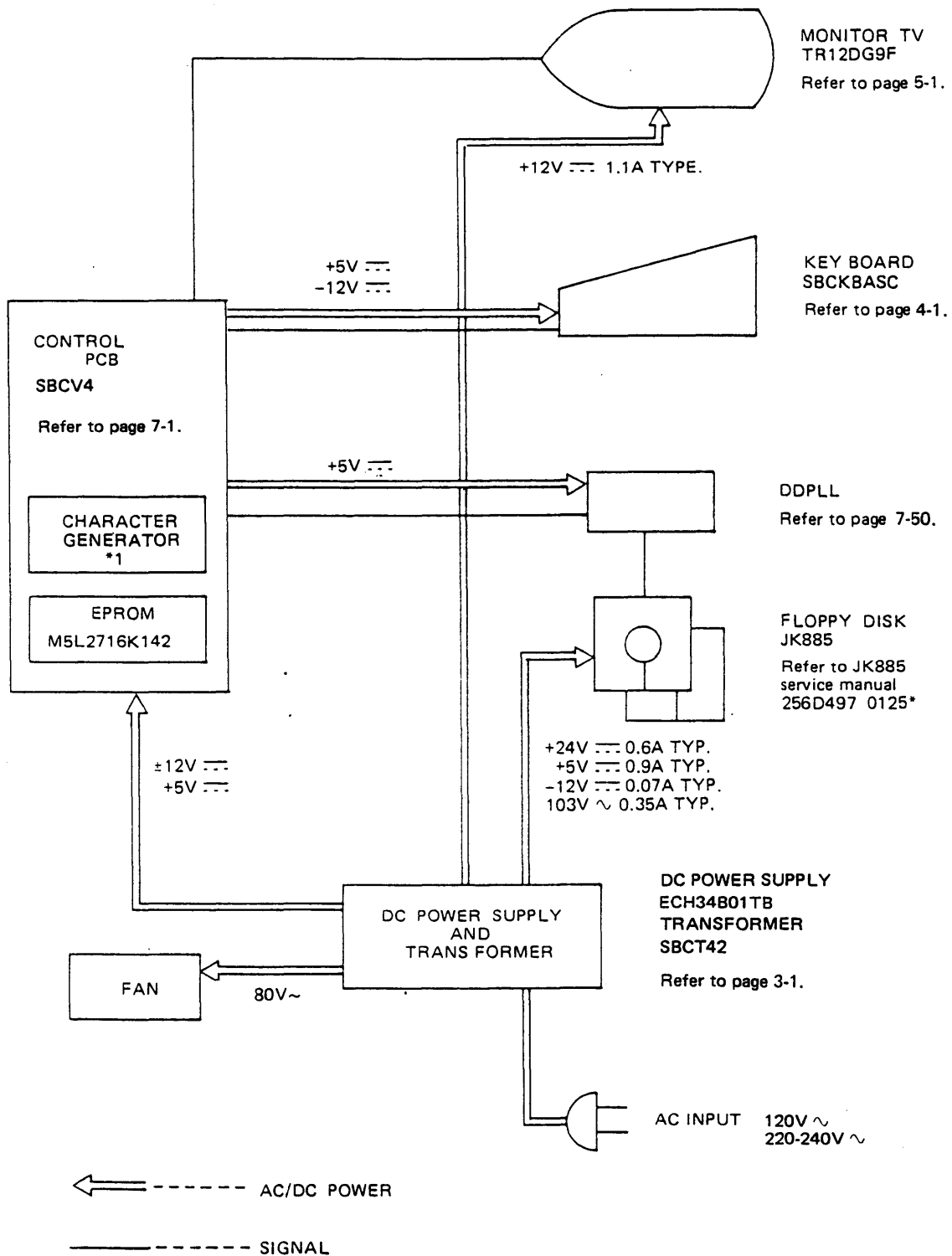
----- SIGNAL

*1	
ASCII	MCM66740
British	MCM66760
French	MCM66780
German	MCM66770

	KEY BOARD	KEY TOP
ASCII	SBCKBASC	—
British	SBCKBASC	SBCKTPBRI
French	SBCKBASC	SBCKTPFRE
German	SBCKBGER	—
Swedish	SBCKBSWE	—

Fig. 2 - 12 BLOCK DIAGRAM JD-840M

2.2.5 JD-850M SYSTEM CONFIGURATION



*1	
ASCII	M5L2716KA
British	M5L2716KE
French	M5L2716KF
German	M5L2716KD

	KEY BOARD	KEY TOP
ASCII	SBCKBASC	—
British	SBCKBASC	SBCKTPBRI
French	SBCKBASC	SBCKTPFRE
German	SBCKBGER	—
Swedish	SBCKBSWE	—

Fig. 2 - 13 BLOCK DIAGRAM JD-850M

2.3 SPECIFICATIONS

2.3.1 JD-700M/740M

		700M	740M
1) Power Supply			
Power Supply:	120V $\sim \pm 10\%$ 200/220/240V $\sim \pm 10\%$	per sector: 128 bytes	256 bytes
Frequency:	50 – 60Hz (Single Phase)	sectors per track: 16	16
Power Consumption:	2.5A max. (120V) 1.3A max. (220/240V)	tracks: 35	35 x 2
		Transfer Rate: 125Kbits/sec	250Kbits/sec
		Latency(average): 100ms	100ms
2) Processor			
Micro Processor:	Intel 8085A - 2	Access Time	
Clock Frequency:	4MHz	track to track: 40ms	30ms
Work Size:	8 bits	average time: 463ms	350ms
No. or Instructions:	246	setting time: 10ms	15ms
Interruption:	4	Head Load Time: 90ms	50ms
		Disk Motor Start	
		Time: 1sec	1sec
		Media: SA-104	DYSAN 104/2D
3) Memory			
Dynamic RAM:	32Kbytes or 56Kbytes	7) Communications Interface	
P-ROM:	2Kbytes (2Kbytes Option)	Interface:	RS-232C/CCITT
Static RAM:	2Kbytes (for Indication of CRT)	Number of ports:	3
		Modes:	asynchronous synchronous
4) Keyboard			
Key Codes:	ASCII	Speeds:	asynchronous – 110, 150, 300, (PORT 1 ~ 3) 600, 1200, 2400, 4800
Key Modes:	Unshift, shift, control shift control 4-step shift change		9600BPS
Character unit:	8 bits		synchronous – 1200, 2400, (PORT 2) 4800, 9600BPS
Key Kinds:	Numeric and alphabetic key Tenkey Cursor control key Function key (PF1-PF15, PE1- PE6), CTRL, SHIFT LOCK, SHIFT, REP, CAPS LOCK	8) Physical Specification	
Interlock:	2 Key roll over	Environment:	
Repeat:	Continuous code output by REP key and other key Speeds approx. 100ms	operating:	5°C ~ 35°C 35 ~ 80%
		storage:	-20°C ~ 60°C 10 ~ 90%
		weight:	30kg
5) CRT Display			
Display Format:	24 lines x 80 characters (1920 characters)		
View Area:	220mm x 165mm		
Screen Type:	12 inch p.39 green phosphor		
Character Generation:	7 x 12 dot matrix		
Character Field:	10 x 14 dot matrix		
Video Control:	Highlight, Reverse, Underline, Blink		
6) Minifloppy			
	700M	740M	
Number of dist drives;	2	2	
Capacity (formatted)			
per disk:	70Kbytes	280Kbytes	
per track:	2048bytes	4096bytes	

2.3.2 JD-800M/840M

1) Power Supply

Power Supply: 120V $\sim \pm 10\%$
 220/240V $\sim \pm 10\%$
 Frequency: 50/60Hz (Single Phase) $\pm 1\%$
 Power Consumption: 3.5A max. (120V)
 1.8A max. (220V/240V)

	800M	840M
per sector:	128 bytes	256 bytes
sectors per track:	26	26
tracks:	77	77 $\times$ 2
Transfer Rate:	250Kbits/sec	500Kbits/sec
Latency(average):	83ms	83ms
Access Time		
track to track:	10ms	3ms
average time:	260ms	91ms
setting time:	8ms	15ms
Head Load Time:	40ms	50ms
Media:	SA-100	DYSAN 3740-2DS256

2) Processor

Micro Processor: Intel 8085A - 2
 Clock Frequency: 4MHz
 Work Size: 8 bits
 No. of Instructions: 246
 Interruption: 4

3) Memory

Dynamic RAM: 56Kbytes
 P-RAM: 2Kbytes (2Kbytes Option)
 Static RAM: 2Kbytes (for Indication of CRT)

7) Communications Interface

Interface: RS-232C/CCITT
 Number of ports: 3
 Modes: asynchronous or synchronous
 Speeds: asynchronous - 110, 150, 300,
 (PORT1 ~ 3) 600, 1200,
 2400, 4800
 9600BPS
 synchronous - 1200, 2400,
 (PORT 2) 4800, 9600BPS

4) Keyboard

Key Codes: ASCII
 Key Modes: Unshift, shift, control, shift
 control 4-step shift change
 Character Unit: 8 bits
 Key Kinds: Numeric and alphabetic key
 Tenkey
 Cursor control key
 Function key (PF1-PF15, PE1-
 PE6), CTRL, SHIFTLOCK,
 SHIFT, REP, CAPS LOCK
 Interlock: 2 Key roll over
 Repeat: Continuous code output by
 REP key and other key
 Speeds approx. 100ms

8) Physical Specification

Environment:
 operating: 5°C ~ 35°C 35 ~ 80%
 storage: -20°C ~ 60°C 10 ~ 90%
 weight: 50kg

5) CRT Display

Display Format: 24 lines $\times$ 80 characters (1920
 characters)
 Viewing Area: 220mm $\times$ 165mm
 Screen Type: 12 inch p.39 green phosphor
 Character Generation: 7 $\times$ 12 dot matrix
 Character Field: 10 $\times$ 14 dot matrix
 Video Control: Highlight, Reverse, Underline,
 Blink

6) Floppy

	800M	840M
Number of dist drives:	2	2
Capacity (formatted)		
per disk:	250.25Kbytes	1001 Kbytes
per track:	3328bytes	6656 bytes

2.3.3 JD-850M

1) Power Supply

Power Supply: 120V $\sim \pm 10\%$
 220-240V $\sim \pm 10\%$
 Frequency: 50/60Hz (Single Phase) $\pm 1\%$
 Power Consumption: 3.5A max. (120V)
 1.8A max. (220V/240V)

2) Processor

Micro Processor: Intel 8085A - 2
 Clock Frequency: 4MHz
 Work Size: 8 bits
 No. of Instructions: 246
 Interruption: 4

3) Memory

Dynamic RAM: 56Kbytes
 P-RAM: 2Kbytes (2Kbytes Option)
 Static RAM: 2Kbytes (for Indication of CRT)

4) Keyboard

Key Codes: ASCII
 Key Modes: Unshift, shift, control, shift
 control 4-step shift change
 Character Unit: 8 bits
 Key Kinds: Numeric and alphabetic key
 Tenkey
 Cursor control key
 Function key (PF1-PF15, PE1-
 PE6), CTRL, SHIFTLOCK,
 SHIFT, REP, CAPS LOCK
 Interlock: 2 Key roll over
 Repeat: Continuous code output by
 REP key and other key
 Speeds approx. 100ms

5) CRT Display

Display Format: 24 lines $\times$ 80 characters (1920
 characters)
 Viewing Area: 220mm $\times$ 165mm
 Screen Type: 12 inch p.39 green phosphor
 Character Generation: 7 $\times$ 12 dot matrix
 Character Field: 10 $\times$ 14 dot matrix
 Video Control: Highlight, Reverse, Underline,
 Blink

6) Floppy

850M

Number of dist
 drives: 2
 Capacity (formatted)
 per disk: 1001 Kbytes
 per track: 6656 bytes

850M

per sector: 256 bytes
 sectors per track: 26
 tracks: 77 $\times$ 2
 Transfer Rate: 500Kbits/sec
 Latency(average): 83ms
 Access Time
 track to track: 3ms
 average time: 91ms
 setting time: 15ms
 Head Load Time: 50ms
 Media: DYSAN
 3740-2DS256

7) Communications Interface

Interface: RS-232C/CCITT
 Number of ports: 3
 Modes: asynchronous or synchronous
 Speeds: asynchronous - 110, 150, 300,
 (PORT1 $\sim$ 3) 600, 1200,
 2400, 4800
 9600BPS
 synchronous - 1200, 2400,
 (PORT 2) 4800, 9600BPS

8) Physical Specification

Environment:
 operating: 5°C $\sim$ 35°C 35 $\sim$ 80%
 storage: -20°C $\sim$ 60°C 10 $\sim$ 90%
 weight: 50kg

2.3.4 FUNCTION BLOCK

Microprocessor is centered, around which provided are memories of 2Kbytes P-ROM and 56Kbytes RAM. Additionally provided are 12 inch display, floppy 2 sets as for data file, keyboard as for I/O device and 3 channel communication interfaces as for external connection.

Block diagram is shown in Fig. 2 - 11.

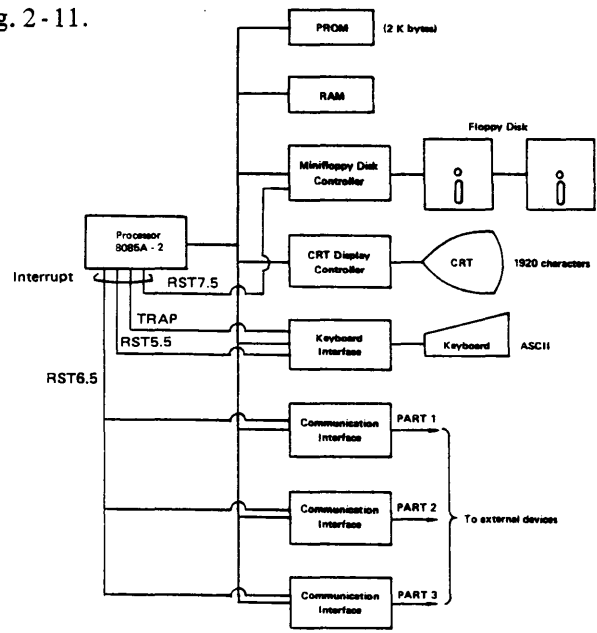


Fig. 2 - 14 FUNCTION BLOCK DIAGRAM

2.3.5 MEMORY STRUCTURE

There are provided 32Kbytes/56Kbytes RAM as for main memory and 2 Kbytes RAM as for display memory. Also P-ROM has 2 Kbytes. Memory map is shown in Fig. 2 - 12.

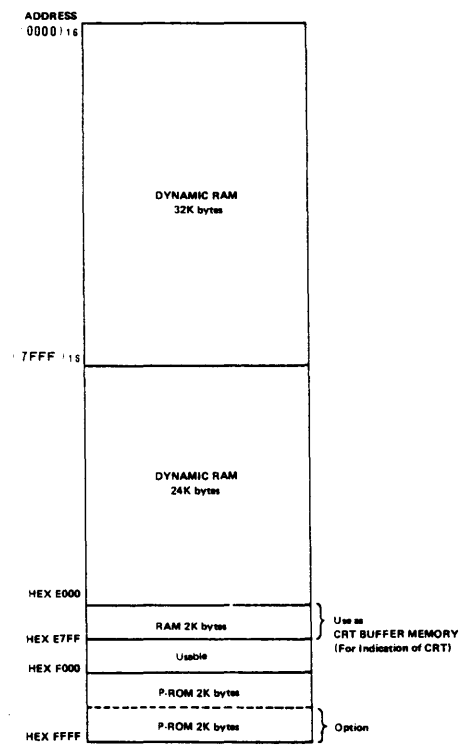


Fig. 2 - 15 MEMORY MAP

3. POWER SUPPLY

3.1 JD-700M/JD-740M POWER SUPPLY

3.1.1 BLOCK DIAGRAM

JD-700M/740M power supply generates 3 kinds of stabilized DC power supply of 5V, +12V and -12V which are required for control PCB, mini-floppy disk and monitor TV.

Constructionally, all circuits are assembled on one PCB for easy maintenance and inspection.

Block diagram of power supply is shown below.

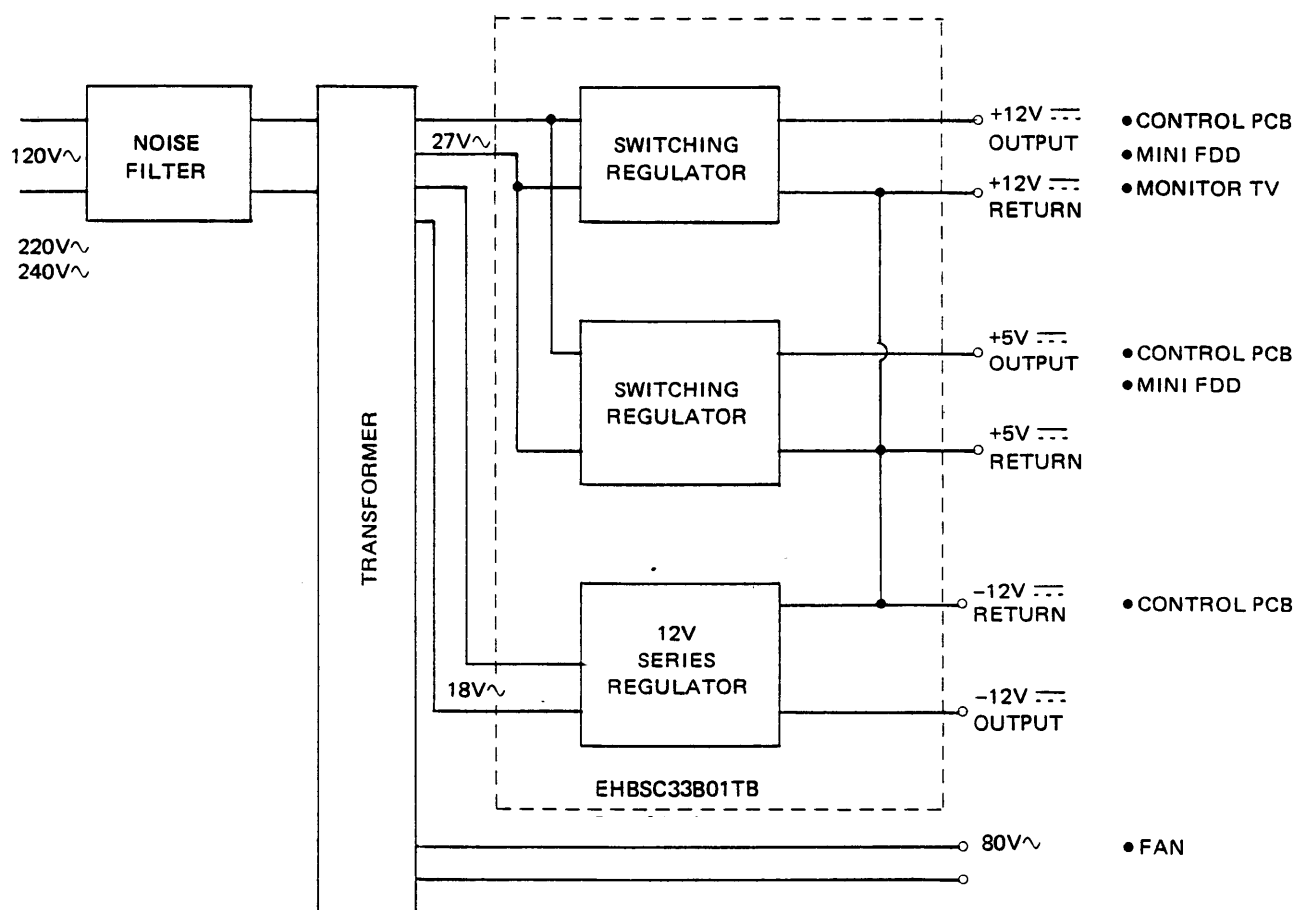
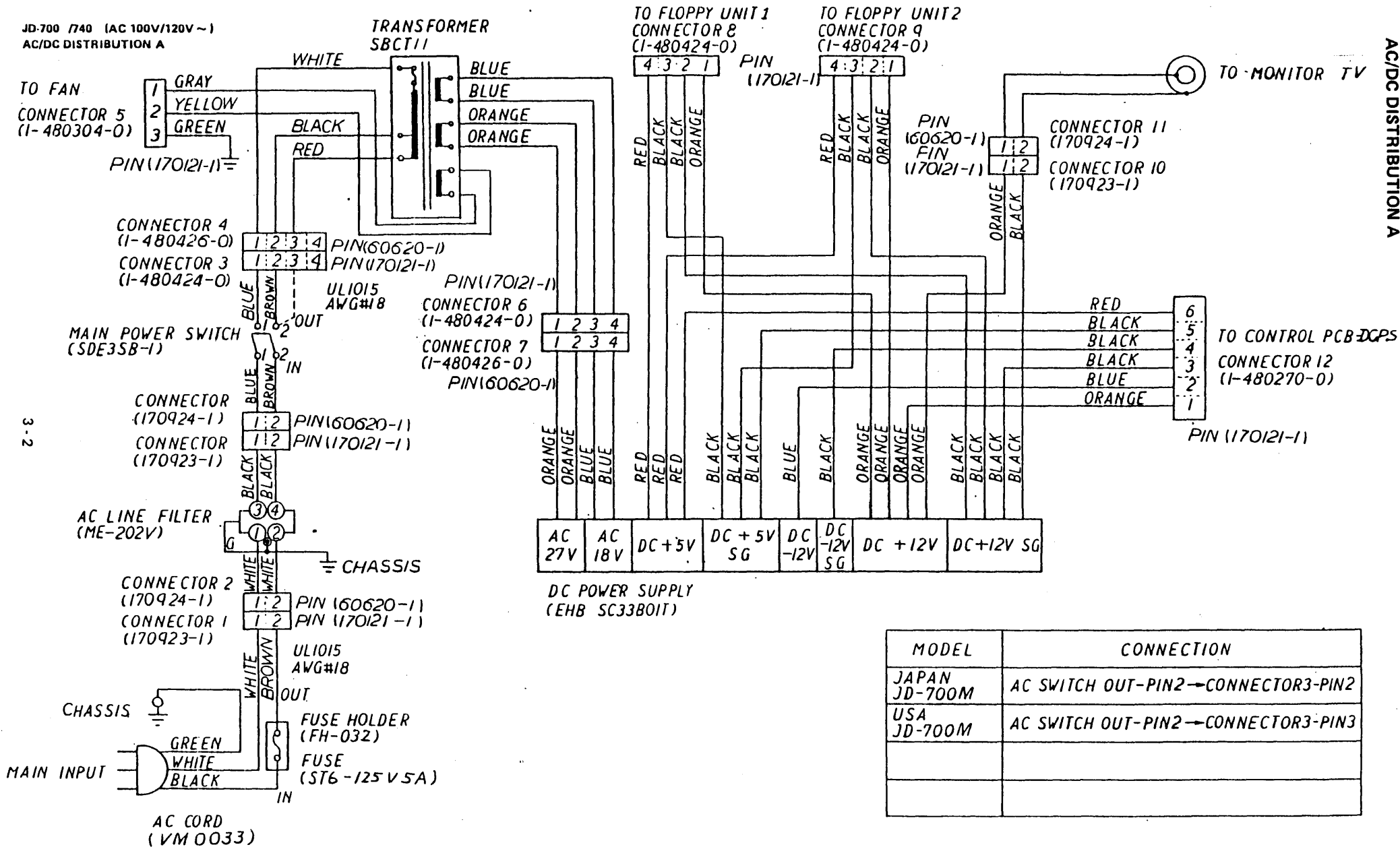


Fig. 3 - 1 POWER SUPPLY BLOCK DIAGRAM

3.1.2 SPECIFICATION (JD-700M/JD-740M)

- Input voltage: 120V $\sim \pm 10\%$
220/240V $\sim \pm 10\%$
- Input frequency: 50-60Hz
- Output voltage/current: +12V/3.3A max.
+5V/5A max.
-12V/0.1A max.
- Overall stability: $\pm 5\%$ or less

JD-700 /740 (AC 100V/120V ~)
AC/DC DISTRIBUTION A

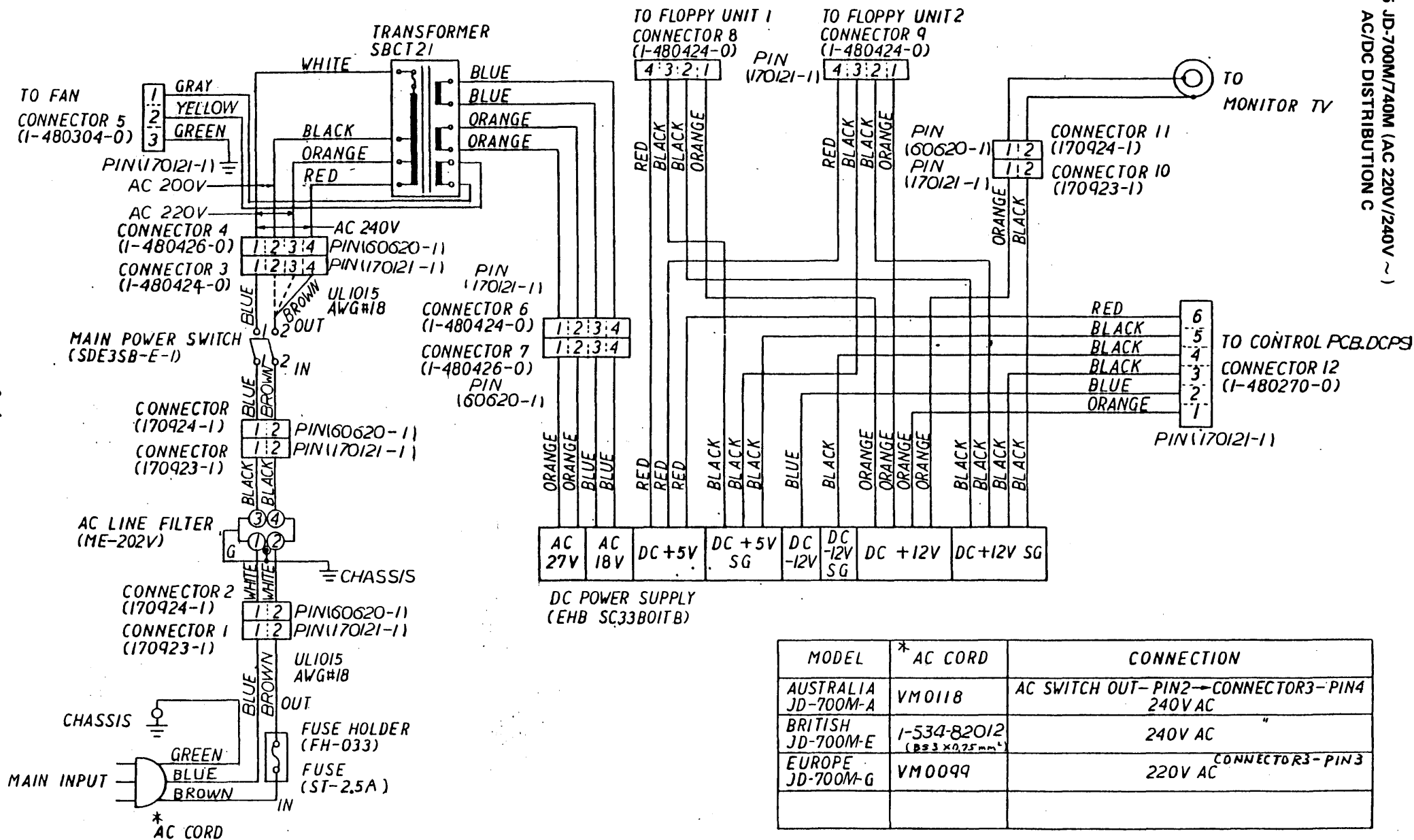


3.1.3 JD-700M/740M (AC 100V/120V ~)
AC/DC DISTRIBUTION A

MODEL	CONNECTION
JAPAN JD-700M	AC SWITCH OUT-PIN2 → CONNECTOR 3-PIN2
USA JD-700M	AC SWITCH OUT-PIN2 → CONNECTOR 3-PIN3

3.1.4 JD-700M/740M 100V/120V. AC/DC DISTRIBUTION PARTS LIST

[illegible]

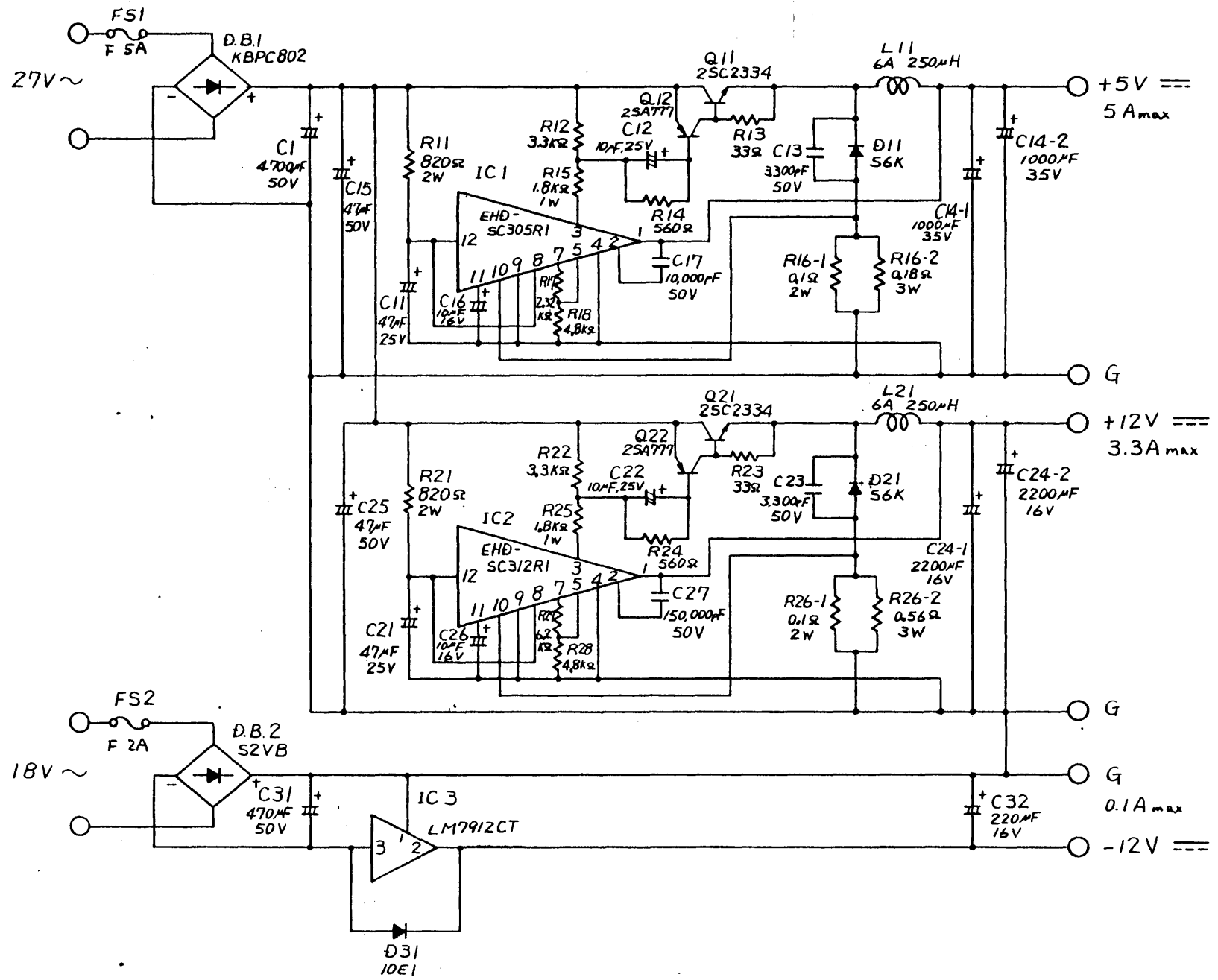


3.1.6 JD-700M/740M 220V/240V

AC/DC DISTRIBUTION PARTS LIST

[illegible]

3.1.7 JD-700M/740M DC POWER SUPPLY (EHBSC33B01TB)
SCHEMATICS



3.1.8 PARTS LAYOUT (EHBSC33B01TB)

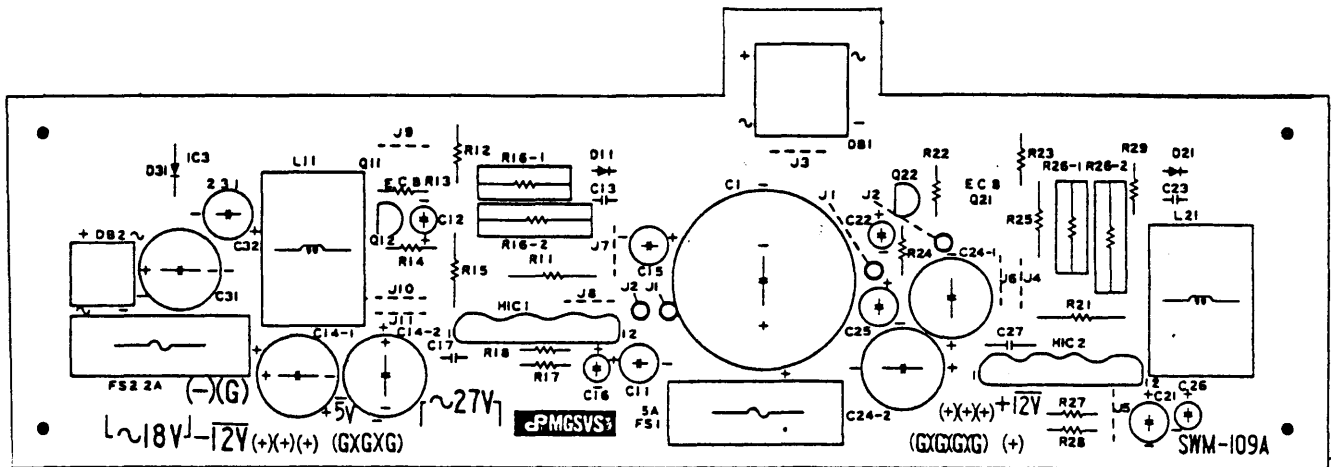


Fig. 3 - 2 PARTS LAYOUT DWG.

3.1.9 JD-700M/740M DC POWER SUPPLY (EHBSC33B01TB) PARTS LIST

LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
DB1	KBPC802	Diode bridge 10A 200V	
DB2	S2VB	Diode bridge 2A 200V	
IC1	EHD-SC305R1	Regulation IC	
IC2	EHD-SC312R1	Regulation IC	
IC3	LM7912CT	Regulation IC	
Q11, 21	2SC2334	Transister	
Q12, 22	2SA777	Transister	
D11, 21	S6K	Diode	
D31	10E1	Diode	
L11, 21	SN14-561	Choke Coil 6A 250 μ H	
R11, 21	ERG2ANJ681	Metal 680 Ω 2W	
R12, 22	ERD25TJ332	Carbon 3.3k Ω 1/4W	
R13, 23	ERD25FJ330	Carbon 33 Ω 1/4W	
R14, 24	ERD25FJ561	Carbon 560 Ω 1/4W	
R15, 25	ERG1ANJ182	Metal 1.8k Ω 1W	
R16-1,26-1	ERF2AKR10	Non flame 0.1 Ω 2W	
R16-2,26-2	ERF2AKR10	Non flame 0.1 Ω 2W	
R17, 28	ERO25CKF4771	Metal 4.77k Ω 1/4W	
R18, 27	ERO25CKF6201	Metal 6.2k Ω 1/4W	
C1	ECET50R472SL	Electrolytic 4700 μ F 50V	
C11, 21	ECEA1ES470	Electrolytic 47 μ F 25V	
C12, 22	ECEA1ES100	Electrolytic 10 μ F 25V	
C14-1,14-2	ECEA1VS102	Electrolytic 1000 μ F 35V	
C24-1,24-2	ECEA1CS222	Electrolytic 2200 μ F 16V	
C15, 25	ECEA1HS470	Electrolytic 47 μ F 50V	
C16, 26	ECEA1CS100.	Electrolytic 10 μ F 16V	
C31	ECEA1HS471	Electrolytic 470 μ F 50V	
C32	ECEA1CS221	Electrolytic 220 μ F 16V	
C17	ECQM1H103MZ	Plastic film 10,000PF 50V	
C27	ECQM1H154MZ	Plastic film 150,000PF 50V	
C13, 23	ECKD1H332KB2	Ceramic 3300PF 50V	
FS1		Fuse F5A	
FS2		Fuse F2A	
	F2041A20L-10P	Terminal	

3.2 JD-800M/JD-840/JD-850M POWER SUPPLY

3.2.1 BLOCK DIAGRAM

JD-800M/840M power supply generates 4 kinds of stabilized DC power supply of +24V, +12V, +5V and -12V which are required for control PCB, floppy disk and monitor TV.

Constructionally, all circuits are assembled on one PCB for easy maintenance and inspection.

Block diagram of power supply is shown below.

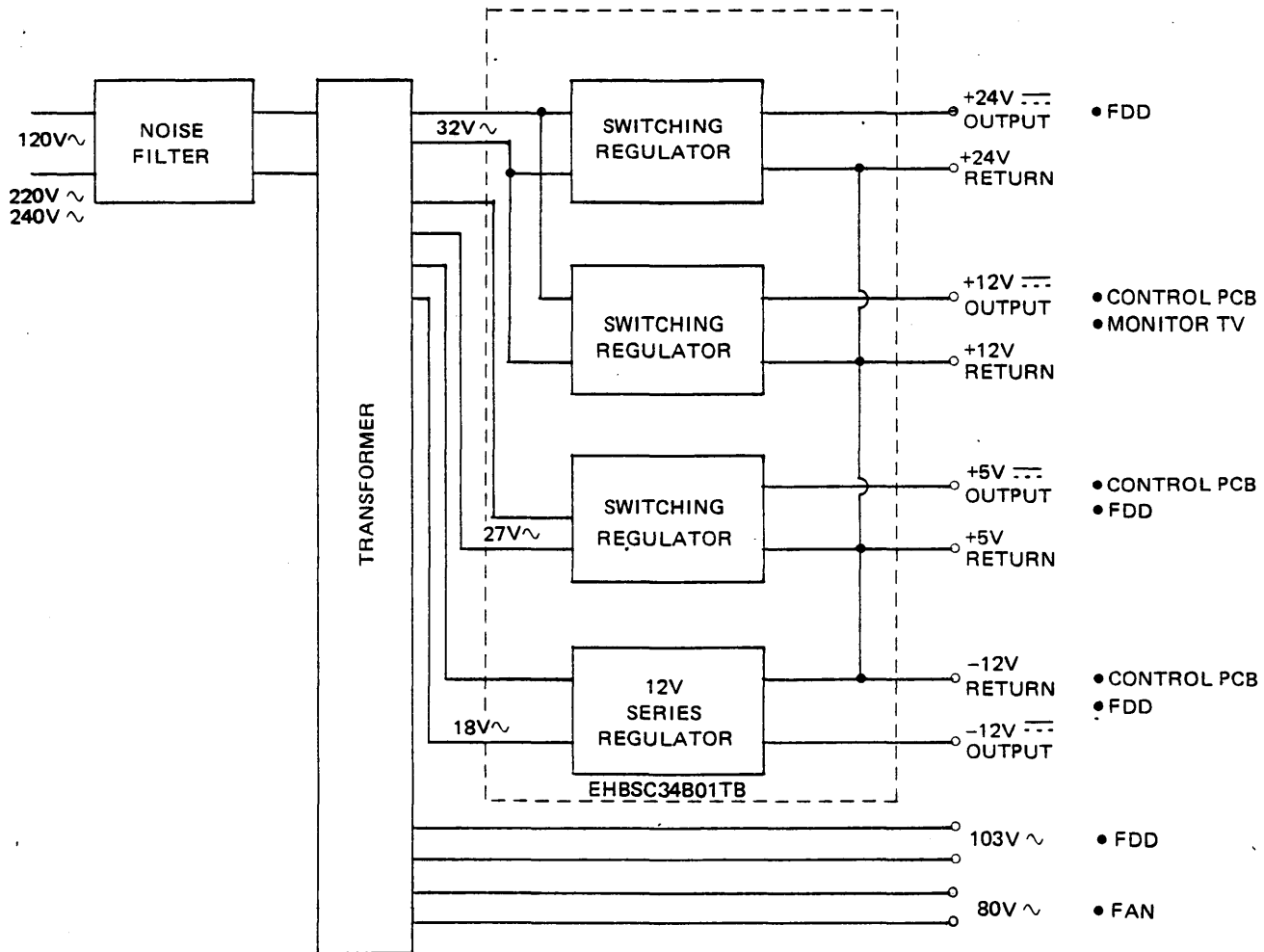
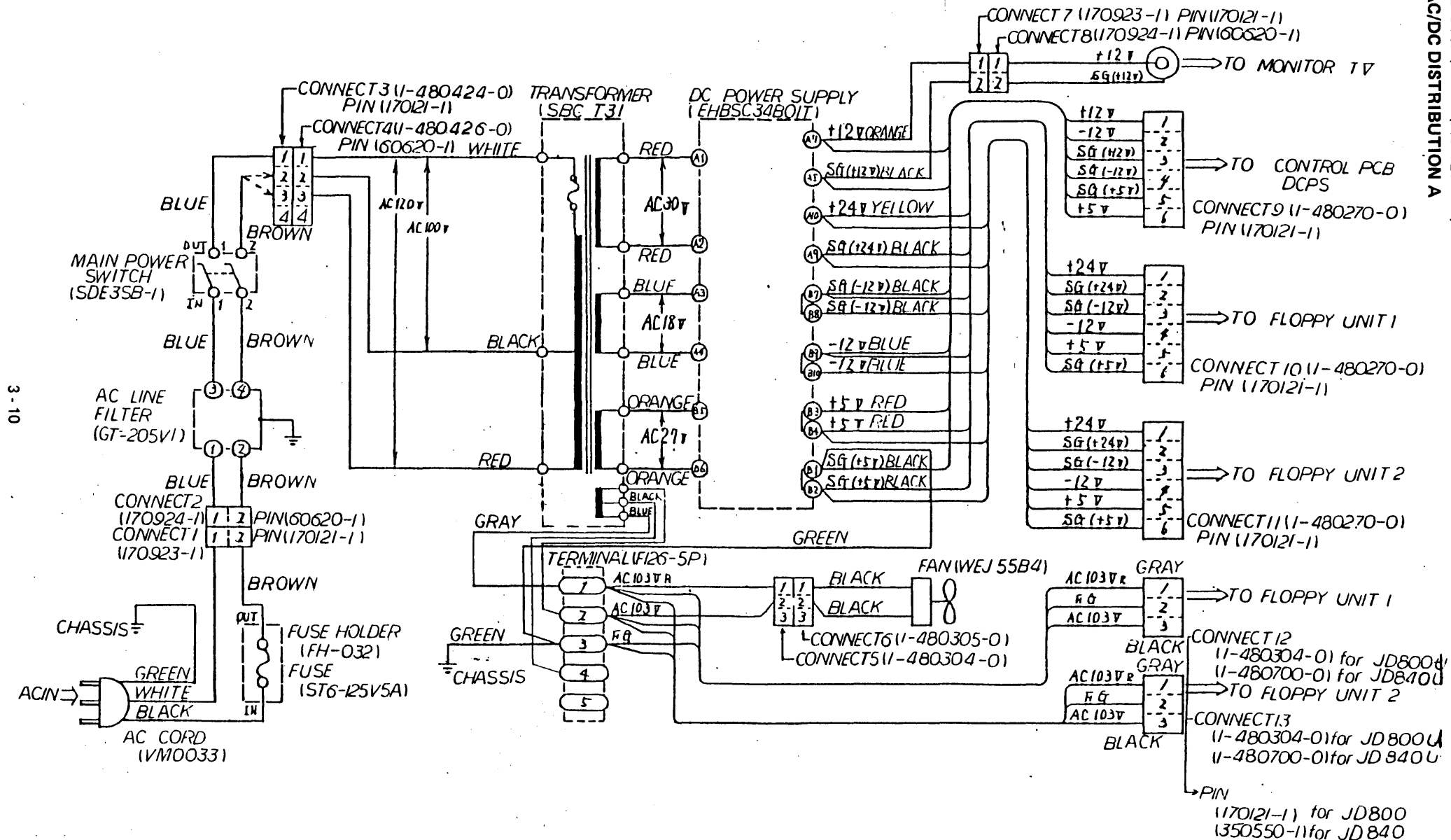


Fig. 3 - 2 POWER SUPPLY BLOCK DIAGRAM

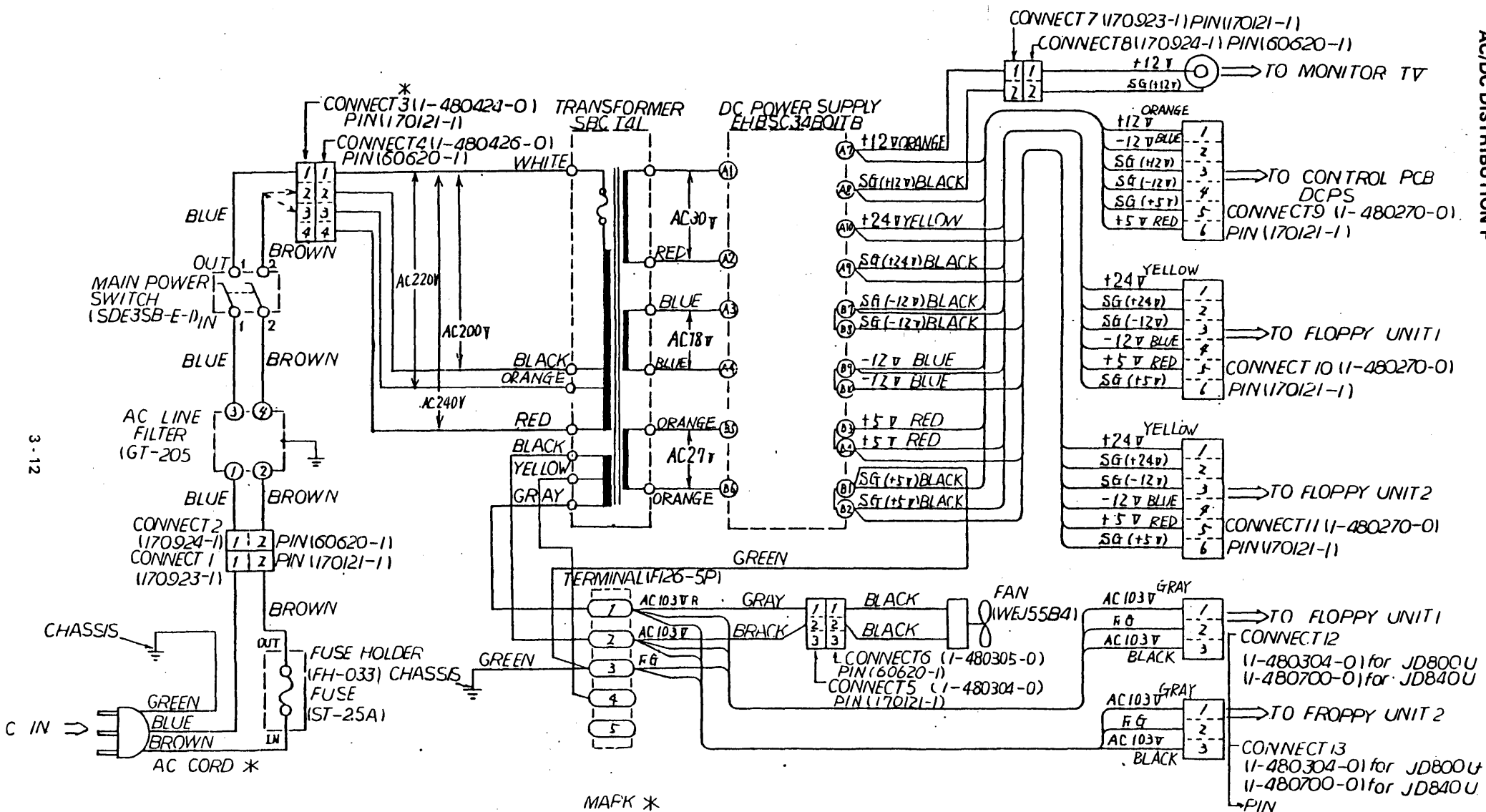
3.2.2 SPECIFICATION (JD-800M/JD-840M)

- Input voltage: 120V $\sim \pm 10\%$
220/240V $\sim \pm 10\%$
- Input frequency: 50Hz or 60Hz (fixed) $\pm 1\%$
- Output voltage/current: 24V 1.7A max.
12V 1.5A max.
5V 6.2A max.
-12V 0.35A max.
- Overall stability: $\pm 5\%$ or less



3.2.4 JD-800M/840M 100V/120V AC/DC DISTRIBUTION PARTS LIST

[illegible]

