Personal Computer Hardware Reference Library

IBM Personal Computer AT® 128KB/640KB Memory Expansion Option

6183312

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Contents

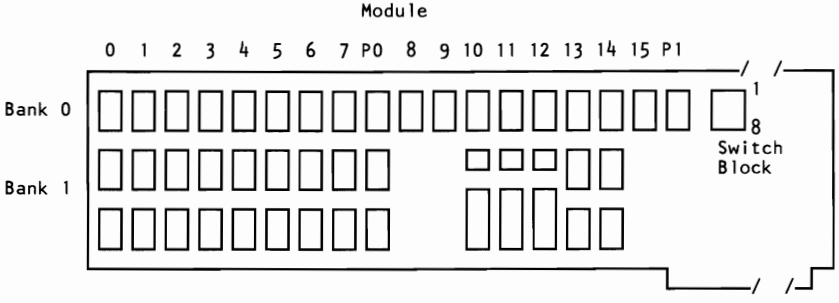
Notes:

Description

The IBM PERSONAL COMPUTER AT® 128KB/640KB Memory Expansion Option is a variable-size memory adapter designed to:

- Increase the size of base memory by 128K to allow full 640K real mode memory addressing
- Increase the size of expansion memory by 512K without using an additional I/O slot.

The option has two banks of pluggable sockets, Bank 0 and Bank 1.



Memory Module Location

Bank 1 is the 128K bank. It contains eighteen 64K by 1 dynamic random access memory (DRAM) modules. The 128K is base memory residing at address hex 80000 through hex 9FFFF. Bank 0 is the 512K bank. This bank may be populated by an IBM Personal Computer AT 512KB Memory Module Kit, consisting of eighteen 256K by 1 DRAM modules. The 512K is expansion memory residing at an address determined by the option's dual-inline-package (DIP) switch settings.

Operating Characteristics

Memory-read (MEMR) and memory-write (MEMW) operations require a 1-wait-state, 3-clock memory cycle. Data moves as a byte (8 data bits and 1 parity bit) or as a word (16 data bits and 2 parity bits) and is parity-checked on the adapter.

I/O Channel Check

If a parity error is detected, a latch is set and an I/O 'channel check' line is activated; the result being a non-maskable interrupt (NMI) indicating an error to the system unit's microprocessor. The status bits (I/O channel check and system-board parity check) determine the source. Writing to the failing option clears the status bit.

Memory Address Switches

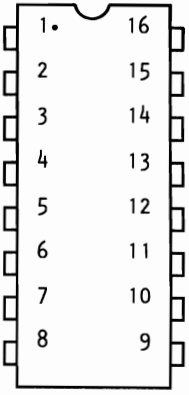
An eight-position DIP module is mounted on the option. Its switch assignments are as follows:

Switch Number	Switch Assignments	
1	ON:LA23 = 0	OFF:LA23 = 1
2	ON:LA22 = 0	OFF:LA22 = 1
3	ON:LA21 = 0	OFF:LA21 = 1
4	ON:LA20 = 0	OFF:LA20 = 1
5	ON:LA19 = 0	OFF:LA19 = 1
6	ON:Bank 0 populated	OFF:Bank 0 not populated
7	ON:Bank 1 populated	OFF:Bank 1 not populated
8	ON:Reserved	OFF:Bank 1 memory is 128K

DIP Module Switch Assignments

The first 512K of expansion memory must start at address space hex 100000. If additional memory expansion options are installed, no gaps between memory are allowed. All expansion memory must be one contiguous block starting at address hex 100000.

