

*Badger OmniRemote*TM

BAM Installation Manual

08/09/99

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Badger Technology, Inc. - Part No. D47-20233-01, August 1999

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Manual Overview

1

Chapter Summary

In this Chapter The following topics are covered in this chapter:

Topic	See Page
About this Manual	1-2
Using this Manual	1-3
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About this Manual

Purpose This manual covers hook-up and installation of the OmniRemote™ Bistate Analog Module (BAM). It is organized into task-based topics, each with a step-by-step description of how to perform the task.

Topics Covered The topics covered in this manual are as follows:

Topic	Page
Manual Overview	
About this Manual	1-2
Using this Manual	1-3
Technical Support	1-5
Instrument Overview	
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Using this Manual

-
- Who Should Use this Manual** This manual is designed for the technician installing the OmniRemote Shelf. Knowledge of electrical and mechanical connectivity is required.
-
- User Attention Words** Five user attention words appear throughout this manual. Each word implies a particular level of observation or action as follows:
- Note** This word is used to call attention to information.
- IMPORTANT** This word calls attention to information that is necessary for correct use of the kit or instrument.
- CAUTION** This word informs the user that damage to the instrument could occur if the user does not comply with the information. It also indicates a potentially hazardous situation that could result in minor or moderate injury to the user.
- ! WARNING !** This word informs the user that serious physical injury or illness to the user or other persons could occur if these required precautions are not taken.
-
- Typographical Conventions** The following typographical conventions are used in this manual:
- ◆ **Bold:** indicates literal values that you type or select. For example, press **Enter** indicates that you should press the enter/return key.
 - ◆ ***Bold italic:*** indicates a variable value that you supply. For example, *file name* indicates that you enter a file name of your choice.
 - ◆ `Courier font:` indicates the computer response.
-
- CDROM** The OmniRemote manuals are provided as Adobe Acrobat® pxx dxx files (pdfs) on the CDROM included with your OmniRemote purchase. You may print as many manuals as you require for your use. Copyright regulations are in effect for distribution or resale to other companies not directly involved with the installation of your OmniRemote.
- Note** The Adobe Acrobat Reader program can be used with most computer operating systems. The program can be downloaded from the Internet through the Adobe Systems Incorporated web site: www.adobe.com.
-

If You Need More Information

If you need information on...	See the...	Part Number
Installing the OmniRemote Shelf,	<i>Shelf Installation Manual</i>	Badger: D47-20525-xx
Installing the Serial Alarm Module (SAM),	<i>SAM Installation Manual</i>	Badger: D47-20228-xx
Installing the Router Access Module-Dual Port (RAM-DP),		
Installing the Router Access Module-Single Port (RAM-SP),		
Running the OmniRemote software,	<i>DAD Provisioner's Manual</i>	Badger: D47-20544-xx
	<i>DAD/BAM Application Notes</i>	Badger: AP01-20933-xx
	<i>Other DAD Application Notes</i>	See your Sales Representative.
The OmniRemote product overview and specifications,	<i>OmniRemote 2020 Brochure</i>	See your Sales Representative.

Technical Support

How to Reach Us If you have questions or encounter problems while installing the OmniRemote, you can reach us as follows:

Telephone	1-408-957-8600
Facsimile	1-408-957-8601
Mailing address	Badger Technology, Inc. 1423 South Milpitas Boulevard Milpitas, CA 95035-6828
World Wide Web:	http://www.badger.com Note We encourage you to visit our web site for answers to frequently asked questions (FAQs) and to learn more about our products.

Hours for Telephone Technical Support Telephone technical support is available at the following times.

Days	Hours
Monday through Friday	8:00 a.m. to 5:00 p.m., Pacific Time

Manual Corrections If you have comments, corrections, or suggestions regarding this manual, you can reach us as follows:

E-mail	techpubs@badger.com
Facsimile	1-408-957-8601 Attn: Badger Technology Manual Publications
Mailing address	Badger Technology Manual Publications 1423 South Milpitas Boulevard Milpitas, CA 95035-6828

Instrument Overview

2

Chapter Summary

In this Chapter The following topics are covered in this chapter:

Topic	See Page
About the OmniRemote	2-2
Hardware Component Overview	2-4
Ordering Hardware Components and Accessories	2-7

About the OmniRemote

OmniRemote Overview The OmniRemote™ instrument is a universal, remote-site gateway. It performs:

- ◆ Environmental monitoring
- ◆ Multi-vendor telecommunications equipment monitoring
- ◆ Alarm management
- ◆ Protocol mediation
- ◆ Local Area Network (LAN) to Wide Area Network (WAN) remote access routing

The OmniRemote SAM provides a single communications path to all of your remote site network elements and environmental equipment. It eliminates multiple costly communications channels to each remote site by sharing bandwidth on a single channel. This channel can be modified to meet your needs, from a simple, low-cost , 9600-baud dial-up phone line to a dedicated 10BaseT Ethernet integrated to your WAN and corporate Intranet.

Network traffic can be significantly reduced by configuring SAM active message filters to eliminate redundant or status-only messages (such as those normally produced by TL1 devices). Protocol translation between different network elements and the Network Management System (NMS) has been caused by the rapid introduction of new technologies and legacy devices. The SAM provides these mediation services to offload processing from the NMS and reduce programming costs. Unlike traditional terminal services, communications bandwidth is conserved and central NMS processing reduced, thus providing the most scalable solution.

Hardware Components The OmniRemote has several hardware components:

- ◆ OmniRemote Shelf with Data Ports
- ◆ OmniRemote Shelf with 10BaseT Hub
- ◆ Bistate Analog Module (BAM)
- ◆ Serial Alarm Module (SAM)
- ◆ Router Access Module, Dual Port (RAM-DP)
- ◆ Router Access Module, Single Port (RAM-SP)

These hardware components can be combined in various configurations to suit your needs.

Note For a brief description of each of these components, see "Hardware Component Overview" on page 2-4.

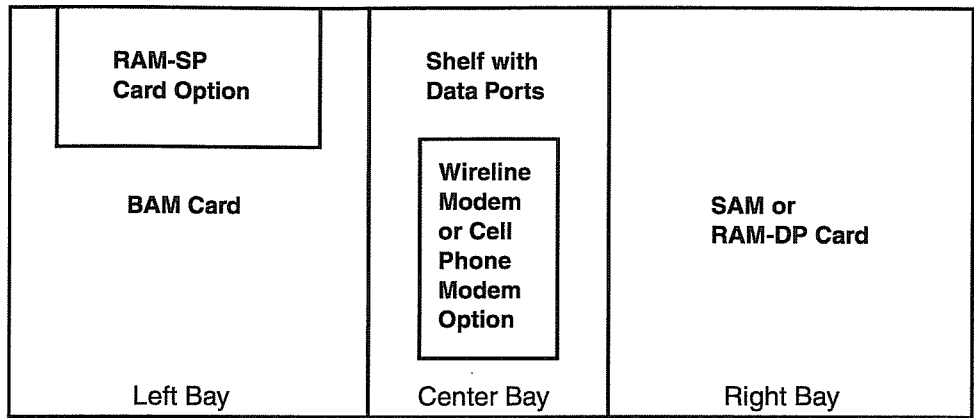
Chassis Configuration

The OmniRemote chassis requires only 1 RU height (1.75 inches) in a 19-inch mounting rack.

The chassis has left and right bays to hold the BAM, SAM, RAM-DP, or RAM-SP. A 3.5-inch center bay holds the power supply and other shared communication functions. The center bay card determines the OmniRemote Shelf configuration, which is one of the following:

- ◆ OmniRemote Shelf with Data Ports
- ◆ OmniRemote Shelf with 10BaseT Hub

The diagram below shows an example of a fully featured chassis configuration.



Software

The BAM, SAM, RAM-DP, and RAM-SP cards each support a microprocessor. The BAM and SAM cards can be downloaded via software.

The SAM uses Badger's Data Acquisition Device (DAD) software to collect serial and IP Ethernet alarm reports from the BAM and other network elements. The DAD software can operate on other platforms (*e.g.*, PC, Sun Workstation) or reside on a SAM installed in the OmniRemote. This allows you to filter and process alarm messages centrally, regionally, or from a remote site.

The DAD software can be extended for custom applications using a scripting language. With this scripting language, Badger can create new network element interfaces for your serial ports, identify their processing components, and route output to the specified destination port (*e.g.*, Network Operations Center [NOC]).

The BAM software collects voltage contact closures and values that result in serial alarm outputs.

The BAM and SAM are easily configured and downloaded using the DAD Control application. This JAVA-based application operates on any network PC running the Microsoft® Windows application (WIN95 or later versions).

Hardware Component Overview

Shelf with Data Ports The OmniRemote Shelf with Data Ports uses a Master Communications Interface (MCI) card in the center bay to provide power to the other modules in the chassis.

The MCI card supports the following communication options:

- ◆ Two bridged, asynchronous (RS-232 or RS-422) ports
- ◆ One synchronous (RS-422) V.35 port (e.g., T1 channel bank DSU/CSU) for a high-speed digital carrier
- ◆ Wireline phone modem
- ◆ Cell phone modem

This shelf can be configured with any combination of BAM, SAM, or RAM-SP in the chassis bays. When configured with a SAM, it also supports an Ethernet interface to the NOC.

Shelf with 10BaseT Hub The OmniRemote Shelf with 10BaseT Hub uses a built-in Ethernet 10BaseT Hub card in the center bay to provide power to the other modules in the chassis and to support a remote-site LAN. Six twisted-pair connections to your site equipment or PCs eliminate a separate hub.

