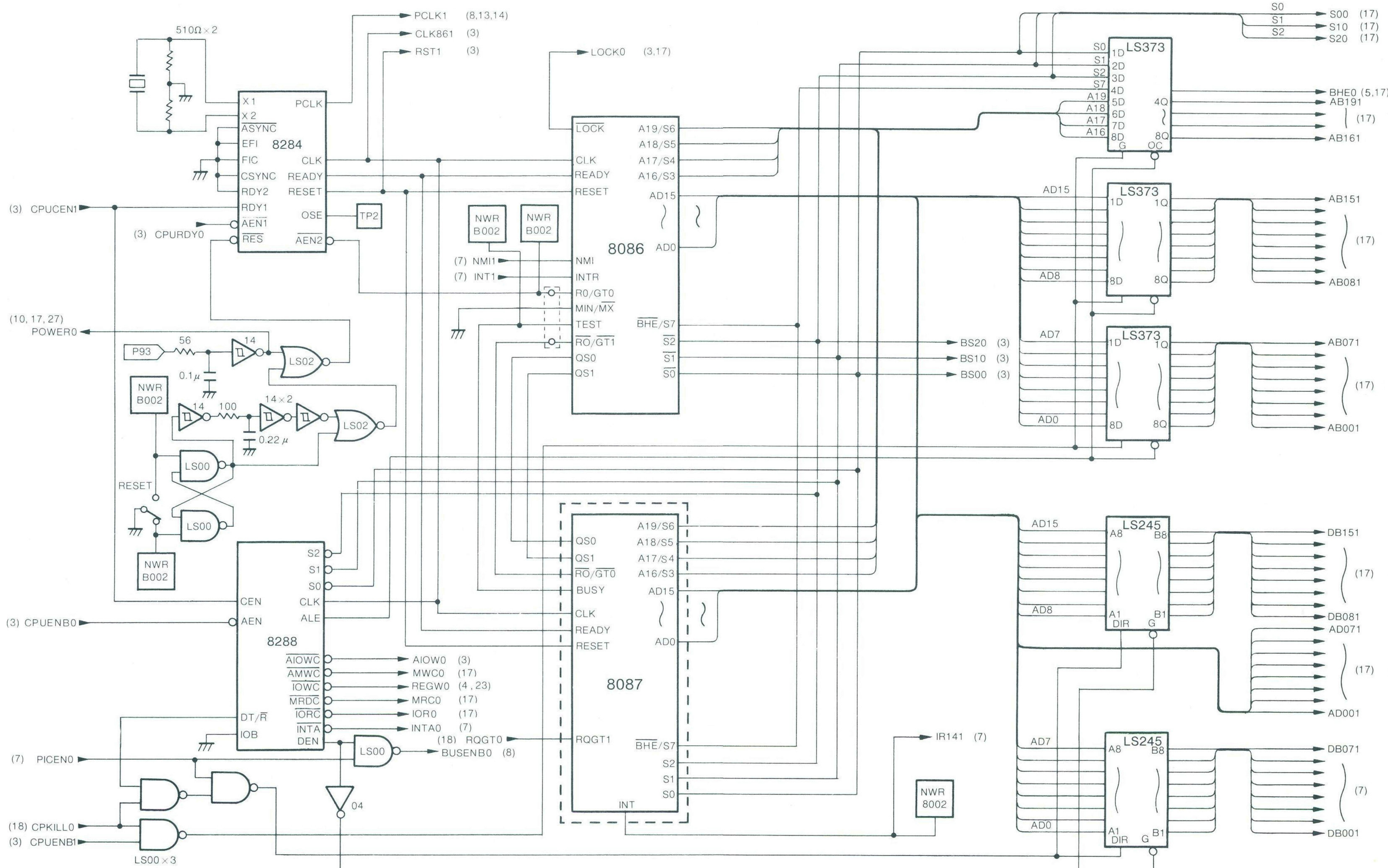
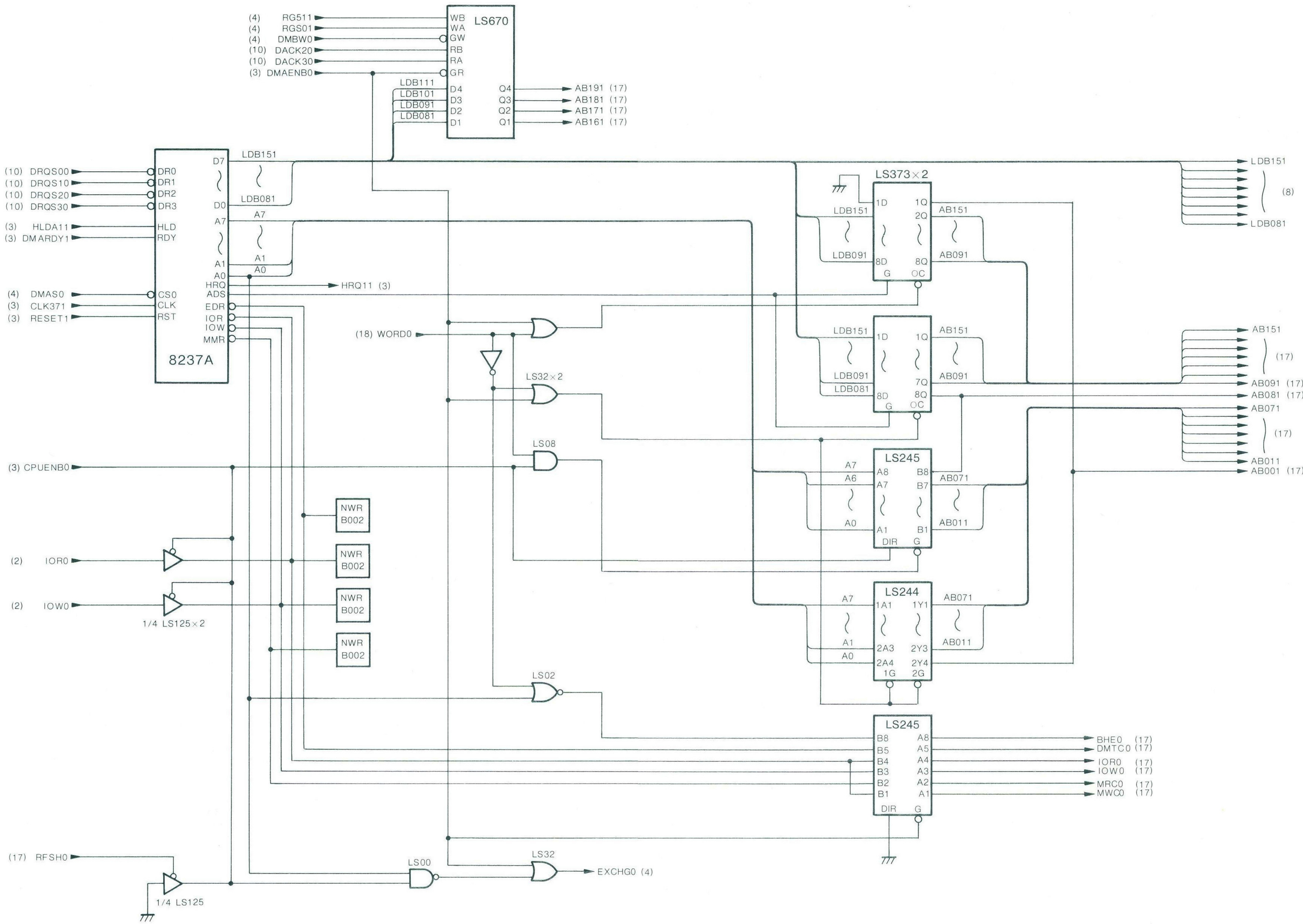
NEC PC9801 16 bit personal computer schematics

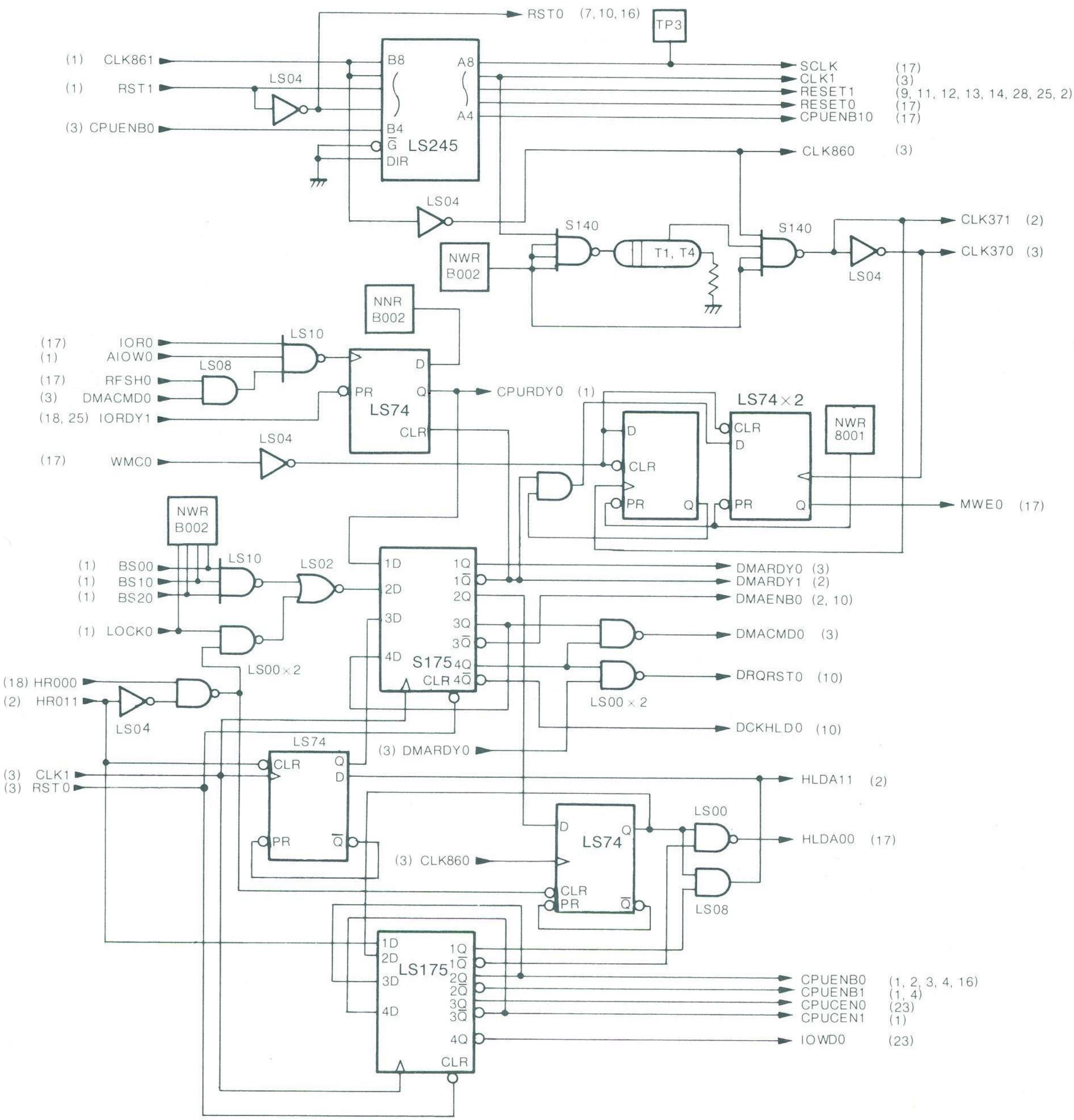
PC9801 had been dominating Japanese PC market since 1982 until IBM PC gained the top market share in 1995.
To ease tracing signals, a sheet number enclosed by parenthesis inside the functional block such as “Motherboard” is attached to each signal name.
Example: “(3) CPUCEN1”; Signal, CPUCEN1, comes from sheet number 3, “S00 (17)”; Signal, S00, jumps to sheet number 17.
The last numeric of signal name exhibits active high (1) and active low (0).



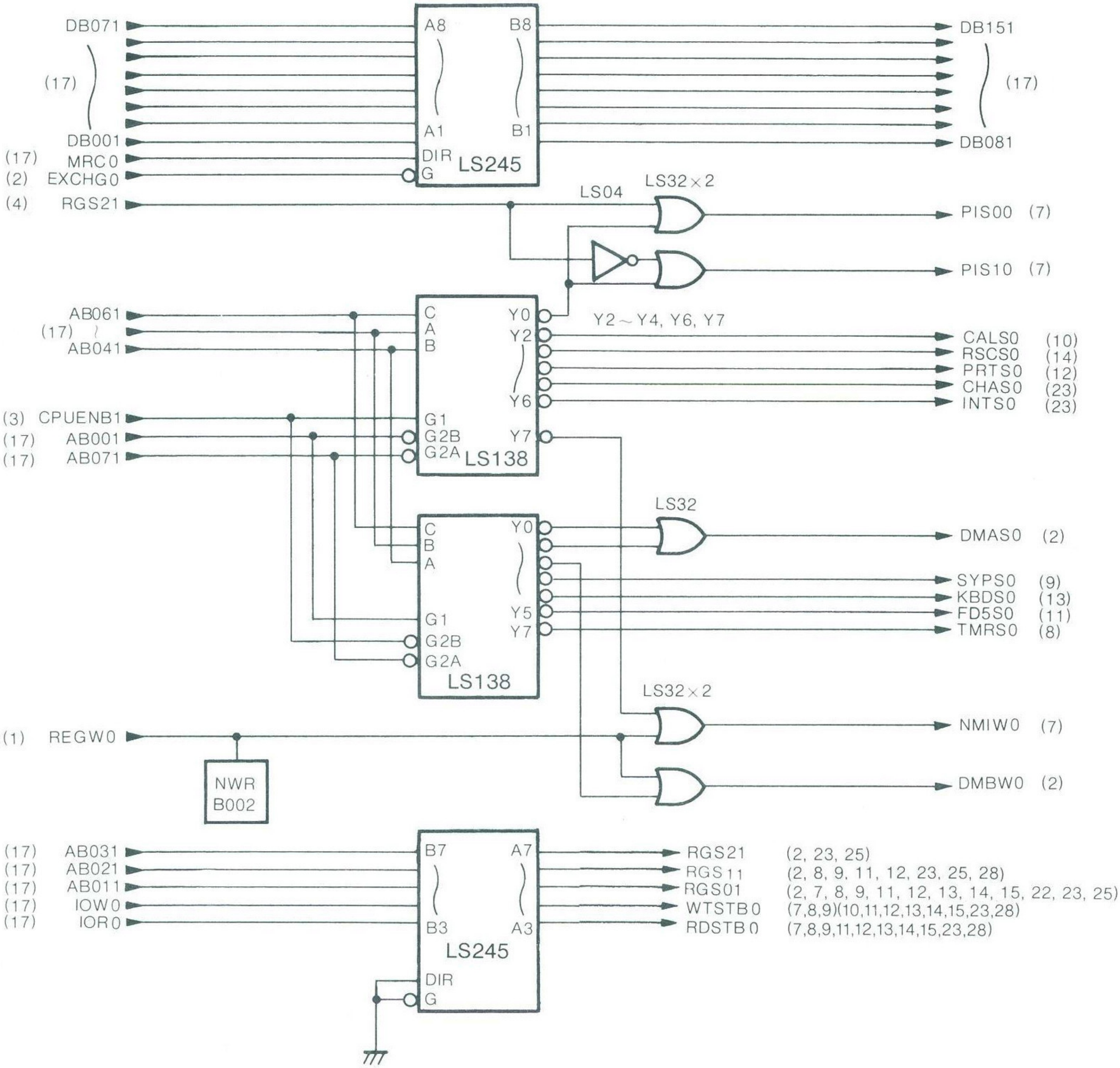
Motherboard (1) Central Processing Unit (8086), Floating Point co-Processor (8087)



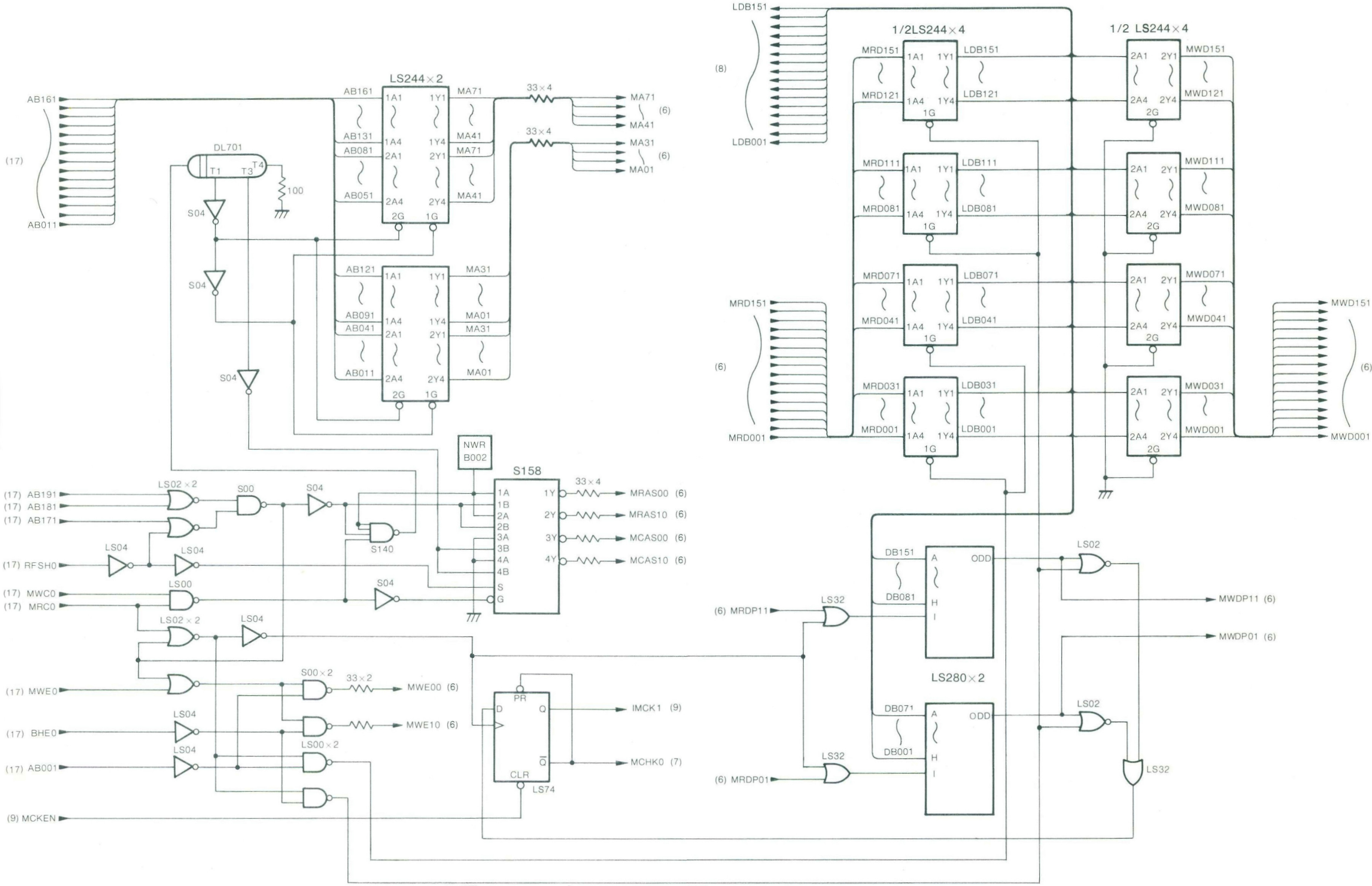
Motherboard (2)   Direct Memory Access (8237) control 1



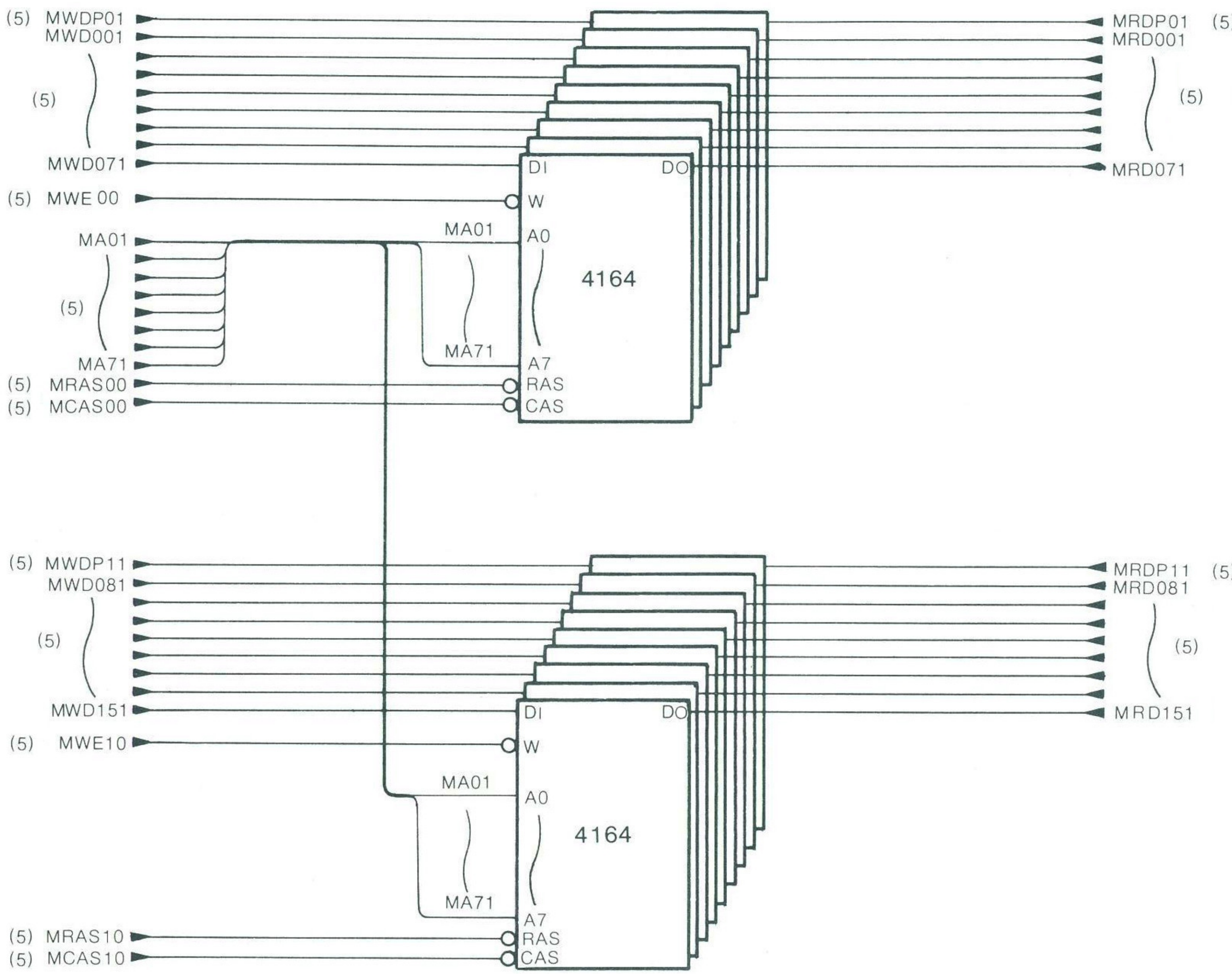
Motherboard (3) Direct Memory Access control 2



