



## RM 65 DATA SHEET

### 16-SLOT CARD CAGE AND MOTHERBOARD

#### RM 65

The RM 65 product line is designed for OEM and end user microcomputer applications requiring state-of-the-art performance, compact size, modular design and low cost. Software for RM 65 systems can be developed in R6500 Assembly Language, PL/65, BASIC and FORTH. Both BASIC and FORTH are available in ROM and can be incorporated into the user's system.

The RM 65 product line uses a motherboard interconnect concept and accepts any card in any slot. The 64-line RM 65 Bus offers memory addressing up to 128K bytes, high immunity to electrical noise and includes growth provisions for user functions. A set of card cages allows a broad variety of packaging options. RM 65 products may also be used with Rockwell's AIM 65 and AIM 65/40 Microcomputers for product development and desktop microcomputer applications.

#### PRODUCT OVERVIEW

The 16-slot card cage consists of a 16-slot RM 65 Bus compatible motherboard in a card cage. Memory, I/O or special functions may be added to the AIM 65 Microcomputer by use of the 16-slot card cage. When connected to the AIM 65 Master Module through the Adapter/Buffer, the card cage may be mounted over, under, or behind the AIM 65 Master Module in a variety of orientations to meet unique application requirements. The form factor of the 16-slot card cage allows low profile placement in a table top or terminal style enclosure.

The 16-Slot Motherboard (RM65-7016N and RM65-7016NE) is a printed circuit board (PCB) less 16 connectors, two mini-terminal strips, three filter capacitors and 16 mounting blocks used to fasten the PCB to the RM65-7016 card cage. Connectors, mini-terminal strips, filter capacitors, and custom mounting blocks as needed can easily be added to meet unique installation requirements.

#### FEATURES

- 16-slot card cage with integral module guides
- Rugged, yet lightweight construction
- Screw-down terminals for connecting external power (+ 5V, + 12V/ + V, - 12V/ - V, GND)
- Predrilled holes for various mounting configurations
- Assembled, tested and warranted
- Removable jumpers on motherboard support  $\pm 12V$  as well as  $\pm V$ .

#### ORDERING INFORMATION

Part No.	Description
RM65-7016	16-Slot Card Cage (Edge Connector)
RM65-7016E	16-Slot Card Cage (Euroconnector)
RM65-7016N	16-Slot Motherboard (Edge Connector)
RM65-7016NE	16-Slot Motherboard (Euroconnector)



RM65—7016(E) Card Cage

16-SLOT CARD CAGE AND MOTHERBOARD

# RM 65 Bus Pin Assignments

Bottom (Solder Side)			Top (Component Side)		
Signal Mnemonic	Signal Name	Pin	Pin	Signal Mnemonic	Signal Name
	Not Connected (See Note)	Wa	Wc		Not Connected (See Note)
+5V	+5 Vdc Line (See Note)	Xa	Xc	+5V	+5 Vdc (See Note)
GND	Ground	1a	1c	+5V	+5 Vdc
BADR/	Buffered Bank Address	2a	2c	BA15/	Buffered Address Bit 15
GND	Ground	3a	3c	BA14/	Buffered Address Bit 14
BA13/	Buffered Address Bit 13	4a	4c	BA12/	Buffered Address Bit 12
BA11/	Buffered Address Bit 11	5a	5c	GND	Ground
BA10/	Buffered Address Bit 10	6a	6c	BA9/	Buffered Address Bit 9
BA8/	Buffered Address Bit 8	7a	7c	BA7/	Buffered Address Bit 7
GND	Ground	8a	8c	BA6/	Buffered Address Bit 6
BA5/	Buffered Address Bit 5	9a	9c	BA4/	Buffered Address Bit 4
BA3/	Buffered Address Bit 3	10a	10c	GND	Ground
BA2/	Buffered Address Bit 2	11a	11c	BA1/	Buffered Address Bit 1
BA0/	Buffered Address Bit 0	12a	12c	B $\phi$ 1	Buffered Phase 1 Clock
GND	Ground	13a	13c	BSYNC	Buffered Sync
BSO	Buffered Set Overflow	14a	14c	BDRQ1/	Buffered DMA Request 1
BRDY	Buffered Ready	15a	15c	GND	Ground
	User Spare 1	16a	16c	-12V/-V	-12 Vdc/-V
+12V/+V	+12 Vdc/+V	17a	17c		User Spare 2
GND	Ground Line	18a	18c	BFLT/	Buffered Bus Float
BDMT/	Buffered DMA Terminate	19a	19c	B $\phi$ 0	Buffered External Phase 0 Clock
	User Spare 3	20a	20c	GND	Ground
BR/W/	Buffered Read/Write "Not"	21a	21c	BDRQ2/	Buffered DMA Request 2
	System Spare	22a	22c	BR/W	Buffered Read/Write
GND	Ground	23a	23c	BACT/	Buffered Bus Active
BIRQ/	Buffered Interrupt Request	24a	24c	BNMI/	Buffered Non-Maskable Interrupt
B $\phi$ 2/	Buffered Phase 2 "Not" Clock	25a	25c	GND	Ground
B $\phi$ 2	Buffered Phase 2 Clock	26a	26c	BRES/	Buffered Reset
BD7/	Buffered Data Bit 7	27a	27c	BD6/	Buffered Data Bit 6
GND	Ground	28a	28c	BD5/	Buffered Data Bit 5
BD4/	Buffered Data Bit 4	29a	29c	BD3/	Buffered Data Bit 3
BD2/	Buffered Data Bit 2	30a	30c	GND	Ground
BD1/	Buffered Data Bit 1	31a	31c	BD0/	Buffered Data Bit 0
+5V	+5 Vdc	32a	32c	GND	Ground
+5V	+5 Vdc (See Note)	Ya	Yc	+5V	+5 Vdc (See Note)
	Not Connected (See Note)	Za	Zc		Not Connected (See Note)