Specifications

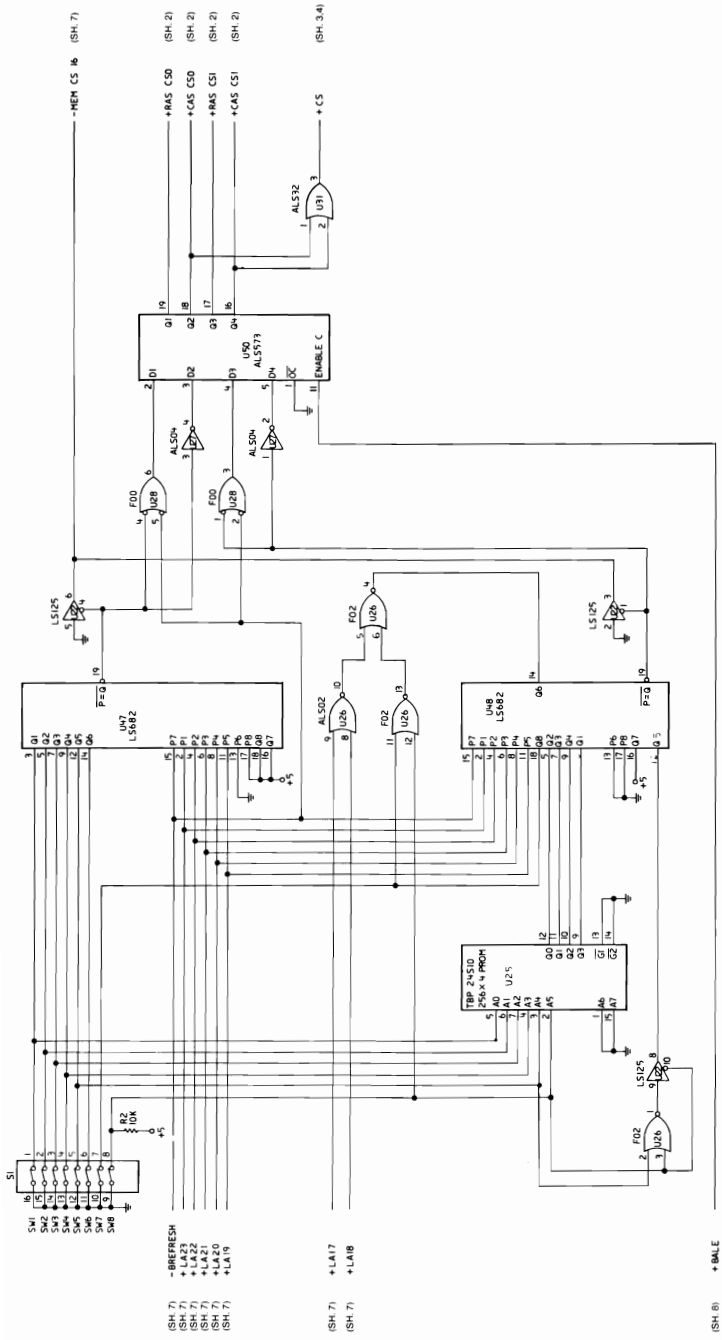


Pin	256K by 1 bit Module	64K by 1 Bit Module
1	A8	N/C
2	Data In *	Data In *
3	-Write	-Write
4	-RAS	-RAS
5	A0	A0
6	A2	A2
7	A1	A1
8	+5 Vdc	+5 Vdc
9	A7	A7
10	A5	A5
11	A4	A4
12	A3	A3
13	A6	A6
14	Data Out *	Data Out
15	-CAS	-CAS
16	GND	GND

* Data In and Data Out are tied together on Data Bits 0 - 7 (three state bus)

