ADVANTAGE® RCU
Remote Control Unit

Operation Manual

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an affiliate of Rauland Borg Corp.

9/2/99

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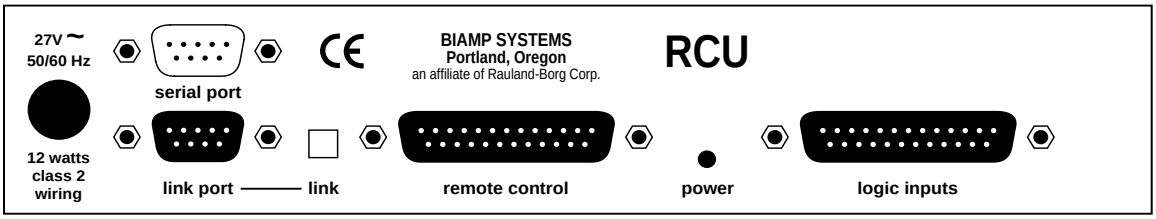
INTRODUCTION

The ADVANTAGE® **RCU** Remote Control Unit allows control of certain other ADVANTAGE® programmable products, such as VRAM, MSP, & SPM522D, via external potentiometers and/or contact-closures. The RCU includes programming software for assignment of specific functions to the external controls. Control panels can then be customized to control a variety of level, muting, source selection, & recall preset functions within a system having multiple ADVANTAGE® products. The RCU carries a five-year warranty.

RCU features include:

- ♦ RS-232 serial & link ports for communication with products
- ♦ remote control port accepts up to 23 potentiometers
- ♦ logic inputs port accepts up to 24 contact-closures
- ♦ programming software assigns functions to controls
- ♦ potentiometers provide various level control functions
- ♦ logic inputs provide muting, source, & preset functions
- ♦ logic inputs may be used to enable/disable other controls
- ♦ logic inputs can emulate control buttons & RS-232 commands
- ♦ covered by Biamp Systems' five-year warranty
- ♦ incorporates **AES** recommended grounding practices
- ♦ CE marked and **UL** / **C-UL** listed power source

CONNECTIONS



AC Power Cord: The power transformer provides 27 Volts AC to the RCU, and is detachable via a 5-pin DIN connector. The RCU has two internal 'self-resetting' fuses (there are no user serviceable parts inside the unit). If the internal fuses blow, they will attempt to re-set after a short period. However, this may be an indication that the RCU requires service.

Serial Port: This 9-pin Sub-D (male) connector provides an RS-232 Serial Port for control of the RCU (and associated products) via computers or third-party controllers (see RS-232 Control on pg. 10). The Serial Port has the following pin assignments (left-to-right & top-to-bottom): **Pin 1)** not used; **Pin 2)** Receive Data (RxD) input; **Pin 3)** Transmit Data (TxD) output; **Pin 4)** Data Terminal Ready (DTR) output; **Pin 5)** Ground; **Pin 6)** not used; **Pin 7)** Request To Send (RTS) output; **Pin 8)** not used; **Pin 9)** not used. PC Control Software and a serial cable are provided for programming via Windows® 95 (see Setup on pg. 4). ***NOTE:*** *The Serial Port also transmits commands assigned to external potentiometers & contact-closures (see Remote Control & Logic Inputs below).*

Link Port: This 9-pin Sub-D (female) connector provides a Link Port for RS-232 control from the RCU to other ADVANTAGE® programmable products (see RS-232 Control on pg. 10). The Link Port of one device simply connects to the Serial Port of the next device (and so forth). Link cables are available as an option (Biamp #909-0057-00). ***NOTE:*** *All but the final device in a system should have the Link Switch pressed in (see below)*. The Link Port has the following pin assignments (right-to-left & top-to-bottom): **Pin 1)** not used; **Pin 2)** Transmit Data (TxD) output; **Pin 3)** Receive Data (RxD) input; **Pin 4)** not used; **Pin 5)** Ground; **Pin 6)** Data Set Ready (DSR) output; **Pin 7)** not used; **Pin 8)** Clear To Send (CTS) output; **Pin 9)** not used. ***NOTE:*** *The Link Port also transmits commands assigned to external potentiometer & contact-closures (see Remote Control & Logic Inputs below).*

Link Switch: The Link Switch is used when connecting multiple devices in a 'Link Port to Serial Port' configuration (see Link Port above). From the factory, the Link Switch is released (out). When connecting multiple devices, the Link Switch must be depressed (in) on all devices except the final device in the system (the device with no Link Port connection).

Remote Control: This 25-pin Sub-D (female) connector allows connection of up to 23 potentiometers (on pins 1~23 respectively), with a common control voltage (+5 Volts DC on pin 24), and a common ground (on pin 25). Potentiometers should be between 5k ohms and 50k ohms in value, with a linear taper (see Controls on next page). Potentiometers are wired with high to +5 Volts (pin 24), low to ground (pin 25), & wiper to the desired control terminal (pins 1~23). Each potentiometer may be programmed to control a specific function on a specific product (see Setup on pg. 4). These functions typically include various level adjustments.

Logic Inputs: This 25-pin Sub-D (female) connector allows connection of up to 24 contact-closures (on pins 1~24 respectively) with a common ground (on pin 25). Contact-closures may be switches, relays, or logic outputs from other devices (see Controls on next page). Each logic input may be programmed to control a specific function on a specific product (see Setup on pg. 4). These functions typically include muting, source selection, & preset selection. However, logic inputs may also be programmed to enable/disable potentiometers or other logic inputs, as well as to transmit custom ASCII characters commands to other products.

Power Indicator: When the power transformer is plugged in, and AC power is applied to the RCU, the Power indicator remains lit.

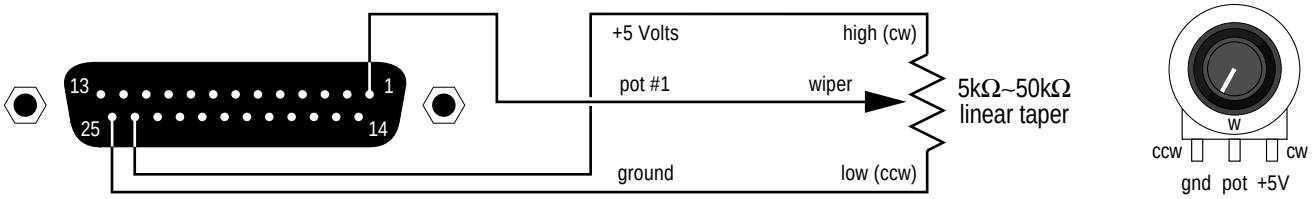
REMOTE CONTROL / POTENTIOMETERS

remote control

remote control	pin numbers
pots #1~23	pin #1~23
+5 Volts	pin #24
ground	pin #25

Rotary or slide potentiometers may be used with the RCU. Potentiometers should be between 5k ohms and 50k ohms in value, with a linear taper. Potentiometers are wired to the RCU Remote Control port with the 'high' side of the potentiometer to +5 Volts (pin 24), the 'low' side of the potentiometer to ground (pin 25), & the 'wiper' of the potentiometer to the desired control terminal (pins 1~23).