This shelf can be configured with any combination of BAM, SAM, RAM-DP, or RAM-SP in the chassis bays.

BAM-64 The Bistate Analog Module (BAM) addresses a wide range of both public and private network supervisory applications. It is a flexible, field-expandable system that meets a variety of needs in many fields, such as telcos, pipeline, transportation, private networks, and water and electric utilities.

The BAM-64 supports 64 bistate inputs, 12 analog inputs, and 4 control outputs. The BAM-64 monitors discrete alarm conditions (contact closures, TTL, and voltage measurements) and provides remote control (relay contacts). Alarms are time-tagged, transient changes are filtered, and analog inputs have applied upper and lower thresholds.

Typical BAM-64 alarm reports include:

- ◆ Battery and station power
 - ◆ Security sensor
 - ◆ Various environmental measurements (e.g., temperature, humidity)
 - ◆ Communications equipment
-

SAM-10 The Serial Alarm Module (SAM-10) supports 10 serial ports and an Ethernet port for monitoring network elements. The SAM-10 monitors serial alarms and provides remote control (terminal cut-through to equipment) and protocol mediation.

Using the DAD software, the SAM-10 can be configured to receive autonomous messages or to actively poll network elements to determine their status. Received messages are parsed, filtered, translated, and buffered for immediate or later transmission. Log components may be configured between processing flow components to trace the message path.

Primary communications to the NMS can use the router WAN interface or dedicated or dial-up serial links on the MCI card. A point-to-point (PPP) protocol is recommended for serial communications over a WAN or a dial-up phone line to ensure integrity and transparency of the data.

Typical SAM-10 alarm reports include:

- ◆ TL1-based network elements
- ◆ Private Branch Exchanges (PBXs)
- ◆ Switches and cross-connects
- ◆ Intelligent remote communications equipment
- ◆ Badger BAMs

RAM-DP The Router Access Module-Dual Port (RAM-DP) is a flexible Ethernet bridge/router that may be configured to provide one LAN port and 1–2 WAN ports.

The RAM-DP supports the following:

- ◆ Leased lines on one to two physical WAN ports, interfacing to a high-speed digital carrier (*e.g.*, DSU/CSU)
 - ◆ ISDN for 1–2 Basic Rate Interface (BRI) B channels
 - ◆ Frame relay for 1–40 Permanent Virtual Circuits (PVC) across 1–2 physical WAN ports
 - ◆ WAN interfaces: ISDN/U, RS-422, V.24, V.35, X.21
 - ◆ One 10BaseT LAN interface
-

RAM-SP The Router Access Module-Single Port (RAM-SP) is especially suited for geographically dispersed sites. It is a flexible Ethernet bridge/router that can be configured to provide one LAN port and one WAN port.

The RAM-SP supports the following:

- ◆ A leased line on one physical WAN port, interfacing to a high-speed digital carrier (e.g., DSU/CSU)
- ◆ ISDN for one BRI B channel
- ◆ Frame relay for 1–20 PVC across one physical WAN port
- ◆ Two WAN interfaces: V.35 (DB25), ISDN/U (RJ45)
- ◆ One LAN interface: Ethernet 10BaseT (supports six IP addresses)

Note The RAM-SP can share a bay with the BAM-64.

Ordering Hardware Components and Accessories

Overview Your OmniRemote has been custom-built. It should be shipped with all necessary hardware components and accessories. However, if you wish to upgrade your instrument, the hardware components and accessories listed below are for use with the OmniRemote.

Ordering Order hardware components and accessories from Badger Technology, Inc. by part number. See the table below.

Hardware Components and Accessories	Part Number
OmniRemote Shelf with Data Ports	M01-20230-01
Dial-up modem for the MCI card (28.8 Kbps)	A04-20231-01
Dial-up cell phone modem for the MCI card (9.6 Kbps)	P971000235
OmniRemote Shelf with 10BaseT Hub	M01-20235-02
Bistate Analog Module (BAM-64)	A04-20233-01
BAM-64 50-pin cable: 10 feet, SCSI I to SCSI II (telco C50)	PK45-20405-01
BAM-64 50-pin cable: 25 feet, SCSI I to SCSI II (telco C50)	PK45-20405-02
Serial Alarm Module (SAM-10)	A04-20228-01
SAM-10 RS-530 cable: 10 feet, DB-25, for RS-530 port to RS-530 DCE device	PK45-20410-01
Router Access Module, Dual Port (RAM-DP)	A04-20240-01
RAM -DP RS-530 cable: 10 feet, DB-25, for V.35 WAN to RS-530 DCE device	PK45-20408-01
RAM -DP WAN slots:	
V.35 card, DB-25	A04-20241-01
V.24/RS-232 card, DB-25	A04-20242-01
RS-422 card, DB-25	A04-20243-01
X.21 card, DB-25	A04-20244-01
ISDN/U card, RJ-45 (built-in NTI unit)	A04-20246-01
56K DSU/CSU card, RJ-48S	A04-20247-01
64K DSU/CSU card, RJ-48S	A04-20248-01
Router Access Module, Single Port (RAM-SP)	A04-20240-02
RAM -SP RS-530 cable: 10 feet, DB-25, for V.35 WAN to RS-530 DCE device	PK45-20409-01

BAM Hook-Up

3

Chapter Summary

In this Chapter The following topics are covered in this chapter:

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About the BAM-64	3-2
Before Hooking Up the BAM	3-9
Hooking Up the BAM	3-10
Pin Designations	3-14
What Next?	3-16

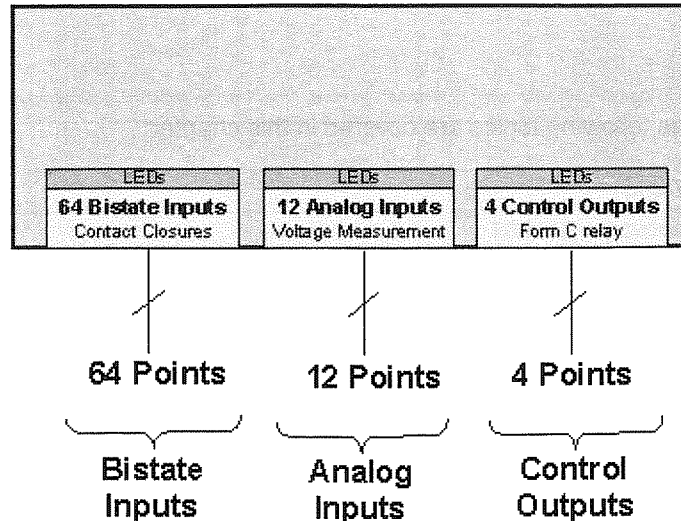
About the BAM-64

How the BAM-64 Alarm Inputs

Works

The Bistate Analog Module (BAM) -64 performs remote data acquisition through three types of alarm inputs:

- ◆ Bistate (contact closure)
- ◆ Analog
- ◆ Control relays



Bistate (ON or OFF) points detect any contact closure activation and cause a change-of-state (COS) indication. Analog voltage inputs are ideal for both housekeeping and transmission status monitoring on both cable and radio networks. The actual voltage units are measured at the desired monitoring point. Both upper and lower threshold limits are set by the system user to define Normal and Off-Normal conditions. When the measured voltage exceeds the threshold, an alarm is generated. A COS exceeding a user-specified time delay is reported (debounce).

Three measurement-type inputs are supported for bistate or analog points:

- ◆ A grounded open input
- ◆ A grounded closed input
- ◆ A positive TTL input

Control relays may be activated remotely from the master station to provide a first level of maintenance without the need for repair personnel on site. A positive control activation results in a COS indication returned to the master.

About the Software

Data Acquisition Device (DAD) software operating on the local Serial Alarm Module (SAM) serves as the master and actively polls the BAM to determine the bistate, analog, and control status. If there is only a BAM installed on the OmniRemote, the BAM may also be configured to autonomously report status to the NMS. The DAD software treats the BAM just like any other connected serial network element. Received messages are parsed, filtered, translated, and buffered for immediate or later transmission to the NMS.

Parameters governing the operation of the BAM are downloaded from the DAD software. The DAD Control GUI operating on a PC captures the configuration parameters. A SAVE operation saves these parameters in the DAD environment and downloads the BAM device. These parameters include:

- ◆ Point name
- ◆ Point severity
- ◆ Analog thresholds
- ◆ Delay times for Normal and Off-Normal reporting
- ◆ Control latch and momentary settings

The BAM continuously scans the status of bistate, analog, and control inputs. A real-time clock records the exact time a COS occurs (1-second accuracy). The BAM reports this information to the master (via the DAD software) on the next reporting cycle. The BAM always has the current state. If a point has multiple COSs between reporting cycles, the first and last COS are reported to the master. If for any reason a COS report is missed (*e.g.*, autonomous mode), it will be caught in the next reporting cycle. The master and BAM each maintain status tables, which must always match. The BAM reports its status table with every reporting cycle. A discrepancy indicates a missed COS and a status is retransmitted to the master until synchronization of the status tables is achieved. The front panel LEDs indicate the current COS status for all points.

About Bistate Inputs

A bistate COS is determined by an input voltage crossing the higher or lower fixed bistate threshold for the given debounce time. Positive voltages are measured as a TTL input circuit. Any input voltage greater than a 3.3-V threshold is high and any input voltage less than a 0.9-V threshold is low. A voltage between 0.9 V and 3.3 V is undefined and does not result in a COS alarm. The Normal and Off-Normal conditions are associated with the high or low voltage state as determined by the user.