Memory Module Pin Configuration

Logic Diagrams



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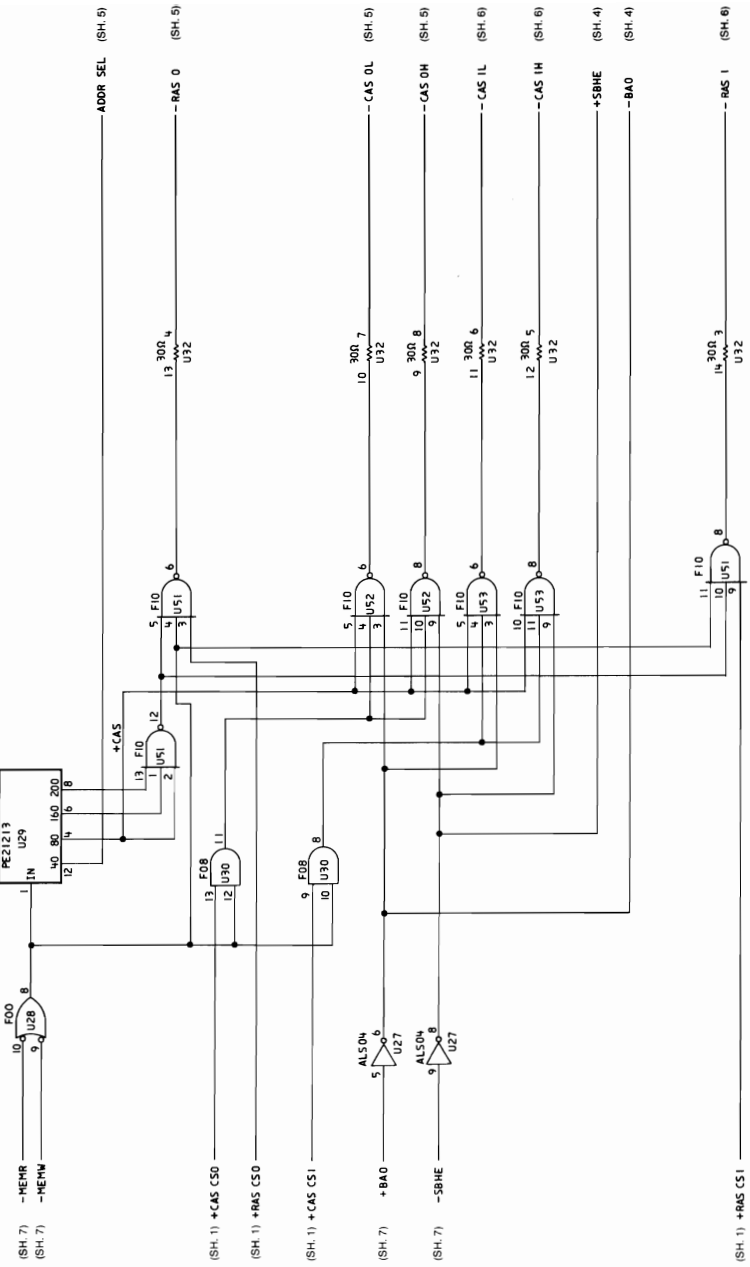

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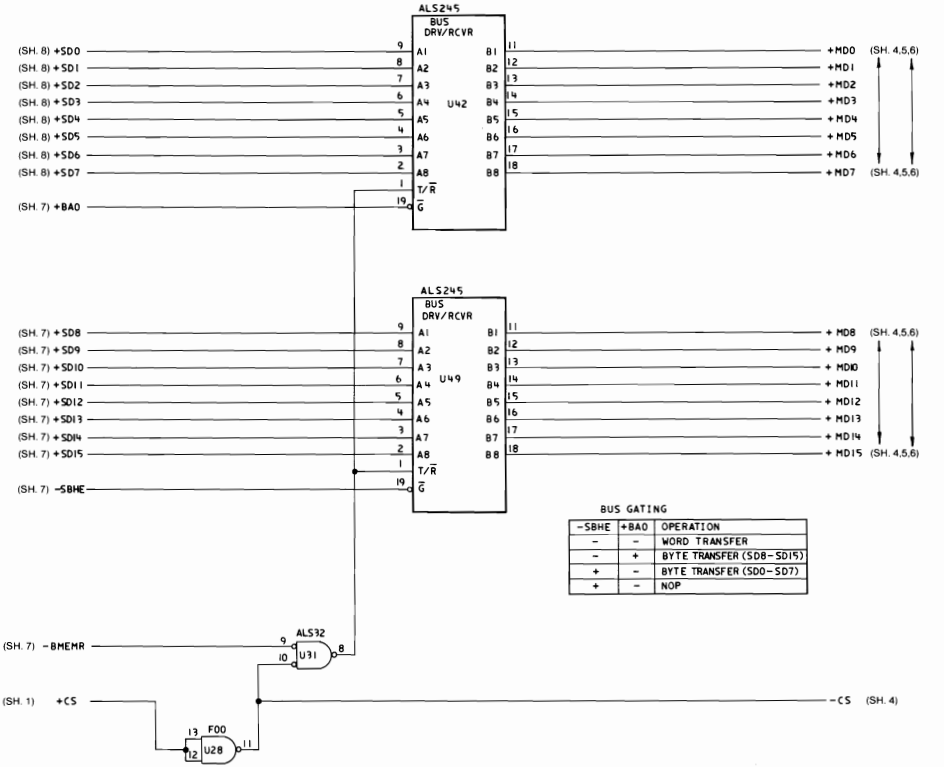

