



A65-905 AIM 65 MEMORY CARTRIDGE

PRODUCT OVERVIEW

The A65-905 Memory Cartridge is one of the hardware options available for the AIM 65 Microcomputer family.

Many applications of AIM 65 microcomputers, particularly in test equipment, instrumentation, monitors, analyzers or controllers, require that the resident application software or fixed parametric data be changed periodically. This may occur because the item under test or being controlled has been changed, or parameter values have been revised. For OEM installations, the change may be required to customize the system for different customers.

The AIM 65 Memory Cartridge system is an economical and convenient method for expanding the memory of an AIM 65 microcomputer. The cartridges are designed for use with the Rockwell packaged 500 Series of desktop microcomputers, but may also be used with any AIM 65 board-level microcomputer. A Buffer Module connects to the AIM 65 Master Module, buffers the expansion bus signals, and provides a covered host receptacle for a Memory Cartridge. In addition to expanded RAM and provisions for user application PROM firmware, a variety of pre-configured AIM 65 high level languages, assembler and math package routines are available in plug-in Memory Cartridge form. These language cartridges permit the user to program different applications in different languages. Unpopulated RAM and PROM/ROM cartridges are also available for complete user flexibility.

The Buffer Module fits under the AIM 65 Master Module and fastens securely to the Rockwell AIM 65 Enclosure. Rugged injection molded plastic covers for both the Buffer Module and the Memory Cartridge complement the AIM 65 Enclosure in color, texture and sturdiness. A Memory Cartridge plugs vertically into the Buffer Module immediately behind the microcomputer enclosure to require a minimum of area in desktop applications. A recessed label area on the Memory Cartridge cover allows configuration information to be neatly added in an area visible to the operator. Address decoding required by the different cartridges is accomplished automatically without user intervention.

FEATURES

- Preconfigured Memory Cartridges
 - AIM 65 high level languages and support firmware
 - Up to 16K bytes additional RAM
 - Up to 32K byte additional PROM/ROM
 - Combination RAM and PROM/ROM
- Permanent Buffer Module installation
- Convenient Memory Cartridge plug-in installation
- Use with any AIM 65 500 Series Desktop Microcomputer
- Compatible with A65-006 enclosure and power supply
- Cartridges are fully assembled, tested and warranted

ORDERING INFORMATION

Part No.	Description
A65-905-00	Buffer Module
A65-905-01	BASIC Interpreter, Assembler, 8K CMOS RAM & 4K User PROM Socket
A65-905-02	PL/65 Compiler, Assembler, 8K CMOS RAM & 4K User PROM Socket
A65-905-03	FORTH, Math Package, 8K CMOS RAM & 4K User PROM Socket
A65-905-04	Instant PASCAL & 6K CMOS RAM
A65-905-05	32K PROM/ROM (1)
A65-905-06	16K CMOS RAM
A65-905-07	16K CMOS RAM (unpopulated)
A65-905-08	8K CMOS RAM & 16K PROM/ROM (1)

(1) PROMs not included.



AIM 65 Desktop Microcomputer with Memory Cartridge

FUNCTIONAL DESCRIPTION

BUFFER MODULE

The Buffer Module interfaces the AIM 65 Expansion Connector to a Memory Cartridge as illustrated. Non-inverting circuits buffer the data and address lines. Data direction is controlled by the BR/W signal. During a write operation, data from the AIM 65 Master Module is directed towards the cartridge. During a read operation, data from the cartridge is directed towards the AIM 65 Master Module. The RAM R/W signal is routed through the Buffer Module to the cartridge interface to control the Memory Cartridge device read/write operation.

Address decoding is accomplished by a factory programmed 256×4 PROM which drives a 3-to-8 decoder. An interlock signal (PE) ensures the PROM is enabled only when a cartridge is installed. Three address straps within the cartridge (S1, S2, and S3) identify the cartridge type installed by selecting the appropriate address decoding section in the PROM. The five most significant buffered address lines address one of the 32 bytes within the selected section. A valid address for the installed cartridge results in a low level signal on the most significant PROM output pin. This signal in turn enables both the 3-to-8 decoder and the data transceiver. The remaining three PROM outputs (O1, O2, and O3) provide the selection input to the

decoder and drive the appropriate decoder output to the low state. The eight decoder outputs form the eight active low chip select signals for the cartridge.

