EMB-6

EXPANSION MOTHERBOARD MODULE

OPERATOR'S GUIDE

APPLIED BUSINESS COMPUTER
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Specifications Subject To
Change Without Notice

INTRODUCTION

The EMB-6 is a 6 card slot Expansion Motherboard which is used to extend the AIM-65 Microcomputer Bus, enhancing in this manner its capabilities. The EMB-6 plugs directly to the AIM-65 expansion connector. Different Modules can be used as add-on boards to this Microcomputer, such as the CRT-80 video display, FP-950 Floppy Disk controller, MB-64, 64K dynamic RAM, A/D converters or any other modules supporting the EXORciser Bus.

FEATURES

* EXORciser Bus compatible

* 6 card slots

* Fully decoded to select portions of memory in 4K increments by DIP switches.

* Fully Buffered.

* Supports DMA.

* Straight extended from the expansion connector on the AIM-65.

SPECIFICATIONS

Expansion capacity   64K bytes, 6 Modules

Interfaces: AIM-65 to EXORciser Bus

Size: 12" wide by 8.25" long

Expansion Connector: 44 pins on 0.156" centers

EXORciser Connectors: 86 pins on 0.156" centers

Operating temperature   0°C to 70°C.

Expansion Board Power   +5 Vdc $\pm$ 5% @ 0.3 Amp.
Requirement (Module only)

Logic Levels

	Symbol	Min	Max	Conditions
Power	VCC	4.75V	5.25V	
Inputs: D0-D7, A0-A15, SYNC, R/W, Ø2	V_{IL}		0.8V	$I_{IL} = -0.4$ mA
	V_{IH}	2.0V	VCC	$I_{IH} = 40$ uA
Ouputs: D0-D7	V_{OL}		0.5V	$I_{OL} = 48$ mA
	V_{OH}	2.4V		$I_{OH} = -10$ mA
A0-A15, SYNC, Ø2	V_{OL}		0.5V	$I_{OL} = 48$ mA
	V_{OH}	2.4V		$I_{OH} = -5.2$ mA

TABLE 1

EMB-6 ADDRESS SELECTION

Silk Screen Label	Address Range (Hex)
0	0000 to 0FFF
1	1000 to 1FFF
2	2000 to 2FFF
3	3000 to 3FFF
4	4000 to 4FFF
5	5000 to 5FFF
6	6000 to 6FFF
7	7000 to 7FFF
8	8000 to 8FFF
9	9000 to 9FFF
A	A000 to AFFF
B	B000 to BFFF
C	C000 to CFFF
D	D000 to DFFF
E	E000 to EFFF
F	F000 to FFFF

Note that the on-board 4K RAM and ROM (Monitor, BASIC, Assembler, I/O) on the AIM-65 occupy locations $0000 to $0FFF and $B000 to $FFFF respectively. They should be physically removed if external access to AIM-65 at these locations is intended. For instance, if and external RAM memory board is desired, which starts at location $0000, the RAM devices on the AIM-65 should be removed before enabling the switch labeled "0" on the expansion board.

A jumper (H2) is provided to optionally connect the $\emptyset$2 clock on Pin J to pin L on the 6 card slots for some boards supporting the EXORciser bus, which require this clock on pin L.

INSTALLATION

The EMB-6 is shipped with the card guides dismounted for easy way of handling. The following procedure should be followed to set the Module in operation with the AIM-65.

a) Install the 12 card guide on AIM-65 with the screws provided, one on each side of the EXORciser bus connector.

b) Remove all power to the AIM-65

c) Attach the expansion connector to the expansion connector on the AIM-65.

d) Jumper the power lines from the power block connector on the AIM-65 to the power block on the EMB-6.

e) Install the modules on the EXORcier Bus connectors and make sure they are installed correctly with the component side facing the AIM-65.

f) Configure address selection switches 0-F to enable external Data access according to Table 1.

g) Apply power to both the AIM-65 and the EMB-6.