## NOTE

Pins Wa, Wc, Xa, Xc, Ya, Yc, Za and Zc are not used on Eurocard version.



## MOTHERBOARD CONNECTION AND MODULE INSTALLATION

1. Connect power to TB1 and/or TB2. The power lines should be long enough to allow the card cage to be oriented and positioned as required.

### WARNING

Ensure that the external power supplies are turned off before connecting to TB1 or TB2.

- a. Connect +5V from an external power supply to either terminal marked "+5". "+5" is connected to all +5V pins on all module receptacles.
- b. Connect GND from the power supply to either terminal marked "G". Both of these terminals are connected to all GND pins on all module receptacles.
- c. Connect +12V/+V from an external power supply to the terminal marked "+V". "+V" is connected to Pin 17a on each module receptacle.

### NOTES

1. If both +12V and +V (e.g., +15V) are required, remove the soldered jumper corresponding to pin 17a between receptacle 3 and 4 on the soldered side of the motherboard. Connect +12V to TB1 if three or less modules require +12V, or to TB2 if more than three modules require +12V. Connect +V to the other terminal strip.
  2. If the jumper has been removed and only one voltage is required (i.e., +12V or +V), connect the power lead to both TB1 and TB2.
- d. Connect GND from the +12V/+V power supply to either "G" terminal.
  - e. Connect -12V/-V from an external power supply to the terminal marked "-V". "-V" is connected to Pin 16c on each module receptacle.

### NOTES

1. If both -12V and -V (e.g., -15V) are required, remove the soldered jumper corresponding to pin 16c between receptacle 3 and 4 on the soldered side of the motherboard. Connect -12V to TB1 if three or less modules require -12V or to TB2 if more than three modules require -12V. Connect -V to the other terminal strip.
  2. If the jumper has been removed and only one voltage is required (i.e., -12V or -V) connect the power lead to both TB1 and TB2.
- f. Connect GND from the -12V/-V power supply to either "G" terminal.

2. Install the card cage in the desired position. Mounting holes are provided to allow attachment at the top or bottom of the card cage.

### CAUTION

Ensure that neither the left nor right side of the card cage is blocked such that the flow of forced cooling air is impeded.

3. To install a module in the card cage:

### CAUTION

Ensure that power is turned off to the card cage motherboard before installing a module.

- a. Position the module, component side facing TB1 end, in front of the desired card slot.

Card slot No. 1 (slot closest to TB1) has 0.85 inch of component clearance whereas the other seven slots are 0.6 inch centers. If a module is higher than 0.4 inch above the surface of the module, install it in card slot No. 1.

### CAUTION

If  $\pm 12V$  and  $\pm V$  have been connected to different terminal strips (TB1 or TB2), ensure that any modules requiring  $\pm 12V$  or  $\pm V$  are installed in the slots corresponding to the proper voltage.

- b. Insert the module into the card guide and slide the module straight in until it touches the mating motherboard receptacle.