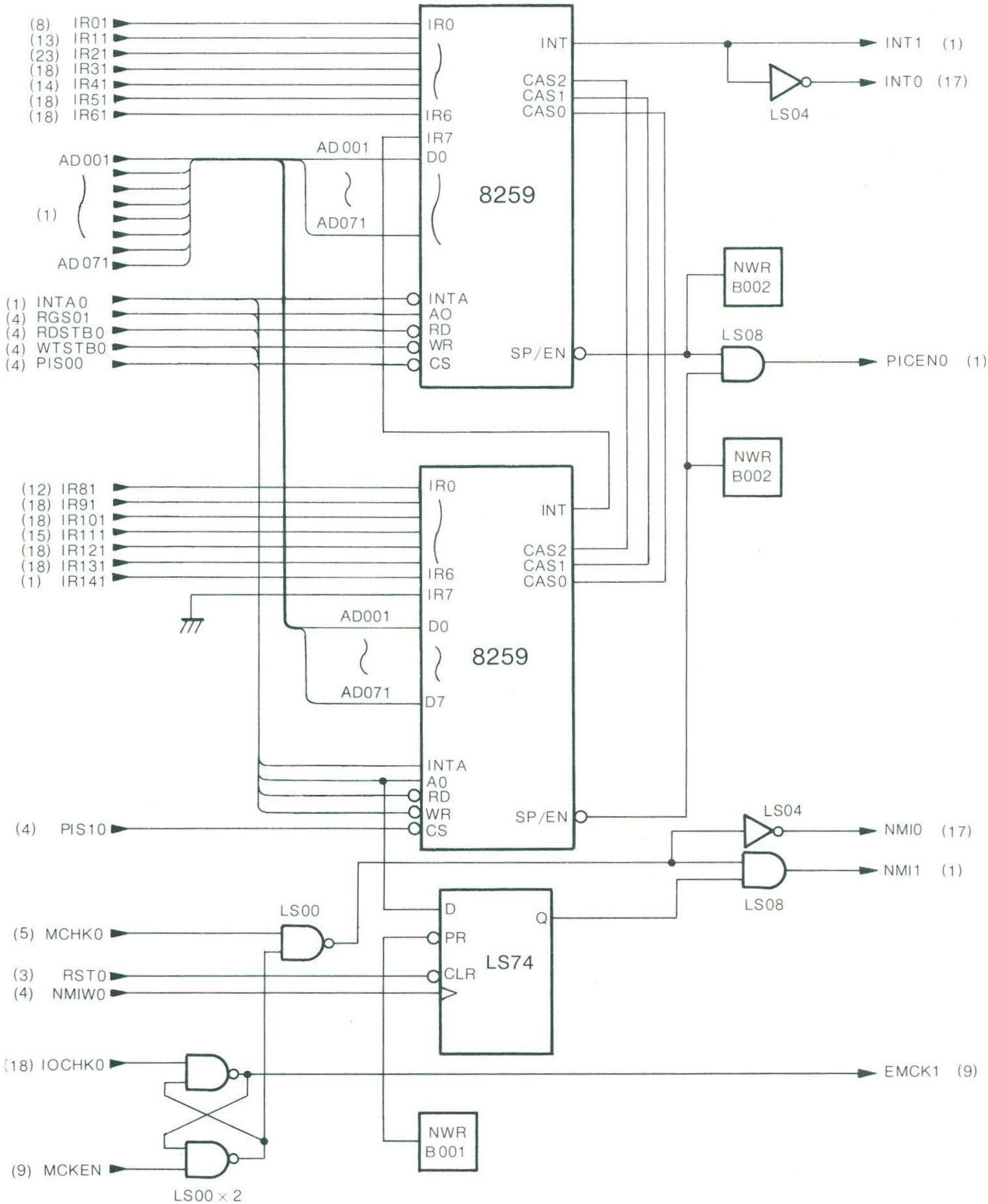
Motherboard (4)   Buffers/decoders 1



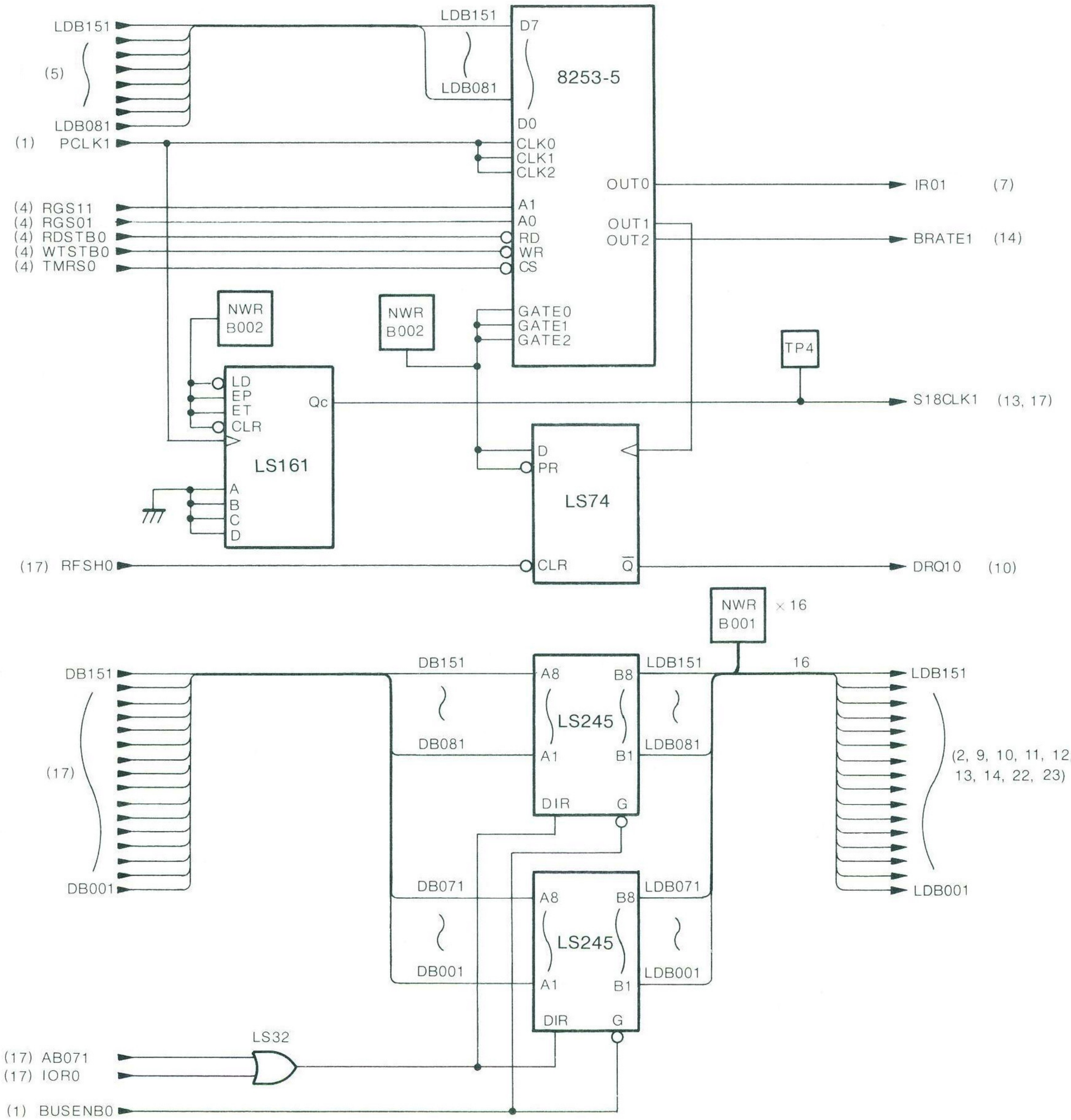
Motherboard (5)   Buffers/decoders 2



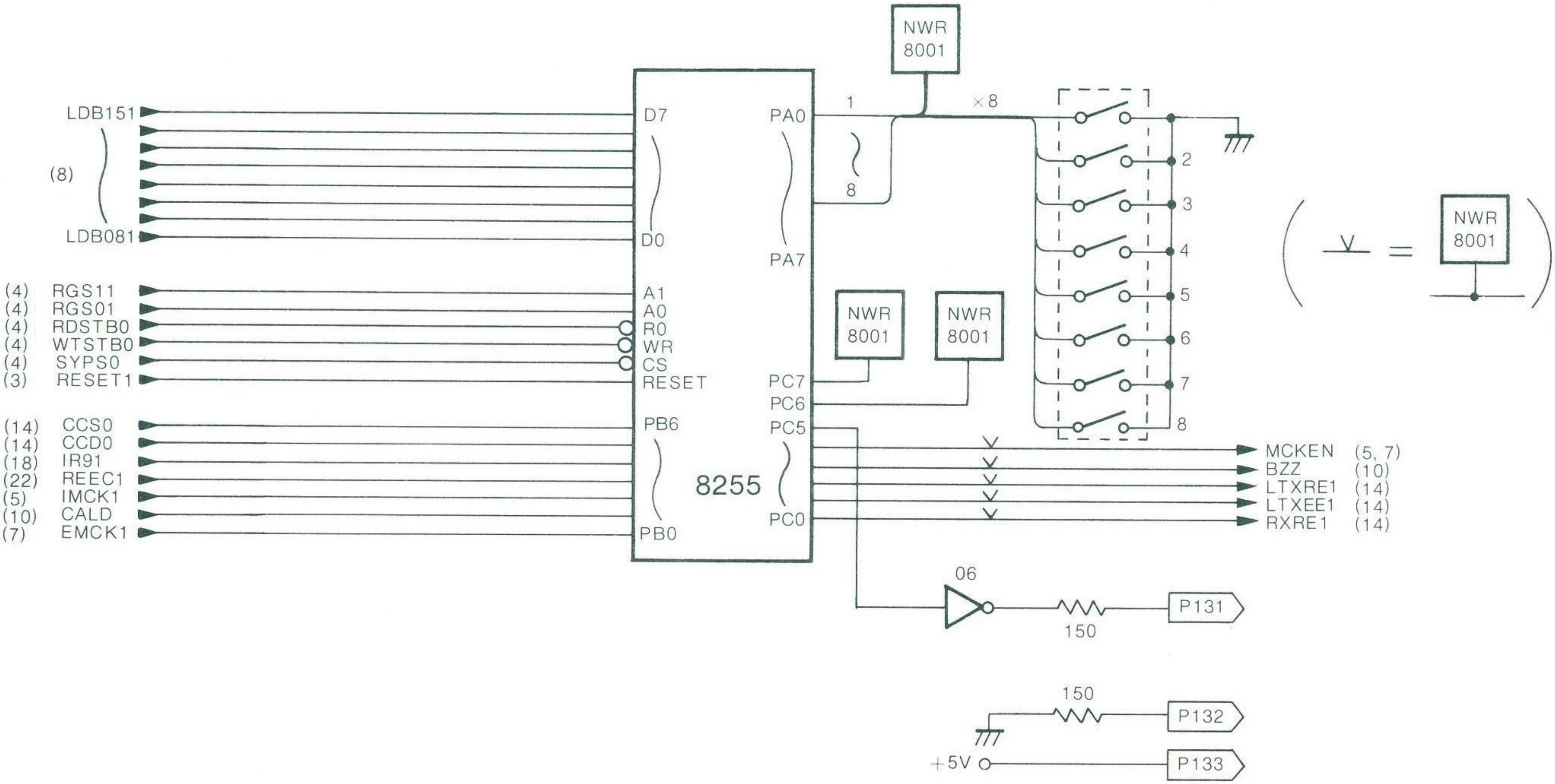
Motherboard (6)   Main memory Dynamic Random Access Memories (4164 x 16)



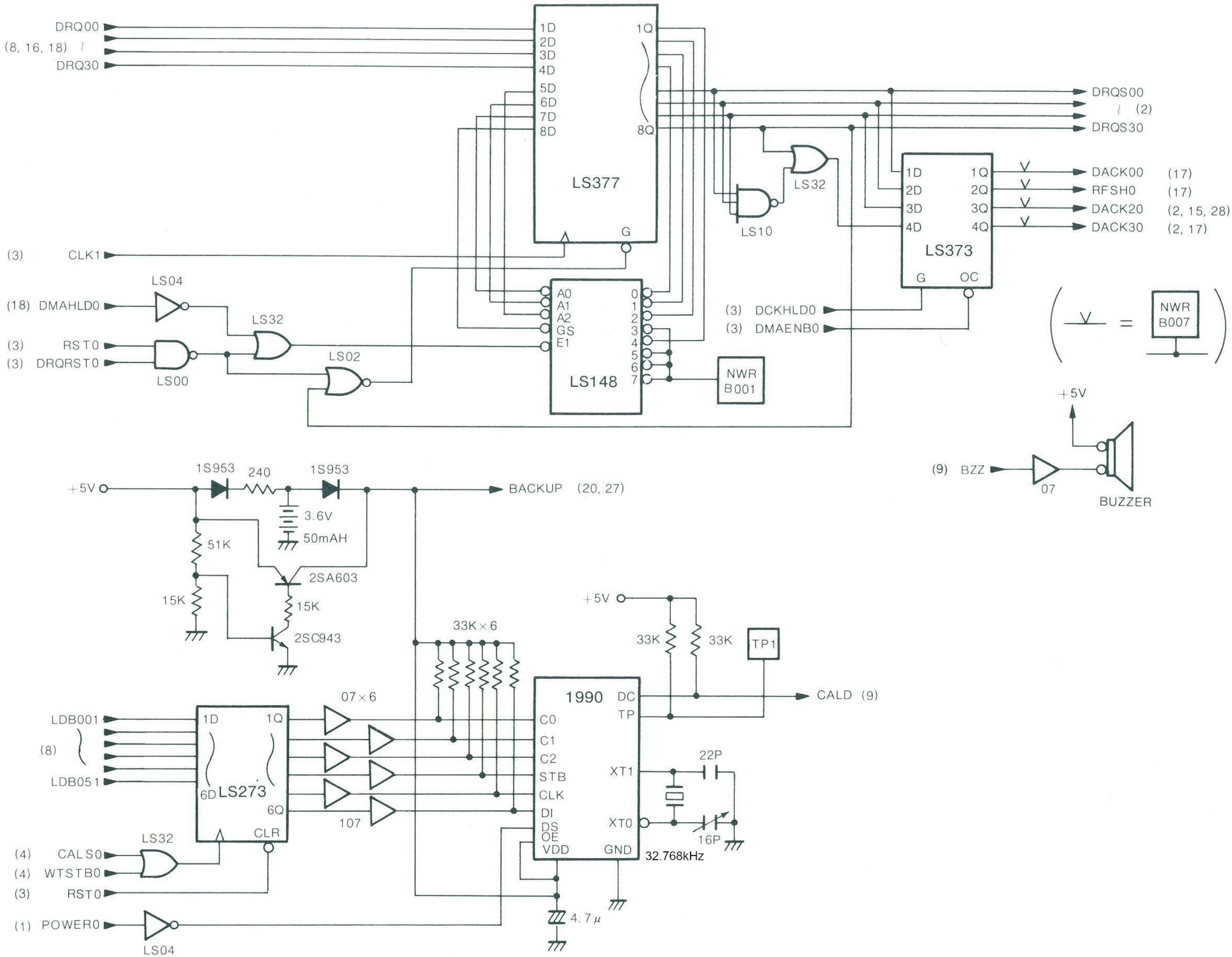
Motherboard (7)   Interrupts (8259 x 2)



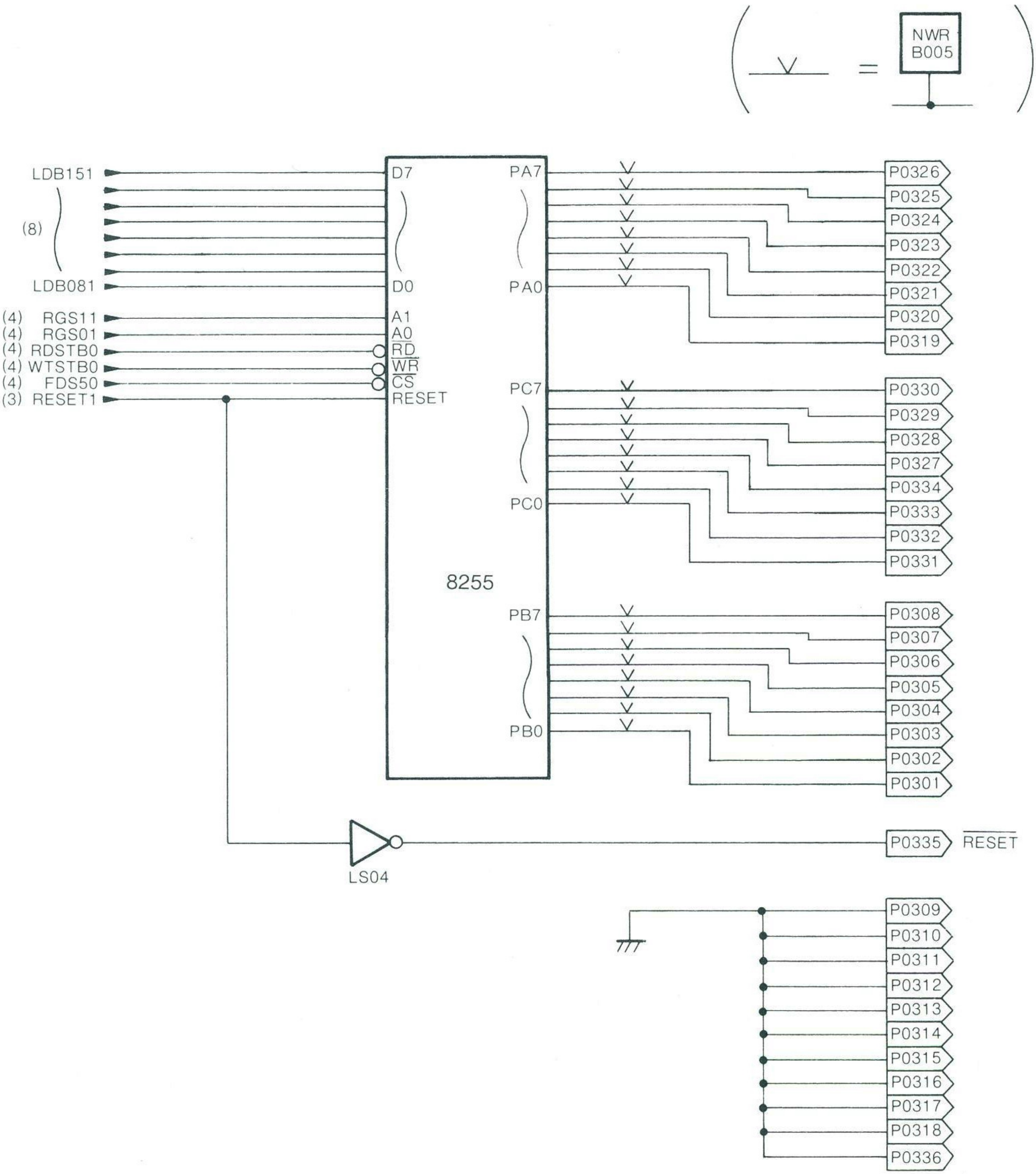
Motherboard (8)   Timer (8253), buffers



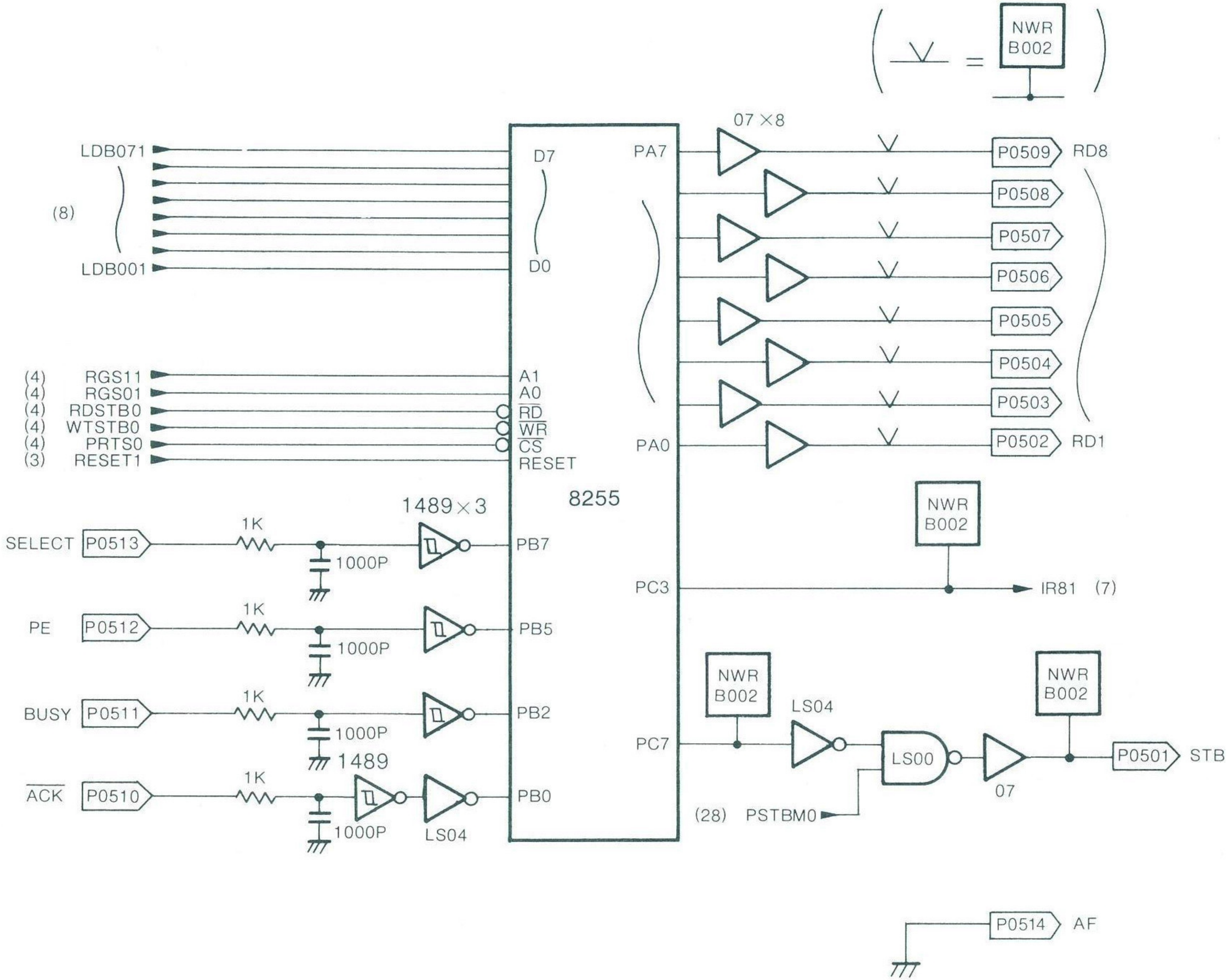
Motherboard (9)   System ports (8255)



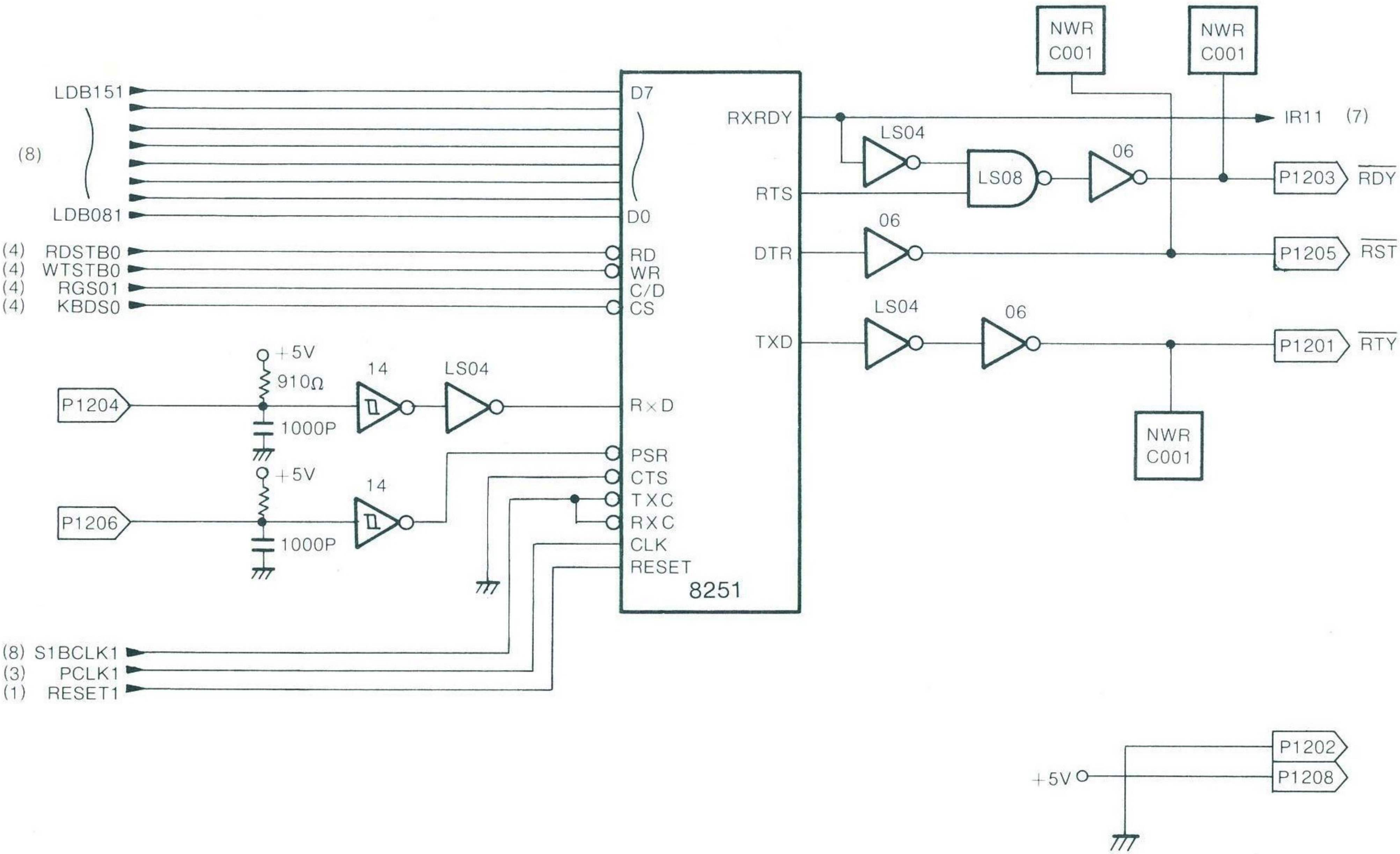
Motherboard (10)   Calendar (1990), Direct Memory Access control 3



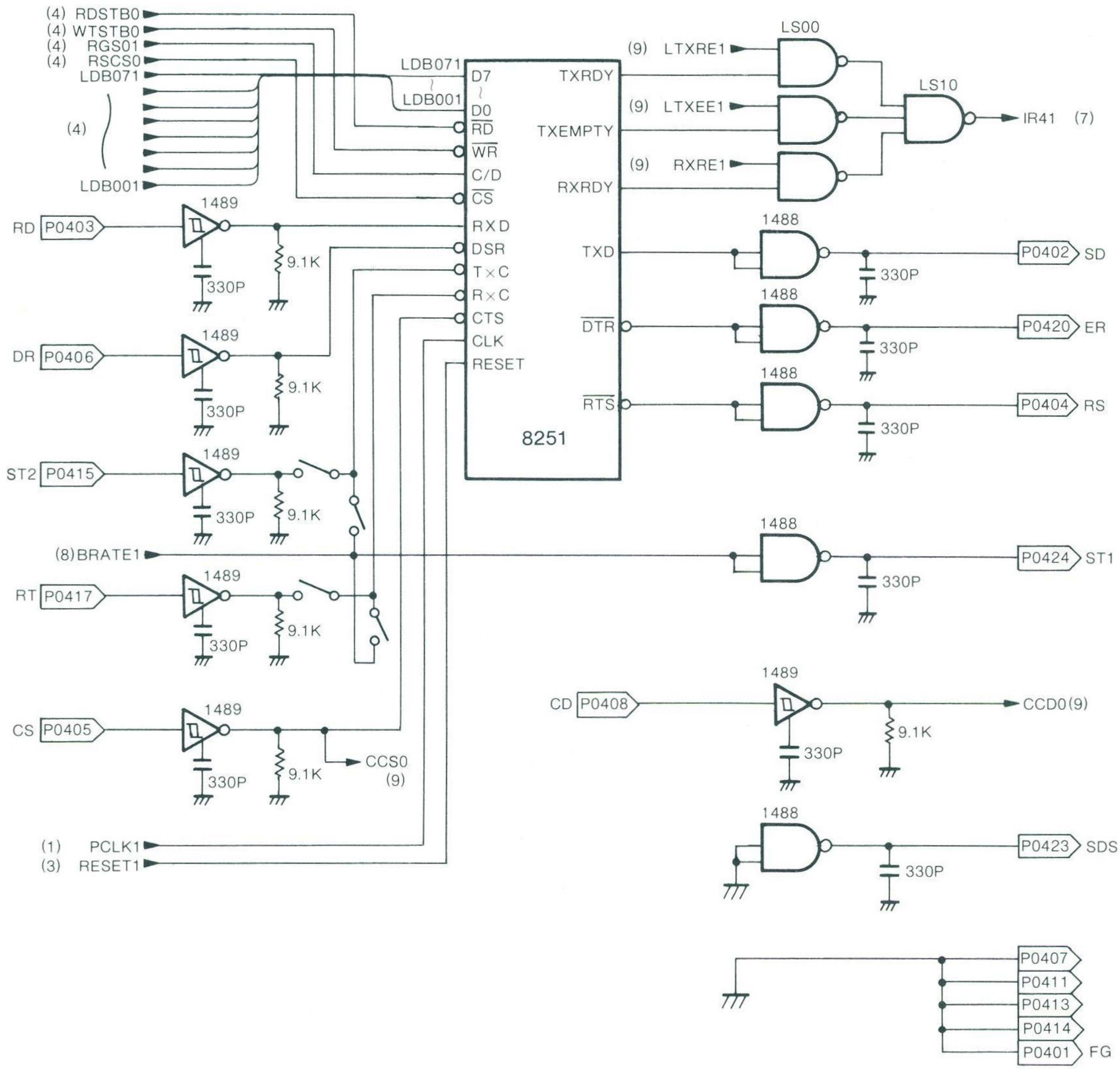
Motherboard (11)   Floppy Disk (8255) control 1



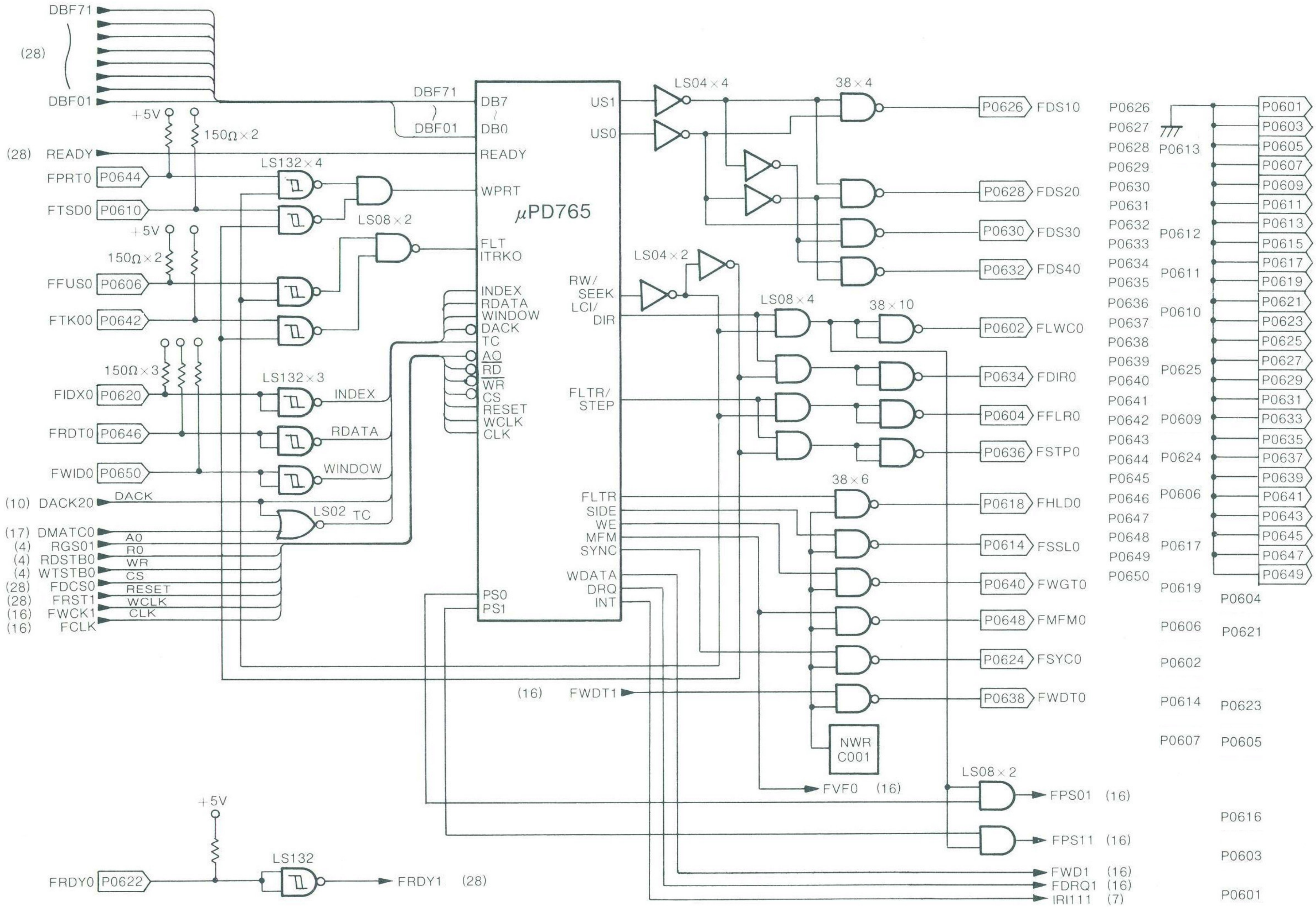
Motherboard (12)   Centronics Printer (8255)