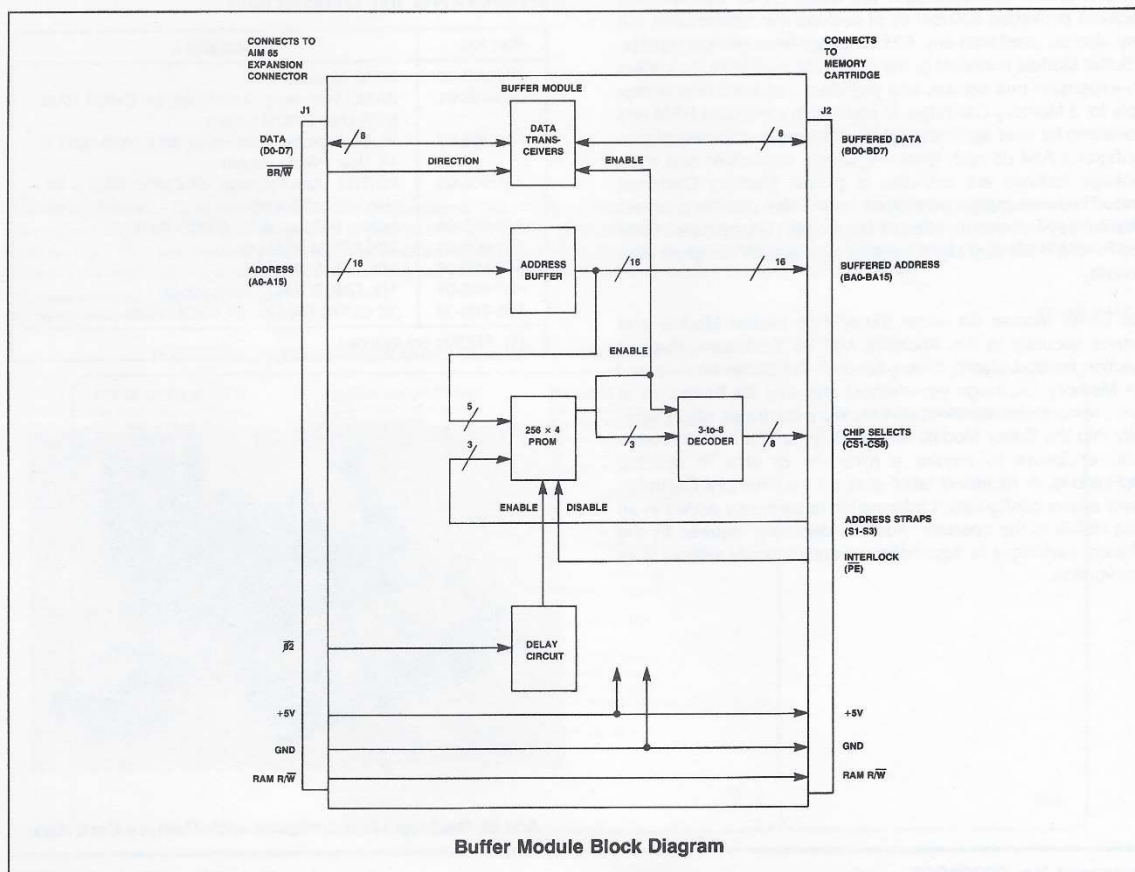
PROM timing is controlled by a delay circuit implemented with a mono-stable multivibrator. This circuit delays the turn-on of the address decode PROM to prevent bus contentions at the beginning of each cycle.

Power for the Buffer Module is derived from the AIM 65 power supply through the Expansion Connector. Power for the cartridge is routed through the Buffer Module.

MEMORY CARTRIDGE

The Memory Cartridge has eight 24-pin sockets which can accept 2K RAMs, 4K PROMs or 4K ROMs. In models -01, -02, -03, -05, and -08, sockets are available for user supplied PROMs. In model -07, sockets are provided for user supplied RAMs.

Variations in socket functions are accomplished by routing selected signals through factory installed jumpers. The eight sockets are arranged into three groups as illustrated in the block diagram. All sockets in each group are configured to accept the same memory device type.