### NOTE

The card slot guides may be snug on the inserted module.

- c. Ensure that the module connector is positioned properly against the mating receptacle.

### CAUTION

A key is installed in each edge connector receptacle between pin 5 and pin 6. Forcing an edge connector module without a corresponding slot in the plug may damage the receptacle and/or the module.

- d. Press in firmly on the exposed edge of the module until it is firmly seated.

4. To remove a module from the card cage:

### CAUTION

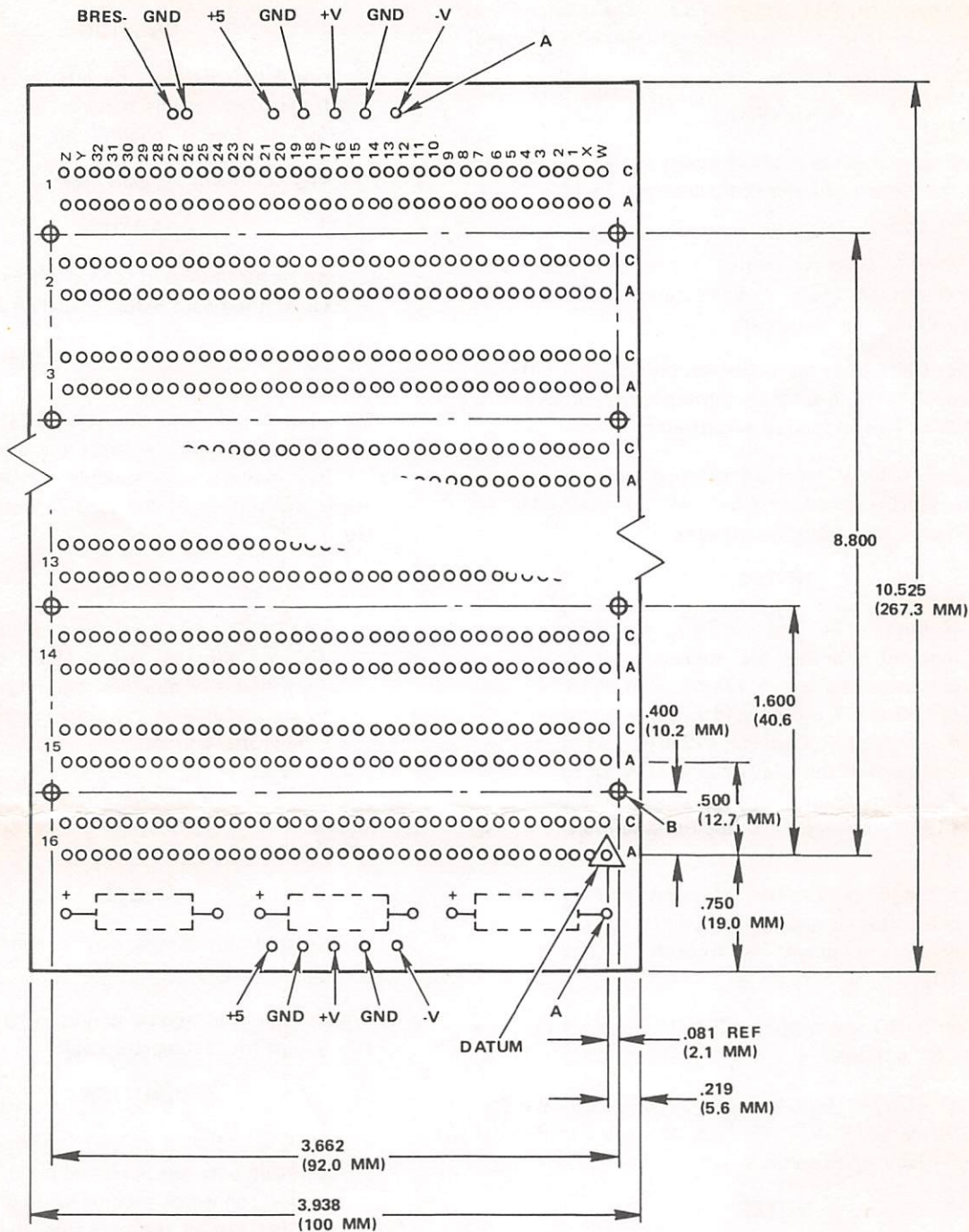
Remove power from the card cage motherboard before removing a module.