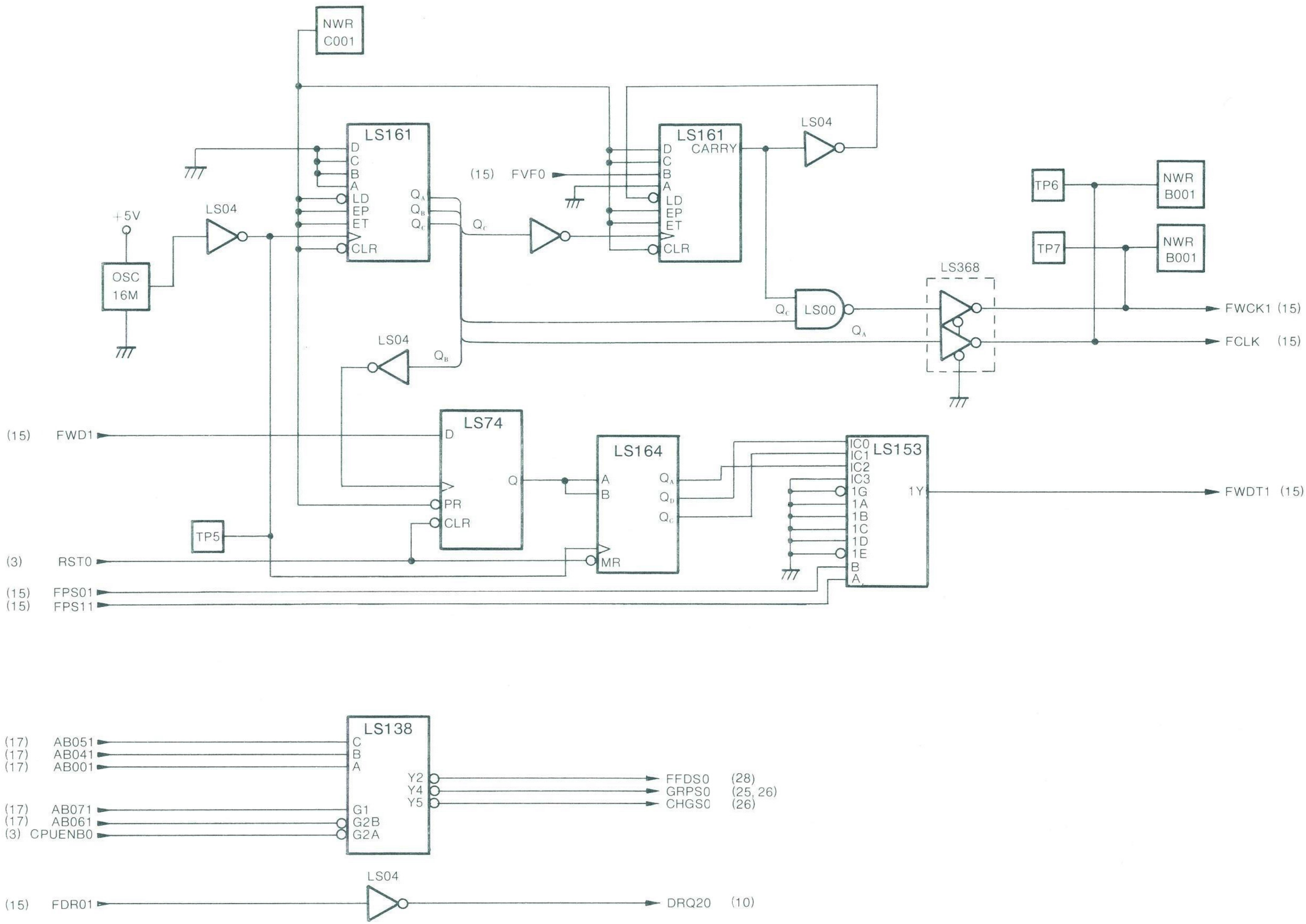
Motherboard (13) Keyboard (8251)



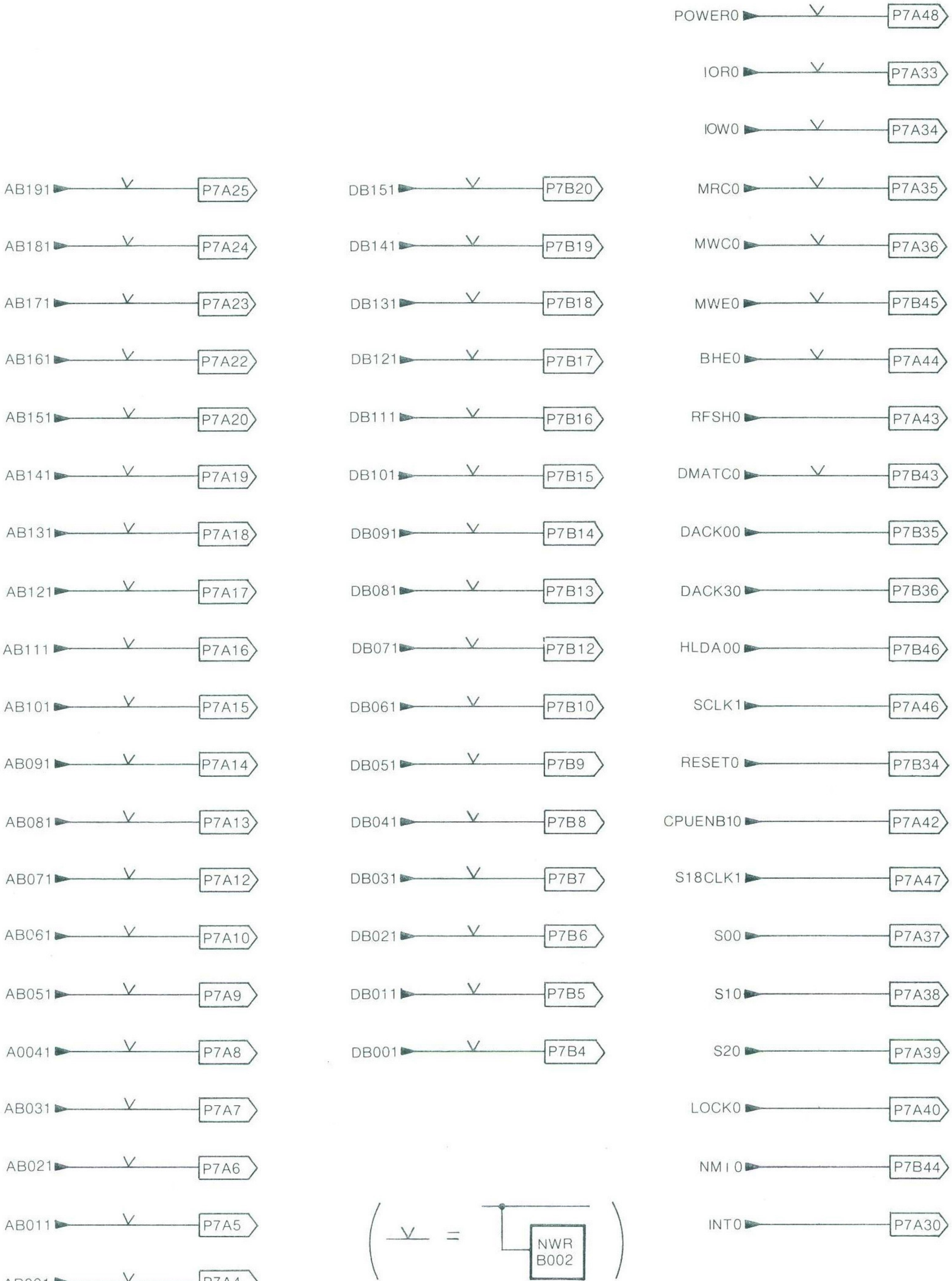
Motherboard (14)   RS-232C Serial Interface (8251)



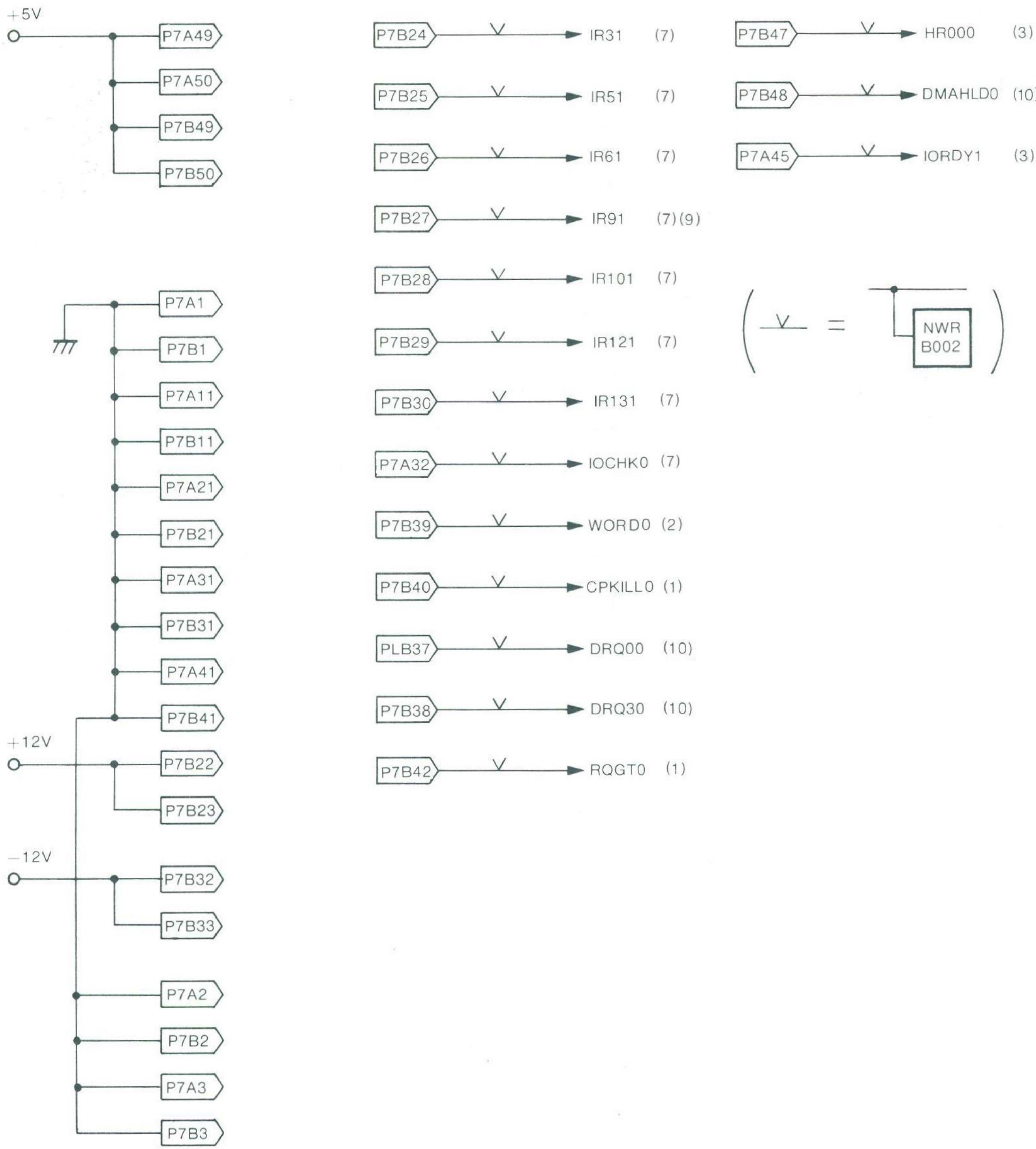
Motherboard (15)   Floppy Disk (765) control 2



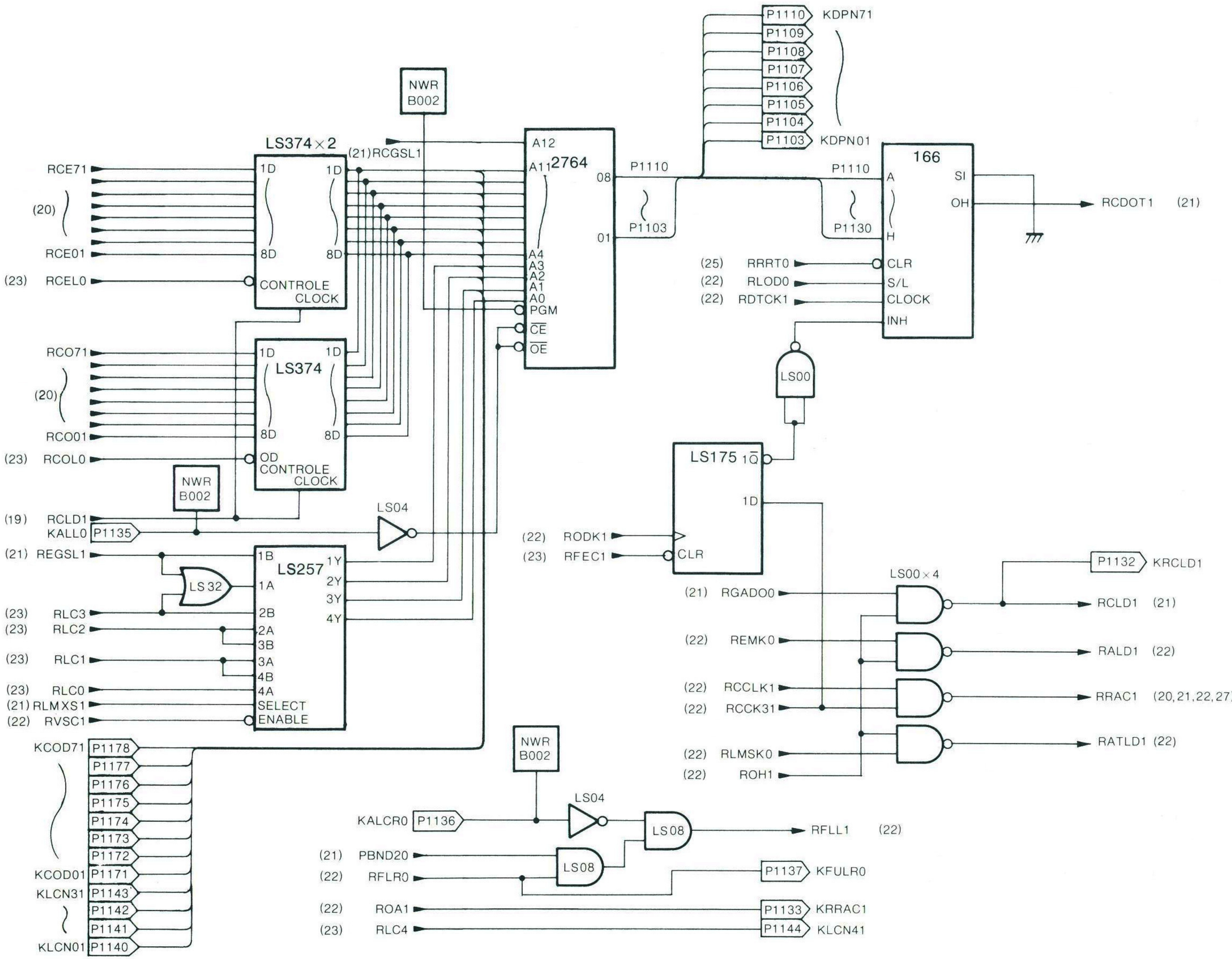
Motherboard (16)   **Floppy Disk control 3**



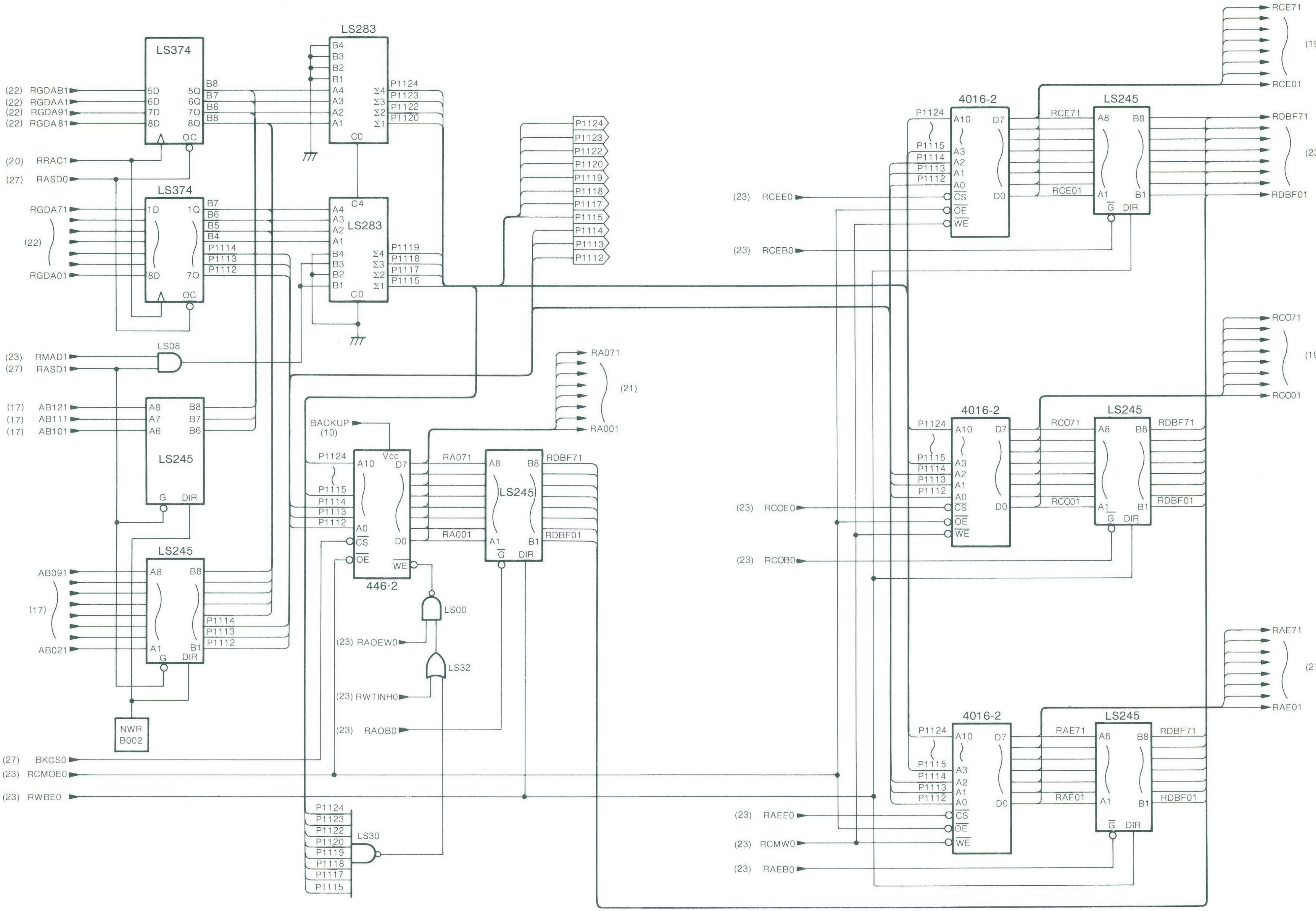
Motherboard (17) Expansion slot 1 (General)



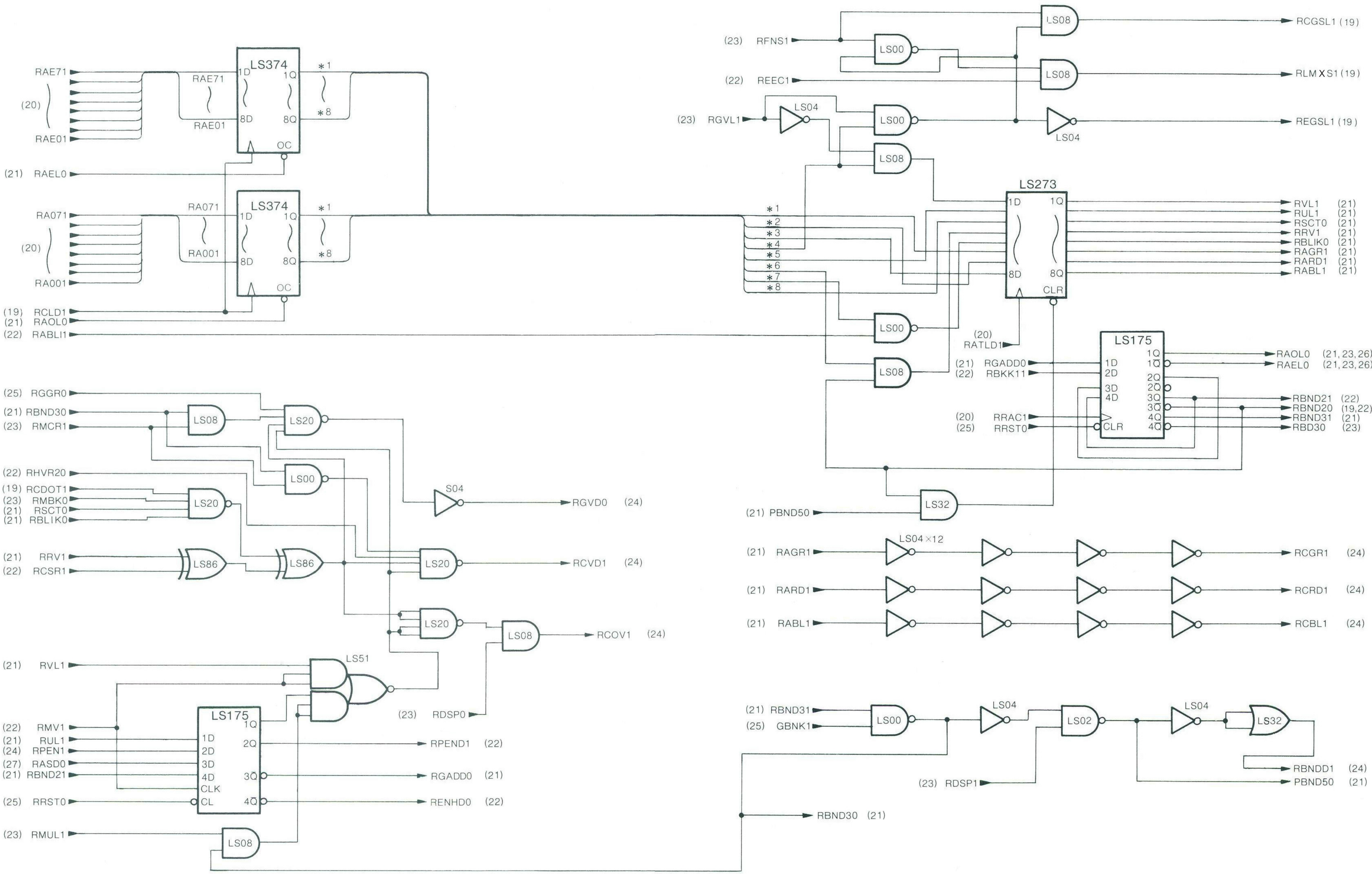
Motherboard (18) **Expansion slot 2 (General)**



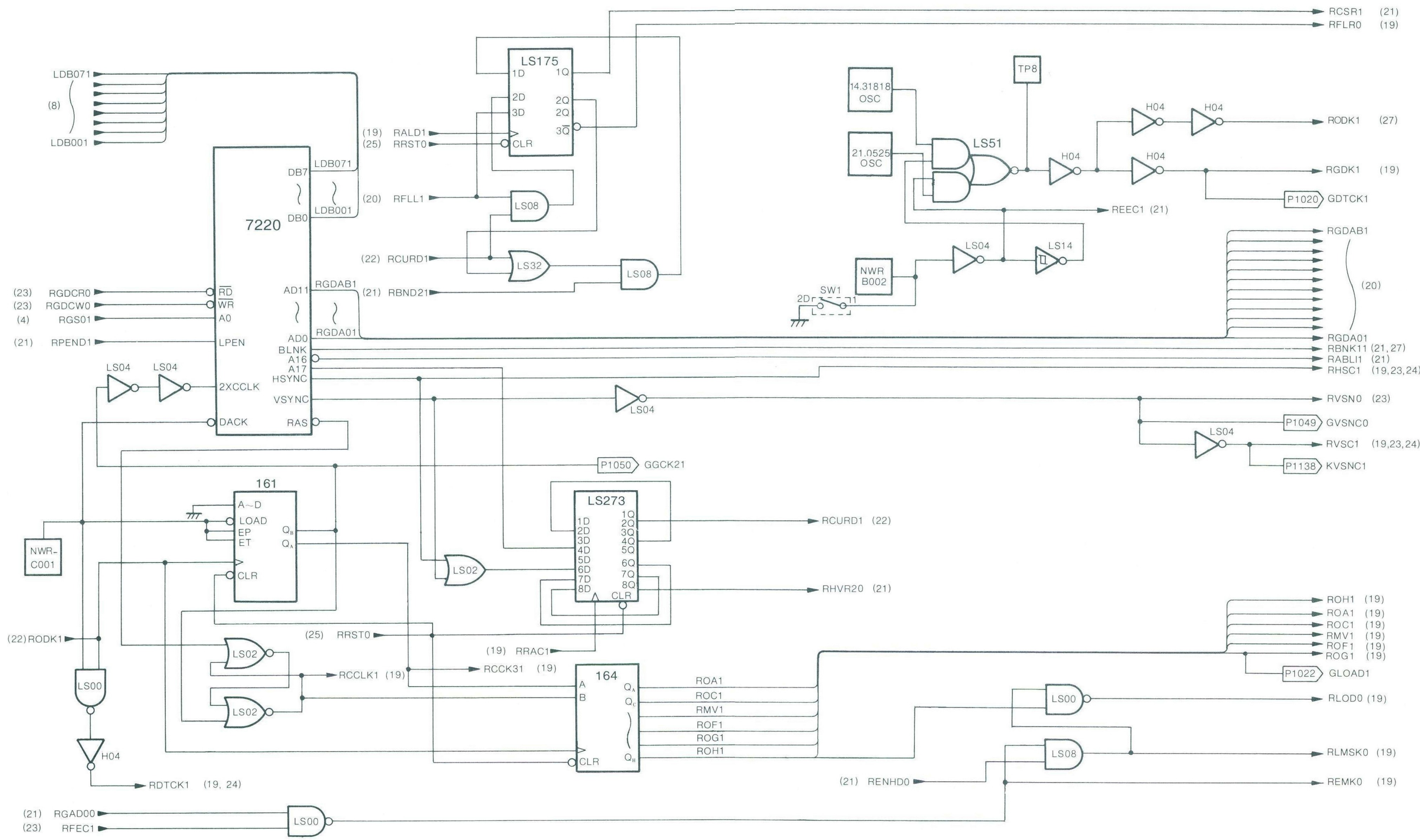
Motherboard (19)   Character Programmable Read Only Memory (2764)



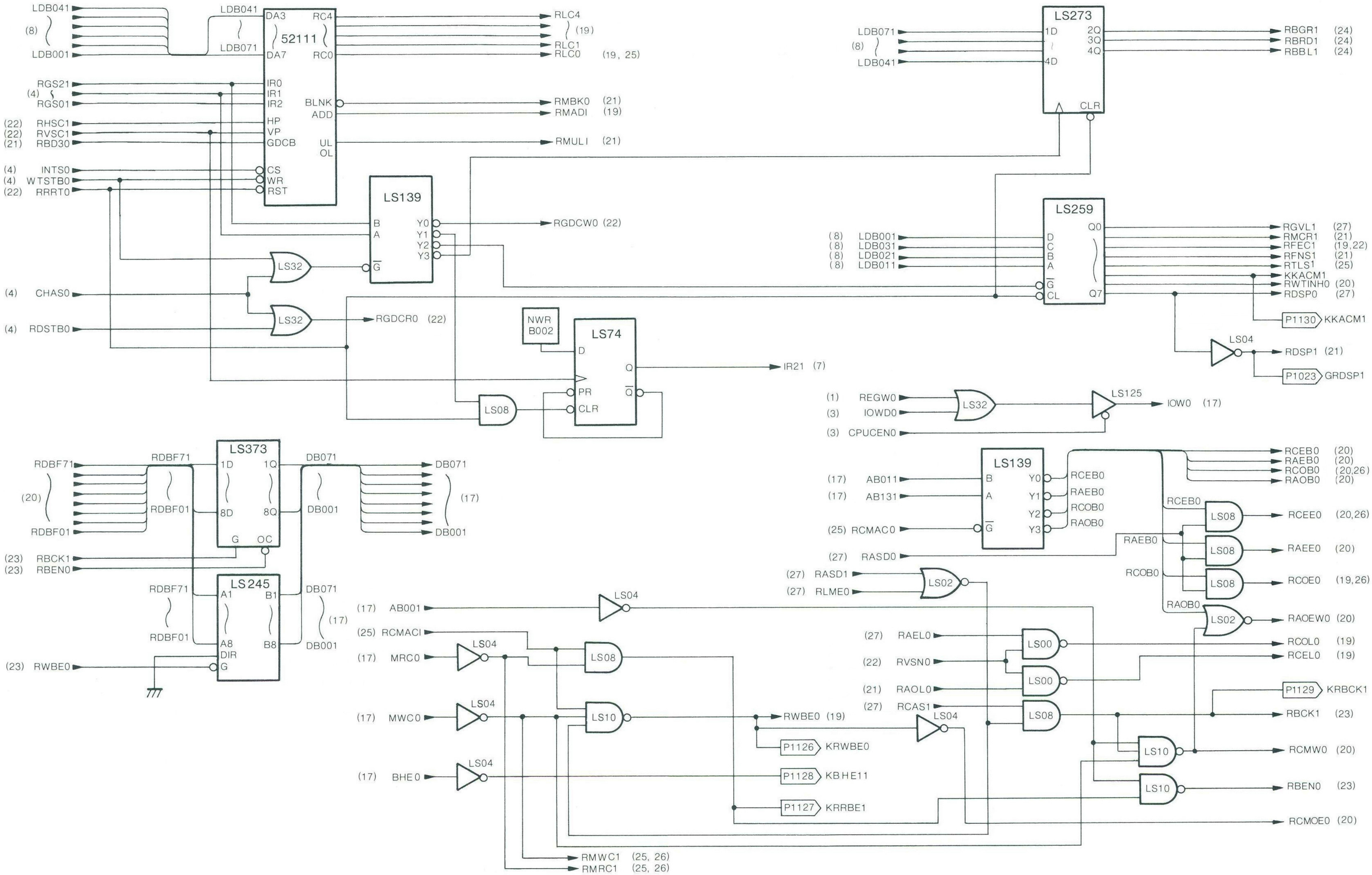
Motherboard (20) **Character Static Random Access Memory (4016 x 3)**