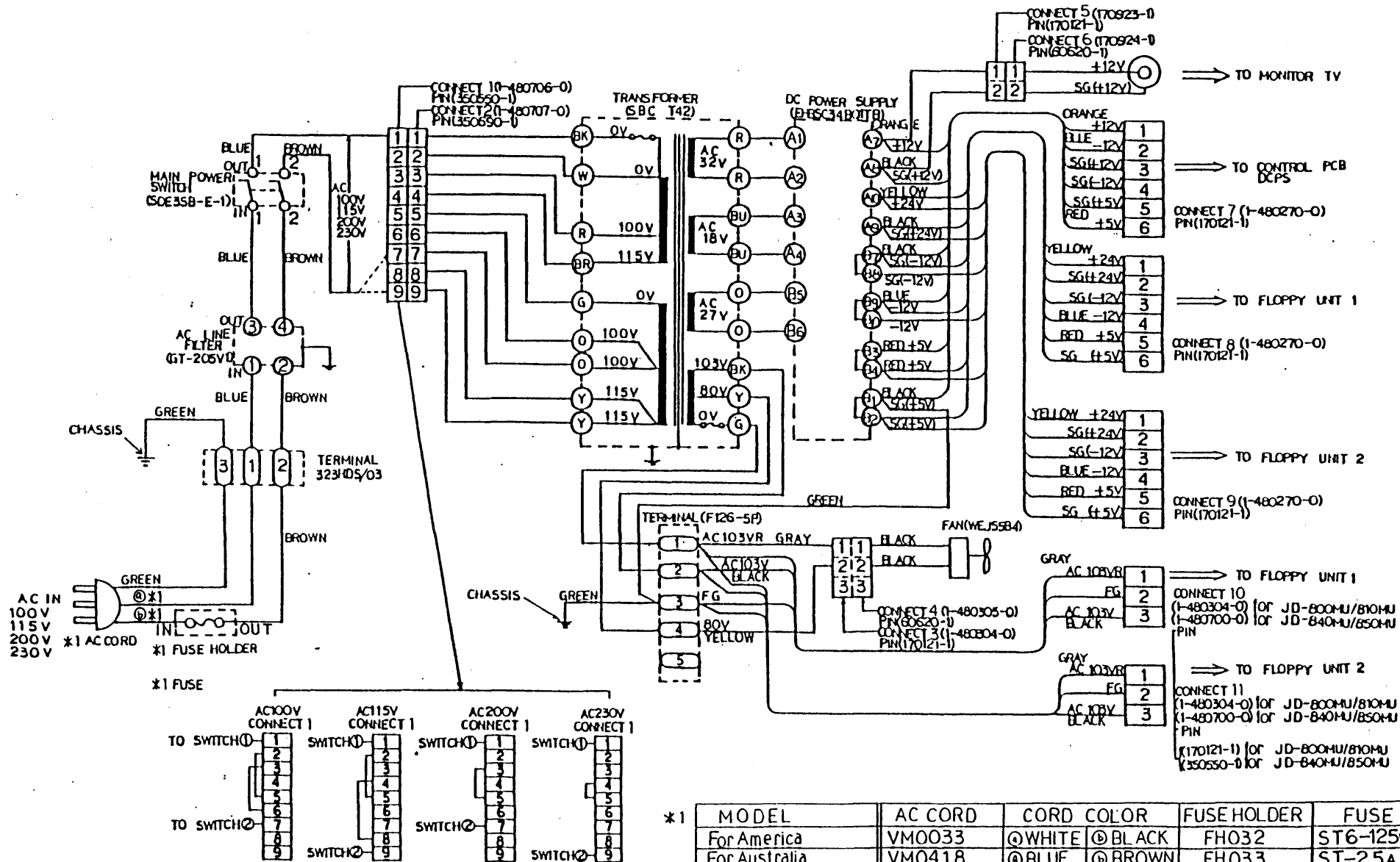


MARK *

MODEL	AC CORD	CONNECT 3 CONNECTION	
For Australia	VM011B	MAIN POWER SWITCH OUT-2PIN → CONNECT 3-3	1170121-1 for JD800
For Continent (Europe)	VM0099	MAIN POWER SWITCH OUT-2PIN → CONNECT 3-3	1350550-1 for JD840
For British	BS	MAIN POWER SWITCH OUT-2PIN → CONNECT 3-3	

AC/DC DISTRIBUTION PARTS LIST

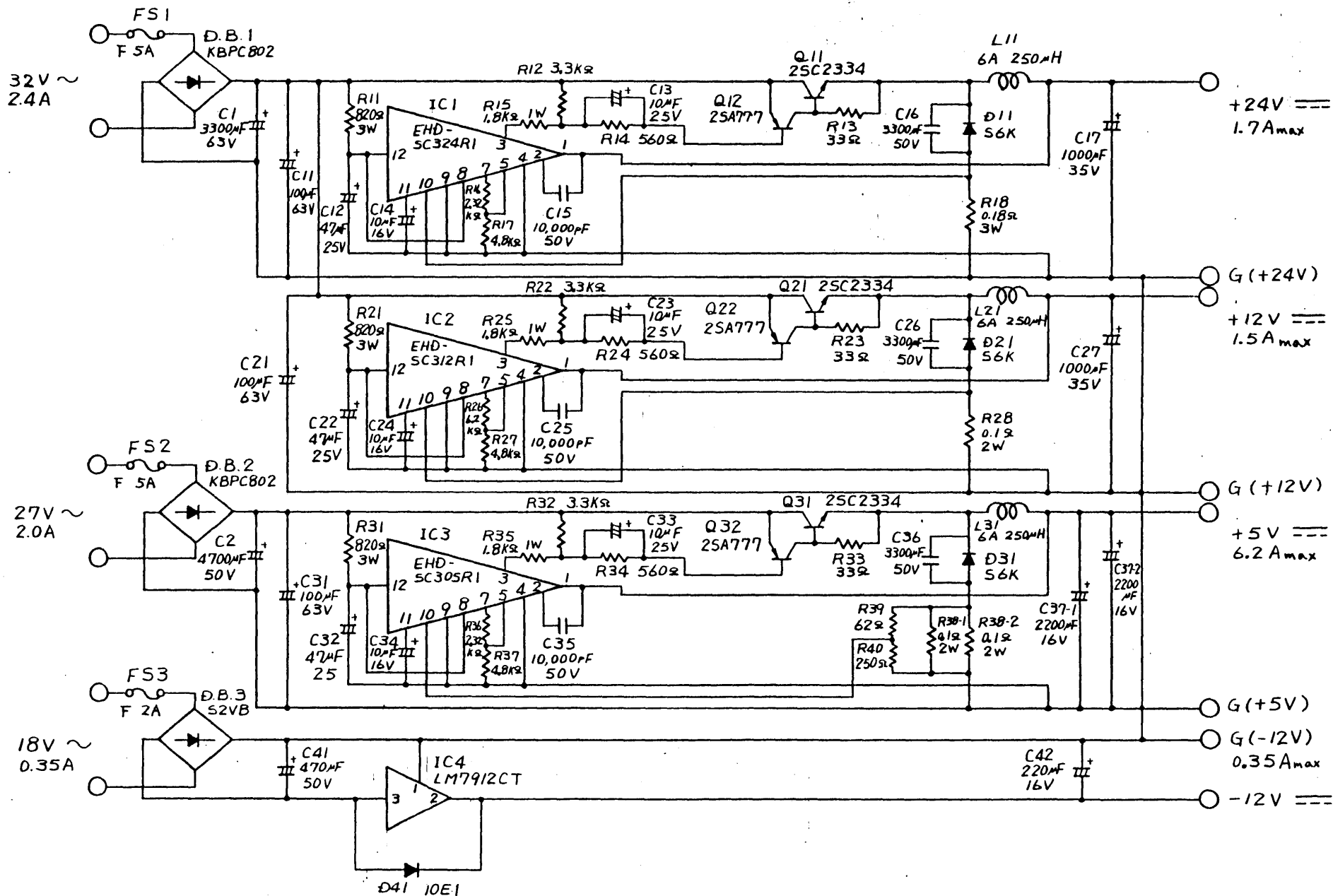
[illegible]



8.2.8 JD-850M 220V/240V, 120V AC/DC DISTRIBUTION PARTS LIST

[illegible]

3.2.9 JD-800M/840M/850M DC POWER SUPPLY (EHBSC34B01TB)
SCHEMATICS



3.2.10 PARTS LAYOUT (EHBSC34B01TB)

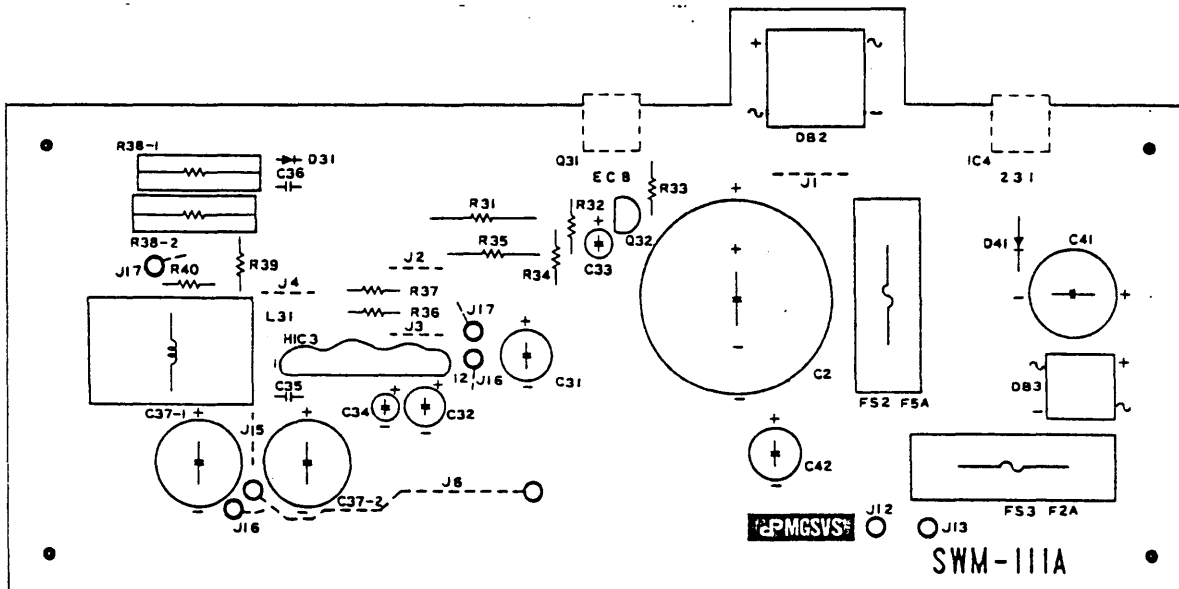
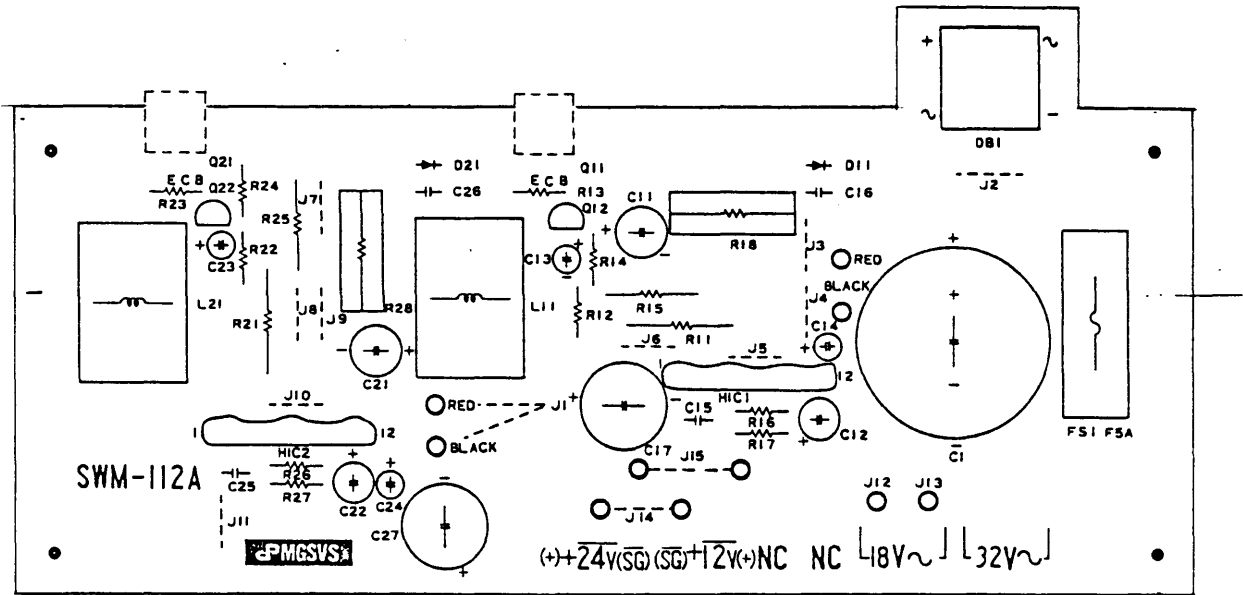


Fig. 3 - 4 PARTS LAYOUT DWG.

3.2.11 JD-800M/840M/850M DC POWER SUPPLY (EHBSC34B01TB)
PARTS LIST

LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
DB1, 2	KBPC802	Diode bridge	
DB3	S2VB	Diode bridge 2A 100V	
IC1	EHDSC312R1	Reguration IC	
IC2	EHDSC324R1	Reguration IC	
IC3	EHDSC305R1	Reguration IC	
IC4	LM7912CT	Reguration IC	
Q11, 21, 31	2SC2334	Transister	
Q12, 22, 32	2SA777	Transister	
D11, 21, 31	S6K20	Diode	
D41	10E1	Diode	
L11, 21, 31	SN14-561	Choke coil	
R11, 21	ERG2ANJ821	Metal 820Ω 3W	
R31	ERG2ANJ681	Metal 680Ω 2W	
R12, 22, 32	ERD25TJ332	Carbon 3.3kΩ 1/4W	
R13, 23, 33	ERD25FJ330	Carbon 33Ω 1/4W	
R14, 24, 34	ERD25FJ561	Carbon 560Ω 1/4W	
R15, 25, 35	ERG1ANJ182	Metal 1.8kΩ 1W	
R16, 37	ERO25CKF6201	Metal 6.2kΩ 1/4W	
R17, 36	ERO25CKF4771	Metal 4.77kΩ 1/4W	
R18, 28, 38-1, 38-2	ERF2AKR10	Non flame 0.1Ω 2W	
R27	ERO25CK3321	Metal 3.32kΩ 1/4W	
R39	ERO25CKF62R0	Metal 62Ω 1/4W	
R40	ERO25CKF2500	Metal 250Ω 1/4W	
R26	ERO25CKF6201	Metal 6.2kΩ 1/4W	
C1	ECET63R332SL	Electrolytic 3300μF 63V	
C2	ECET50R472SL	Electrolytic 4700μF 50V	
C11, 21, 31	ECEA1JS101	Electrolytic 100μF 63V	
C12, 22, 32	ECEA1ES470	Electrolytic 47μF 25V	
C13, 23, 33	ECEA1ES100	Electrolytic 10μF 25V	
C14, 34	ECEA1CS100	Electrolytic 10μF 16V	
C24	ECEA1HSOR1	Electrolytic 0.1μF 50V	
C17, 27	ECEA1VS102	Electrolytic 1,000μF 35V	
C37-1, 37-2	ECEA1CS222	Electrolytic 2,200μF 16V	
C41	ECEA1HS471	Electrolytic 470μF 50V	
C42	ECEA1CS221	Electrolytic 220μF 16V	
C16, 26, 36	ECKD1H332KBZ	Ceramic 3300μF 50V	
C15, 25, 35	ECQM1H103MZ	Plastic film 10,000PF 50V	
FS1, 2		Fuse 5A	
FS3		Fuse 2A	

4. KEYBOARD

4.1 OUTLINE

This keyboard consists basically of microprocessor, P-ROM and keyswitch.

As primary functions, it provides 4 kinds of shift functions, i.e. unshift, shift, control and control shift, CAPS-LOCK and CAPSLOCK shift and data code output is generated by ASCII code.

4.2 KEYBOARD LAYOUT

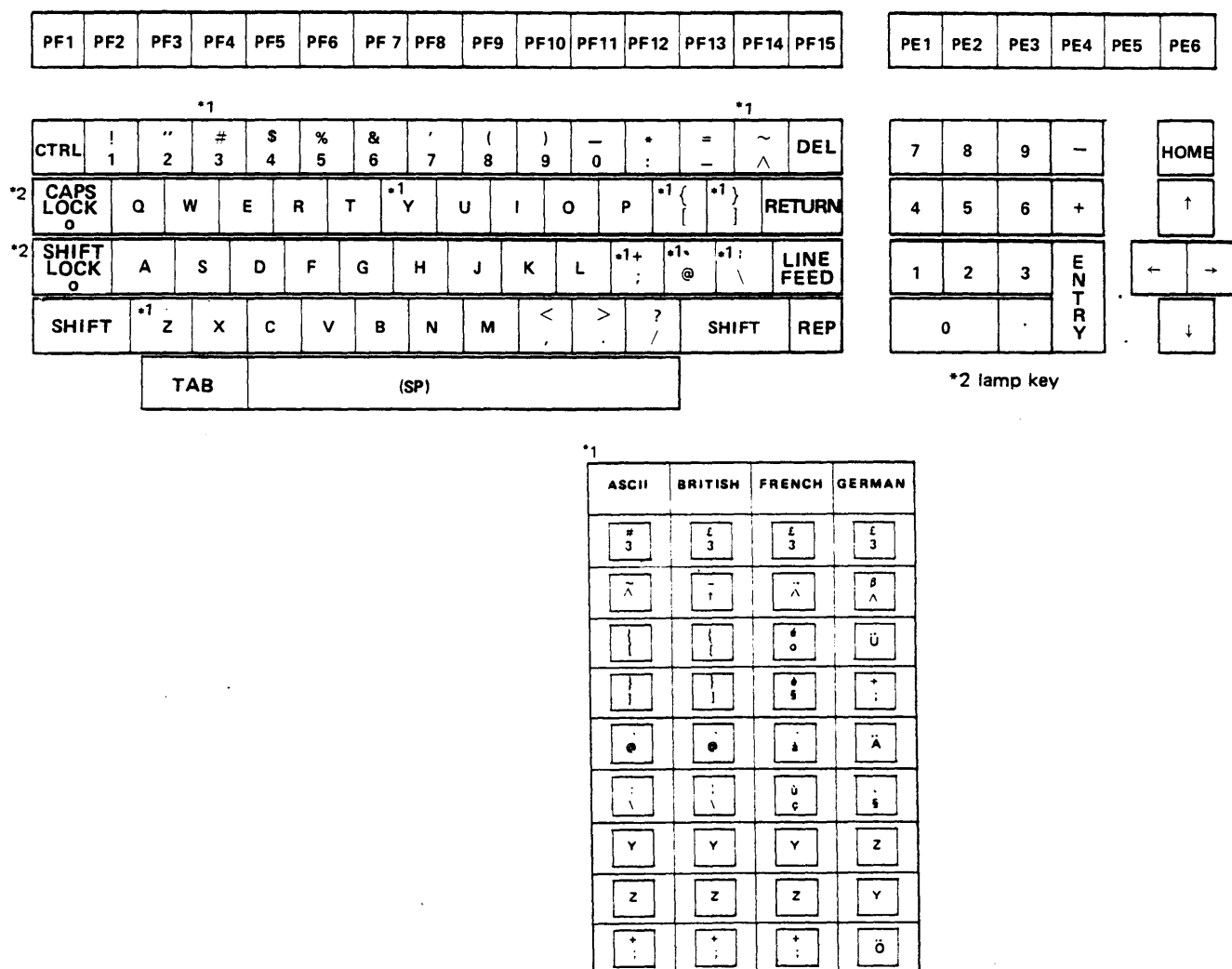


Fig. 4 - 1 KEYBOARD LAYOUT (ASCII)

4.3 KEYBOARD CODE TABLE

MODE CODE SYMBOL	UNSHIFT				CTRL (UNSHIFT)				MODE CODE SYMBOL	SHIFT				CTRL (SHIFT)			
	7	6	5	4	3	2	1	0		7	6	5	4	3	2	1	0
PF1	0				0				PF1	0				C			0
PF2	0				1				PF2	0				C			1
PF3	0				2				PF3	0				C			2
PF4	0				3				PF4	0				C			3
PF5	0				4				PF5	0				C			4
PF6	0				5				PF6	0				C			5
PF7	0				6				PF7	0				C			6
PF8	0				7				PF8	0				C			7
PF9	1				0				PF9	1				D			0
PF10	1				1				PF10	1				D			1
PF11	1				2				PF11	1				D			2
PF12	1				3				PF12	1				D			3
PF13	1				4				PF13	1				D			4
PF14	1				5				PF14	1				D			5
PF15	1				6				PF15	1				D			6
PE1	1				7				PE1	1				D			7
PE2	1				8				PE2	1				D			8
PE3	1				9				PE3	1				D			9
PE4	1				A				PE4	1				D			A
PE5	1				B				PE5	1				D			B
PE6	1				C				PE6	1				D			C
1	3				1				1	2				E			1
2	3				2				"	2				E			2
3	3				3				#	2				E			3
4	3				4				\$	2				E			4
5	3				5				%	2				E			5
6	3				6				&	2				E			6
7	3				7				'	2				E			7
8	3				8				(	2				E			8
9	3				9				)	2				E			9
0	3				0				-	5				F			F
:	3				A				•	2				E			A
-	2				D				=	3				D			D
^	5				E				~	7				E			E
DEL	7				F				DEL	7				F			F
q	7				1				Q	5				9			1
w	7				7				W	5				9			7
e	6				5				E	4				8			5
r	7				2				R	5				9			2
t	7				4				T	5				9			4
y	7				9				Y	5				9			9
u	7				5				U	5				9			5
i	6				9				I	4				8			9
o	6				F				O	4				8			F
p	7				0				P	5				9			0
*[	5				B				{	7				B			B

KEYBOARD CODE TABLE (CONT'D)

MODE CODE SYMBOL	UNSHIFT				CTRL (UNSHIFT)				MODE CODE SYMBOL	SHIFT				CTRL (SHIFT)			
	7	6	5	4	3	2	1	0		7	6	5	4	3	2	1	0
*]	5				D				9	D							
RETURN	0				D				C	D							
a	6				1				A	1				8			1
s	7				3				B	3				9			3
d	6				4				A	4				8			4
f	6				6				A	6				8			6
g	6				7				A	7				8			7
h	6				8				A	8				8			8
j	6				A				A	A				8			A
k	6				B				A	B				8			B
l	6				C				A	C				8			C
;	3				B				F	B				E			B
*@	4				0				8	0				A			0
*\	5				C				9	C				B			C
LINE FEED	0				A				C	A				C			A
z	7				A				B	A				9			A
x	7				8				B	8				9			8
c	6				3				A	3				8			3
v	7				6				B	6				9			6
b	6				2				A	2				8			2
n	6				E				A	E				8			E
m	6				D				A	D				8			D
,	2				C				E	C				F			C
.	2				E				E	E				F			E
/	2				F				E	F				F			F
TAB	0				9				C	9				C			9
(SP)	2				0				E	0				E			0
7	3				7				F	7				F			7
8	3				8				F	8				F			8
9	3				9				F	9				F			9
-	2				D				E	D				E			D
4	3				4				F	4				F			4
5	3				5				F	5				F			5
6	3				6				F	6				F			6
+	2				B				E	B				E			B
1	3				1				F	1				F			1
2	3				2				F	2				F			2
3	3				3				F	3				F			3
ENTRY	0				D				C	D				C			D
0	3				0				F	0				F			0
•	2				E				E	E				E			E
HOME	0				F				C	F				C			F
↑	0				E				C	E				C			E
←	0				8				C	8				C			8
→	0				C				C	C				C			C
↓	0				B				C	B				C			B

KEYBOARD CODE TABLE (CONT'D)

MODE CODE SYMBOL	CAPSLOCK and UNSHIFT					CTRL (CAPSLOCK & UNSHIFT)					MODE CODE SYMBOL	CAPSLOCK and SHIFT					CTRL (CAPSLOCK & SHIFT)							
	7	6	5	4	3	2	1	0	7	6		5	4	3	2	1	0	7	6	5	4	3	2	1
PF1	0					0			C		0						PF1	0				C		0
PF2	0					1			C		1						PF2	0				C		1
PF3	0					2			C		2						PF3	0				C		2
PF4	0					3			C		3						PF4	0				C		3
PF5	0					4			C		4						PF5	0				C		4
PF6	0					5			C		5						PF6	0				C		5
PF7	0					6			C		6						PF7	0				C		6
PF8	0					7			C		7						PF8	0				C		7
PF9	1					0			D		0						PF9	1				D		0
PF10	1					1			D		1						PF10	1				D		1
PF11	1					2			D		2						PF11	1				D		2
PF12	1					3			D		3						PF12	1				D		3
PF13	1					4			D		4						PF13	1				D		4
PF14	1					5			D		5						PF14	1				D		5
PF15	1					6			D		6						PF15	1				D		6
PE1	1					7			D		7						PE1	1				D		7
PE2	1					8			D		8						PE2	1				D		8
PE3	1					9			D		9						PE3	1				D		9
PE4	1					A			D		A						PE4	1				D		A
PE5	1					B			D		B						PE5	1				D		B
PE6	1					C			D		C						PE6	1				D		C
1	3					1			F		1							2				E		1
2	3					2			F		2						"	2				E		2
3	3					3			F		3						#	2				E		3
4	3					4			F		4						\$	2				E		4
5	3					5			F		5						%	2				E		5
6	3					6			F		6						&	2				E		6
7	3					7			F		7						▼	2				E		7
8	3					8			F		8						(	2				E		8
9	3					9			F		9						)	2				E		9
0	3					0			F		0						-	5			F	9		F
:	3					A			F		A						•	2			A	E		A
-	2					D			E		D						=	3			D	F		D
^	5					E			9		E						~	7			E	B		E
DEL	7					F			B		F						DEL	7			F	B		F
Q	5					1			9		1						Q	5			1	9		1
W	5					7			9		7						W	5			7	9		7
E	4					5			8		5						E	4			5	8		5
R	5					2			9		2						R	5			2	9		2
T	5					4			9		4						T	5			4	9		4
Y	5					9			9		9						Y	5			9	9		9
U	5					5			9		5						U	5			5	9		5
I	4					9			8		9						I	4			9	8		9
O	4					F			8		F						O	4			F	8		F
P	5					0			9		0						P	5			0	9		0
[	5					B			9		B						{	7			B	B		B

KEYBOARD CODE TABLE (CONT'D)

MODE CODE SYMBOL	CAPSLOCK and UNSHIFT				CTRL (CAPSLOCK & UNSHIFT)				MODE CODE SYMBOL	CAPSLOCK and SHIFT				CTRL (CAPSLOCK & SHIFT)			
	7	6	5	4	3	2	1	0		7	6	5	4	3	2	1	0
]		5				D			9		D				B		D
RETURN		0				D			C		D				C		D
A		4				1			8		1				8		1
S		5				3			9		3				9		3
D		4				4			8		4				8		4
F		4				6			8		6				8		6
G		4				7			8		7				8		7
H		4				8			8		8				8		8
J		4				A			8		A				8		A
K		4				B			8		B				8		B
L		4				C			8		C				8		C
;		3				B			F		B				E		B
@		4				0			8		0				A		0
\		5				C			9		C				B		C
LINE FEED		0				A			C		A				C		A
Z		5				A			9		A				9		A
X		5				8			9		8				9		8
C		4				3			8		3				8		3
V		5				6			9		6				9		6
B		4				2			8		2				8		2
N		4				E			8		E				8		E
M		4				D			8		D				8		D
,		2				C			E		C				F		C
.		2				E			E		E				F		E
/		2				F			E		F				F		F
TAB		0				9			C		9				C		9
(SP)		2				0			E		0				E		0
7		3				7			F		7				F		7
8		3				8			F		8				F		8
9		3				9			F		9				F		9
-		2				D			E		D				E		D
4		3				4			F		4				F		4
5		3				5			F		5				F		5
6		3				6			F		6				F		6
+		2				B			E		B				E		B
1		3				1			F		1				F		1
2		3				2			F		2				F		2
3		3				3			F		3				F		3
ENTRY		0				D			C		D				C		D
0		3				0			F		0				F		0
.		2				E			E		E				E		E
HOME		0				F			C		F				C		F
↑		0				E			C		E				C		E
←		0				8			C		8				C		8
→		0				C			C		C				C		C
↓		0				B			C		B				C		B

4.4 DESCRIPTION OF OPERATION

4.4.1

Push key switch, then P-ROM address output is generated by microprocessor and code data output is generated from P-ROM. Additionally, key strobe output is generated. When REP key and a data key are pressed in this order, key strobe signals are repeatedly produced at the period of about 100ms while the REP key is kept pressed.

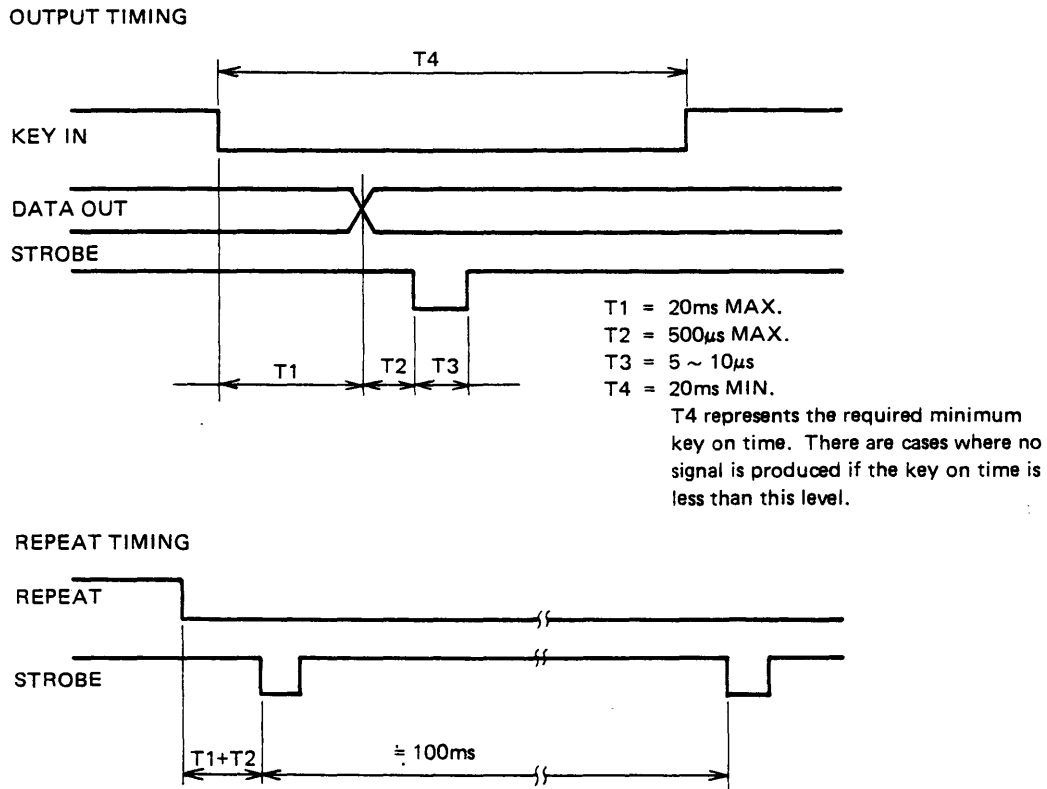


Fig. 4 - 2 TIMING CHART

4.4.2 Indicated in No.2 of this manual.

MPD8035LC microprocessor

4.4.3 SHIFT MODE

Shift condition consists of 5 kinds of UNSHIFT, SHIFT, CTRL UNSHIFT, CTRL SHIFT, CAPSLOCK. On power switching in, shift condition is UNSHIFT. Each shift condition is held while corresponding SHIFT key is made on.

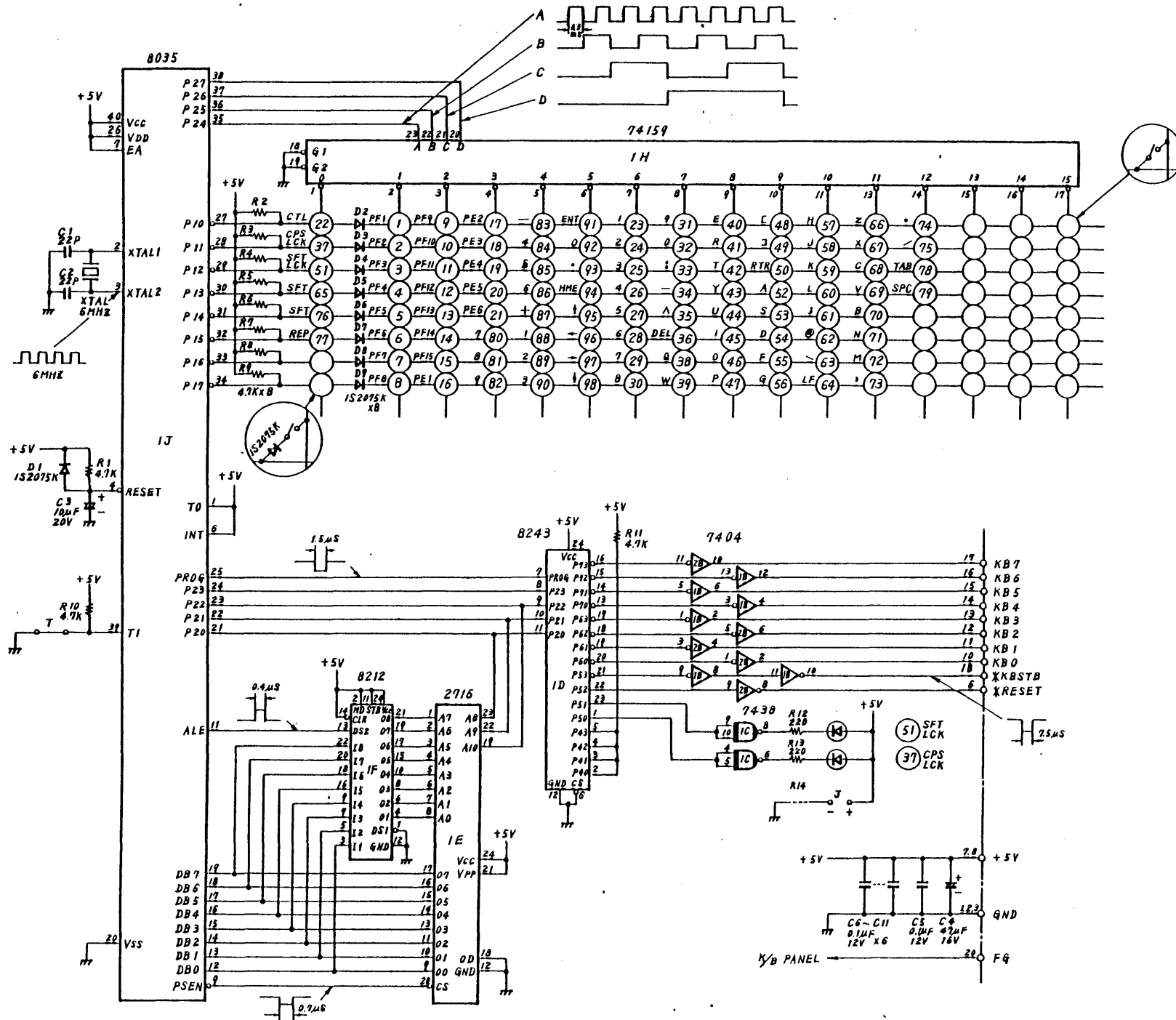
However, SHIFT LOCK key locks shifted condition electrically when once made on. Then SHIFT LOCK key lamp lights. On shift lock condition, shift condition does not change even if SHIFT LOCK key is turned on again. Release of shift lock is made by turning shift key on.

In addition, if CTRL key is turned on during UNSHIFT, CTRL UNSHIFT condition is established. When CTRL key is made on during SHIFT, CTRL SHIFT condition appears.

By turning CAPSLOCK key on, UNSHIFT or SHIFT condition can be fixed to CAPSLOCK condition. Then CAPSLOCK key lamp lights.

Also, in case that CAPSLOCK condition is fixed by CAPSLOCK key, it can be returned to UNSHIFT or SHIFT condition by turning CAPSLOCK key on again.

4.5 KEYBOARD (SBCKBASC)



4.5.3 SBCKBASC PARTS LIST

LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
1B	SN7404N	IC	
2B	SN7404N	IC	
1C	SN7438N	IC	
1D	MPD8243C	IC	
1E	MPD2716D	IC	
1F	MPB8212C	IC	
1H	SN74159N	IC	
1J	MPD8035LC	LSI	
D1	1S2075K	Diode	
D2	1S2075K	Diode	
D3	1S2075K	Diode	
D4	1S2075K	Diode	
D5	1S2075K	Diode	
D6	1S2075K	Diode	
D7	1S2075K	Diode	
D8	1S2075K	Diode	
D9	1S2075K	Diode	
R1	ERC25TJ472	Solid 4.7k Ω 1/4W	
R2	ERC25TJ472	Solid 4.7k Ω 1/4W	
R3	ERC25TJ472	Solid 4.7k Ω 1/4W	
R4	ERC25TJ472	Solid 4.7k Ω 1/4W	
R5	ERC25TJ472	Solid 4.7k Ω 1/4W	
R6	ERC25TJ472	Solid 4.7k Ω 1/4W	
R7	ERC25TJ472	Solid 4.7k Ω 1/4W	
R8	ERC25TJ472	Solid 4.7k Ω 1/4W	
R9	ERC25TJ472	Solid 4.7k Ω 1/4W	
R10	ERC25TJ472	Solid 4.7k Ω 1/4W	
R11	ERC25TJ472	Solid 4.7k Ω 1/4W	
R12	ERC25TJ221	Solid 220 Ω 1/4W	
R13	ERC25TJ221	Solid 220 Ω 1/4W	
R14	ERC25TJ331	Solid 330 Ω 1/4W	

SBCKBASC PARTS LIST (CONT'D)[illegible]

5. MONITOR TV

5.1 OUTLINE

A 12 inch frame type CRT display which can display 1920 characters.

5.2 MONITOR TV LAYOUT

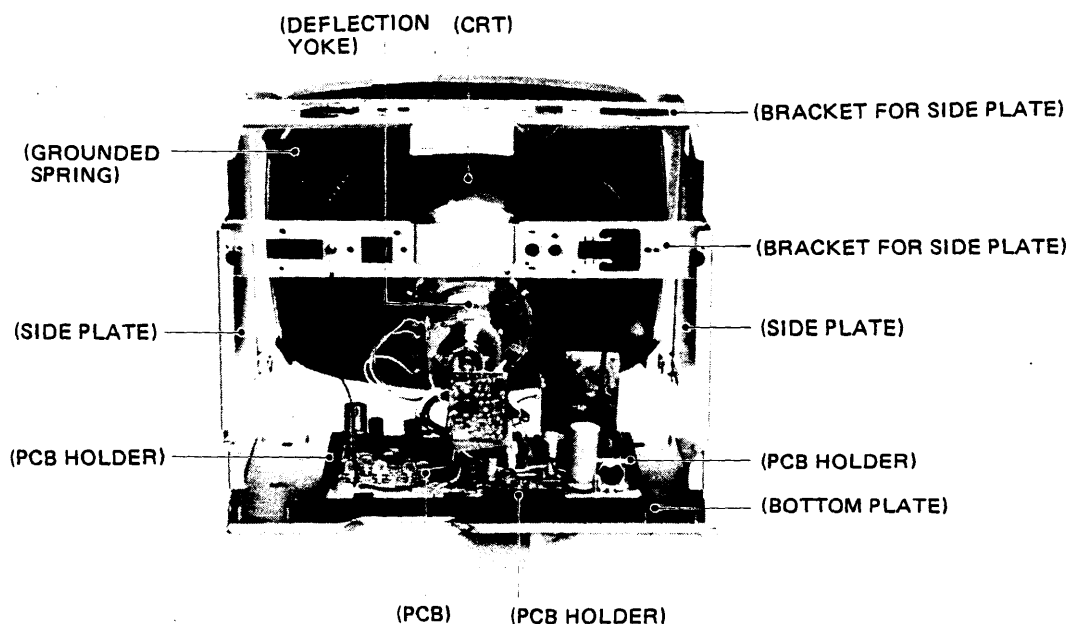


Fig. 5 - 1 LAYOUT (1/2)

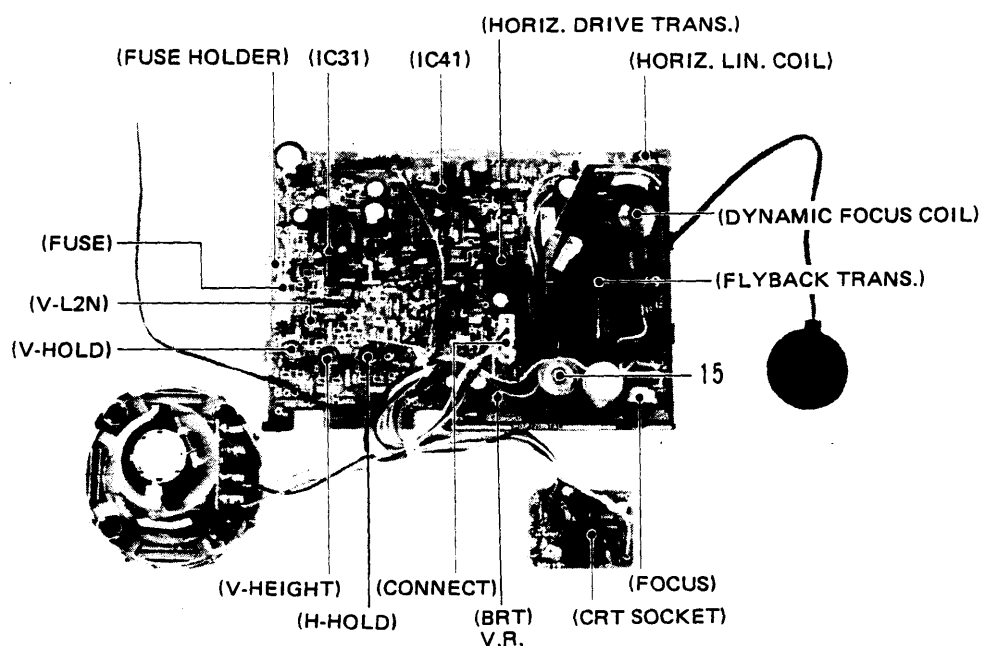


Fig. 5 - 2 LAYOUT (2/2)

5.3 POINTS AND METHOD OF CONTROL WITH VARIABLE RESISTORS

No.	Point of control	Method of control	Remarks
1	V. HOLD (VR31)	Control the vertical hold when characters flow upward or downward.	• Carry out these controls after the CRT display has been warmed up for 30 minutes. • Make brightness control to the point at which the raster disappears with the CONTRAST knob turned between minimum and maximum positions. • Make contrast control to the best point.
2	V. HEIGHT (VR32)	Control the vertical amplitude of the picture. (158 ± 7mm)	
3	V. LIN (VR33)	Control the character heights so that they are equal between upper and lower positions.	
4	H. HOLD (VR41)	Control the horizontal hold so that characters are located at the center of the raster.	
5	H. WIDTH (L403)	Control the horizontal amplitude of the picture. (213 ± 10mm)	
6	FOCUS (VR64)	Control the all-round focus of the picture. (After control with L406)	
7	DYNAMIC FOCUS (L406)	Control the peripheral focus of the picture.	
8	BRIGHT (VR67)	Control the brightness of the picture.	
—	CONTRAST	Control the contrast of the picture.	
9	Centering magnet of deflection yoke	Control centering so that characters are located at the center of the screen.	

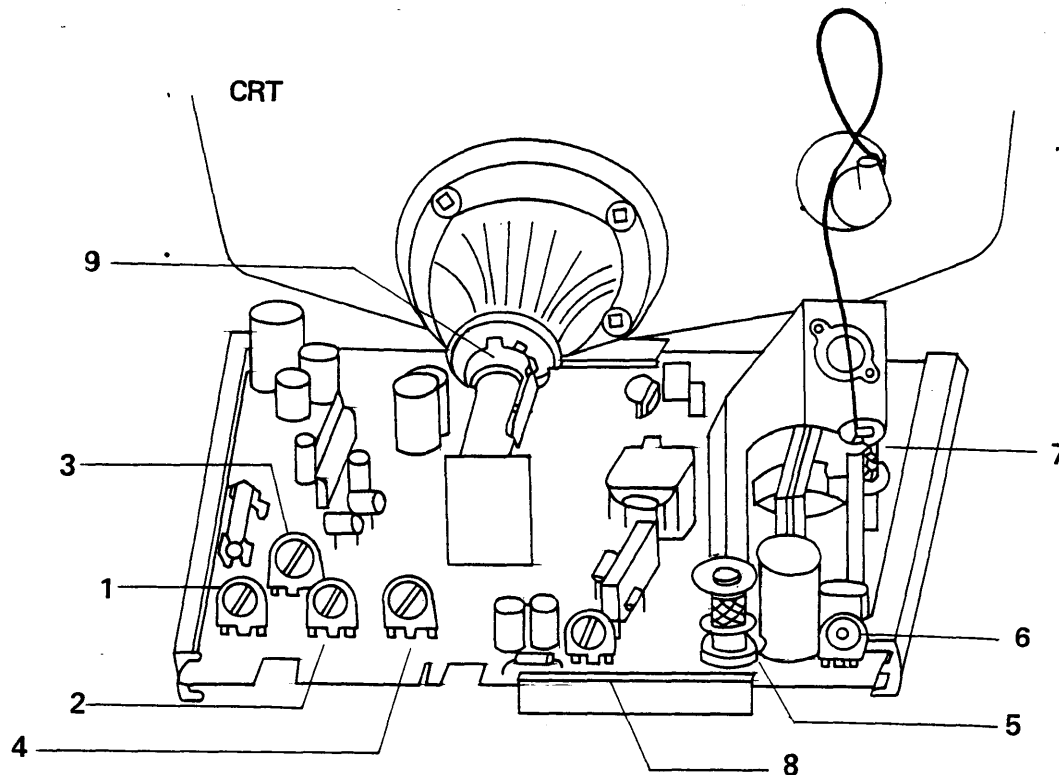


Fig. 5 - 3

5.4 SCHEMATICS CONFIGURATION

5.4.1 BLOCK DIAGRAM

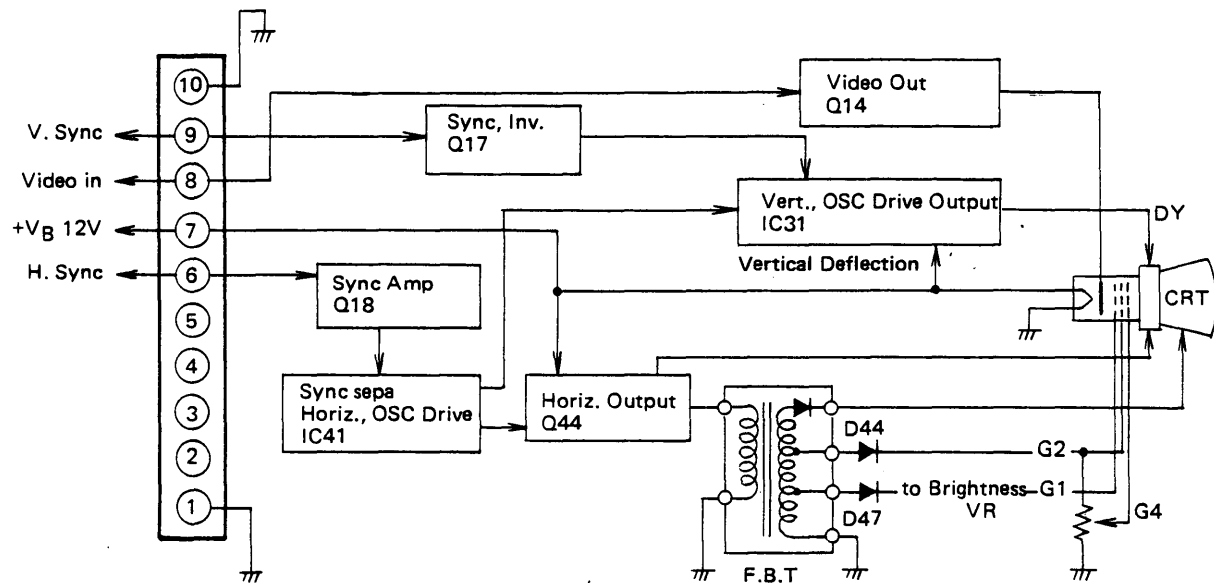


Fig. 5 - 4

5.4.2 CONNECTOR CONNECTION DIAGRAM

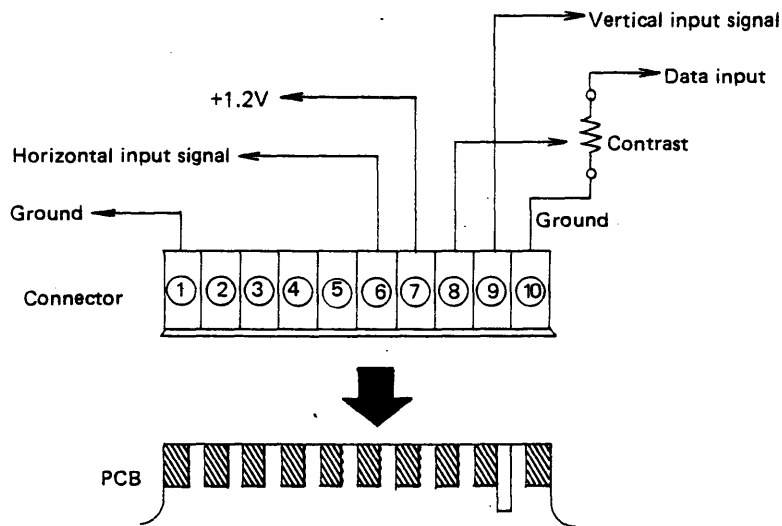


Fig. 5 - 5

5.4.3 TIMING CHART

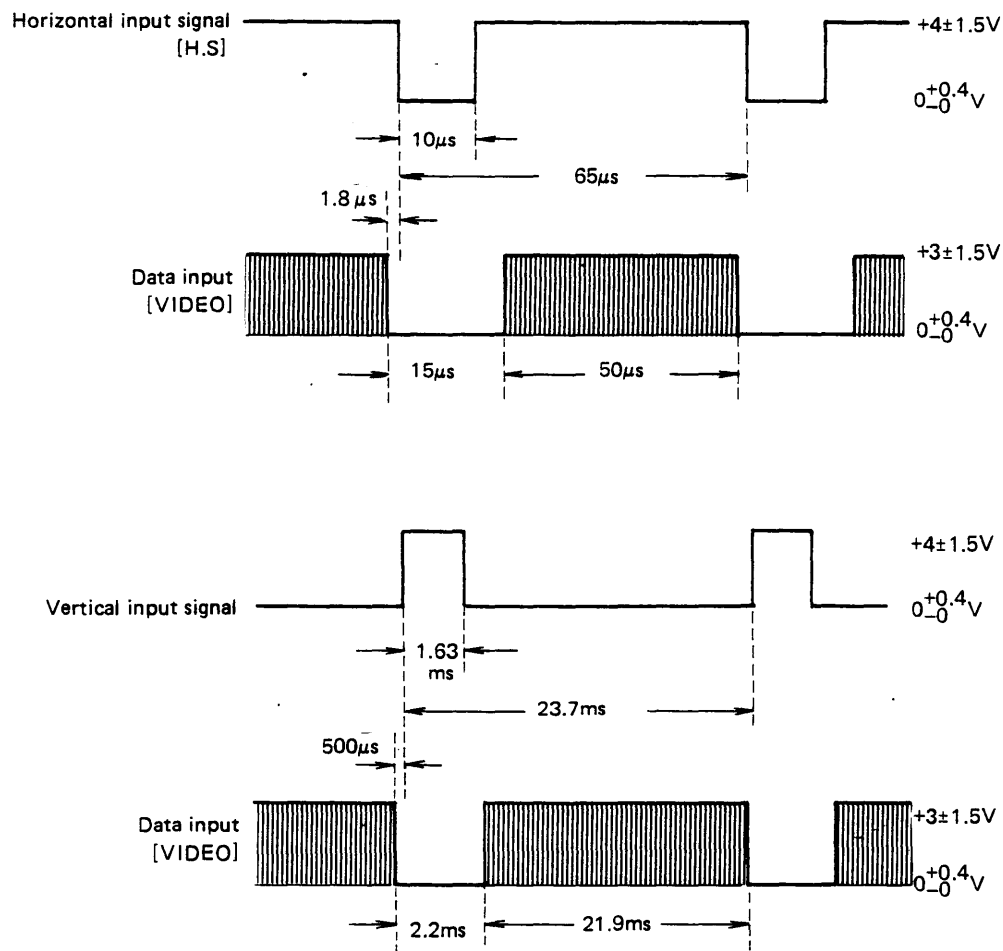


Fig. 5 - 6

5.5 DESCRIPTION OF MONITOR TV

5.5.1 VIDEO CIRCUITS

A Video output circuit

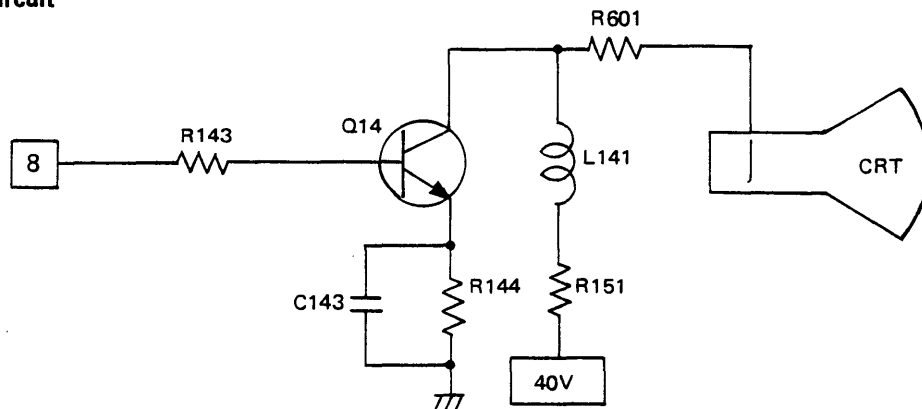


Fig. 5 - 7 VIDEO OUTPUT CIRCUIT

- (a) Video signals of positive polarity obtained from the control PCB are amplified with Q14 by one step and become video signals of negative polarity, and are then impressed to the cathode of the CRT.