A bistate pin may be connected to a Normally Open or Normally Closed circuit. The BAM internally polls each open pin up to +5 Vdc. A ground or negative voltage may be connected at the far end to complete the circuit. A closed circuit results in a ground or negative (low) reading. An open circuit results in a +5 Vdc (high) reading.

Note A closed circuit with a positive voltage (>0.9 Vdc) cannot be distinguished from an open circuit. Positive voltage circuits are not supported.

If the bistate input is configured as...	And the result value is...	Then the circuit is...
Normally Open (NO)	+5 Vdc	Normal
	ground	Off Normal (alarm)
Normally Closed (NC)	+5 Vdc	Off Normal (alarm)
	ground	Normal

Bistate Input Specifications

The table below lists the bistate input specifications.

Maximum voltage input range	±75 Vdc
Valid voltage input range	Ground to -75 Vdc
Input impedance	100,000 ohm to ground ±10 Vdc
Debounce time delay	User-defined to a resolution of 10 ms to 20 minutes

About Analog Inputs

An analog COS is determined by the input voltage exceeding the user-defined upper or lower threshold voltage value for the given debounce time. The BAM supports an input voltage of ± 10 Vdc referenced to ground. The analog input voltage conversion results in a 10-bit value that gives an accuracy of 1024 digital units (steps) of measure. The user-defined scaling factor and offset are used to convert the measured unit value to normal engineering units (Vdc). The engineering unit along with the thresholds are reported to the master. Voltage inputs exceeding ± 10 Vdc must be stepped down using a resistor, transducer, or other component to the valid input range.

Note All analog points are single-ended. As such, they cannot detect the difference between two input voltages.

Analog Input Specifications

The table below lists the analog input specifications.

Maximum voltage input range	± 75 Vdc
Valid voltage input range	+10 Vdc to -10 Vdc, referenced to ground
Input impedance	1M ohm to ground, ± 10 Vdc
Debounce time delay	User-defined to a resolution of 10 ms to 20 minutes
Accuracy	$\pm 3\%$ of full-scale (0 to ± 10 Vdc) if the measured source impedance is <10,000 ohm
Conversion resolution	5 mV steps from 0 to 10 Vdc (1024 steps); sample and hold functionality
Threshold detection limits	User-defined within the valid input voltage range to a 20 mV resolution

About Control

~~Inputs~~

Output

The master station operator can open or close output relays on the BAM. Typically, DAD software either generates the control command or relays the control operation. DAD scripts can automatically trigger a control based on any COS or other factor known to it. The DAD can relay a control command received from the DAD Control application or from the NMS.

A control relay is a simple switch that can be remotely commanded to open or close.

If you...	Then...
want to turn on a device that is usually off,	use the Normally Open (NO) pin and common pin.
want to turn off a device that is usually on,	use the Normally Closed (NC) pin and common pin.
have two devices that are always in opposite states,	you may use all three pins (NO, NC, and common).

The control relay may be commanded to magnetically latch to ensure the relay position is secure in the event of a power failure. Loss of power during a momentary operation will preserve the relay status at the instant of power loss. The control relay may be commanded to open or close momentarily for a prescribed duration. Each control point state is user-defined as to Normally Open or Normally Closed.

Note The control relays may be in a set or reset condition as received from the factory. The control relay settings must be cleared from the DAD master before beginning normal operations.

Control Input Specifications

The table below lists the control input specifications.

Contact rating	60 Vdc at 1 A resistive or 1/2 A inductive
Contact type	Form C, single coil, double pole, double throw relays
Latch	5 Vdc, magnetically latching

Re-configuring the BAM

The BAM is configured in the factory according to your specifications. See the OmniRemote Data Port Shelf label on the top of your OmniRemote to see how your BAM is configured.

If you wish to re-configure the BAM, see Appendix B.

About the Battery

The BAM-64 card holds a 3.6-V, 1/2 AA, lithium battery. The battery provides power to the static RAM and real-time clock in the event of power loss. This saves the time and BAM configuration settings, thus avoiding re-configuration.

The expected battery life is 5–10 years, assuming normal power-on operations. This may vary depending on your environment.

About the Front Panel The front panel is illustrated in the figure below. See the table that follows for a description of each item on the front panel.

Need diagram.

BAM: Front Panel Items

Item	Description
Bank 1–16 LED (green)	Indicates the first bank of bistate inputs (per the SCSI II pin designations on the rear panel).
Bank 17–32 LED (green)	Indicates the second bank of bistate inputs (per the SCSI II pin designations on the rear panel).
Bank 33–48 LED (green)	Indicates the third bank of bistate inputs (per the SCSI II pin designations on the rear panel).
Bank 49–64 LED (green)	Indicates the fourth bank of bistate inputs (per the SCSI II pin designations on the rear panel).
Alarm 1–16 LEDs (red)	Indicates bistate inputs, analog inputs, or control outputs (per the SCSI II pin designations on the rear panel).
MA LED (red)	Indicates a major alarm.
MI LED (yellow)	Indicates a minor alarm.
LAMP TEST/BANK SELECT button	<p>LAMP TEST: Used to test whether or not the front panel LEDs are working.</p> <p>BANK SELECT: Used to select the following:</p> <ul style="list-style-type: none"> ◆ Bistate inputs: All bank and alarm LEDs ◆ Analog inputs: Alarm LEDs 1–12 ◆ Analog internal battery input: Alarm LED 13 ◆ Control outputs: Alarm LEDs 1–4 <p>Note Analog point 13 is internally connected to the BAM battery to indicate a low battery condition. Analog point 13 is visible on the LED, but is not available as an input on the rear panel of the BAM. The normal battery voltage is 3.6 Vdc. A lower threshold crossing of 2.7 Vdc triggers an Off Normal (alarm) condition.</p>
RESET switch	<p>Used to reset the BAM.</p> <p>IMPORTANT Do not reset the BAM unless you are instructed to do so by Badger Technical Support.</p>

About the Rear Panel The rear panel is illustrated in the figure below. See the table that follows for a description of each item on the rear panel.

Need diagram.

BAM: Rear Panel Items

Item	Description
Left SCSI II port	Connects the following: <ul style="list-style-type: none">◆ Bistate inputs 1–32◆ Control outputs 1–4 (three pins per control output)◆ Grounds See “Left SCSI II Port” on page 3-15 for the exact pin designations.
Right SCSI II port	Connects the following: <ul style="list-style-type: none">◆ Bistate inputs 33–64◆ Analog inputs 1–12◆ Grounds See “Right SCSI II Port” on page 3-14 for the exact pin designations.

Note The SCSI II ports are labeled as left and right when the rear of the OmniRemote is facing you).

Before Hooking Up the BAM

Overview Your OmniRemote™ has been custom-built and is shipped to you fully assembled. Before you hook up the BAM, you must:

- ◆ Review all safety information. See Chapter 2, “Safety Information,” of the *Shelf Installation Manual*.
 - ◆ Gather the required tools/equipment.
-

Tools/Equipment Required You will need the following tools and equipment to hook up the BAM:

- ◆ Small flathead screwdriver
- ◆ 16- to 22-gauge, solid or stranded insulated wire
- ◆ 3/32” slotted screwdriver
- ◆ Voltmeter, DC range
- ◆ Two SCSI II snap-on connector/cable assemblies

Need diagram of the assembly.

Note Badger has the following connector/cable assemblies available:

- ◆ 10-foot assembly: PK45-20405-01
 - ◆ 25-foot assembly: PK45-20405-02
-

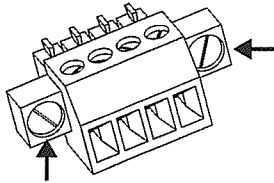
Hooking Up the BAM

Overview To hook up the BAM, you must perform the following steps:

- ◆ Connect the power.
- ◆ Test the BAM LEDs.
- ◆ Make the external communication connections.
- ◆ Test the alarm inputs.
- ◆ Test the control relays.

Connecting the Power If the OmniRemote is not already powered on, perform the steps below.

To connect the power:

Step	Action
1	<p>Use a small flathead screwdriver to remove the male part of the power connector from the rear panel of the OmniRemote.</p>  <p>Unscrew these two screws.</p>
2	<p>If the power connector is not already wired, use 16- to 22-gauge, solid or stranded insulated wire to connect the Battery power (#2) and Battery return (#3) ports on the power connector to your power source.</p> <p>Use a 3/32" slotted screwdriver to tighten the flathead terminal screws.</p>
3	<p>Use a small flathead screwdriver to screw the power connector back on the rear panel of the OmniRemote.</p>
4	<p>Continue with "Testing the BAM LEDs" on page 3-11.</p>

Testing the BAM LEDs

IMPORTANT If any of the BAM LEDs do not illuminate, contact Technical Support. See "Technical Support" on page 1-5.