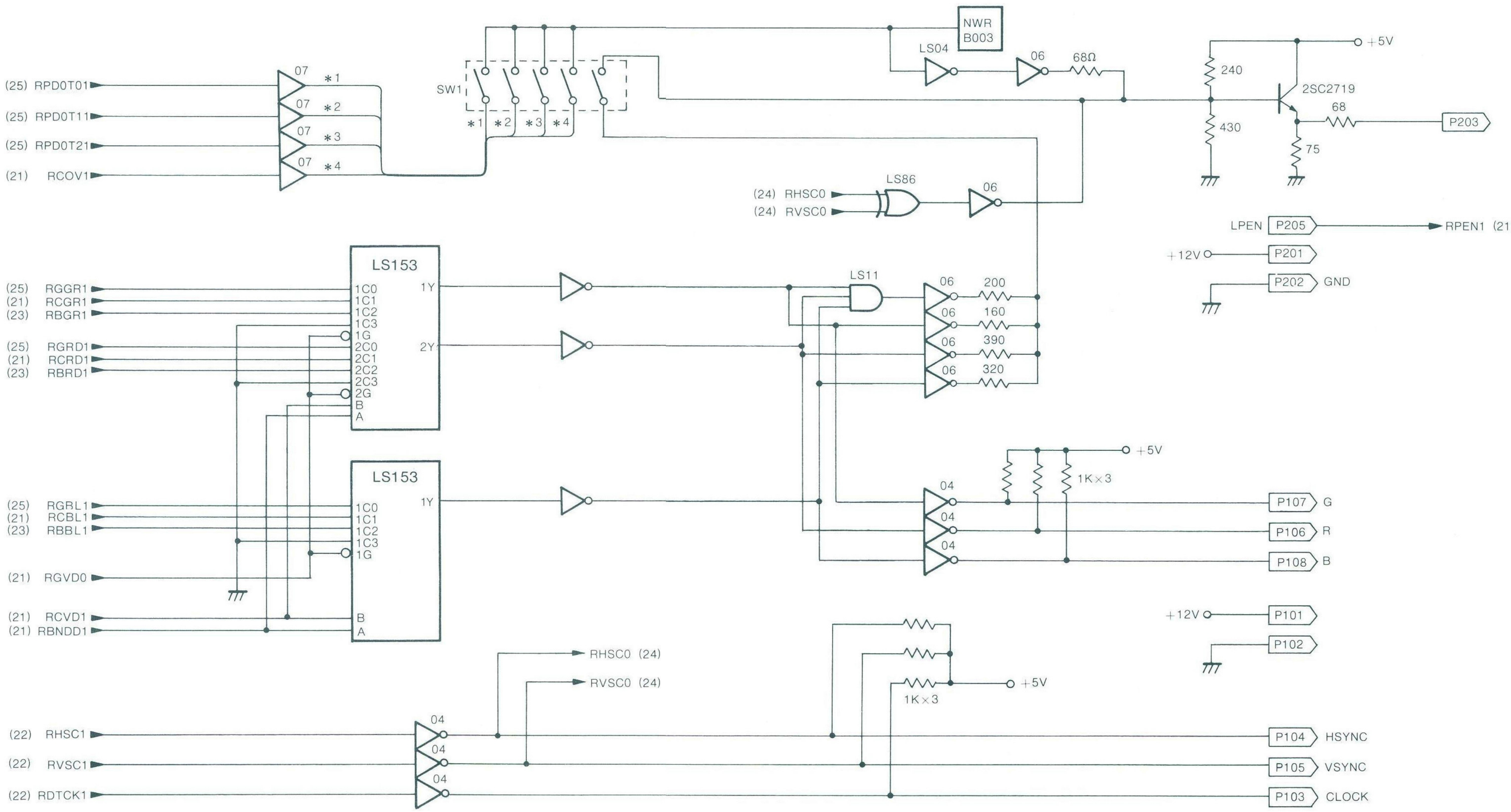
Motherboard (21)   Character Display 1



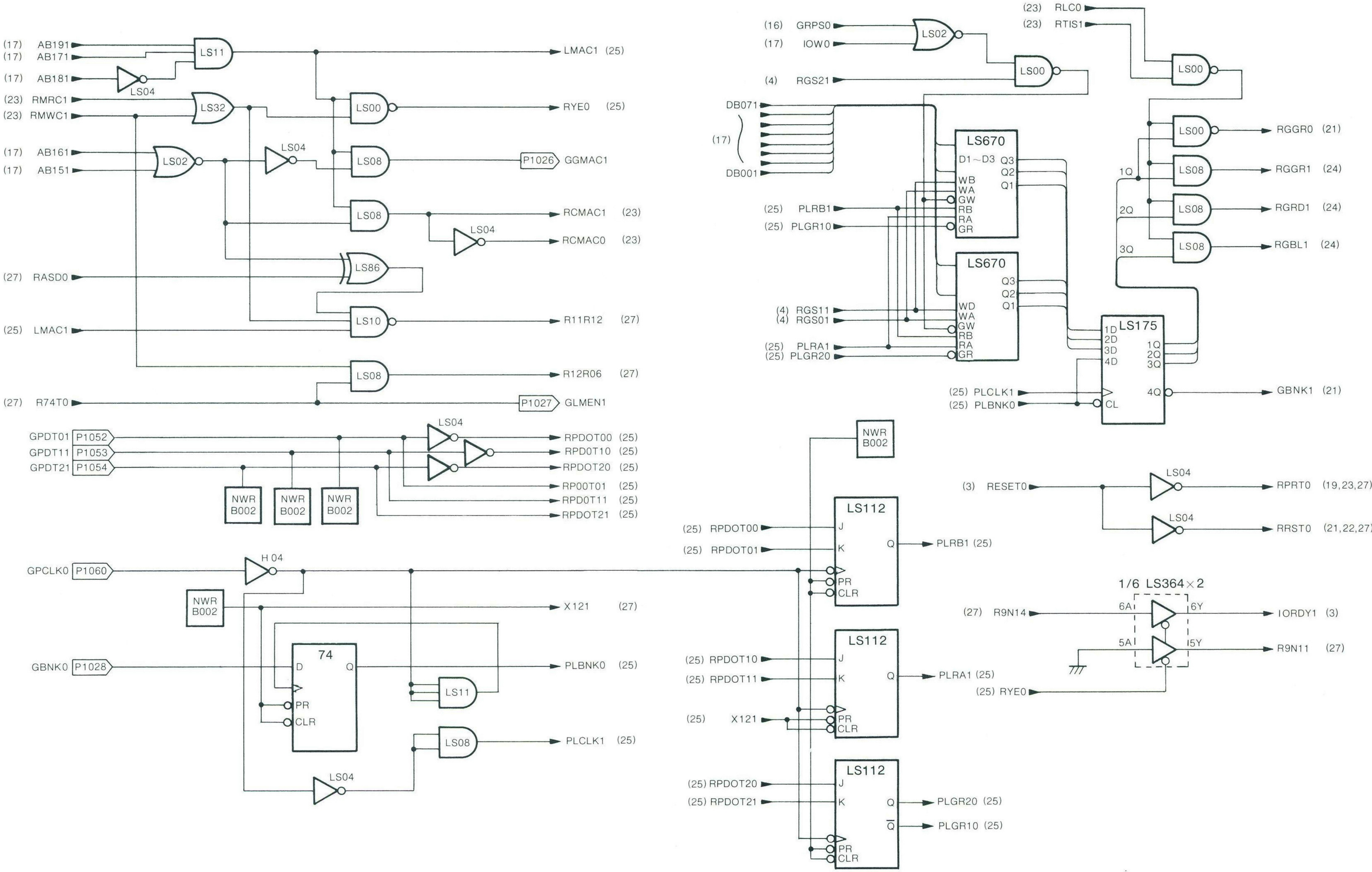
Motherboard (22) Character Display (7220; master)



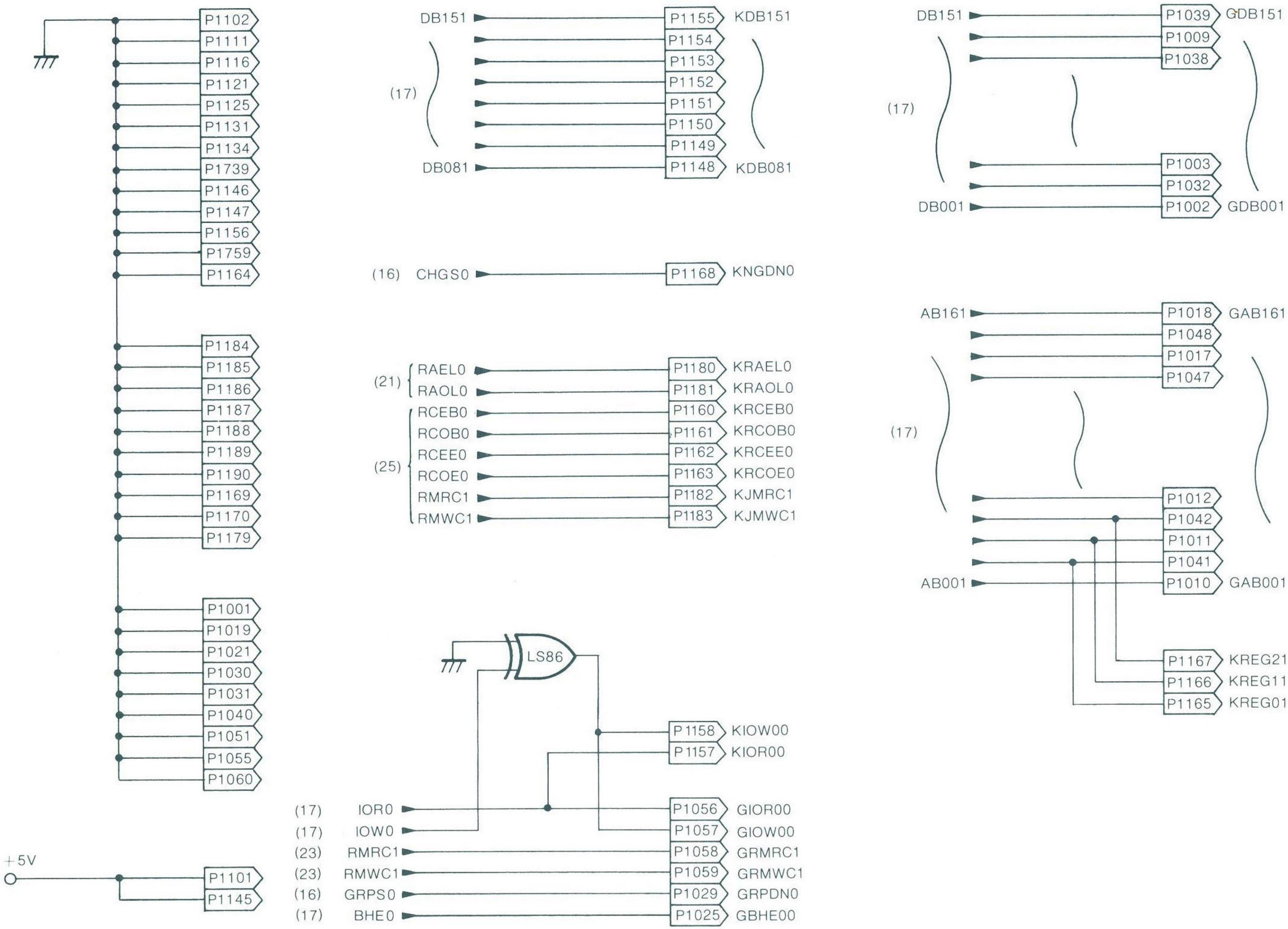
Motherboard (23)   Character Display 2 (52111)



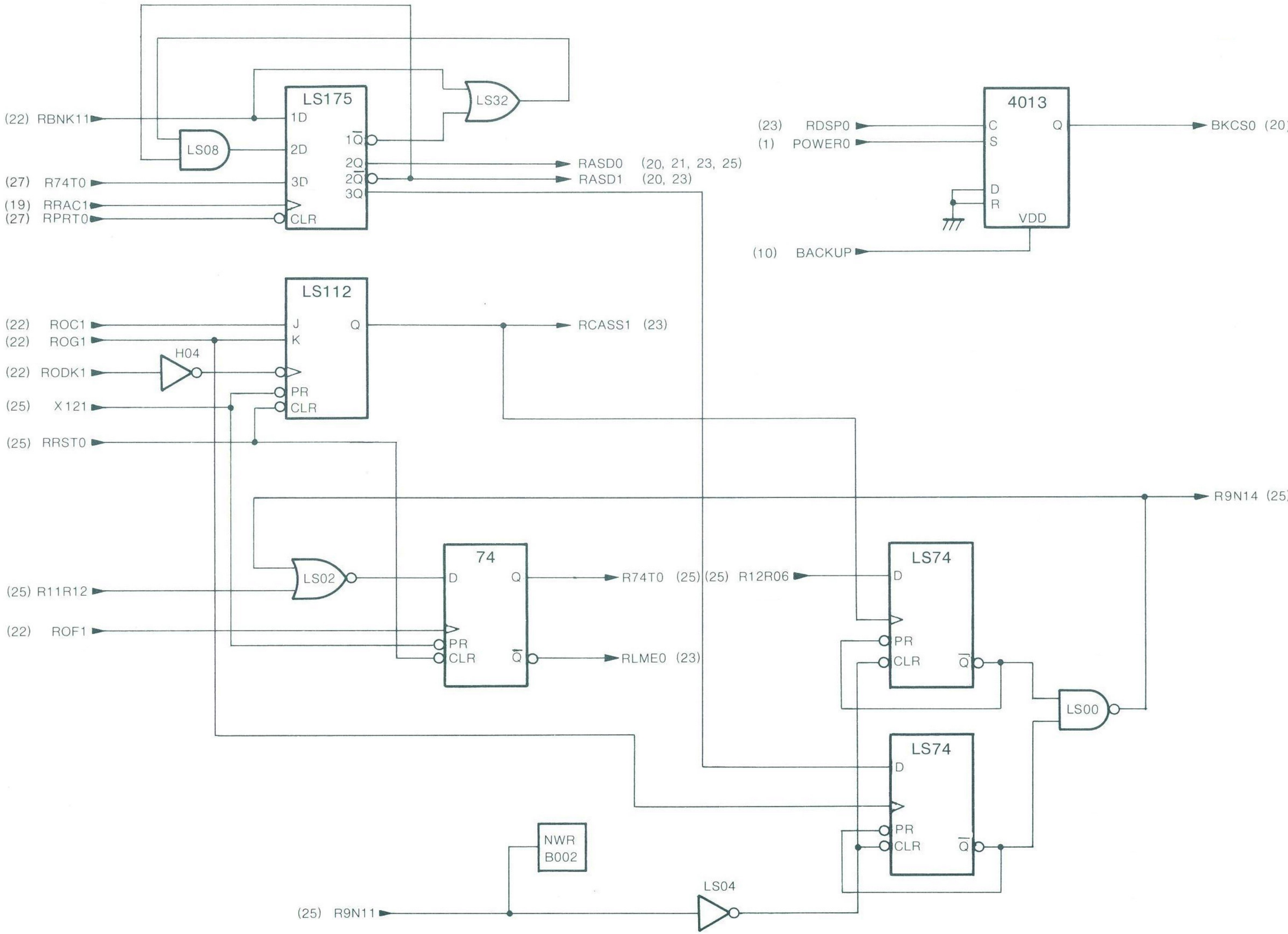
Motherboard (24) Character Display 3



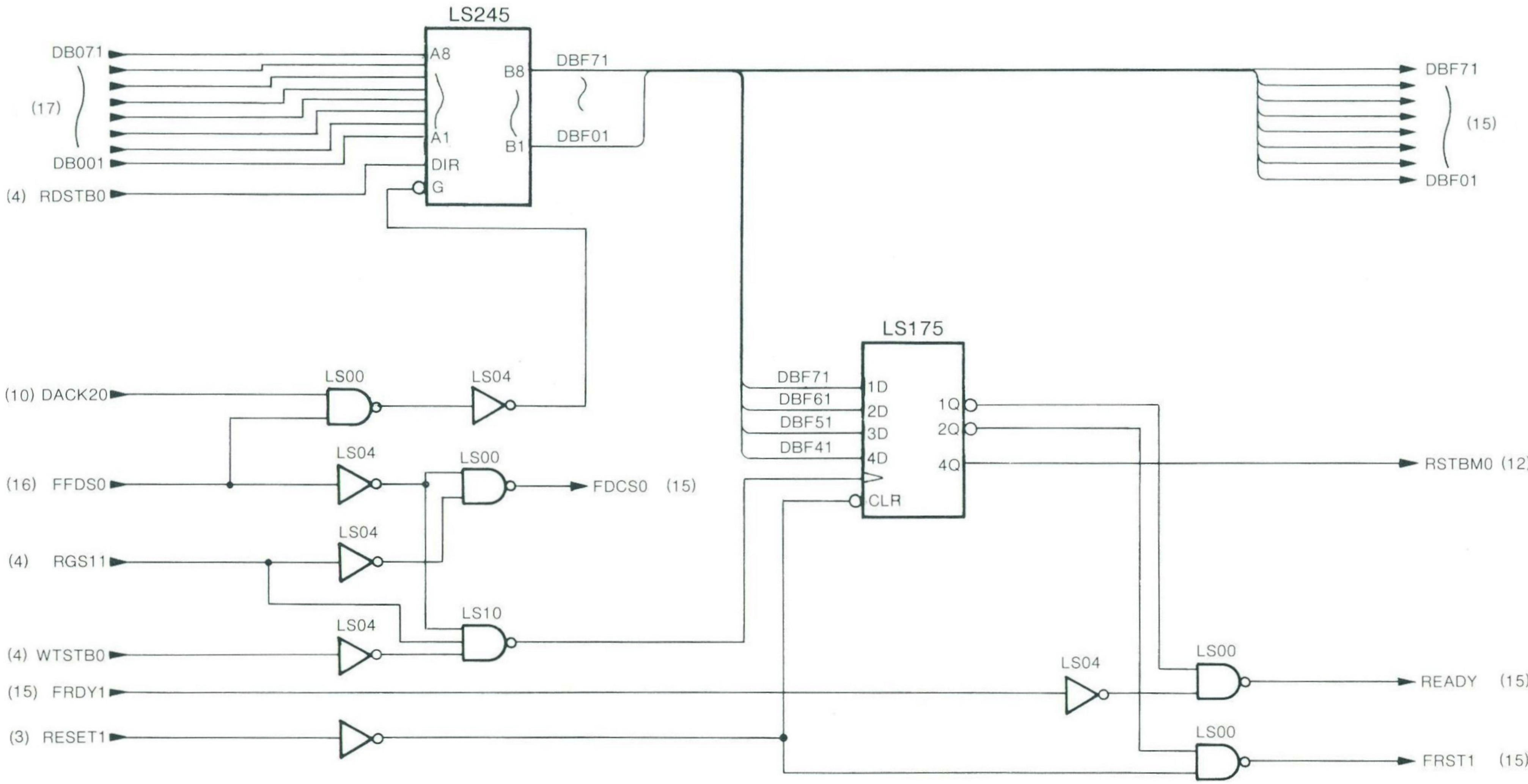
Motherboard (25) Character Display 4



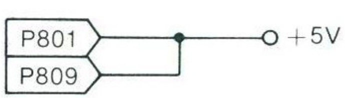
Motherboard (26) Expansion slot (Graphics Display, Kanji Read Only Memory)

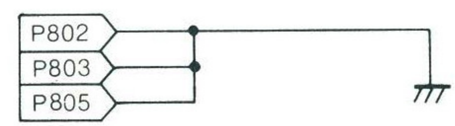


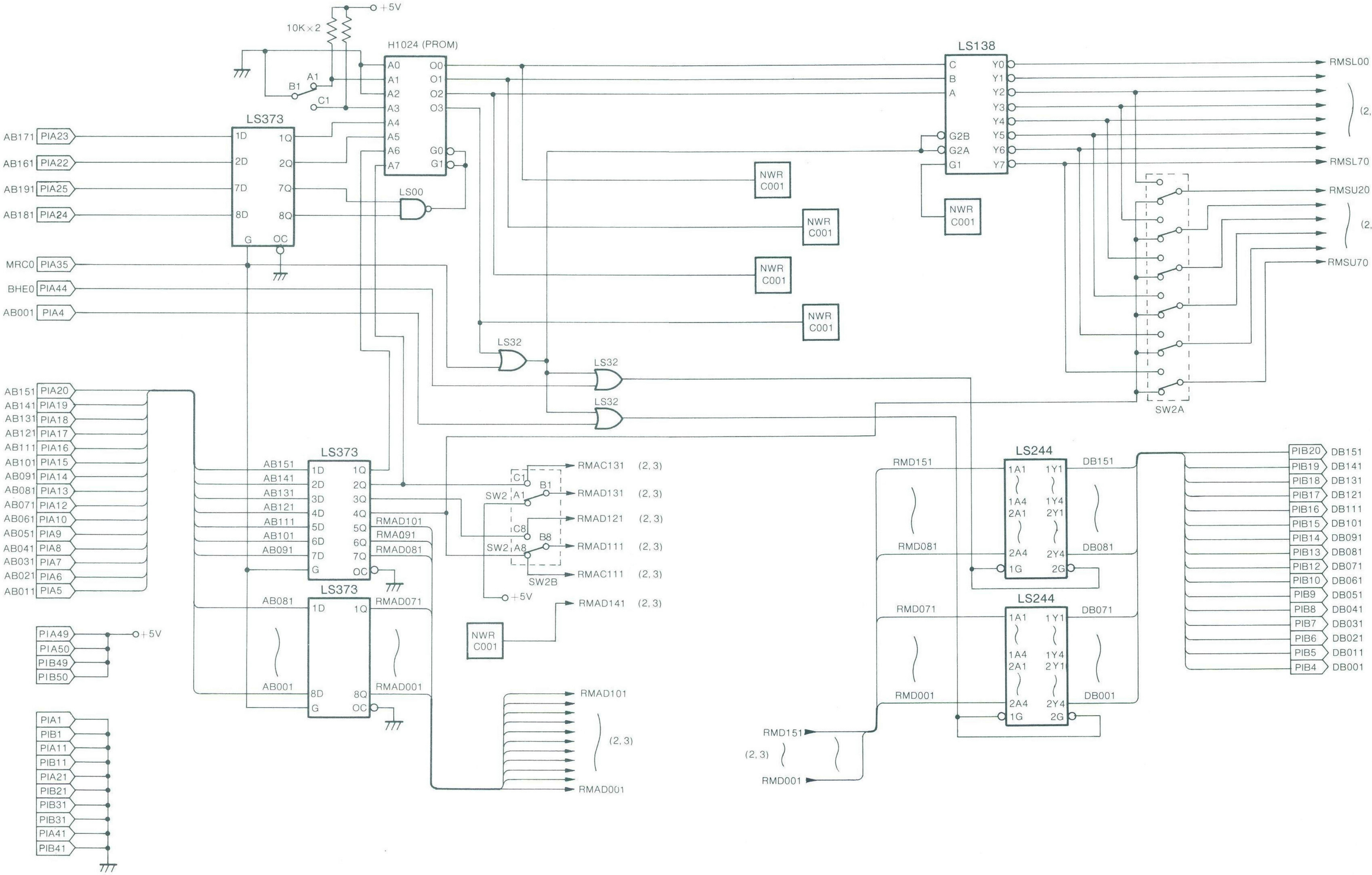
Motherboard (27) **Character Display 5**



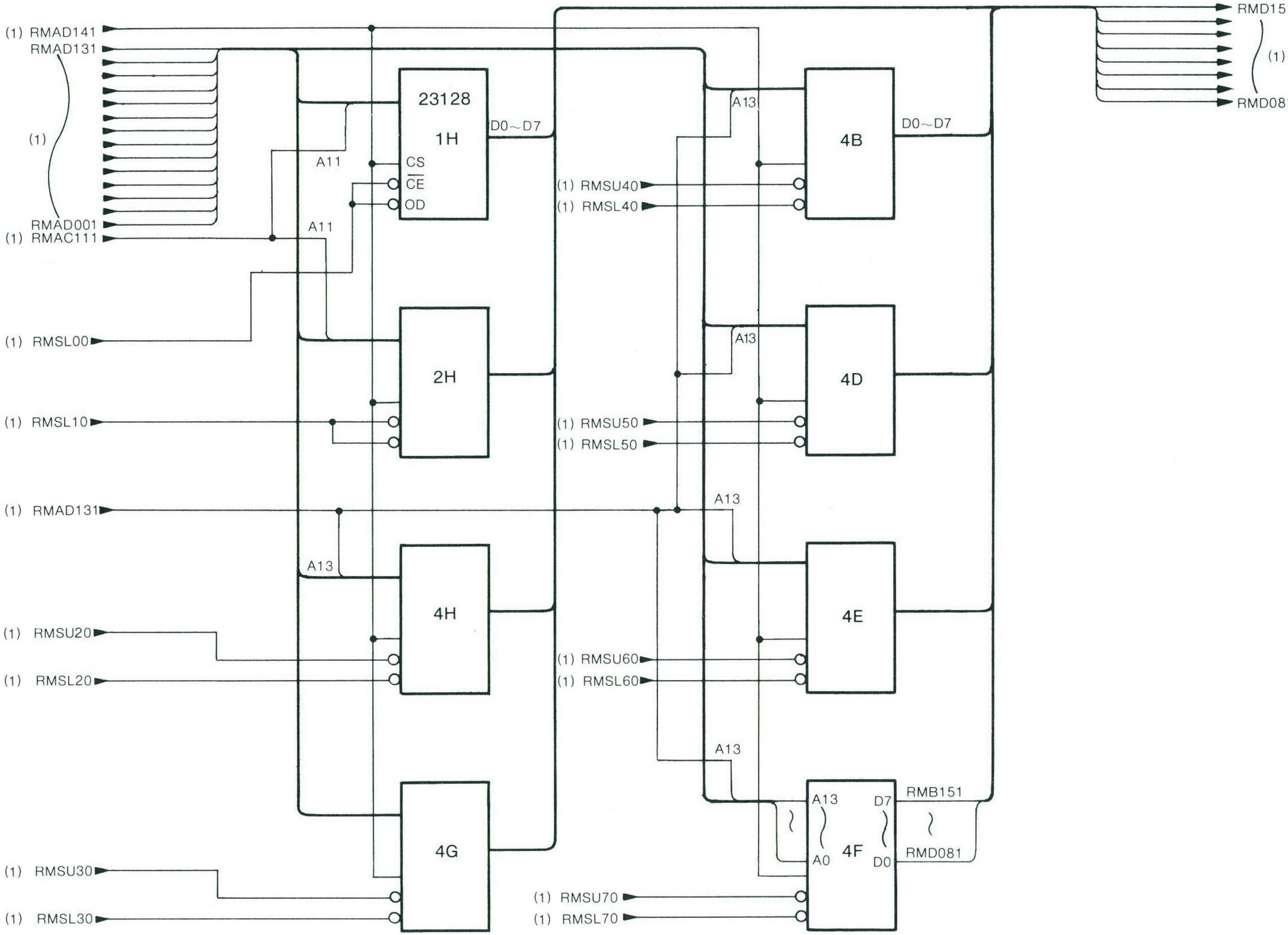
Motherboard (28)   Floppy Disk control 4