potentiometer wiring



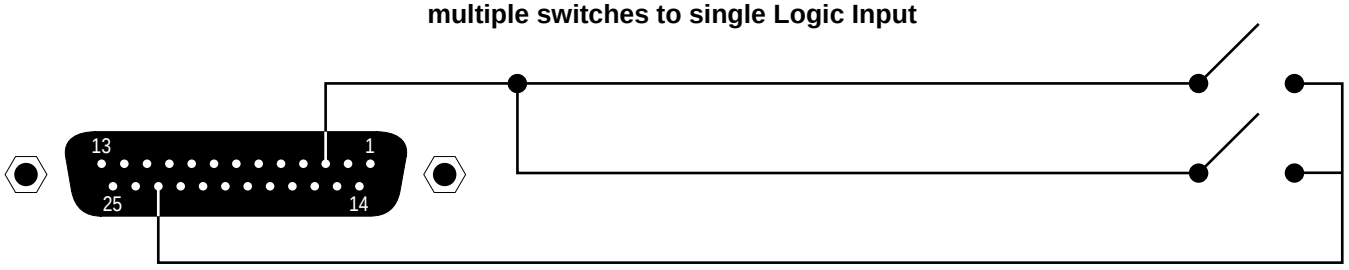
LOGIC INPUTS / CONTACT-CLOSURES

logic inputs

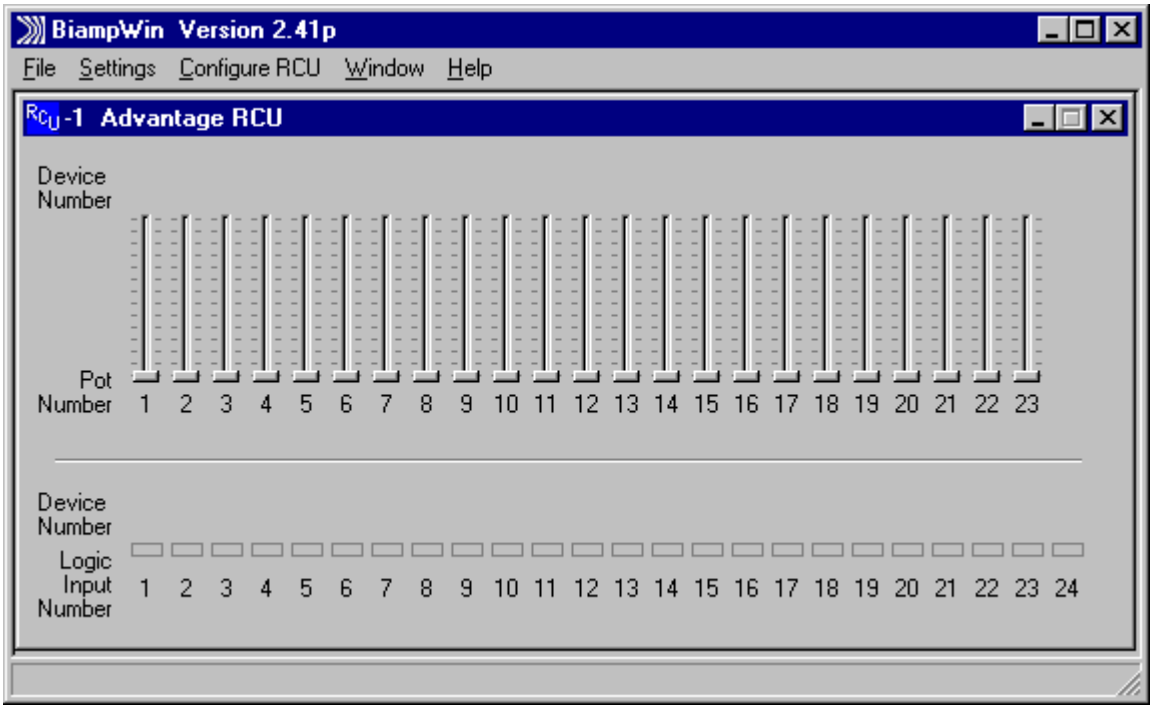
logic inputs	pin numbers
logic #1~24	pin #1~24
ground	pin #25

When nothing is connected to a Logic Input, an internal pull-up resistor keeps it at a 'high' idle state (+5.0 VDC). The Logic Input is activated when its input goes 'low' (less than +0.8 VDC), and is de-activated when its input goes 'high' (greater than +2.4 VDC). A Logic Input is controlled in one of three ways: 1) Use a switch, relay, or other contact-closure (such as from a third-party controller) to short the Logic Input to ground. 2) Use an NPN style 'open-collector' logic output from an external to short the Logic Input to ground. 3) Use an active TTL output driver circuit (such as from a third-party controller) to actively drive the Logic Input to a 'high' or 'low' state. Multiple contact-closures or 'open-collector' logic outputs may be wired in parallel to a single Logic Input (see diagram below). Logic Outputs and contact-closures should be rated for at least 5 Volts / 1mA operation. Low-current / dry-contact closures are recommended for reliability. Active output driver circuits should not exceed a signal range of 0~5 Volts DC, and should have a minimum pulse width of 100 milli-seconds. Logic Input impedances are approximately 10k ohms.

multiple switches to single Logic Input



RCU parameters are all adjustable using the BiampWin PC Control Software and serial cable provided with the unit. The BiampWin software provides programs for various ADVANTAGE® products, including the RCU. The RCU program includes several control screens, which are described on the following pages. Once the software is started (and Comm Port Configuration is set), the control screens are accessed via the drop-down menus at the top of the opening screen. The Main screen appears whenever an RCU file is opened. Pot Definition, Logic Input Definition, & Configuration Options screens are then available from the Configure RCU menu. The File menu provides functions such as open, close, save, etc. The Settings menu recalls the Comm Port Configuration screen. The Window menu arranges the active product screens. The Help menu explains the available adjustments. To install PC Control Software: Insert BiampWin Disk 1 into Drive A:, select 'Run' from the Start' menu, and enter A:\SETUP. System Requirements: Windows® 95/98/NT, with 16M RAM and 5M of available hard disk space (serial port required for 'on-line' operation).



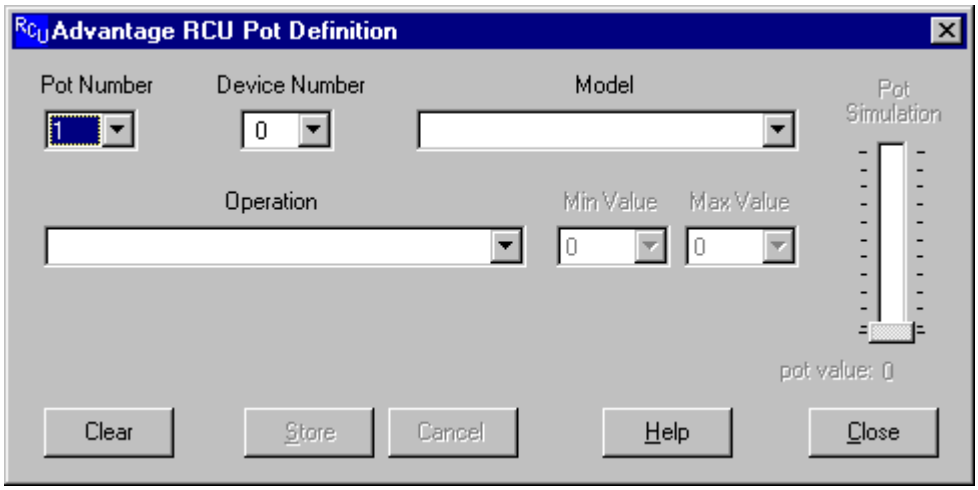
MAIN SCREEN

MAIN SCREEN

The Main Screen allows you to view the current status of all 23 potentiometers ('pots') and all 24 logic inputs.

Pots: Each of the 23 pots is represented on the Main Screen by a linear fader which is continuously updated to indicate the current pot setting and to indicate whether the pot is currently enabled or disabled. When a pot is disabled, the fader knob is grayed-out slightly and a small 'X' appears in the knob. The fader knob position is updated whenever the pot is adjusted, even if the pot is disabled. Since the faders always reflect the current settings of the physical pots which are connected to the RCU, any attempts to use the mouse to move fader knobs on the Main Screen will have no effect. Each pot may be programmed to perform a specific control function for a specific product. The programming process is performed using the Pot Definition Screen. The Pot Definition Screen may be activated by selecting it from the "Configure RCU" menu or by double-clicking on any fader. When a definition has been established for a particular pot, an icon and device number will appear above the fader on the Main Screen. The icon and device number indicate which device the pot is programmed to control. When the mouse pointer is positioned over the fader, a pop-up 'hint' appears which provides a detailed description of the function which the pot is programmed to perform.