B CRT circuit

- (a) The CRT reproduces light and darkness of a picture by such properties that light emission is made when electrons collide against fluorescent substances on the inside surface of the CRT.
- (b) Electrons discharged out of cathode (K) are at first controlled by the potential difference between K and G1 and are further accelerated by G2 before they make collision against the fluorescent surface.
- (c) The potential difference between K and G1 varies by video signals of negative polarity impressed to the cathode, and produces light and darkness of the image.
- (d) The electron flow accelerated with G2 tends to make dispersion due to repulsive force among electrons. Therefore, the electron flow is concentrated by impressing a voltage of 0 to 400V to the focus (G4) electrode.

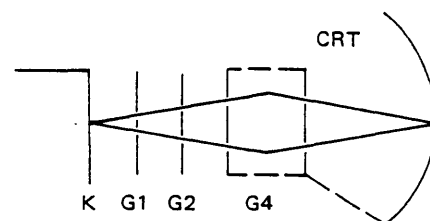


Fig. 5 - 8

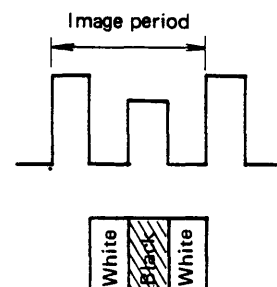


Fig. 5 - 9

C Brightness control

- (a) Brightness control is made through control of electron beams by changing the voltage impressed to G1 of the CRT with VR67. When G1 voltage decreases, the potential difference between K and G1 increases, resulting in reduction of electron beams and darkening of the picture. When G1 voltage increases, on the other hand, the picture becomes lighter as a result of the operation opposite to what was described above.
- (b) The flyback pulses of negative polarity are rectified with D51, and are produced at point A as a negative voltage. A positive voltage obtained by rectifying positive pulses of flyback transformer's terminal 1 with D46 is impressed to point B.

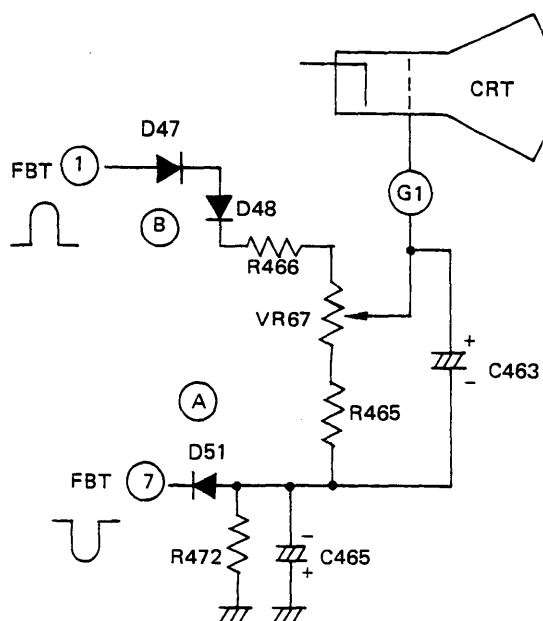


Fig. 5 - 10

D Spot killer circuit

- (a) When the power is off, the deflection circuit stops within a short period of time. In the CRT, however, electrons in the CRT are focused to the vicinity of the center of the picture and this area becomes very bright because high voltage is accumulated and remains between the internal conductive film and the external conductive film of the anode. Accordingly, there is a fear that the fluorescent surface of the CRT is burnt. The spot killer circuit is provided for preventing occurrence of the phenomenon stated above.
- (b) When the power is on, charging current flows to C463, and it is charged in the polarity shown in Fig. 5 - 11.
- (c) When the power is off, the voltage at points A and B drops to 0V, but G1 is of $\oplus$ potential because of the electric charge charged in C463. Consequently, such a state that facilitates flow of beams in the CRT is produced and thus spot phenomenon is prevented.

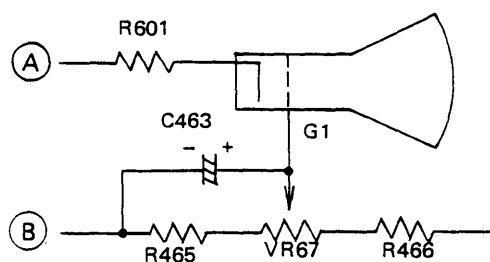


Fig. 5 - 11

5.5.2 VERTICAL DEFLECTION CIRCUIT

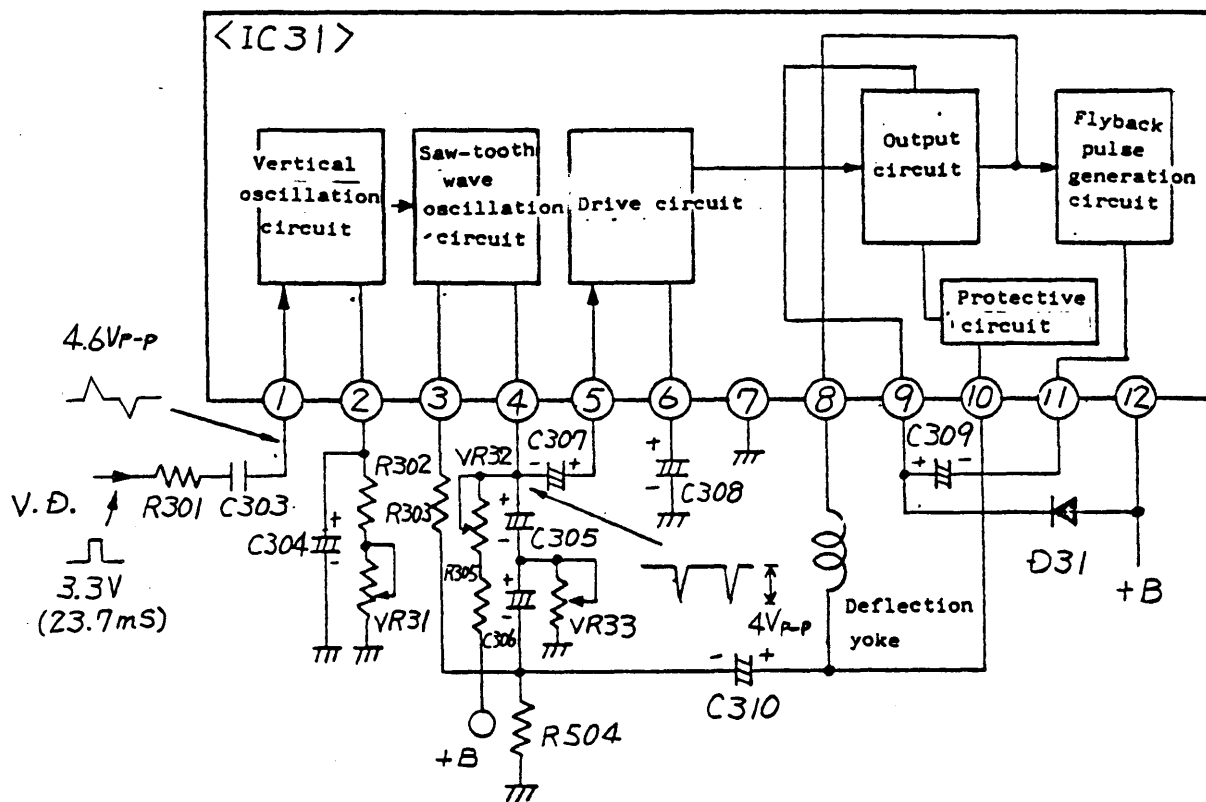


Fig. 5 - 12 VERTICAL DEFLECTION CIRCUIT

- (a) ON-OFF of the vertical oscillation circuit is made by charge and discharge of C304, and pulsewise oscillation waves of 42.2Hz can be taken out as the oscillation frequency.
 - The vertical oscillation frequency is controlled to 42.2Hz by changing the ON-OFF time constant of the vertical oscillation circuit by varying the charge-discharge time constant of C304 with VR31.
- (b) The saw-tooth wave generation circuit generates a saw-tooth wave voltage by charge and discharge of C305 and C306 through ON-OFF operation by vertical oscillation pulses. Compensation of vertical linearity is made by superposing the saw-tooth wave voltage between C305 and C306 with the parabolic voltage obtained by differentiating the saw-tooth wave current on $\ominus$ side of C310 with C306 and VR33.
 - VR32 VR for controlling the amplitude by varying the extent of charge of C305 and C306.
 - VR33 VR for compensating linearity by varying the feedback saw-tooth wave voltage.
- (c) The saw-tooth wave voltage is amplified by one step and polarity conversion is made with the drive circuit.
- (d) Saw-tooth wave current for vertical scanning is produced by the vertical output circuit, and this current flows to the deflection yoke.
- (e) D31 and C309 constitute the boost up circuit. High efficiency vertical output circuit that makes use of flyback pulses is provided.

5.5.3 HORIZONTAL DEFLECTION CIRCUIT

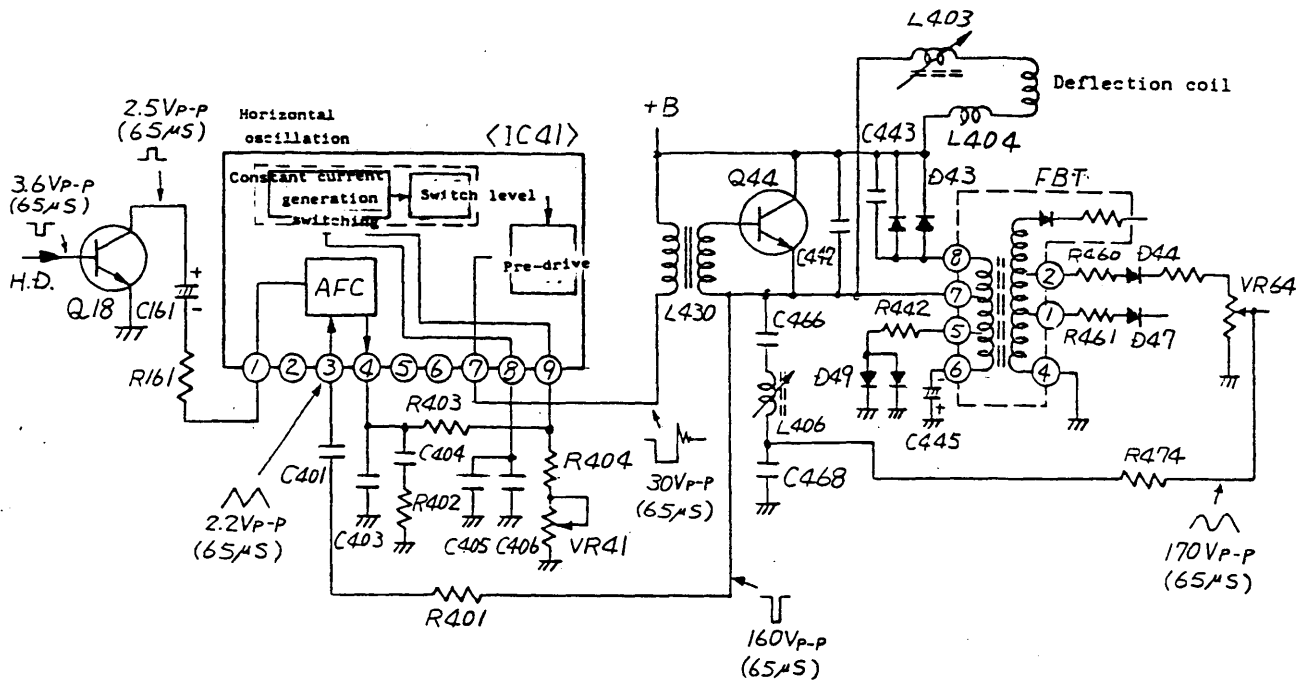
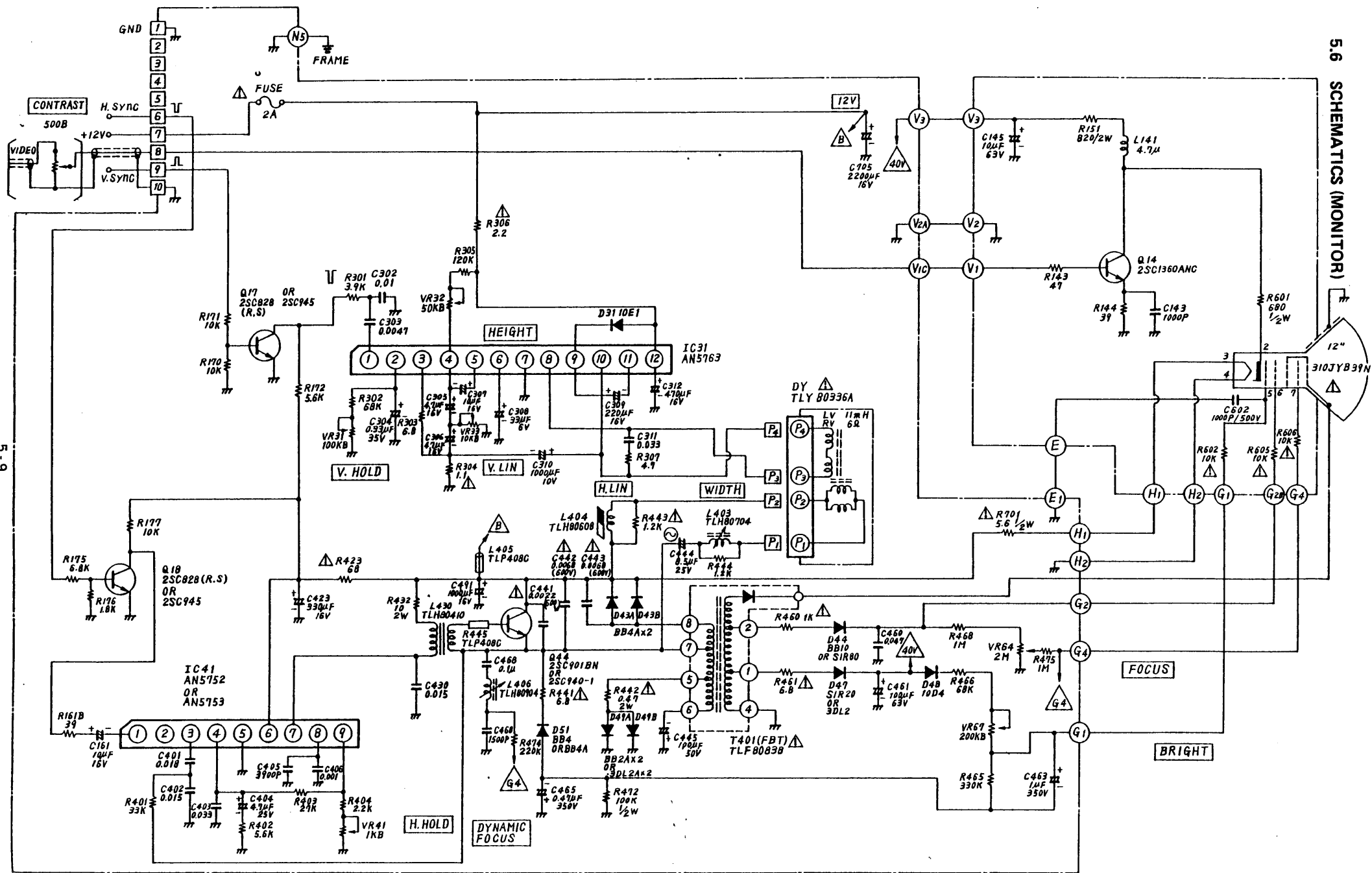


Fig. 5 - 13 HORIZONTAL DEFLECTION CIRCUIT

- (a) Q18 makes polarity conversion of horizontal synchronizing signals.
- (b) AFC circuit makes phase detection of horizontal synchronizing signals, makes phase comparison with the flyback pulses input to IC terminal 3, impresses its output 4 to IC terminal 9 and thus automatically controls the horizontal oscillation frequency.
- (c) The horizontal oscillation circuit causes oscillation in the IC by making use of charge and discharge of C405 and C406 of terminal 8.
VR41 is used for varying the oscillation frequency by changing the discharge time constant of C405 and C406.
- (d) The output of the horizontal oscillation circuit is taken out as pulse waves of 15370Hz out of terminal 7, and is impressed to horizontal output TR of Q44.
- (e) Horizontal output transistor Q44 performs switching operation with pulse waves described in paragraph (d) above, supplied saw-tooth wave current to the deflection coil and thus makes horizontal deflection.
L403 is the coil for controlling the horizontal amplitude. Horizontal amplitude is controlled by regulating the current supplied to the deflection coil by changing the inductance.
- (f) R442, D49 and C445 constitute the boost up circuit. The flyback pulses of negative polarity generated at FBT terminal 5 are smoothened with D49 and C445, and +B line of the horizontal output circuit is lifted by $\ominus$ potential generated at terminal 6.
- (g) The flyback pulses generated in the horizontal flyback period with the flyback transformer are boosted and rectified, a high voltage of 14kV is generated and is impressed to the anode.
- (h) The output of terminal 2 of the flyback transformer is rectified with D44, a voltage of DC 600V is generated and is impressed to G2 of the CRT.
- (i) The output of terminal 1 of the flyback transformer is rectified with D47, and a voltage of DC 40V is taken out.
- (j) The dynamic focus voltage is generated by the resonance circuit of C466, C468 and L406. It is impressed to G4 of the CRT for controlling the peripheral focus.



MONITOR CIRCUIT BOARD-SOLDER VIEW

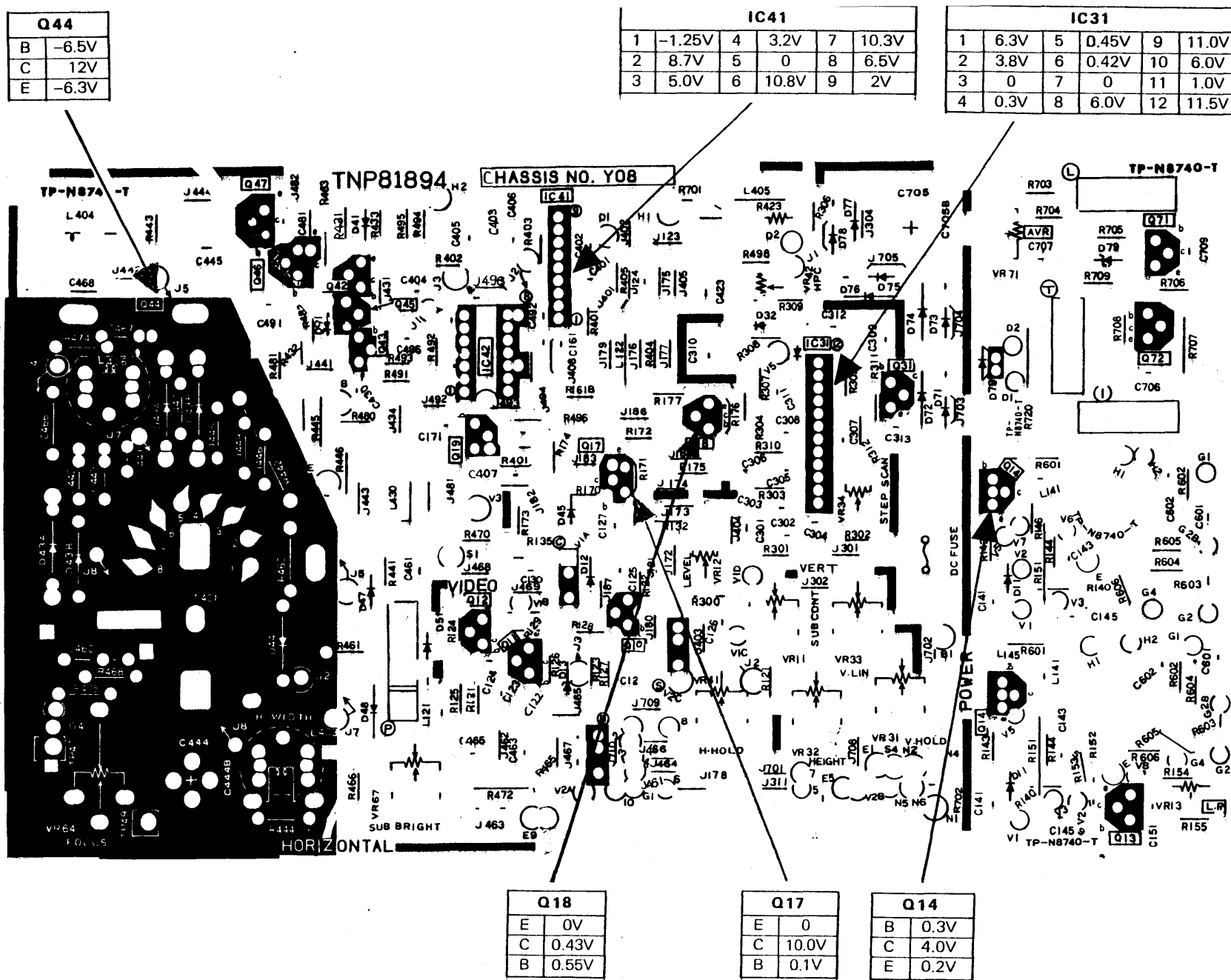


Fig. 5 - 14 LAYOUT (SOLDER SIDE)

5.8 PARTS LIST

TR-12DG9F

[illegible]

PARTS LIST (CONT'D)

TR-12DG9F

LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
IC31	AN5763	IC	Vert-OSC drive out
IC41	AN5752	IC	Sync-sepamp horiz-atc, OSC drive
Q14	2SC1360ANC	Transistor	Video out
Q17	2SC828AR	Transistor	Vert. sync. amp
Q18	2SC828AR	Transistor	Horiz. sync. amp
Q44	2SC940-1	Transistor	Horiz. out
D31	TVS10E1	Diode	Boost. up
D43A	TVSBB4A	Diode	Damper
D43B	TVSBB4A	Diode	Damper
D44	TVSBB10	Diode	Rectifier
D47	TVSS1R20	Diode	Rectifier
D48	TVS10D4	Diode	Rectifier
D49A	TVSBB2A	Diode	Boost. up
D49B	TVSBB2A	Diode	Boost. up
D51	TVSBB4A	Diode	Rectifier
L141	TLT047-999	Coil	Peaking coil
L403	TLH80716	Coil	Horiz. width coil
L404	TLH80608	Coil	Horiz.lin. coil
L405	TLP408	Coil	Choke coil
L406	TLH80904	Coil	Dramic focus coil
L430	TLH80410	Trans	Horiz. drive trans
R445	TLP408	Coil	Choke coil
T401	TLF80838	Trans	Fly back trans
C143	ECKD1H102KB2	Ceramic	1,000PF 50V
C145	ECEA1JS10D	Electrolytic	10 μ F 63V
C161	ECEA1CS100	Electrolytic	10 μ F 16V
C302	ECQM05103JZ	Polyester	0.01 μ F 50V
C303	ECQM05472JZ	Polyester	4,700PF 50V
C304	ECSZ35EFR33V	Tantal	0.33 μ F 35V
C305	ECSZ16EF4R7N	Tantal	4.7 μ F 16V
C306	ECSZ16EF4R7N	Tantal	4.7 μ F 16V

PARTS LIST (CONT'D)

TR-12DG9F

LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
C307	ECEA1CS100	Electrolytic 10 μ F 16V	
C308	ECEA0JS330	Electrolytic 33 μ F 6.3V	
C309	ECEA1CS221	Electrolytic 220 μ F 16V	
C310	ECEA1AS102	Electrolytic 1,000 μ F 10V	
C311	ECQM05333JZ	Polyester 0.033 μ F 50V	
C312	ECEA1CS471	Polyester 470 μ F 16V	
C407	ECQM05183JZ	Polyester 0.018 μ F 50V	
C402	ECQM05153JZ	Polyester 0.015 μ F 50V	
C403	ECQM05333JZ	Polyester 0.033 μ F 50V	
C404	ECEA1ES4R7	Electrolytic 4.7 μ F 25V	
C405	ECQS1392JWT	Styrol 3900 μ F 100V	
C406	ECQM05152JZ	Polyester 1500 μ F 50V	
C423	ECEA1CS331	Electrolytic 330 μ F 16V	
C430	ECQM05153JZ	Polyester 0.015 μ F 50V	
C441	ECKD2H222KB2	Ceramic 2200 μ F 500V	
C442	ECQM6682KZ	Polyester 6800 μ F 600V	
C443	ECQM6682KZ	Polyester 6800 μ F 600V	
C444	ECEA25W8R5Z	Electrolytic 8.5 μ F 25V	
C445	ECEA50V100Y	Electrolytic 100 μ F 50V	
C460	ECQE12223KZ	Polyester 0.022 μ F 1.2kV	
C461	ECEA1JS101	Electrolytic 100 μ F 63V	
C463	ECEA350V1	Electrolytic 1 μ F 350V	
C465	ECEA350VR47	Electrolytic 0.47 μ F 350V	
C466	ECQE6104KZ	Polyester 0.1 μ F 600V	
C468	ECKD3A152KB9	Ceramic 1,500PF 1kV	
C491	ECEA1CS102	Electrolytic 1,000 μ F 16V	
C602	ECKD2H102KB2	Ceramic 1,000PF 500V	
C705	ECEA1CS222	Electrolytic 2,200 μ F 16V	
R143	ERD25TJ470	Carbon 47 Ω 1/4W	
R144	ERD25TJ390	Carbon 39 Ω 1/4W	
R151	ERG2ANJ821	Metal oxide 820 Ω 2W	
R161B	ERD25TJ390	Carbon 39 Ω 1/4W	
R170	ERD25TJ103	Carbon 10 Ω 1/4W	
R171	ERD25TJ103	Carbon 10 Ω 1/4W	
R172	ERD25TJ562	Carbon 5.6k Ω 1/4W	

PARTS LIST (CONT'D)

TR-12DG9F

LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
R175	ERD25TJ682	Carbon 6.8k Ω 1/4W	
R176	ERD25TJ182	Carbon 1.8k Ω 1/4W	
R177	ERD25TJ103	Carbon 10k Ω 1/4W	
R301	ERD25TJ392	Carbon 3.9k Ω 1/4W	
R302	ERD25TJ683	Carbon 68k Ω 1/4W	
R303	ERD25FJ6R8	Carbon 6.8 Ω 1/4W	
R304	ERD25FJ1R1	Carbon 1.1 Ω 1/4W	
R305	ERD25TJ125	Carbon 120k Ω 1/4W	
R306	ERD25FJ2R2	Carbon 2.2 Ω 1/4W	
R307	ERD25TJ4R7	Carbon 4.7 Ω 1/4W	
R401	ERD25TJ333	Carbon 3.3k Ω 1/4W	
R402	ERD25TJ562	Carbon 5.6k Ω 1/4W	
R403	ERD25TJ273	Carbon 27k Ω 1/4W	
R404	ERD25TG2201	Carbon 2.2k Ω 1/4W	
R423	ERD25FJ680	Carbon 68 Ω 1/4W	
R432	TRF2SJ100	Non flame 10 Ω 2W	
R441	ERD25FJ6R8	Carbon 6.8 Ω 1/4W	
R442	TRF2SKR47	Non flame 0.47 Ω 2W	
R443	ERD25FJ122	Carbon 1.2k Ω 1/2W	
R444	ERD25TJ122	Carbon 1.2k Ω 1/2W	
R460	ERD25FJ102	Carbon 1k Ω 1/4W	
R461	ERD25FJ6R8	Carbon 6.8 Ω 1/4W	
R465	ERD25TJ334	Carbon 330k Ω 1/4W	
R466	ERD25TJ683	Carbon 68k Ω 1/4W	
R468	ERD25TJ105	Carbon 1M Ω 1/4W	
R472	ERC12GJ104	Solid 100k Ω 1/2W	
R474	ERD25TJ224	Carbon 220k Ω 1/4W	
R475	ERD25TJ105	Carbon 1M Ω 1/4W	
R601	ERD12FJ681	Carbon 680 Ω 1/2W	
R602	ERD25FJ103	Carbon 10k Ω 1/4W	
R605	ERD25FJ103	Carbon 10k Ω 1/4W	
R606	ERD25FJ103	Carbon 10k Ω 1/4W	
R701	ERD25FJ5R6	Carbon 5.6 Ω 1/4W	

PARTS LIST (CONT'D)

TR-12DG9F

[illegible]

6. FLOPPY DISK DRIVE

6.1 MINIFLOPPY DISK DRIVE

- Refer to JK874 minifloppy Diskette Storage Drive Service Manual (212D497 0110*).
- Refer to JK875 Service Manual (262D497 0157*).

6.2 STANDARD FLOPPY DISK DRIVE

- Refer to JK880 Diskette Storage Drive Maintenance Manual (256D497 0106*).
- Refer to JK885 Double Sided Diskette Storage Drive Service Manual (256D497 0125*).

7. CONTROL PCB

7.1 OUTLINE

This board is composed of LSIs and ICs for controlling the keyboard, floppy disk drives, CRT display and communication interface. They are also controlled by micro-processor 8085A-2.

The memory is composed of a programmable ROM and a dynamic RAM.

7.2 CIRCUIT DIAGRAM

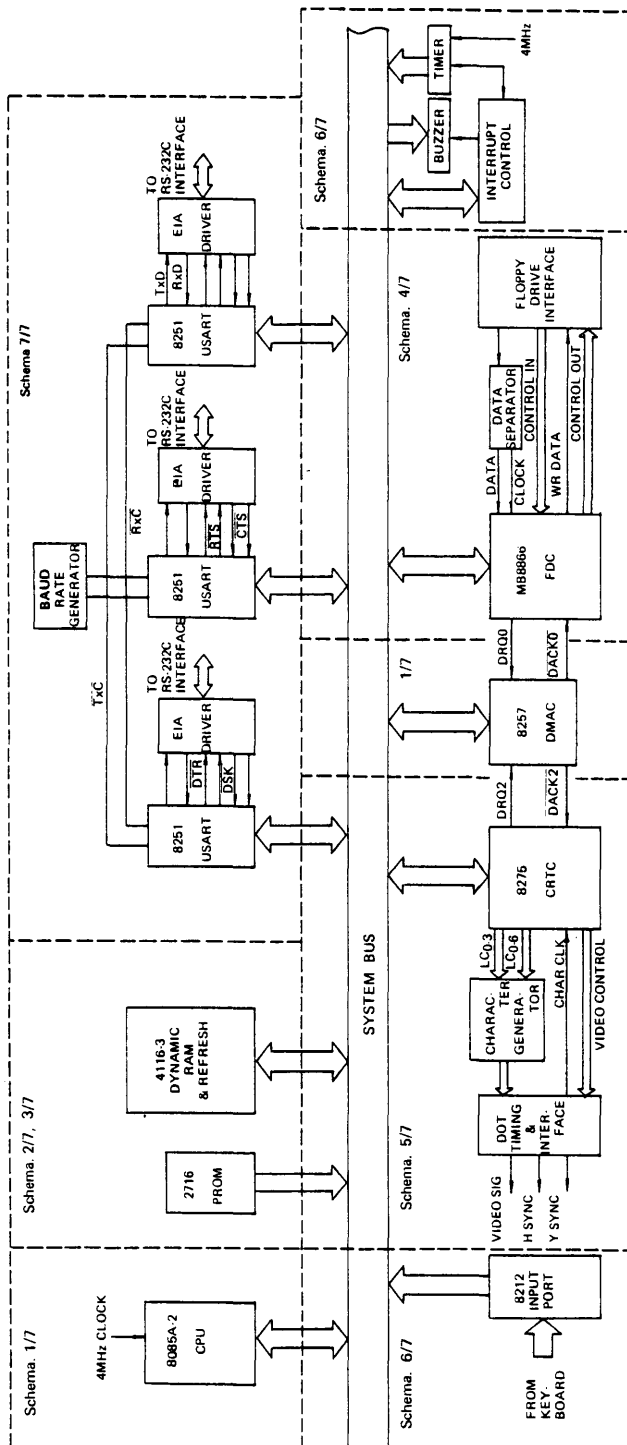


Fig. 7 - 1

7.3 MEMORY MAP

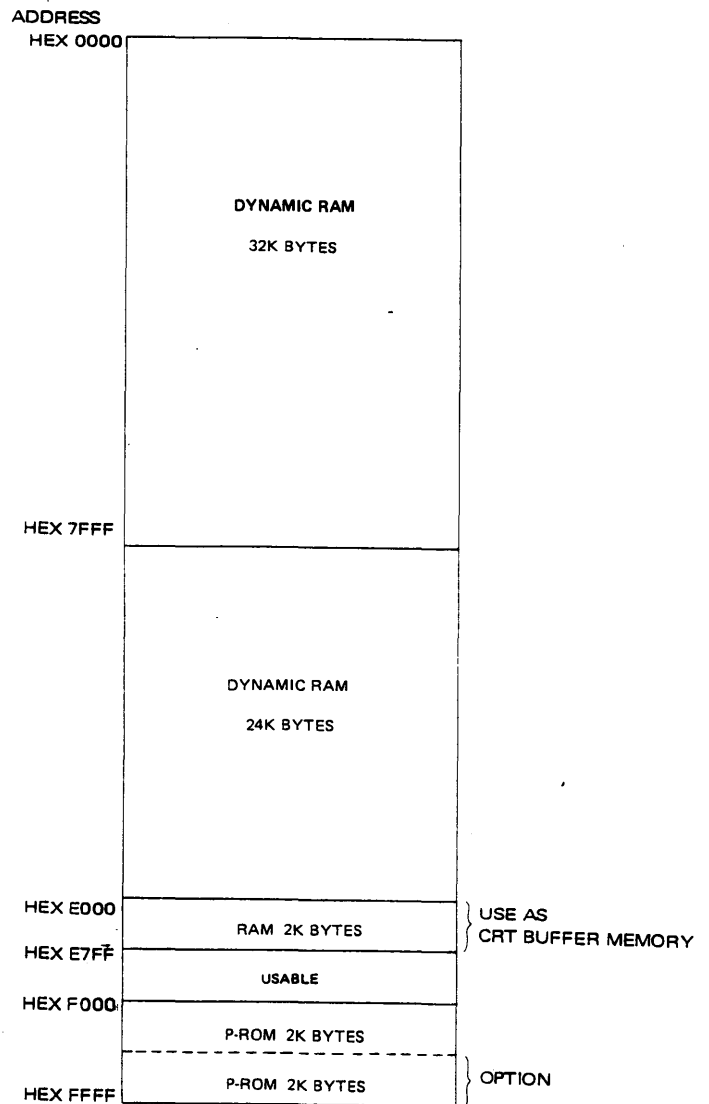


Fig. 7 - 2

7.4 DESCRIPTION OF LSI OPERATION

As to the following LSI, please refer to the SERVICE MANUAL No. 2. (IC. LSI CATALOG)

8085A-2	CPU
8257	Programmable DMA controller
8275	Programmable CRT controller
8251	Programmable communication interface
MB8866 (FD1791)	Floppy disk formatter/controller
4116 Family	16.384 × 1 bit dynamic RAM JD700M/800M series adopts the column 4116-3
2716	16K (2K×8) UV erasable PROM

(4) Address line control under CPU control

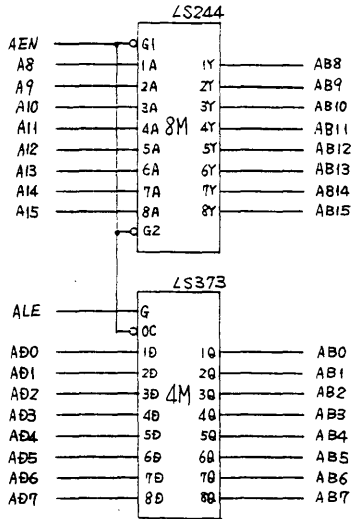


Fig. 7-6

The information of A8 ~ A15 is output to AB8 ~ AB15 as it is. As address and information is output out of AD0 ~ AD7, they are latched with signal ALE and information is output out of AB8 ~ AB15 as address information. The impedance level of AB0 ~ AB15 becomes high by signal AEN output at the occasion of DMA.

(5) Address control at the occasion of direct memory access

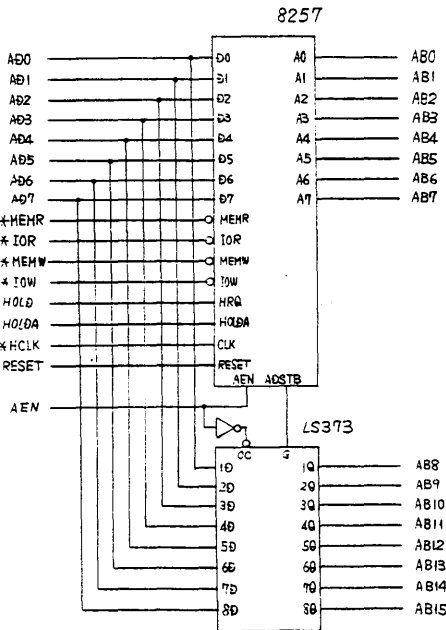


Fig. 7-7

When the mode changes to DMA mode, signal AEN is output, more significant address A8 ~ A15 are output to D0 ~ D7 of DMA controller 8257, more significant addresses are latched to LS373 by the subsequently output ADSTB, and AB8 ~ AB15 are output.

Furthermore, less significant addresses are output to A0 ~ A7 of 8257, and addresses AB0 ~ AB15 become complete. The address data of the CPU is kept at high impedance level by signal AEN at this occasion as described earlier.

(6) Power clear

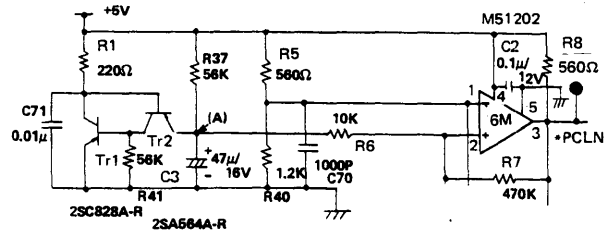


Fig. 7-8

A circuit protecting abnormal write to floppy disk drive in case of power ON, OFF or interruption.

When TR2 base voltage drops from (A) point to 0.6V (V_{BE}) approximately, TR2 turns to active working to further lower base voltage of TR2. Consequently, C3 is promptly discharged and (A) point comes low level, then comparator output (*PCLN) turns to low level.

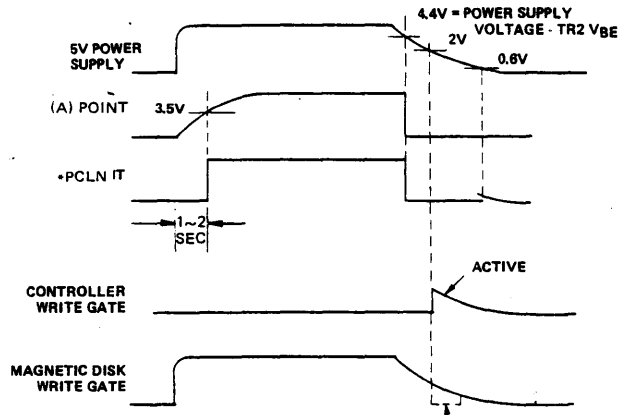


Fig. 7-9

7.5.2 CIRCUIT DIAGRAM 2/7 (DYNAMIC RAM CONTROL)

(1) Generation of signals to refresh controller 3242

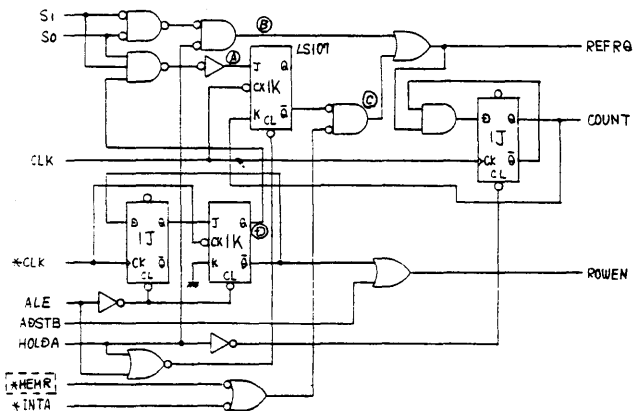


Fig. 7 - 10

Refresh of the dynamic RAM is made by T4 of operation code fetch cycle M1 and also by HALT at occasions other than DMA. ① is detection of operation code fetch cycle M1, ② is detection of operation code fetch cycle M1, and ③ is detection of HALT at occasions other than DMA. At the occasion of DMA, refresh of the dynamic RAM is inhibited by output signals HOLDA and ADSTB.

(2) Generation of *RAM, *CAS, *WE to dynamic RAM

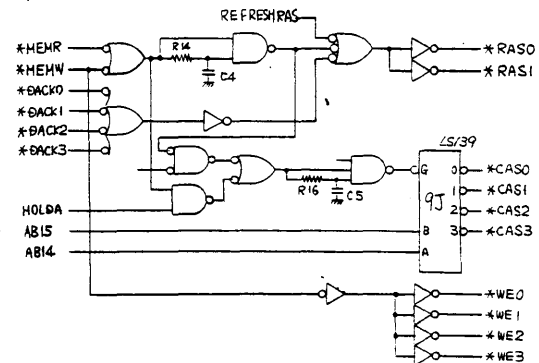


Fig. 7 - 11

Under CPU control, a *RAS signal is output about 60msec after a *MEMR or *MEMW signal is output, by the function of the delay circuit constituted by R14 and C4. A *CAS signal is output about 160msec later by the function of the delay circuit constituted by R16 and C5.

The *CAS signal is decoded with LS139 by address data signals AB14 and AB15, and the *CAS is output only to the applicable address of the memory.

Dynamic RAM write enable signals *WE0 ~ 3 are output at the timing same as that of *MEMW only at the occasion of memory write.

At the occasion of DMA, *RAS signal is produced by response output signals *DACK0 ~ 3 from DMA controller 8257, and a *CAS signal is output about 160nsec after output of *MEMR or *MEMW. The dynamic RAM control signals for the above are shown in the following pages.

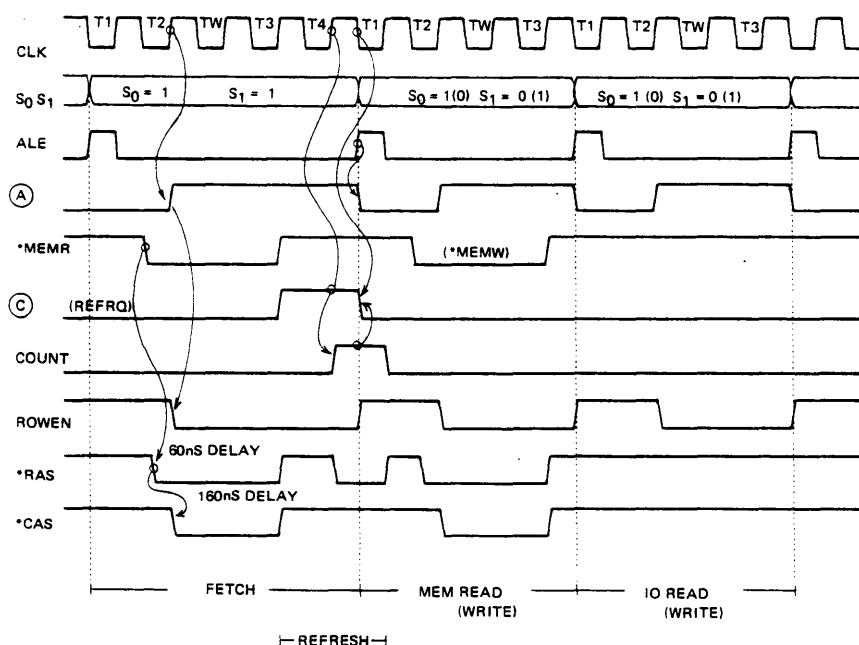


Fig. 7 - 12 At the occasion of CPU, dynamic RAM refresh timing

7.5.3 SCHEMATICS 4/7 (FD CONTROL)

(1) Input/Output signal of floppy disk controller

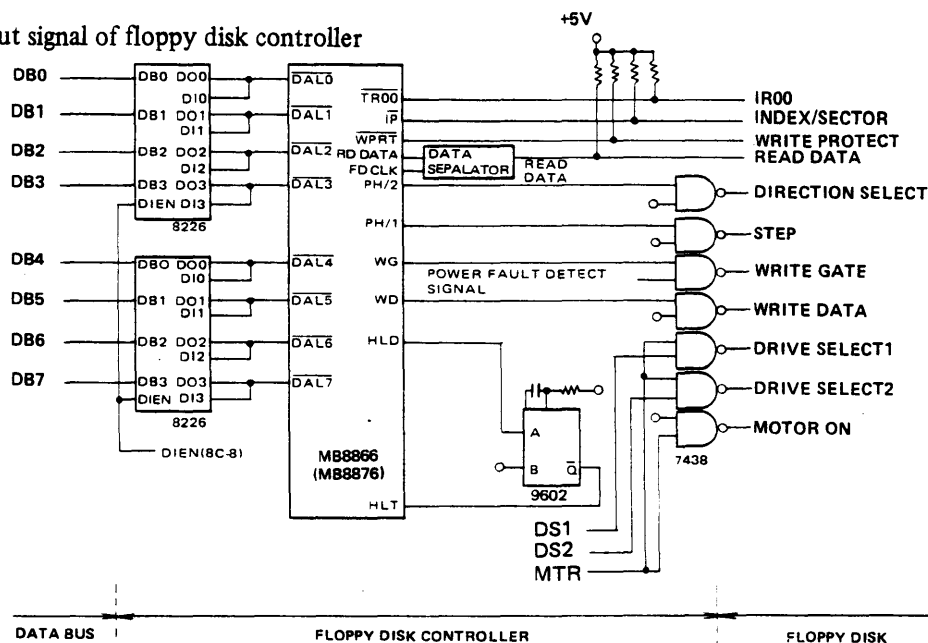


Fig. 7 - 17

- Data bus (DB0 ~ DB7) employs positive logic and data access line (DAL0 ~ DAL7) negative logic. Therefore, connection is made through bus driver (8226).

DIEN = "0": DBX - DIX - DALX

DIEN signal is generated (by chip selection signal) and IORN signal.

DIEN = "1": DBX - DIX - DALX

- By HLD signal, either disk unit head is loaded. Head load time is designated by one-shot of (16M). Control LSI confirm head load by HLT signal.

(2) CONTROL SIGNAL OF FLOPPY DISK CONTROLLER

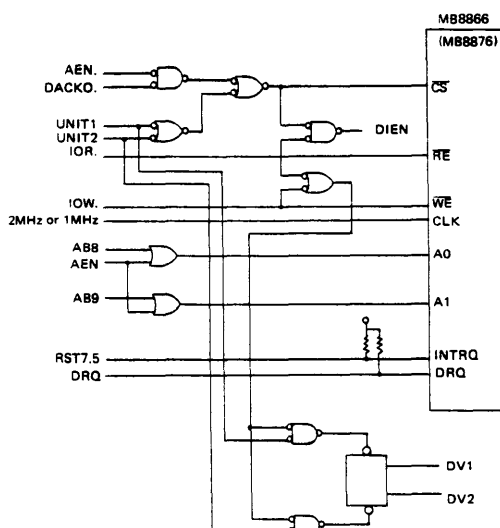


Fig. 7 - 18

- CS terminal is selected by UNIT1 selection signal (UNIT1N) or UNIT2 selection signal (UNIT2N) or, in case of DMA transfer, by AENN signal and DACON signal.
- To RE and WE terminals, entered is IORN IOWN signal as generated by CPU and, on DMA transfer, IORN IOWN signal generated by DMAC.
- By entering address signal line (AB8, AB9) in A0 and A1 terminals, selected is either of command register, status register, track register, sector register or data register in control chip. On DMA transfer, data register in control chip is selected by AEN signal.
- J-K F/F of (15L) is provided for holding which disk unit is currently selected.