To test the BAM LEDs:

Step	Action										
1	<p>Test the bistate LEDs on the front panel of the BAM. To do this:</p> <table border="1"> <thead> <tr> <th>Press LAMP TEST/BANK SELECT...</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Once</td> <td>The bank 1–16 LED should illuminate (green).</td> </tr> <tr> <td>A second time</td> <td>The bank 17–32 LED should illuminate (green).</td> </tr> <tr> <td>A third time</td> <td>The bank 33–48 LED should illuminate (green).</td> </tr> <tr> <td>A fourth time</td> <td>The bank 49–64 LED should illuminate (green).</td> </tr> </tbody> </table> <p>Note If any of the alarm LEDs (1–16) illuminate (red), then the corresponding bistate point is in alarm. If the MA LED is illuminated (red), it is a major alarm; if the MI LED is illuminated (yellow), it is a minor alarm.</p>	Press LAMP TEST/BANK SELECT...	Result	Once	The bank 1–16 LED should illuminate (green).	A second time	The bank 17–32 LED should illuminate (green).	A third time	The bank 33–48 LED should illuminate (green).	A fourth time	The bank 49–64 LED should illuminate (green).
Press LAMP TEST/BANK SELECT...	Result										
Once	The bank 1–16 LED should illuminate (green).										
A second time	The bank 17–32 LED should illuminate (green).										
A third time	The bank 33–48 LED should illuminate (green).										
A fourth time	The bank 49–64 LED should illuminate (green).										
2	<p>Test the analog LEDs on the front panel of the BAM. To do this, press LAMP TEST/BANK SELECT a fifth time.</p> <p>The bottom two bank LEDs (1–16 and 17–32) should illuminate (green).</p> <p>Note If any of the alarm LEDs (1–12) illuminate (red), then the corresponding analog point is in alarm. If the MA LED is illuminated (red), it is a major alarm; if the MI LED is illuminated (yellow), it is a minor alarm.</p>										
3	<p>Test the control LEDs on the front panel of the BAM. To do this, press LAMP TEST/BANK SELECT a sixth time.</p> <p>The top two bank LEDs (33–48 and 49–64) should illuminate (green).</p> <p>Note If any of the alarm LEDs (1–4) illuminate (red), then the corresponding control point is in alarm. If the MA LED is illuminated (red), it is a major alarm; if the MI LED is illuminated (yellow), it is a minor alarm.</p>										
4	<p>Test all of the LEDs. To do this, press LAMP TEST/BANK SELECT a seventh time.</p> <p>All of the BAM LEDs should illuminate.</p>										
5	<p>After you have tested the BAM LEDs, disconnect the power. To do this, remove the male part of the power connector from the rear panel of the OmniRemote (see step 1 of "Connecting the Power" on page 3-10).</p> <p>IMPORTANT Disconnecting the power connector ensures the power will be turned off while you make all required communication connections.</p>										
6	<p>Continue with "Making the External Communication Connections" on page 3-12.</p>										

**Making the External
Communication
Connections**

To make the external communication connections for the BAM:

Step	Action
1	<p>Make sure the power connector is disconnected (see step 1 of "Connecting the Power" on page 3-10).</p> <p>IMPORTANT Disconnecting the power connector ensures the power will be turned off while you make all required communication connections.</p>
2	<p>Connect the following to the appropriate wires in the right SCSI II cable:</p> <ul style="list-style-type: none"> ◆ Bistate inputs 33–64 ◆ Analog inputs 1–12 ◆ Grounds (available for your use) <p>See "Right SCSI II Port" on page 3-14 for the exact pin designations.</p>
3	<p>Connect the following to the appropriate wires in the left SCSI II cable:</p> <ul style="list-style-type: none"> ◆ Bistate inputs 1–32 ◆ Control outputs 1–4 (three pins per control output) ◆ Grounds (available for your use) <p>See "Left SCSI II Port" on page 3-15 for the exact pin designations.</p>
4	<p>Snap the SCSI II cables into the SCSI II ports on the rear panel of the BAM.</p>
5	<p>Power on the OmniRemote (see steps 2 and 3 of "Connecting the Power" on page 3-10).</p>
6	<p>Use the DAD Control application and the DAD software to provision and download the BAM. Refer to the <i>DAD Provisioner's Manual: BAM Application Notes</i>.</p>
7	<p>Continue with "Testing the Alarm Inputs" on page 3-13.</p>

Insert the bistate schematic. Can't read file.

Testing the Alarm Inputs

To test the alarm inputs:

Step	Action
1	Set the BAM configuration in the DAD software/DAD Control application and download.
2	Attach the bistate, analog, and control relays.
3	Attach a cable (66-block) to the sensors and apply power.
4	Perform the Lamp Test to make sure the LEDs are working properly. See "Testing the BAM LEDs" on page 3-11.
5	If the input permits, change the input state. IMPORTANT It may not be possible to change the input state for some alarms (e.g., a generator).
6	Observe the LEDs to...

Testing the Control Relays

To test the control relays:

Step	Action
1	
2	
3	
4	
5	
6	
7	

Pin Designations

Note The SCSI II ports are labeled as left and right when the rear of the OmniRemote is facing you).

Right SCSI II Port The table below lists the pin designations for the right SCSI II port (located on the rear panel of the BAM).

Alarm In	Pin	Alarm In	Pin	Alarm In	Pin
Ground	1	Bistate Input 49	18	Bistate Input 64	35
Bistate Input 33	2	Bistate Input 50	19	Ground	36
Bistate Input 34	3	Bistate Input 51	20	Ground	37
Bistate Input 35	4	Bistate Input 52	21	Analog Input 1	38
Bistate Input 36	5	Bistate Input 53	22	Analog Input 2	39
Bistate Input 37	6	Bistate Input 54	23	Analog Input 3	40
Bistate Input 38	7	Bistate Input 55	24	Analog Input 4	41
Bistate Input 39	8	Ground	25	Analog Input 5	42
Bistate Input 40	9	Ground	26	Analog Input 6	43
Bistate Input 41	10	Bistate Input 56	27	Analog Input 7	44
Bistate Input 42	11	Bistate Input 57	28	Analog Input 8	45
Bistate Input 43	12	Bistate Input 58	29	Analog Input 9	46
Bistate Input 44	13	Bistate Input 59	30	Analog Input 10	47
Bistate Input 45	14	Bistate Input 60	31	Analog Input 11	48
Bistate Input 46	15	Bistate Input 61	32	Analog Input 12	49
Bistate Input 47	16	Bistate Input 62	33	Ground	50
Bistate Input 48	17	Bistate Input 63	34	—	—

Left SCSI II Port The table below lists the pin designations for the left SCSI II port (located on the rear panel of the BAM).

Alarm In	Pin	Alarm In	Pin	Alarm In	Pin
Ground	1	Bistate Input 17	18	Bistate Input 32	35
Bistate Input 1	2	Bistate Input 18	19	Ground	36
Bistate Input 2	3	Bistate Input 19	20	Ground	37
Bistate Input 3	4	Bistate Input 20	21	Control Output 1, NC	38
Bistate Input 4	5	Bistate Input 21	22	Control Output 1, common	39
Bistate Input 5	6	Bistate Input 22	23	Control Output 1, NO	40
Bistate Input 6	7	Bistate Input 23	24	Control Output 2, NC	41
Bistate Input 7	8	Ground	25	Control Output 2, common	42
Bistate Input 8	9	Ground	26	Control Output 2, NO	43
Bistate Input 9	10	Bistate Input 24	27	Control Output 3, NC	44
Bistate Input 10	11	Bistate Input 25	28	Control Output 3, common	45
Bistate Input 11	12	Bistate Input 26	29	Control Output 3, NO	46
Bistate Input 12	13	Bistate Input 27	30	Control Output 4, NC	47
Bistate Input 13	14	Bistate Input 28	31	Control Output 4, common	48
Bistate Input 14	15	Bistate Input 29	32	Control Output 4, NO	49
Bistate Input 15	16	Bistate Input 30	33	Ground	50
Bistate Input 16	17	Bistate Input 31	34	—	—

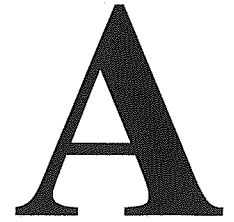
What Next?

Complete Installation Procedures

The table below lists the procedures required to completely install an OmniRemote. You have just completed Procedure No. 2. See the table for instructions on what to do next.

No.	Procedure	What Next?
1	Install the OmniRemote Shelf into the rack, connect the power, and connect the primary host communications.	You have completed this procedure. See Procedure No. 2 below.
2	Hook-up the OmniRemote BAM.	You have completed this procedure. See Procedure No. 3 below.
3	Optional Hook-up the OmniRemote SAM, RAM-DP, or RAM-SP.	Refer to the following, as appropriate: <ul style="list-style-type: none"> ◆ <i>SAM Installation Manual</i> ◆ <i>RAM-DP Installation Manual</i> ◆ <i>RAM-SP Installation Manual</i>
4	Provision the BAM and/or SAM configuration variables.	Refer to the following, as appropriate: <ul style="list-style-type: none"> ◆ <i>DAD Provisioner's Manual</i> ◆ <i>DAD/BAM Application Notes</i> ◆ <i>Other DAD Application Notes</i>

Troubleshooting



Appendix Summary

In this Chapter The following topics are covered in this chapter:

Topic	See Page
Observations	A-2
Replacing the Lithium Battery	A-3

Observations

Observations Table Use this table if you are having problems hooking up the BAM.

TBD

Observation	Possible Cause	Recommended Action
?	The lithium battery is dead.	Replace the battery. See "Replacing the Lithium Battery" on page A-3.