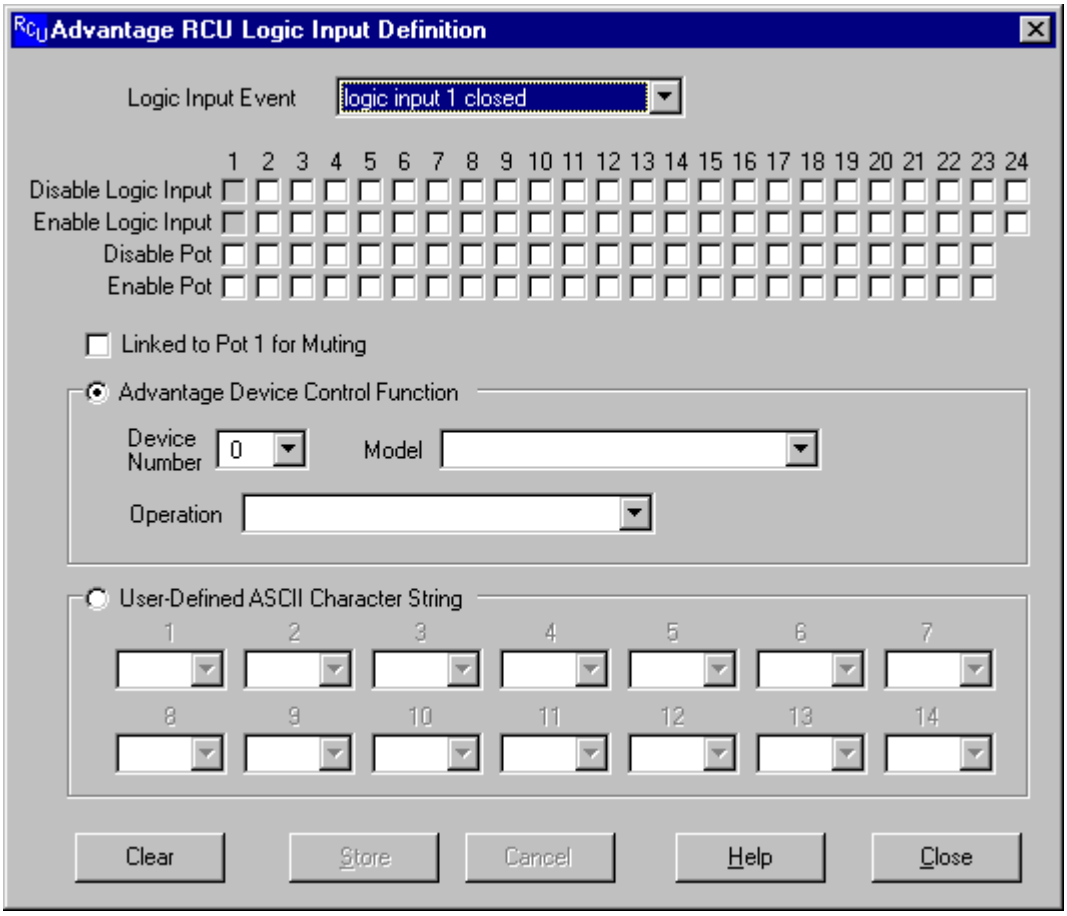
Logic Inputs: Each of the 24 logic inputs is represented on the Main Screen by an 'LED' indicator which is continuously updated to indicate the current on/off status and to indicate whether the logic input is currently enabled or disabled. When a logic input is disabled, the LED indicator is grayed-out slightly and a small 'X' appears in the LED. The LED indicator is updated whenever the logic input status is changed, even if the logic input is disabled. When the LED indicator is 'on' (red), the switch contact is closed (the logic input is shorted to ground through the contact-closure). When the LED indicator is 'off', the switch contact is open. Each logic input may be programmed to perform a specific control function for a specific product. Logic inputs may also be programmed to disable or enable other logic inputs or pots. A logic input may also be programmed to output a user-defined ASCII character string. The programming process is performed using the Logic Input Definition Screen. The Logic Input Definition Screen may be activated by selecting it from the "Configure RCU" menu or by double-clicking on any logic input LED indicator. When a definition has been established for a logic input, an icon and, in most cases, a device number will appear above the LED indicator on the Main Screen. The icon and device number indicate which device the logic input is programmed to control. When the mouse pointer is positioned over the LED indicator, a pop-up 'hint' appears which provides a detailed description of the function which the logic input is programmed to perform. The last six logic inputs (logic inputs 19 through 24) may be programmed to operate in 'binary mode' using the Configuration Options Screen. In this mode, whenever one of these six logic inputs changes state, the binary on/off status of all six logic inputs determines what function will be performed. There are sixty-four possible binary on/off combinations of these six logic inputs. Each of the sixty-four combinations may have a logic input definition assigned to it. These logic input definitions are created using the Logic Input Definition Screen.



POT DEFINITION SCREEN

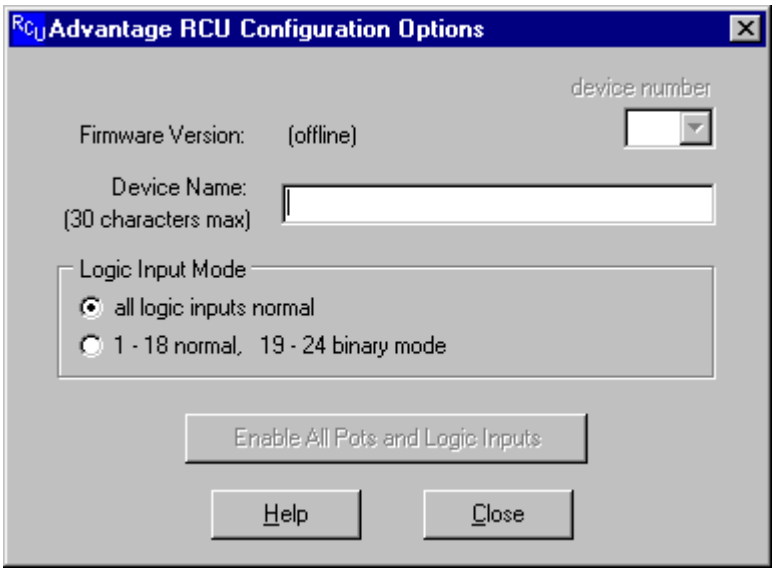
Up to 23 potentiometers may be connected to the Remote Control input port of the RCU. Each pot may be programmed to perform a specific control function for a specific product. The programming process is performed using the Pot Definition Screen. Each product that is linked to the RCU must have a unique device number. When creating a pot definition, you must specify the device number of the product which that pot will be controlling. You must also specify the model of the product (VRAM, MSP22e, etc.). Once you have specified the model, a list of available operations appears in the "Operation" list box. The list of operations changes depending upon which model is selected. Most operations also allow you to specify a minimum value and a maximum value for the pot. If you do not override the default values shown, the entire range of pot travel will correspond directly to the entire volume range that is possible for the specified operation. By specifying a Min Value and/or a Max Value, you may restrict the range of volume levels for the pot. For example, each volume control on an VRAM has 32 settings (or 'steps'), ranging from a minimum value of 0 to a maximum value of 31. If you set Min Value to 3 and Max Value to 28, then the fully counter-clockwise position of the pot will correspond to volume step 3 and the fully clockwise position of the pot will correspond to volume step 28. A "Pot Simulation" fader appears on the Pot Definition Screen. This fader provides a convenient method to test the pot definition as it is being created. Using the mouse to move the fader knob simulates the movement of the actual potentiometer which is being defined. During an on-line session, moving the Pot Simulation fader knob will cause BiampWin to transmit the appropriate character string commands to the specified product. ***NOTE:*** *RS-232 level commands from other sources, including the Pot Simulation fader, may conflict with actual pot settings. However, these conflicts are resolved as soon as the pot is again manipulated.* If the specified model is either a VRAM/VRAMeq or an SPM522D, then a "Use Logic Input for Muting" checkbox appears. With these models, if you wish to use a pot as a volume control AND use a logic input to perform muting functions for the pot, you should select the "Use Logic Input for Muting" checkbox and an appropriate logic input definition will automatically be created for you. This links the operation of the logic input and the pot, allowing for cooperative control. ***NOTE:*** *"Use Logic Input for Muting" is defined to mute when a switch closes, and un-mute when the switch opens. Therefore, a 'latching' switch will maintain the selected muting status (muted or un-muted), whereas a 'momentary' switch will temporarily mute (only while the switch is held closed).* Other forms of muting are available, which behave differently when used in conjunction with a pot (see Logic Input Definition Screen on next page). However, these forms of muting may cause conflicts, such as un-muting when the pot is manipulated, and un-muting to levels established by means other than the pot (RS-232 commands, Pot Simulation fader, product software, etc.). In some cases, these forms of muting may actually be considered desirable. When a definition has been established for a particular pot, an icon and device number will appear above the fader on the Main Screen. The icon and device number indicate which device the pot is programmed to control. When the mouse pointer is positioned over the fader, a pop-up 'hint' appears which provides a detailed description of the function which the pot is programmed to perform.

Connecting Pots to the RCU: The RCU is designed to be used with linear taper pots. The resistance value of the pots can be as low as 5K ohms or as high as 50K ohms. Pins 1 through 23 of the "Remote Control" connector on the RCU are for pot inputs. Pin 24 is a reference voltage output (which is approximately +5 volts DC), and pin 25 is ground. The 'high' (clockwise) side of all pots should be connected to the reference voltage output on pin 24 of the remote control connector. The 'low' (counter-clockwise) side of all pots should be connected to ground on pin 25 of the remote control connector. The wiper of each pot should be connected to the pin corresponding to the pot number (1 through 23). In some cases, the wiper could be connected to more than one pin if you want to control more than one volume level with the same pot (to simulate a 'ganged' pot).