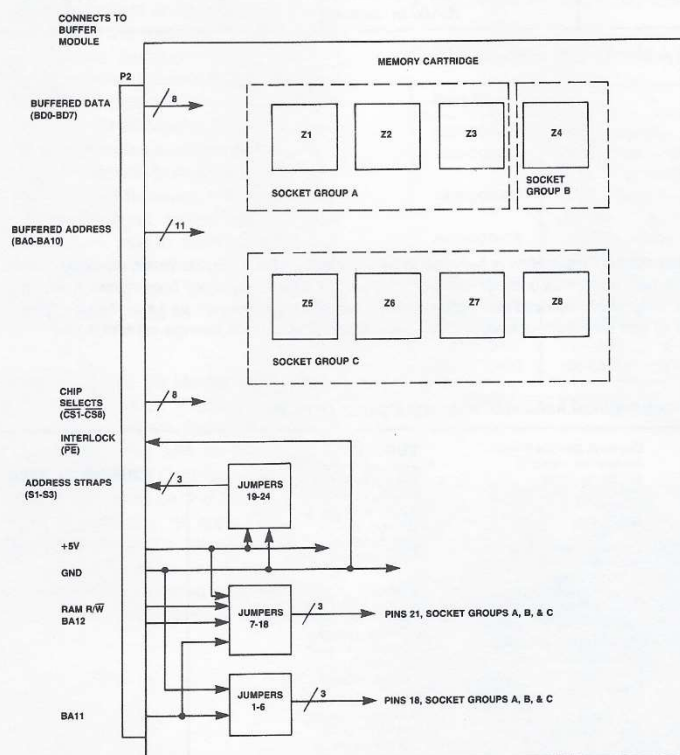
INSTALLATION

BUFFER MODULE

1. Before installing the Buffer Module, turn off power to the AIM 65 Microcomputer.
2. Align the Buffer Module Connector J1 pin 1 with the AIM 65 Expansion Connector J3 pin 1.
3. Carefully slide the Buffer Module under the AIM 65 Master Module, plugging the Buffer Module onto the Expansion Connector. Press in firmly on the end of the module assembly until all pins are securely seated.
4. If your AIM 65 Microcomputer is installed in an AIM 65 Enclosure, fasten the Buffer Module Assembly bottom plate to the base plate of the enclosure using the screws provided with the Buffer Module.

MEMORY CARTRIDGE

1. Before installing or removing a Memory Cartridge, turn off power to the AIM 65 Microcomputer.
2. To install the cartridge, align the cartridge with the label side towards the microcomputer and plug the cartridge into the Buffer Module receptacle (the cartridge is keyed to prevent improper insertion). Press down firmly on the top of the cartridge until all pins are securely seated.



Memory Cartridge Block Diagram

Memory Cartridge Memory Map

Block Starting Address	Cartridge Model (A65-905-XX)							
	-01	-02	-03	-04	-05	-06	-07	-08
0000 (1)	AIM 65 Master Module RAM							
1000	8K RAM	8K RAM	8K RAM	6K RAM	32K PROM	16K RAM	16K RAM	8K RAM
2000								
3000								
4000	4K PROM	4K PROM	4K PROM	PASCAL				16K PROM
5000								
6000								
7000								
8000								
9000								
A000	AIM 65 Master Module I/O							
B000	BASIC	PL65	FORTH	PASCAL				
C000								
D000	Assembler	Assembler	Math Pack					
E000	AIM 65 Monitor	AIM 65 Monitor	AIM 65 Monitor	AIM 65 Monitor	AIM 65 Monitor	AIM 65 Monitor	AIM 65 Monitor	AIM 65 Monitor
F000								

Notes:

(1) Master Module only.

(2) These blocks are addressed on the AIM 65 Master Module in addition to the cartridges. Components must be removed from AIM 65 Master Module sockets Z24, Z25, and Z26 prior to installing the memory cartridge model -01, -02, or -03. Component must be removed from AIM 65 Master Module socket Z26 prior to installing cartridge model -04.

Memory Cartridge Component Summary

Socket	Cartridge Model No. (A65-905-XX)							
	-01	-02	-03	-04	-05	-06	-07	-08
Function	BASIC	PL/65	FORTH	PASCAL	PROM/ROM	RAM	User RAM	RAM and PROM/ROM
Z1	RAM	RAM	RAM	RAM	PROM	RAM	RAM	RAM
Z2	RAM	RAM	RAM	RAM	PROM			RAM
Z3	RAM	RAM	RAM	RAM	PROM			RAM
Z4	RAM	RAM	RAM	R32P2-11 ROM	PROM			RAM
Z5	(1) PROM	(1) PROM	(1) PROM	R32P3-11 ROM	PROM			PROM
Z6	R3226-11 ROM	R3299-11 ROM	R32J1-11 ROM	R32P4-11 ROM	PROM			PROM
Z7	R3225-11 ROM	R3298-21 ROM	R32J2-11 ROM	R32P5-11 ROM	PROM			PROM
Z8	R3224-11 ROM	R3224-11 ROM	R32L3-11 ROM	R32P6-11 ROM	PROM			PROM

Notes:

1. All PROM is user provided TI2532 or equivalent.

2. All RAM is Toshiba TC5516AP or Suwa Seikosha SRM2018C.

Buffer Module to AIM 65 Expansion Connector Pin Assignments

Top (Component Side)				Bottom (Solder Side)			
Pin	Signal Mnemonic	Signal Name	Input/Output**	Pin	Signal Mnemonic	Signal Name	Input/Output**
1	SYNC	*SYNC		A	A0	Address Bit 0	I
2	RDY	*Ready		B	A1	Address Bit 1	I
3	$\phi 1$	*Phase 1 Clock		C	A2	Address Bit 2	I
4	IRQ	*Interrupt Request		D	A3	Address Bit 3	I
5	S.O.	*Set Overflow		E	A4	Address Bit 4	I
6	NMI	*Non-Maskable Interrupt		F	A5	Address Bit 5	I
7	RES	*Reset		H	A6	Address Bit 6	I
8	D7	Data Bit 7	I/O	J	A7	Address Bit 7	I
9	D6	Data Bit 6	I/O	K	A8	Address Bit 8	I
10	D5	Data Bit 5	I/O	L	A9	Address Bit 9	I
11	D4	Data Bit 4	I/O	M	A10	Address Bit 10	I
12	D3	Data Bit 3	I/O	N	A11	Address Bit 11	I
13	D2	Data Bit 2	I/O	P	A12	Address Bit 12	I
14	D1	Data Bit 1	I/O	R	A13	Address Bit 13	I
15	D0	Data Bit 0	I/O	S	A14	Address Bit 14	I
16	-12V	*-12 Vdc		T	A15	Address Bit 15	I
17	+12V	*+12 Vdc		U	SYS $\phi 2$	System Phase 2 Clock	
18	CS8	*Chip Select 8		V	SYS R/W	System Read/Write	
19	CS9	*Chip Select 9		W	R/W		I
20	CSA	*Chip Select A		X	TEST	*Test	
21	+5V	+5 Vdc		Y	$\phi 2$	Phase 2 Clock "Not"	I
22	GND	Ground		Z	RAM R/W	RAM Read/Write	I

Note:

* = Not used on this module.

** = With respect to the Buffer Module.

Memory Cartridge to Buffer Module Connector Pin Assignments

Front (Label Side)				Rear			
Pin	Signal Mnemonic	Signal Name	Input/Output**	Pin	Signal Mnemonic	Signal Name	Input/Output**
2	BA3	Address Bit 3	I	1	BA2	Address Bit 2	I
4	BA1	Address Bit 1	I	3	BA0	Address Bit 0	I
6	BA7	Address Bit 7	I	5	BA6	Address Bit 6	I
8	BA4	Address Bit 4	I	7	BA5	Address Bit 5	I
10	BA15	Address Bit 15	I	9		Not Used	
12	BA14	Address Bit 14	I	11	PE	PROM Enable	O
14	BA12	Address Bit 12	I	13	BA13	Address Bit 13	I
16	BA9	Address Bit 9	I	15	BA8	Address Bit 8	I
18	BA11	Address Bit 11	I	17	BA10	Address Bit 10	I
20	BD1	Data Bit 1	I/O	19	BD0	Data Bit 0	I/O
22	BD3	Data Bit 3	I/O	21	BD2	Data Bit 2	I/O
24	BD5	Data Bit 5	I/O	23	BD4	Data Bit 4	I/O
26	BD7	Data Bit 7	I/O	25	BD6	Data Bit 6	I/O
28	CS2	Chip Select 2	I	27	CS1	Chip Select 1	I
30	CS4	Chip Select 4	I	29	CS3	Chip Select 3	I
32	CS6	Chip Select 6	I	31	CS5	Chip Select 5	I
34	CS8	Chip Select 8	I	33	CS7	Chip Select 7	I
36	RAM R/W	RAM Read/Write	I	35	S3	Address Strap 3	O
38	S2	Address Strap 2	O	37	S1	Address Strap 1	O
40		Not Used		39		Not Used	
42	+5V	+5 Vdc		41	+5V	+5 Vdc	
44	GND	Ground		43	GND	Ground	

Note:

**With respect to Memory Cartridge.

SPECIFICATIONS

Parameter	Value	
	Memory Cartridge	Buffer Module
Dimensions		
Width	5.25 in. (133 mm)	4.75 in. (121 mm)
Length	4.85 in. (123 mm)	4.69 in. (119 mm)
Height	0.88 in. (22 mm)	1.48 in. (38 mm)
Power	+5V \pm 5%	+5V \pm 5%
	-01, -02, -03 550 ma—Typical	250 ma—Typical
	-04 550 ma—Typical	
	-05 870 ma—Typical	
	-06, -07 380 ma—Typical	
	-08 620 ma—Typical	
Environment		
Operating Temperature	0°C to 70°C	0°C to 70°C
Storage Temperature	-40°C to 85°C	-40°C to 85°C
Relative Humidity	0% to 85% (without condensation)	0% to 85% (without condensation)
Interface Connections		
AIM 65 Expansion Connector		44 pin-edge receptacle (0.156 in. centers)
Buffer Module to Cartridge	44 pin-edge connector (0.100 in. centers)	44 pin-edge receptacle (0.100 in. centers)

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