DATA BUS

The polarity of the EXORciser data bus in the EMB-6 is determined by the buffers used on U4, U5. The boards are shipped with 8T26 devices on these sockets to make the data bus invert. The reason for this is that most modules that plug on the EXORciser bus come with buffers to invert the data. Should the data bus not invert on the EMB-6 then the 8T26 buffers on U4, U5 are to be replaced for 8T28 devices. Note that if the replacement of the 8T26's for 8T28's is done, then the buffers on some of the modules that plug on the EXORciser bus may have to replaced so the data is not inverted. Modules such as RAM memory do not require this type of change since what goes in is what comes out (inverted or not).

DMA

The $\overline{DMA}$ line is used to tri-state the address, data and R/W buffers on the EMB-6. The DMA signal when high enables the address, data and R/W signal from the AIM-65. When $\overline{DMA}$ signal is pulled low these signals are tri-stated to allow other controller modules to take over the bus for fast transfers of data or any other application. The $\overline{DMA}$ has a pullup resistor which keeps the signal high when not used.

CONNECTORS

The EMB-6 connects to the AIM-65 through the 44 pin expansion connector. The pin assignment is given on Table 2. The EXORciser connectors pin assignment is shown on Table 3.

TABLE 2 EMB-6 TO AIM-65 CONNECTOR (P1)			
1	SYNC	A	10
2	RY	B	A1
3	Ø1	C	A2
4	$\overline{IRQ}$	D	A3
5	S.O.	E	A4
6	$\overline{NMI}$	F	A5
7	$\overline{RES}$	H	A6
8	D7	J	A7
9	D6	K	A8
10	D5	L	A9
11	D4	M	A10
12	D3	N	A11
13	D2	P	A12
14	D1	R	A13
15	D0	S	A14
16	-12V	T	A15
17	+12V	U	SYS Ø2
18	$\overline{CS8}$	V	SYS $\overline{R/W}$
19	$\overline{CS9}$	W	R/$\overline{W}$
20	$\overline{CSA}$	X	TEST
21	+5V	Y	Ø2
22	GND	Z	RAM R/W

TABLE 3

EXORciser BUS PIN ASSIGNMENT (J1-J6)

PIN NO.	NAME	PIN NO.	NAME
1	+5 VDC	A	+5 VDC
2	+5 VDC	B	+5 VDC
3	+5 VDC	C	+5 VDC
4		D	$\overline{IRQ}$
5	$\overline{RES}$	E	$\overline{NMI}$
6	R/W	F	
7	Ø1	H	GND
8	GND	J	Ø2
9	GND	K	GND
10		L	(Ø2)*
11	-12 VDC	M	-12 VDC
12		N	
13		P	
14		R	
15		S	BANK SELECT
16	+12 VDC	T	+12 VDC
17		U	
18		V	
19		W	
20		X	
21		Y	
22		Z	
23		$\overline{A}$	SYNC
24	GND	$\overline{B}$	GND
25		$\overline{C}$	S.O.
26	GND	$\overline{D}$	$\overline{DMA}$
27	RDY	$\overline{E}$	
28		$\overline{F}$	
29	$\overline{D1}$	$\overline{H}$	$\overline{D3}$
30	$\overline{D5}$	$\overline{J}$	$\overline{D7}$
31	$\overline{D0}$	$\overline{K}$	$\overline{D2}$
32	$\overline{D4}$	$\overline{L}$	$\overline{D6}$
33	A15	$\overline{M}$	A14
34	A12	$\overline{N}$	A13
35	A11	$\overline{P}$	A10
36	A8	$\overline{R}$	A9
37	A7	$\overline{S}$	A6
38	A4	$\overline{T}$	A5
39	A3	$\overline{U}$	A2
40	A0	$\overline{P}$	A1
41	GND	$\overline{W}$	GND
42	GND	$\overline{X}$	GND
43	GND	$\overline{Y}$	GND

* PIN L is Ø2 when jumper H2 is installed.