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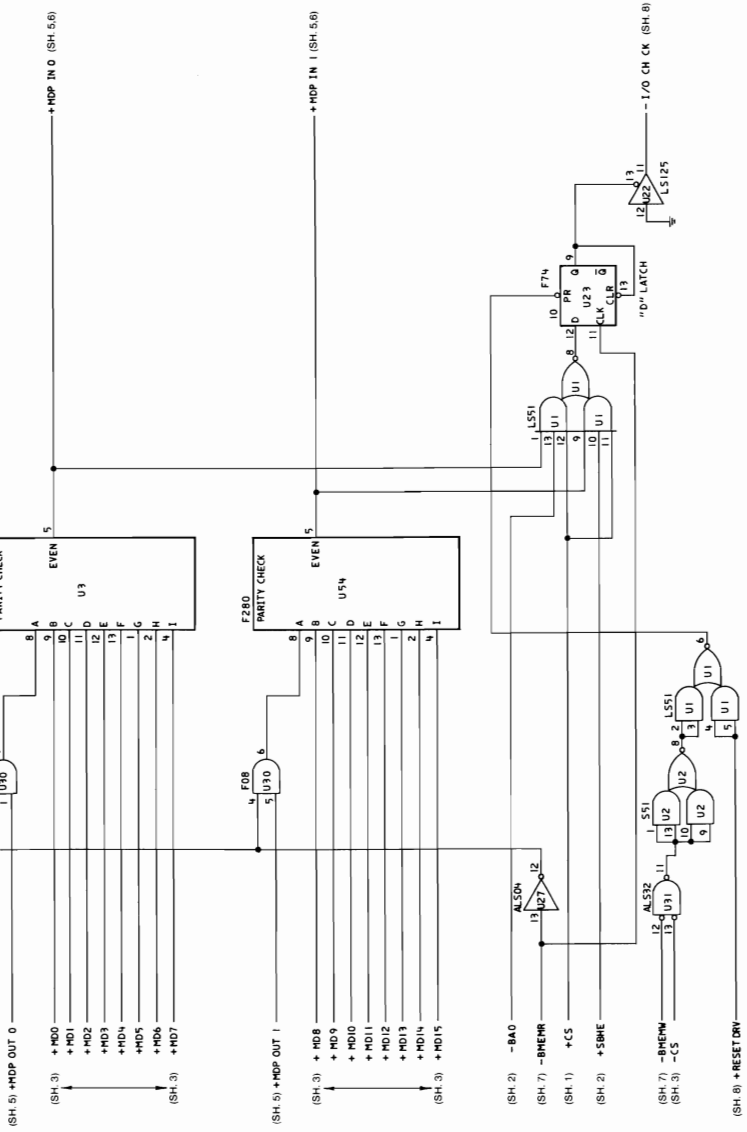

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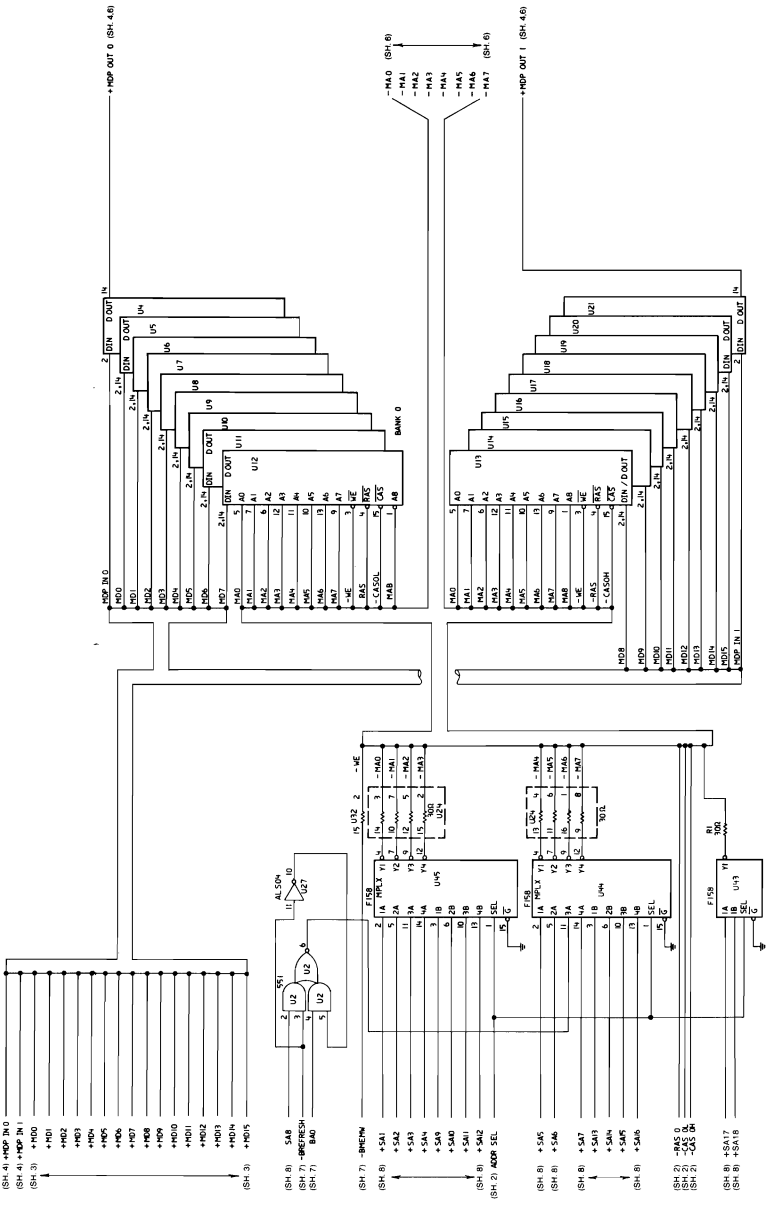