(3) Motor control signal of floppy disk controller

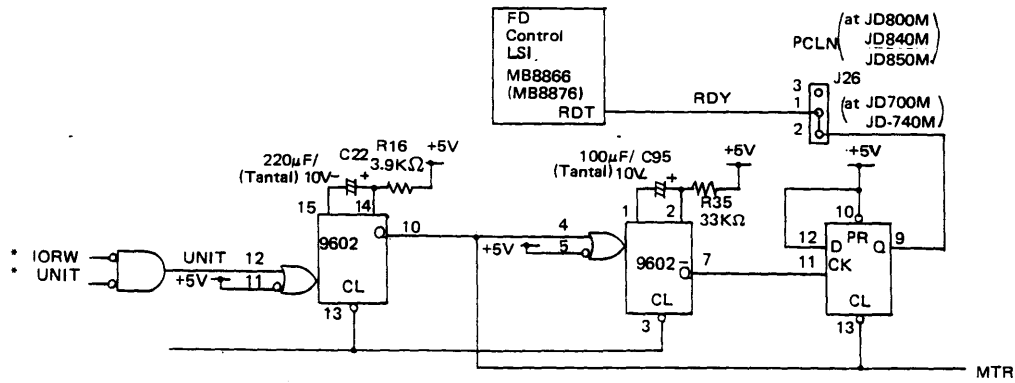


Fig. 7 - 19

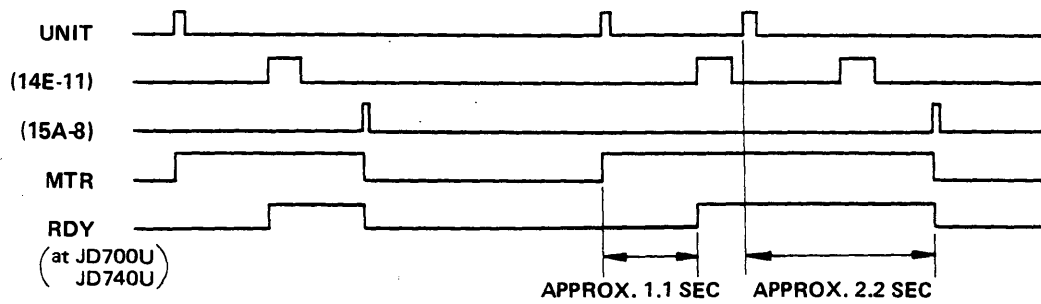


Fig. 7 - 20

- MTR signal (motor starting signal) is held for approx. 2.2 seconds after final input/output instruction to control LS1 (MB8866).
- RDY signal (disk ready signal) is generated as output approx. 1.1 seconds after the first input/output instruction to control LS1 (MB8866). (Motor revolution of floppy disk becomes normal after approx. .1 second.)

(4) RD/WT timing of floppy disk controller

1) RD/WT timing by CPU

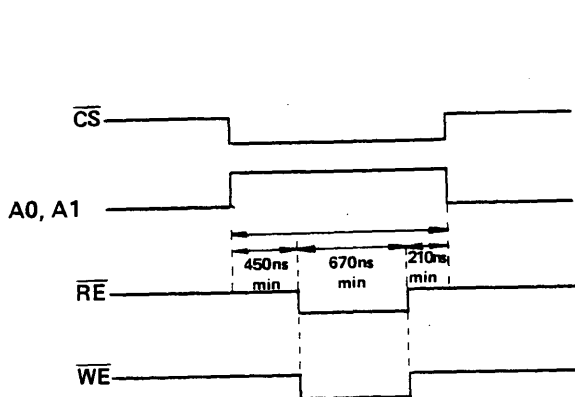


Fig. 7 - 21

2) RD/WT timing on DMA transfer

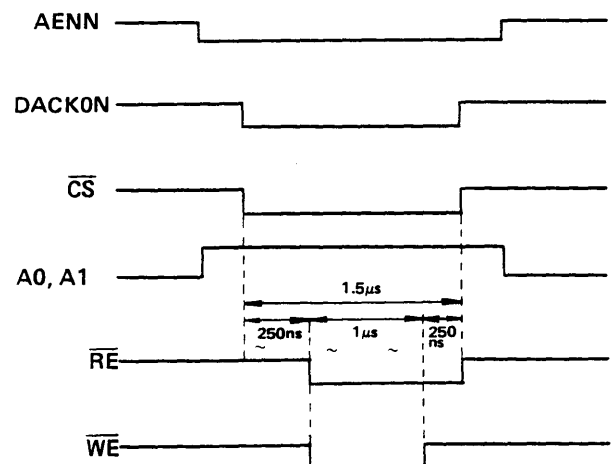


Fig. 7 - 22

7.5.4 SCHEMATICS 5/7 (CRT CONTROL)

(1) 74S163 (16C) operation

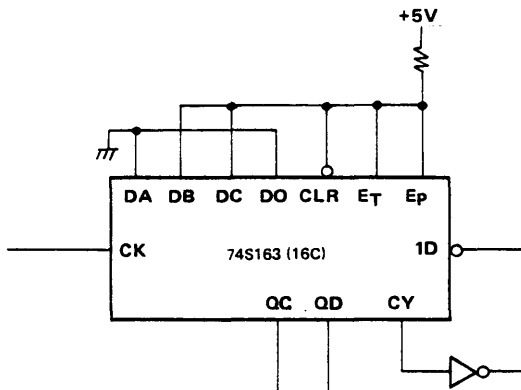


Fig. 7 - 23

- It generates character clock. It is set at binary counter, i.e. 1 character 10 dots.
- Time chart is shown on the next page.

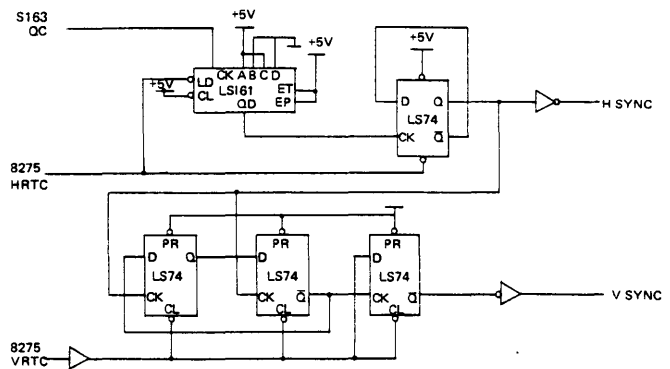


Fig. 7 - 24

74S163 (16C) operation

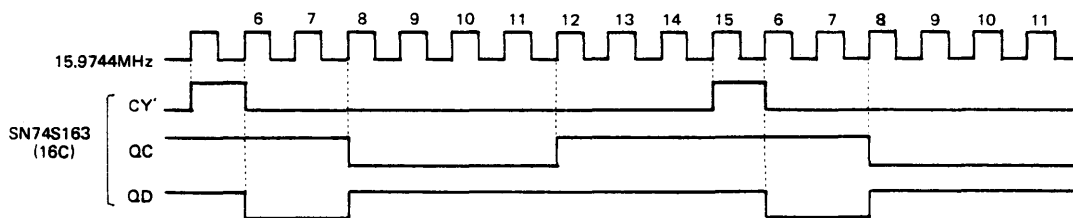


Fig. 7 - 25

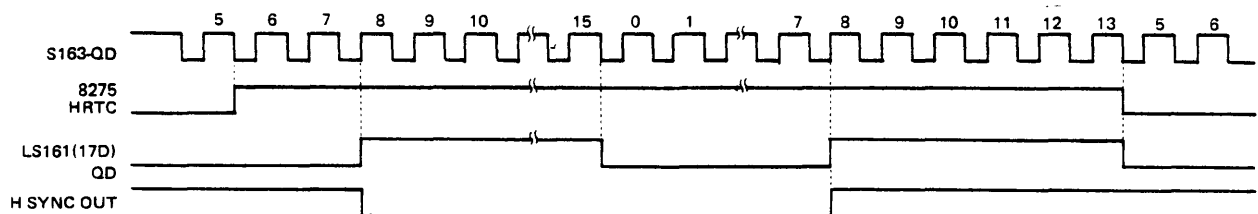


Fig 7 - 26 Horizontal Sync. Timing

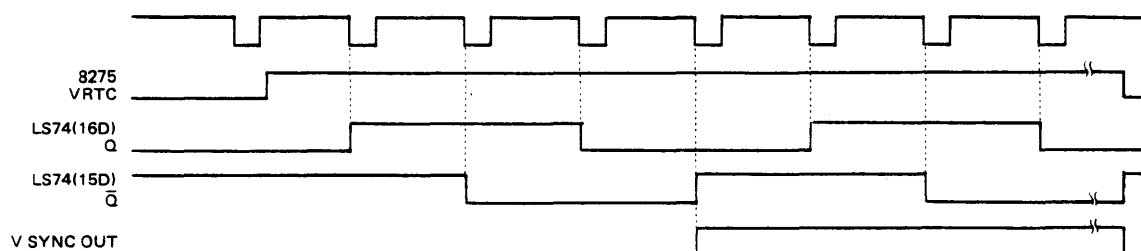


Fig. 7 - 27 Vartical Sync. Timing

(3) Attribute Data Latch

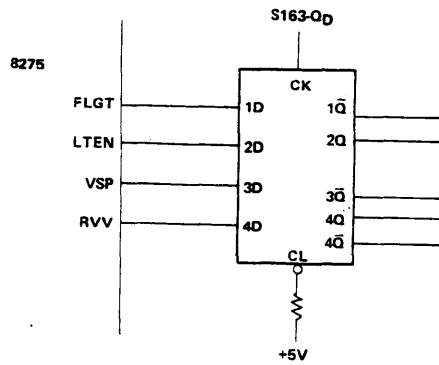


Fig. 7 - 28

- Attribute code is latched by 1 character clock delay.
- Timing chart is shown below. (Fig. 7 - 30, 7 - 31)

(4) Displayed data latch

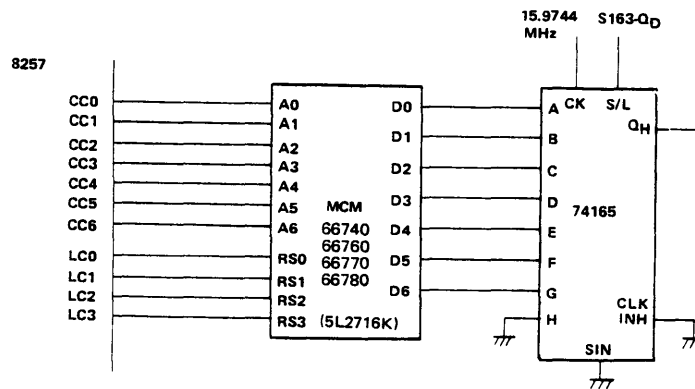


Fig. 7 - 29

- Displayed data is latched at 74165 by 1 character clock delay.
- Timing chart is shown below. (Fig. 7 - 30, 7 - 31)

Timing chart of attribute data

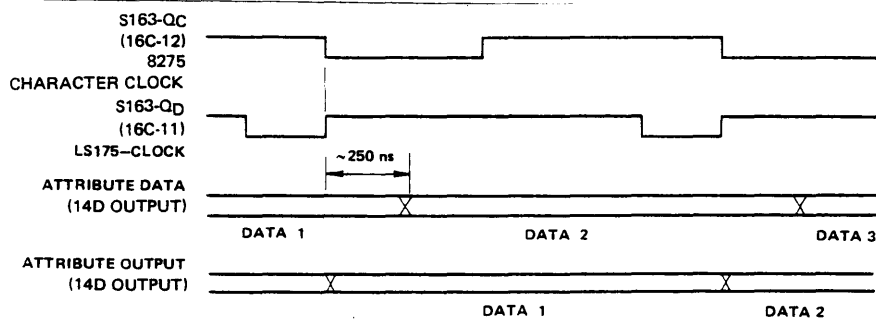
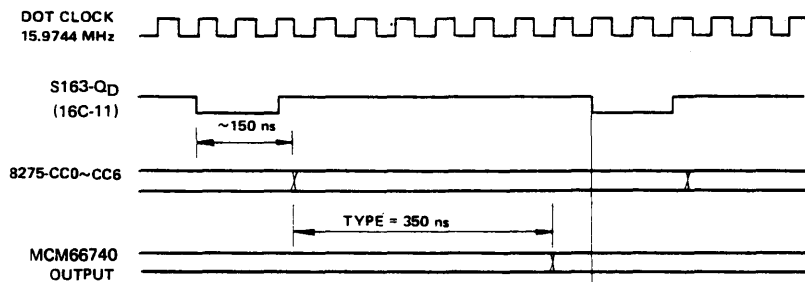


Fig. 7 - 30

Timing chart of attribute data

Timing chart of display data latch



74165 LATCH TIMING Timing chart of display data latch

Fig. 7 - 31

(5) Generation of video signal

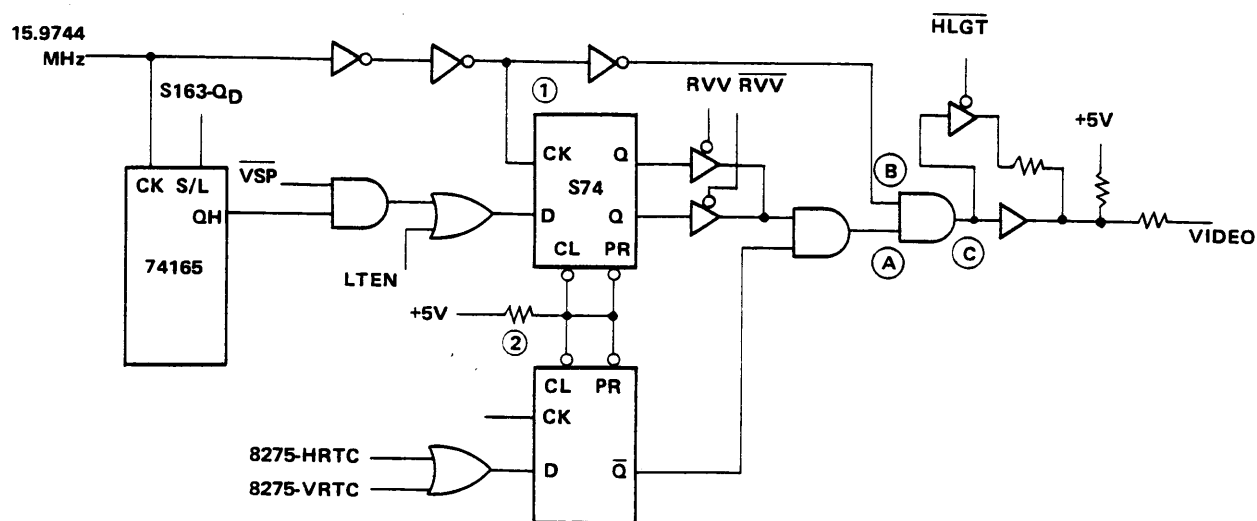


Fig. 7 - 32

Timing chart

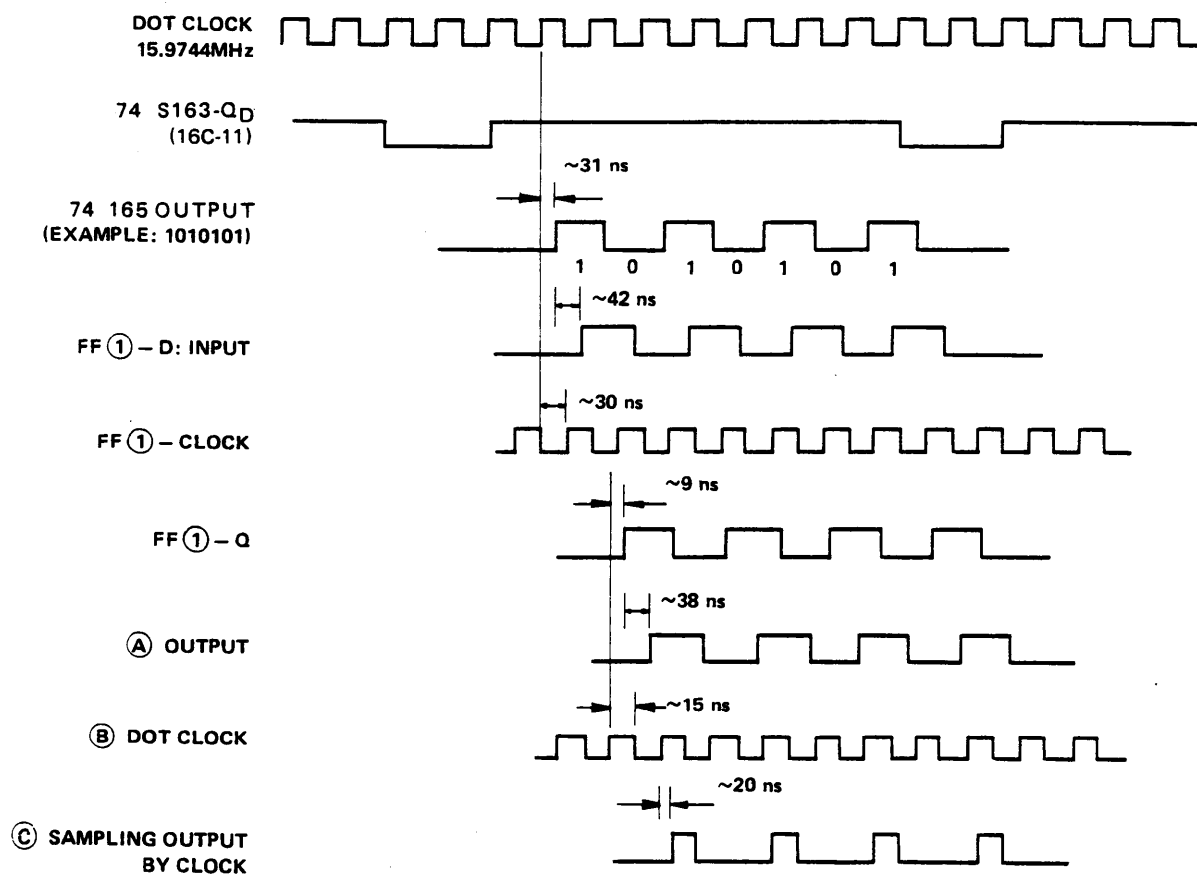


Fig. 7 - 33

7.5.5 SCHEMATICS 5/7

(1) Unit signal generation

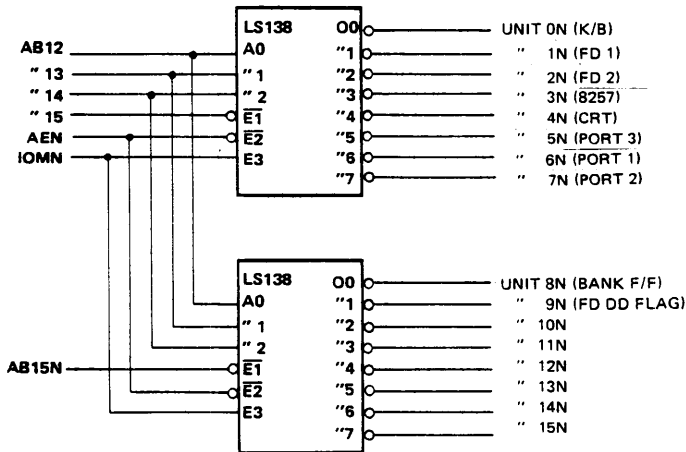


Fig. 7 - 34

- When IOMN is high, AB12 ~ AB15 are decoded and UNIT0N ~ UNIT 15N are generated.
- On DMA transfer, decoder is disabled by AEN signal output from DMA controller 8257 and all of UNIT0N ~ UNIT15N become high.

(2) Key-in data processing

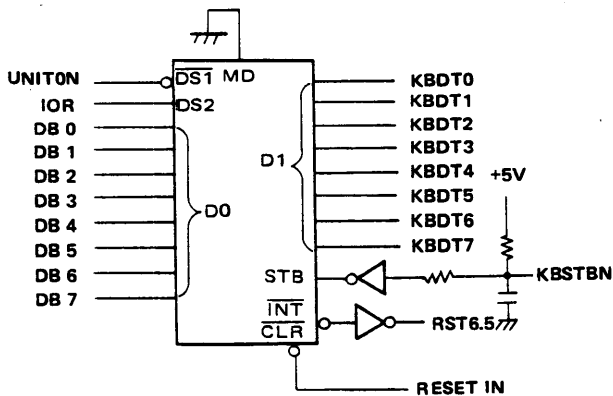


Fig. 7 - 35

- By KBSTBN signal, KBDT latch and INT signal output are made.
- By UNIT0N signal and IOR signal, data output is made on data bus and data are transferred to CPU.

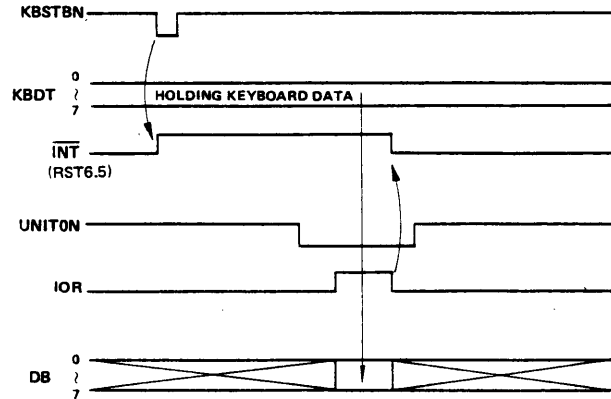


Fig. 7 - 36

7.5.6 SCHEMATICS 7/7 (RS-232C)

(1) Generation of 8251 TxC and RxC

Those signals work as clock for asynchronous transmission/receiving.

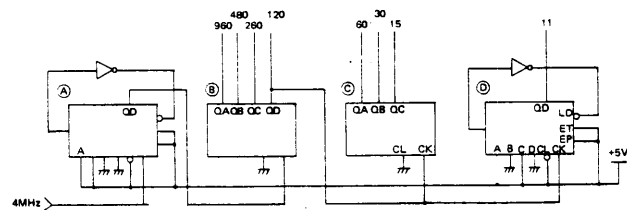


Fig. 7 - 37

• Demultiply data

Demultiply by counter A $3.9936\text{MHz}/13 = 307.2\text{kHz}$

Q_A of counter B $307.2\text{kHz}/2 = 153.6\text{kHz}$
 $= 9600 \times 16 (9600\text{BPS})$

Q_B ditto $153.6\text{kHz}/2 = 76.8\text{kHz}$
 $= 4800 \times 16 (4800\text{BPS})$

Q_C ditto $76.8\text{kHz}/2 = 38.4\text{kHz}$
 $= 2400 \times 16 (2400\text{BPS})$

Q_D ditto $38.4\text{kHz}/2 = 19.2\text{kHz}$
 $= 1200 \times 16 (1200\text{BPS})$

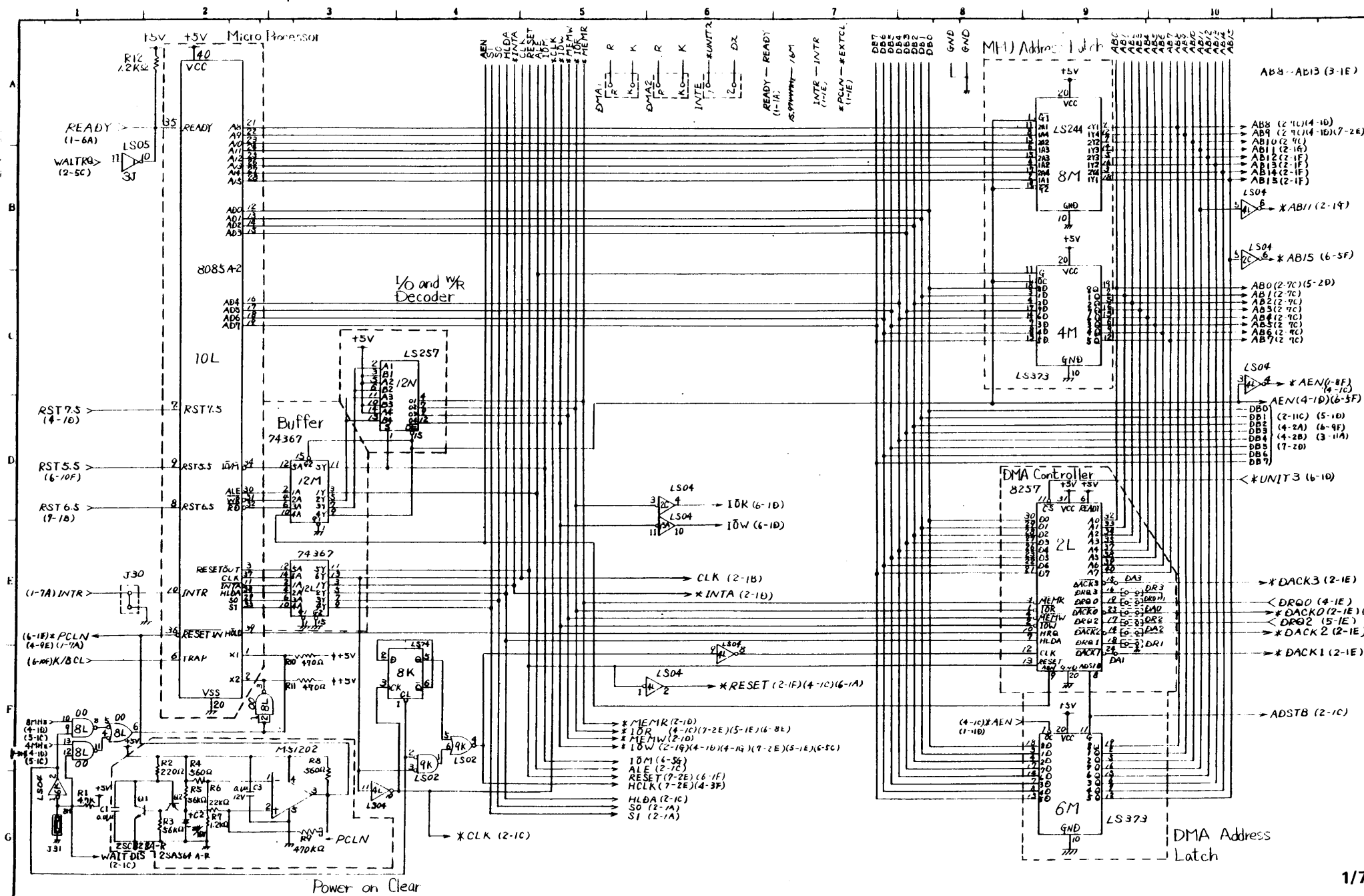
Q_A of counter C $19.2\text{kHz}/2 = 9.6\text{kHz}$
 $= 600 \times 16 (600\text{BPS})$

Q_B ditto $9.6\text{kHz}/2 = 4.8\text{kHz}$
 $= 300 \times 16 (300\text{BPS})$

Q_C ditto $4.8\text{kHz}/2 = 2.4\text{kHz}$
 $= 150 \times 16 (150\text{BPS})$

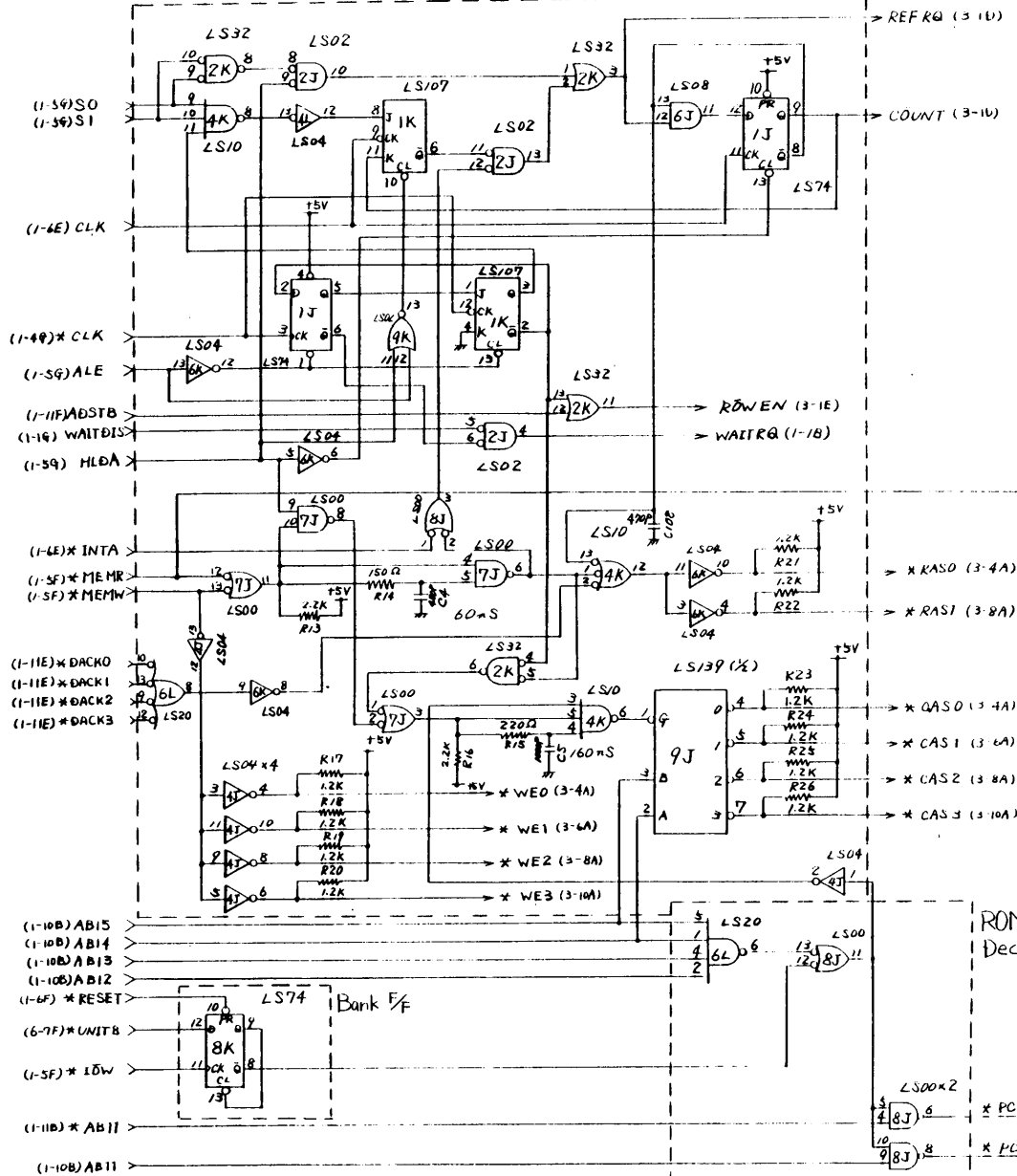
Q_D of counter D $19.2\text{kHz}/11 = 1.745\text{kHz}$
 $= 109 \times 16 (110\text{BPS})$

- Each clock is selected by short plug on hardware. Refer to the parts layout on PCB.

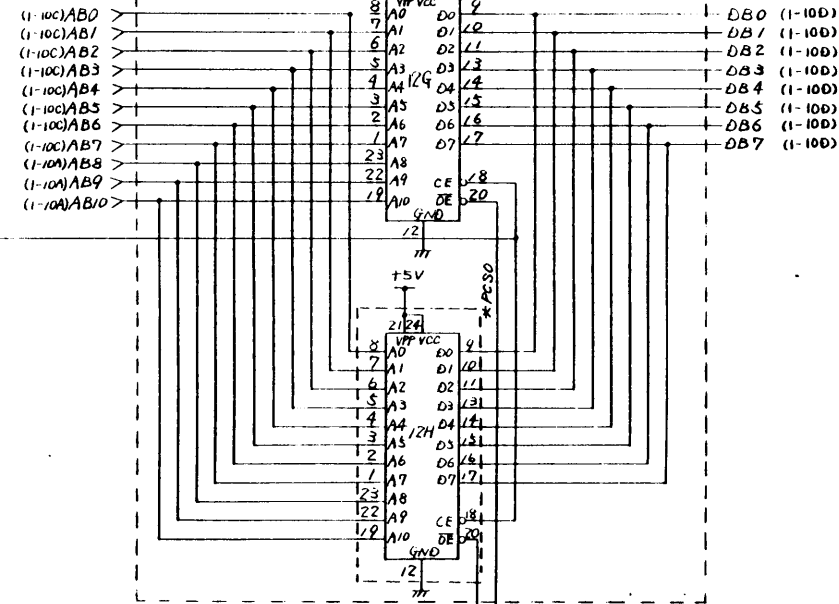


Power on Clear

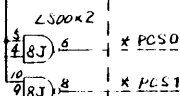
Refresh Controller

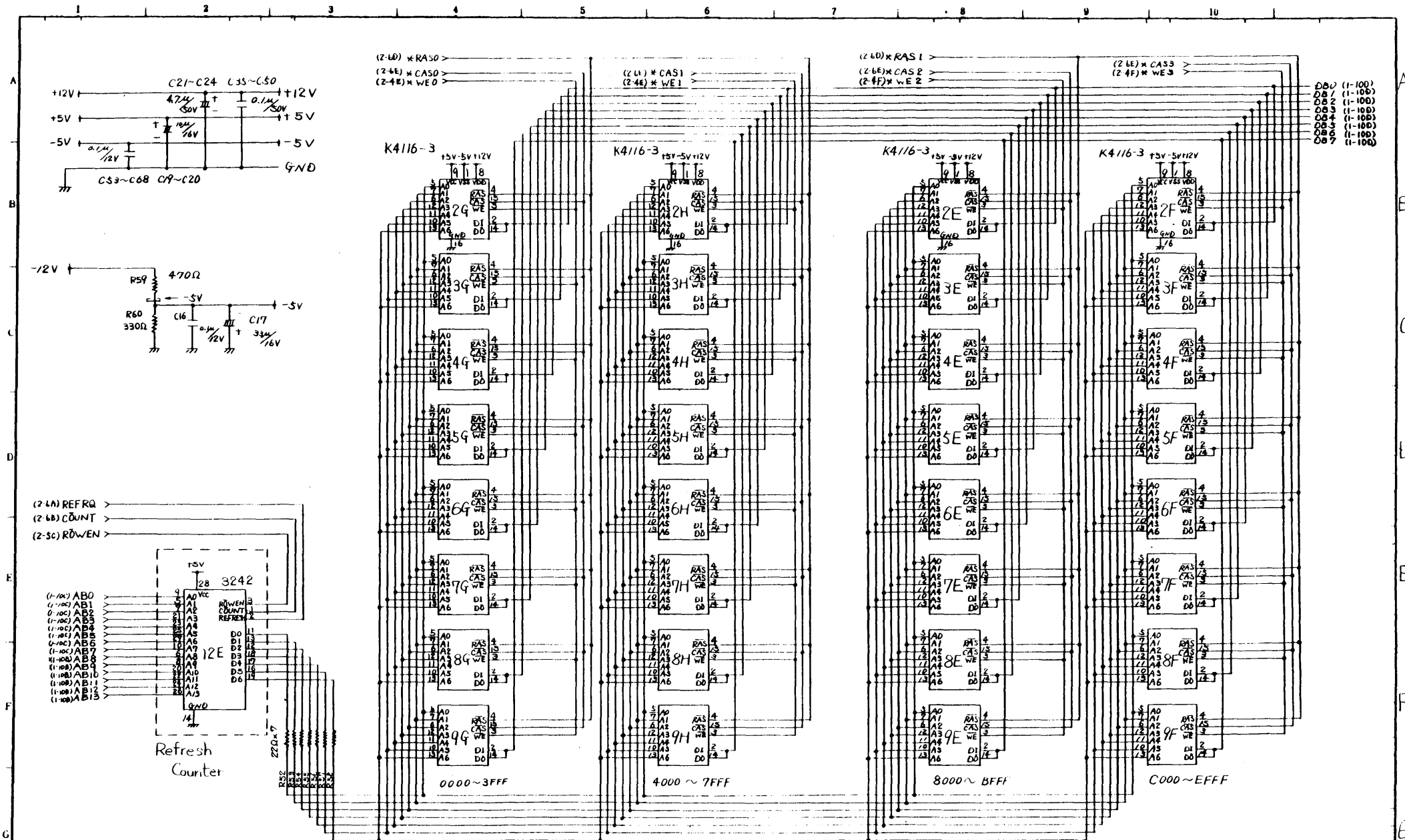


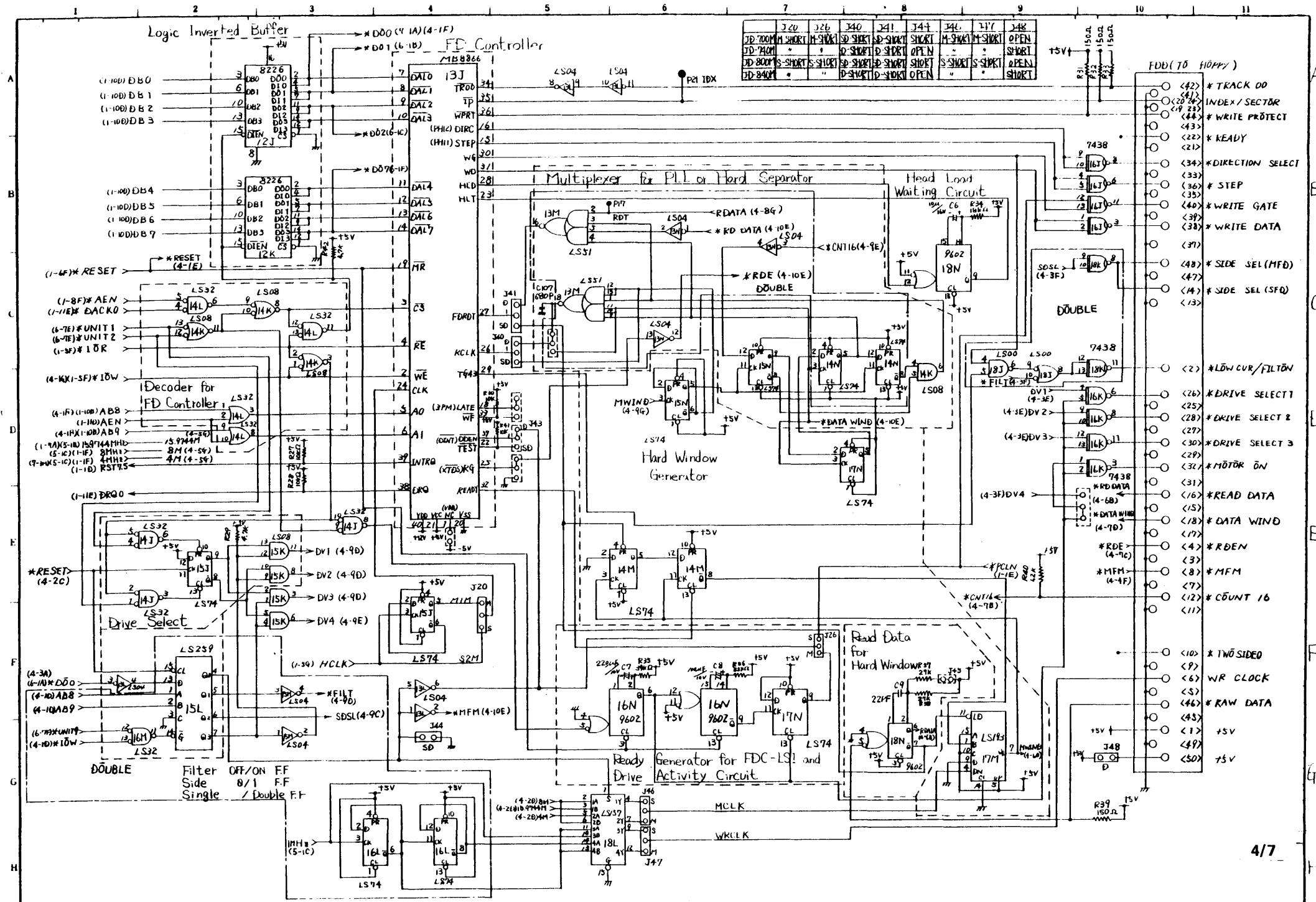
EP ROM

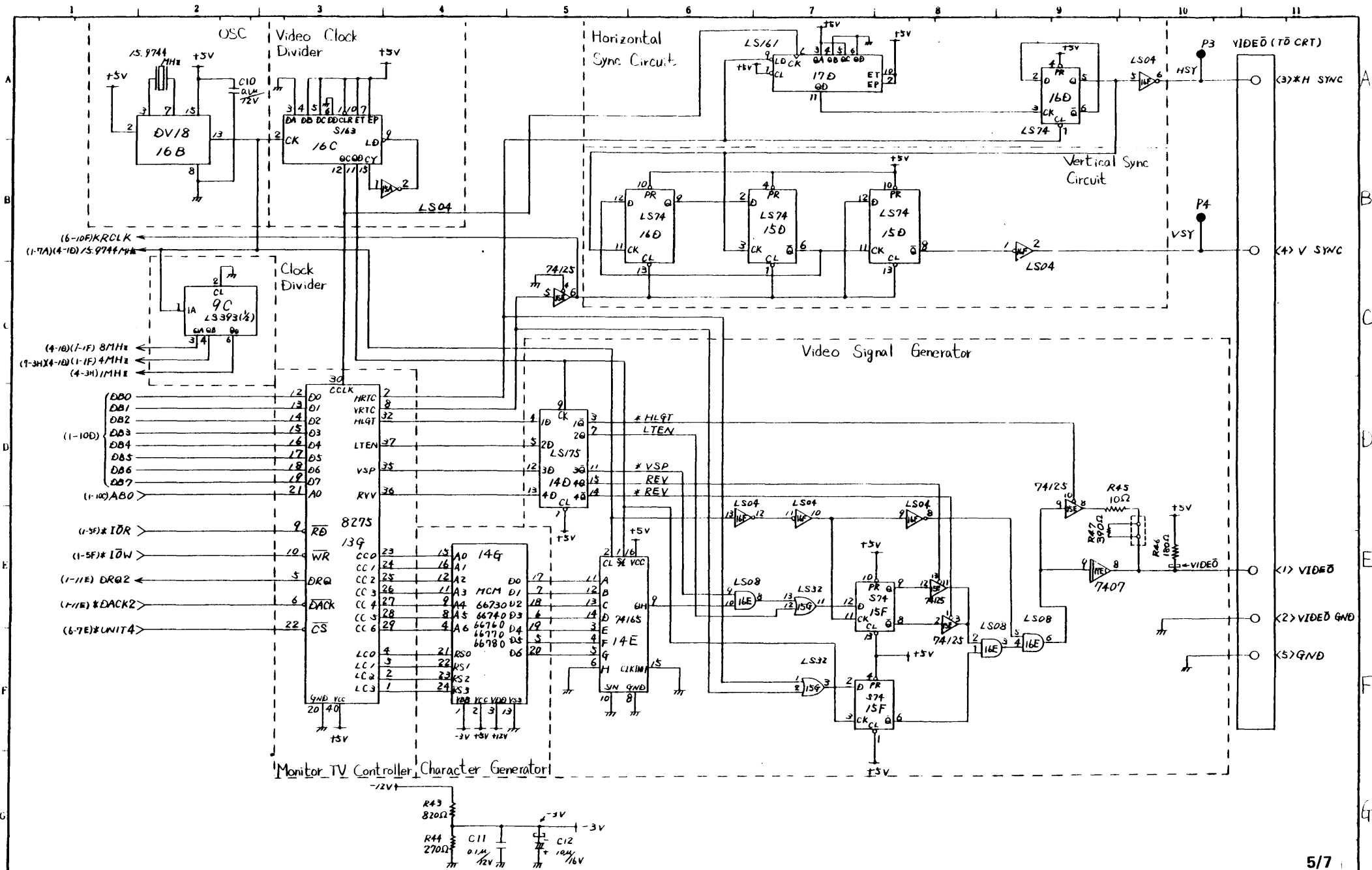


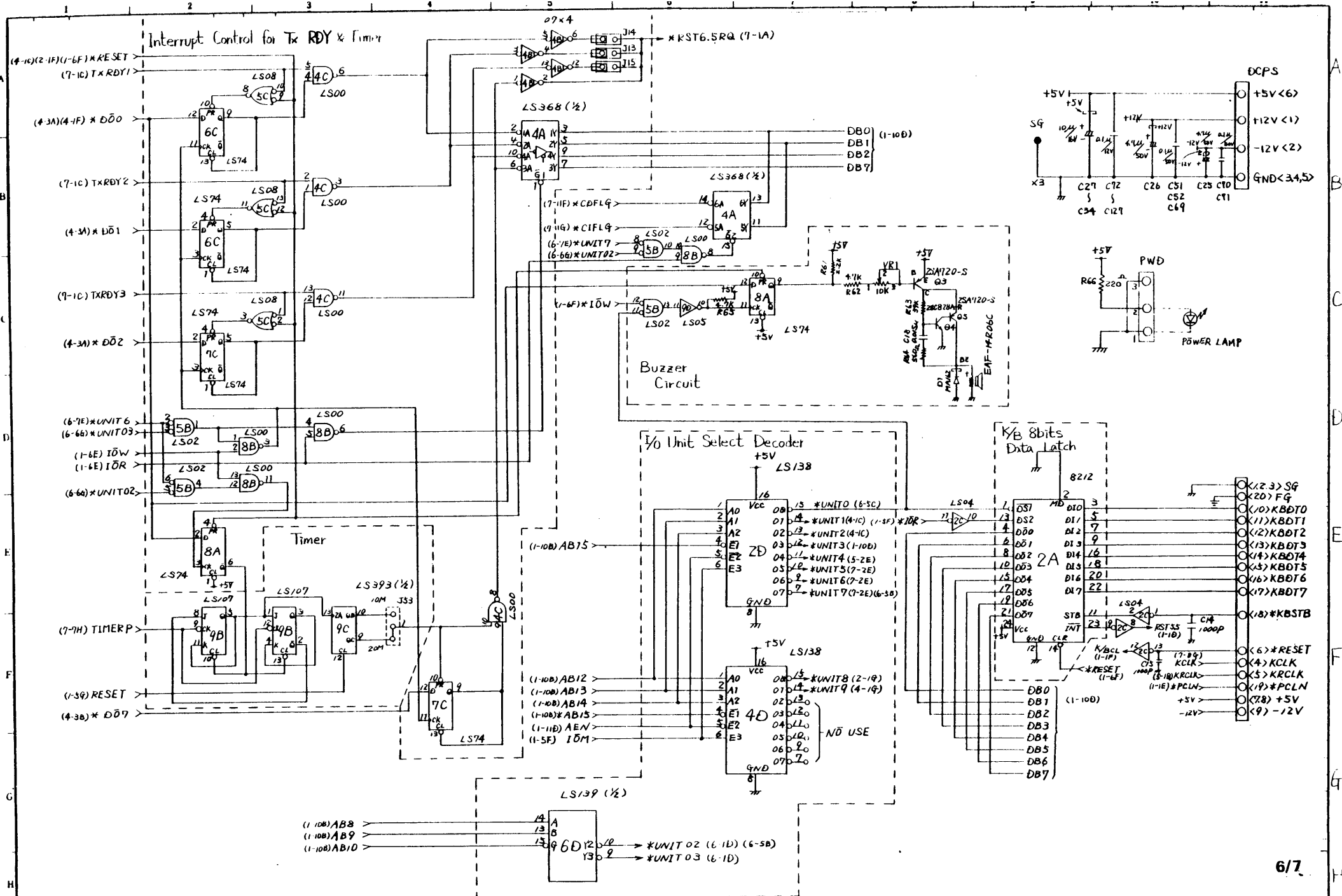
ROM Address Decoder

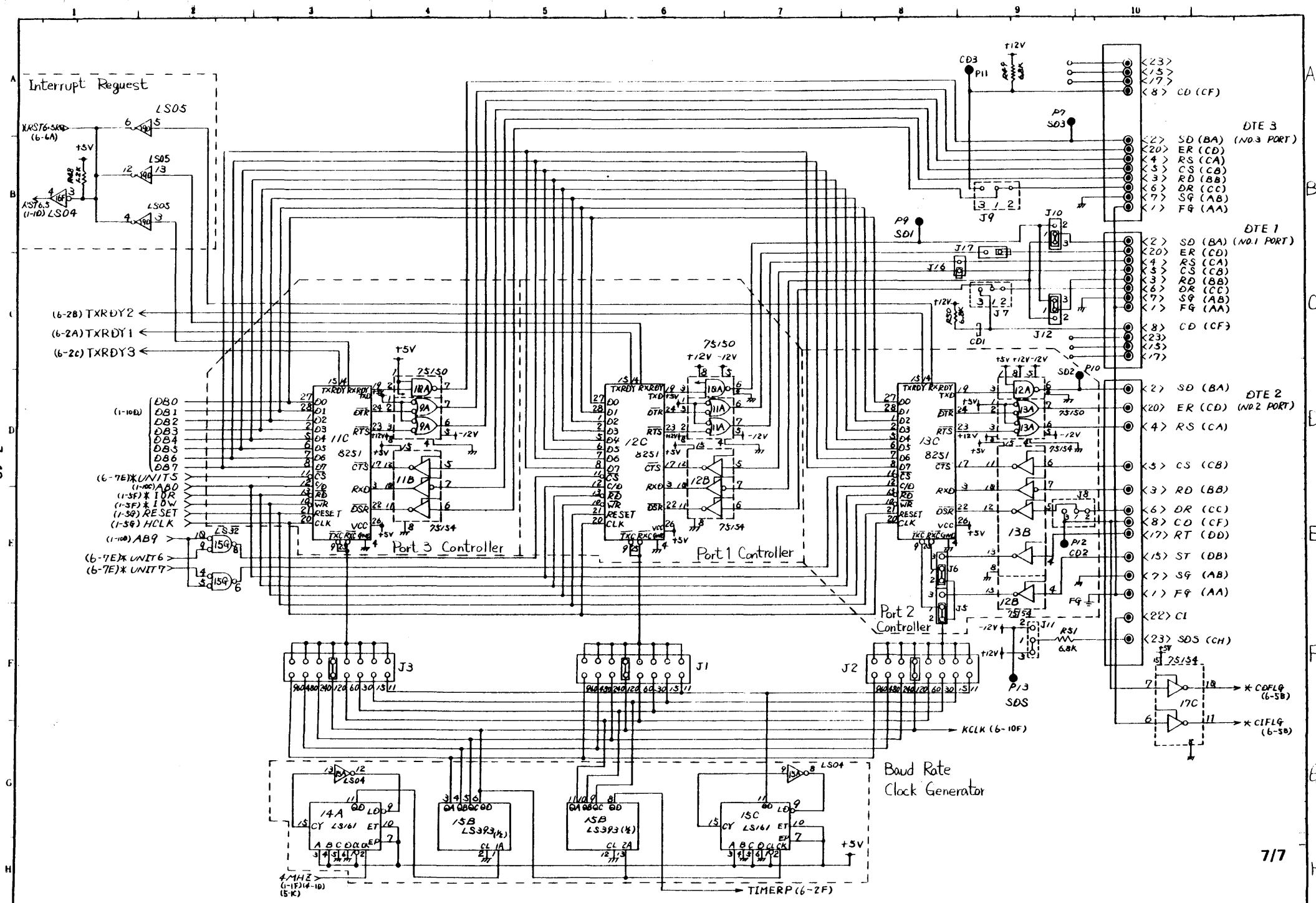












7.6.2 SBCV3 – PCB COMPONENT LOCATION

SBCV3 2742-2 MOS IC

7.6.3 SBCV3 PARTS LIST

SBCV3 (1/10)

LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
2A	M54552P	LSI	
4A	M74LS368P	IC	
8A	M74LS74P	"	
9A	SN75150P	"	
10A	SN75150P	"	
11A	SN75150P	"	
12A	SN75150P	"	
13A	SN75150P	"	
14A	M74LS161P	"	
15A	M74LS04P	"	
4B	SN7407N	"	
5B	M74LS02P	"	
8B	M74LS00P	"	
9B	M74LS107P	"	
11B	SN75154N	"	
12B	SN75154N	"	
13B	SN75154N	"	
15B	M74LS393P	"	
16B	DV18	"	
2C	M74LS04P	"	
4C	M74LS00P	"	
5C	M74LS08P	"	
6C	M74LS74P	"	
7C	M74LS74P	"	
9C	M74LS393P	"	
11C	MPD8251C	LSI	
12C	MPD8251C	"	
13C	MPD8251C	"	
15C	M74LS161P	IC	
16C	SN74S163N	"	
17C	SN75154N	"	
2D	SN74LS138N	"	
4D	SN74LS138N	"	
6D	M74LS139P	"	
9D	M74LS05P	"	
14D	M74LS175P	"	
15D	M74LS74P	"	
16D	M74LS74P	"	
17D	M74LS161P	"	
2E	M5K4116P-3	LSI	Option for 64KB

LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
3E	M5K4116P-3	LSI	Option for 64KB
4E	M5K4116P-3	"	"
5E	M5K4116P-3	"	"
6E	M5K4116P-3	"	"
7E	M5K4116P-3	"	"
8E	M5K4116P-3	"	"
9E	M5K4116P-3	"	"
12E	D3242	IC	
14E	SN74165N	"	
15E	SN74125N	"	
16E	M74LS08P	"	
17E	SN7407N	"	
2F	M5K4116P-3	LSI	
3F	M5K4116P-3	"	
4F	M5K4116P-3	"	
5F	M5K4116P-3	"	
6F	M5K4116P-3	"	
7F	M5K4116P-3	"	
8F	M5K4116P-3	"	
9F	M5K4116P-3	"	
15F	SN74S74N	IC	
16F	M74LS04P	"	
2G	M5K4116P-3	LSI	
3G	M5K4116P-3	"	
4G	M5K4116P-3	"	
5G	M5K4116P-3	"	
6G	M5K4116P-3	"	
7G	M5K4116P-3	"	
8G	M5K4116P-3	"	
9G	M5K4116P-3	"	
12G	M5L2716K2	LSI	for JD700M
12G	M5L2716K102	"	for JD740M
12G	M5L2716K42	"	for JD800M
12G	M5L2716K142	"	for JD840M
13G	P8275	"	
14G	MCM66740L	"	ASCII
14G	MCM66760P	"	British
14G	MCM66770P	"	German
14G	MCM66780P	"	French
15G	M74LS32P	IC	

LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
2H	M5K4116P-3	LSI	
3H	M5K4116P-3	"	
4H	M5K4116P-3	"	
5H	M5K4116P-3	"	
6H	M5K4116P-3	"	
7H	M5K4116P-3	"	
8H	M5K4116P-3	"	
9H	M5K4116P-3	"	
1J	M74LS74P	IC	
2J	M74LS02P	"	
3J	M74LS05P	"	
4J	M74LS04P	"	
6J	M74LS08P	"	
7J	M74LS00P	"	
8J	M74LS00P	"	
9J	M74LS139P	"	
12J	M5L8226P	LSI	
13J	MB8866C	"	
14J	M74LS32P	IC	
15J	M74LS74P	"	for JD740M/JD840M
16J	SN7438N	"	
18J	M74LS00P	"	for JD740M/JD840M
1K	M74LS107P	"	
2K	M74LS32P	"	
4K	M74LS10P	"	
6K	M74LS04P	"	
8K	M74LS74P	"	
9K	M74LS02P	"	
12K	M5L8226P	LSI	
14K	M74LS08P	IC	
15K	M74LS08P	"	
16K	SN7438N	"	
18K	SN7438N	"	for JD740M/JD840M
2L	M5L8257P	LSI	
4L	M74LS04P	IC	
6L	M74LS20P	"	
8L	SN7400N	"	
10L	P8085A-2	LSI	
12L	SN74367AN	IC	
13L	M74LS04P	"	

LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
14L	M74LS32P	IC	
15L	M74LS259P	"	for JD740M/JD840M
16L	M74LS74P	"	for JD740M/JD840M
18L	M74LS157P	"	
4M	M74LS373P	"	
6M	M74LS373P	"	
8M	M74LS244P	"	
12M	SN74367AN	"	
13M	M74LS51P	"	for JD740M/JD840M
14M	M74LS74P	"	
15M	M74LS04P	"	for JD740M/JD840M
16M	M74LS32P	"	for JD740M/JD840M
17M	M74LS193P	"	
8N	M51202L	"	
12N	M74LS257P	"	
13N	M74LS04P	"	for JD740M/JD840M
14N	M74LS74P	"	for JD740M/JD840M
15N	M74LS74P	"	
16N	FC-9602PC	"	
17N	M74LS74P	"	
18N	FC-9602PC	"	
R1	ERD25TJ472	Carbon 4.7k Ω 1/4W	
R2	ERD25TJ221	" 220 Ω 1/4W	
R3	ERD25TJ563	" 56k Ω 1/4W	
R4	ERD25TJ561	" 560 Ω 1/4W	
R5	ERD25TJ563	" 56k Ω 1/4W	
R6	ERD25TJ223	" 22k Ω 1/4W	
R7	ERD25TJ122	" 1.2k Ω 1/4W	
R8	ERD25TJ561	" 560 Ω 1/4W	
R9	ERD25TJ474	" 470k Ω 1/4W	
R10	ERD25TJ471	" 47 Ω 1/4W	
R11	ERD25TJ471	" 47 Ω 1/4W	
R12	ERD25TJ122	" 1.2k Ω 1/4W	
R13	ERD25TJ222	" 2.2k Ω 1/4W	
R14	ERD25TJ151	" 150 Ω 1/4W	
R15	ERD25TJ221	" 220 Ω 1/4W	
R16	ERD25TJ222	" 2.2k Ω 1/4W	
R17	ERD25TJ122	" 1.2k Ω 1/4W	

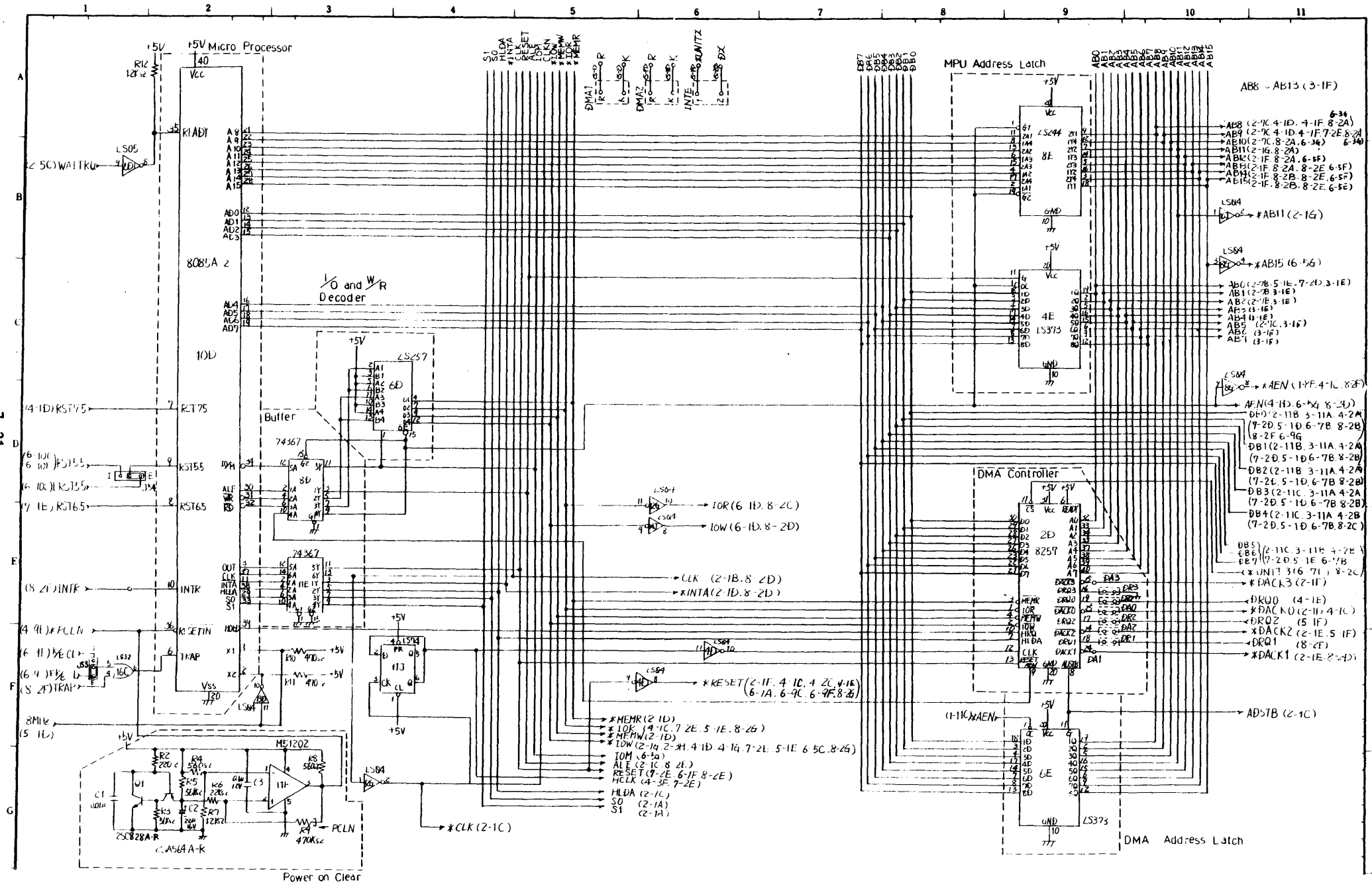
LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
R18	ERD25TJ122	Carbon 1.2k Ω 1/4W	
R19	ERD25TJ122	" 1.2k Ω 1/4W	
R20	ERD25TJ122	" 1.2k Ω 1/4W	
R21	ERD25TJ122	" 1.2k Ω 1/4W	
R22	ERD25TJ122	" 1.2k Ω 1/4W	
R23	ERD25TJ122	" 1.2k Ω 1/4W	
R24	ERD25TJ122	" 1.2k Ω 1/4W	
R25	ERD25TJ122	" 1.2k Ω 1/4W	
R26	ERD25TJ122	" 1.2k Ω 1/4W	
R27	ERD25TJ103	" 10k Ω 1/4W	
R28	ERD25TJ103	" 10k Ω 1/4W	
R29	ERD25TJ472	" 4.7k Ω 1/4W	
R30	ERD25TJ103	" 10k Ω 1/4W	
R31	ERD25TJ151	" 150 Ω 1/4W	
R32	ERD25TJ151	" 150 Ω 1/4W	
R33	ERD25TJ151	" 150 Ω 1/4W	
R34	ERD25TJ183	" 18k Ω 1/4W	
R35	ERD25TJ393	" 39k Ω 1/4W	
R36	ERD25TJ333	" 33k Ω 1/4W	
R37	ERD25TJ273	" 27k Ω 1/4W	
R38	ERD25TJ273	" 27k Ω 1/4W	
R39	ERD25TJ151	" 150 Ω 1/4W	
R40	ERD25TJ122	" 1.2k Ω 1/4W	
R41	ERD25TJ103	" 10k Ω 1/4W	
R42	ERD25TJ472	" 4.7k Ω 1/4W	
R43	ERD25TJ821	" 820 Ω 1/4W	
R44	ERD25TJ271	" 270 Ω 1/4W	
R45	ERD25TJ100	" 100 Ω 1/4W	
R46	ERD25TJ181	" 180 Ω 1/4W	
R47	ERD25TJ391	" 390 Ω 1/4W	
R48	ERD25TJ122	" 1.2k Ω 1/4W	
R49	ERD25TJ682	" 6.8k Ω 1/4W	
R50	ERD25TJ682	" 6.8k Ω 1/4W	
R51	ERD25TJ682	" 6.8k Ω 1/4W	
R52	ERD25TJ220	" 22 Ω 1/4W	
R53	ERD25TJ220	" 22 Ω 1/4W	
R54	ERD25TJ220	" 22 Ω 1/4W	
R55	ERD25TJ220	" 22 Ω 1/4W	
R56	ERD25TJ220	" 22 Ω 1/4W	
R57	ERD25TJ220	" 22 Ω 1/4W	

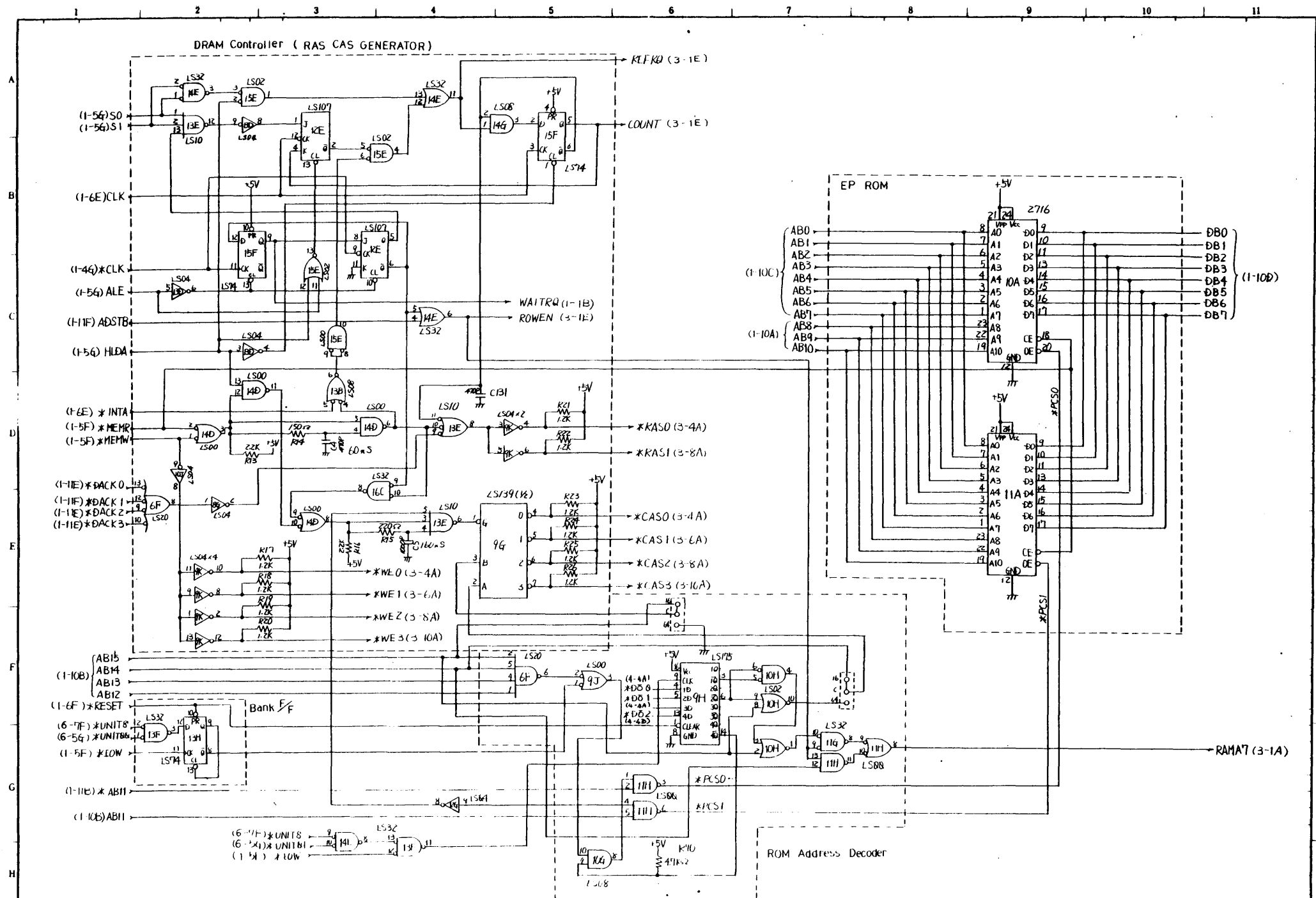
LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
R58	ERD25TJ220	Carbon 22Ω 1/4W	
R59	ERD25TJ471	" 470Ω 1/4W	
R60	ERD25TJ331	" 330Ω 1/4W	
R61	ERD25TJ222	" 2.2kΩ 1/4W	
R62	ERD25TJ472	" 4.7kΩ 1/4W	
R63	ERD25TJ393	" 39kΩ 1/4W	
R64	ERD25TJ561	" 560Ω 1/4W	
R65	ERD25TJ472	" 4.7kΩ 1/4W	
R66	ERD25TJ221	" 220Ω 1/4W	
C1	ECKD1H103ZFZ	Ceramic 0.01μF 25V	
C2	ECEB1CS220	Electrolytic 22μF 16V	
C3	825001410	Ceramic 0.1μF 12V	DD600-BC104M12V
C4	ECKD1H471MB	" 470PF	
C5	ECKD2H102KB	" 1,000PF	
C6	ECEB1CS100	Electrolytic 10μF 16V	
C7	ECSZ10VH220	Tantalum 220μF 10V	
C8	ECSZ10VH100	" 100μF 10V	
C9	ECCD1H220KC	Ceramic 22PF	
C10	825001410	Ceramic 0.1μF 12V	DD600-BC104M12V
C11	825001410	" 0.1μF 12V	"
C12	ECEB1CS100	Electrolytic 10μF 16V	
C14	ECKD2H102KB	Ceramic 1,000PF	
C15	ECKD2H102KB	" 1,000PF	
C16	825001410	" 0.1μF 12V	DD600-BC104M12V
C17	ECEB1CS330	Electrolytic 33μF 16V	
C18	ECQM1H153KZ	Ceramic 0.015μF	
C19	ECEB1CS100	Electrolytic 10μF 16V	
C20	ECEB1CS100	" 10μF 16V	
C21	ECEB1HS4R7	" 4.7μF 50V	
C22	ECEB1HS4R7	" 4.7μF 50V	
C23	ECEB1HS4R7	" 4.7μF 50V	
C24	ECEB1HS4R7	" 4.7μF 50V	
C25	ECEB1HS4R7	" 4.7μF 50V	
C26	ECEB1HS4R7	" 4.7μF 50V	
C27	ECEB1CS100	" 10μF 16V	
C28	ECEB1CS100	" 10μF 16V	
C29	ECEB1CS100	" 10μF 16V	
C30	ECEB1CS100	" 10μF 16V	

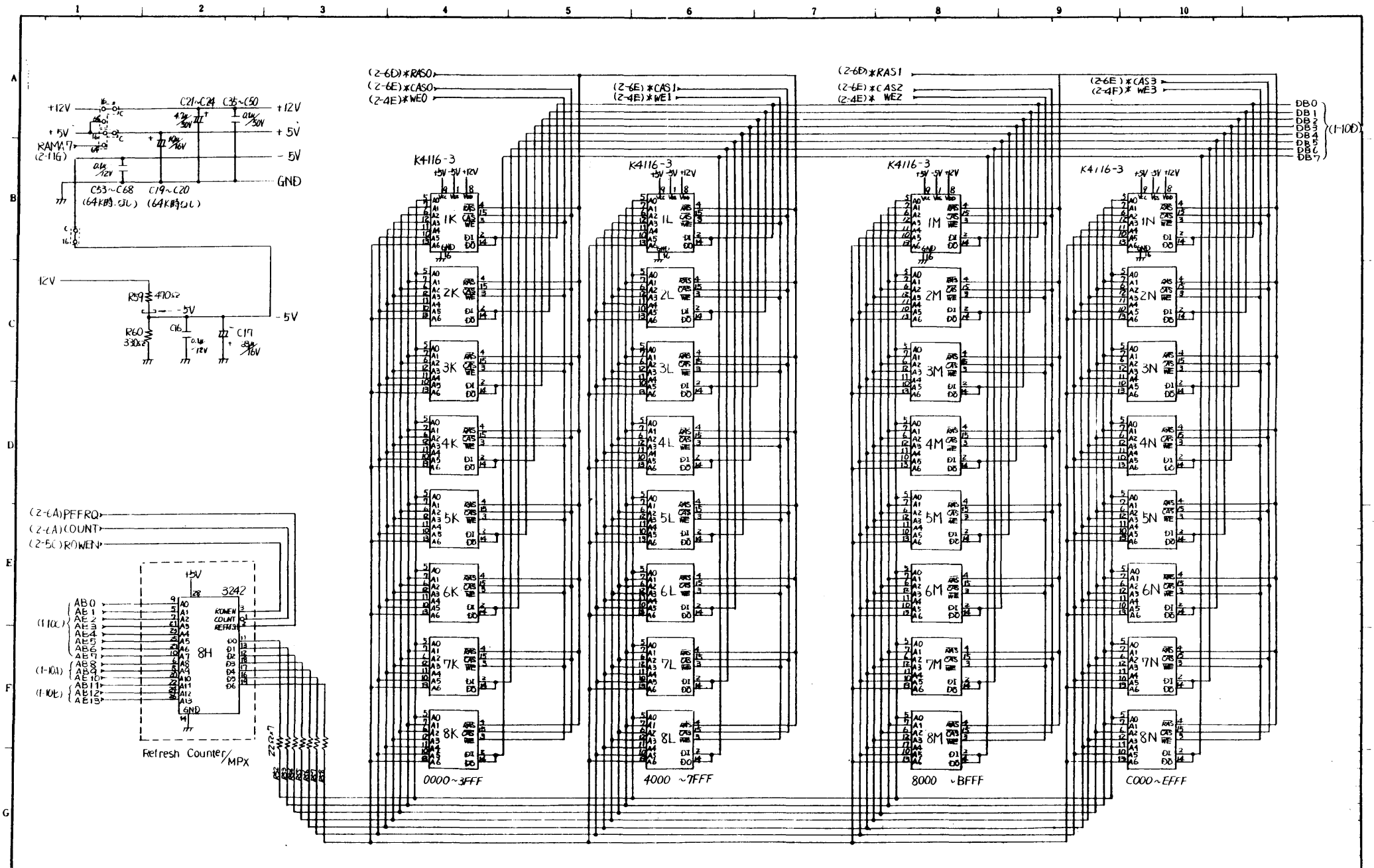
LOC.	PART NO.	PART NAME & DESCRIPTION			REMARKS
C31	ECEB1CS100	Electrolytic	10 μ F	16V	
C32	ECEB1CS100	"	10 μ F	16V	
C33	ECEB1CS100	"	10 μ F	16V	
C34	ECEB1CS100	"	10 μ F	16V	
C35	829918063	Ceramic	0.1 μ F	50V	RPE112F104Z50V
C36	829918063	"	0.1 μ F	50V	"
C37	829918063	"	0.1 μ F	50V	"
C38	829918063	"	0.1 μ F	50V	"
C39	829918063	"	0.1 μ F	50V	"
C40	829918063	"	0.1 μ F	50V	"
C41	829918063	"	0.1 μ F	50V	"
C42	829918063	"	0.1 μ F	50V	"
C43	829918063	"	0.1 μ F	50V	"
C44	829918063	"	0.1 μ F	50V	"
C45	829918063	"	0.1 μ F	50V	"
C46	829918063	"	0.1 μ F	50V	"
C47	829918063	"	0.1 μ F	50V	"
C48	829918063	"	0.1 μ F	50V	"
C49	829918063	"	0.1 μ F	50V	"
C50	829918063	"	0.1 μ F	50V	"
C51	829918063	"	0.1 μ F	50V	"
C52	829918063	"	0.1 μ F	50V	"
C53	825001410	"	0.1 μ F	12V	DD600-BC104M12V
C54	825001410	"	0.1 μ F	12V	"
C55	825001410	"	0.1 μ F	12V	"
C56	825001410	"	0.1 μ F	12V	"
C57	825001410	"	0.1 μ F	12V	"
C58	825001410	"	0.1 μ F	12V	"
C59	825001410	"	0.1 μ F	12V	"
C60	825001410	"	0.1 μ F	12V	"
C61	825001410	"	0.1 μ F	12V	"
C62	825001410	"	0.1 μ F	12V	"
C63	825001410	"	0.1 μ F	12V	"
C64	825001410	"	0.1 μ F	12V	"
C65	825001410	"	0.1 μ F	12V	"
C66	825001410	"	0.1 μ F	12V	"
C67	825001410	"	0.1 μ F	12V	"
C68	825001410	"	0.1 μ F	12V	"
C69	829918063	"	0.1 μ F	50V	RPE112F104Z50V
C70	829918063	"	0.1 μ F	50V	"

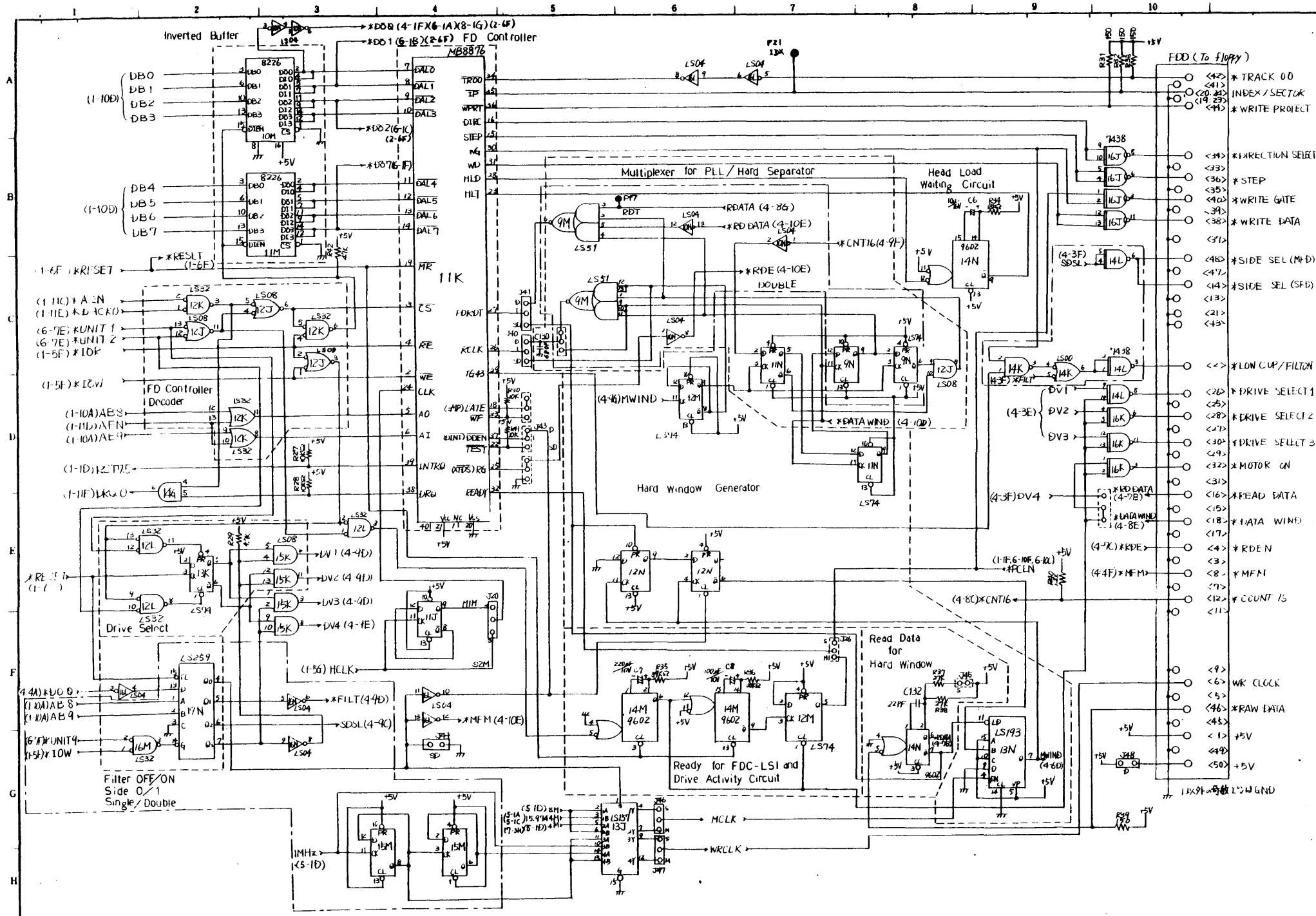
LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
C71	829918063	Ceramic 0.1 μ F 50V	RPE112F104Z50V
C72	825001410	" 0.1 μ F 12V	DD600-BC104M12V
C73	825001410	" 0.1 μ F 12V	"
C74	825001410	" 0.1 μ F 12V	"
C75	825001410	" 0.1 μ F 12V	"
C76	825001410	" 0.1 μ F 12V	"
C77	825001410	" 0.1 μ F 12V	"
C79	825001410	" 0.1 μ F 12V	"
C80	825001410	" 0.1 μ F 12V	"
C81	825001410	" 0.1 μ F 12V	"
C83	825001410	" 0.1 μ F 12V	"
C84	825001410	" 0.1 μ F 12V	"
C85	825001410	" 0.1 μ F 12V	"
C86	825001410	" 0.1 μ F 12V	"
C88	825001410	" 0.1 μ F 12V	"
C89	825001410	" 0.1 μ F 12V	"
C90	825001410	" 0.1 μ F 12V	"
C91	825001410	" 0.1 μ F 12V	"
C93	825001410	" 0.1 μ F 12V	"
C94	825001410	" 0.1 μ F 12V	"
C95	825001410	" 0.1 μ F 12V	"
C97	825001410	" 0.1 μ F 12V	"
C98	825001410	" 0.1 μ F 12V	"
C99	825001410	" 0.1 μ F 12V	"
C101	825001410	" 0.1 μ F 12V	"
C104	825001410	" 0.1 μ F 12V	"
C105	825001410	" 0.1 μ F 12V	"
C106	825001410	" 0.1 μ F 12V	"
C107	ECKD1H681KB2	" 680PF	
C108	ECKD1H471MB	" 470PF	
C109	825001410	" 0.1 μ F 12V	DD600-BC104M12V
C110	825001410	" 0.1 μ F 12V	"
C111	825001410	" 0.1 μ F 12V	"
C114	825001410	" 0.1 μ F 12V	"
C116	825001410	" 0.1 μ F 12V	"
C117	825001410	" 0.1 μ F 12V	"
C118	825001410	" 0.1 μ F 12V	"
C121	825001410	" 0.1 μ F 12V	"
C122	825001410	" 0.1 μ F 12V	"
C123	825001410	" 0.1 μ F 12V	"

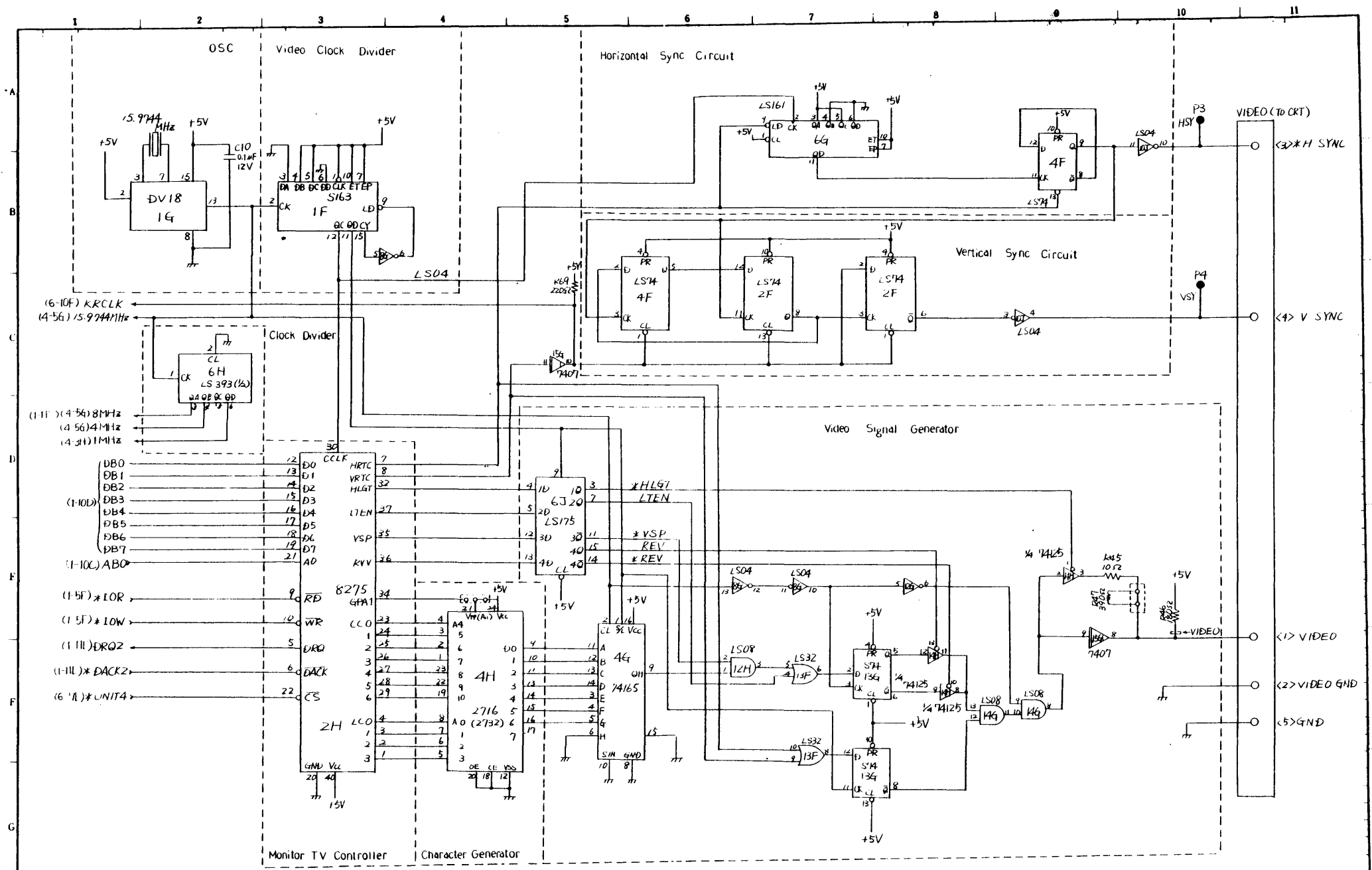
LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
C124	825001410	Ceramic 0.1 μ F 12V	DD600-BC104M12V
C126	825001410	" 0.1 μ F 12V	"
C127	825001410	" 0.1 μ F 12V	"
J1	969926050	Short pin	Z-152-16P
J2	969926050	"	"
J3	969926050	"	"
J5	969926053	"	Z-149-3P
J6	969926053	"	"
J10	969926053	"	"
J12	969926053	"	"
J13	969926057	"	Z-152-6P
J14	969926057	"	"
J15	969926057	"	"
J16	969926048	"	Z-152-2P
J17	969926048	"	"
J20	969926053	"	Z-149-3P
J26	969926053	"	"
J31	969926048	"	Z-152-2P
J40	969926053	"	Z-149-3P
J41	969926053	"	"
J44	969926048	"	Z-152-2P
J46	969926053	"	Z-149-3P
J47	969926053	"	"
J48	969926048	"	Z-152-2P
	919926190	Short plug	Z-128
Q1	2SC828A-R	Transister	
Q2	2SA564A-R	"	
Q3	2SA720-S	"	
Q4	2SC828A-R	"	
Q5	2SA720-S	"	
D1	MA162	Diode	

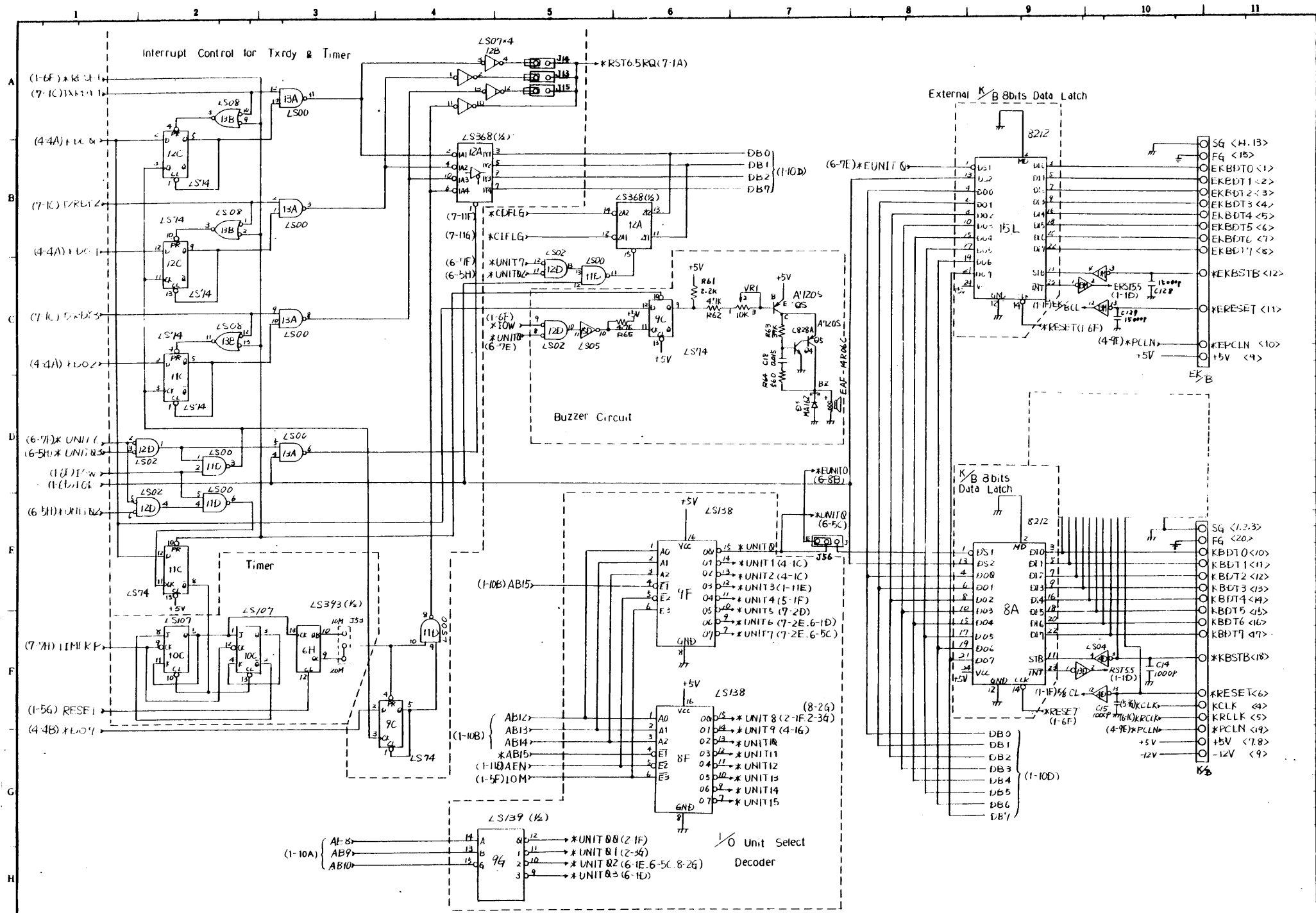


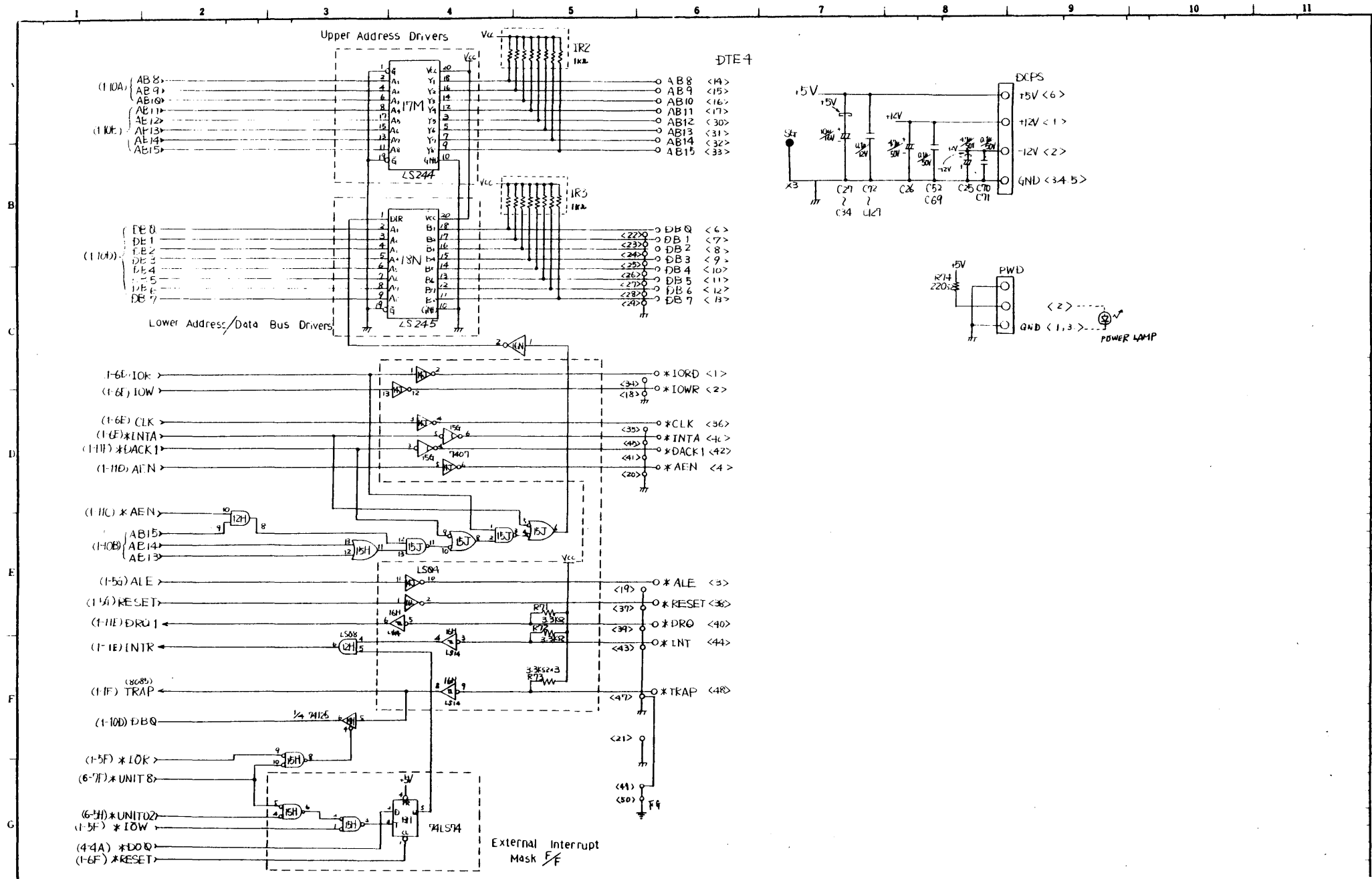




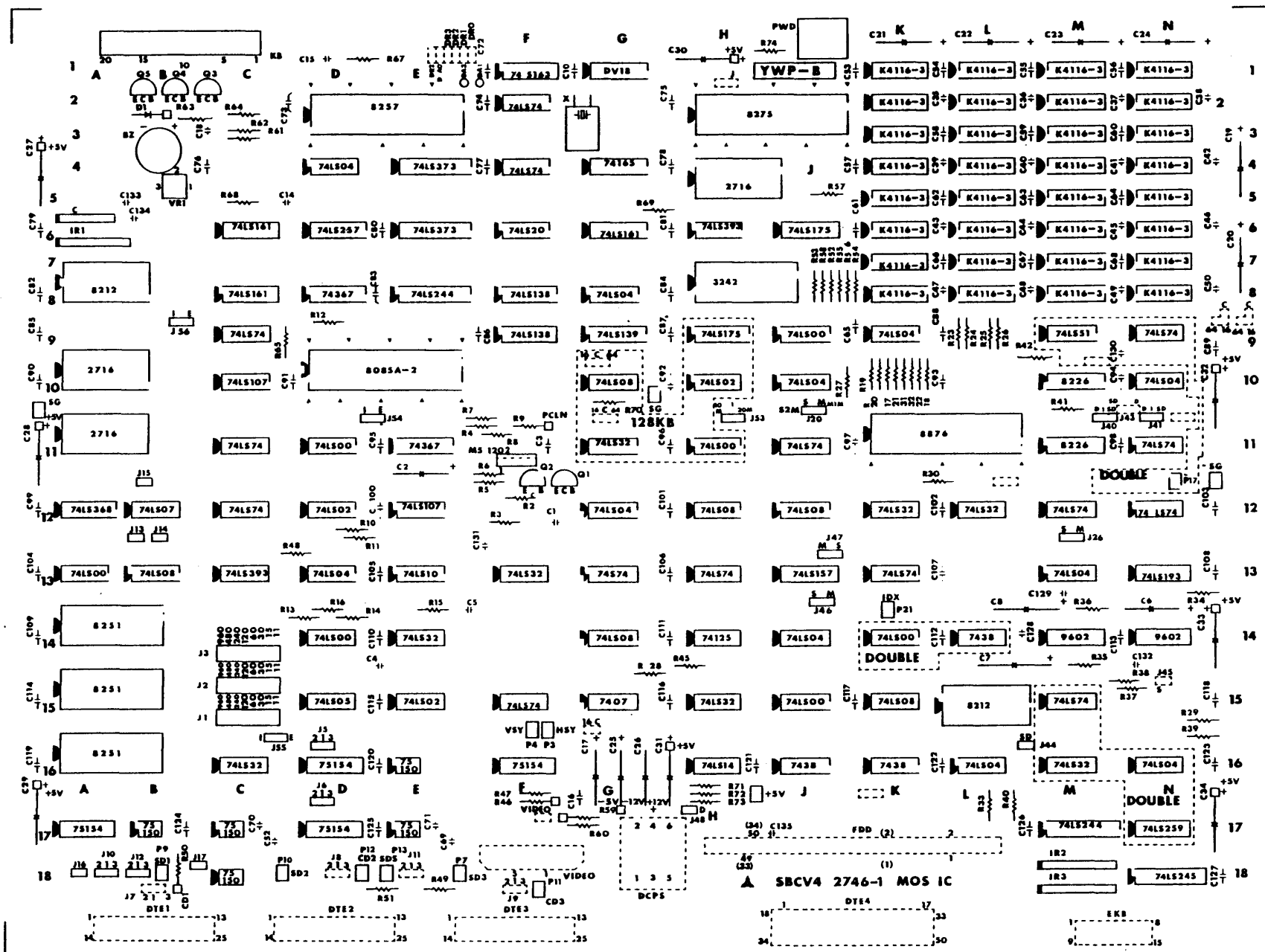








7.6.5 SBCV4 - PCB COMPONENT LOCATION



7.6.6 SBCV4 PARTS LIST

SBCV4 (1/10)

LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
10A	M5L2716K142	LSI	IPL
12A	M74LS368P	IC	
13A	M74LS00P	IC	
14A	MPD8251C	LSI	
15A	MPD8251C	LSI	
16A	MPD8251C	LSI	
17A	SN75154N	IC	
12B	SN7407N	IC	
13B	M74LS08P	IC	
17B	SN75150P	IC	
6C	M74LS161P	IC	
8C	M74LS161P	IC	
9C	M74LS74P	IC	
10C	M74LS107P	IC	
11C	M74LS74P	IC	
12C	M74LS74P	IC	
13C	M74LS393P	IC	
16C	M74LS32P	IC	
17C	SN75150P	IC	
18C	SN75150P	IC	
2D	M5L8257P-5	IC	DMAC
4D	M74LS04P	IC	
6D	M74LS257P	IC	
8D	SN74367AN	IC	
10D	P8085A-2	IC	CPU
11D	M74LS00P	IC	
12D	M74LS02P	IC	
13D	M74LS04P	IC	
14D	M74LS00P	IC	
15D	M74LS05P	IC	
16D	SN75154N	IC	
17D	SN75154N	IC	
4E	M74LS373P	IC	
6E	M74LS373P	IC	
8E	M74LS244P	IC	
11E	SN74367AN	IC	
12E	M74LS107P	IC	
13E	M74LS10P	IC	
14E	M74LS32P	IC	
15E	M74LS02P	IC	
16E	SN75150P	IC	
17E	SN75150P	IC	
1F	SN74S163N	IC	
2F	M74LS74P	IC	
4F	M74LS74P	IC	
6F	M74LS20P	IC	
8F	M74LS138P	IC	

LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
9F	M74LS138P	IC	
11F	M51202L	IC	
13F	M74LS32P	IC	
15F	M74LS74P	IC	
16F	SN75154N	IC	
1G	DV18	IC	OSC
4G	SN74165N	IC	
6G	M74LS161P	IC	
8G	M74LS04P	IC	
9G	M74LS139P	IC	
10G	M74LS08P	IC	
11G	M74LS32P	IC	
12G	M74LS04P	IC	
13G	SN74S74N	IC	
14G	M74LS08P	IC	
15G	SN7407N	IC	
2H	P8275	LSI	CRTC
4H	M5L2716KA	LSI	C-G ASCII
	M5L2716KE	LSI	C-G British
	M5L2716KD	LSI	C-G German
	M5L2716KF	LSI	C-G French
6H	M74LS393P	IC	
8H	MC3242AP	LSI	
9H	M74LS175P	IC	
10H	M74LS02P	IC	
11H	M74LS00P	IC	
12H	M74LS08P	IC	
13H	M74LS74P	IC	
14H	SN74125N	IC	
15H	M74LS32P	IC	
16H	M74LS14P	IC	
6J	M74LS175P	IC	
9J	M74LS00P	IC	
10J	M74LS04P	IC	
11J	M74LS74P	IC	
12J	M74LS08P	IC	
13J	M74LS157P	IC	
14J	M74LS04P	IC	
15J	M74LS00P	IC	
16J	M53238P	IC	
1K	M5K4116P-3	LSI	DRAM
2K	M5K4116P-3	LSI	DRAM
3K	M5K4116P-3	LSI	DRAM
4K	M5K4116P-3	LSI	DRAM
5K	M5K4116P-3	LSI	DRAM
6K	M5K4116P-3	LSI	DRAM
7K	M5K4116P-3	LSI	DRAM

L O C.	PART NO.	PART NAME & DESCRIPTION	REMARKS
8K	M5K4116P-3	LSI	
9K	M74LS04P	IC	
11K	MB8876C	LSI	FDC
12K	M74LS32P	IC	
13K	M74LS74P	IC	
14K	M74LS00P	IC	
15K	M74LS08P	IC	
16K	M53238P	IC	
1L	M5K4116P-3	LSI	DRAM
2L	M5K4116P-3	LSI	DRAM
3L	M5K4116P-3	LSI	DRAM
4L	M5K4116P-3	LSI	DRAM
5L	M5K4116P-3	LSI	DRAM
6L	M5K4116P-3	LSI	DRAM
7L	M5K4116P-3	LSI	DRAM
8L	M5K4116P-3	LSI	DRAM
12L	M74LS32P	IC	
14L	M53238P	IC	
15L	M5L8212P	LSI	
16L	M74LS04P	IC	
1M	M5K4116P-3	LSI	DRAM
2M	M5K4116P-3	LSI	DRAM
3M	M5K4116P-3	LSI	DRAM
4M	M5K4116P-3	LSI	DRAM
5M	M5K4116P-3	LSI	DRAM
6M	M5K4116P-3	LSI	DRAM
7M	M5K4116P-3	LSI	DRAM
8M	M5K4116P-3	LSI	DRAM
9M	M74LS51P	IC	
10M	M5L8226P	LSI	
11M	M5L8226P	LSI	
12M	M74LS74P	IC	
13M	M74LS04P	IC	
14M	FC-9602PC	IC	
15M	M74LS74P	IC	
16M	M74LS32P	IC	
17M	M74LS244P	IC	DRAM
1N	M5K4116P-3	LSI	DRAM
2N	M5K4116P-3	LSI	DRAM
3N	M5K4116P-3	LSI	DRAM
4N	M5K4116P-3	LSI	DRAM
5N	M5K4116P-3	LSI	DRAM
6N	M5K4116P-3	LSI	DRAM
7N	M5K4116P-3	LSI	DRAM
8N	M5K4116P-3	LSI	DRAM
9N	M74LS74P	IC	
10N	M74LS04P	IC	
11N	M74LS74P	IC	
12N	M74LS74P	IC	

LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
13N	M74LS193P	IC	
14N	FC-9602PC	IC	
16N	M74LS04P	IC	
17N	M74LS259P	IC	
18N	SN74LS245N	IC	
R2	ERD25TJ221	Carbon 200 Ω 1/4W	
R3	ERD25TJ563	Carbon 56K Ω 1/4W	
R4	ERD25TJ561	Carbon 560 Ω 1/4W	
R5	ERD25TJ563	Carbon 56K Ω 1/4W	
R6	ERD25TJ223	Carbon 22K Ω 1/4W	
R7	ERD25TJ122	Carbon 1.2K Ω 1/4W	
R8	ERD25TJ561	Carbon 560 Ω 1/4W	
R9	ERD25TJ474	Carbon 470K Ω 1/4W	
R10	ERD25TJ471	Carbon 470 Ω 1/4W	
R11	ERD25TJ471	Carbon 470 Ω 1/4W	
R12	ERD25TJ122	Carbon 1.2K Ω 1/4W	
R13	ERD25TJ222	Carbon 2.2K Ω 1/4W	
R14	ERD25TJ151	Carbon 150 Ω 1/4W	
R15	ERD25TJ221	Carbon 220 Ω 1/4W	
R16	ERD25TJ222	Carbon 2.2K Ω 1/4W	
R17	ERD25TJ122	Carbon 1.2K Ω 1/4W	
R18	ERD25TJ122	Carbon 1.2K Ω 1/4W	
R19	ERD25TJ122	Carbon 1.2K Ω 1/4W	
R20	ERD25TJ122	Carbon 1.2K Ω 1/4W	
R21	ERD25TJ122	Carbon 1.2K Ω 1/4W	
R22	ERD25TJ122	Carbon 1.2K Ω 1/4W	
R23	ERD25TJ122	Carbon 1.2K Ω 1/4W	
R24	ERD25TJ122	Carbon 1.2K Ω 1/4W	
R25	ERD25TJ122	Carbon 1.2K Ω 1/4W	
R26	ERD25TJ122	Carbon 1.2K Ω 1/4W	
R27	ERD25TJ103	Carbon 10K Ω 1/4W	
R28	ERD25TJ103	Carbon 10K Ω 1/4W	
R29	ERD25TJ472	Carbon 47K Ω 1/4W	
R30	ERD25TJ103	Carbon 10K Ω 1/4W	
R31	ERD25TJ152	Carbon 150 Ω 1/4W	
R32	ERD25TJ152	Carbon 150 Ω 1/4W	
R33	ERD25TJ151	Carbon 150 Ω 1/4W	
R34	ERD25TJ183	Carbon 18K Ω 1/4W	
R35	ERD25TJ393	Carbon 39K Ω 1/4W	
R36	ERD25TJ333	Carbon 33K Ω 1/4W	
R37	ERD25TJ273	Carbon 27K Ω 1/4W	
R38	ERD25TJ273	Carbon 27K Ω 1/4W	
R39	ERD25TJ151	Carbon 150 Ω 1/4W	
R40	ERD25TJ122	Carbon 1.2K Ω 1/4W	
R41	ERD25TJ103	Carbon 10K Ω 1/4W	
R42	ERD25TJ472	Carbon 4.7K Ω 1/4W	

LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
R45	ERD25TJ100	Carbon 10 Ω 1/4W	
R46	ERD25TJ181	Carbon 180 Ω 1/4W	
R47	ERD25TJ391	Carbon 390 Ω 1/4W	
R48	ERD25TJ122	Carbon 12K Ω 1/4W	
R49	ERD25TJ682	Carbon 6.8K Ω 1/4W	
R50	ERD25TJ682	Carbon 6.8K Ω 1/4W	
R51	ERD25TJ682	Carbon 6.8K Ω 1/4W	
R52	ERD25TJ220	Carbon 22 Ω 1/4W	
R53	ERD25TJ220	Carbon 22 Ω 1/4W	
R54	ERD25TJ220	Carbon 22 Ω 1/4W	
R55	ERD25TJ220	Carbon 22 Ω 1/4W	
R56	ERD25TJ220	Carbon 22 Ω 1/4W	
R57	ERD25TJ220	Carbon 22 Ω 1/4W	
R58	ERD25TJ220	Carbon 22 Ω 1/4W	
R59	ERD25TJ471	Carbon 470 Ω 1/4W	
R60	ERD25TJ331	Carbon 330 Ω 1/4W	
R61	ERD25TJ222	Carbon 2.2K Ω 1/4W	
R62	ERD25TJ472	Carbon 4.7K Ω 1/4W	
R63	ERD25TJ393	Carbon 39K Ω 1/4W	
R64	ERD25TJ561	Carbon 560 Ω 1/4W	
R65	ERD25TJ472	Carbon 4.7K Ω 1/4W	
R69	ERD25TJ221	Carbon 220 Ω 1/4W	
R70	ERD25TJ472	Carbon 4.7K Ω 1/4W	
R71	ERD25TJ332	Carbon 3.3K 1/4W	
R72	ERD25TJ332	Carbon 3.3K 1/4W	
R73	ERD25TJ332	Carbon 3.3K 1/4W	
R74	ERD25TJ221	Carbon 220 Ω 1/4W	
C1	ECK D1H103ZFZ	Ceramic 0.01 μ F 25V	
C2	ECEB1CS220	Electrolytic 22 μ F 16V	
C3	825001410	Ceramic 0.1 μ F 12V	DD600-BC104M12V
C4	ECK D1H471MB	Ceramic 470PF	
C5	ECK D2H102KB	Ceramic 1000PF	
C6	ECEB1CS100	Electrolytic 10 μ F 16V	
C7	ECSZ10VH220	Tantalum 220 μ F 10V	
C8	ECSZ10VH100	Tantalum 100 μ F 10V	
C10	825001410	Ceramic 0.1 μ F 12V	DD600-BC104M12V
C14	ECK D2H102KB	Ceramic 1000PF	
C15	ECK D2H102KB	Ceramic 1000PF	

LOC.	PART NO.	PART NAME & DESCRIPTION			REMARKS
C16	825001410	Ceramic	0.1 μ F	12V	DD600-BC104M12V
C17	BCEB1CS330	Electrolytic	33 μ F	16V	
C18	ECQM1H153KZ	Myler	0.015 μ F		
C19	ECEB1CS100	Electrolytic	10 μ F	16V	
C20	ECEB1CS100	Electrolytic	10 μ F	16V	
C21	ECEB1HS4R7	Electrolytic	4.7 μ F	50V	
C22	ECEB1HS4R7	Electrolytic	4.7 μ F	50V	
C23	ECEB1HS4R7	Electrolytic	4.7 μ F	50V	
C24	ECEB1HS4R7	Electrolytic	4.7 μ F	50V	
C25	ECEB1HS4R7	Electrolytic	4.7 μ F	50V	
C26	ECEB1HS4R7	Electrolytic	4.7 μ F	50V	
C27	ECEB1CS100	Electrolytic	10 μ F	16V	
C28	ECEB1CS100	Electrolytic	10 μ F	16V	
C29	ECEB1CS100	Electrolytic	10 μ F	16V	
C30	ECEB1CS100	Electrolytic	10 μ F	16V	
C31	ECEB1CS100	Electrolytic	10 μ F	16V	
C32	ECEB1CS100	Electrolytic	10 μ F	16V	
C33	ECEB1CS100	Electrolytic	10 μ F	16V	
C34	ECEB1CS100	Electrolytic	10 μ F	16V	
C35	829918063	Ceramic	0.1 μ F	50V	PRE112F104Z50V
C36	829918063	Ceramic	0.1 μ F	50V	"
C37	829918063	Ceramic	0.1 μ F	50V	"
C38	829918063	Ceramic	0.1 μ F	50V	"
C39	829918063	Ceramic	0.1 μ F	50V	"
C40	829918063	Ceramic	0.1 μ F	50V	"
C41	829918063	Ceramic	0.1 μ F	50V	"
C42	829918063	Ceramic	0.1 μ F	50V	"
C43	829918063	Ceramic	0.1 μ F	50V	"
C44	829918063	Ceramic	0.1 μ F	50V	"
C45	829918063	Ceramic	0.1 μ F	50V	"
C46	829918063	Ceramic	0.1 μ F	50V	"
C47	829918063	Ceramic	0.1 μ F	50V	"
C48	829918063	Ceramic	0.1 μ F	50V	"
C49	829918063	Ceramic	0.1 μ F	50V	"
C50	829918063	Ceramic	0.1 μ F	50V	"
C52	829918063	Ceramic	0.1 μ F	50V	PRE112F104Z50V
C53	825001410	Ceramic	0.1 μ F	12V	DD600-DC104M12V
C54	825001410	Ceramic	0.1 μ F	12V	"
C55	825001410	Ceramic	0.1 μ F	12V	"
C56	825001410	Ceramic	0.1 μ F	12V	"
C57	825001410	Ceramic	0.1 μ F	12V	"
C58	825001410	Ceramic	0.1 μ F	12V	"
C59	825001410	Ceramic	0.1 μ F	12V	"
C60	825001410	Ceramic	0.1 μ F	12V	"
C61	825001410	Ceramic	0.1 μ F	12V	"
C62	825001410	Ceramic	0.1 μ F	12V	"
C63	825001410	Ceramic	0.1 μ F	12V	"
C64	825001410	Ceramic	0.1 μ F	12V	"

LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
C	825001410	Ceramic 0.1 μ F 12V	DD600-BC104M12V
C66	825001410	Ceramic 0.1 μ F 12V	"
C67	825001410	Ceramic 0.1 μ F 12V	"
C68	8250014140	Ceramic 0.1 μ F 12V	"
C69	829918063	Ceramic 0.1 μ F 50V	RPE112F104Z50V
C70	829918063	Ceramic 0.1 μ F 50V	"
C71	829918063	Ceramic 0.1 μ F 50V	"
C72	825001410	Ceramic 0.1 μ F 12V	DD600-BC104M12V
C73	825001410	Ceramic 0.1 μ F 12V	"
C74	825001410	Ceramic 0.1 μ F 12V	"
C75	825001410	Ceramic 0.1 μ F 12V	"
C76	825001410	Ceramic 0.1 μ F 12V	"
C77	825001410	Ceramic 0.1 μ F 12V	"
C78	825001410	Ceramic 0.1 μ F 12V	"
C79	825001410	Ceramic 0.1 μ F 12V	"
C80	825001410	Ceramic 0.1 μ F 12V	"
C81	825001410	Ceramic 0.1 μ F 12V	"
C82	825001410	Ceramic 0.1 μ F 12V	"
C83	825001410	Ceramic 0.1 μ F 12V	"
C84	825001410	Ceramic 0.1 μ F 12V	"
C85	825001410	Ceramic 0.1 μ F 12V	"
C86	825001410	Ceramic 0.1 μ F 12V	"
C87	825001410	Ceramic 0.1 μ F 12V	"
C88	825001410	Ceramic 0.1 μ F 12V	"
C89	825001410	Ceramic 0.1 μ F 12V	"
C90	825001410	Ceramic 0.1 μ F 12V	"
C91	825001410	Ceramic 0.1 μ F 12V	"
C92	825001410	Ceramic 0.1 μ F 12V	"
C93	825001410	Ceramic 0.1 μ F 12V	"
C94	825001410	Ceramic 0.1 μ F 12V	"
C95	825001410	Ceramic 0.1 μ F 12V	"
C96	825001410	Ceramic 0.1 μ F 12V	"
C97	825001410	Ceramic 0.1 μ F 12V	"
C98	825001410	Ceramic 0.1 μ F 12V	"
C99	825001410	Ceramic 0.1 μ F 12V	"
C100	825001410	Ceramic 0.1 μ F 12V	"
C101	825001410	Ceramic 0.1 μ F 12V	"
C102	825001410	Ceramic 0.1 μ F 12V	"
C103	825001410	Ceramic 0.1 μ F 12V	"
C104	825001410	Ceramic 0.1 μ F 12V	"
C105	825001410	Ceramic 0.1 μ F 12V	"
C106	825001410	Ceramic 0.1 μ F 12V	"
C107	825001410	Ceramic 0.1 μ F 12V	"
C108	825001410	Ceramic 0.1 μ F 12V	"
C109	825001410	Ceramic 0.1 μ F 12V	"
C110	825001410	Ceramic 0.1 μ F 12V	"
C111	825001410	Ceramic 0.1 μ F 12V	"
C112	825001410	Ceramic 0.1 μ F 12V	"
C113	825001410	Ceramic 0.1 μ F 12V	"

LOC.	PART NO.	PART NAME & DESCRIPTION		REMARKS
C114	825001410	Ceramic	0.1 μ F 12V	DD600-BC104M12V
C115	825001410	Ceramic	0.1 μ F 12V	"
C116	825001410	Ceramic	0.1 μ F 12V	"
C117	825001410	Ceramic	0.1 μ F 12V	"
C118	825001410	Ceramic	0.1 μ F 12V	"
C119	825001410	Ceramic	0.1 μ F 12V	"
C120	825001410	Ceramic	0.1 μ F 12V	"
C121	825001410	Ceramic	0.1 μ F 12V	"
C122	825001410	Ceramic	0.1 μ F 12V	"
C123	825001410	Ceramic	0.1 μ F 12V	"
C124	825001410	Ceramic	0.1 μ F 12V	"
C125	825001410	Ceramic	0.1 μ F 12V	"
C126	825001410	Ceramic	0.1 μ F 12V	"
C127	825001410	Ceramic	0.1 μ F 12V	"
C128	ECK D2H102KB	Ceramic	1000PF	
C129	ECK D2H102KB	Ceramic	1000PF	
C130	ECK D1H471MB	Ceramic	470PF	
C131	ECK D1H471MB	Ceramic	470PF	
C132	ECC D1H220KC	Ceramic	22PF	
Q1	2SC828A-R	Transister		
Q2	2SA564A-R	Transister		
Q3	2SA720-S	Transister		
Q4	2SC828A-R	Transister		
Q5	2SA720-S	Transister		
VR1	849916017	Variable resister	10K Ω	PN822H103H
IR2			1K Ω	
IR3			1K Ω	
J1	969926050	Short pin		Z-152-16P
J2	969926050	Short pin		Z-152-16P
J3	969926050	Short pin		Z-152-16P
J5	969926053	Short pin		Z-149-3P
J6	969926053	Short pin		Z-149-3P
J10	969926053	Short pin		Z-149-3P
J12	969926053	Short pin		Z-149-3P
J13	969926048	Short pin		Z-149-3P

LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
J14	969926048	Short pin	Z-152-2P
J15	969926048	Short pin	Z-152-2P
J16	969926048	Short pin	Z-152-2P
J17	969926048	Short pin	Z-152-2P
J20	969926053	Short pin	Z-149-3P
J26	969926053	Short pin	Z-149-3P
J40	969926053	Short pin	Z-149-3P
J41	969926053	Short pin	Z-149-3P
J44	969926048	Short pin	Z-152-2P
J46	969926053	Short pin	Z-149-3P
J47	969926053	Short pin	Z-149-3P
J48	969926048	Short pin	Z-152-2P
J54	969926053	Short pin	Z-149-3P
J55	969926053	Short pin	Z-149-3P
J56	969926053	Short pin	Z-149-3P
	919926190	Short plug	Z-128
D1	MA162	Diode	
BZ	EAF14R06C	Buzzer	
	212D40301250	Crystal	15.9744MHz
D3,4,7,10,11 13,17,21	TM-027	Check pin	
4H	DL2-24A	Socket	
10A	DL2-24A	Socket	
PWD	UFP-03A02#2	Connector	
DTE1~3	919023625	Housing	DBC-25S-F0
	919904002	Guide	D20418-J2
	03-50659	Pin	
	030-50660	Pin	
	015-0350-000	Bracket	
KB	FF-20-002	Connector	

7.7 DDPLL PCB (for JD-740M, 840M, 850M)

7.7.1 OUTLINE

The DDPLL PCB is a phase lock loop consisting of a:

- Phase Comparator
- Low Pass Filter
- Voltage Controlled Oscillator (VCO).
- VCO Divider
- Window Generator

The VCO phase makes it capable of synchronizing with the incoming read data from the drive. If the phase changes, indicating the read data Frequency is changing, the Phase Comparator and the Low Pass Filter output voltage increases or decreases just enough to keep the oscillator frequency the same as the frequency of the read data, preserving the synchronized condition.

(1) Phase Comparator

The function of the Phase Comparator is to synchronize the VCO frequency to the frequency of the read data.

(2) Low Pass Filter

The Low Pass Filter translate pulsative signal of the Phase Comparator into DC voltage.

(3) Voltage Controlled Oscillator (VCO)

The VCO consists of IC (SN74LS124), etc. The frequency of VCO is controlled by DC voltage from Low Pass Filter.

(4) VCO Divider

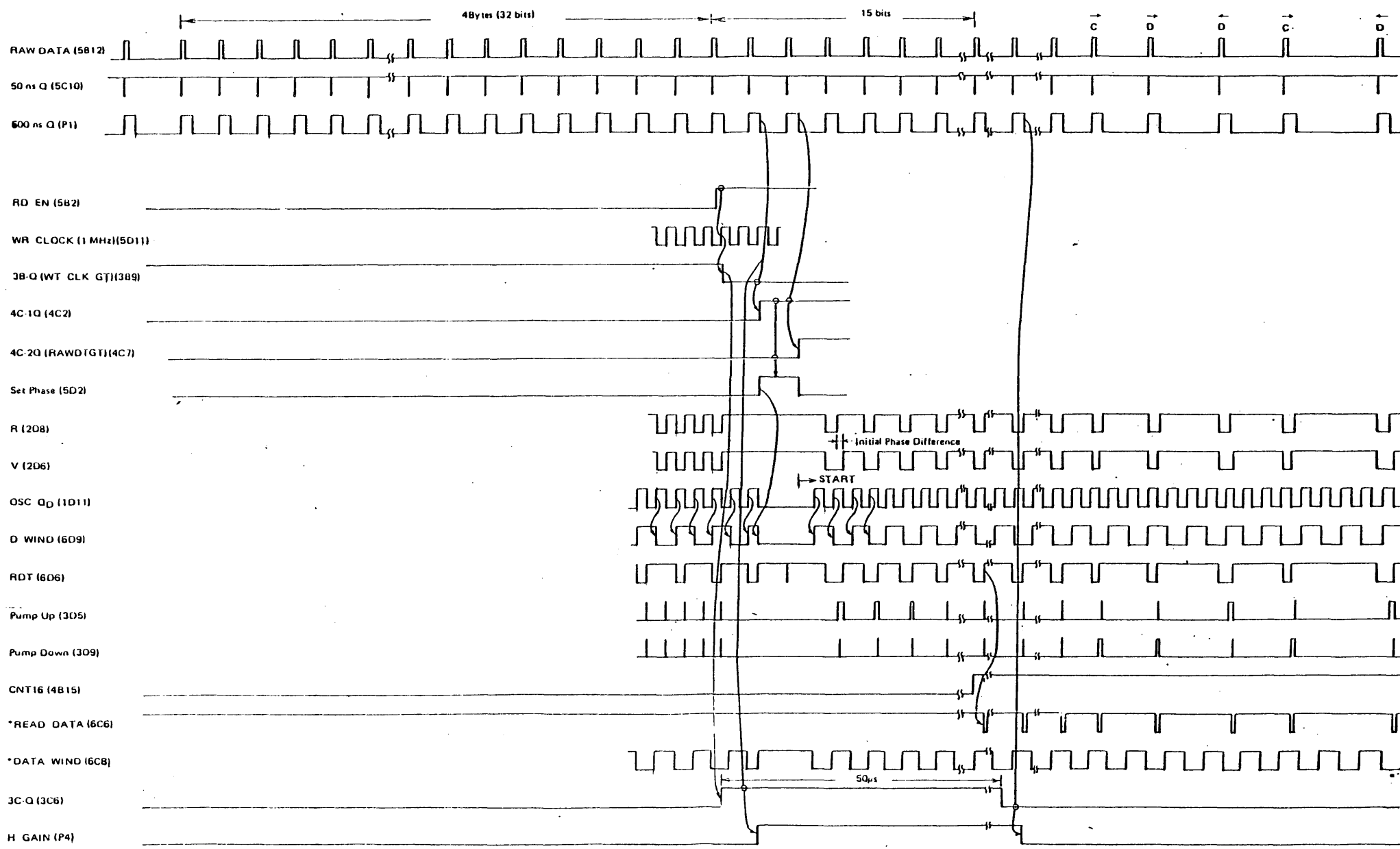
The function of VCO Divider is to divide a frequency of VCO by counter.

(5) Window Generator

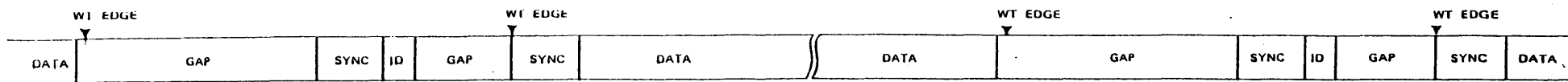
One Clock and one Data Window is generated for every bit cell.

- Timing chart is shown on the next page.

7.7.2 TIME CHART OF DDPLL



7-51

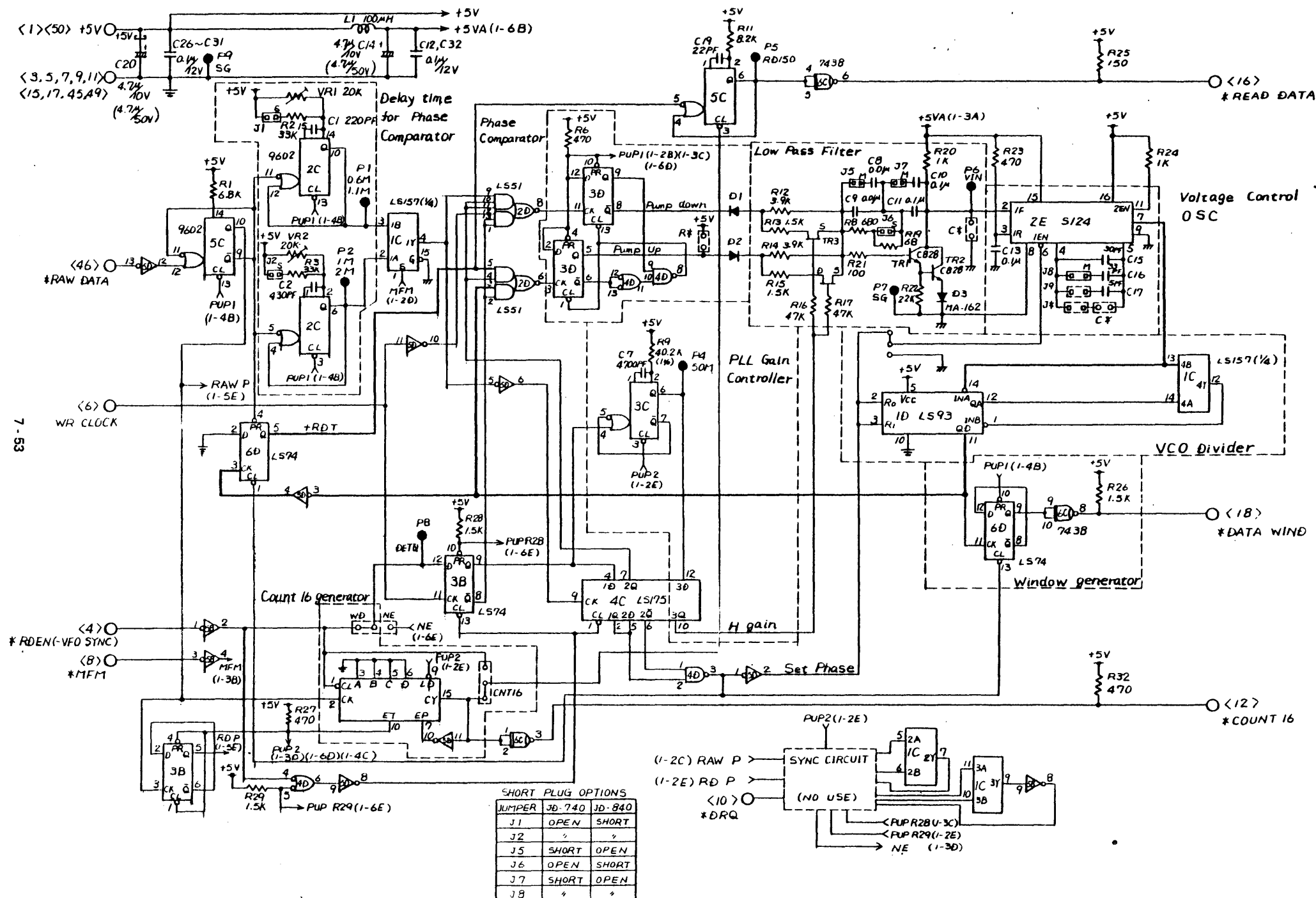


H GAIN (4C10)

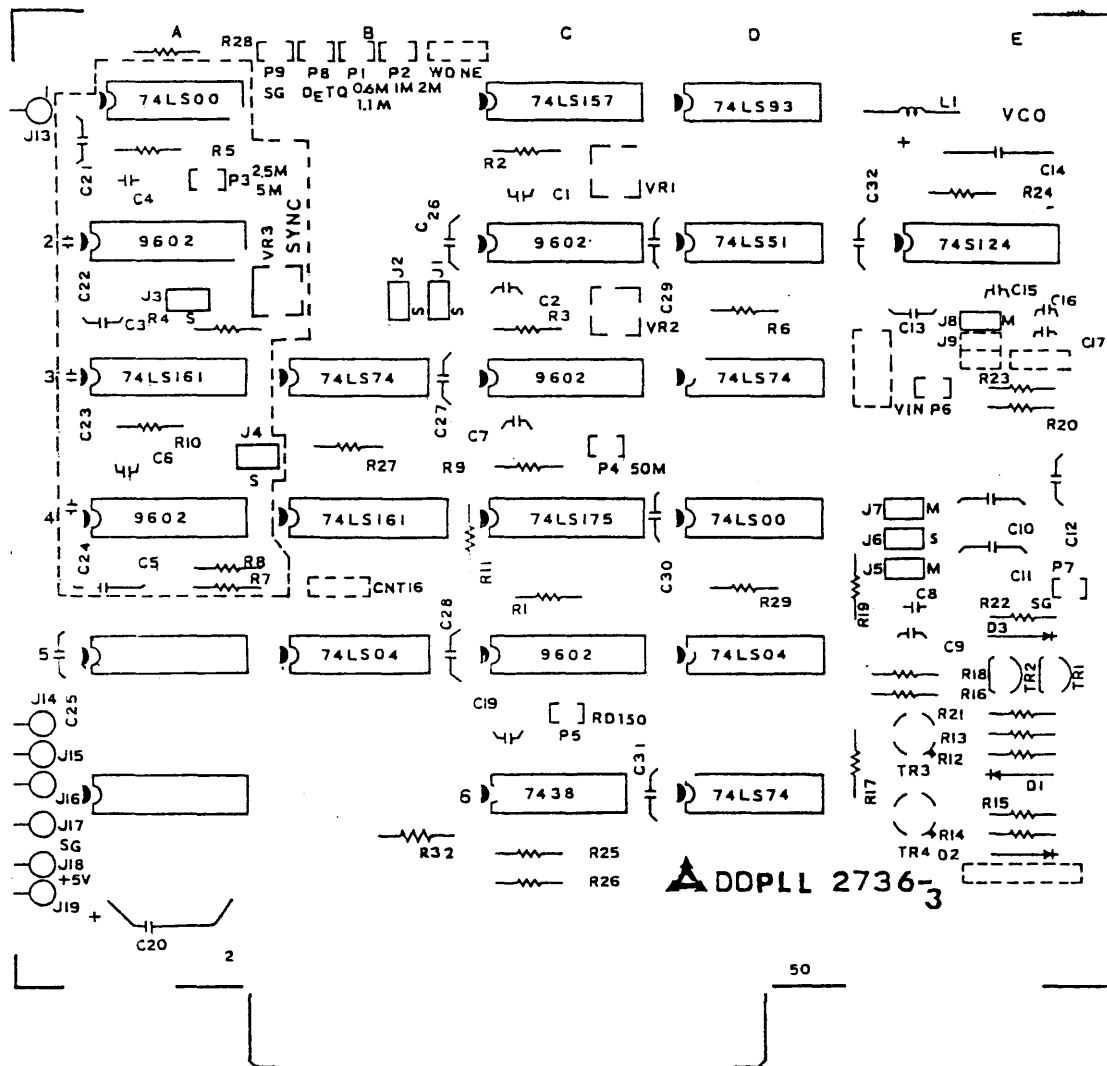
SET PHASE (5D2)

VIN (P6)

7-52



7.7.4 JD-740M, JD-840M DDPLL COMPONENT LOCATION



LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
3 B	SN74LS74N	IC	
4 B	SN74LS161N	"	
5 B	SN74LS04N	"	
1 C	SN74LS157N	"	
2 C	FC-9602PC	"	
3 C	FC-9602PC	"	
4 C	SN74LS175N	"	
5 C	FC-9602PC	"	
6 C	SN7438N	"	
1 D	SN74LS93N	"	
2 D	SN74LS51N	"	
3 D	SN74LS74N	"	
4 D	SN74LS00N	"	
5 D	SN74LS04N	"	
6 D	SN74LS74N	"	
2 E	SN74LS124N	"	
TR1	2SC828A-R	Transistor	
TR2	2SC828A-R	"	
TR3	3SK-49R	"	
TR4	3SK-49R	"	
D 1	MA-162	Diode	
D 2	MA-162	"	
D 3	MA-162	"	
R 1	ERD25TJ682	Carbon 68k Ω 1/4W	
R 2	ERD25TJ333	" 33k Ω 1/4W	
R 3	ERD25TJ333	" 33k Ω 1/4W	

LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
R 6	ERD25TJ471	Carbon 470 Ω 1/4W	
R 9	ERO25CKF4022	Metal 402k Ω 1/4W	
R11	ERD25TJ822	Carbon 8.2k Ω 1/4W	
R12	ERD25TJ392	" 3.9k Ω 1/4W	
R13	ERD25TJ152	" 1.5k Ω 1/4W	
R14	ERD25TJ392	" 3.9k Ω 1/4W	
R15	ERD25TJ152	" 1.5k Ω 1/4W	
R16	ERD25TJ473	" 47k Ω 1/4W	
R17	ERD25TJ473	" 47k Ω 1/4W	
R18	ERD25TJ681	" 680 Ω 1/4W	
R19	ERD25TJ680	" 68 Ω 1/4W	
R20	ERD25TJ102	" 1 k Ω 1/4W	
R21	ERD25TJ101	" 110 Ω 1/4W	
R22	ERD25TJ223	" 22k Ω 1/4W	
R23	ERD25TJ471	" 470 Ω 1/4W	
R24	ERD25TJ102	" 1k Ω 1/4W	
R25	ERD25TJ151	" 150 Ω 1/4W	
R26	ERD25TJ152	" 1.5k Ω 1/4W	
R27	ERD25TJ471	" 470 Ω 1/4W	
R28	ERD25TJ152	" 1.5k Ω 1/4W	
R29	ERD25TJ152	" 1.5k Ω 1/4W	
R32	ERD25TJ471	Carbon 470 Ω 1/4W	
VR1	849916018	Variable resistor 20k Ω	PN822H203H
VR2	849916018	" 20k Ω	"
L 1	932320013	Coil 100 μ H	FDL-101

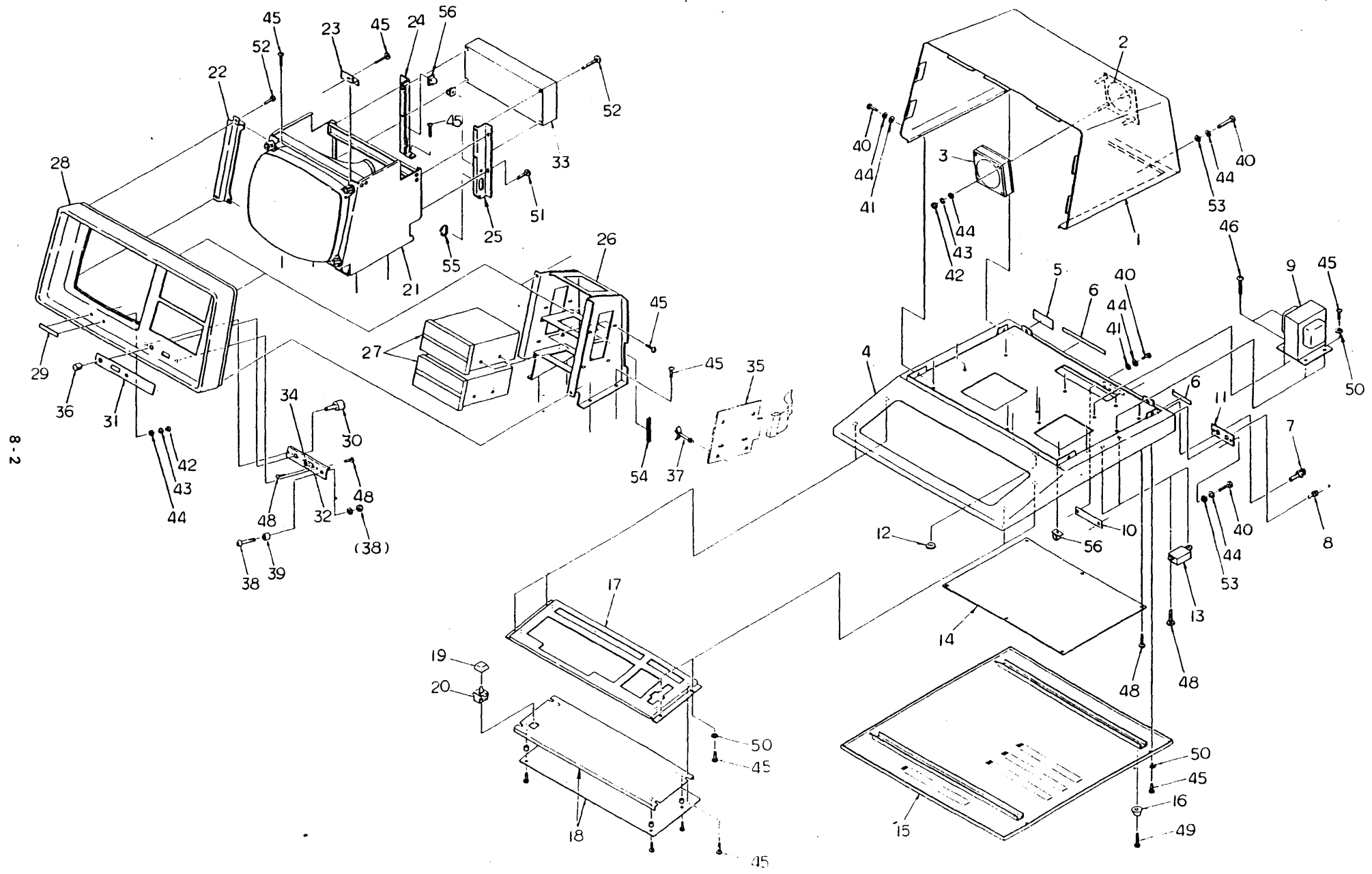
LOC.	PART NO.	PART NAME & DESCRIPTION			REMARKS
C 1	825311122	Mica	220p		DM10C221J1
C 2	825330143	"	430p		DM15C431J1
C 7	ECQM1H472KZ	Myler	4700p		
C 8	ECQM1H103KZ	"	0.01 μ		
C 9	ECQM1H103KZ	"	0.01 μ		
C10	ECQM1H104KZ	"	0.1 μ		
C11	ECQM1H104KZ	"	0.1 μ		
C12	825001410	Ceramic	0.1 μ	12V	BC104M12V
C13	825001410	"	0.1 μ	12V	"
C14	ECEB1AS470	Electrolytic	47 μ	10V	
C15	825310030	Mica	30p		DM10C300J1
C16	825301033	"	33p		DM05C330J1
C17	825300050	"	5p		DM05C050J1
C19	ECCD1H220KC	Ceramic	22p		
C20	ECEB1AS470	Electrolytic	47 μ	10V	
C26	825001410	Ceramic	0.1 μ	12V	BC104M12V
C27	825001410	"	"	"	"
C28	825001410	"	"	"	"
C29	825001410	"	"	"	"
C30	825001410	"	"	"	"
C31	825001410	"	"	"	"
C32	825001410	"	"	"	"
	969926048	Short Pin			Z-152-2P
	919926190	Short Plug			Z-128

8. ASSEMBLY

General

The illustrated Part Catalog is arranged so that the figures precede the parts lists and will be on the opposite page.

The JD-700M/800M series assembly is contained on 13 pages.



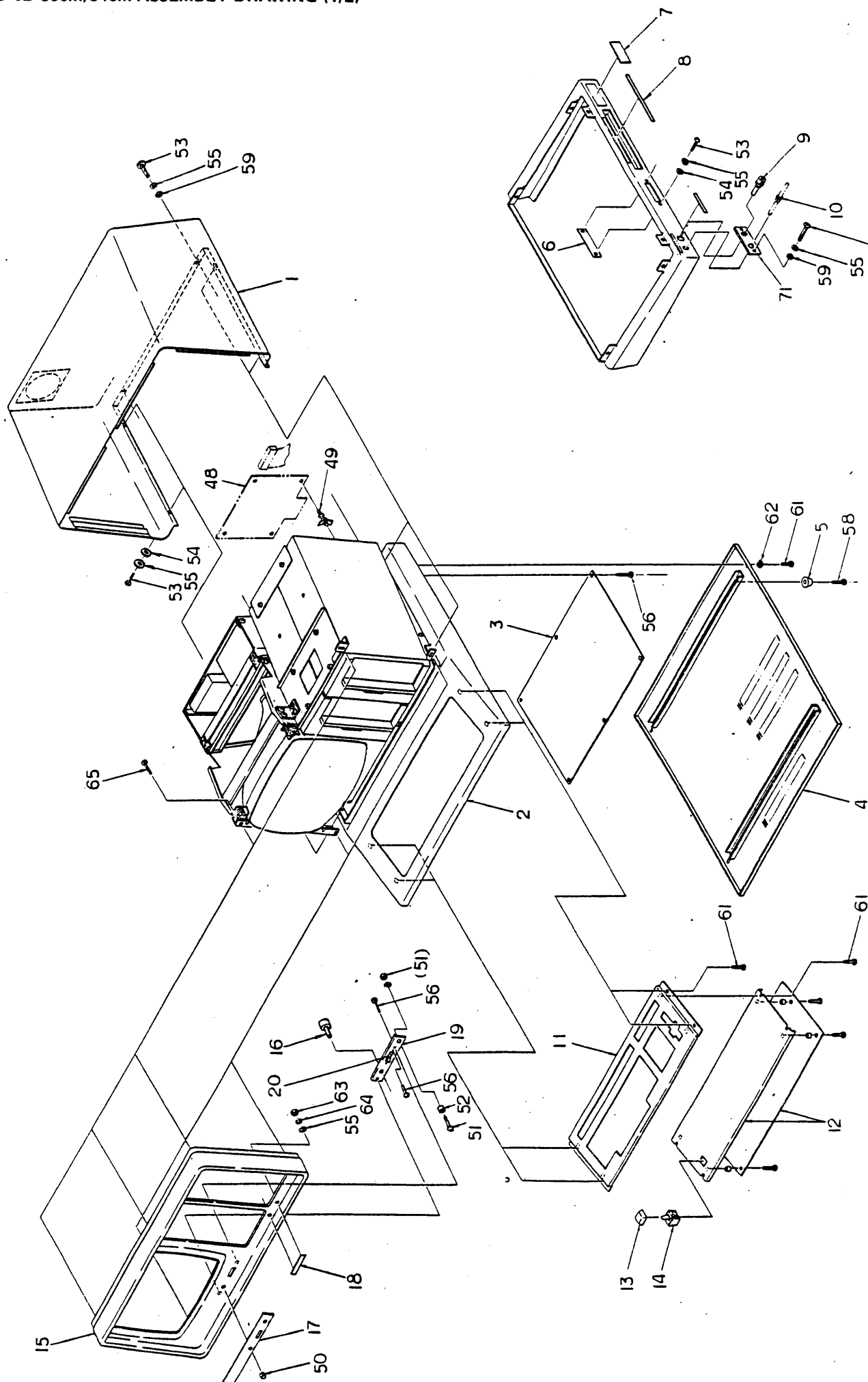
8.2 JD-700M/740M MAIN PARTS LIST

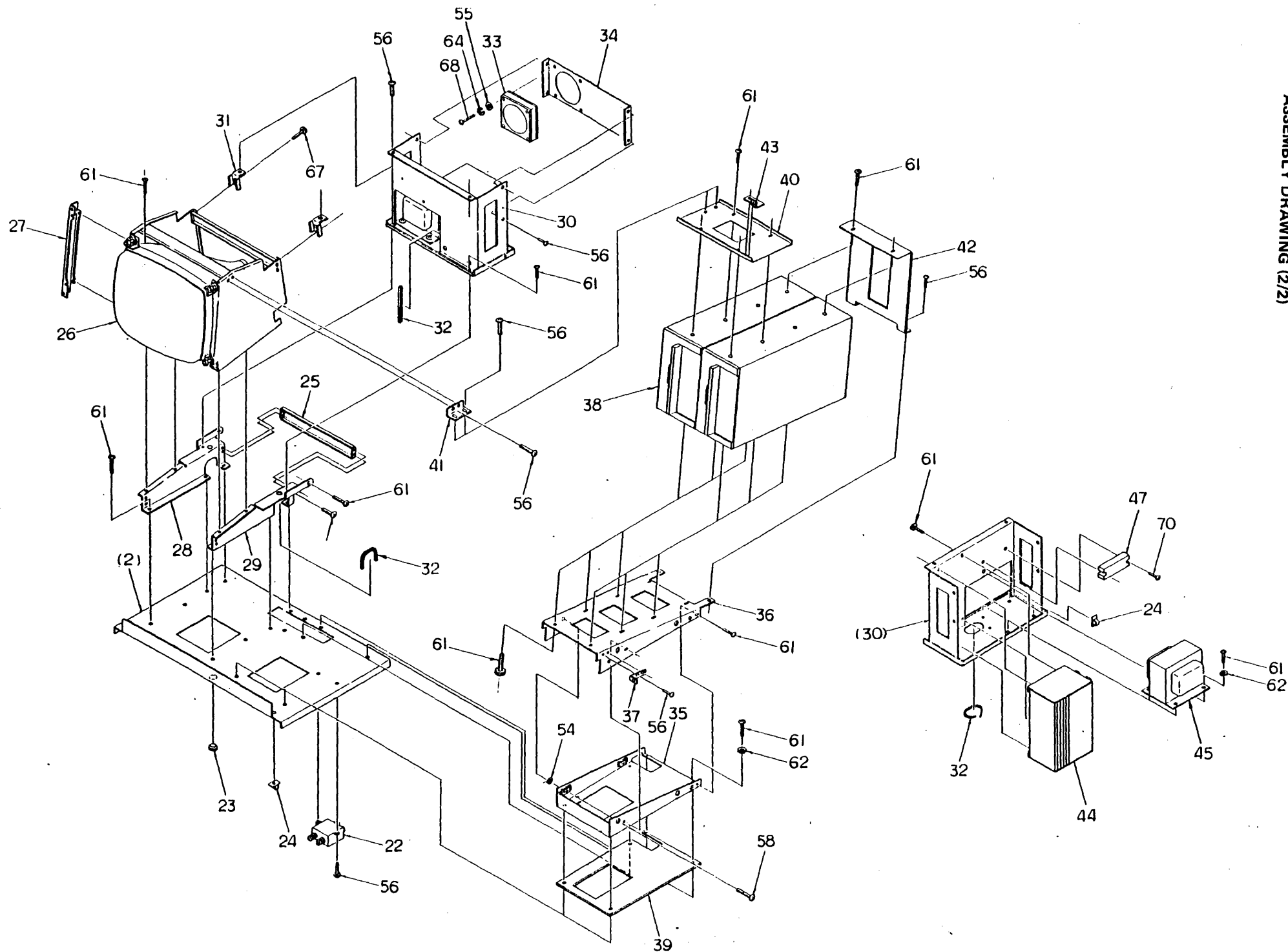
LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
1	212D161-10274	Upper Cover	
2	212D468-07183	Fan Net	
3	WEJ55B4	Fan	
4	256D161-13800	Base Chassis	
5	212D435-01080	Main Name Plate	
6	212D435-01570	Seal 120V AC	
"	212D435-01620	Seal 220V AC	
"	212D435-01630	Seal 240V AC	
7	932006022	Fuse Holder 100/120V	FH-032
"	FH-033	Fuse Holder 220/240V	
8	KR-51	Code Bushing	
9	212D343-00451	Transformer SBCT11 100/120V	
"	212D343-00461	Transformer SBCT21 220/240V	
10	256D461-11640	Blank Panel	
11	256D461-14030	Code Panel	BKS07
12	G26	Grommet	
13	ME-202V	AC Line Filter	
14	SBCV3	Main Circuit Board Assy	
15	256D261-13790	Bottom Cover	
16	K-8	Rubber Foot 7028	4 PCS/set
17	256D361-14040	Key Board Panel	
18	SBCKBASC	Key Board Assy	for Alphabet Type
"	SBCKBGERM	Key Board Assy	for German Type
18	SBCKBJIS	Key Board Assy	for JIS Type
19		Key Top	Order Key Top with Key No.
20	CK4C208B	Key Switch	
21	212D459-00431	B/W Monitor TV	TR12DG9F
22	212D463-23150	TV Bracket	
23	212D463-23160	Bracket/2	
24	212D463-23180	PSU Plate/R	
25	212D463-23190	PSU Plate/L	
26	212D363-23910	Mount Angle Assy	
27	JK-874	Mini Floppy Disk Drive	2 PCS/set for JD700M
"	JK-875	Mini Floppy Disk Drive	2 PCS/set for JD740M
28	212D268-11470	Escutcheon	
29	N/A	Panasonic Badge	
30	EVVBIAF20E52	Variable Resister	