- a. Lift up on the module ejector tab, if installed; otherwise grasp the exposed edge of the module and pull, to release the module from the mating receptacle.
- b. Pull the module straight back until it is free from the card slot guides.



# 16-SLOT MOTHERBOARD

REAR VIEW



## ELECTRONIC DEVICES DIVISION REGIONAL ROCKWELL SALES OFFICES

### HOME OFFICE

Electronic Devices Division  
Rockwell International  
3310 Miraloma Avenue  
P.O. Box 3669  
Anaheim, California 92803  
(714) 632-3729  
TWX: 910 591-1698

### UNITED STATES

Electronic Devices Division  
Rockwell International  
1842 Reynolds  
Irvine, California 92626  
(714) 632-3710  
DDD (714) 545-6227

Electronic Devices Division  
Rockwell International  
921 Bowser Road  
Richardson, Texas 75080  
(214) 996-6500  
Telex: 73-307

Electronic Devices Division  
Rockwell International  
10700 West Higgins Rd., Suite 102  
Rosemont, Illinois 60018  
(312) 297-8862  
TWX: 910 233-0179 (RI MED ROSM)

Electronic Devices Division  
Rockwell International  
5001B Greentree  
Executive Campus, Rt. 73  
Marlton, New Jersey 08053  
(609) 596-0090  
TWX: 710 940-1377

### EUROPE

Electronic Devices Division  
Rockwell International GmbH  
Fraunhoferstrasse 11  
D-8033 Munchen-Martinsried  
Germany  
(089) 859-9575  
Telex: 0521/2650

Electronic Devices Division  
Rockwell International  
Heathrow House, Bath Rd.  
Cranford, Hounslow,  
Middlesex, England  
(01) 759-9911  
Telex: 851-25463

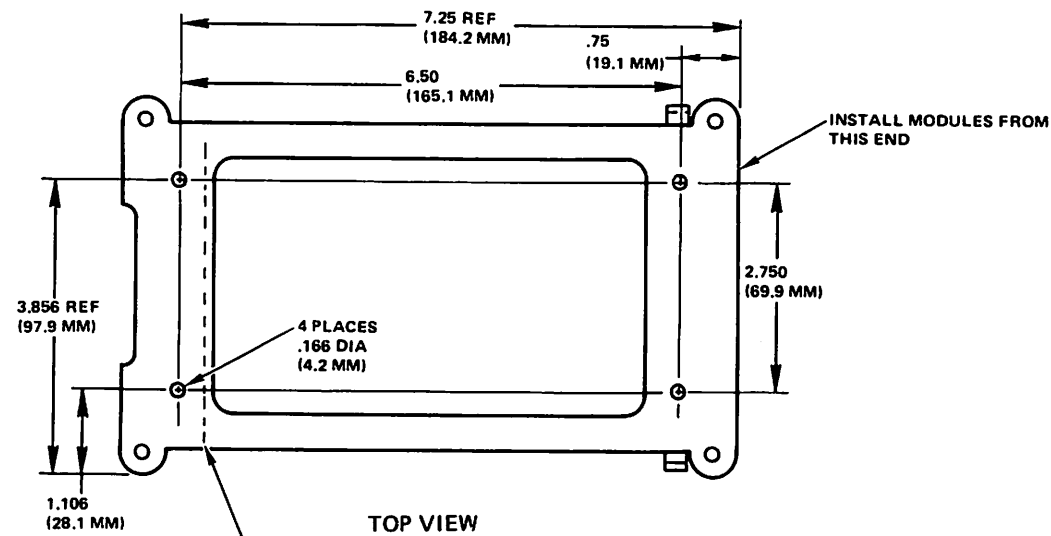
### FAR EAST

Electronic Devices Division  
Rockwell International Overseas Corp.  
Itohpia Hirakawa-cho Bldg.  
7-6, 2-chome, Hirakawa-cho  
Chiyoda-ku, Tokyo 102, Japan  
(03) 265-8806  
Telex: J22198