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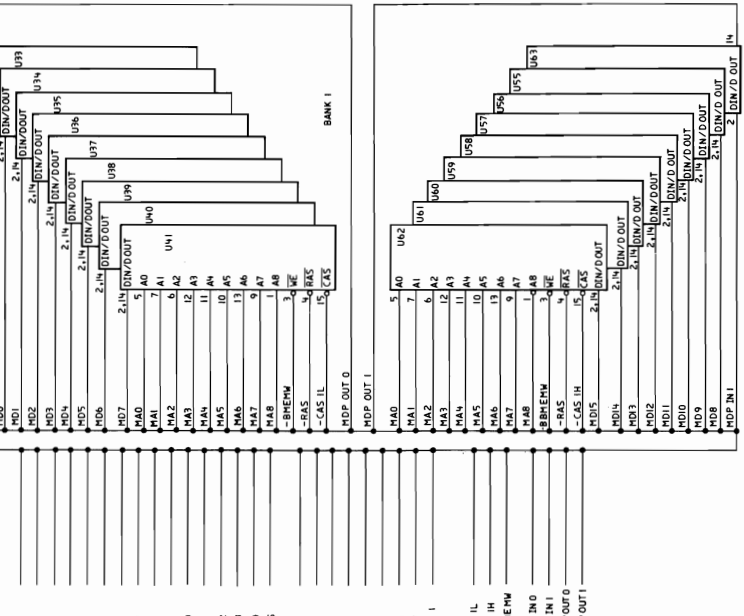

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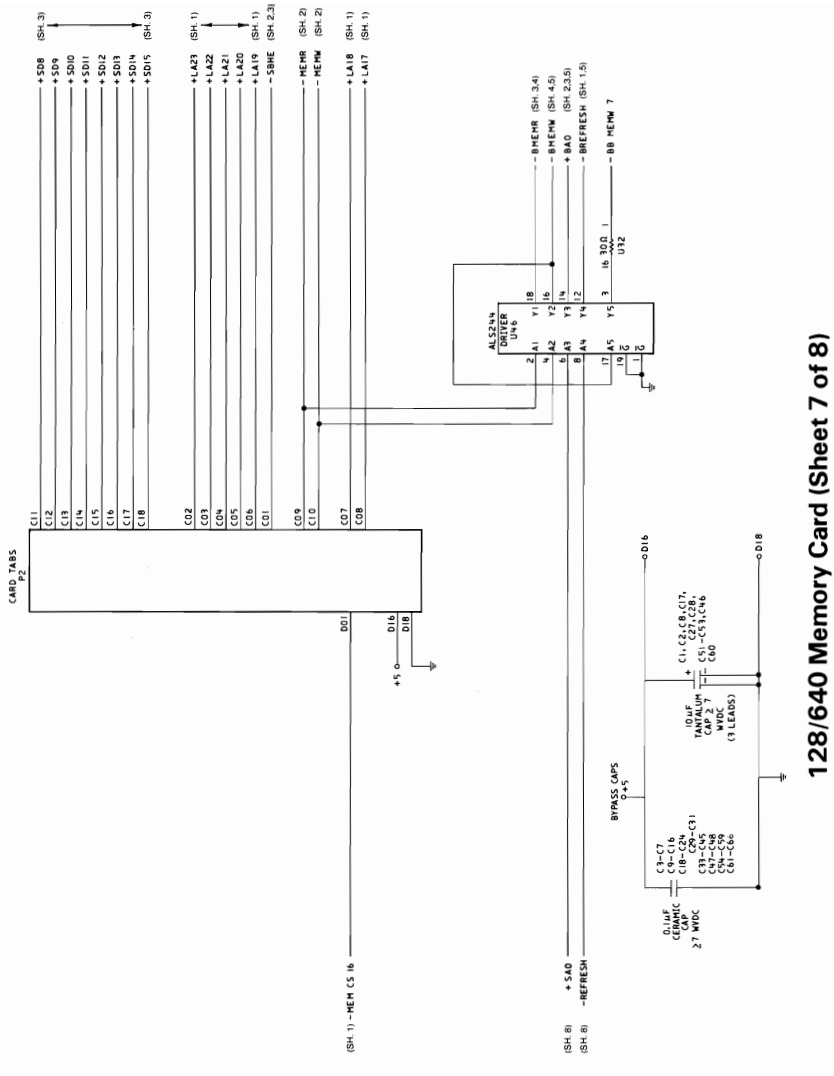