Replacing the Lithium Battery

Overview To replace the lithium battery, you must perform the following steps:

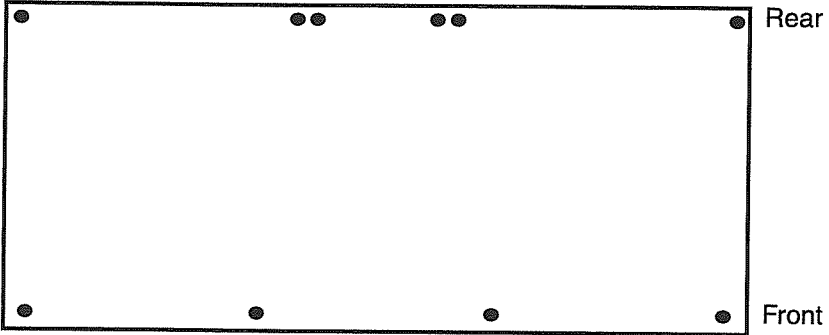
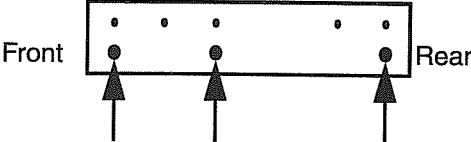
- ◆ Remove the chassis cover.
- ◆ Replace the battery.

! WARNING ! Wear a grounding wrist strap while performing these procedures.

Note Removal of the lithium battery destroys the date/time setting and the DAD permanent log files. Contact Technical Support if you require backup of your log files (see "Technical Support" on page 1-5). After power-on of the OmniRemote™, you must run the DAD Control GUI to reset the date/time setting.

Removing the Chassis Cover

To remove the chassis cover:

Step	Action
1	<p>Make sure all of your external communications and power cables are labeled, then disconnect all of these cables from the OmniRemote.</p> <p>Note You will need a small flathead screwdriver to remove the flathead terminal screws.</p>
2	<p>Unscrew the two mounting brackets from the mounting rack. Remove the OmniRemote from the mounting rack and place it on a workbench.</p>
3	<p>Use a #2 Phillips screwdriver to:</p> <p>a. Remove all 10 screws from the top of the chassis cover.</p>  <p>b. Remove the bottom three screws on each side of the chassis cover.</p> 
4	<p>Remove the chassis cover and set it aside.</p>
5	<p>Continue with "Replacing the Battery" on page A-4.</p>

Replacing the Battery

To replace the lithium battery:

Step	Action
1	Cut the battery tiedown and remove the old lithium battery.
2	Insert the new lithium battery into the battery holder. Note Align the positive and negative battery ends according to the labels on the battery holder.
3	Replace the OmniRemote's chassis cover. Use a #2 Phillips screwdriver to: a. Re-insert all 10 screws on the top of the chassis cover. b. Re-insert the bottom three screws on each side of the chassis cover.
4	Place the OmniRemote back in the mounting rack and screw on the mounting brackets.
5	Reconnect all of your external communications and power cables. See Chapter 3, "BAM Hook-Up," for instructions on making the external connections for the BAM.
6	Dispose of the old lithium battery according to the proper hazardous waste procedures.

Installing a BAM

B

Appendix Summary

In this Appendix The following topics are covered in this appendix:

Topic	See Page
Before Installing a BAM	B-2
Installing a BAM	B-3
BAM Jumper Settings	B-7
Changing the BAM Address	B-11
Changing the Port Settings for Channels A and B	B-12

Before Installing a BAM

Overview You may wish to customize your OmniRemote™ by installing a Bistate Analog Module (BAM). Before continuing with these procedures, you must:

- ◆ Review all safety information. See Chapter 2, “Safety Information,” of the *Shelf Installation Manual*.
- ◆ Gather the required tools/equipment.

Tools/Equipment Required You will need the following tools and equipment to install a BAM:

- ◆ Grounding wrist strap
 - ◆ Small flathead screwdriver
 - ◆ An appropriate screwdriver for the four screws holding the mounting brackets to your mounting rack
 - ◆ #2 Phillips screwdriver
 - ◆ Four #6 panhead screws (provided in the BAM kit)
 - ◆ Four #256 (1/4-inch) panhead screws (provided in the BAM kit)
-

Installing a BAM

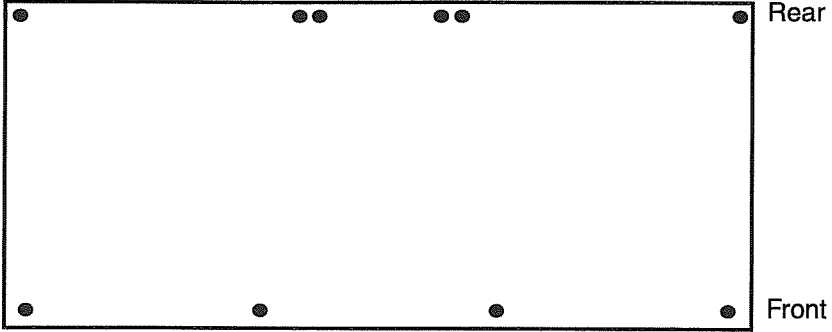
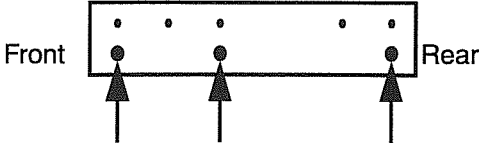
Overview To install a BAM, you must perform the following steps:

- ◆ Remove the chassis cover.
- ◆ Disassemble the OmniRemote.
- ◆ Connect a BAM.
- ◆ Re-assemble the OmniRemote.

! WARNING ! Wear a grounding wrist strap while performing these procedures.

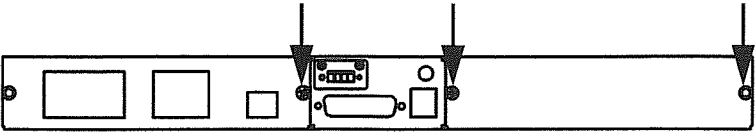
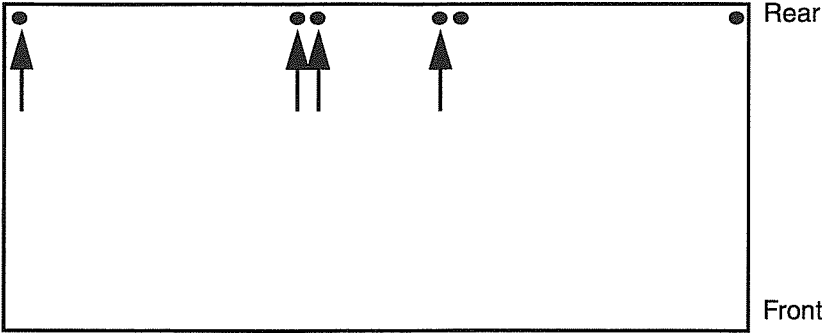
Removing the Chassis Cover

To remove the chassis cover:

Step	Action
1	<p>Make sure all of your external communications and power cables are labeled, then disconnect all of these cables from the OmniRemote.</p> <p>Note You will need a small flathead screwdriver to remove the flathead terminal screws.</p>
2	<p>Unscrew the two mounting brackets from the mounting rack. Remove the OmniRemote from the mounting rack and place it on a workbench.</p>
3	<p>Use a #2 Phillips screwdriver to:</p> <p>a. Remove all 10 screws from the top of the chassis cover.</p> <div style="text-align: center;">  </div> <p>b. Remove the bottom three screws on each side of the chassis cover.</p> <div style="text-align: center;">  </div>
4	<p>Remove the chassis cover and set it aside.</p>
5	<p>Continue with "Disassembling the OmniRemote" on page B-4.</p>

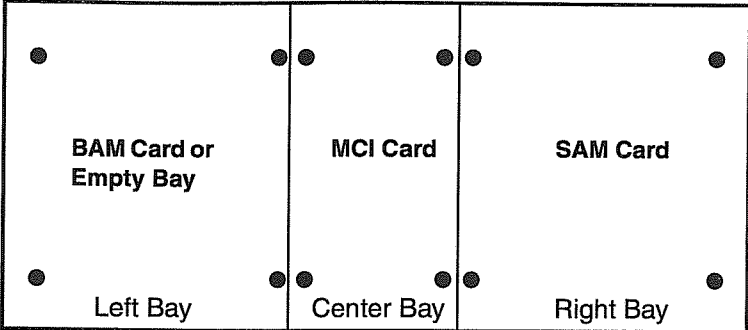
Disassembling the OmniRemote

To disassemble the OmniRemote:

Step	Action
1	<p>Use a #2 Phillips screwdriver to remove:</p> <ul style="list-style-type: none"> ◆ Two screws on either side of the MCI card rear panel face ◆ One screw on the empty bay rear panel face 
2	<p>Use a #2 Phillips screwdriver to remove:</p> <ul style="list-style-type: none"> ◆ Two screws from the MCI card rear panel bottom ◆ Two screws from the empty bay rear panel bottom 
3	Remove the empty bay rear panel.
4	<p>Remove the MCI card rear panel and set it aside.</p> <p>IMPORTANT Leave the MCI card in place. Do not disconnect any cables from the MCI card.</p>
5	Continue with "Connecting a BAM" on page B-5.