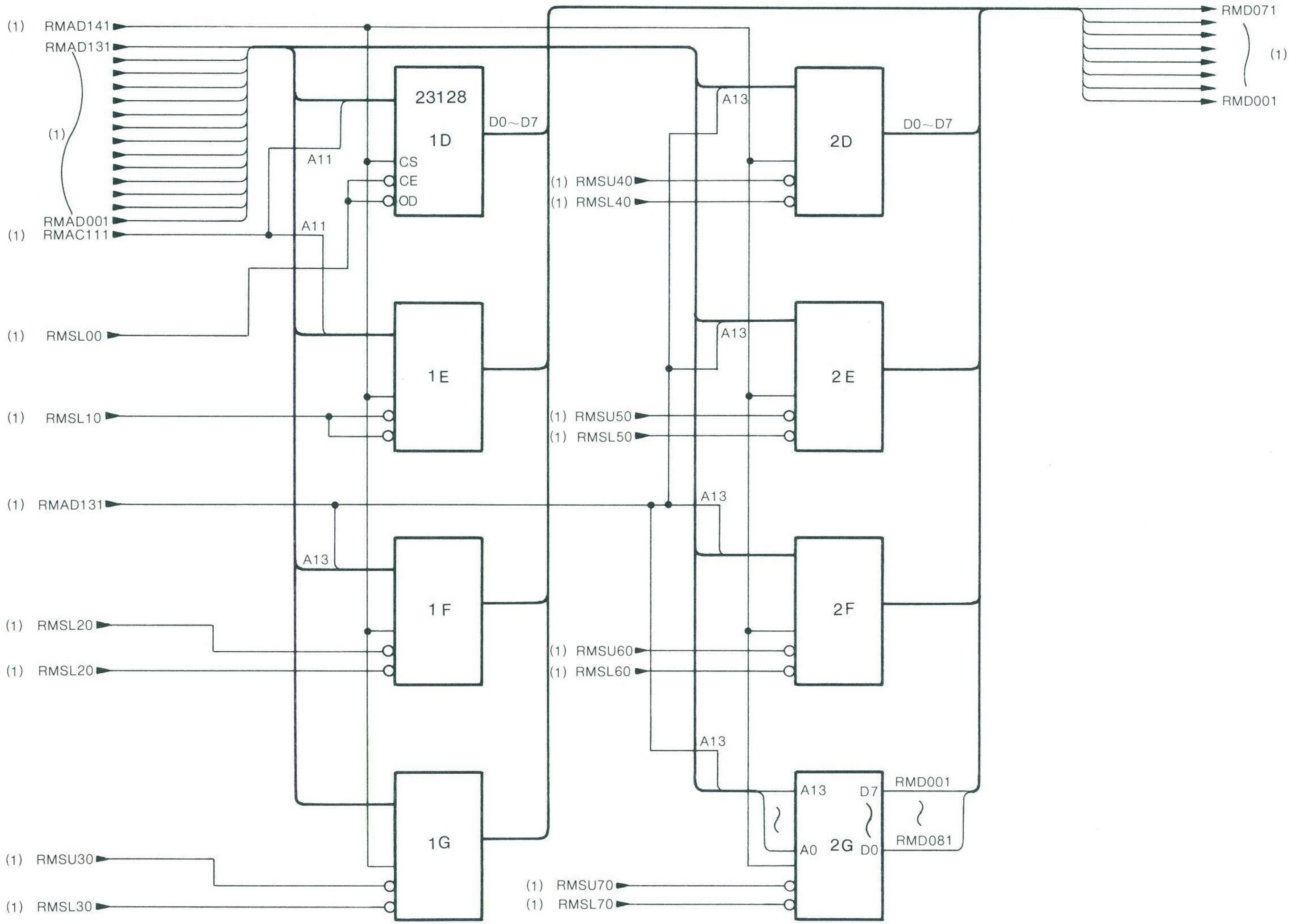




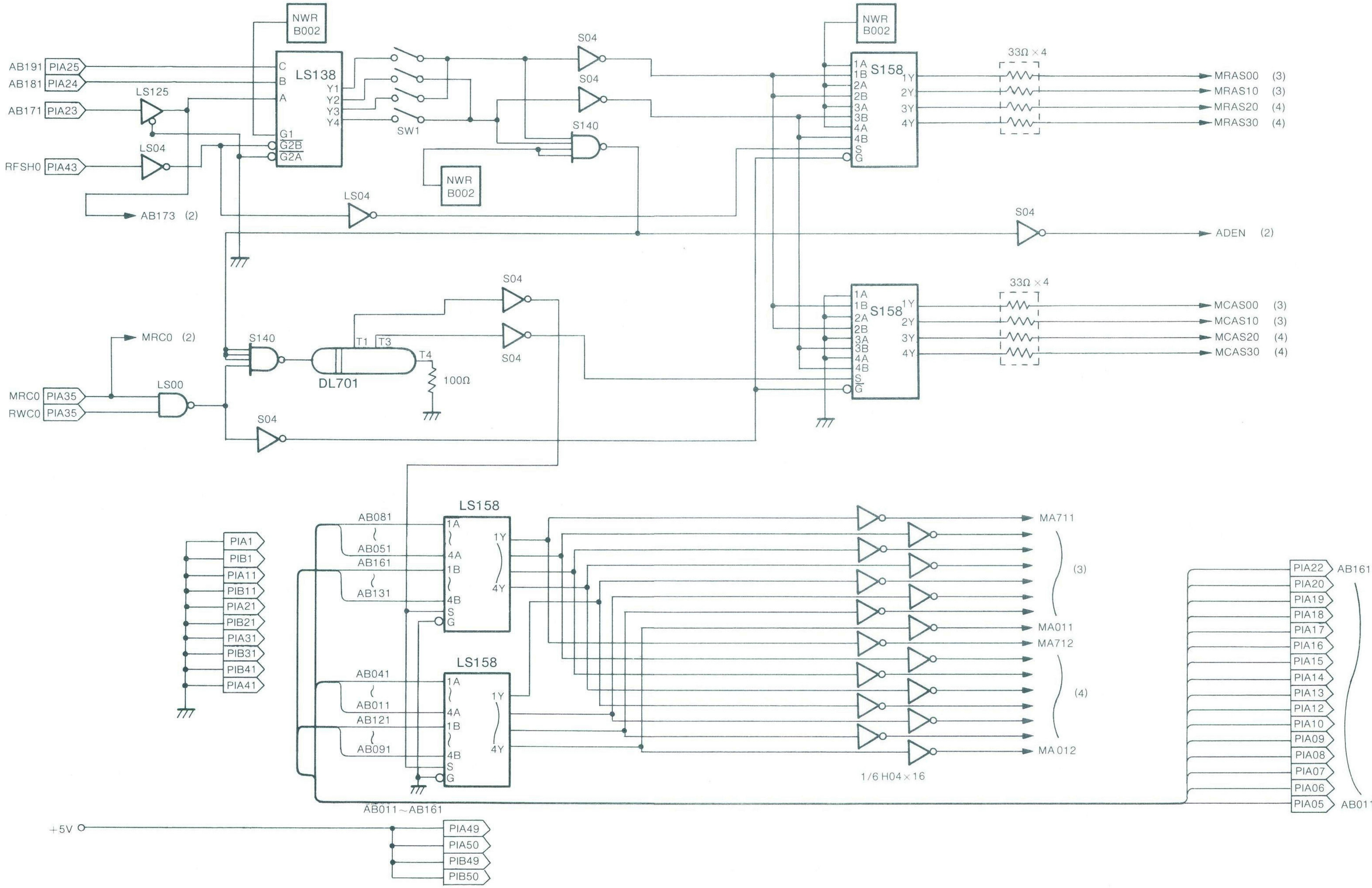
BIOS ROM (1)   Basic I/O System Read Only Memory control



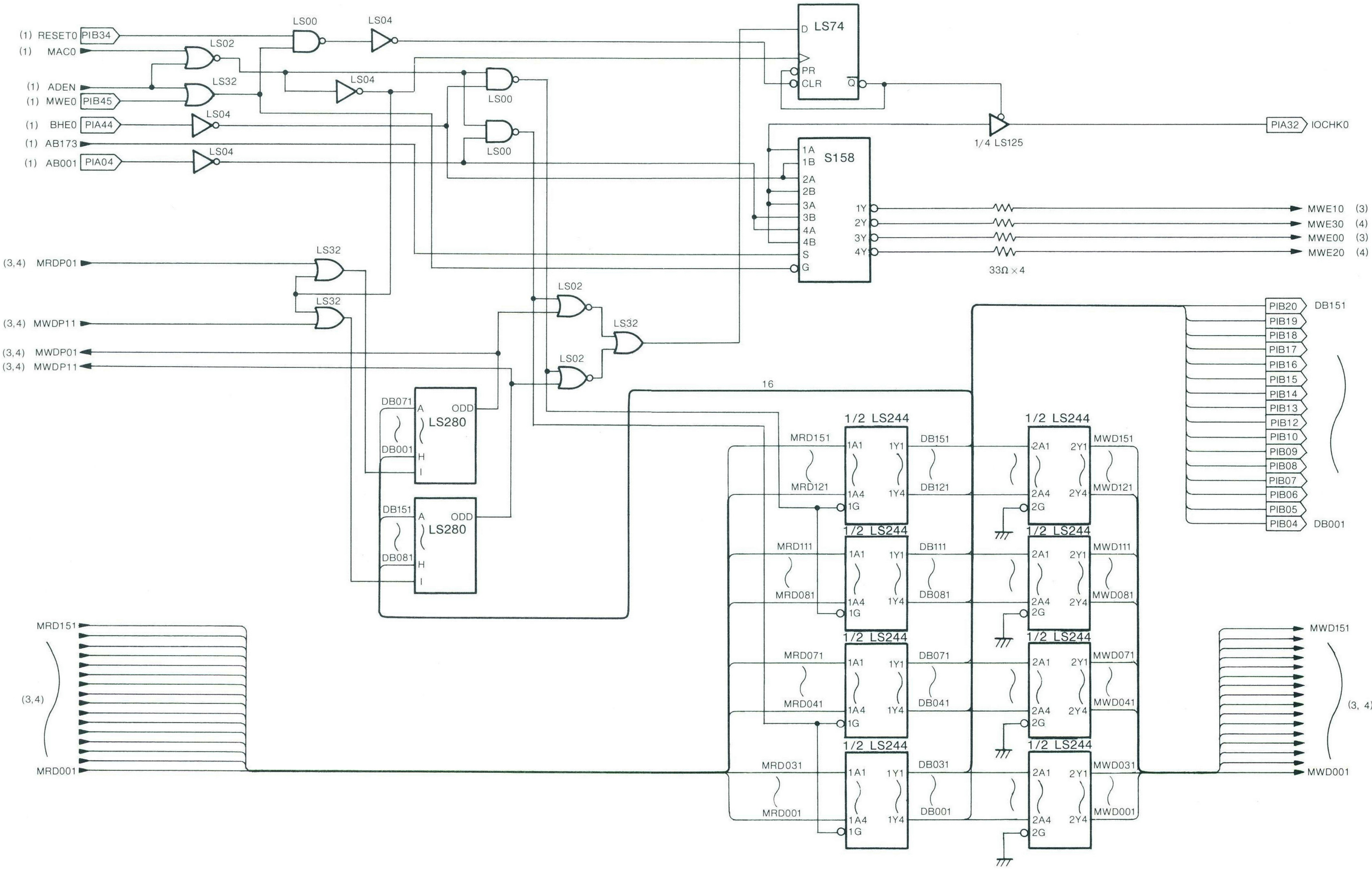
BIOS ROM (2)　　Basic I/O System Read Only Memory 1 (23128 x 8)



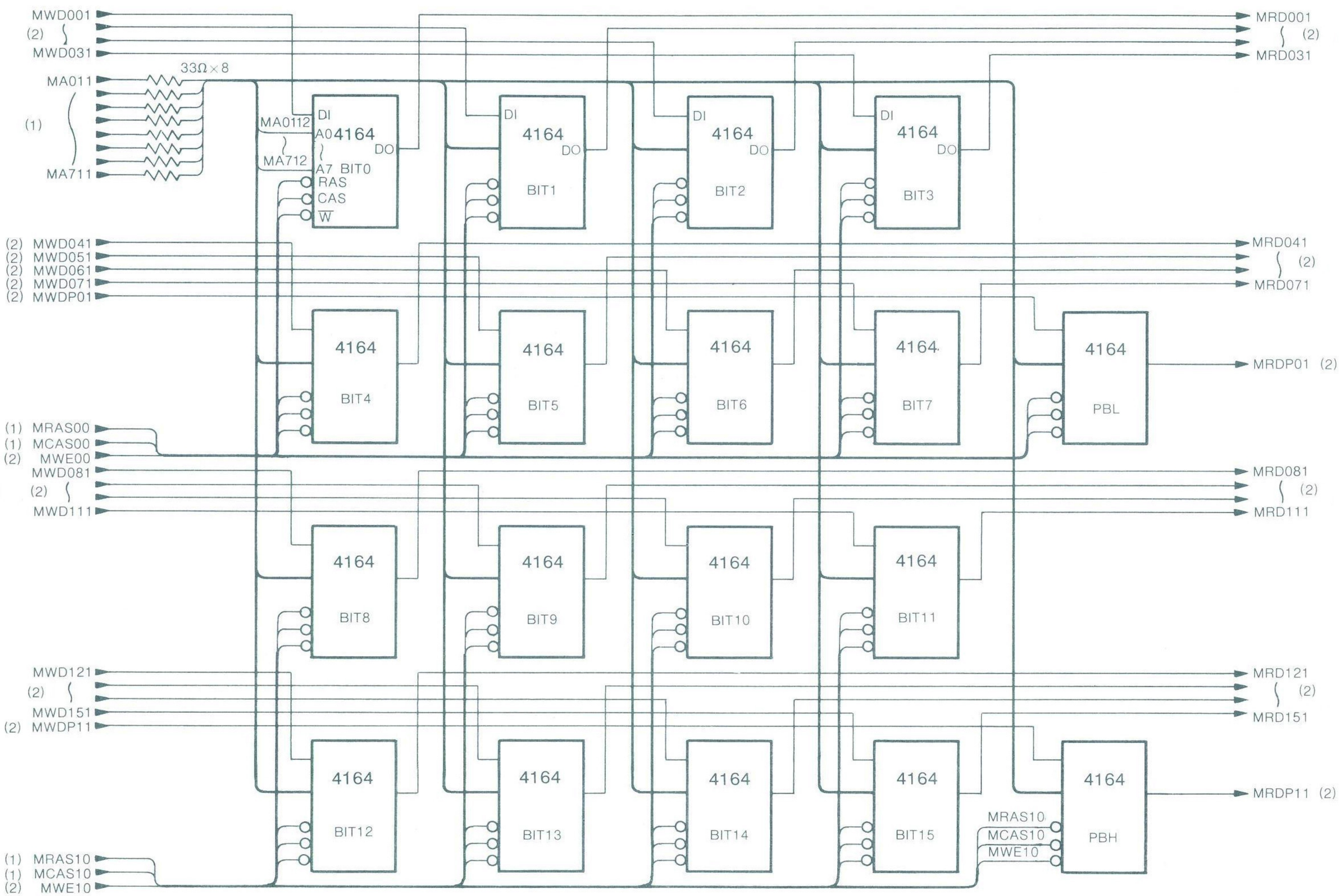
BIOS ROM (3) **Basic I/O System Read Only Memory 2 (23128 x 8)**



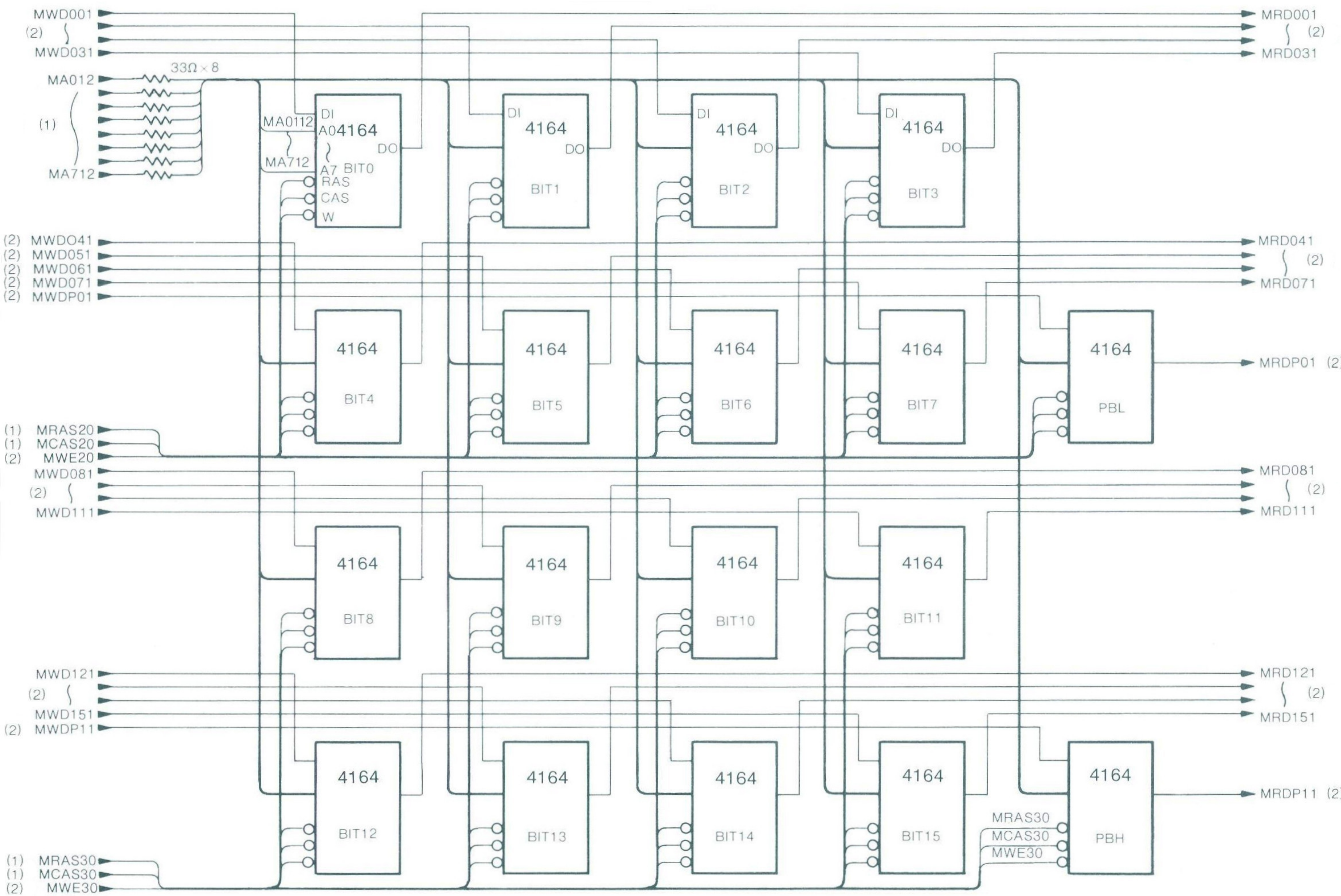
Extended Main Memory (1)   Extended Dynamic Random Access Memory control 1



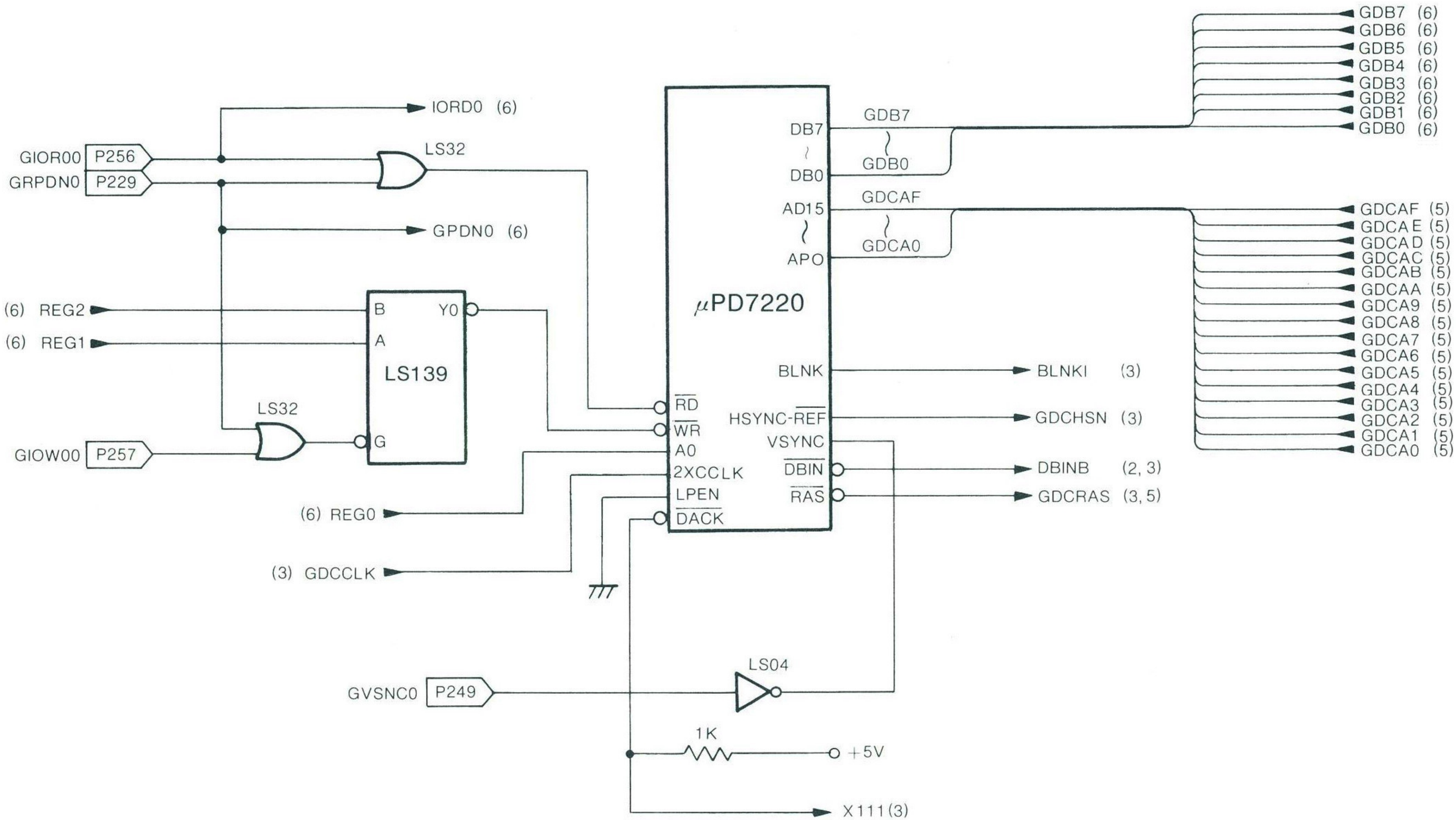
Extended Main Memory (2) Extended Dynamic Random Access Memory control 2



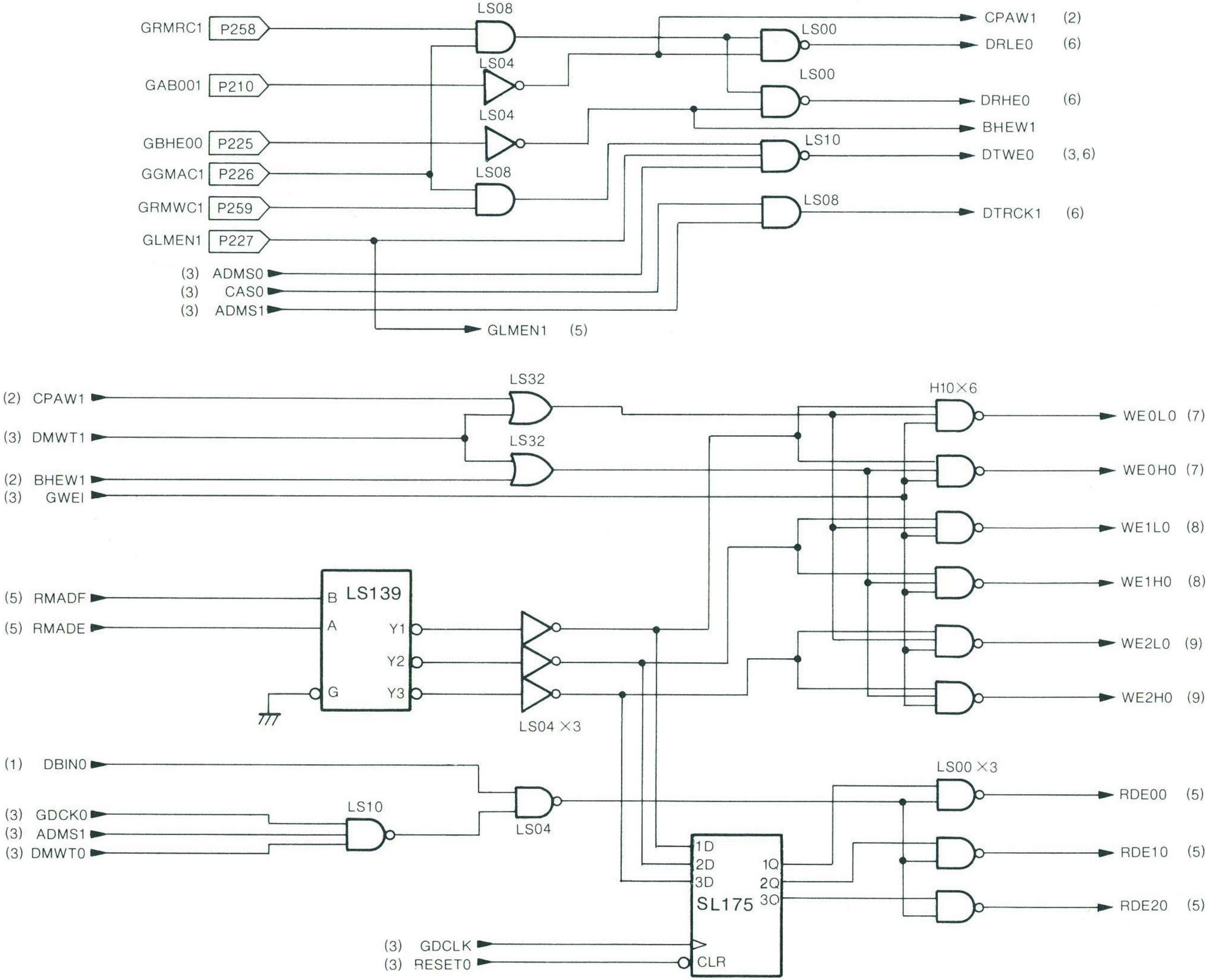
Extended Main Memory (3)   Extended Dynamic Random Access Memory 1 (4164 x 18 with parity bit)



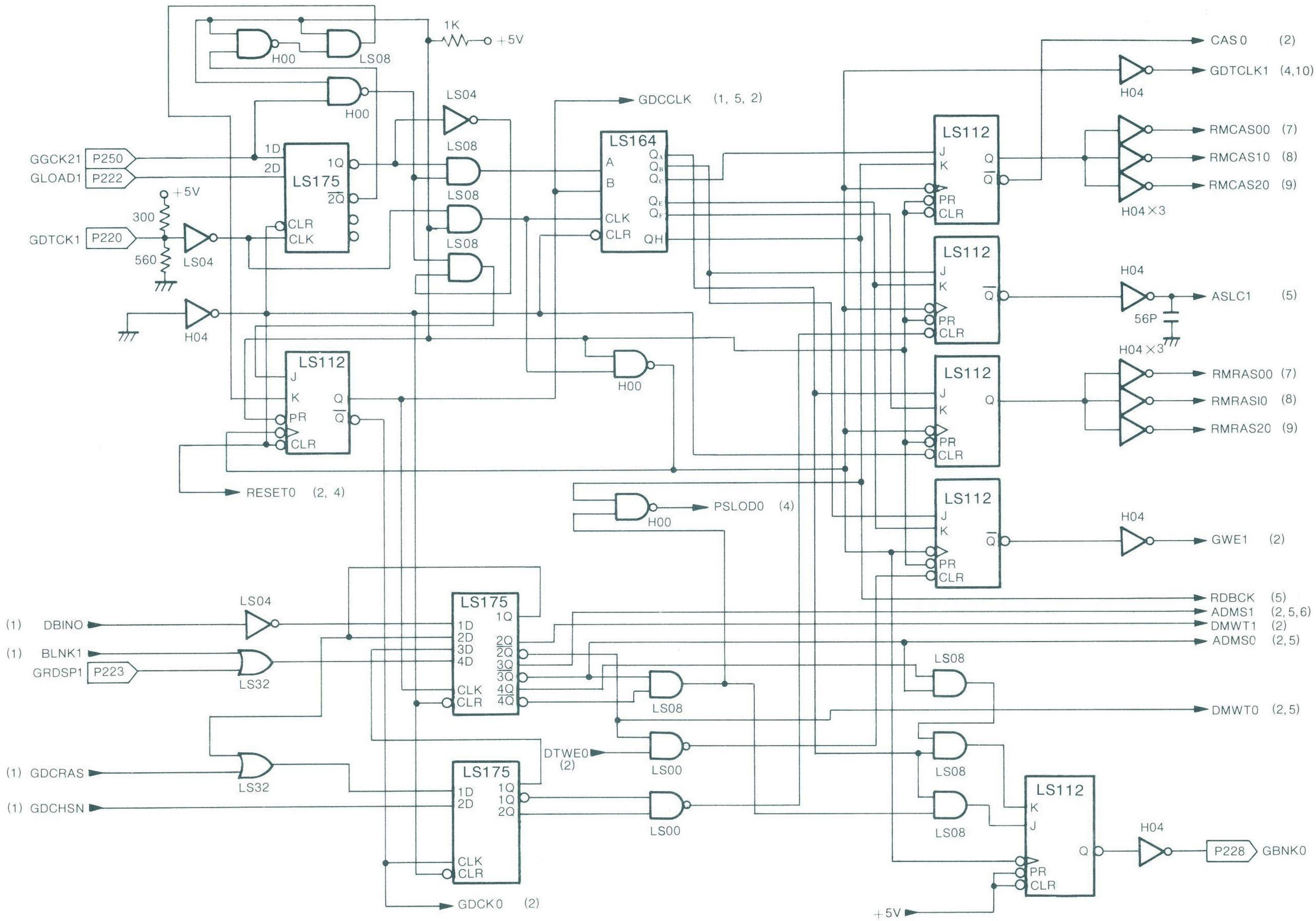
Extended Main Memory (4)   Extended Dynamic Random Access Memory 2 (4164 x 18 with parity bit)