LOGIC INPUT DEFINITION SCREEN

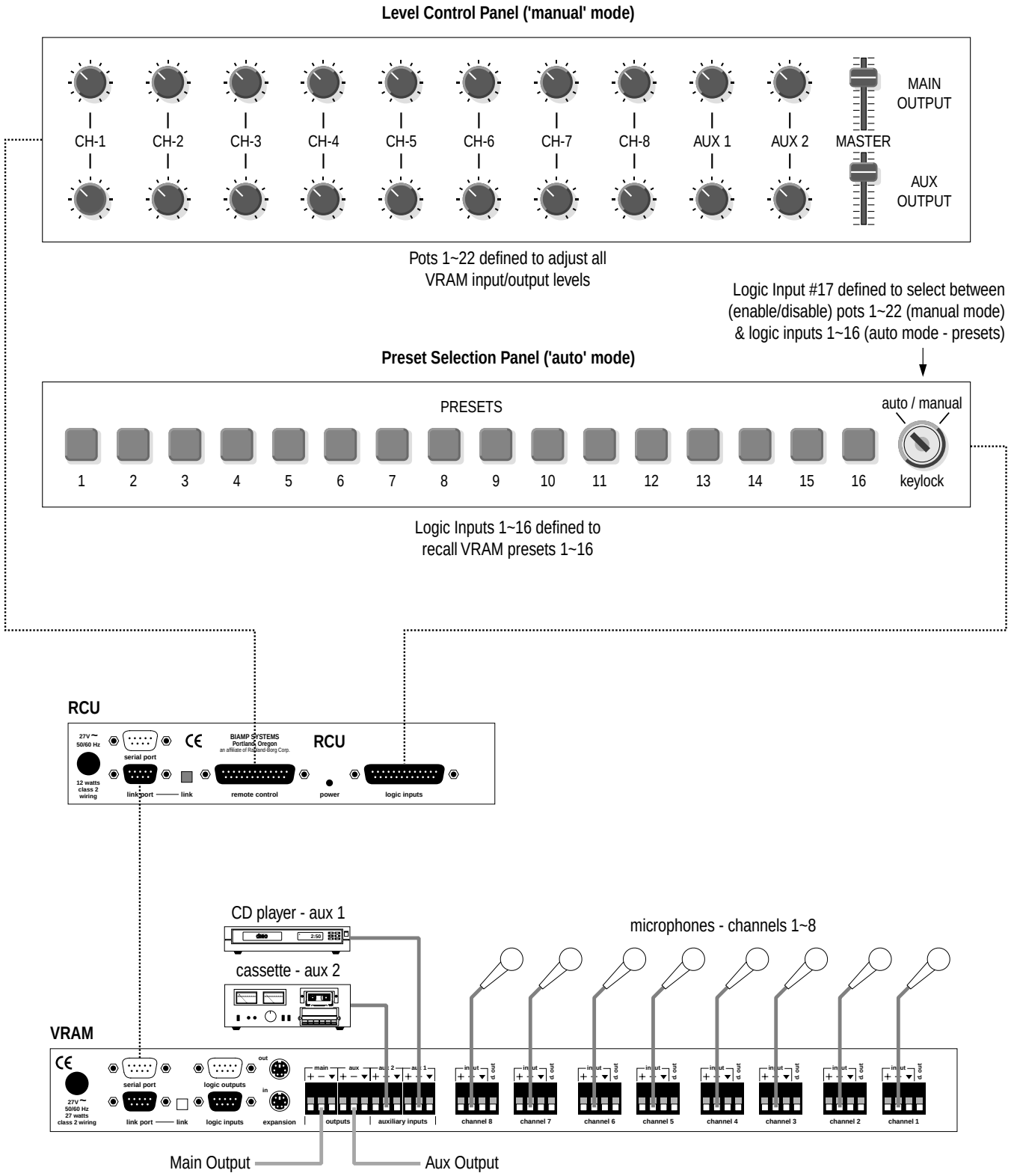
Up to 24 contact-closures may be connected to the Logic Inputs port of the RCU. Contact-closures may be switches, relays, or logic outputs from other devices. Each logic input may be programmed to perform a specific control function for a specific product. This programming process is performed using the "Advantage Device Control Function" section of the Logic Input Definition Screen. Each product that is linked to the RCU must have a unique device number. When creating a logic input definition, you must specify the device number of the product which that logic input will be controlling. You must also specify the model of the product (VRAM, MSP22e, etc.). Once you have specified the model, a list of available operations appears in the "Operation" list box. The list of operations changes depending upon which model is selected. When a definition has been established for a particular logic input, an icon and device number will appear above the 'LED' indicator on the Main Screen. The icon and device number indicate which device the logic input is programmed to control. When the mouse pointer is positioned over the LED indicator, a pop-up 'hint' appears which provides a detailed description of the function which the logic input is programmed to perform. In addition to specifying which actions occur when a contact closes, you also may specify which actions occur when a contact opens. Normally, each of the 24 logic inputs acts independently of the others. Using the Configuration Options Screen, the six highest logic inputs (19 through 24) may be programmed to operate in 'binary' mode. When in binary mode, a logic input definition may be created for each of the 64 possible binary on/off combinations of logic inputs 19 through 24. Logic inputs may also be programmed to enable/disable other logic inputs or pots, or to transmit a user-defined ASCII character string (this programming does NOT require a device number or product model be specified). Individual checkboxes are provided for disabling or enabling each of the other logic inputs, as well as for disabling or enabling each of the 23 pots. The Logic Input Definition Screen prevents you from disabling or enabling the logic input which is currently being defined. You should be careful not to create a situation where one or more pots or logic inputs have been disabled with no way of becoming re-enabled again (if you find yourself in such a situation, a quick way of re-enabling all pots and logic inputs can be found on the Configuration Options Screen). When programming a logic input to transmit a user-defined ASCII character string, you may define a string of up to 14 characters. This string may consist of any combination of ASCII characters except for the NUL character (whose decimal value is zero). ASCII character strings may be used to write advanced product/function commands which are not available from the 'Options' list box (see Computer Control Manual for the product to be controlled). Single ASCII characters may also be used to emulate remote control buttons, which are then programmable on an individual product basis, using this same BiampWin software (see RS-232 Control on pg. 10).



CONFIGURATION OPTIONS SCREEN

The Configuration Options screen displays information about the RCU which is currently active, and allows changes to certain "global" configuration options associated with that device. The Firmware Version field displays the version date of the firmware (software) which resides inside the currently active device. This date is the "release" date of the firmware, not the date that the device was manufactured. The firmware version may not be edited. Device Number allows a device number (0~63) to be assigned to the currently active RCU. ***NOTE:*** *When multiple ADVANTAGE® programmable products are to be linked (via RS-232) for system-wide communications, each product must first be assigned a unique Device Number.* Each RCU may be assigned a name by using the Device Name field. This name is stored in the non-volatile memory of the device. If a name is assigned, it will appear in the title bar of the PC software's Main Screen for that RCU. Each RCU may be assigned a device number from 0 to 63. This allows multiple RCUs (or other ADVANTAGE® programmable products) to be individually controlled when linked together. Unique device numbers must be assigned to each device before the devices are linked together. The last six logic inputs (logic inputs 19 through 24) may be configured to operate in "binary mode." In this mode, whenever one of the six logic inputs changes state, the binary on/off status of all six logic inputs determines what function will be performed. There are sixty-four possible binary on/off combinations of these six logic inputs. Each of the sixty-four combinations may have a logic input definition assigned to it. These logic input definitions are created using the Logic Input Definition Screen (see previous page). When creating logic input definitions which disable other logic inputs or pots, it is possible to find yourself in a situation where one or more logic inputs or pots have been disabled, with no way of re-enabling them. Clicking on the "Enable All Pots and Logic Inputs" button causes all pots and logic inputs to immediately be re-enabled.

RCU Remote Control of VRAM



RS-232 CONTROL

The RCU has an RS-232 Serial Port, which allows it to be controlled by a computer, and a Link Port, which allows the RCU itself to transmit computer control commands to other ADVANTAGE® programmable products (see Connections on pg. 2). In addition to the BiampWin PC Control Software, the RCU offers two other methods of computer control.

Control Button Emulation: This method allows the RCU (or computer) to imitate the operation of infrared or wall-mount control panels. Although the RCU does not accept these types of controls itself, it can still receive and transmit ASCII characters (via RS-232) which emulate the remote control buttons supported by other ADVANTAGE® programmable products. From the factory, remote control buttons on ADVANTAGE® programmable products have equivalent ASCII characters permanently assigned to them (see table below). Therefore, actions can be assigned to remote control buttons during the programming of these products. Then, using this method, the RCU (or computer) can then output (to the other products) ASCII characters which are equivalent to the commands generated by remote control buttons. Control Button Emulation allows these other products to utilize up to forty button definitions (unlike standard remote controls, which have only twenty-eight buttons). For more information, see the manual or BiampWin program for the products to be controlled.

Advanced Computer Control: This method provides advanced commands, which allow the RCU (or computer) to retrieve or edit various settings from other ADVANTAGE® programmable products. The computer may also emulate control buttons. Using this method, the computer may designate up to sixty-four devices, and may also provide 'real-time' display of various settings.