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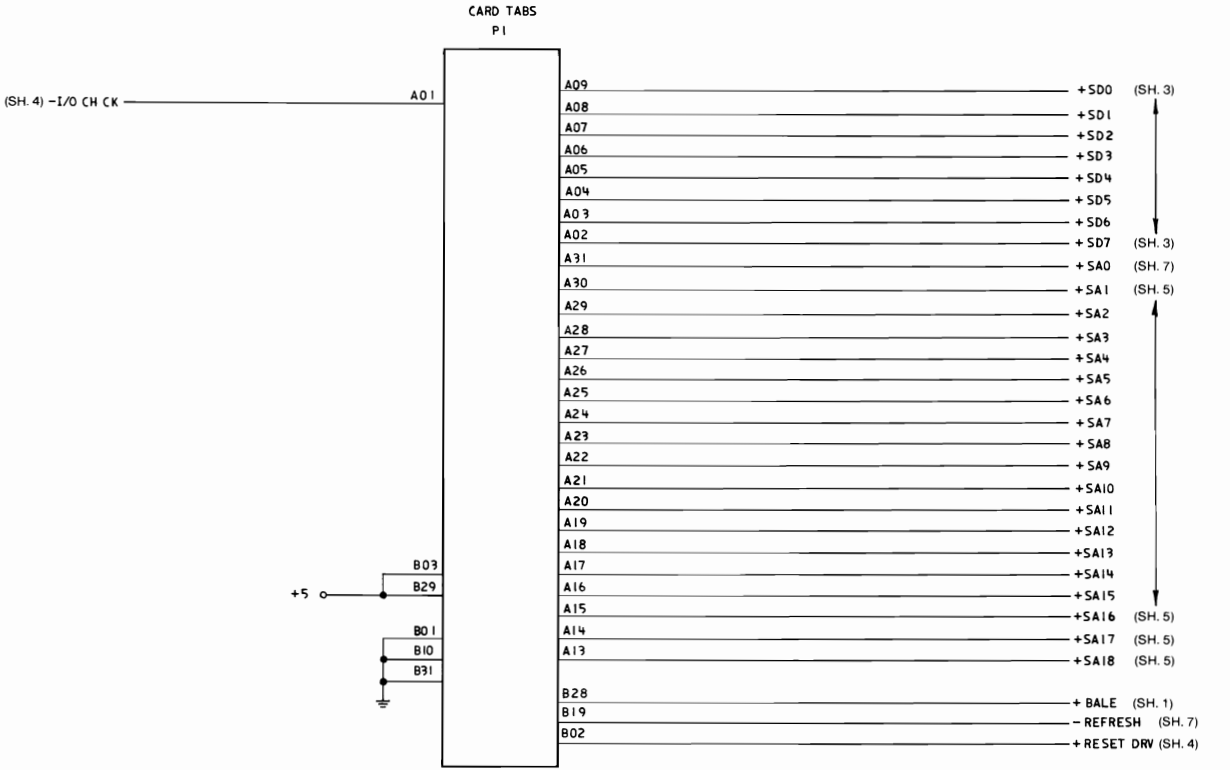

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