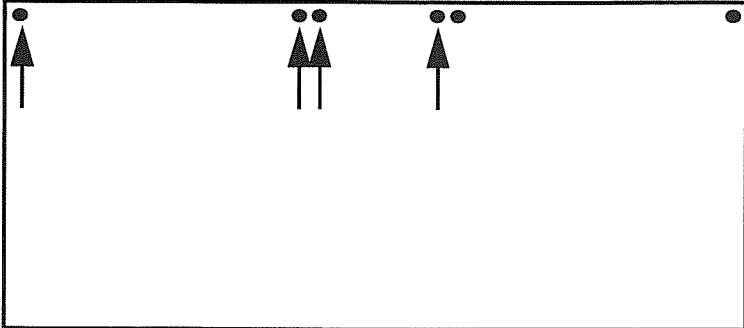
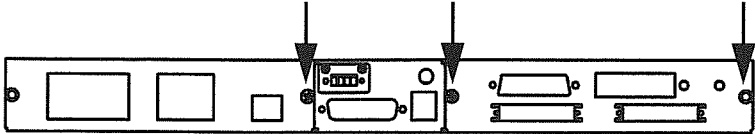
Connecting a BAM

To connect a BAM:

1	<p>Insert the BAM card in the empty bay, placing the holes in the BAM card over the standoffs in the chassis. Use a #2 Phillips screwdriver to insert four #6 panhead screws into the standoffs.</p>  <p>Note The BAM is usually installed in the left bay and the SAM is usually installed in the right bay (when the front of the OmniRemote is facing you).</p>															
2	<p>Verify the BAM jumper settings and correct them if necessary. See "BAM Jumper Settings" on page B-7.</p>															
3	<p>Connect the white power cable harness from the BAM to the MCI card.</p> <table border="1" data-bbox="623 961 1477 1138"> <thead> <tr> <th>If the...</th> <th>Then...</th> </tr> </thead> <tbody> <tr> <td>BAM card is in the left bay,</td> <td>the white cable goes from the J4 serial port on the BAM to the J2 serial port on the MCI card.</td> </tr> <tr> <td>BAM card is in the right bay,</td> <td>the white cable goes from the J2 serial port on the BAM to the J4 serial port on the MCI card.</td> </tr> </tbody> </table>	If the...	Then...	BAM card is in the left bay,	the white cable goes from the J4 serial port on the BAM to the J2 serial port on the MCI card.	BAM card is in the right bay,	the white cable goes from the J2 serial port on the BAM to the J4 serial port on the MCI card.									
If the...	Then...															
BAM card is in the left bay,	the white cable goes from the J4 serial port on the BAM to the J2 serial port on the MCI card.															
BAM card is in the right bay,	the white cable goes from the J2 serial port on the BAM to the J4 serial port on the MCI card.															
4	<p>Connect the communications cable from the BAM to the MCI card or to the SAM.</p> <table border="1" data-bbox="623 1213 1477 1648"> <thead> <tr> <th>If the...</th> <th>And you...</th> <th>Then...</th> </tr> </thead> <tbody> <tr> <td>BAM card is in the left bay</td> <td>do not have a SAM,</td> <td>the blue ribbon cable goes from the J6 serial port on the BAM to the J9 serial port on the MCI card.</td> </tr> <tr> <td>BAM card is in the left bay</td> <td>do have a SAM,</td> <td>the blue Y-cable goes from the J6 serial port on the BAM to the J9 serial port on the SAM.</td> </tr> <tr> <td>BAM card is in the right bay</td> <td>do not have a SAM,</td> <td>the blue ribbon cable goes from the J1 serial port on the BAM to the J10 serial port on the MCI card.</td> </tr> <tr> <td>BAM card is in the right bay</td> <td>do have a SAM,</td> <td>the blue Y-cable goes from the J1 serial port on the BAM to the J9 serial port on the SAM.</td> </tr> </tbody> </table> <p>Note The red edge of the ribbon cable always faces the front of the chassis.</p>	If the...	And you...	Then...	BAM card is in the left bay	do not have a SAM,	the blue ribbon cable goes from the J6 serial port on the BAM to the J9 serial port on the MCI card.	BAM card is in the left bay	do have a SAM,	the blue Y-cable goes from the J6 serial port on the BAM to the J9 serial port on the SAM.	BAM card is in the right bay	do not have a SAM,	the blue ribbon cable goes from the J1 serial port on the BAM to the J10 serial port on the MCI card.	BAM card is in the right bay	do have a SAM,	the blue Y-cable goes from the J1 serial port on the BAM to the J9 serial port on the SAM.
If the...	And you...	Then...														
BAM card is in the left bay	do not have a SAM,	the blue ribbon cable goes from the J6 serial port on the BAM to the J9 serial port on the MCI card.														
BAM card is in the left bay	do have a SAM,	the blue Y-cable goes from the J6 serial port on the BAM to the J9 serial port on the SAM.														
BAM card is in the right bay	do not have a SAM,	the blue ribbon cable goes from the J1 serial port on the BAM to the J10 serial port on the MCI card.														
BAM card is in the right bay	do have a SAM,	the blue Y-cable goes from the J1 serial port on the BAM to the J9 serial port on the SAM.														
5	<p>Continue with "Re-assembling the OmniRemote" on page B-6.</p>															

Re-assembling the OmniRemote

To re-assemble the OmniRemote:

<p>1</p>	<p>Use a #2 Phillips screwdriver to attach:</p> <ul style="list-style-type: none"> ◆ Two screws to the MCI card rear panel bottom ◆ Two screws to the BAM card rear panel bottom 
<p>2</p>	<p>Use a #2 Phillips screwdriver to attach:</p> <ul style="list-style-type: none"> ◆ Two screws to either side of the MCI card rear panel face ◆ One screw to the BAM rear panel face 
<p>3</p>	<p>Use a #2 Phillips screwdriver to attach the two SCSI II connectors on the back of the BAM rear panel. You will need two #256 (1/4-inch) panhead screws for each SCSI II connector.</p>
<p>4</p>	<p>Replace the OmniRemote's chassis cover. Use a #2 Phillips screwdriver to:</p> <ol style="list-style-type: none"> a. Re-insert all 10 screws on the top of the chassis cover. b. Re-insert the bottom three screws on each side of the chassis cover.
<p>5</p>	<p>Place the OmniRemote back in the mounting rack and screw on the mounting brackets.</p>
<p>6</p>	<p>Reconnect all of your external communications and power cables. See Chapter 3, "BAM Hook-Up," for instructions on making the external connections for the BAM.</p>
<p>7</p>	<p>The front panel Lexan may need to be replaced. The Lexan can be difficult to remove and factory service may be required. Contact Technical Support; see "Technical Support" on page 1-5.</p>

BAM Jumper Settings

Jumper Settings for the Operating Mode

The Operating mode is the normal BAM state. The BAM application software is downloaded when the BAM is in the Operating mode.

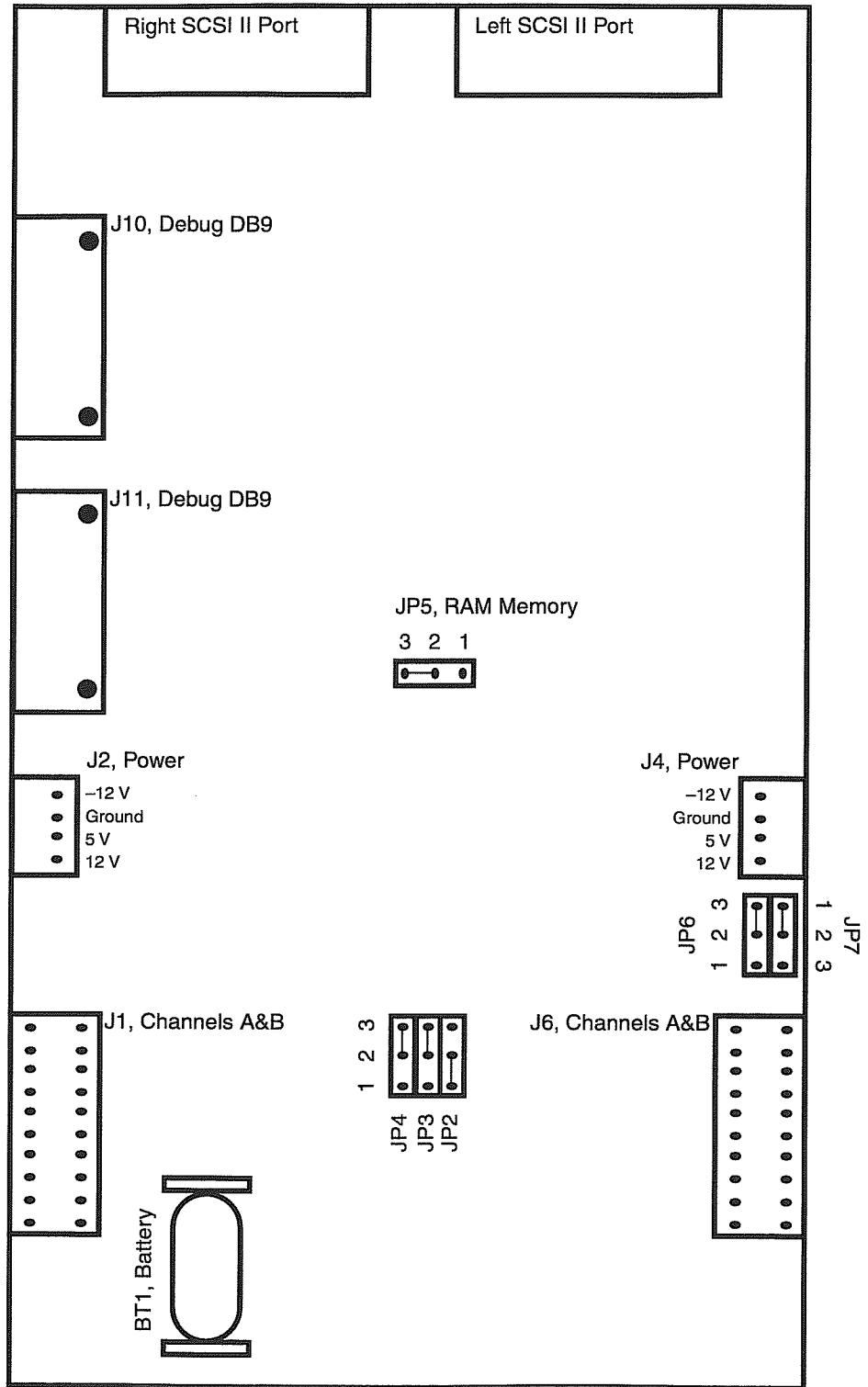
The BAM jumper settings for the Operating mode are shown below. A diagram of the BAM card in Operating mode is shown on page B-8.