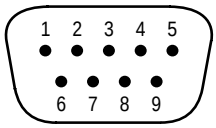
This manual only describes the Control Button Emulation method of computer control. For complete details about using the RCU with a computer, including Advanced Computer Control, contact Biamp Systems for the manual "Computer Control of ADVANTAGE® RCU".

Each control button on an infrared transmitter or wall-mount control panel corresponds to one character in the standard ASCII character set. The character equivalents are summarized in the following table. This table includes all forty possible buttons, their button numbers, and their ASCII code equivalents. Their button definitions are defined during programming of the product to be controlled.

button 01	B	programmable by product	button 15	P	programmable by product	button 29	^	programmable by product
button 02	C	programmable by product	button 16	Q	programmable by product	button 30	_	programmable by product
button 03	D	programmable by product	button 17	R	programmable by product	button 31	'	programmable by product
button 04	E	programmable by product	button 18	S	programmable by product	button 32	b	programmable by product
button 05	F	programmable by product	button 19	T	programmable by product	button 33	c	programmable by product
button 06	G	programmable by product	button 20	U	programmable by product	button 34	d	programmable by product
button 07	H	programmable by product	button 21	V	programmable by product	button 35	e	programmable by product
button 08	I	programmable by product	button 22	W	programmable by product	button 36	f	programmable by product
button 09	J	programmable by product	button 23	X	programmable by product	button 37	g	programmable by product
button 10	K	programmable by product	button 24	Y	programmable by product	button 38	h	programmable by product
button 11	L	programmable by product	button 25	Z	programmable by product	button 39	i	programmable by product
button 12	M	programmable by product	button 26	[	programmable by product	button 40	j	programmable by product
button 13	N	programmable by product	button 27	\	programmable by product			
button 14	O	programmable by product	button 28	]	programmable by product			

The RCU (or computer) can initiate any functions or actions that a standard control can, by simply transmitting the equivalent control button ASCII character. When interfacing the RCU to a computer, the computer must be aware that the RCU will 'echo' all characters it receives via the Serial Port Transmit Data (TXD) output signal. ***NOTE:*** *The Serial Port will also transmit commands which have been assigned to the RCU Remote Control pots & Logic Input switches (see Setup on pg. 4).*

Serial Port: The 9-pin Sub-D (male) connector provides the RS-232 compatible serial interface signals used for computer (or third-party) control of the RCU. The RCU Serial Port transmits serial data on pin 3 (TxD), receives serial data on pin 2 (RxD), and provides a ground on Pin 5. The Data Terminal Ready (DTR) & Request To Send (RTS) output signals are connected to the +12 Volt power supply (through a resistor) and are always asserted when the RCU power is on. ***NOTE:*** *The Serial Port will also transmit commands which have been assigned to the RCU Remote Control pots & Logic Input switches (see Setup on pg. 4).*



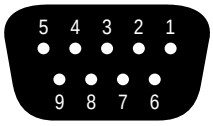
serial port

pin #1 = not used
pin #2 = Receive Data (RxD) input
pin #3 = Transmit Data (TxD) output
pin #4 = Data Terminal Ready (DTR) output
pin #5 = ground
pin #6 = not used
pin #7 = Request To Send (RTS) output
pin #8 = not used
pin #9 = not used

The RCU only requires receive data (pin 2), transmit data (pin 3), and signal ground (pin 5) to be connected for successful data communications (see cable diagram below). However, the PC may require that signals be present on the data set ready, clear to send, or carrier detect inputs, as well as the receive data, transmit data, and signal ground pins. Success or failure depends entirely on the actual computer hardware and software being used. When trying to solve an interfacing problem, the most important thing to remember is that an output of one device should connect to one or more inputs of the other device, and that two outputs should never be connected together. Also, keep in mind that the RS-232 specification calls for the cable length to be no greater than 50 feet (although it is not unusual to be able to operate over distances of 150 to 250 feet), and the connectors must be of the appropriate gender (male or female) to mate properly. For best results, a shielded cable should be used, with the shield connected to chassis ground. Undesirable ground loops may occur when the RCU is connected to a PC (if the system grounding is not carefully designed). For best performance, the PC ground and the chassis ground of the RCU should be at the same potential, and the PC should get AC power from the same source as the RCU (and any other audio equipment which is connected to the RCU). Since most lap-top computers are isolated from earth ground, this should rarely pose a problem.

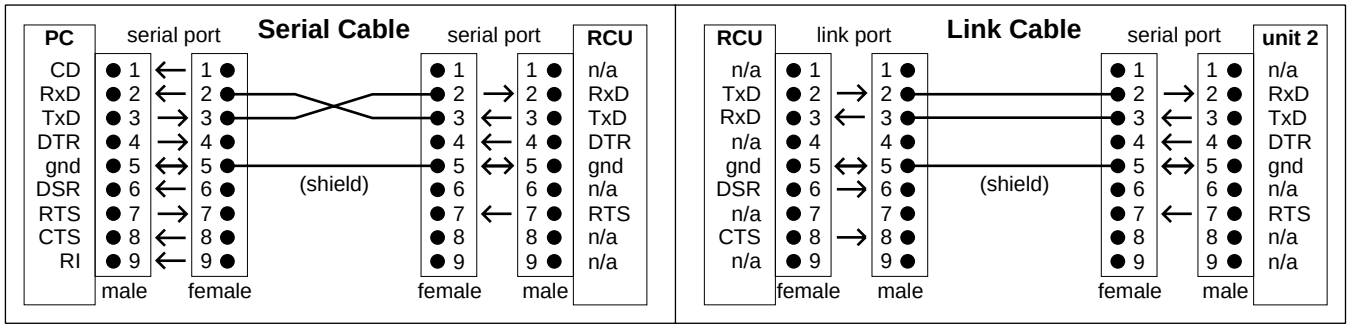
Serial Port Data Communications Parameters: The RCU communicates through the Serial Port at the factory selected rate of 9600 bits per second, with 8 data bits, 1 stop bit, and no parity. The RCU utilizes a subset of the standard 7-bit ASCII character set. The eighth data bit of each character (the most significant bit) should always be 0. The computer should not echo the characters it receives. The computer should not be set for either hardware (DTR) or software (XON/XOFF) flow control. The baud rate may be changed to either 2400, 19200, or 38400 bits per second by means of the software (see Setup on pg. 4).

Link Port Connections: The 9-pin Sub-D (female) connector provides the RS-232 compatible serial interface signals used for RCU control of other ADVANTAGE® programmable products within a system. The Link Port of one device simply connects to the Serial Port of the next device, and so forth (see diagram below). Link cables are available as an option (Biamp #909-0057-00). The Data Set Ready (DSR) & Clear To Send (CTS) output signals are connected to the +12 Volt power supply (through a resistor) and are always asserted when the RCU power is on. ***NOTE:*** *All but the final device in a system should have its 'Link' switch pressed in (see Connections on pg. 2).* The Link Port transmits commands assigned to the Remote Control pots & Logic Inputs, and will 'echo' commands received at the Serial Port (from computers or third-party controllers).



link port

pin #1 = not used
pin #2 = Transmit Data (TxD) output
pin #3 = Receive Data (RxD) input
pin #4 = not used
pin #5 = ground
pin #6 = Data Set Ready (DSR) output
pin #7 = not used
pin #8 = Clear To Send (CTS) output
pin #9 = not used



WARRANTY

BIAMP SYSTEMS IS PLEASED TO EXTEND THE FOLLOWING 5-YEAR LIMITED WARRANTY TO THE ORIGINAL PURCHASER OF THE PROFESSIONAL SOUND EQUIPMENT DESCRIBED IN THIS MANUAL.

BIAMP Systems expressly warrants this product to be free from defects in material and workmanship for a period of 5 YEARS from the date of purchase as a new product from an authorized BIAMP Systems dealer under the following conditions.

1. In the event the warranted BIAMP Systems product requires service during the warranty period, BIAMP Systems will repair or replace, at its option, defective materials, provided you have identified yourself as the original purchaser of the product to any authorized BIAMP Systems Service Center. Transportation and insurance charges to and from an authorized Service Center or the BIAMP Systems factory for warranted products or components thereof to obtain repairs shall be the responsibility of the purchaser.

2. This warranty will be VOIDED if the serial number has been removed or defaced; or if the product has been subjected to accidental damage, abuse, rental usage, alterations, or attempted repair by any person not authorized by BIAMP Systems to make repairs; or if the product has been installed contrary to BIAMP Systems's recommendations.

3. Electro-mechanical fans, electrolytic capacitors, and the normal wear and tear of appearance items such as paint, knobs, handles, and covers are not covered under this warranty.