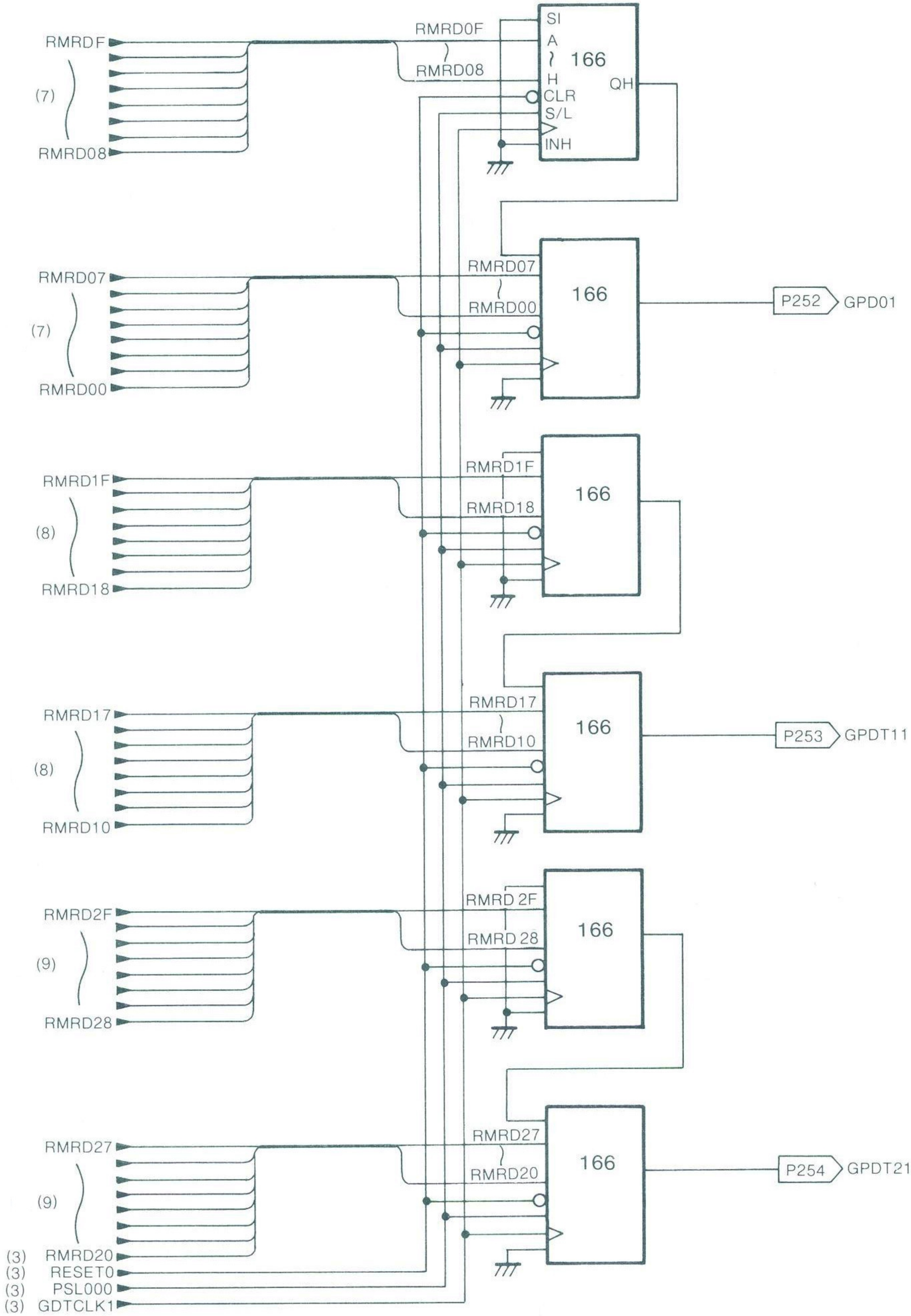
Graphics (1) Graphics Display (7220; Slave)



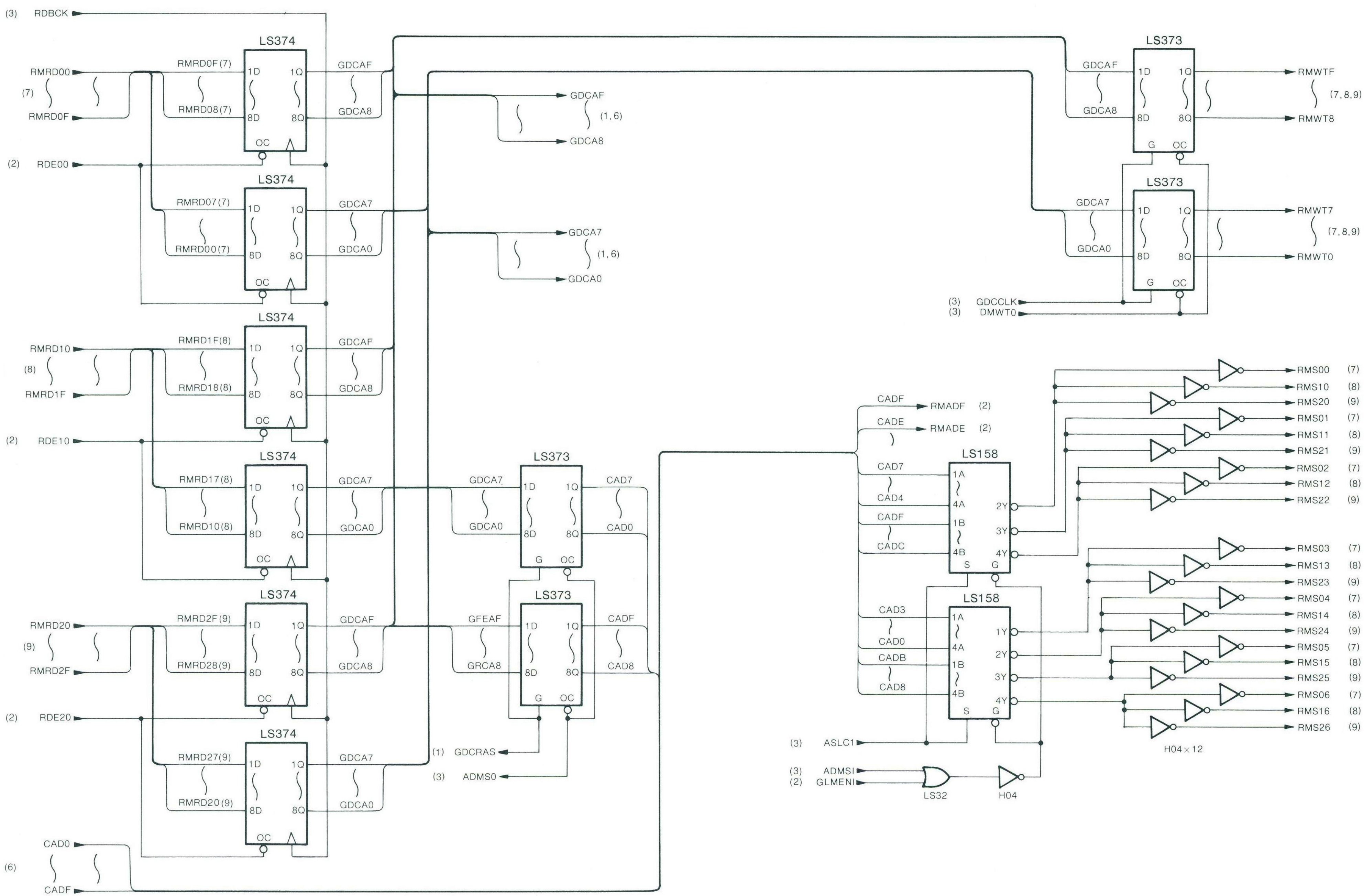
Graphics (2) Graphics Dynamic Random Access Memory control 1



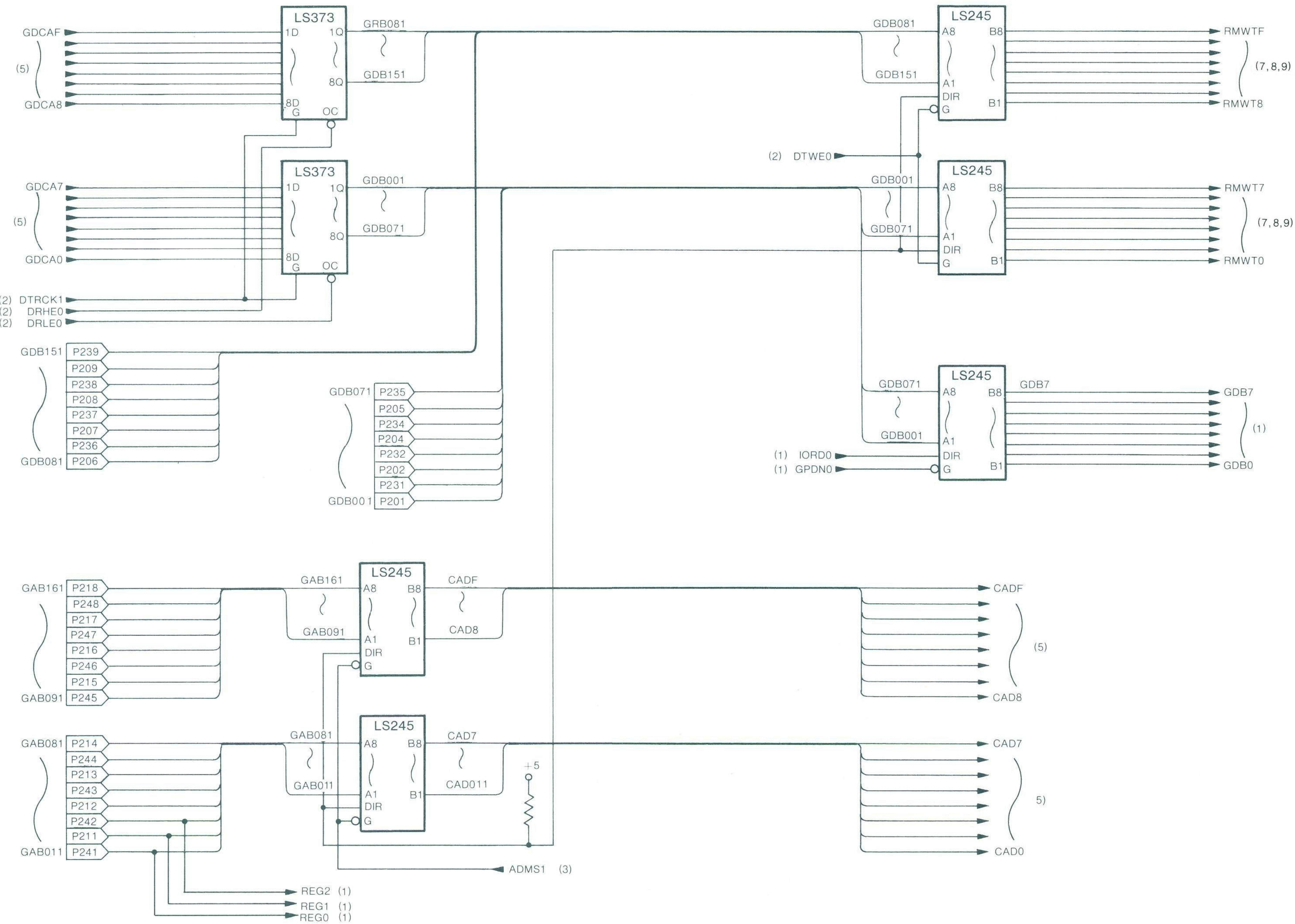
Graphics (3) **Graphics Dynamic Random Access Memory control 2**



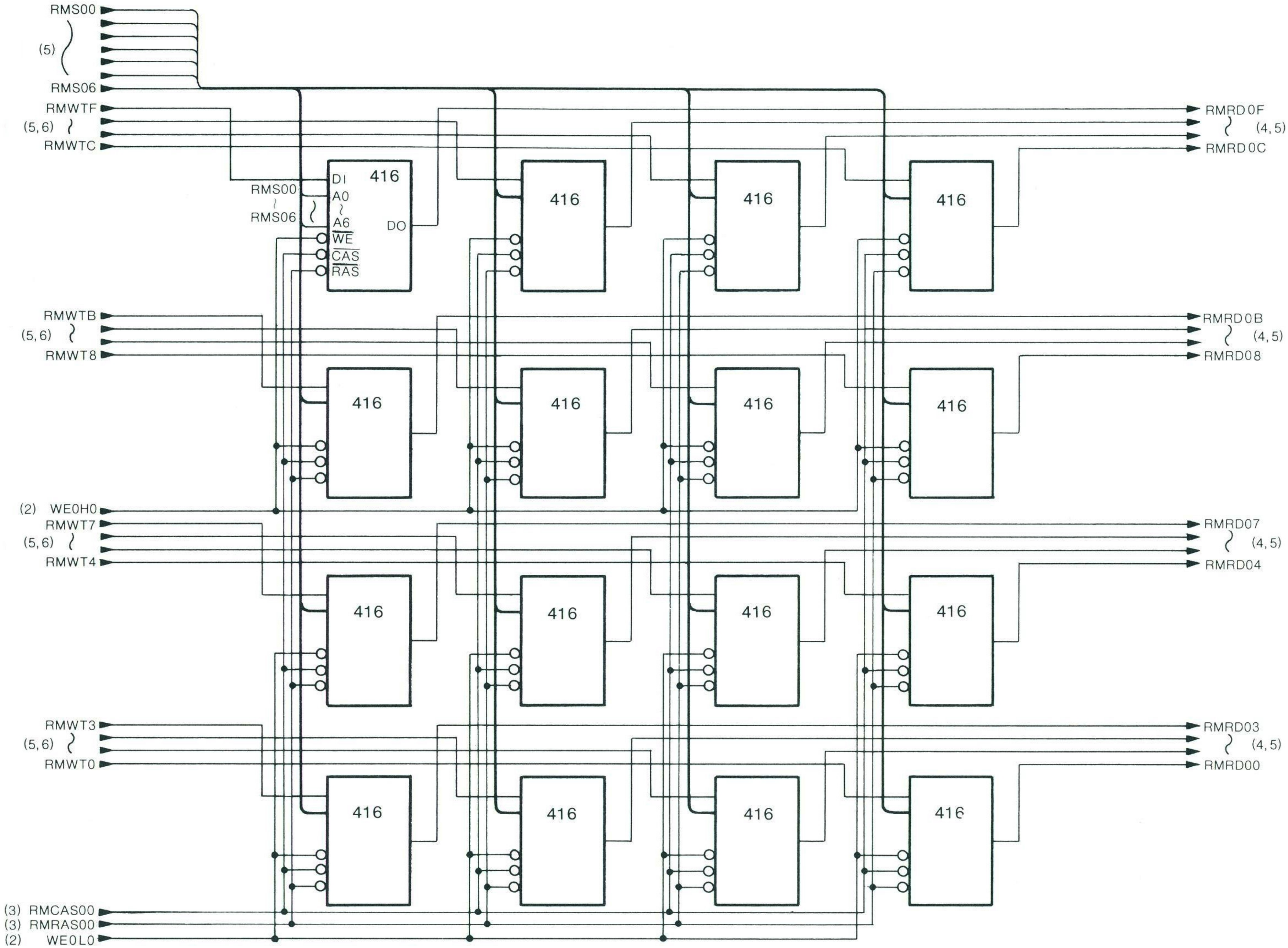
Graphics (4) Graphics/Character Display Parallel to Serial Registers



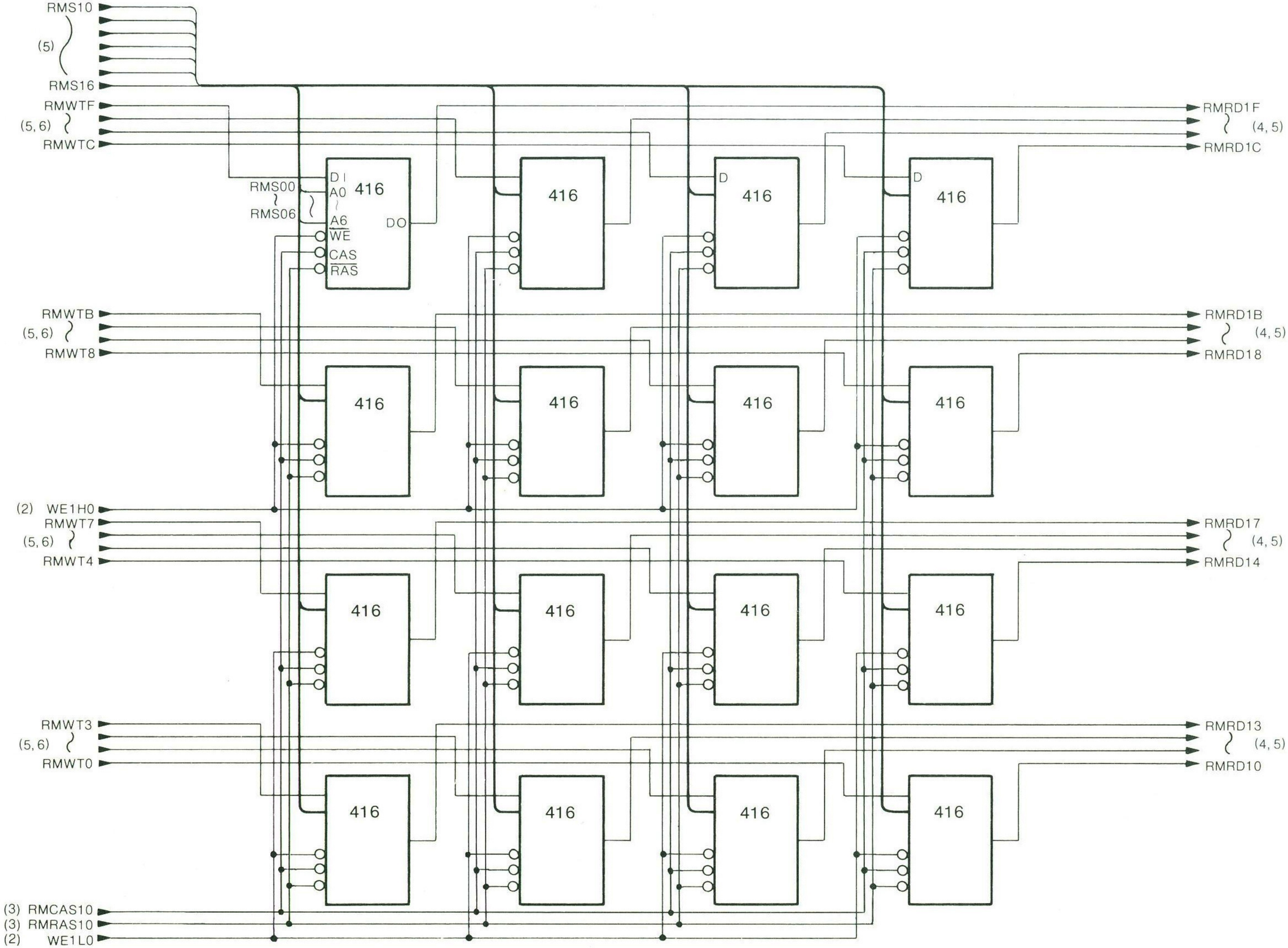
Graphics (5)   Graphics Dynamic Random Access Memory control 3



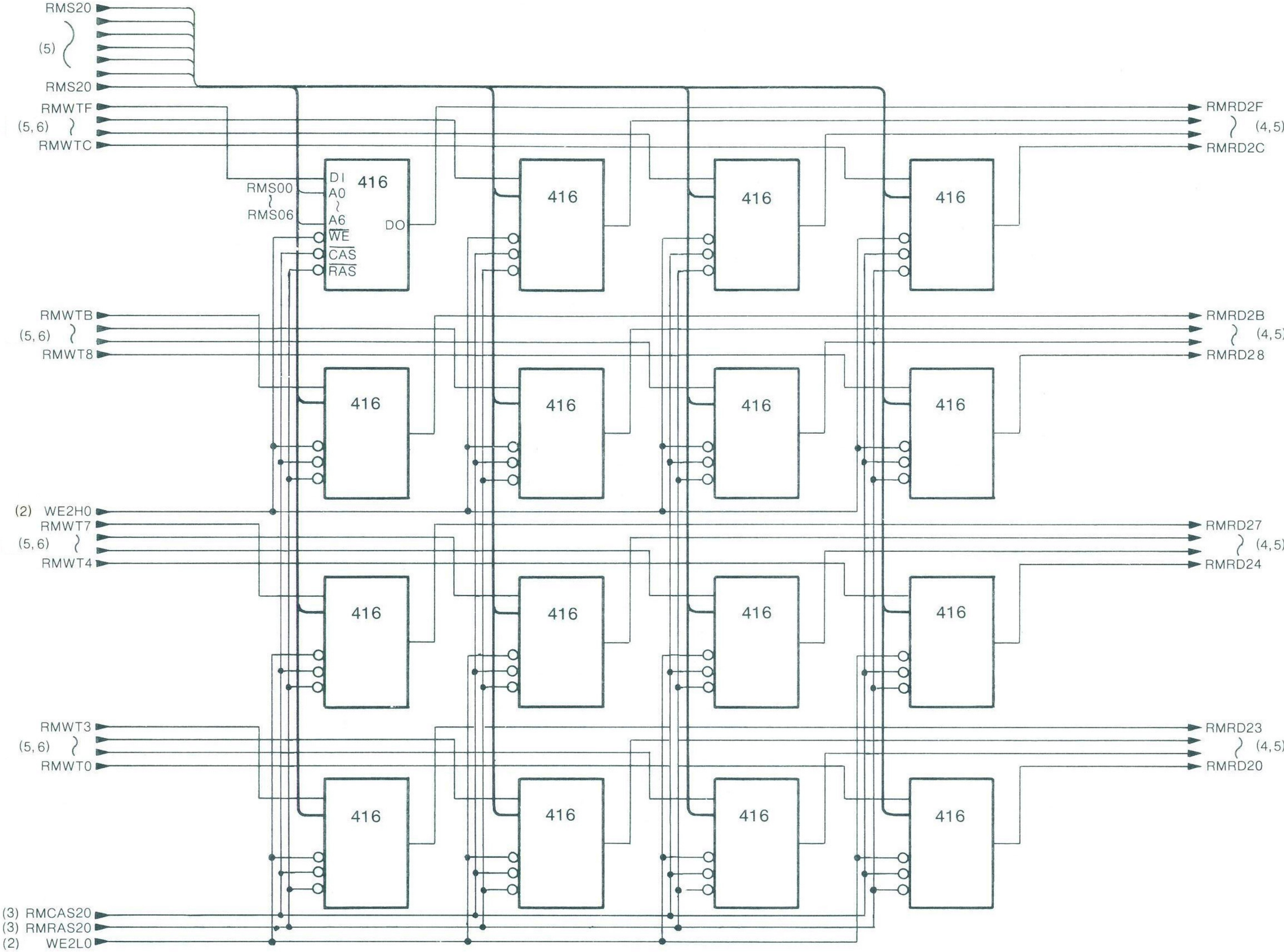
Graphics (6) Graphics Dynamic Random Access Memory control 4



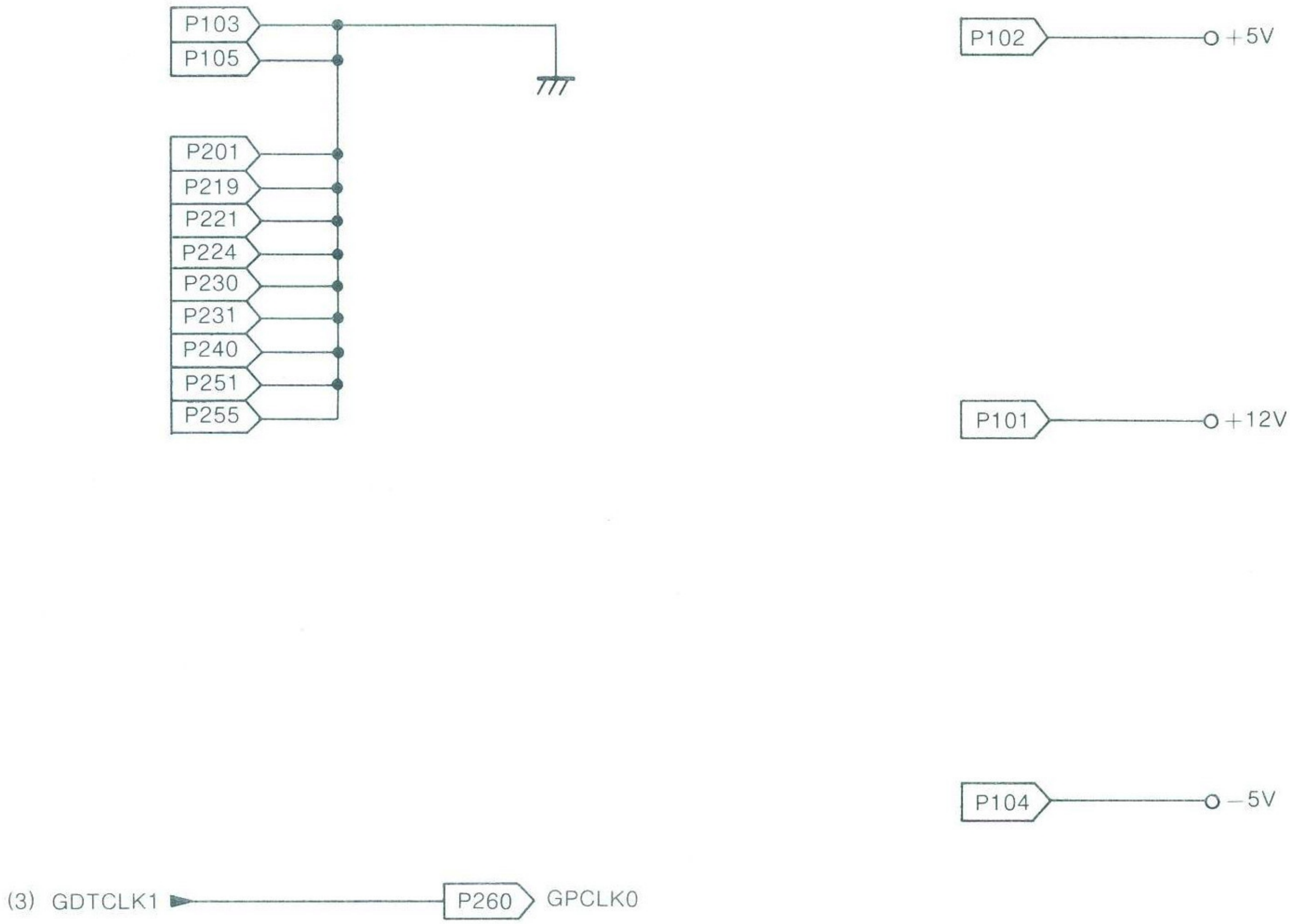
Graphics (7) **Graphics Dynamic Random Access Memory 1 (416 x 16)**



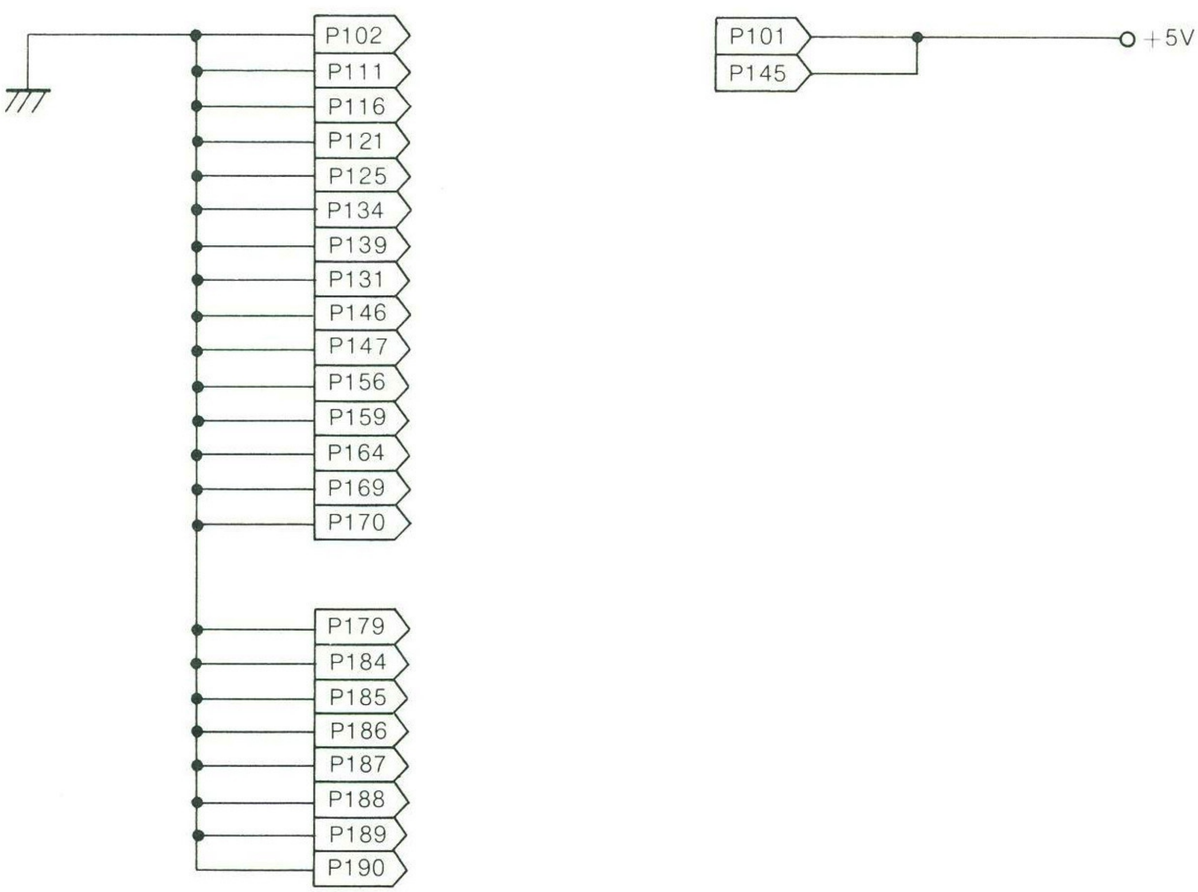
Graphics (8)   Graphics Dynamic Random Access Memory 2 (416 x 16)