JD-700M/740M MAIN PARTS LIST (CONT'D)

LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
31	212D435-01610	Front Name Plate JD-700M	
"	212D435-01510	Front Name Plate JD-740M	
32	212D463-2390	Switch Holder	
33	212D451-00111	Power Supply	EHBSC33B01TB
34	SDE3SB-1	Main Switch 100/120V	
"	SDE3SB-E-1	Main Switch 220/240V	
35	DDPLL	Floppy Interface Board Assy	for JD740M
36	K8075	Knob	
37	LCBS-14N	Plastic Holder	for JD740M
38	DB2R(B)	LED	With Nut
39	212D468-12040	Color	
40	N/A	M3x6 Screw XSB3+6FC	
41	"	M3 Nylon Washer PW3NYLON	
42	"	M3 Nut XNG3FX	
43	"	M3 Spring Washer XWA3FX	
44	"	M3 Plane Washer XWG3FX	
45	"	M4x8 Screw XYN4+F8FX	
46	"	M4x10 Screw XYN4+F10FX	
48	N/A	M3x6 Screw XYN3+F6FX	
49	"	M4x14 Screw XYN4+C14FX	
50	"	M4 Star Washer YWC4C	
51	"	M3x6 Tapping XTN3+6DFX	
52	"	M3x8 Screw XYN3+F8FX	
53	"	M3 Star Washer YWC3C	
54	KG016	Frexible Bush	
55	KG012	Frexible Bush	
56	DKS07	Cable Clamper	

8.3 JD-800M/840M ASSEMBLY DRAWING (1/2)





8.4 JD-800M/840M MAIN PARTS LIST

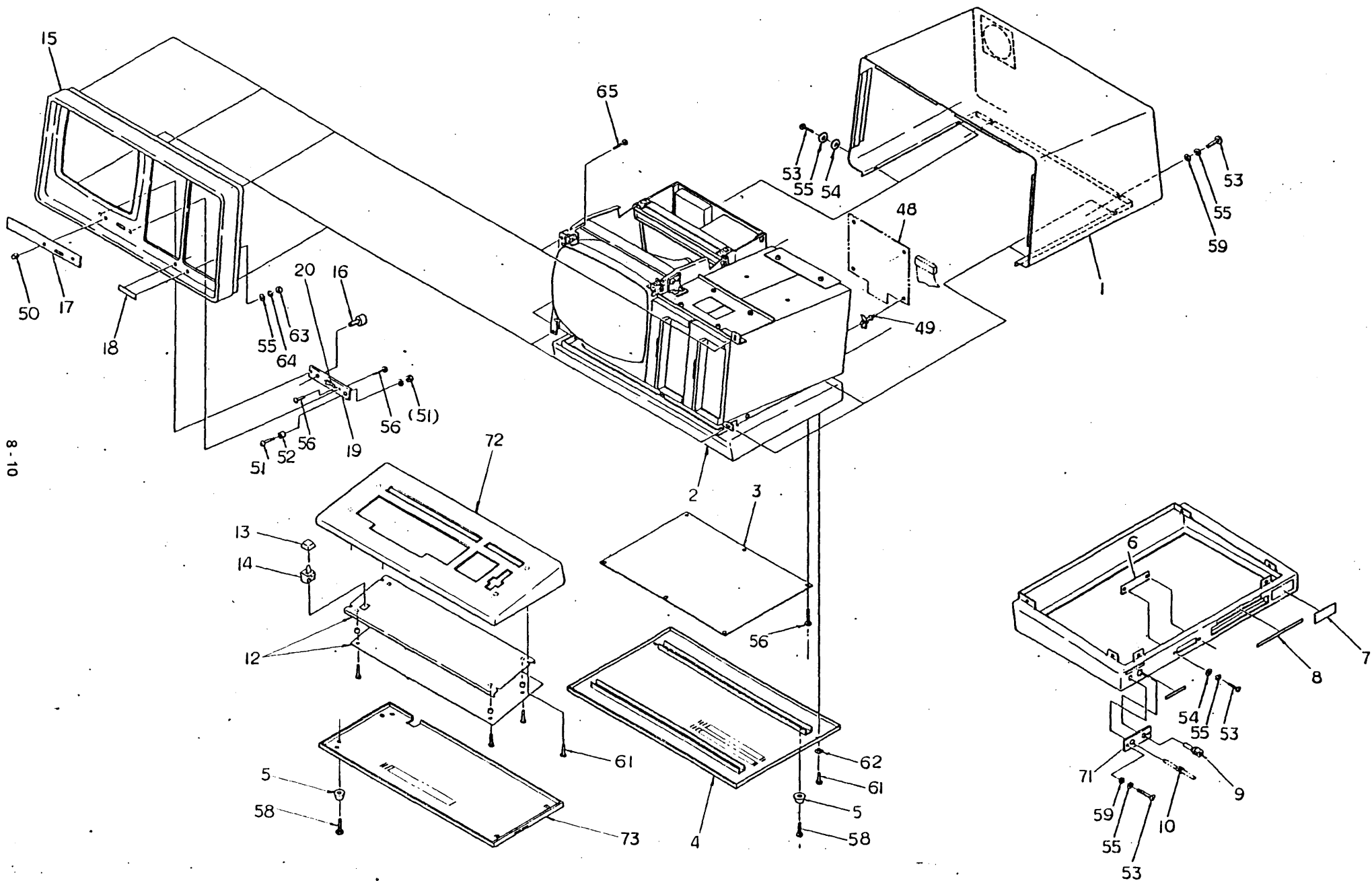
LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
1	256D161-10992	Upper Cover	
2	256D161-13800	Base Chassis	
3	SBCV3	Main Circuit Board Assy	
4	256D261-13790	Bottom Cover	
5	K-8	Rubber Foot 7028	4 PCS/set
6	256D461-11640	Blank Panel	
7	212D435-01080	Main Name Plate	
8	212D435-01570	Seal 120V AC	
"	212D435-01620	Seal 220V AC	
"	212D435-01630	Seal 240V AC	
9	932006022	Fuse Holder 100/120V	FH-032
"	FH-033	Fuse Holder 220/240V	
10	KR-51	Code Bushing	
11	256D361-14040	Key Board Panel	
12	SBCKBASC	Key Board Assy	for Alphabet Type
"	SBCKGERM	Key Board Assy	for German Type
12	SBCKBJIS	Key Board Assy	for JIS Type
13		Key Top	Order Key Top with Key No.
14	CK4C208B	Key Switch	
15	256D268-11480	Escutcheon	
16	EVVBIAF20E52	Variable Resister	
17	256D435-01590	Front Name Plate JD800M	
"	256D435-01580	Front Name Plate JD840M	
18	N/A	Panasonic Badge	
19	212D463-23900	Switch Holder	
20	SDE3SB-1	Main Switch 100/120V	
"	SDE3SB-E-1	Main Switch 220/240V	
22	GT-205V	AC Line Filter	
23	G26	Grommet 7126	
24	DKS07	Cable Clamper	
25	256D463-23290	Stay	
26	212D459-00431	B/W Monitor TV	TR12DG9F
27	256D463-23260	Bracket/R	
28	256D363-23320	Foot/R	
29	256D363-23310	Foot/L	
30	256D263-23350	Power Supply Panel	

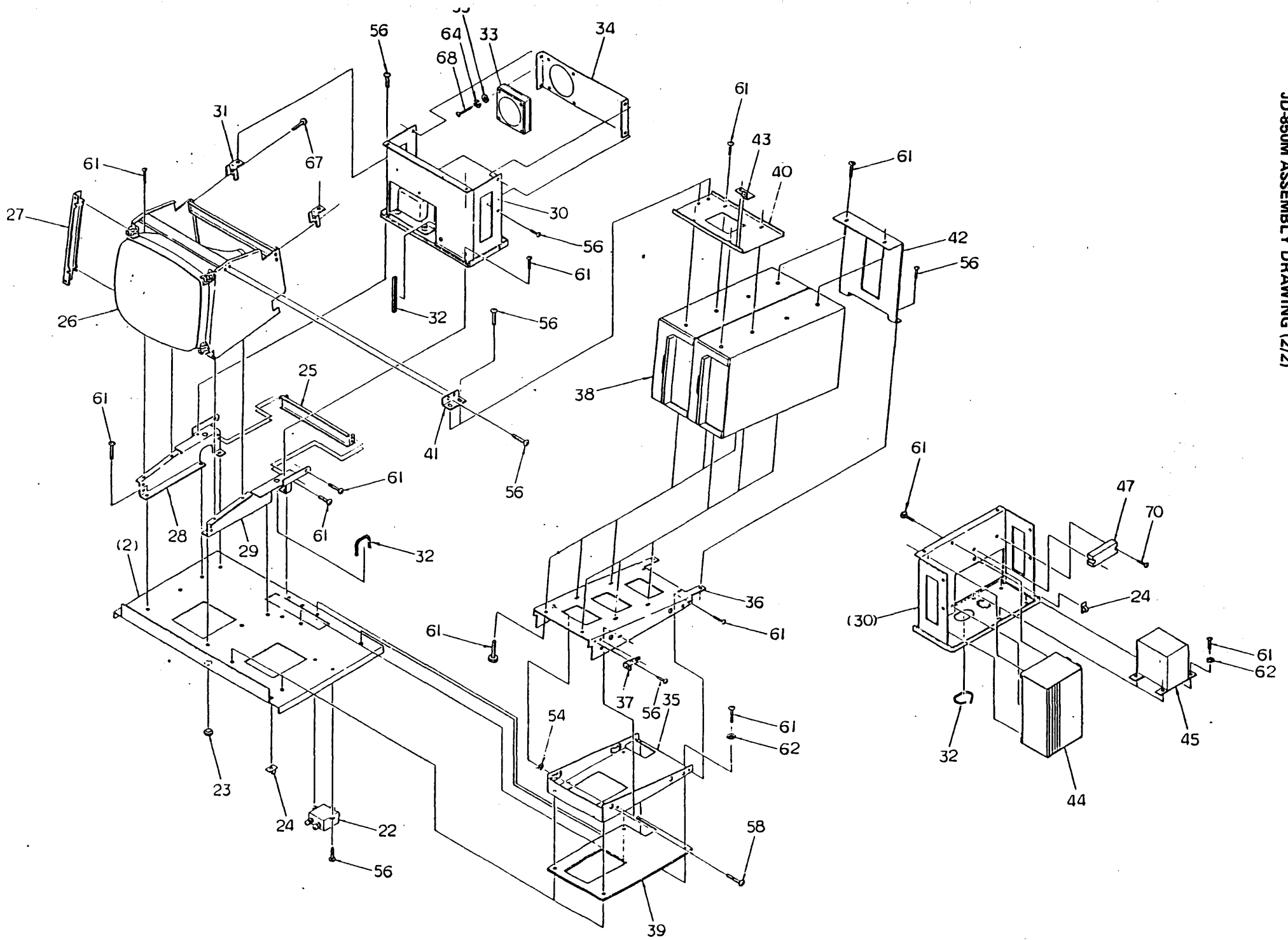
JD-800M/840M MAIN PARTS LIST (CONT'D)

LOC.	PART NO.	PART NAME & DESCRIPTION		REMARKS
31	256D463-23590	Angle/3		
32	KG016	Frexible Bush		
33	WEJ55B4	Fan		
34	256D363-23330	Fan Panel		
35	256D363-16994	FD Angle		
36	256D363-16984	FD Chassis		
37	256D463-23270	FD Bracket/1		
38	JK880350E1	Floppy Disk Drive	50Hz	2 PCS/set for JD800M
"	JK880360E1	Floppy Disk Drive	60Hz	2 PCS/set for JD800M
"	JK885SD50B	Floppy Disk Drive	50Hz	2 PCS/set for JD840M
"	JK885SD60B	Floppy Disk Drive	60Hz	2 PCS/set for JD840M
39	256D463-20800	FD Mat		
40	256D463-23240	FD Upper Panel		
41	256D463-23300	TV Angle		
42	256D363-21820	FD Back Panel		
43	256D463-23280	Angle		
44	EHBSC34BOLTB	Power Supply		
45	256D343-00471	Transformer SBCT31	100/120V	
"	256D343-00481	Transformer SBCT41	220/240V	
47	F126-5P	Terminal		
48	DDPLL	Floppy Interface Board Assy		for JD840M
49	LCBS-04N	Plastic Holder		for JD840M
50	K8075	Knob		
51	DB2R(B)	LED		With Nut
52	212D468-12040	Color		
53	N/A	M3x6 Screw	XSB3+6FC	
54	"	M3 Nylon Washer	PW3NYLON	
55	"	M3 Plane Washer	XWE3FX	
56	"	M3x6 Screw	XYN3+F6FX	
58	N/A	M4x14 Screw	XYN4+F14FX	
59	"	M3 Star Washer	YWC3C	
61	N/A	M4x8 Screw	XYN4F8FX	

JD-800M/840 MAIN PARTS LIST (CONT'D)

[illegible]





8.6 JD-850M MAIN PARTS LIST

(1/2)

LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
1	256D161-10992	UPPER COVER	
2	256D161-15130	BASE CHASSIS	
3	SBCV4	MAIN CIRCUIT BOARD ASSY	
4	256D261-15150	BOTTOM COVER/1	
5	K-8	RUBBER FOOT 7028	4 PCS/SET
6	256D461-11640	BLANK PANEL	
7	212D435-01080	MAIN NAME PLATE	
8	212D435-01570	SEAL 120V AC	
"	212D435-01620	SEAL 220V AC	
"	212D435-01630	SEAL 240V AC	
9	932006022	FUSE HOLDER 100/120V	FH-032
"	FH-033	FUSE HOLDER 220/240V	
10	KR-51	CODE BUSHING	
11			
12	SBCKBASC	KEY BOARD ASSY	for Alphabet Type
"	SBCKGERM	KEY BOARD ASSY	for German Type
12	SBCKBJIS	KEY BOARD ASSY	for JIS Type
13		KEY TOP	Order Key Top with Key No.
14	CK4C208B	KEY SWITCH	
15	256D268-11480	ESCUTCHEON	
16	EVVBIAF20E52	VARIABLE RESISTER	
17	N/A	FRONT NAME PLATE JD850M	
18	N/A	PANASONIC BADGE	
19	212D463-23900	SWITCH HOLDER	
20	SDE3SB-1	MAIN SWITCH 100/120V	
"	SDE3SB-E-1	MAIN SWITCH 220/240V	
22	GT-205V1	AC LINE FILTER	
23	G26	GROMMET 7126	
24	DKS07	CABLE CLAMPER	
25	256D463-23290	STAY	
26	212D459-00431	B/W MONITOR TV	TR12DG9F
27	256D463-23260	BLACKET/R	
28	256D363-23320	FOOT/R	
29	256D363-23310	FOOT/L	
30	256D263-26831	POWER SUPPLY PANEL	

JD-850M MAIN PARTS LIST (CONT'D)

LOC.	PART NO.	PART NAME & DESCRIPTION	REMARKS
31	256D463-23590	ANGLE/3	
32	KG016	FREXIBLE BUSH	
33	WEJ55B4	FAN	
34	256D363-23330	FAN PANEL	
35	256D363-16994	FD ANGLE	
36	256D363-16984	FD CHASSIS	
37	256D463-23270	FD BRACKET/1	
38	JK885SD50B	FLOPPY DISK DRIVE 50Hz	2 PCS/set for JD850M
	JK885SD60B	FLOPPY DISK DRIVE 60Hz	2 PCS/set for JD850M
39	256D463-20800	FD MAT	
40	256D463-23240	FD UPPER PANEL	
41	256D463-23300	TV ANGLE	
42	256D363-21820	FD BACK PANEL	
43	256D463-23280	ANGLE	
44	FHBSC34B01TB	POWER SUPPLY	
45	256D343-00483	TRANSFORMER SBCT42 100/120V 220/240V	
47	F126-5P	TERMINAL	
48	DDPLL	FLOPPY INTERFACE BOARD ASSY	
49	LCBS-04N	PLASTIC HOLDER	
50	K8075	KNOB	
51	DB2R(B)	LED	with Nut
52	212D468-12040	COLOR	
53	N/A	M3×6 SCREW XSB3+6FC	
54	"	M3 NYLON WASHER PW3NYLON	
55	"	M3 PLANE WASHER XWE3FX	
56		M3×6 SCREW XYN3+F6FX	
58	N/A	M4×14 SCREW XYN4+F14FX	
59	"	M3 STAR WASHER YWC3C	
61	N/A	M4×8 SCREW XYN4F8FX	
62	N/A	M4 STAR WASHER YWC4C	
63	"	M3 NUT XNG3FC	
64	"	M3 SPRING WASHER XWA3FC	
65	"	M3×8 SCREW XYN3+F8FX	

9. TROUBLE-SHOOTING

9.1 PROCEDURES OF TROUBLE-SHOOTING

Refer to next check list for hearing about troubles by user.

CHECK LIST

- 1) When did the trouble happen?
- 2) Does the fan work?
- 3) Does the light of FDD illuminate?
- 4) Does system work when another system disk is set?
- 5) Is FLOPPY disk inserted properly?
- 6) Is there any noise when head of FDD load?
- 7) Can anything make Key-In from keyboard?
- 8) Is anything displayed properly?
- 9) Does peripheral equipment work correctly?

When trouble occurs, check its aspect and condition, investigate its cause referring to 9.2 Trouble-shooting guidance, check troubled part referring to operational

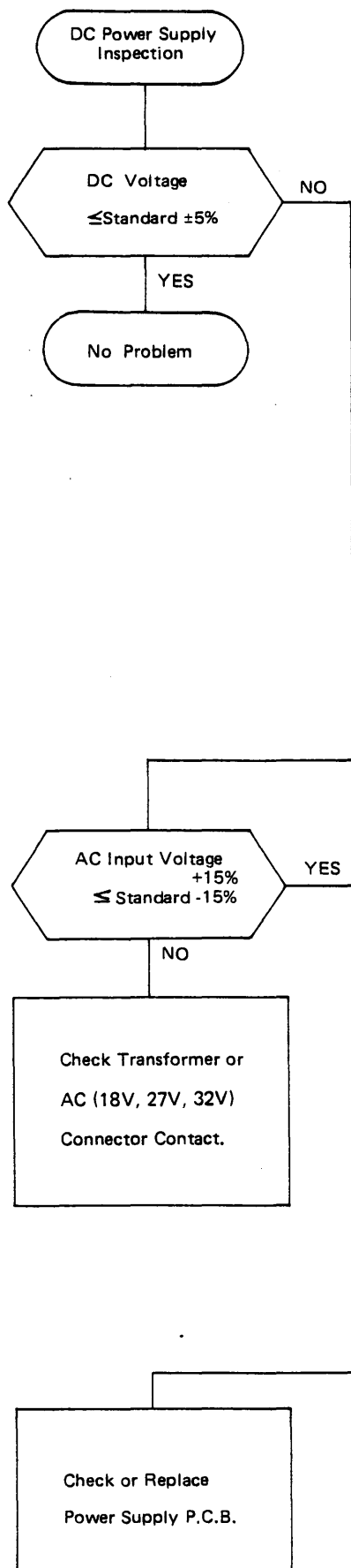
description and timing chart of each part, then apply trouble-shooting work.

9.2 TROUBLE-SHOOTING GUIDANCE

Item	Check Point or Reference Section
Fan noise is not present.	Examine Fuse, Main Cord, Main Switch or Transformer
FDD LED is not illuminated.	9.2.1 DC Power Supply Inspection 9.2.6 Control PCB Inspection
FDD Error	9.2.2 FDD and FDC Inspection
K/B Error	9.2.3 K/B Inspection
Monitor TV Trouble	9.2.4 Monitor TV and TV Controller Inspection
Peripheral Error	9.2.5 Port Inspection
Another Error	9.2.6 Control PCB Inspection

Tab. 9.1 TROUBLE-SHOOTING GUIDANCE

9.2.1 DC POWER SUPPLY INSPECTION



		Check Point (DC)			
		+24VDC	+12VDC	+5VDC	-12VDC
JD-700 740	Power Supply		Orange Wire - GND	Red Wire - GND	Blue Wire - GND
	FDD		J2-pin 1	J2-pin 4	
	Control PCB		C28 (16H) $\rightarrow \oplus^{*1}$	C27 (16H) $\rightarrow \oplus^{*1}$	C25 (16H) $\rightarrow \ominus^{*2}$
	Monitor TV		Power Connector		
JD-800 840 (850)	Power Supply	Yellow Wire (A-pin 10)	Orange Wire (A-pin 7)	Red Wire (B-pin 1)	Blue Wire (B-pin 10)
	FDD	J5-pin 1		J5-pin 5	J5-pin 4
	Control PCB		C26 (16H) $\rightarrow \oplus^{*1}$	C27 (16H) $\rightarrow \oplus^{*1}$	C25 (16H) $\rightarrow \ominus^{*2}$
	Monitor TV		Power Connector		
Permissible Voltage		22.8V ~ 25.2V	11.4V ~ 12.6V	4.75V ~ 5.25V	-11.4V ~ -12.6V

*1 Plus Pole

*2 Minus Pole

		Check Point (AC Input)			
		30VAC	27VAC	18VAC	
JD-700 740	Power Supply		Orange Pair Wire	Blue Pair Wire	
JD-800 840 850	Power Supply	Red Pair Wire (A-pin 1 - A-pin 2)	Orange Pair Wire (B-pin 5 - B-pin 6)	Blue Pair Wire (A-pin 3 - A-pin 4)	Should Remove Fan Panel
Permissible Voltage		25.5V ~ 33V	23V ~ 29.7V	15.3V ~ 19.8V	

Refer to Power Supply Schematics. (3.1.7, 3.2.7)

Fig. 9 - 1 POWER SUPPLY

9.2.2 FDD AND FDC INSPECTION

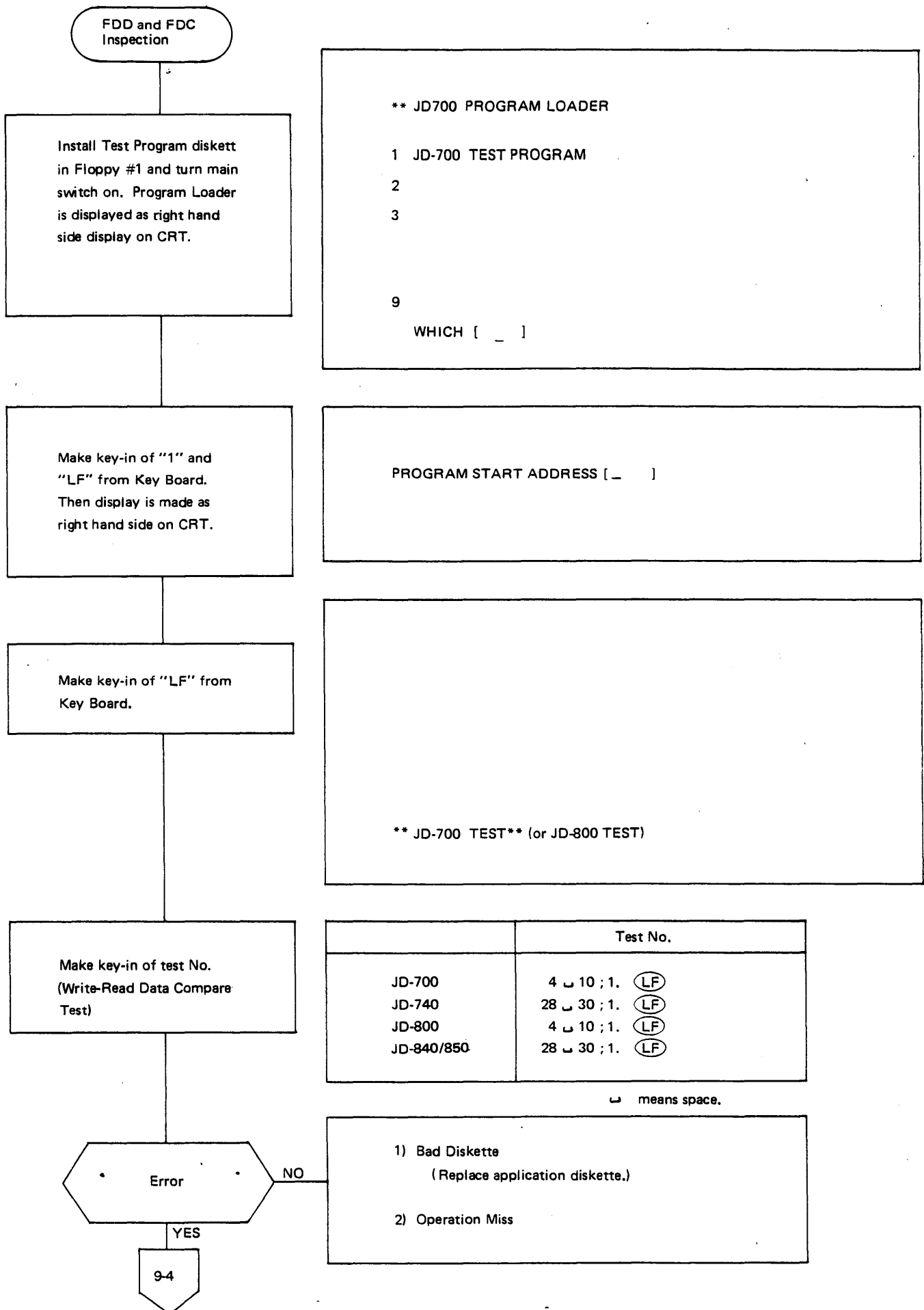


Fig. 9 - 2 FDD & FDC (1/2)

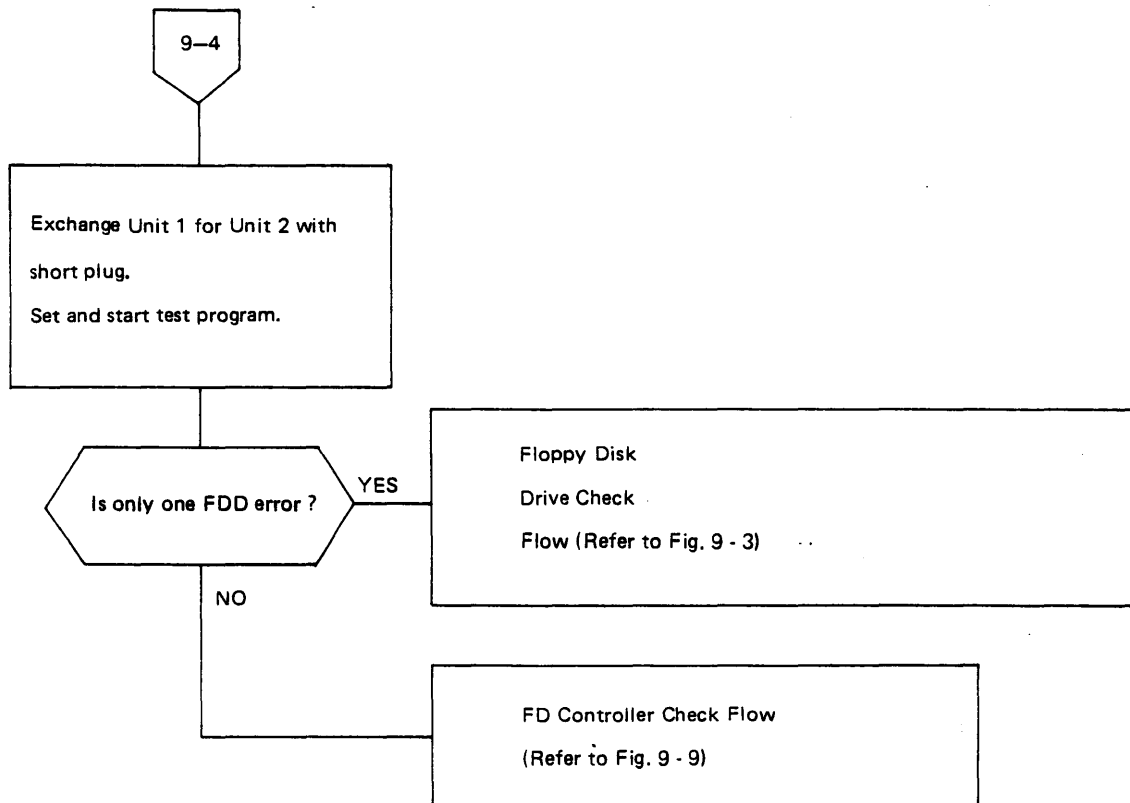


Fig. 9 - 2 FDD & FDC (2/2)

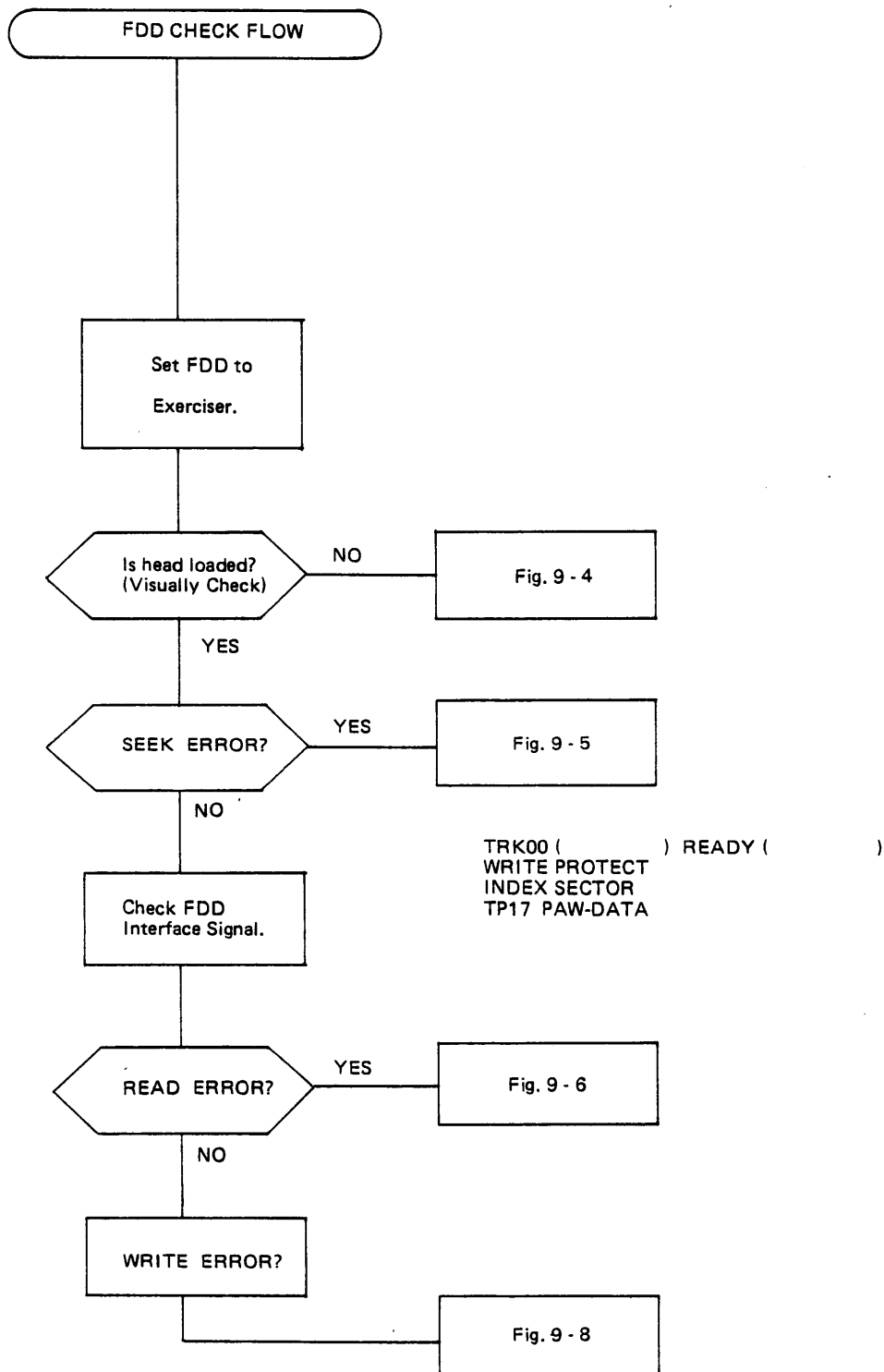


Fig. 9 - 3 FDD CHECK

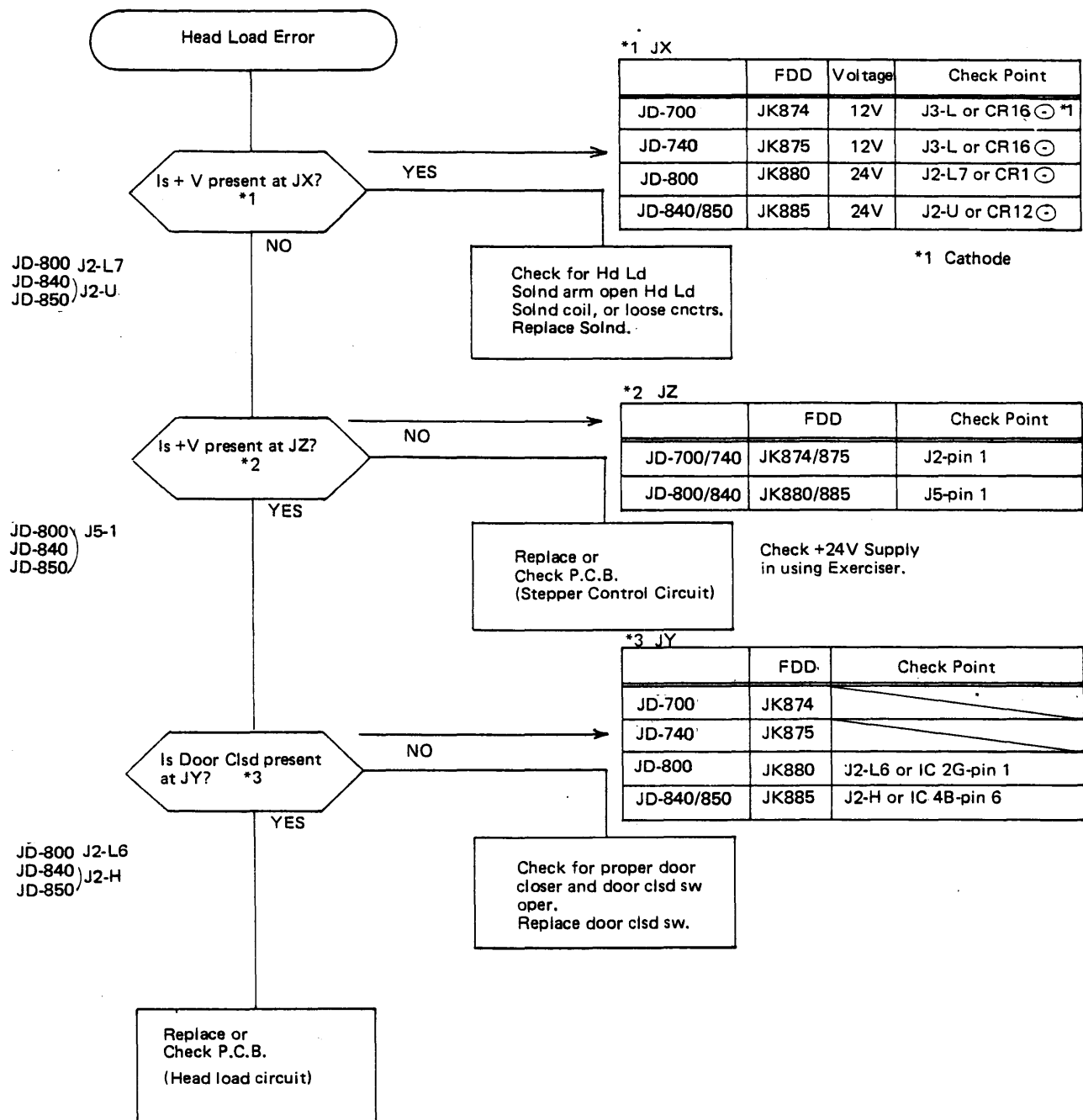


Fig. 9 - 4 FDD HEAD LOAD

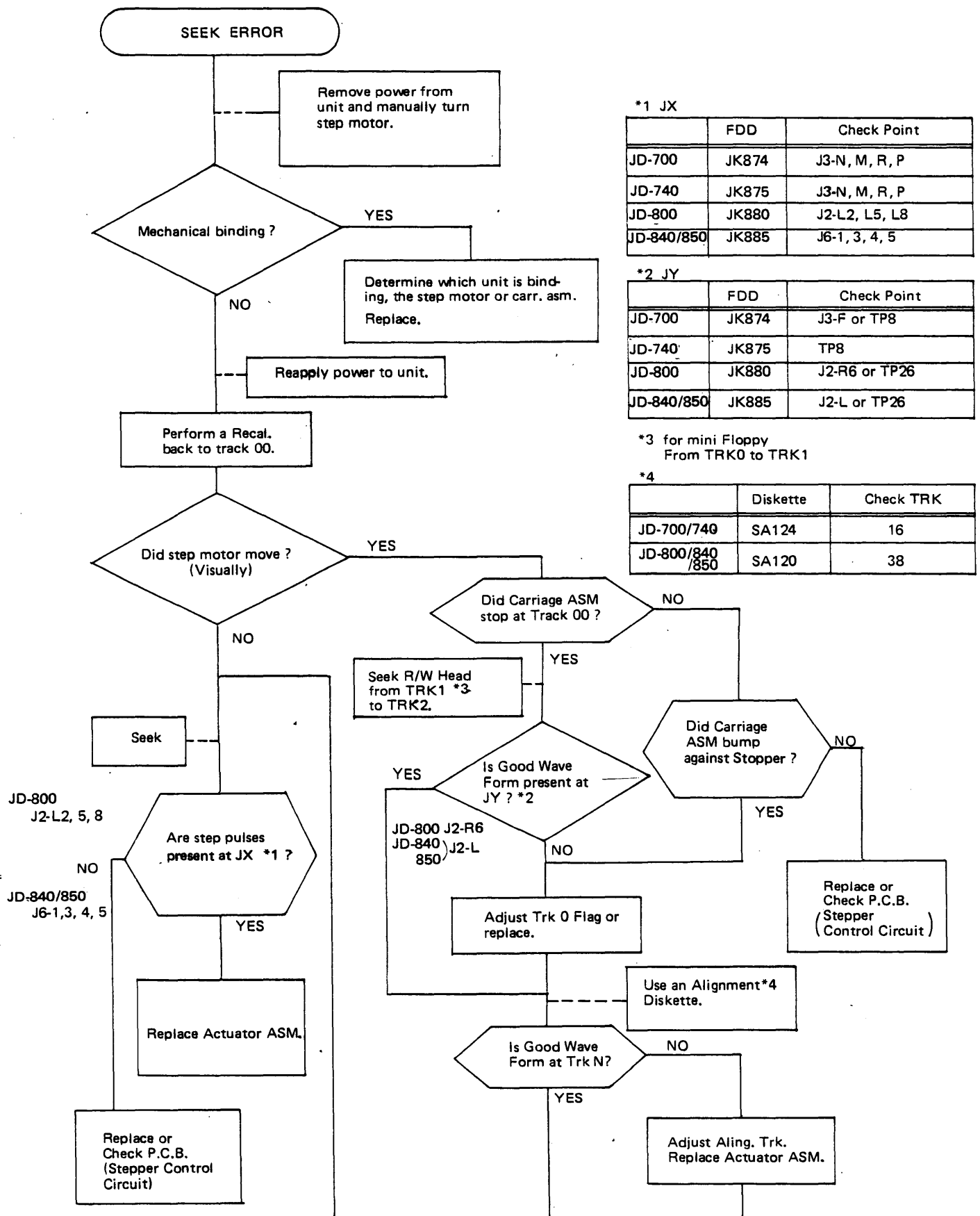


Fig. 9 - 5 FDD SEEK ERROR

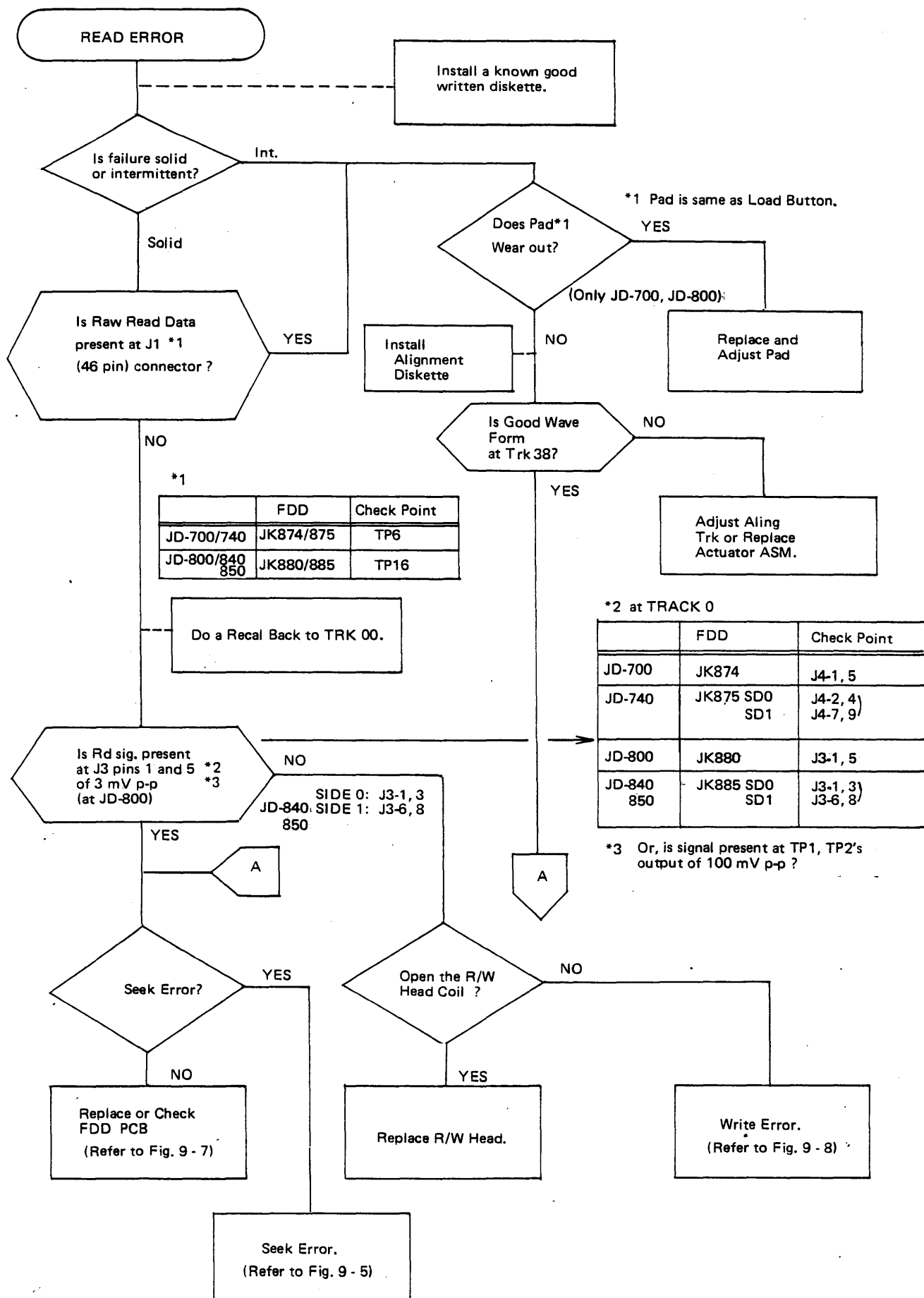


Fig. 9 - 6 FDD READ ERROR

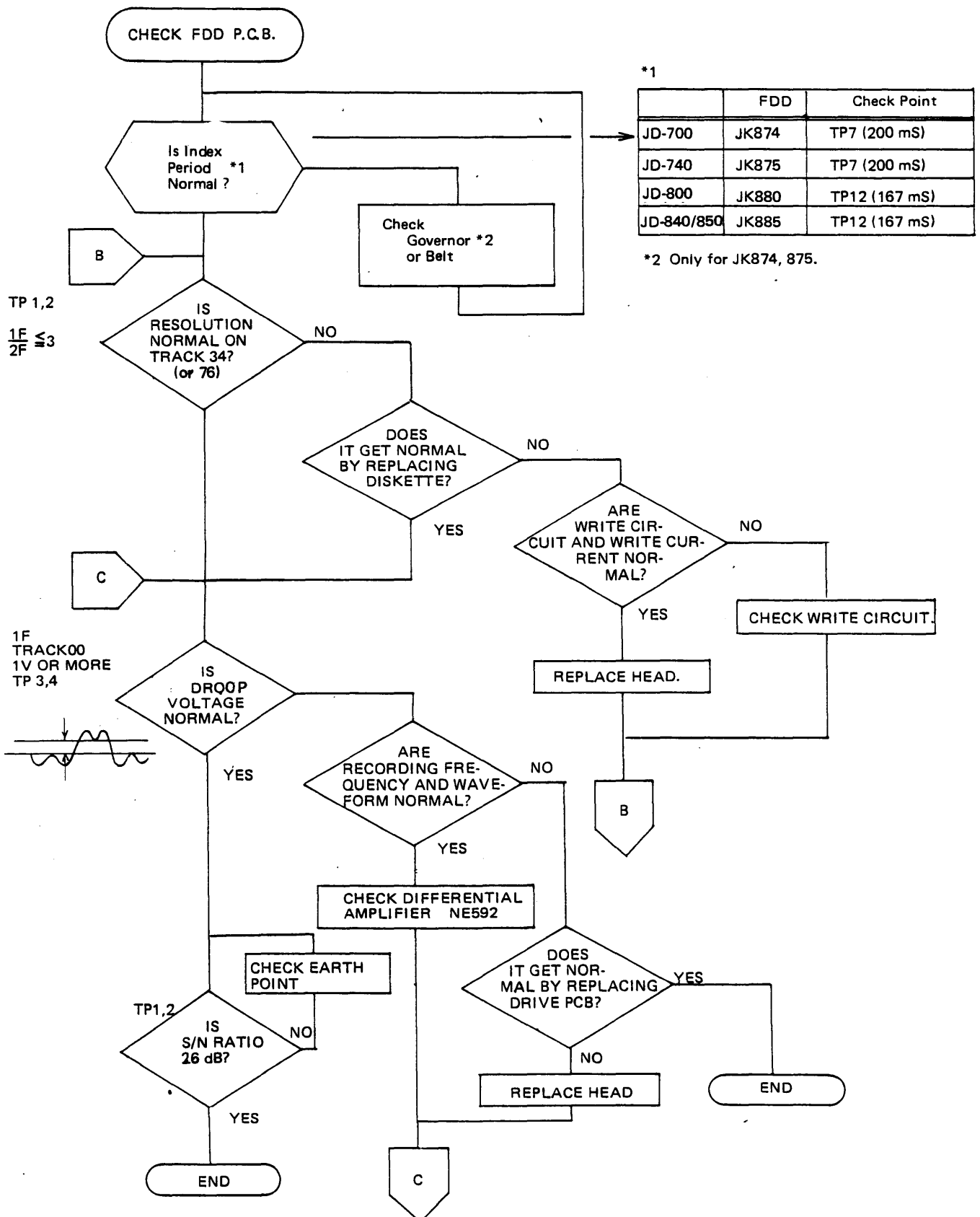


Fig. 9 - 7 CHECK FDD PCB

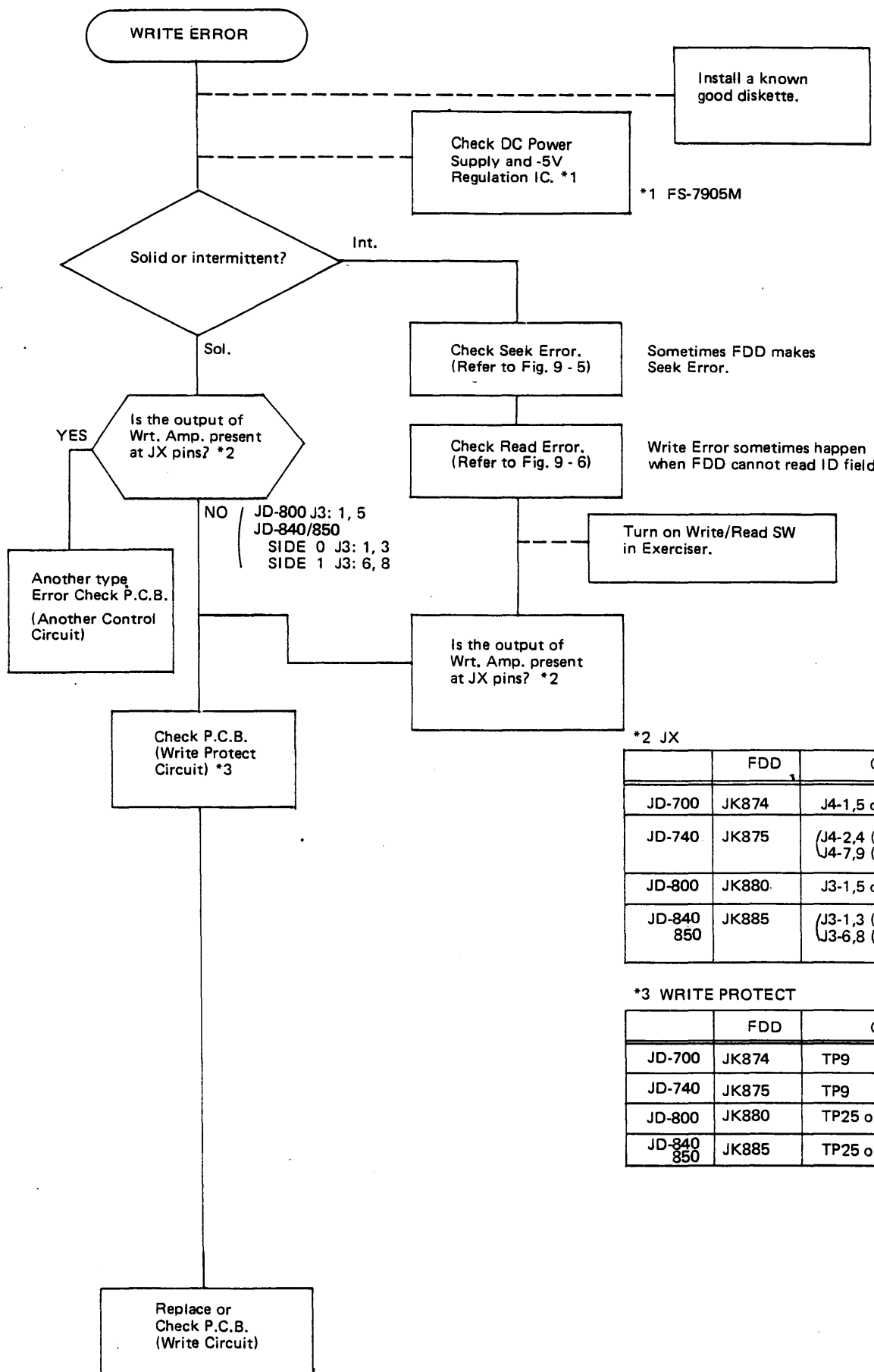


Fig. 9 - 8 FDD WRITE ERROR

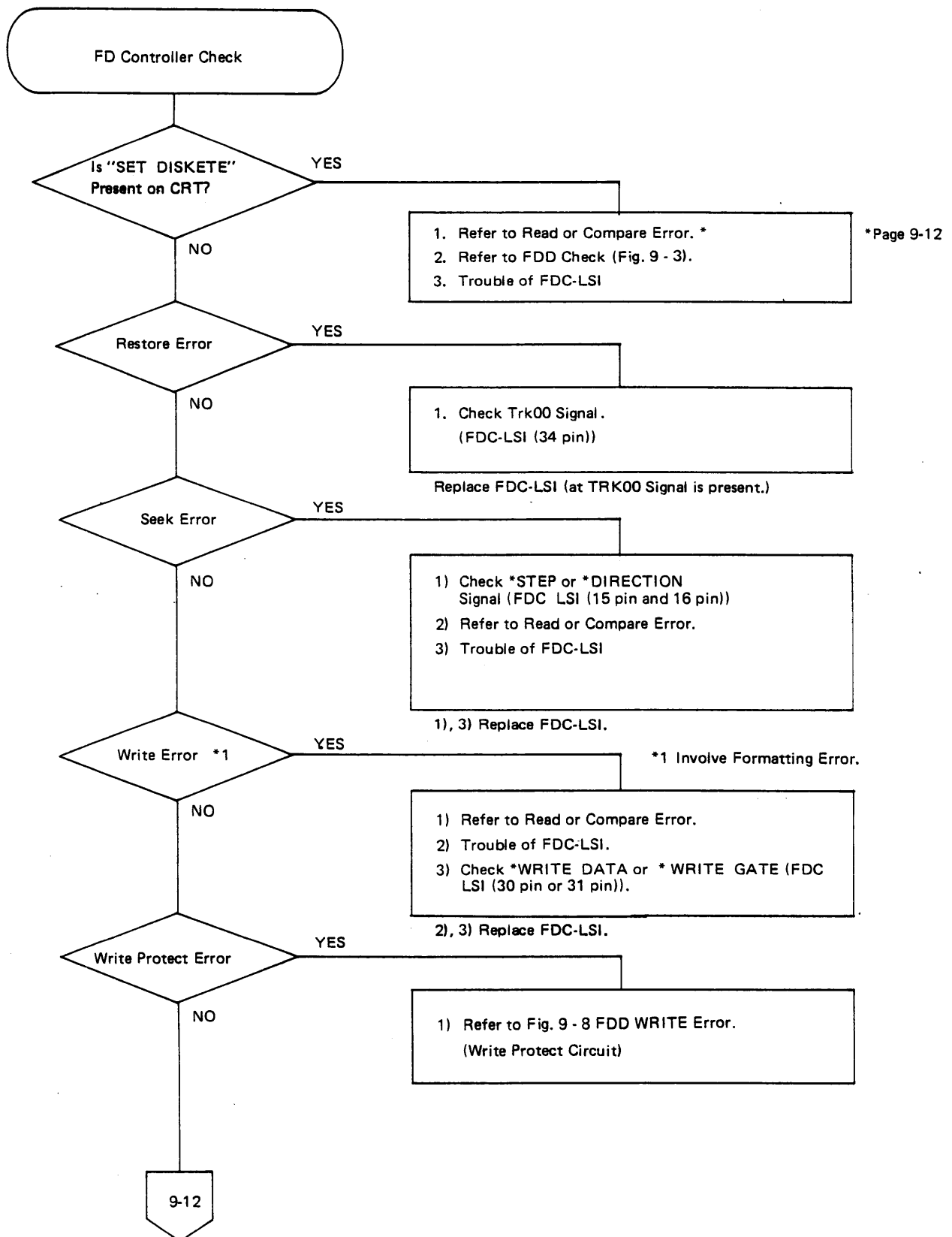


Fig. 9 - 9 FD CONTROLLER (1/2)