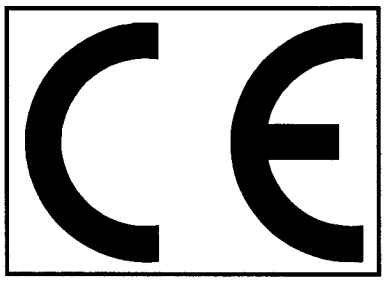
4. BIAMP SYSTEMS SHALL NOT IN ANY EVENT BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING LOST PROFITS, LOSS OF USE, PROPERTY DAMAGE, INJURY TO GOODWILL, OR OTHER ECONOMIC LOSS OF ANY SORT. EXCEPT AS EXPRESSLY PROVIDED HEREIN, BIAMP SYSTEMS DISCLAIMS ALL OTHER LIABILITY TO PURCHASER OR ANY OTHER PERSONS ARISING OUT OF USE OR PERFORMANCE OF THE PRODUCT, INCLUDING LIABILITY FOR NEGLIGENCE OR STRICT LIABILITY IN TORT.

5. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED. BIAMP SYSTEMS EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE REMEDIES SET FORTH HEREIN SHALL BE THE PURCHASER'S SOLE AND EXCLUSIVE REMEDIES WITH RESPECT TO ANY DEFECTIVE PRODUCT. THE AGENTS, EMPLOYEES, DISTRIBUTORS, AND DEALERS OF BIAMP SYSTEMS ARE NOT AUTHORIZED TO MODIFY THIS WARRANTY OR TO MAKE ADDITIONAL WARRANTIES BINDING ON BIAMP SYSTEMS. ACCORDINGLY, ADDITIONAL STATEMENTS SUCH AS DEALER ADVERTISEMENTS OR REPRESENTATIONS DO NOT CONSTITUTE WARRANTIES BY BIAMP SYSTEMS.

6. No action for breach of this warranty may be commenced more than one year after the expiration of this warranty.

Thank you for purchasing BIAMP SYSTEMS...
AMERICAN SOUND CRAFTSMANSHIP

Biamp Systems
10074 S.W. Arctic Drive
Beaverton, Oregon 97005
(503) 641-7287
http://www.biamp.com



Declaration of Conformity

BIAMP SYSTEMS
10074 SW Arctic Drive
Beaverton, OR USA 97005

as the manufacturer, hereby declares that the following described product, in our delivered version, complies with the provisions of the DIRECTIVES as noted herein. In case of alteration of the product, not agreed upon or directed by us, this declaration is no longer valid.

Product: Model: ADVANTAGE® RCU
Description: Remote Control Unit

Applicable EC Directives: EMC Directive (89/336/EEC) LVD Directive (73/23/EEC)

Applicable Harmonized Standards: EN55103-1 emissionsEN55103-2 immunity
EN60065 safety

Special Considerations for Product Environment or Compliance:
Shielded cabling must be used for system connections. The apparatus is deemed incapable of producing harmonic emissions or flicker levels sufficient enough to interfere with other apparatus as noted in EN61000-3-2 and EN61000-3-3.

This apparatus operates from a removeable external power source at voltages below the levels encompassed by the LVD. The external power source complies with the applicable requirements of EN60065. The apparatus itself is outside of the scope of the LVD and presents no hazardous voltages, as defined in the LVD. For compliance, the apparatus shall be powered only from the separate CE marked BIAMP SYSTEMS power source.

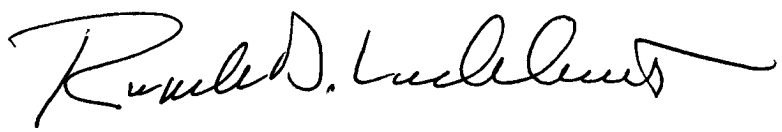
RF interference conducted through interconnect cabling may cause varying degrees of random signal degradation. The effect of increased noise or distortion due to this interference is typically masked by the desired signal. In no instance is operation inhibited.

The Technical Report/File is maintained at:

Biamp Systems
10074 S.W. Arctic Drive
Beaverton, OR USA 97005
phone: (503) 641-7287 fax: (503) 626-0281
e-mail: biamp@biamp.com

Authorized Representative: Ralph Lockhart, President

Authorized Representative Signature:
Issued: 1999



SAFETY INFORMATION

The words WARNING and CAUTION throughout the manual, and on the device, call attention to important safety information. These words have the following meanings.

WARNING: The related information alerts you to conditions that could result in serious injury or damage to property if the instructions are not followed properly.

CAUTION: The related information instructs you on how to prevent damage to the equipment or how to avoid conditions that could result in minor injury if proper steps are not followed.

Product labelling and the operation manual may use the internationally recognized symbols defined below to note safety messages.

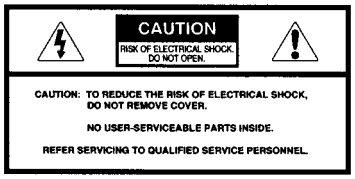
The lightning flash with arrowhead symbol, enclosed within a triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the apparatus's enclosure or at connection terminals that may be of sufficient magnitude to constitute a risk of electrical shock.

The exclamation point, enclosed within a triangle, is intended to alert the user to important installation, operation, and maintenance (servicing) instructions in the literature accompanying the apparatus.

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRICAL SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.

CAUTION: Installation of this apparatus should be made by a qualified installation person and should conform to all applicable local codes.

Modification and optional equipment information referenced in this manual is for use by qualified installation and service personnel only.



"INFORMACIÓN DE SEGURIDAD"

Las palabras **PELIGRO** (WARNING) y **PRECAUCIÓN** (CAUTION) a lo largo del manual y en el dispositivo (sistema), llaman la atención acerca de una importante información de seguridad. Estas palabras tienen los siguientes significados :

PELIGRO (WARNING) : la información relata las condiciones en que podría ser dañada seriamente la propiedad si no se siguen adecuadamente las instrucciones.

PRECAUCIÓN (CAUTION) : la información que se relata te instruye en cómo prevenir daños al equipo o como evitar condiciones que podrían resultar en perjuicio menor si los pasos adecuados no son seguidos correctamente.

El etiquetado del producto y el manual de operación pueden hacer uso de los símbolos reconocidos internacionalmente y cuyos mensajes estan definidos a continuación para modificar mensajes de seguridad:

El símbolo del rayo encerrado en un triángulo pretende alertar al usuario de la presencia de un peligroso voltaje no aislado ,dentro de la caja del aparato o a un terminal de conexión y que podría ser de suficiente magnitud como para constituir un grave riesgo de descarga eléctrica.

El punto de exclamación dentro de un triángulo pretende alertar al usuario de la importancia de las instrucciones de instalación, operación y mantenimiento (servicio) que acompañan al aparato.

PELIGRO (WARNING) : para reducir el riesgo de fuego o una descarga electrica, no exponer este aparato a la lluvia o la humedad.

PRECAUCIÓN (CAUTION) : la instalación de este aparato debería hacerse por una persona cualificada en la instalación, y debería conformar todos los códigos locales aplicables.

La modificación y la información opcional del equipo referenciada en este manual es para ser utilizada únicamente por personal cualificado en instalación y servicio.

INFORMATION CONCERNANT VOTRE SECURITE

Les mots **WARNING** et **CAUTION** dans le manuel d'utilisation et sur les appareils attirent votre attention sur les plus importantes informations concernant votre sécurité. Ces mots ont la signification suivante:

WARNING: Ce mot vous indique les circonstances dans lesquelles vous pourriez être blessé ou endommager votre équipement si les instructions ne sont pas suivies correctement.

CAUTION: Ce mot vous indique comment éviter d'endommager votre matériel et comment éviter de vous blesser si vous ne suivez pas les instructions.

Vous trouverez peut-être les symboles suivants sur votre appareil ou dans le manuel d'utilisation.

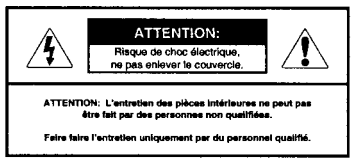
L'éclair se terminant en flèche dans un triangle permet de prévenir l'utilisateur d'un voltage dangereux non isolé dans l'appareil ou d'une connexion d'une amplitude suffisante pour constituer un risque de choc électrique.

Le point d'exclamation dans un triangle permet de prévenir l'utilisateur des points importants concernant l'installation, le fonctionnement et l'entretien de l'appareil figurant dans le manuel d'utulisation.

WARNING: POUR REDUIRE LES RISQUES DE FEU OU DE CHOC ELECTRIQUE, NE PAS METTRE L'APPAREIL SOUS LA PLUIE OU DANS L'HUMIDITE.

CAUTION: L'installation de cet appareil doit être faite par un installateur qualifié et doit être en conformité avec toutes les lois locales en application.

Les informations concernant une modification ou un équipement en option dans le manuel doivent être effectué par du personnel qualifié.