Jumper	Pin		
	1	2	3
JP4	●	●—●	
JP3	●	●—●	
JP2	●—●		●
	3	2	1
JP5*	●—●	●	
	1	2	3
JP6	●	●—●	
JP7	●	●—●	
	3	2	1

* For JP5:

- ◆ Pins 2–3, 128 kb.
- ◆ Pins 1–2, 32 kb. DO NOT USE.

**BAM Card in
Operating Mode**



**Jumper Settings for
the Flash Program
Mode**

The Flash Program mode is only used for burning in new Boot Monitor firmware. This is normally done in the factory.

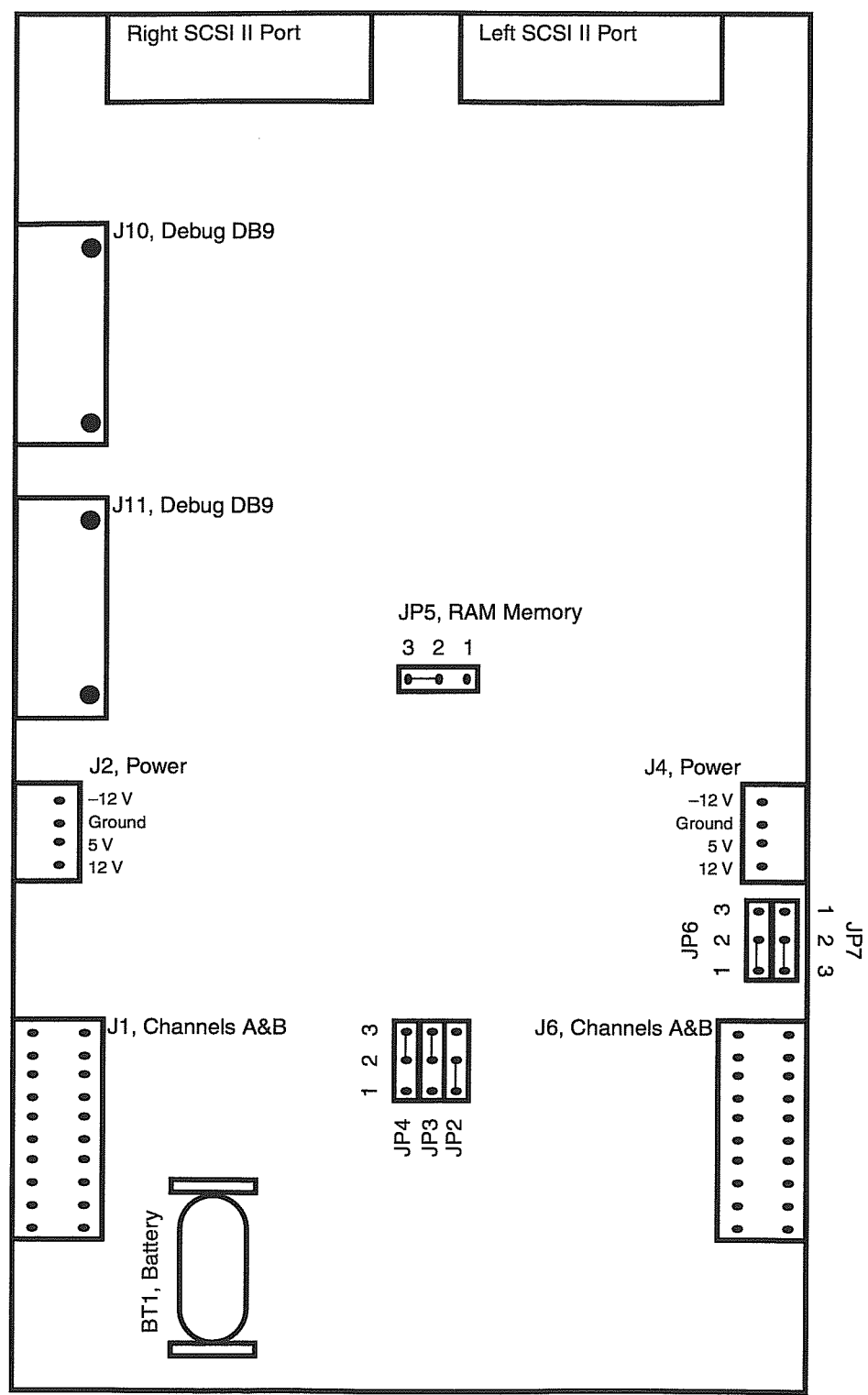
The BAM jumper settings for the Flash Program mode are shown below. A diagram of the BAM card in Flash Program mode is shown on page B-10.

Jumper	Pin		
	1	2	3
JP4	●	●	●
JP3	●	●	●
JP2	●	●	●
	3	2	1
JP5*	●	●	●
	1	2	3
JP6	●	●	●
JP7	●	●	●
	3	2	1

* For JP5:

- ◆ Pins 2–3, 128 kb.
- ◆ Pins 1–2, 32 kb. DO NOT USE.

**BAM Card in Flash
Program Mode**



Changing the BAM Address

Overview The BAM address is set in the factory and is guaranteed to be unique. It is comprised of eight bytes and assigned a MAC address reserved by Badger, even though an Ethernet connection is not provided.

Note The current BAM address is listed in the OmniRemote Data Port Shelf label on the top of your OmniRemote.

Changing the BAM Address

To change the BAM address:

Step	Action																					
1	Use the Craft port on the OmniRemote Master Communications Interface (MCI) card to change BAM address.																					
2	For the Setaddr Command, set the following: <table border="1" data-bbox="609 766 1477 1102"> <thead> <tr> <th>For the...</th> <th>Type/press...</th> <th>Example</th> </tr> </thead> <tbody> <tr> <td rowspan="4">ASCII Message header</td> <td>Ctrl-G</td> <td>Ctrl-G</td> </tr> <tr> <td>Ctrl-G</td> <td>Ctrl-G</td> </tr> <tr> <td>Ctrl-<u> </u></td> <td>Ctrl-<u> </u></td> </tr> <tr> <td>?~@~"m"~"f"~"BAM_name"~</td> <td>?~@~"m"~"f"~"BAM_5"~</td> </tr> <tr> <td>Command</td> <td>"setaddr"</td> <td>"setaddr"</td> </tr> <tr> <td>Address</td> <td>"BAM address"</td> <td>"123456"</td> </tr> <tr> <td>Message tail</td> <td>~any 2 bytes</td> <td>~99</td> </tr> </tbody> </table>	For the...	Type/press...	Example	ASCII Message header	Ctrl-G	Ctrl-G	Ctrl-G	Ctrl-G	Ctrl- <u> </u>	Ctrl- <u> </u>	?~@~"m"~"f"~"BAM_name"~	?~@~"m"~"f"~"BAM_5"~	Command	"setaddr"	"setaddr"	Address	"BAM address"	"123456"	Message tail	~any 2 bytes	~99
For the...	Type/press...	Example																				
ASCII Message header	Ctrl-G	Ctrl-G																				
	Ctrl-G	Ctrl-G																				
	Ctrl- <u> </u>	Ctrl- <u> </u>																				
	?~@~"m"~"f"~"BAM_name"~	?~@~"m"~"f"~"BAM_5"~																				
Command	"setaddr"	"setaddr"																				
Address	"BAM address"	"123456"																				
Message tail	~any 2 bytes	~99																				
3	<table border="1" data-bbox="609 1123 1461 1365"> <thead> <tr> <th>If the...</th> <th>Then...</th> </tr> </thead> <tbody> <tr> <td>BAM address was entered correctly,</td> <td>The computer response is ack. Note You must receive an ack message before the new address goes into effect.</td> </tr> <tr> <td>BAM address was not entered correctly,</td> <td>◆ The computer response is nack. ◆ Repeat these steps.</td> </tr> </tbody> </table>	If the...	Then...	BAM address was entered correctly,	The computer response is ack. Note You must receive an ack message before the new address goes into effect.	BAM address was not entered correctly,	◆ The computer response is nack. ◆ Repeat these steps.															
If the...	Then...																					
BAM address was entered correctly,	The computer response is ack. Note You must receive an ack message before the new address goes into effect.																					
BAM address was not entered correctly,	◆ The computer response is nack. ◆ Repeat these steps.																					

Changing the Port Settings for Channels A and B

Overview Anything here?