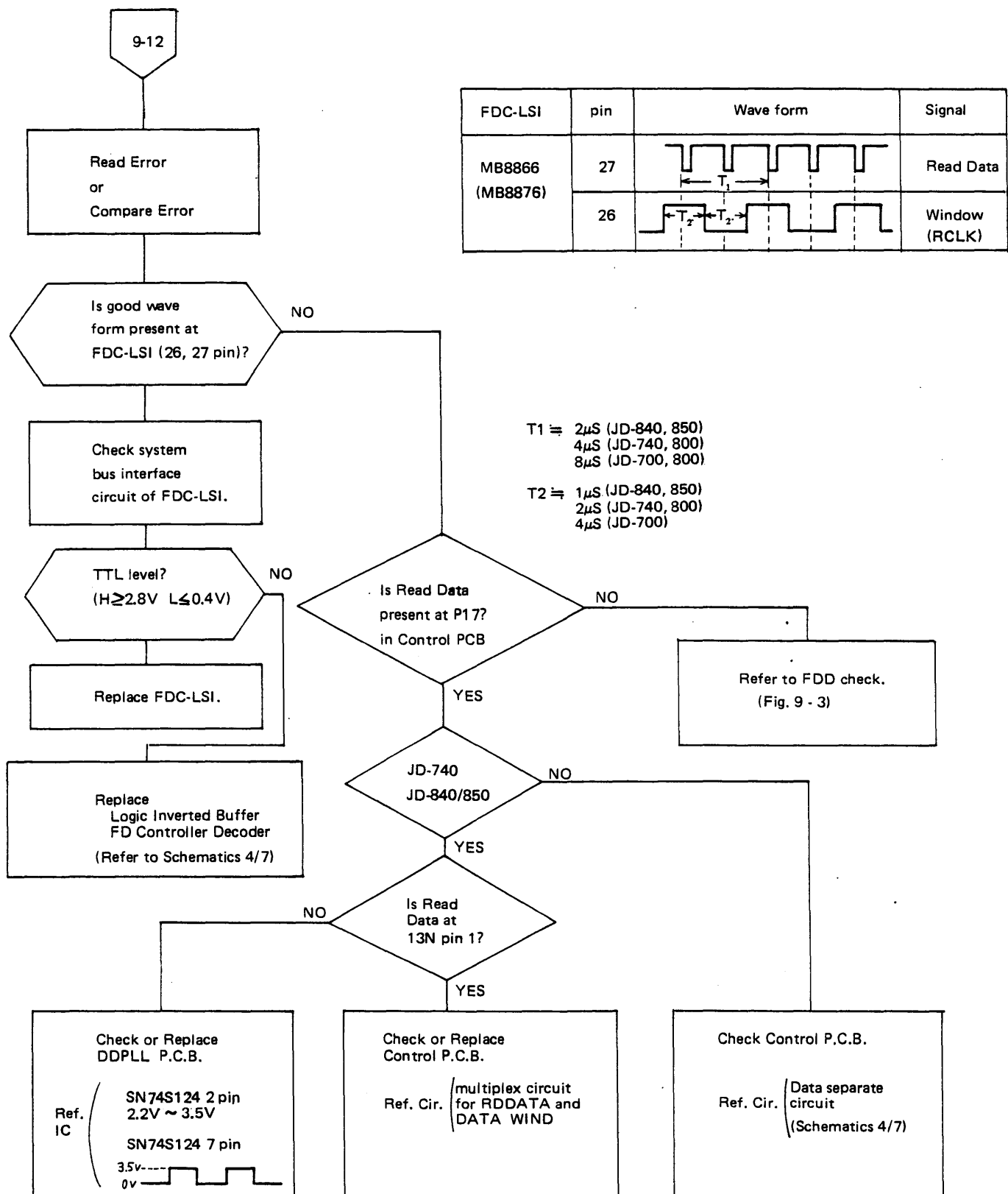


Fig. 9 - 9 FD CONTROLLER (2/2)

9.2.3 KEYBOARD INSPECTION

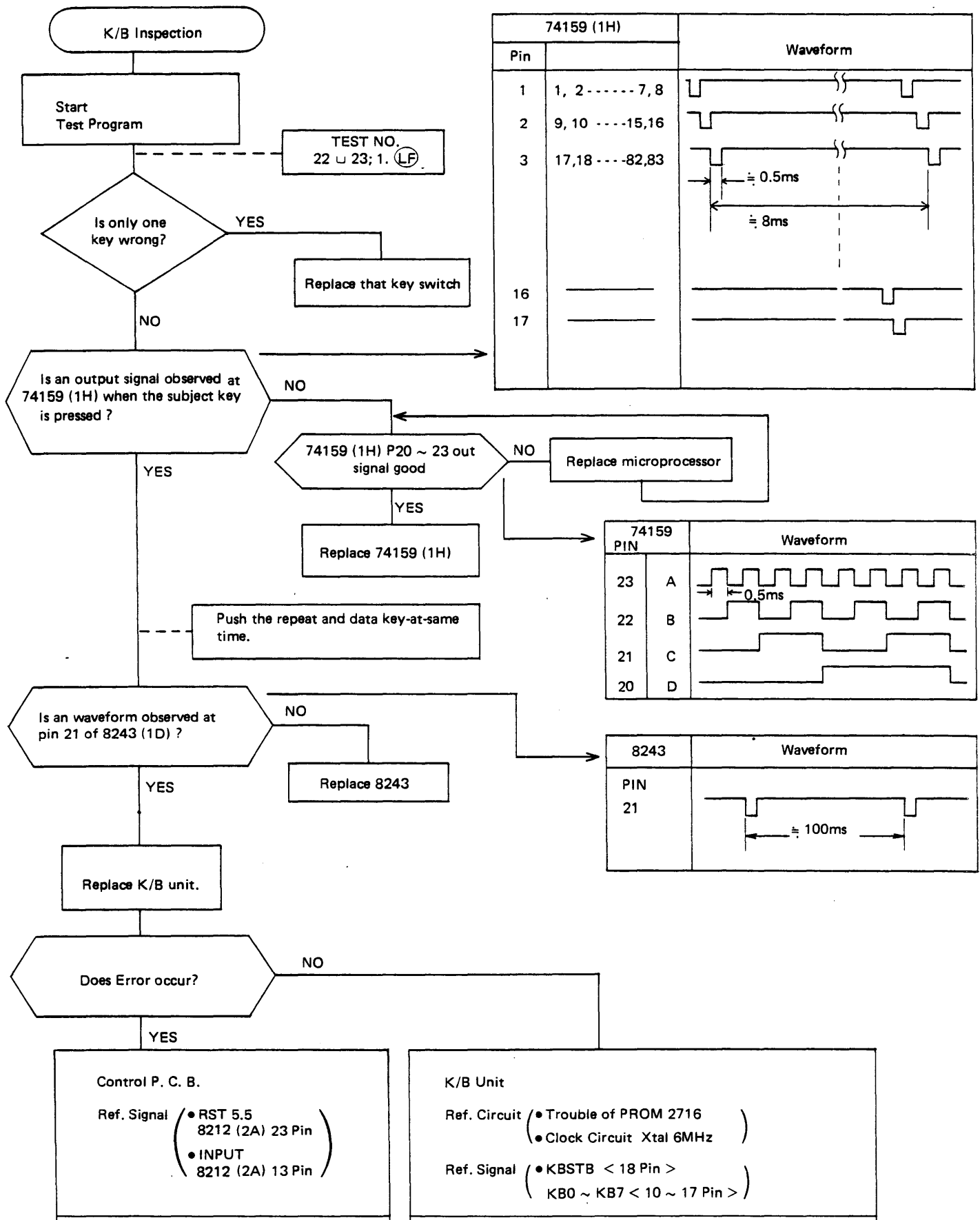


Fig. 9 - 10 K/B

9.2.4 MONITOR TV AND TV CONTROLLER INSPECTION

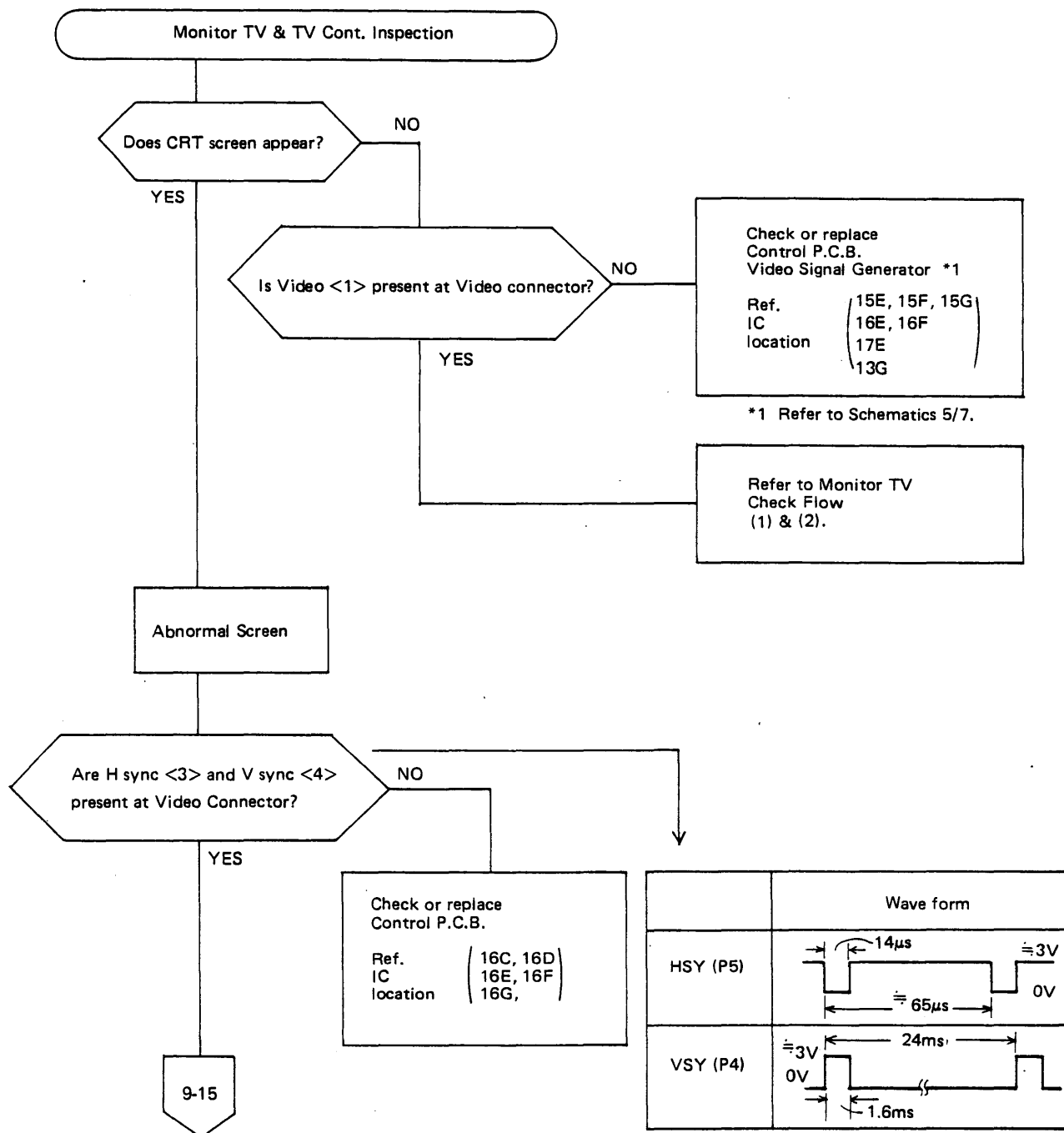


Fig. 9 - 11 MONITOR TV & TV CONTROLLER (1/2)

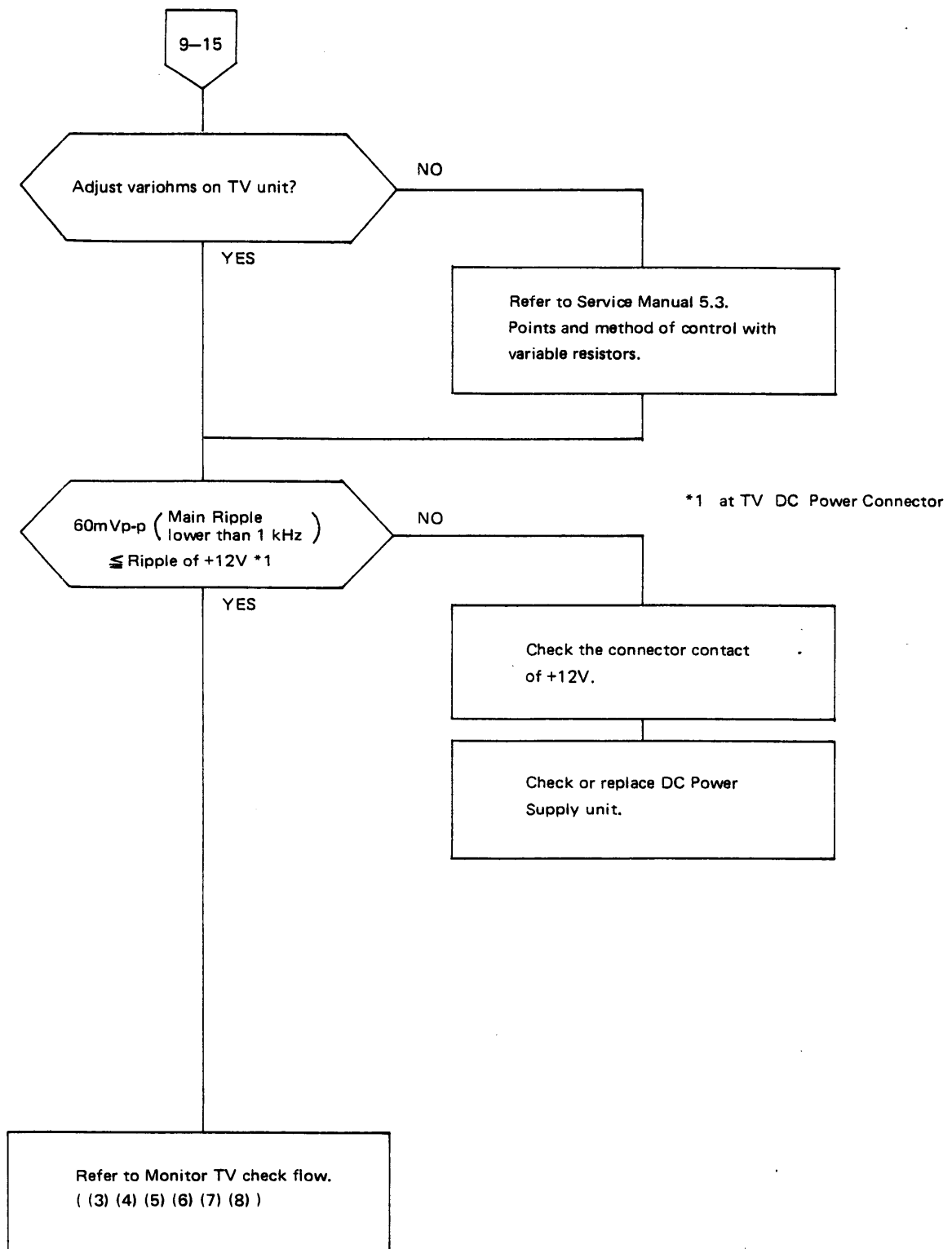


Fig. 9 - 11 MONITOR TV & TV CONTROLLER (2/2)

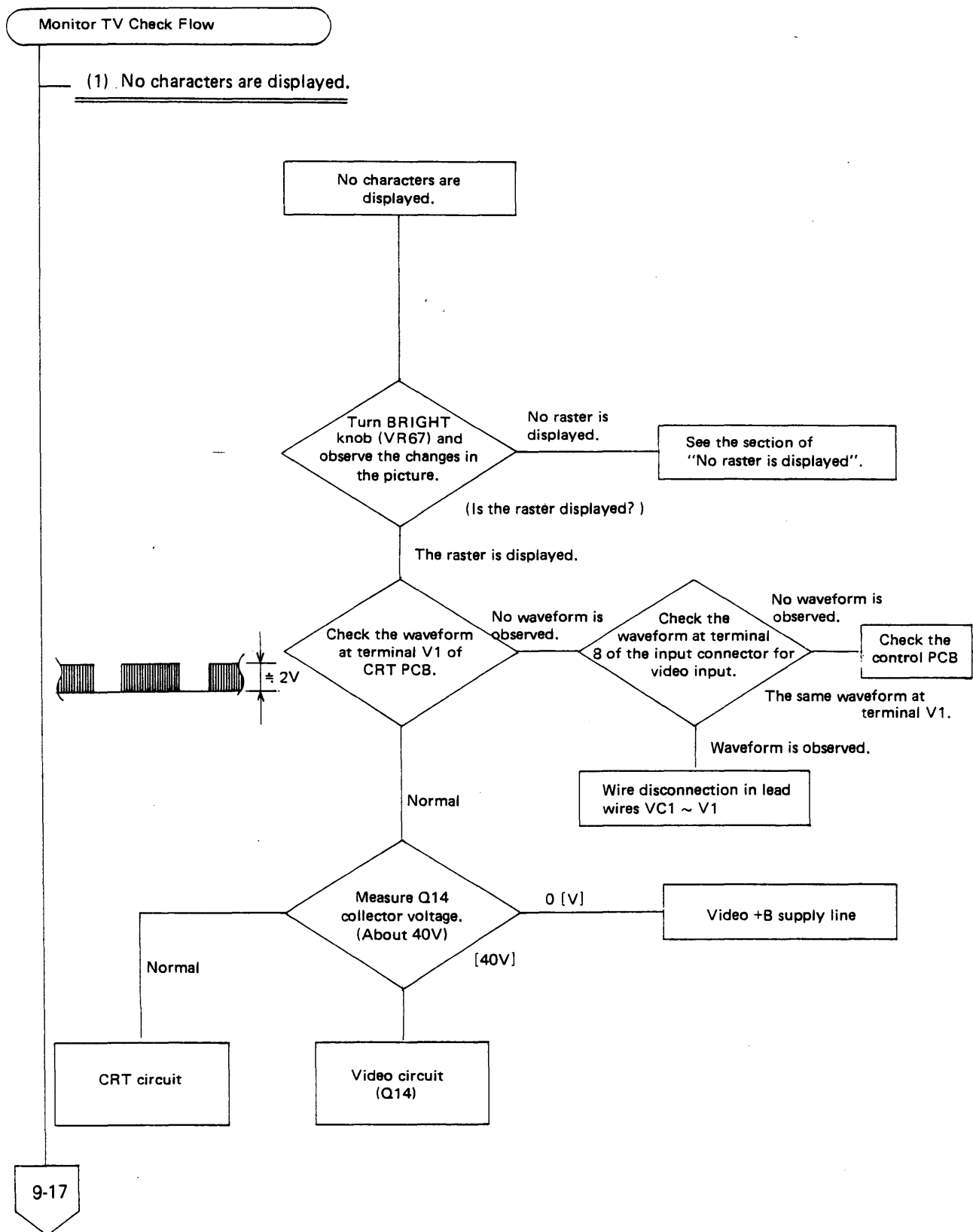


Fig. 9 - 12

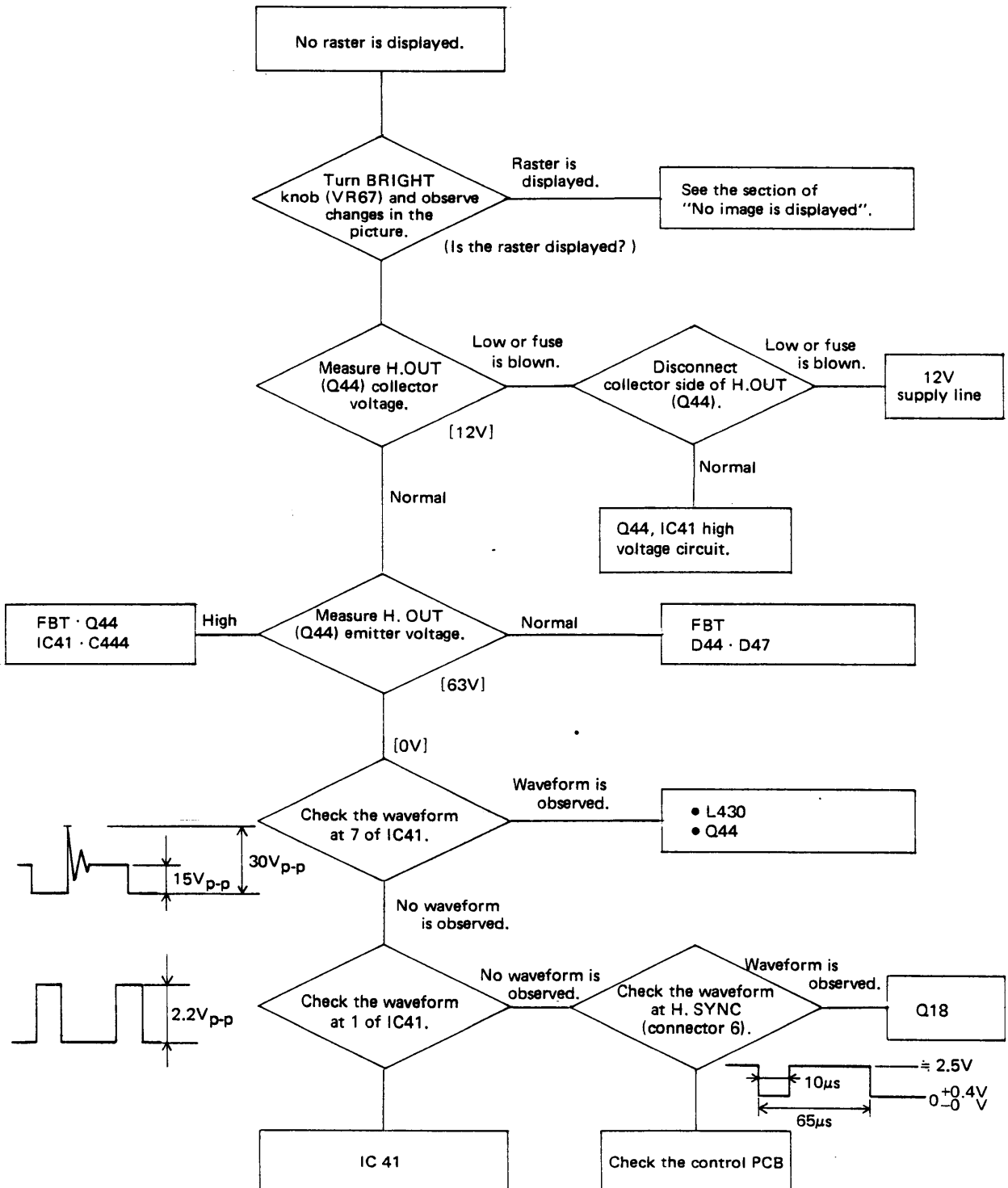
(2) No raster is displayed.

Fig. 9 - 13

9-18

(3) The picture size is small.

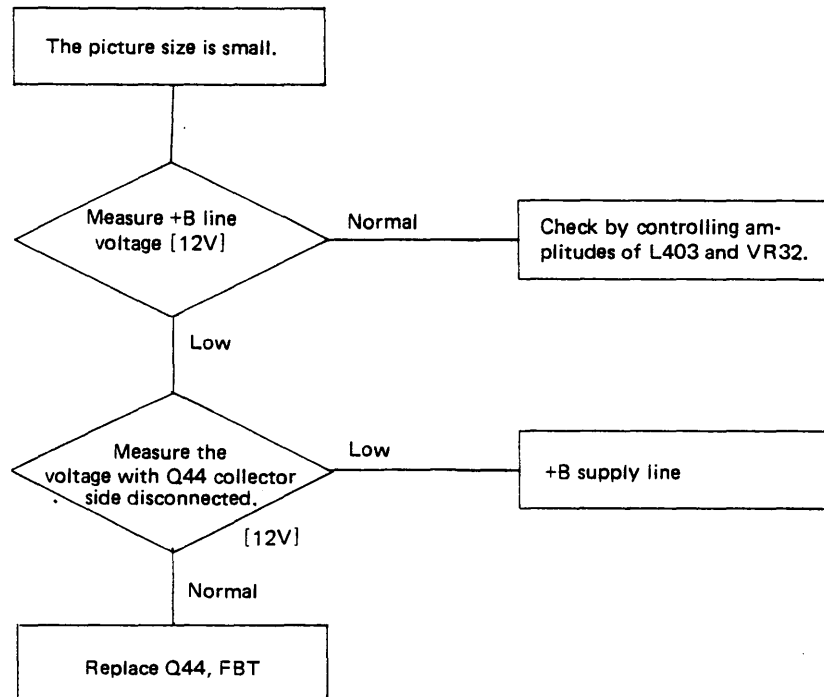


Fig. 9 - 14

(4) Horizontal amplitude is insufficient.

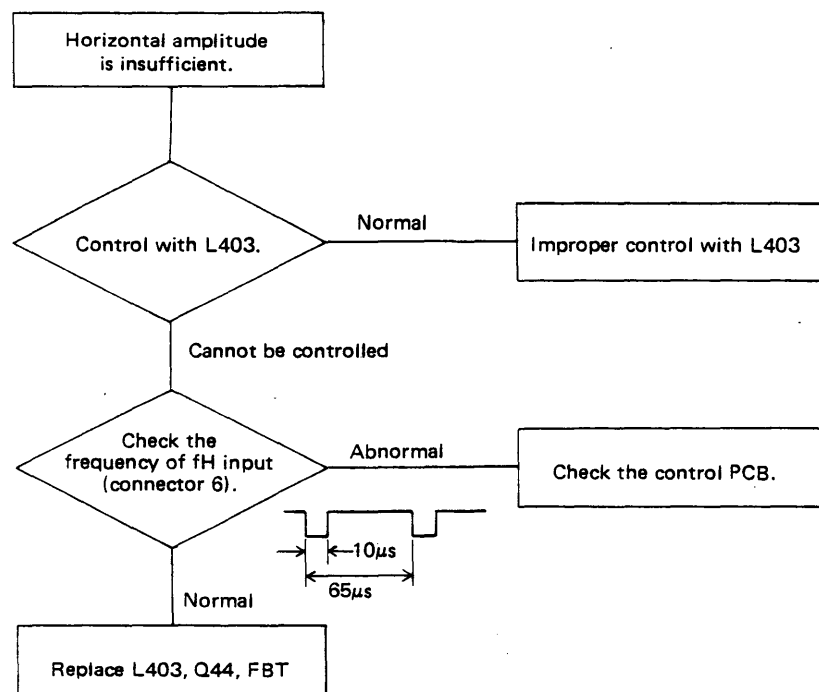


Fig. 9 - 15

9-19

9-19

(5) Vertical amplitude is insufficient.

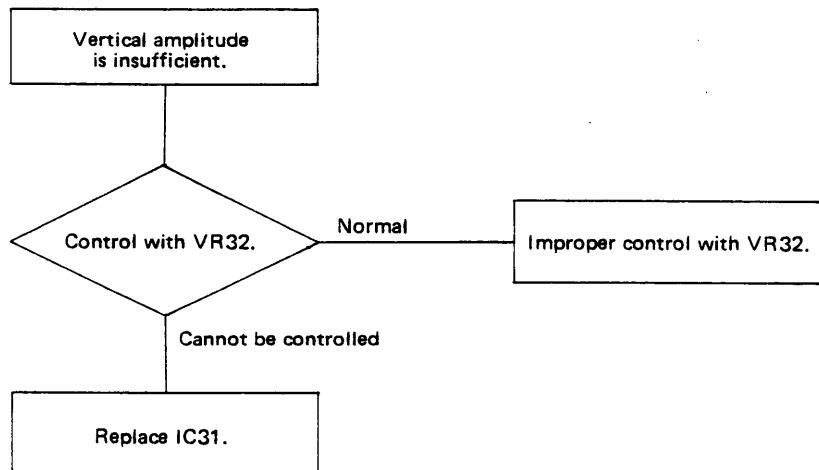


Fig. 9 - 16

(6) Vertical hold cannot be made.

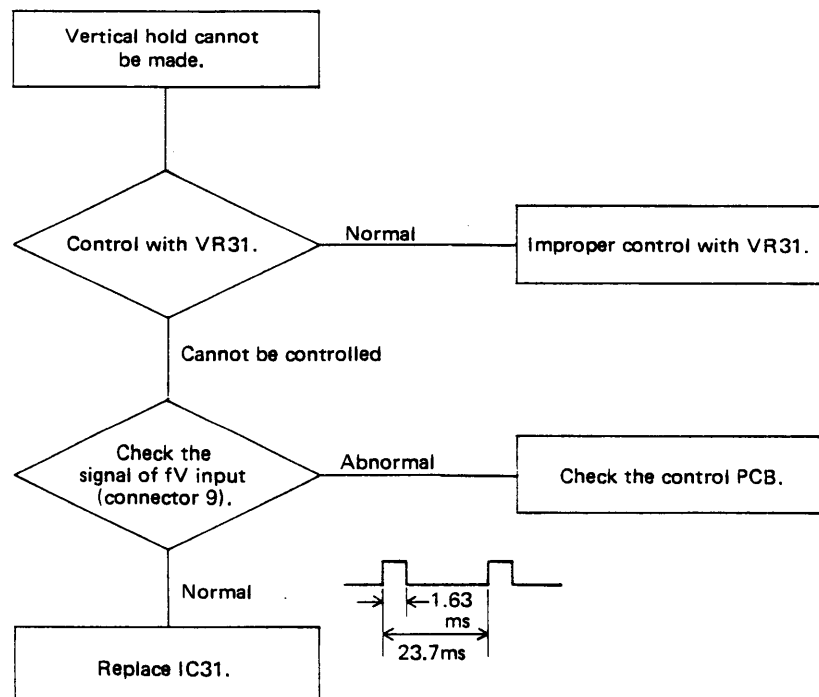


Fig. 9 - 17

9-20

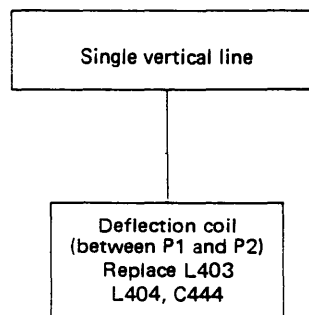
(7) Single vertical line

Fig. 9 - 18

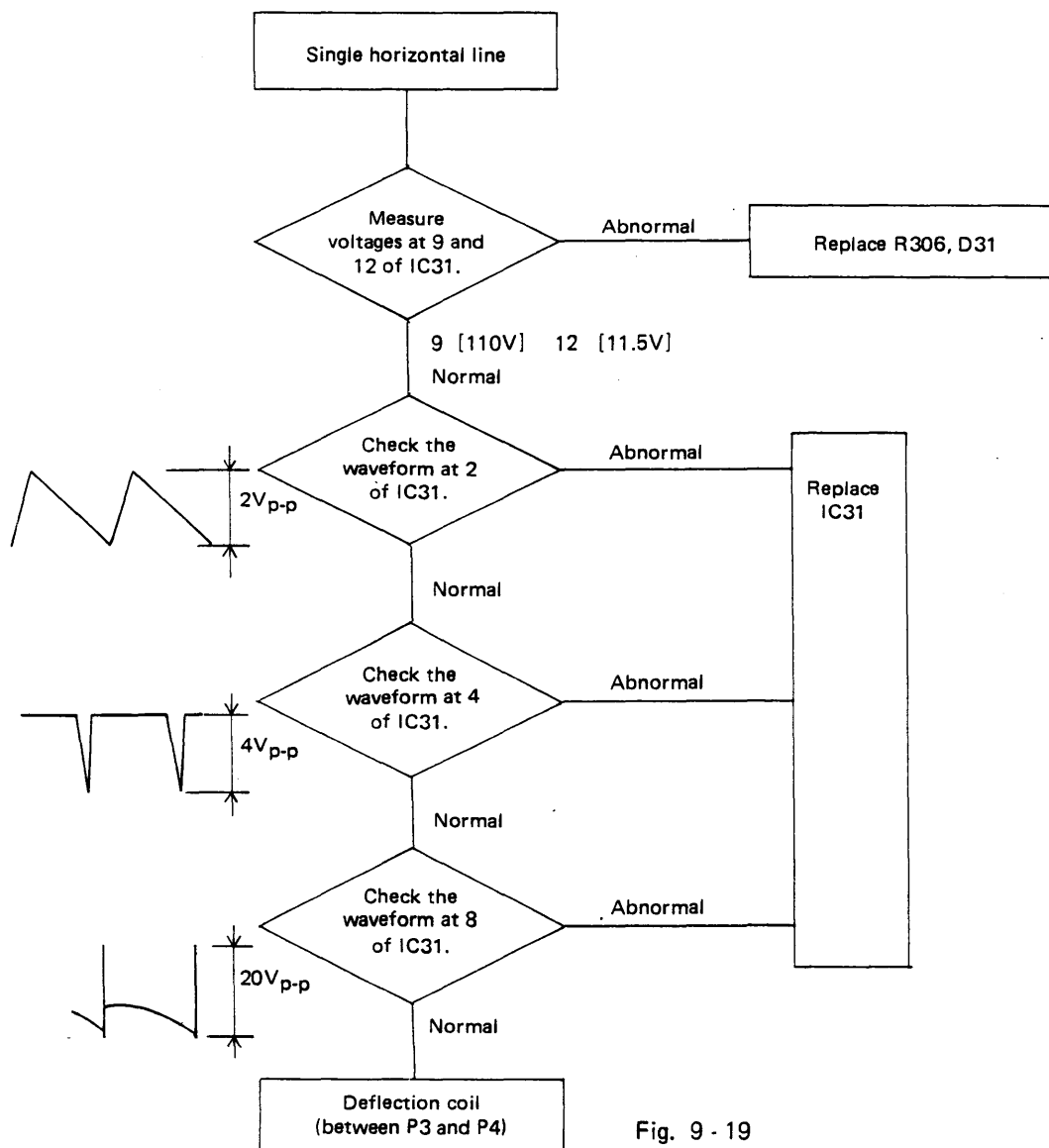
(8) Single horizontal line

Fig. 9 - 19

9.2.5 PORT INSPECTION

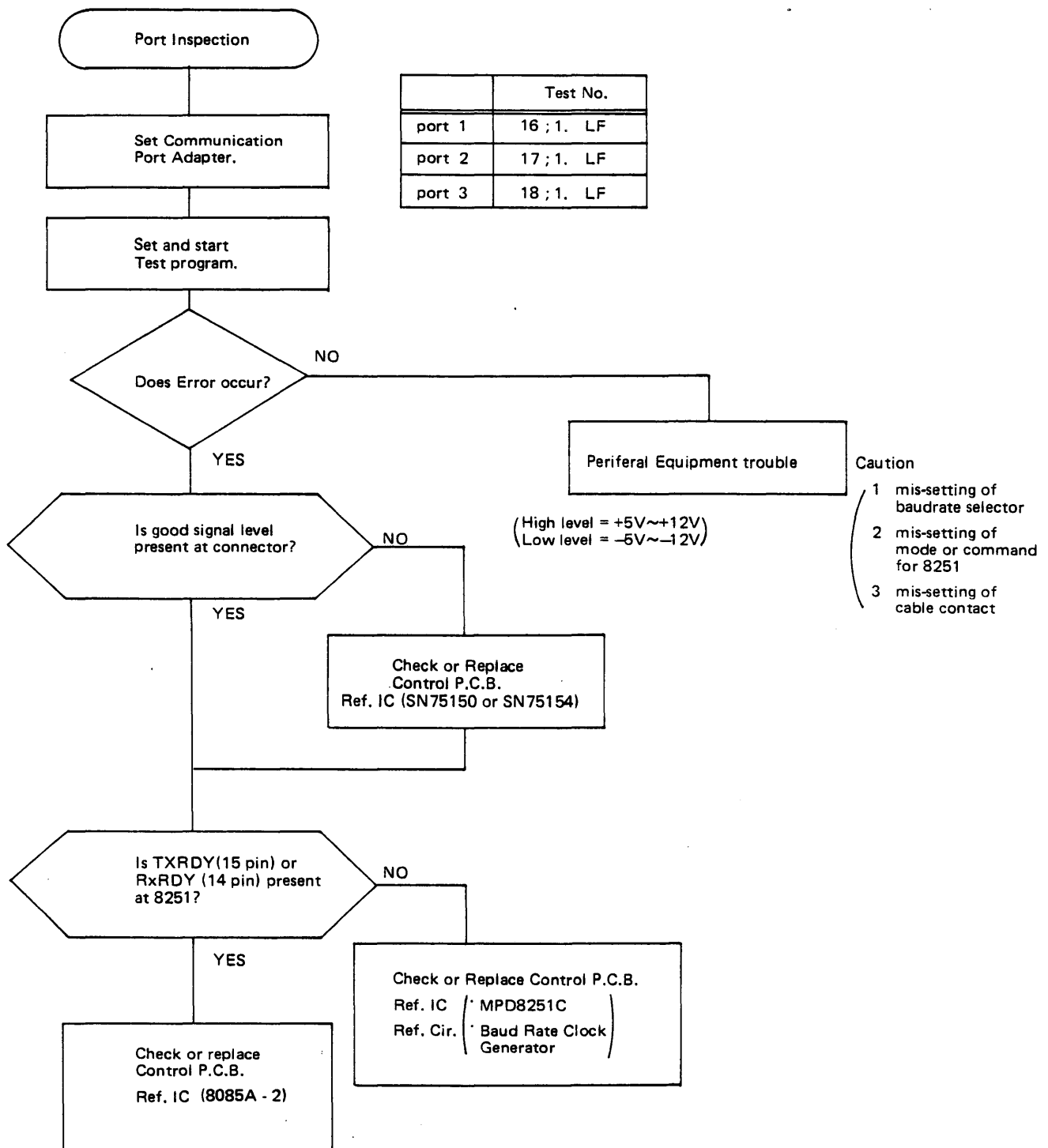


Fig. 9 - 20 PORT

9.2.6 CONTROL PCB INSPECTION

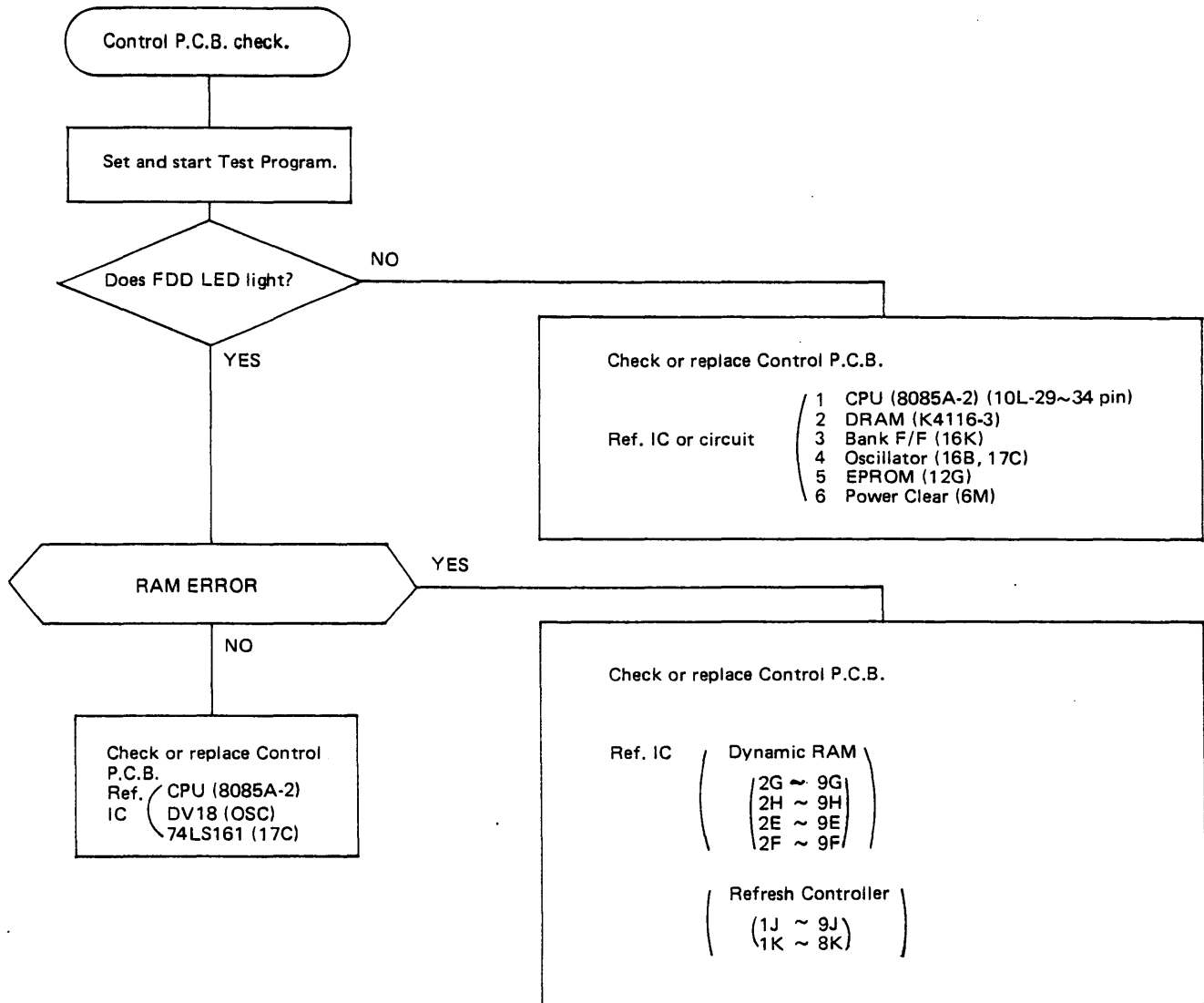


Fig. 9 - 21 CONTROL PCB

9.3 SERVICE TOOLS

9.3.1 BLOCK REPAIR

Name	Part Number
* Oscilloscope (20MHz)	N/A
* Plus long Driver (50cm) with Magnet	N/A
* Connector for Port	(Refer to Test Program Manual)
* Execiser	FDD/EXT/TU

9.3.2 PARTS REPAIR

Name	Part Number
* Oscilloscope (50MHz)	N/A
* Plus long Driver (50cm) with Magnet	N/A
* Connector for Port	(Refer to Test Program Manual)
* Execiser	DFF/EXT/TU
* Alignment Diskette	SA120
* Cartridge Guide	069D47400091
Adj. Tool	
* Load Bail Gauge	069D37400102
* Spanner Wrench	

10. IC LSI CATALOG

Refer to No. 2

11. PRECAUTIONS ON HANDLING MOS IC

LSI as applied to control PCB is called MOS IC which requires different handling method from other IC because of its mechanism. It suffers breakdown of internal electrode influenced from external electricity (static electricity, leakage current from soldering iron). Although protective transistor is incorporated in internal electrode to increase reliability, protective transistor itself is broken if much larger voltage is applied causing trouble. Therefore, be careful to the following points during service time, storage and transportation.

Replacing method of LSI, IC

Use soldering iron of approx. 30W having small tip for removal of LSI or IC. Also apply solder pult (solder soaker). It not sucking type, soak solder by syringe or braided wire as applied to CRT coating earth, etc.

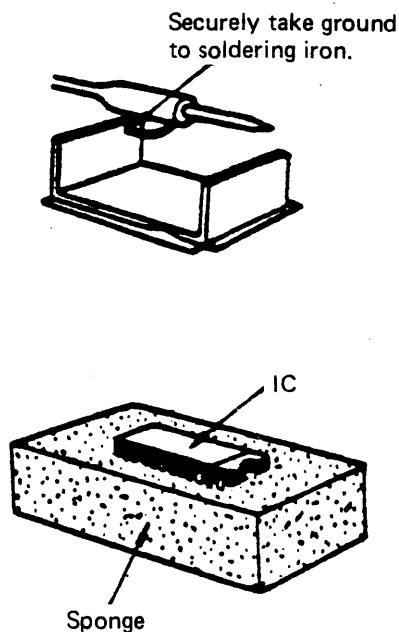


Fig. 11 - 1

- (A) Voltage is often applied during soldering work because of soldering iron leak. Therefore, use highly insulated type iron or, if normal iron is applied, take grounding to chassis as shown on the right drawing.
- (B) Do not apply soldering or replacement during current conduction.
- (C) In case of storage or returning mail, securely bury it in conductive black sponge.
(LSI is delivered as inserted in conductive black sponge for repair.)
- (D) Do not mount LSI on plastic easily subjected to static electrification or foamed styrol after removing it from conductive sponge.

12. MOS IC LIST

i8085A - 2
i8257
i8275
i8251 (μ PD8251C)
i2716
K4116-3

FD1771A-01
MB8866 (FD1791A)
MCM66740 (ASCII)
MCM66760 (British)
MCM66770 (German)
MCM66780 (French)
 μ PD8253LC (K/B)

13. REFERENCE

Description is made by extracting partly from the following brochures.

- MCS-85 USERS' MANUAL
INTEL CORPORATION
- COMPONENT DATA CATALOG
INTEL CORPORATION.
- THE TTL DATA BOOK
TEXAS INSTRUMENTS CORPORATION
- DATA CATALOG
MOTOROLA SEMICONDUCTORS
CORPORATION
- DATA CATALOG
WESTAN DIGITAL CORPORATION
- DATA CATALOG
NATIONAL SEMICONDUCTOR
CORPORATION