INFORMAZIONI PER LA SICUREZZA

Le parole **AVVERTENZA** (WARNING) e **PRUDENZA** (CAUTION) poste sul manuale d'uso e sul apparato richiamano la vostra attenzione su delle importanti informazioni per la vostra sicurezza. Queste parole hanno il seguente significato.

AVVERTENZA: (WARNING) La suddetta indicazione vi avvisa sul rischio di incorrere in danni a cose o a persone ,se le procedure d'uso e installazione non saranno seguite propriamente.

PRUDENZA: (CAUTION) La suddetta indicazione vi instruisce su come prevenire e ridurre al minimo, il rischio di danni agli apparati e alle persone se le instruzioni saranno seguite propriamente.

Le apparecchiature e i manuali di instruzioni riporteranno la simbologia standard raffigurata qui sotto ,accompagnate dalle relative informazioni per la sicurezza.

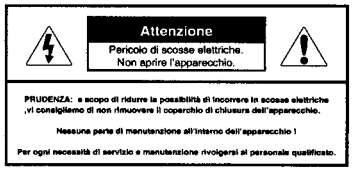
La simbologia con il fulmine all'interno di un triangolo, intende avvisare l'utente della presenza di alto volaggio all'interno del apparecchio in questione, e che il suddetto apparecchio si alimenta attraverso una tensione di rete ad alto voltaggio e che dunque si potrebbe incorrere sul rischio di una possibile scossa elettrica.

La simbologia con il punto esclamativo all'interno di un triangolo, intende avvisare l'utente di una serie di instruzioni contenute nel manuale d'uso riguardanti : operato,manutenzione e assistenza. Il suddetto manuale sarà a corredo dell'apparecchio.

AVVERTENZA: (WARNING) PER RIDURRE IL RISCHIO DI POSSIBILI INCENDI O SCOSSE ELECTTRICHE ,SCONSIGLIAMO DI ESPORRE L'APPARECCHIO ALLA PIOGGIA O ALL'UMIDITA'.

PRUDENZA: (CAUTION) l'Installazione di questo apparato dovrà essere effettuata solo da personale qualificato e il tipo di installazione dovrà essere in regola con le norme vigenti locali..

Modifiche e ulteriori informazioni specificate in questo manuale sono solamente riservate al personale qualificato all'installazione.



Sicherheitshinweise

Die Bergriffe **WARNUNG** (engl. WARNING) und **ACHTUNG** (engl. CAUTION) in der Bedienungsanleitung und auf den Geräten machen auf wichtige Sicherheitsinformationen aufmerksam. Diese Begriffe haben die folgende Bedeutung:

WARNUNG: (WARNING) Der folgende Text warnt Sie vor ernsthaften Verletzungen oder Beschädigungen, die aus einer fehlerhaften Bedienung bzw. Handhabung des Gerätes resultieren können.

ACHTUNG: (CAUTION) Der folgende Text informiert Sie über Bedienungshinweise zum Schutz Ihres Gerätes oder weist auf mögliche Schäden hin, wenn die Bedienungshinweise nicht beachtet werden.

Die Beschriftung der Geräte und die Bedienungsanleitungen weisen unter Umständen international bekannte Symbole auf, die die folgende Bedeutung haben:

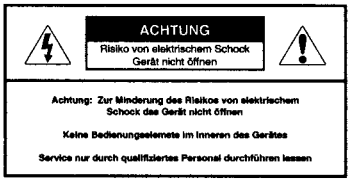
Das Blitzsymbol im Dreieck warnt vor anliegender, nicht isolierter „gefährlicher Spannung" im Inneren oder an den Anschlüssen des Gerätes. Die Berührung der unter Spannung stehenden Teile kann zu einem elektrischen Schock führen.

Das Rufzeichen im Dreieck macht auf wichtige Installations-, Bedienungs- und Servicehinweise in der zugehörigen Bedienungsanleitung aufmerksam.

WARNUNG: (WARNING) Zur Minderung des Risikos von Feuer und elektrischem Schock schützen Sie das Gerät vor Regen und Feuchtigkeit.

ACHTUNG: (CAUTION) Die Installation des Gerätes sollte nur durch qualifiziertes Personal durchgeführt werden und muß den jeweiligen Bestimmungen entsprechen.

Die Modifikationen und die Informationen zu den optionalen Erweiterungen in der Bedienungsanleitung sind nur für qualifiziertes Personal bestimmt.



Sikkerhedsinformation

Ordene ***ADVARSEL*** (WARNING) og ***FORSIGTIG*** (CAUTION), brugt i henholdsvis brugervejledning og på selve produktet, indikerer, at vigtig information omkring sikkerhed følger. Ordene betyder følgende:

ADVARSEL: (WARNING) Den efterfølgende information advarer Dem om forhold, der kan føre til alvorlige ulykker og ejendomsskader, hvis ikke vejledningen følges.

FORSIGTIG: (CAUTION) Den efterfølgende information vejleder Dem i, hvordan De undgår skade på produktet, samt undgår forhold der kan føre til mindre ulykker og ejendomsskader, hvis ikke vejledningen følges.

Produktetiketter og brugervejledning kan indeholde de internationalt anerkendte symboler der er vist nedenfor:

Trekanten med et lyn i midten har til hensigt at advare brugeren om, at produktet indeholder "farlig spænding", og at det derfor er forbundet med fare for elektrisk stød at åbne produktet.

Trekanten med udråbstegn har til hensigt at advare brugeren om, at vigtig information omkring installation, brug, service og vedligeholdelse af produktet er indeholdt i den medfølgende brugervejledning.

ADVARSEL: (WARNING) Med henblik på at reducere risikoen for brand eller elektrisk stød, må produktet ikke udsættes for regn eller fugt.

FORSIGTIG: (CAUTION) Installation af dette produkt skal foretages af en autoriseret installatør og skal være i overensstemmelse med alle anvendelige lokale retningslinier.

Modifikationer samt alternativt udstyr beskrevet i denne brugervejledning er kun henvendt til kvalificerede installatører og servicepersonale.

VEILIGHEIDSINFORMATIE

De woorden **WAARSCHUWING** (WARNING) en **VOORZICHTIG** (CAUTION) welke in de handleiding en op het apparaat voorkomen, waarschuwen U voor belangrijke veiligheidsinformatie. Zij hebben de volgende betekenis:

WAARSCHUWING: (WARNING) De betreffende informatie waarschuwt U voor omstandigheden die kunnen leiden tot defecten of beschadigingen aan apparaten als de instructies niet volledig worden opgevolgd.

VOORZICHTIG: (CAUTION) De betreffende informatie instrueert U hoe U defecten aan apparatuur kunt voorkomen of hoe U omstandigheden kunt vermijden die kunnen resulteren in schade als de juiste stappen niet worden opgevolgd.

Produkt informatie en handleiding hanteren onderstaande internationaal erkende symbolen om veiligheidsinstructies aan te geven.

De bliksemschicht in een driehoek wordt gebruikt om de gebruiker te attenderen op ongeïsoleerde "gevaarlijke spanning" in het apparaat of bij de aansluitklemmen, die het risico van een electrische schok kunnen geven.

Het uitroepteken in een driehoek wordt gebruikt om de gebruiker te attenderen op belangrijke installatie, gebruiks- en onderhoudsinstructies in de beschrijving die bij het apparaat hoort.

WAARSCHUWING: (WARNING) OM HET RISICO VAN BRAND OF EEN ELECTRISCHE SCHOK TE VERMIJDEN DIENT U HET APPARAAT NIET AAN VOCHT BLOOT TE STELLEN.

VOORZICHTIG: (CAUTION) Installatie van dit apparaat dient te geschieden door gekwalificeerd personeel en dient te geschieden conform de plaatselijke voorschriften.

Modificaties en aanvullende informatie waar in de handleiding naar wordt verwezen, dient alleen voor gebruik door gekwalificeerd personeel.

TURVALLISUUSTIEDOTE

Sanat **VAROITUS** (WARNING) ja **HUOMIO** (CAUTION), jotka esiintyvät manuaalissa ja itse laitteessa, ilmoittavat tärkeästä turvallisuusinformaatiosta. Näillä sanoilla on seuraava merkitys:

VAROITUS: (WARNING) Yhteydessä oleva informaatio varoittaa olosuhteista, jotka saattavat johtaa vakaviin vammoihin tai laitteen vaurioitumiseen, mikäli ohjeita ei täysin noudateta.

HUOMIO: (CAUTION) Yhteydessä oleva informaatio neuvoo, miten laitteen vaurioituminen voidaan ehkäistä tai miten voidaan välttää olosuhteet, jotka voivat johtaa lieviin vammoihin, mikäli ohjeita ei noudateta.