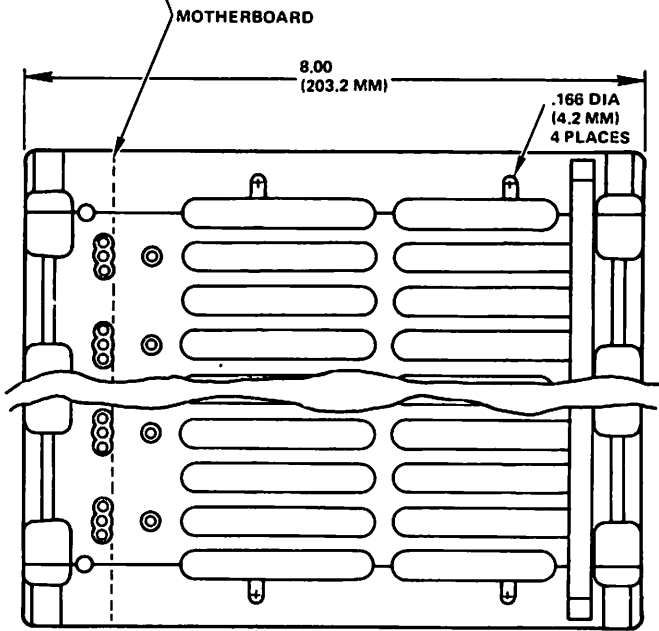
## YOUR LOCAL REPRESENTATIVE

16-SLOT CARD CAGE AND MOTHERBOARD SPECIFICATIONS

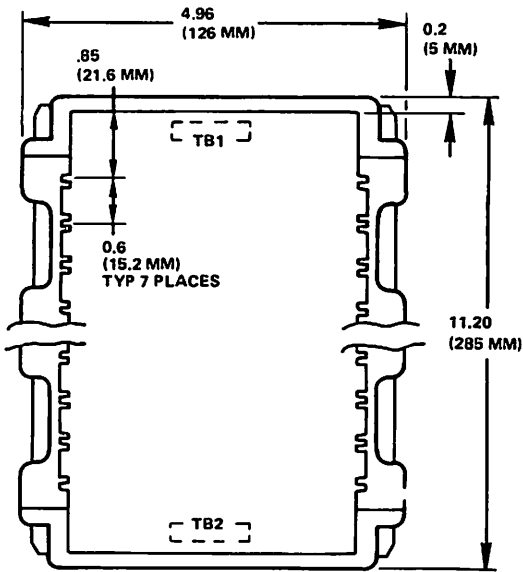
Characteristic	Value
Outer Dimensions	
Width	4.96 in. (126 mm)
Length	8.00 in. (203 mm)
Height	11.20 in. (285 mm)
Module Separation:	
Slot 1: Centerline to Inside Top Cover	0.85 in. (22 mm)
Other Slots: Centerline to Centerline	0.6 in. (15 mm)
Weight	2 lb. 10 oz. (1.20 kg)



TOP VIEW



LEFT SIDE VIEW



END VIEW

16-CONNECTOR MOTHERBOARD ASSEMBLY

The 16-slot motherboard (RM65-7016N or RM65-7016NE) can be assembled as follows:

1. Install up to 16 module connectors (receptacles) from the front of the PCB. Be sure to observe correct connector orientation. The following connectors or their equivalent, may be used:

RM65-7016N (Edge Connector)	
Company*	Part No.
Burndy	ETBH4DD36-18
Continental	6100-200-72W16MSN

RM65-7016NE (Euro Connector)	
Company*	Part No.
Burndy	P196B32R00K00K9
Winchester	96S-6033-0531-3
Elco	00-8257-096-649-124

2. Solder the receptacle pin connections to the back of the PCB.
3. Install three 100 ufd, 25 VDC capacitors from +5V to GND, +V to GND, and -V to GND, from the front of the PCB. Be sure to observe correct polarity.
4. Solder the capacitor leads to the back of the PCB.
5. Install one or two mini-terminal strips to the power supply connection holes from the back of the PCB.
6. Solder the mini-terminal strip leads to the front of the PCB.

\*Burndy Corporation  
Dept. G  
Richards Ave.  
Norwalk, CT 06856

Elco Corporation  
Electrical Connector Division, Dept. G  
Huntington Industrial Park  
Huntington, PA 16652

Continental Connector Corporation  
24-63G 56th Street  
Woodside, NY 11377

Winchester Electronics  
2G Main St./Hillside  
Oakville, CT 06779

16-SLOT MOTHERBOARD SPECIFICATIONS

Characteristic	Value
Dimensions	
Width	3.938 in. (100 mm)
Length	10.525 in. (267 mm)
Height	0.062 in. (1.6 mm)
Hole Size	
Uncoded	0.037 in. (0.940 mm) dia.
A	0.044 in. (1.12 mm) dia.
B	0.128 in. (3.25 mm) dia.