Changing the Port Settings

To change the port settings for Channels A and B:

Step	Action																																						
1	Use the Craft port on the OmniRemote MCI card to change port settings.																																						
2	For the Setport Command, set the following for both channels: <table border="1" data-bbox="597 718 1468 1717"> <thead> <tr> <th>For the...</th> <th>Type/press...</th> <th>Example</th> </tr> </thead> <tbody> <tr> <td rowspan="4">ASCII Message header</td> <td>Ctrl-G</td> <td>Ctrl-G</td> </tr> <tr> <td>Ctrl-G</td> <td>Ctrl-G</td> </tr> <tr> <td>Ctrl_</td> <td>Ctrl_</td> </tr> <tr> <td>?~@~"m"~"f"~"BAM_name"~</td> <td>?~@~"m"~"f"~"BAM_5"~</td> </tr> <tr> <td>Command</td> <td colspan="2">"setport"</td> </tr> <tr> <td rowspan="7"> Parameters Note For each parameter, choose only one of the options listed. </td> <td>Port</td> <td> ♦ "0" ♦ "1" </td> <td>"0"</td> </tr> <tr> <td>Baud rate</td> <td> ♦ "19200" ♦ "9600" ♦ "4800" ♦ "2400" ♦ "1200" </td> <td>"9600"</td> </tr> <tr> <td>Data bit</td> <td> ♦ "8" ♦ "7" </td> <td>"8"</td> </tr> <tr> <td>Parity</td> <td> ♦ "odd" ♦ "even" ♦ "none" </td> <td>"odd"</td> </tr> <tr> <td>Stop bit</td> <td> ♦ "1" ♦ "2" </td> <td>"1"</td> </tr> <tr> <td>Flow control</td> <td> ♦ "hardware" ♦ "software" ♦ "none" </td> <td>"none"</td> </tr> <tr> <td>Message tail</td> <td colspan="2">~any 2 bytes</td> <td>~99</td> </tr> </tbody> </table>	For the...	Type/press...	Example	ASCII Message header	Ctrl-G	Ctrl-G	Ctrl-G	Ctrl-G	Ctrl_	Ctrl_	?~@~"m"~"f"~"BAM_name"~	?~@~"m"~"f"~"BAM_5"~	Command	"setport"		Parameters Note For each parameter, choose only one of the options listed.	Port	♦ "0" ♦ "1"	"0"	Baud rate	♦ "19200" ♦ "9600" ♦ "4800" ♦ "2400" ♦ "1200"	"9600"	Data bit	♦ "8" ♦ "7"	"8"	Parity	♦ "odd" ♦ "even" ♦ "none"	"odd"	Stop bit	♦ "1" ♦ "2"	"1"	Flow control	♦ "hardware" ♦ "software" ♦ "none"	"none"	Message tail	~any 2 bytes		~99
For the...	Type/press...	Example																																					
ASCII Message header	Ctrl-G	Ctrl-G																																					
	Ctrl-G	Ctrl-G																																					
	Ctrl_	Ctrl_																																					
	?~@~"m"~"f"~"BAM_name"~	?~@~"m"~"f"~"BAM_5"~																																					
Command	"setport"																																						
Parameters Note For each parameter, choose only one of the options listed.	Port	♦ "0" ♦ "1"	"0"																																				
	Baud rate	♦ "19200" ♦ "9600" ♦ "4800" ♦ "2400" ♦ "1200"	"9600"																																				
	Data bit	♦ "8" ♦ "7"	"8"																																				
	Parity	♦ "odd" ♦ "even" ♦ "none"	"odd"																																				
	Stop bit	♦ "1" ♦ "2"	"1"																																				
	Flow control	♦ "hardware" ♦ "software" ♦ "none"	"none"																																				
	Message tail	~any 2 bytes		~99																																			

To change the port settings for Channels A and B: *(continued)*

Step	Action	
3	If the...	Then...
	Port settings were entered correctly,	The computer response is ack. Note You must receive an ack message before the new settings goes into effect.
	Port settings were not entered correctly,	◆ The computer response is nack. ◆ Repeat these steps.

BAM Software

C

Appendix Summary

In this Appendix The following topics are covered in this appendix:

Topic	See Page
Before You Begin	C-2
Downloading the BAM Software	C-3
Burning the Flash Boot Monitor Code	C-4

Before You Begin

Overview Anything here?

- ◆ Downloading the Bistate Analog Module (BAM) software
- ◆ Burning the Flash Boot Monitor code

Tools/Equipment Required To download the BAM software, you will need the following:

- ◆
- ◆

To burn the Flash Boot Monitor code, you will need the following:

- ◆ Hitachi 1-18 Flash MicroController Programming Kit
 - ◆ PC running WIN 95 (or later version) and the Hitachi HiFLASH program
 - ◆ Cables for the interface between the PC, Flash MicroController, and the BAM card
-

Downloading the BAM Software

Overview TBD

Downloading the BAM Software

To download the BAM software:

Step	Action
1	
2	
3	
4	
5	
6	
7	
8	

Burning the Flash Boot Monitor Code

Overview

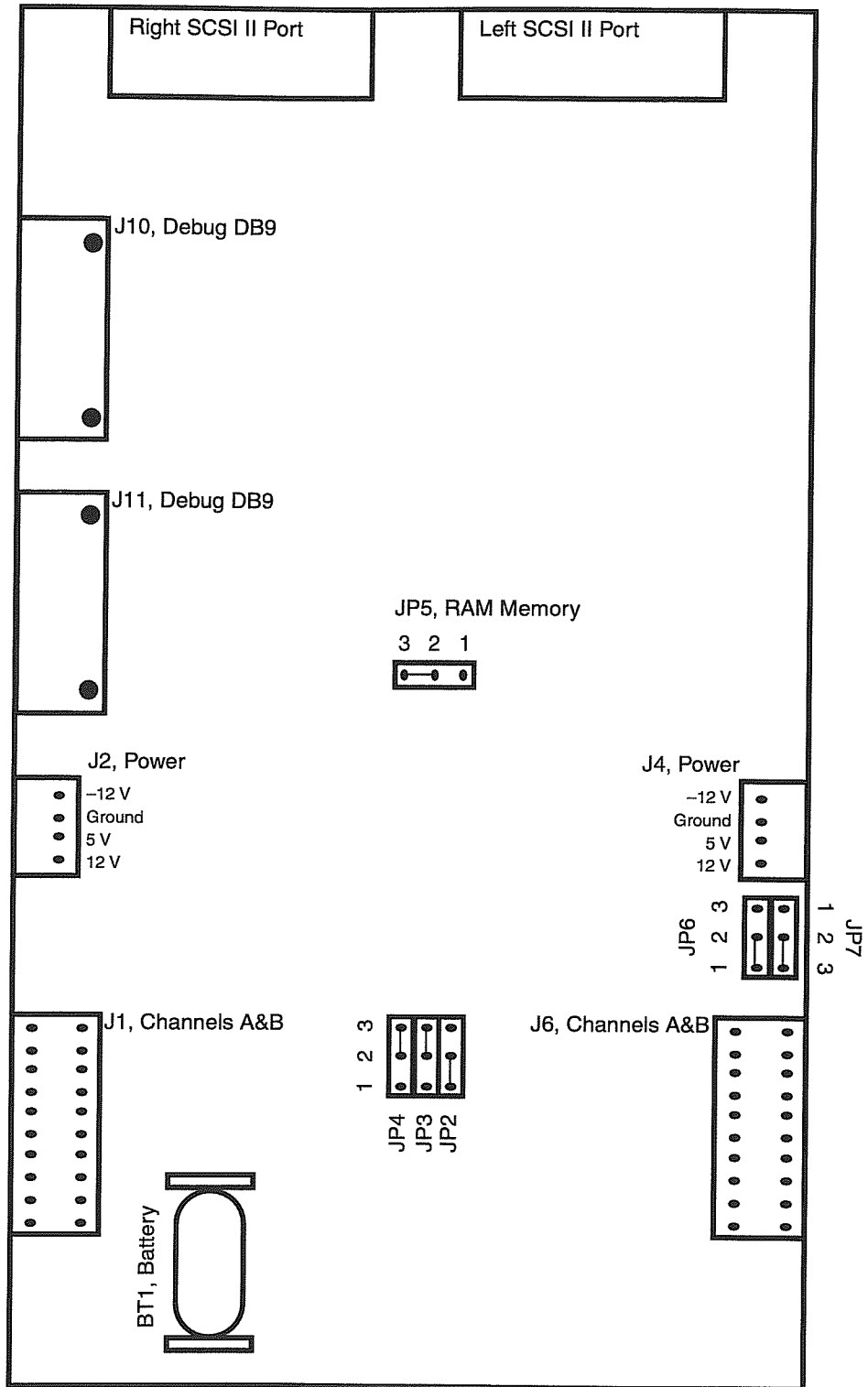
Burning the Flash Boot Monitor Code

Note Refer to the diagram on page C-5 to see the BAM card in Flash Program mode.

To burn the Flash Boot Monitor code:

Step	Action
1	Connect the programmer board to J7 on the BAM card.
2	Change the jumper settings to the Flash Program mode: <ul style="list-style-type: none">◆ JP6 is 1–2.◆ JP7 is 2–3.
3	Start the HiFLASH program. Select Quick Flash , then MCU model H8/3048FI , and set the following: <ul style="list-style-type: none">◆ Clock frequency range: ≥ 16 MHz◆ Data rate: 9600 HS0008EASFIH/I?
4	Select the file Bam_sw.mot and set the following: <ul style="list-style-type: none">◆ Address offset: H'0◆ Lowest address: H'0◆ Highest address: H'1FFFF
5	Press S2 (start/stop button) on the programmer board.
6	Click Next to start burning the code.
7	When you have finished, change the jumper settings to the normal operating mode: <ul style="list-style-type: none">◆ JP6 is 2–3.◆ JP7 is 1–2.

**BAM Card in Flash
Program Mode**



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