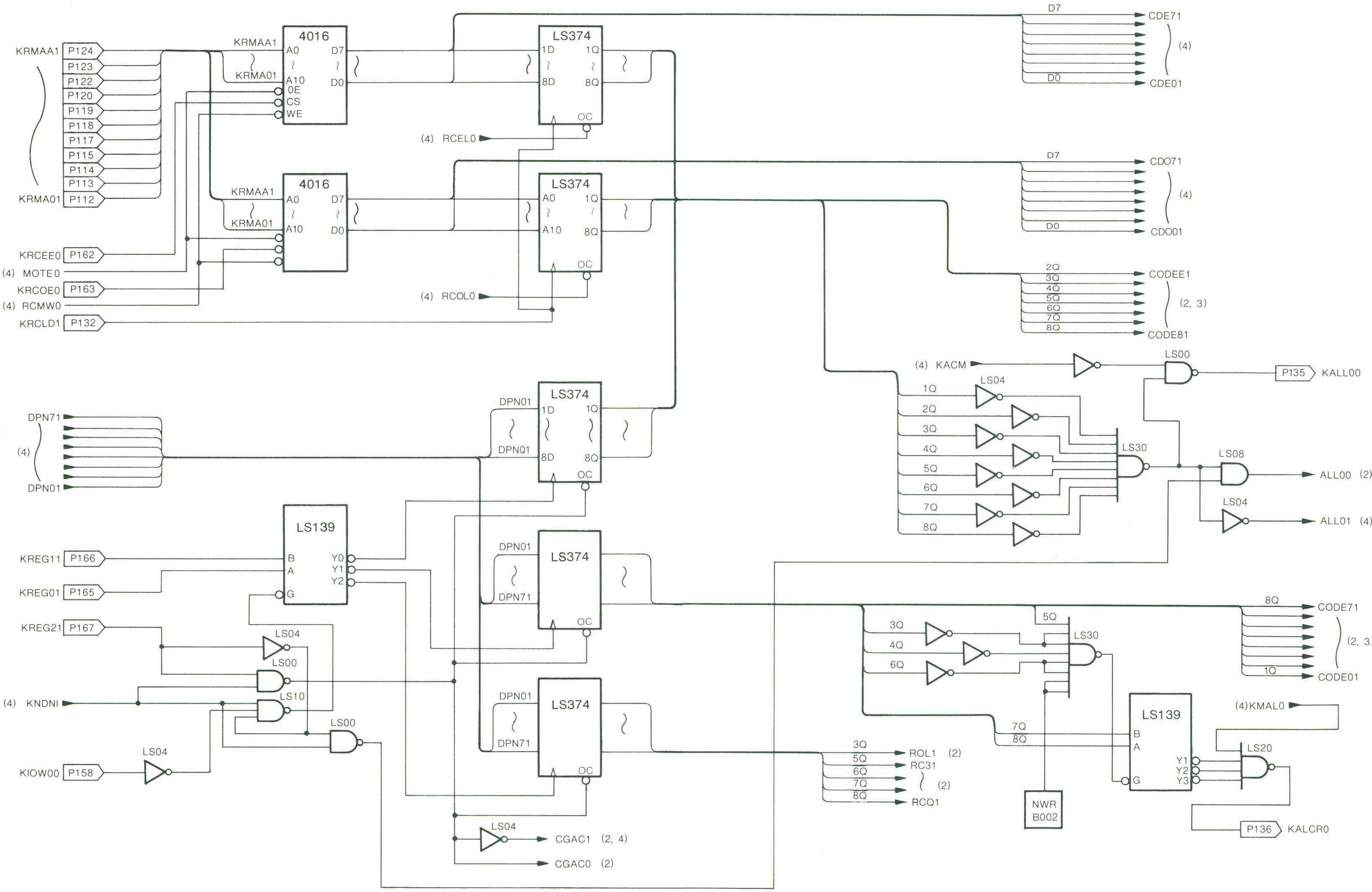
Graphics (9) Graphics Dynamic Random Access Memory 3 (416 x 16)



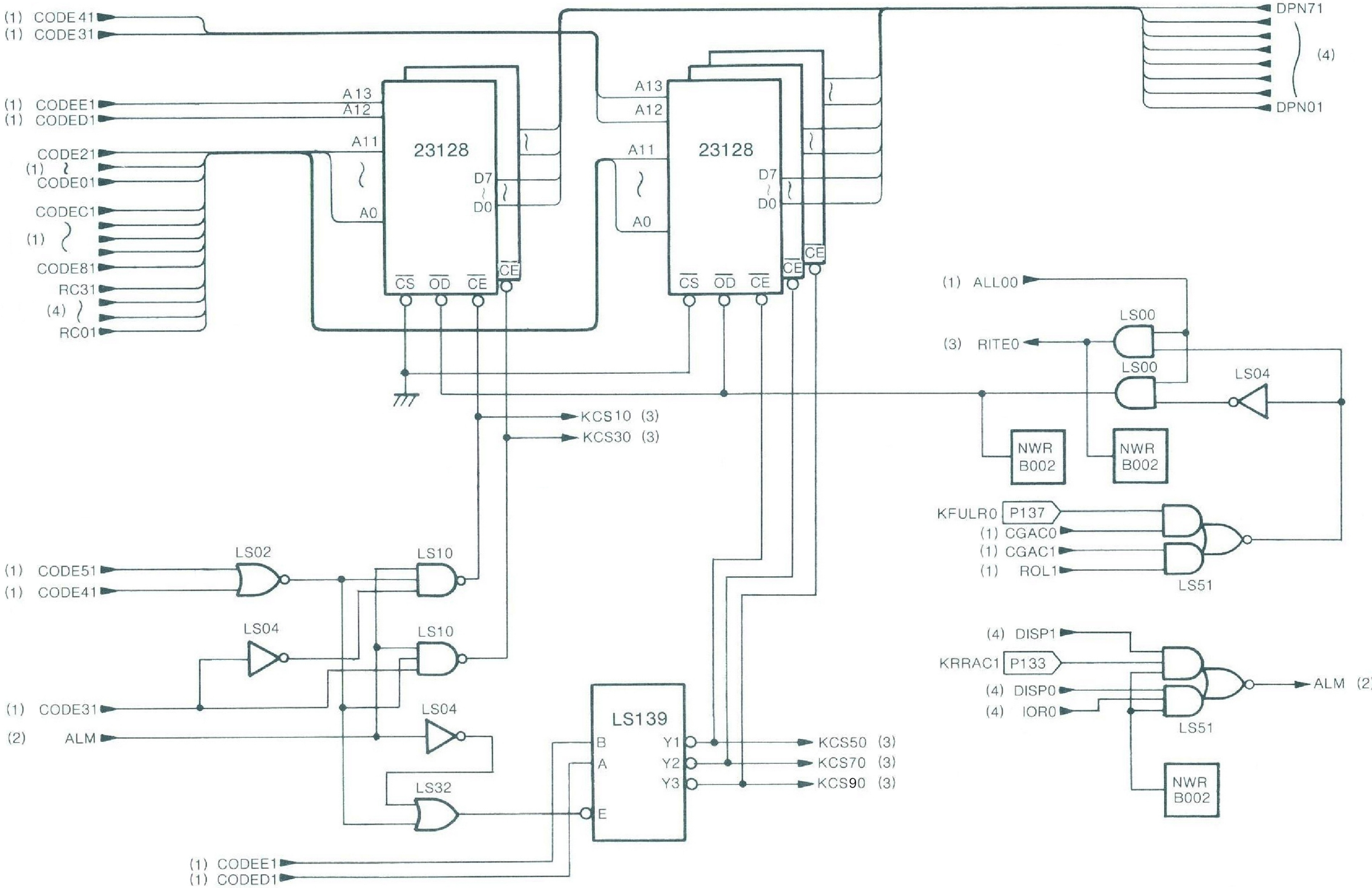
Graphics (10)   Graphics, Power pins



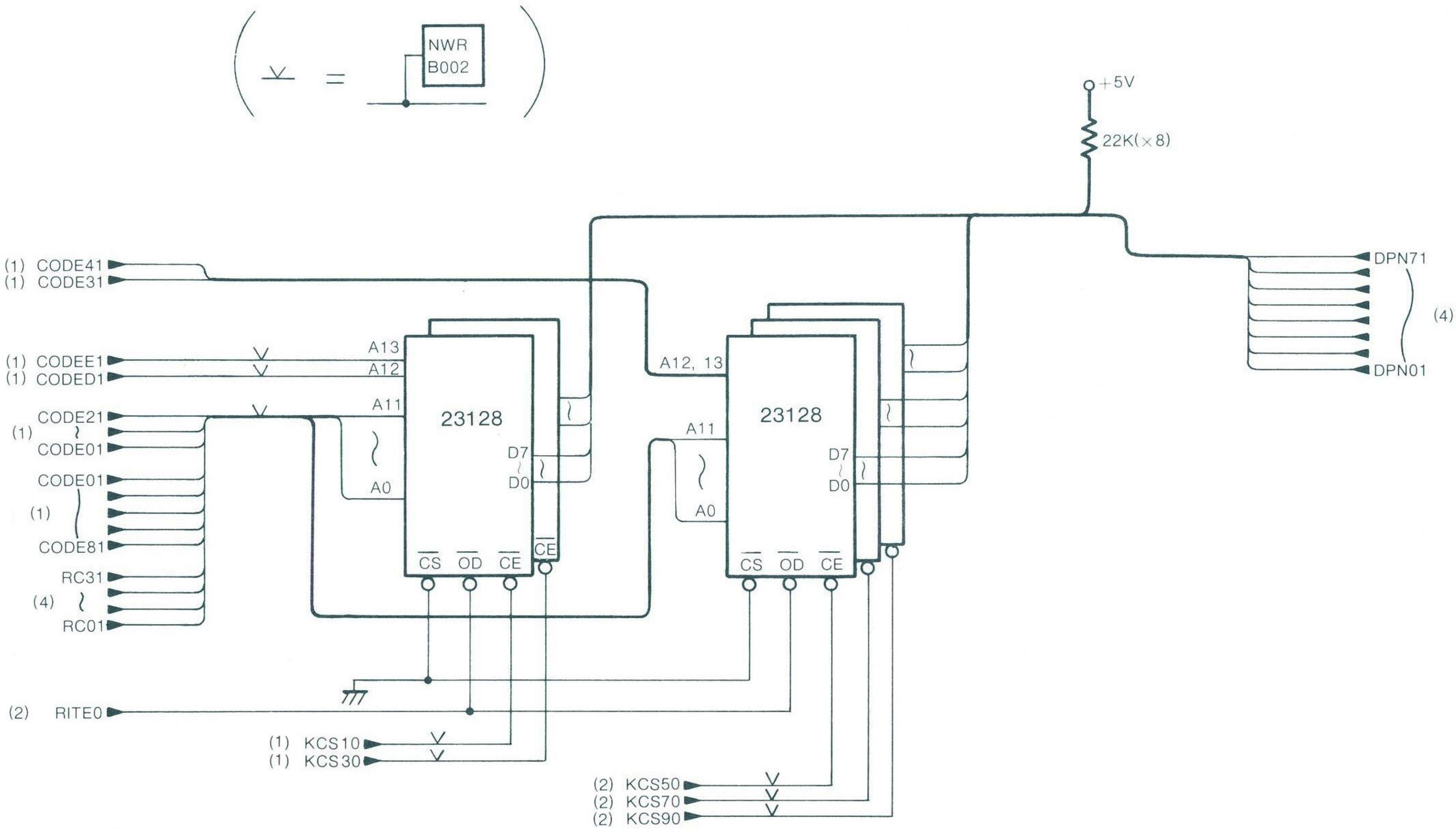
Power pins



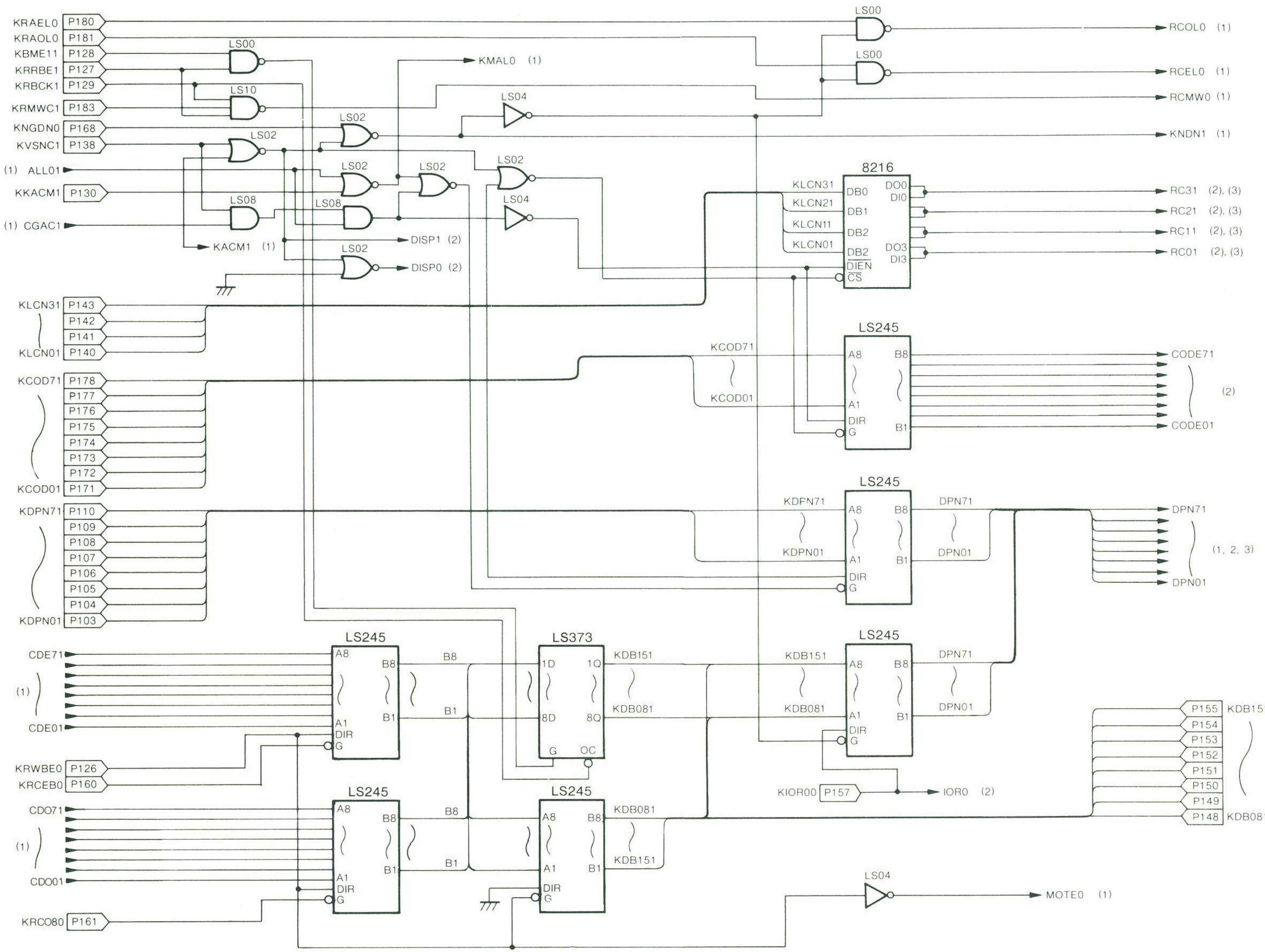
Kanji ROM (1) Kanji Read Only Memory control 1



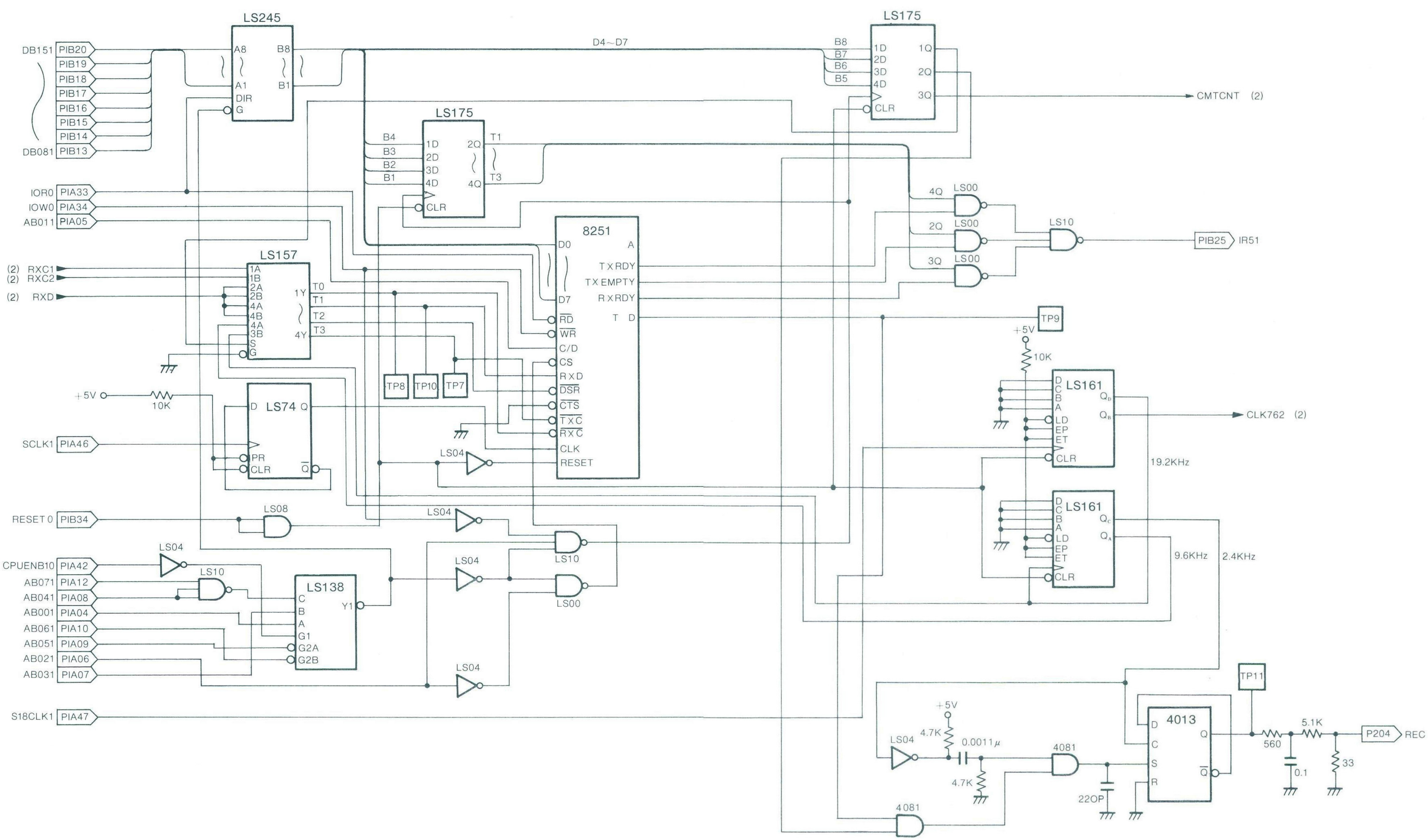
Kanji ROM (2)　　Kanji Read Only Memory 1 (23128 x 5)



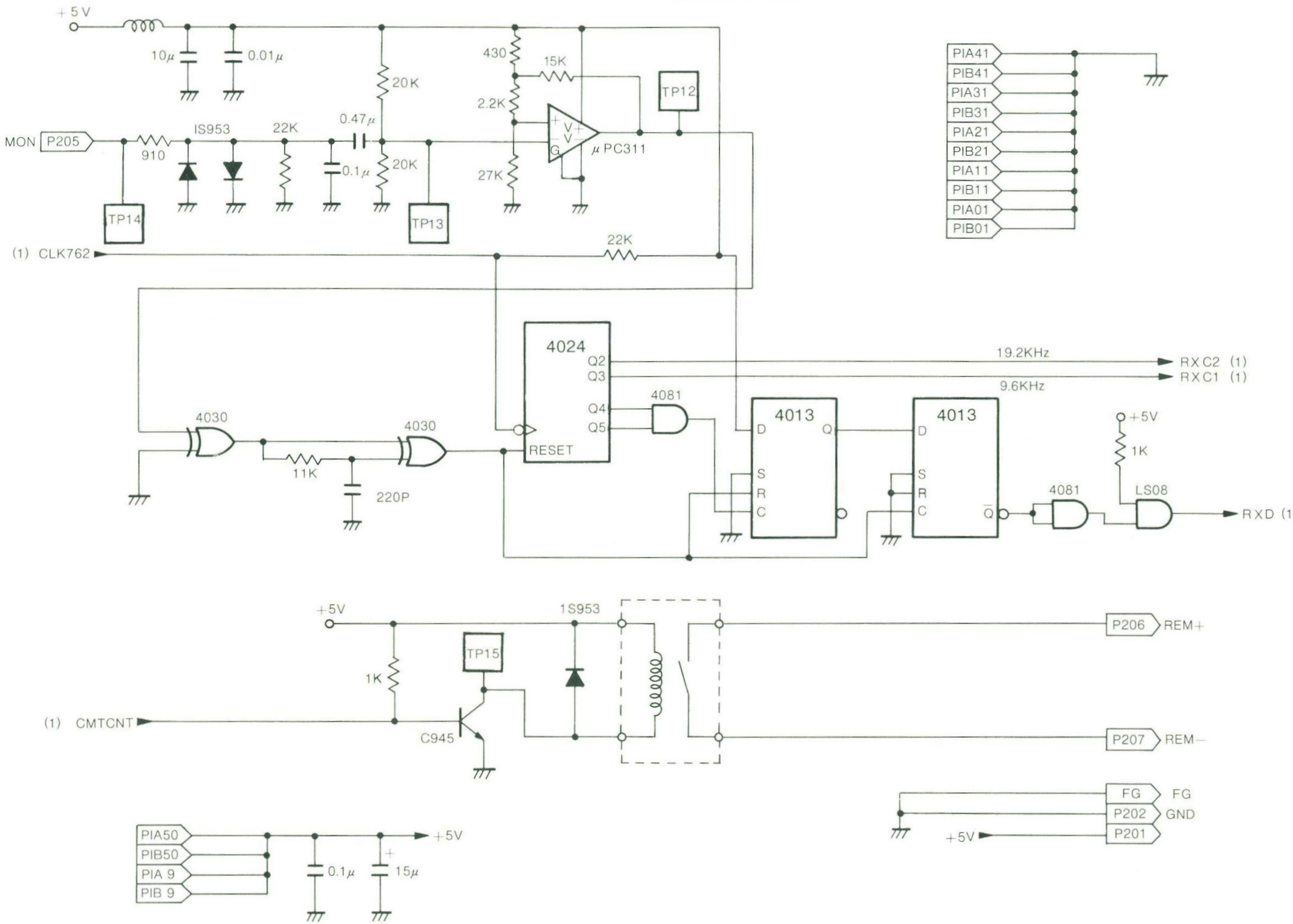
Kanji ROM (3)   Kanji Read Only Memory 2 (23128 x 5)



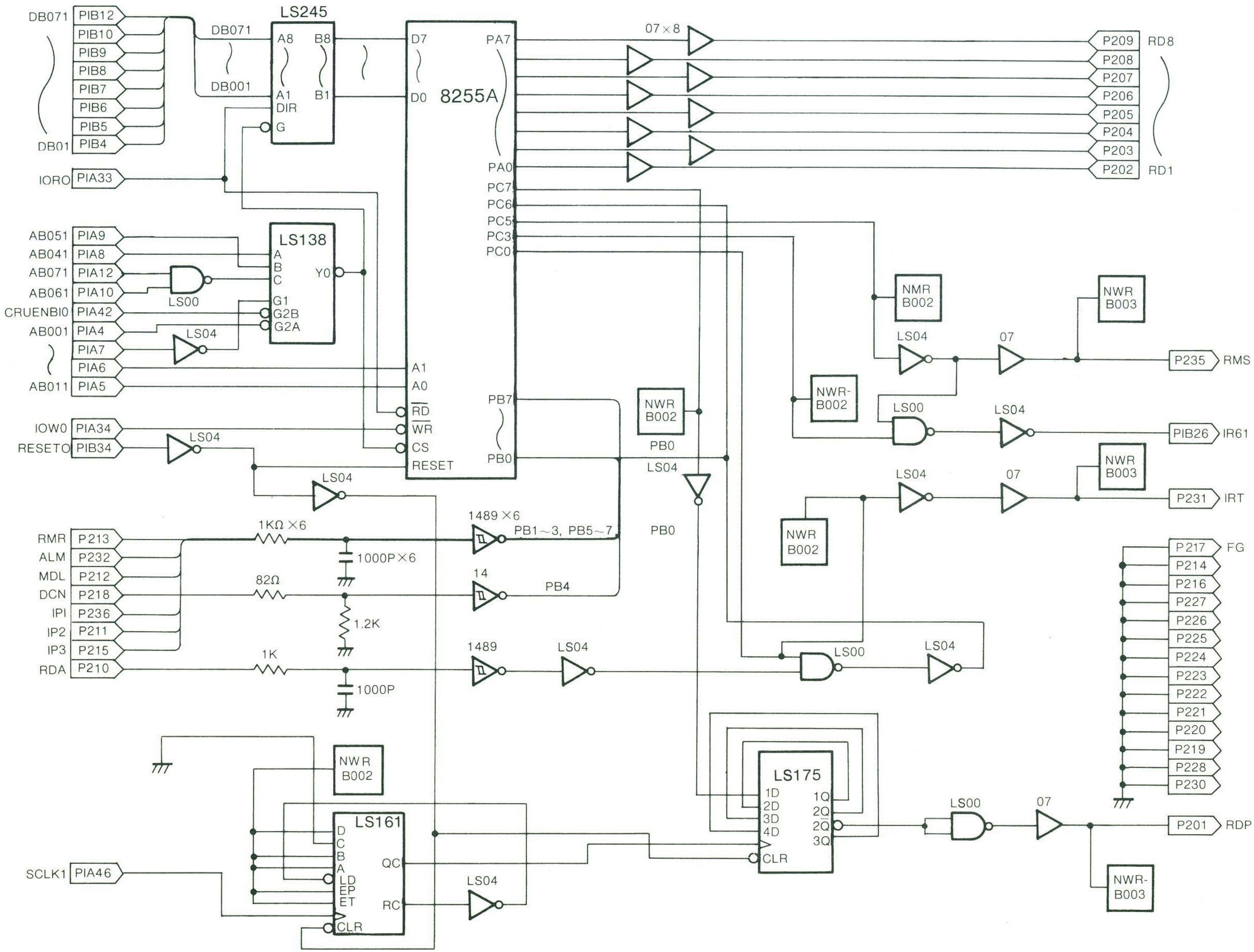
Kanji ROM (4)   Kanji Read Only Memory control 2



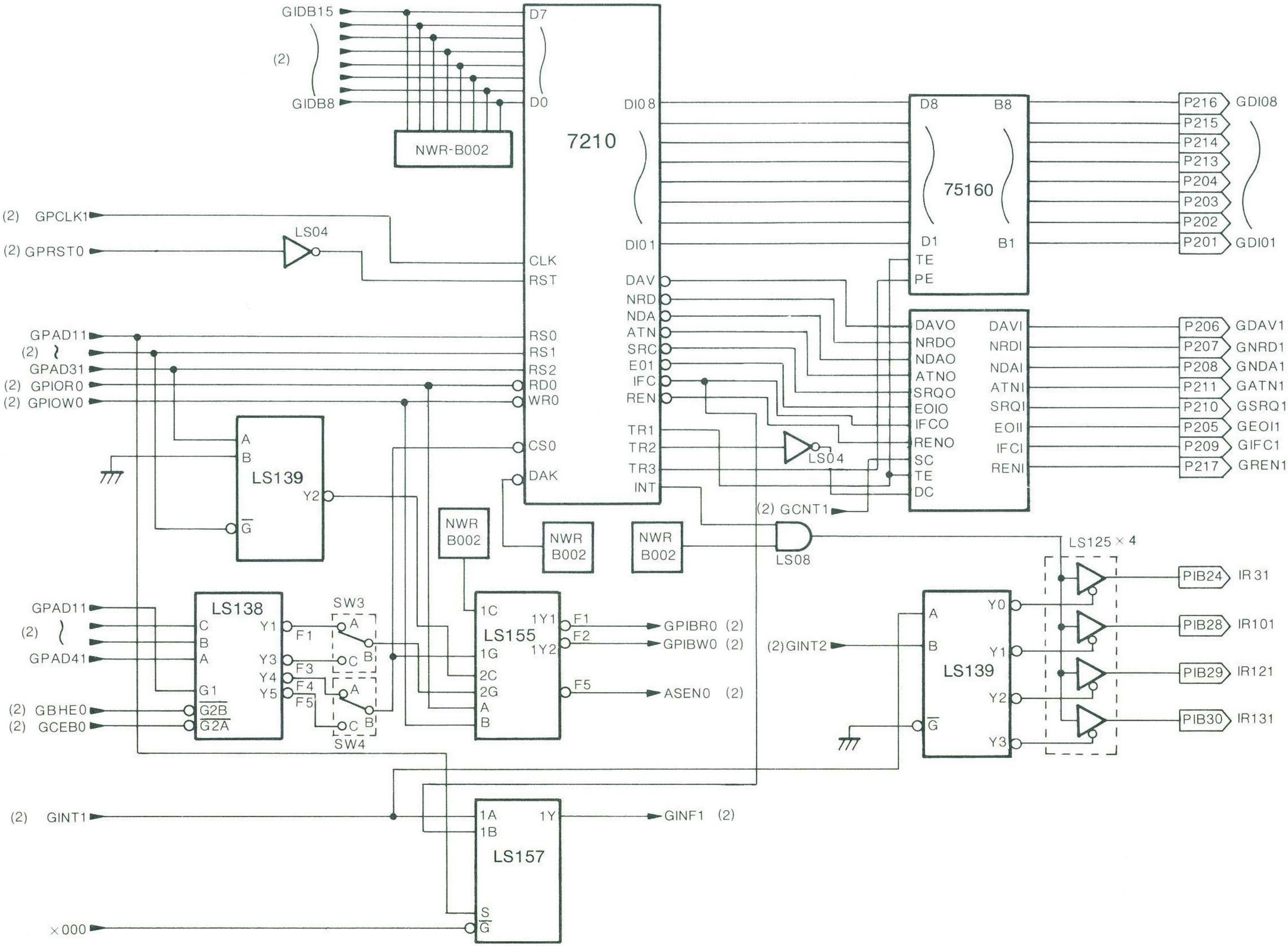
CMT (1) Cassette Magnetic Tape (8251)



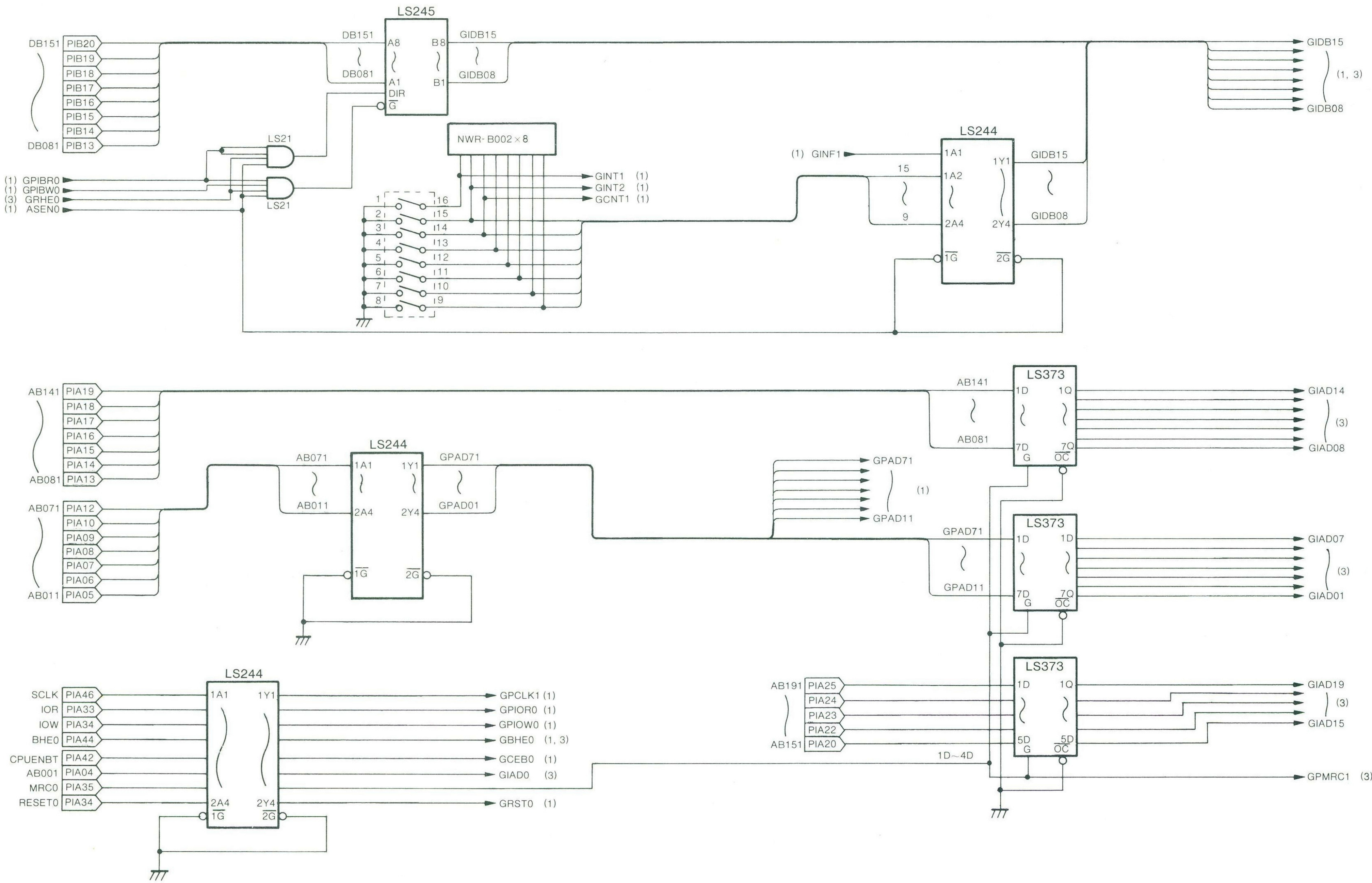
CMT (2) Cassette Magnetic Tape control


LS245
LS138
8255A
LS00
LS04
LS175
LS161
07×8
1489×6
1KΩ×6
1000P×6
82Ω
1.2K
1K
1000P
NMR B002
NWR B003
NWR-B002
NWR B002
NWR-B003
DB071
DB01
DB001
IORO
AB051
AB041
AB071
AB061
CRUENBI0
AB001
AB011
IOW0
RESETO
RMR
ALM
MDL
DCN
IPI
IP2
IP3
RDA
SCLK1
RD8
RD1
RMS
IR61
IRT
FG
RDP
PB1~3, PB5~7
PB4
PB0

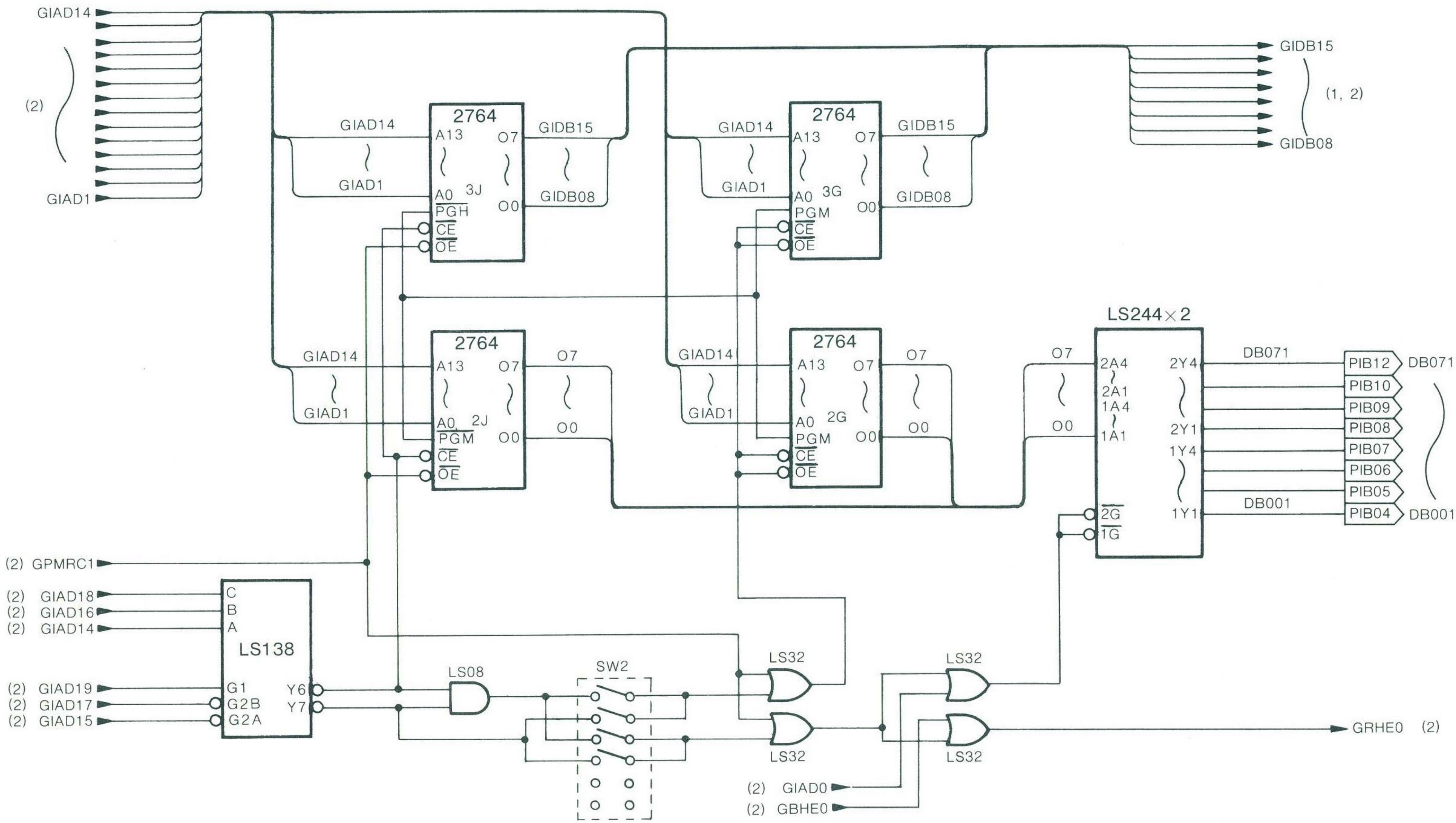
ODA control



GPIB (1) General Purpose Interface Bus (7210) control 1



GPIB (2) General Purpose Interface Bus control 2



GPIB (3)   General Purpose Interface Bus control 3

I/O Map (Major Devices)

Device	Device (Page)	Port Address A[7:0] 7	6	5	4	3	2	1	0	Signal	Decoder (page)
8259 Interrupt Controller (Master)	MB (7)	0	0	0	0	0	X	1/0	0	PIS00	Motherboard MB (4)
8259 Interrupt Controller (Slave)		0	0	0	0	1	X	1/0	0	PIS10	
8237 DMA Controller	MB (2)	0	0	0	1/0	1/0	1/0	1/0	1	DMAS0	
1990 Calendar Clock	MB (10)	0	0	1	0	X	X	X	0	CALS0	
DMA Bank (8237)	MB (2)	0	0	1	0	X	1/0	1/0	1	DMBW0	
8251 RS-232C Port	MB (14)	0	0	1	1	X	X	1/0	0	RSCS0	
8255 System Port	MB (9)	0	0	1	1	X	1/0	1/0	1	SYPS0	
8255 Centronics Printer Port	MB (12)	0	1	0	0	X	1/0	1/0	0	PRTS0	
8251 Keyboard Port	MB (13)	0	1	0	0	X	X	1/0	1	KBDS0	
7220 Character Display (Master)	MB (22)	0	1	0	1	X	X	1/0	0	CHAS0	
8255 5.25″ Floppy Disk Drive Port	MB (11)	0	1	0	1	X	1/0	1/0	1	FD5S0	
52111 Character Smooth Scroll	MB (23)	0	1	1	0	1/0	1/0	1/0	0	INTS0	
NMI (Non-Maskable Interrupt)	MB (7)	0	1	1	1	1/0	1/0	1/0	0	NMIW0	
8253 Timer	MB (8)	0	1	1	1	X	1/0	1/0	1	TMRS0	
(7261 5.25″ Hard Disk Drive)		1	0	0	0	0	1/0	1/0	0		
765 8″/5.25″ Floppy Disk Drive	MB (15)	1	0	0	1	X	1/0	1/0	0	FFDS0	MB (16)
8251 Cassette Magnetic Tape Port	CMT (1)	1	0	0	1	0	1/0	1/0	1	No name	CMT (1)
GPIB Switch	GPIB (2)	1	0	0	1	1	1/0	1/0	1		GPIB (1)
7220 Graphics Display (Slave)	Graphics (1)	1	0	1	0	1/0	1/0	1/0	0	GRPS0	Motherboard MB (16)
23128 Kanji ROM	Kanji ROM (2,3)	1	0	1	0	1/0	1/0	1/0	1	CHGS0	
8255 ODA printer port	ODA (1)	1	1	0	0	0	1/0	1/0	0	No name	ODA (1)
7210 General Purpose Interface Bus	GPIB (1)	1	1	0	0	1/0	1/0	1/0	1	(p53)	GPIB (1)

Signal Abbreviation Examples (I/O Map related)

Signal names Original	Abbreviated	Abbreviation methods	Active level	Motherboard at page
IOW0	WTSTB0	WriTe STRobe 0	Low	4
IOR0	RDSTB0	ReaD STRobe 0	Low	4
AB031	RGS21	ReGister Select 2 1	High	4
AB021	RGS11	ReGister Select 1 1	High	4
AB011	RGS01	ReGister Select 0 1	High	4
--	RGDCW0	chaRacter GDC Write 0	Low	4
--	RGDCR0	chaRacter GDC Read 0	Low	4

Connectors

<table>
<tr><th colspan="9">P1 Kanji ROM, Power pins
Kanji ROM (1, 2, 4), Graphics (10)</th></tr>
<tr><th>Pin #</th><th>Signals</th><th>I/O</th><th>Pin #</th><th>Signals</th><th>I/O</th><th>Pin #</th><th>Signals</th><th>I/O</th></tr>
<tr><td>1</td><td>+5V</td><td>--</td><td>31</td><td>GND</td><td>--</td><td>61</td><td>KRCOB0</td><td rowspan="3">In</td></tr>
<tr><td>2</td><td>GND</td><td>--</td><td>32</td><td>KRCLD1</td><td rowspan="2">In</td><td>62</td><td>KRCEE0</td></tr>
<tr><td>3</td><td>KDPN01</td><td rowspan="8">In</td><td>33</td><td>KRRAC1</td><td>63</td><td>KRCOE0</td></tr>
<tr><td>4</td><td>KDPN11</td><td>34</td><td>GND</td><td>--</td><td>64</td><td>GND</td><td>--</td></tr>
<tr><td>5</td><td>KDPN21</td><td>35</td><td>KALL00</td><td rowspan="2">Out</td><td>65</td><td>KREG01</td><td rowspan="4">In</td></tr>
<tr><td>6</td><td>KDPN31</td><td>36</td><td>KALCR0</td><td>66</td><td>KREG11</td></tr>
<tr><td>7</td><td>KDPN41</td><td>37</td><td>KFULR0</td><td rowspan="2">In</td><td>67</td><td>KREG21</td></tr>
<tr><td>8</td><td>KDPN51</td><td>38</td><td>KVSNC1</td><td>68</td><td>KNGDN0</td></tr>
<tr><td>9</td><td>KDPN61</td><td>39</td><td>GND</td><td>--</td><td>69</td><td rowspan="2">GND</td><td rowspan="2">--</td></tr>
<tr><td>10</td><td>KDPN71</td><td>40</td><td>KLCN01</td><td rowspan="4">In</td><td>70</td></tr>
<tr><td>11</td><td>GND</td><td>--</td><td>41</td><td>KLCN11</td><td>71</td><td>KCOD01</td><td rowspan="8">In</td></tr>
<tr><td>12</td><td>KRMA01</td><td rowspan="4">In</td><td>42</td><td>KLCN21</td><td>72</td><td>KCOD11</td></tr>
<tr><td>13</td><td>KRMA11</td><td>43</td><td>KLCN31</td><td>73</td><td>KCOD21</td></tr>
<tr><td>14</td><td>KRMA21</td><td>44</td><td>--</td><td>--</td><td>74</td><td>KCOD31</td></tr>
<tr><td>15</td><td>KRMA31</td><td>45</td><td>+5V</td><td>--</td><td>75</td><td>KCOD41</td></tr>
<tr><td>16</td><td>GND</td><td>--</td><td>46</td><td rowspan="2">GND</td><td rowspan="2">--</td><td>76</td><td>KCOD51</td></tr>
<tr><td>17</td><td>KRMA41</td><td rowspan="4">In</td><td>47</td><td>77</td><td>KCOD61</td></tr>
<tr><td>18</td><td>KRMA51</td><td>48</td><td>KDB081</td><td rowspan="8">In</td><td>78</td><td>KCOD71</td></tr>
<tr><td>19</td><td>KRMA61</td><td>49</td><td>KDB091</td><td>79</td><td>GND</td><td>--</td></tr>
<tr><td>20</td><td>KRMA71</td><td>50</td><td>KDB101</td><td>80</td><td>KRAEL0</td><td rowspan="2">In</td></tr>
<tr><td>21</td><td>GND</td><td>--</td><td>51</td><td>KDB111</td><td>81</td><td>KRAOL0</td></tr>
<tr><td>22</td><td>KRMA81</td><td rowspan="3">In</td><td>52</td><td>KDB121</td><td>82</td><td>--</td><td>--</td></tr>
<tr><td>23</td><td>KRMA91</td><td>53</td><td>KDB131</td><td>83</td><td>KRMWC1</td><td>In</td></tr>
<tr><td>24</td><td>KRMAA1</td><td>54</td><td>KDB141</td><td>84</td><td rowspan="7">GND</td><td rowspan="7">--</td></tr>
<tr><td>25</td><td>GND</td><td>--</td><td>55</td><td>KDB151</td><td>85</td></tr>
<tr><td>26</td><td>KRWBE0</td><td rowspan="5">In</td><td>56</td><td>GND</td><td>--</td><td>86</td></tr>
<tr><td>27</td><td>KRRBE1</td><td>57</td><td>--</td><td>--</td><td>87</td></tr>
<tr><td>28</td><td>KBME11</td><td>58</td><td>KIOW00</td><td>In</td><td>88</td></tr>
<tr><td>29</td><td>KRBCK1</td><td>59</td><td>GND</td><td>--</td><td>89</td></tr>
<tr><td>30</td><td>KKACM1</td><td>60</td><td>KRCEB0</td><td>In</td><td>90</td></tr>
</table>

<table>
<tr><th colspan="3">P1 Display Monitor (Color)
Motherboard (24)</th></tr>
<tr><th>Pin #</th><th>Signals</th><th>I/O</th></tr>
<tr><td>1</td><td>+12V</td><td>--</td></tr>
<tr><td>2</td><td>GND</td><td>--</td></tr>
<tr><td>3</td><td>CLOCK</td><td rowspan="6">Out</td></tr>
<tr><td>4</td><td>HSYNC</td></tr>
<tr><td>5</td><td>VSYNC</td></tr>
<tr><td>6</td><td>R</td></tr>
<tr><td>7</td><td>G</td></tr>
<tr><td>8</td><td>B</td></tr>
</table>

<table>
<tr><th colspan="3">P1 Display Monitor (Monochrome)
Motherboard (24)</th></tr>
<tr><th>Pin #</th><th>Signals</th><th>I/O</th></tr>
<tr><td>1</td><td>+12V</td><td>--</td></tr>
<tr><td>2</td><td>GND</td><td>--</td></tr>
<tr><td>3</td><td>VIDEO</td><td rowspan="2">Out</td></tr>
<tr><td>4</td><td>HSYNC</td></tr>
<tr><td>5</td><td>LPEN</td><td>In</td></tr>
<tr><td>6</td><td></td><td>--</td></tr>
<tr><td>7</td><td></td><td>--</td></tr>
<tr><td>8</td><td></td><td>--</td></tr>
</table>

P2 Graphics

Graphics (1, 2, 3, 4, 6, 10)

Pin #	Signals	I/O	Pin #	Signals	I/O
1	GND	--	**31**	GND	--
2			**32**		
3			**33**		
4			**34**		
5			**35**		
6	GDB081		**36**	GDB091	
7	GDB101		**37**	GDB111	In
8	GDB121		**38**	GDB131	
9	GDB141		**39**	GDB151	
10	GAB001		**40**	GND	--
11	GAB021		**41**	GAB011	
12	GAB041	In	**42**	GAB031	
13	GAB061		**43**	GAB051	
14	GAB081		**44**	GAB071	
15	GAB101		**45**	GAB091	In
16	GAB121		**46**	GAB111	
17	GAB141		**47**	GAB131	
18	GAB161		**48**	GAB151	
19	GND	--	**49**	GVSNC0	
20	GDTCK1	In	**50**	GGCK21	
21	GND	--	**51**	GND	--
22	GLOAD1	In	**52**	GPD01	
23	GRDSP1		**53**	GPD11	Out
24	GND	--	**54**	GPD21	
25	GBHE00		**55**	GND	--
26	GGMAC1	In	**56**	GIOR00	
27	GLMEN1		**57**	GIOW00	In
28	GBNK0	Out	**58**	GRMRC1	
29	GRPGN0	In	**59**	GRMWC1	
30	GND	--	**60**	GPCLK0	Out

P2 GPIB

GPIB (1)

Pin #	Signals	I/O
1	GDI01	
2	GDI02	
3	GDI03	
4	GDI04	
5	GEOI1	
6	GDAV1	Out
7	GNRD1	
8	GNDA1	
9	GIFC1	
10	GSRQ1	
11	GATN1	
12		
13	GDI05	
14	GDI06	
15	GDI07	Out
16	GDI08	
17	GREN1	

P2 ODA ODA		
Pin #	**Signals**	**I/O**
1	RDP	Out
2	RD1	
3	RD2	
4	RD3	
5	RD4	
6	RD5	
7	RD6	
8	RD7	
9	RD8	
10	RDA	In
11	IP2	
12	MDL	
13	RMR	
14	GND	--
15	IP3	In
16	GND	--
17		
18	DCN	In
19	GND	--
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30	GND	--
31		
32	ALM	In
33		
34		
35		
36	IPI	In

P2 Light Pen Motherboard (24)		
Pin #	**Signals**	**I/O**
1	+12V	--
2	GND	--
3	LPENO	Out
4		
5	LPENI	In

P2 CMT CMT (1, 2)		
Pin #	**Signals**	**I/O**
1	+5V	--
2	GND	--
3	--	--
4	REC	Out
5	MON	In
6	REM+	Out
7	REM-	
8	--	--

P12 Keyboard Motherboard (13)			
Pin #	**Signals**	**Description**	**I/O**
1	RTY0	Transmitter Data	Out
2	GND	Ground	--
3	RDY0	Request to Send	Out
4	RxD1	Receive Data	In
5	RST0	Data Terminal Ready	Out
6	DSR0	Data Set Ready	In
7	--	--	--
8	+5V	Supply Voltage	

P03 Floppy Disk 8255 ports Motherboard (11)		
Pin #	**Signals**	**I/O**
1	PB0	I/O
2	PB1	
3	PB2	
4	PB3	
5	PB4	
6	PB5	
7	PB6	
8	PB7	
9	GND	--
10		
11		
12		
13		
14		
15		
16		
17		
18		
19	PA0	I/O
20	PA1	
21	PA2	
22	PA3	
23	PA4	
24	PA5	
25	PA6	
26	PA7	
27	PC4	
28	PC5	
29	PC6	
30	PC7	
31	PC0	
32	PC1	
33	PC2	
34	PC3	
35	RESET0	In
36	GND	--

P04 RS232C D-Sub DB25 Motherboard (14)			
Pin #	**Signals**	**Description**	**I/O**
1	GND	--	
2	SD	Send Data	Out
3	RD	Receive Data	In
4	RS	Request to Send	Out
5	CS	Clear to Send	In
6	DR	Data set Ready	In
7	GND	Ground	--
8	CD	Carrier Detect	In
9	--	--	
10			
11	GND	Ground	--
12	--	--	
13	GND	Ground	--
14			
15	ST2	Transmit Clock	In
16	--	--	
17	RT	Receive Clock	In
18	--	--	
19			
20	ER	Data Terminal Ready	Out
21	--	--	
22			
23	SDS	Signal Rate Selector	Out
24	ST1	Auxiliary Clock	Out
25	--	--	

P05 Centronics Printer
Motherboard (12)

Pin #	Signals	Description	I/O
1	STB	Strobe	Out
2	RD1	Data bit 0	
3	RD2	Data bit 1	
4	RD3	Data bit 2	
5	RD4	Data bit 3	
6	RD5	Data bit 4	
7	RD6	Data bit 5	
8	RD7	Data bit 6	
9	RD8	Data bit 7	
10	ACK0	Acknowledge	In
11	BUSY	Busy	
12	PE	Paper Empty	
13	SELECT	Select	
14	AF	Auto Feed	Out
15		(Error)	In
16		(Reset)	Out
17		(Select)	
18	GND	--	
19			
20			
21			
22			
23			
24			
25			

P06 Floppy Disk
Motherboard (15)

Pin #	Signals	Pin #	Signals	Description	I/O
1	GND	**2**	FLWC0	Low Write Current	Out
3		**4**	FFLR0	File Unsafe Reset	
5		**6**	FFUS0	File Unsafe	In
7		**8**	--	--	--
9		**10**	FTSD0	Two Sided	In
11		**12**	--	(Disk Change)	--
13		**14**	FSSL0	Side Select	Out
15		**16**	--	--	--
17		**18**	FHLD0	Head Load	Out
19		**20**	FIDX0	Index	In
21		**22**	FRDY0	Ready	In
23		**24**	FSYC0	VFO Sync	Out
25		**26**	FDS10	Drive Select 1	
27		**28**	FDS20	Drive Select 2	
29		**30**	FDS30	Drive Select 3	
31		**32**	FDS40	Drive Select 4	
33		**34**	FDIR0	Direction Select	
35		**36**	FSTP0	Step	
37		**38**	FWDT0	Write Data	
39		**40**	FWGT0	Write Gate	
41		**42**	FTK00	Track 00	In
43		**44**	FPRT0	Write Protect	
45		**46**	FRDT0	Read Data	
47		**48**	FMFM0	VFO MFM	Out
49		**50**	FWID0	VFO Window	In

P7, PI General Expansion Bus
Motherboard (17, 18)

A				B			
Pin #	**Signals**	**Pin #**	**Signals**	**Pin #**	**Signals**	**Pin #**	**Signals**
1	GND	**26**	(AB201)	**1**	GND	**26**	IR61
2		**27**	(AB211)	**2**		**27**	IR91
3		**28**	(AB221)	**3**		**28**	IR101
4	AB001	**29**	(AB231)	**4**	DB001	**29**	IR121
5	AB011	**30**	INT0	**5**	DB011	**30**	IR131
6	AB021	**31**	GND	**6**	DB021	**31**	GND
7	AB031	**32**	IOCHK0	**7**	DB031	**32**	-12V
8	AB041	**33**	IOR0	**8**	DB041	**33**	
9	AB051	**34**	IOW0	**9**	DB051	**34**	RESET0
10	AB061	**35**	MRC0	**10**	DB061	**35**	DACK00
11	GND	**36**	MWC0	**11**	GND	**36**	DACK30
12	AB071	**37**	S00	**12**	DB071	**37**	DRQ00
13	AB081	**38**	S10	**13**	DB081	**38**	DRQ30
14	AB091	**39**	S20	**14**	DB091	**39**	WORD0
15	AB101	**40**	LOCK0	**15**	DB101	**40**	CPKILL0
16	AB111	**41**	GND	**16**	DB111	**41**	GND
17	AB121	**42**	CPUENB10	**17**	DB121	**42**	RQGT0
18	AB131	**43**	RFSH0	**18**	DB131	**43**	DMATC0
19	AB141	**44**	BHE0	**19**	DB141	**44**	NMI0
20	AB151	**45**	IORDY1	**20**	DB151	**45**	MWE0
21	GND	**46**	SCLK1	**21**	GND	**46**	HLDA00
22	AB161	**47**	S18CLK1	**22**	+12V	**47**	HRQ00
23	AB171	**48**	POWER0	**23**		**48**	DMAHLD0
24	AB181	**49**	+5V	**24**	IR31	**49**	+5V
25	AB191	**50**		**25**	IR51	**50**	

P10 Character
Motherboard (25, 26)

Pin #	Signals	I/O	Pin #	Signals	I/O
1	GND	--	31	GND	--
2	GDB001	I/O	32	GDB011	I/O
3	GDB021		33	GDB031	
4	GDB041		34	GDB051	
5	GDB061		35	GDB071	
6	GDB081		36	GDB091	
7	GDB101		37	GDB111	
8	GDB121		38	GDB131	
9	GDB141		39	GDB151	
10	GAB001	Out	40	GND	--
11	GAB021		41	GAB011	Out
12	GAB041		42	GAB031	
13	GAB061		43	GAB051	
14	GAB081		44	GAB071	
15	GAB101		45	GAB091	
16	GAB121		46	GAB111	
17	GAB141		47	GAB131	
18	GAB161		48	GAB151	
19	GND	--	49	--	
20	--		50		
21	GND	--	51	GND	--
22	--		52	GPDT01	In
23			53	GPDT11	
24			54	GPDT21	
25	GBHE00	Out	55	GND	--
26	GGMAC1		56	GIOR00	Out
27	GLMEN1		57	GIOW00	
28	GBNK0	In	58	GRMRC1	
29	GRPDN0	Out	59	GRMWC1	
30	GND	--	60	GPCLK0	In

P11 Kanji ROM
Motherboard (19, 23, 26)

Pin #	Signals	I/O	Pin #	Signals	I/O	Pin #	Signals	I/O
1	+5V	--	**31**	GND	--	**61**	KRCOB0	Out
2	GND	--	**32**	KRCLD1	Out	**62**	KRCEE0	
3	KDPN01	Out	**33**	KRRAC1		**63**	KRCOE0	
4	KDPN11		**34**	GND	--	**64**	GND	--
5	KDPN21		**35**	--	--	**65**	KREG01	Out
6	KDPN31		**36**	KALCR0	In	**66**	KREG11	
7	KDPN41		**37**	KFULR0	Out	**67**	KREG21	
8	KDPN51		**38**	--	--	**68**	KNGDN0	
9	KDPN61		**39**	GND	--	**69**	GND	--
10	KDPN71		**40**	KLCN01	In	**70**		
11	GND	--	**41**	KLCN11		**71**	KCOD01	In
12	--		**42**	KLCN21		**72**	KCOD11	
13			**43**	KLCN31		**73**	KCOD21	
14			**44**	KLCN41	Out	**74**	KCOD31	
15			**45**	+5V	--	**75**	KCOD41	
16	GND		**46**	GND	--	**76**	KCOD51	
17	--		**47**			**77**	KCOD61	
18			**48**	KDB081	Out	**78**	KCOD71	
19			**49**	KDB091		**79**	GND	--
20			**50**	KDB101		**80**	KRAEL0	Out
21	GND		**51**	KDB111		**81**	KRAOL0	
22	--		**52**	KDB121		**82**	KJMRC1	
23	KRDSP1	Out	**53**	KDB131		**83**	KJMWC1	
24	--	--	**54**	KDB141		**84**	GND	--
25	GND	--	**55**	KDB151		**85**		
26	KRWBE0	Out	**56**	GND	--	**86**		
27	KRRBE1		**57**	KIOR00	Out	**87**		
28	KBHE11		**58**	KIOW00		**88**		
29	KRBCK1		**59**	GND	--	**89**		
30	KKACM1		**60**	KRCEB0	Out	**90**		

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