Tuotteessa tai käyttöohjeessa voidaan käyttää seuraavia alla määriteltyjä kansainvälisiä symboleja, jotka viittaavat turvallisuusinformaatioon.

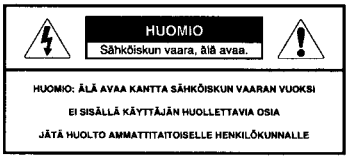
Kolmion sisällä olevan nuolipäinen salama varoittaa käyttäjää laitteen sisällä tai liitännöissä olevasta eristämättömästä vaarallisesta jännitteestä, joka saattaa olla tarpeeksi suuri aiheuttaakseen sähköiskun vaaran.

Kolmion sisällä oleva huutomerkin tarkoituksena on ilmoittaa käyttäjälle tärkeistä asennusta, käyttöä tai huoltoa koskevista ohjeista laitteen mukana seuraavassa kirjallisuudessa.

VAROITUS: (WARNING) ÄLÄ ALTISTA LAITETTA SATEELLE TAI KOSTEUDELLE TULIPALON JA SÄHKÖISKUN VAARAN VUOKSI.

HUOMIO: (CAUTION) Laitteen asentaminen tulisi jättää ammattitaitoisen henkilön suoritettavaksi ja asennuksessa tulee noudattaa kaikkia paikallisia säännöksiä.

Tässä manuaalissa oleva informaatio, joka koskee muutostöitä ja lisälaitteita, on tarkoitettu vain ammattitaitoisten asennus- ja huoltohenkilöiden käyttöön.



SIKKERHETS INFORMASJON

Når ordene **ADVARSEL** (WARNING) og **VIKTIG** (CAUTION) blir brukt i manualen og på produktet, gjelder det informasjon som har med brukerens sikkerhet å gjøre. Ordene har følgende mening:

ADVARSEL: (WARNING) Tilhørende informasjon viser til forhold som kan resultere i alvorlige skader eller ødeleggelser hvis anvisningene ikke følges nøye.

VIKTIG: (CAUTION) Tilhørende informasjon forteller deg hvordan du skal unngå feil på utstyret, eller unngå situasjoner som kan resultere i mindre skader.

Produkt merkingen og bruksanvisningen bruker internasjonale symboler for å merke punkter som er viktige for brukerens sikkerhet.

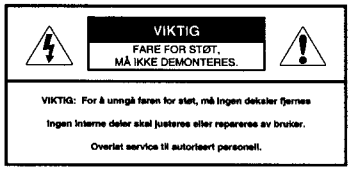
Lynet i en triangel advarer brukeren om uisolert "farlig spenning" inne i apparatet, eller tilkoblings terminaler som kan gi støt.

Etter utropstegnet i en triangel følger informasjon som er viktig når det gjelder installasjon, bruk og vedlikehold (service) av apparatet.

ADVARSEL: (WARNING) FOR Å REDUSERE FAREN FOR BRANN ELLER STØT MÅ APPARATET IKKE UTSETTES FOR VANN ELLER FUKTIGHET.

VIKTIG: (CAUTION) Installasjon av apparatet skal foretas av autorisert installatør etter gjeldende forskrifter.

Modifikasjoner og tilleggs informasjon som følger er kun for kvalifiserte installatører eller service personell.



SÄKERHETS INFORMATION

Orden **VARNING** (WARNING) och **OBSERVERA** (CAUTION) vilka används i denna manual och på apparaten, är menade att uppmärksamma viktig säkerhets information. Dessa ord har följande betydelse.

VARNING: (WARNING) Information som uppmärksammar på omständigheter som kan resultera i allvarlig personskada eller skada på egendom om instruktionerna ej följs.

OBSERVERA: (CAUTION) Information som uppmärksammar på instruktioner om hur skada på utrustning eller hur situationer där lättare personskador kan uppstå undvikes.

Följande internationellt använda ord och symboler används i handboken och på märkningar på produkten för att uppmärksamma användare på viktiga säkerhets instruktioner.

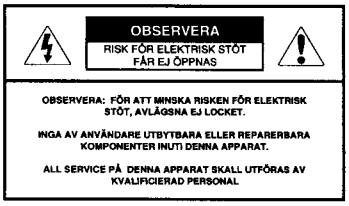
En blixt med pil, innesluten i en triangel, menad att uppmärksamma användare på närvaron av oisolerade "farliga spänningar" i apparaten eller på anslutnings kontakter vilka har tillräcklig styrka för att medföra risk för elektrisk söt.

Ett utropstecken, innesluten i en triangel, menad att uppmärksamma användare på viktiga installations, handhavande eller underhålls-instruktioner i medföljande dokumentation.

VARNING: (WARNING) FÖR ATT MINSKA RISKEN FÖR BRAND ELLER ELEKTRISK STÖT, UTSÄTT EJ APPARATEN FÖR FUKT ELLER VÄTSKA.

OBSERVERA: (CAUTION) Installation av denna apparat skall utföras av kvalificerad installatör samt enligt alla gällande lokala bestämmelser.

Eventuella modifierings instruktioner och annan information av teknisk art i denna manual är endast avsedd att användas av kvalificerad installations och service personal.



ΠΛΗΡΟΦΟΡΙΕΣ ΑΣΦΑΛΕΙΑΣ

Οι λέξεις **ΚΙΝΔΥΝΟΣ** (WARNING) και **ΠΡΟΣΟΧΗ** (CAUTION) που αναφέρονται μέσα στο εγχειρίδιο και στη συσκευή, επικεντρώνουν την προσοχή σε σημαντικές πληροφορίες ασφαλείας. Οι λέξεις αυτές έχουν την παρακάτω σημασία.

ΚΙΝΔΥΝΟΣ : (WARNING) Η αναγραφόμενη πληροφορία επιστά την προσοχή σας σε καταστάσεις που θα μπορούσαν να έχουν σαν αποτέλεσμα σοβαρό τραυματισμό ή καταστροφή της ιδιοκτησίας αν οι οδηγίες δεν ακολουθηθούν κατάλληλα.

ΠΡΟΣΟΧΗ : (CAUTION) Η αναγραφόμενη πληροφορία σας καθοδηγεί πώς να προλάβετε καταστροφή του εξοπλισμού ή πώς να αποφύγετε καταστάσεις που θα μπορούσαν να έχουν ως αποτέλεσμα μικροτραυματισμούς αν δεν ακολουθηθούν τα σωστά βήματα.

Στις επιγραφές των προτόντων και στο εγχειρίδιο λειτουργίας, χρησιμοποιούνται τα σιεθνώς αναγνωρισμένα σύμβολα, των οποίων ο ορισμός δίνεται παρακάτω έτσι ώστε να υπογραμμιστούν τα μηνύματα ασφαλείας.

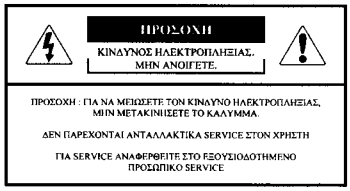
Η φωτεινή αναλαμπή με σύμβολο το βέλος, μέσα στο τρίγωνο, έχει σκοπό να επιστήσει την προσοχή του χρήστη, στην ύπαρξη μη- μονωμένης « επικίνδυνης ισχύος ρεύματος » στο εσωτερικό της συσκευής ή στις άκρες σύνδεσης οι οποίες μπορεί να έχουν αρκετό μέγεθος ώστε να περιέχουν κίνδυνο ηλεκτροπληξίας.

Το επεξηγηματικό σημείο, μέσα στο τρίγωνο, έχει σκοπό να επιστήσει την προσοχή του χρήστη στις σημαντικές οδηγίες εγκατάστασης, λειτουργιας και συντήρησης (service) που περιέχονται στα φυλλάδια που συνοδεύουν την συακευή.

ΚΙΝΔΥΝΟΣ : (WARNING) Για να αποφύγετε τον κίνδυνο φωτιάς ή ηλεκτροπληξίας, μην εκθέτετε αυτή τη αυσκευή σε βροχή ή σε υγρασία.

ΠΡΟΣΟΧΗ : (CAUTION) Η εγκατάσταση αυτής της συσκευής θα πρέπει να γίνει από εξειδικευμένο άτομο και θα πρέπει να προσαρμόζεται σε όλους τους εφαρμόσιμους τοπικούς κώδικες.

Οι τροποποιήσεις και οι προϋποθετικές πληροφορίες για τον εξοπλισμό, που αναφέρονται σε αυτό το εγχειρίδιο, προορίζονται για χρήση μόνο από εξειδικευμένα στην εγκατάσταση και στο service, άτομα.



INFORMAÇÃO SOBRE SEGURANÇA

As palavras ADVERTÊNCIA (WARNING) e PRECAUÇÃO (CAUTION) neste manual, e no dispositivo, alertam para importantes informações sobre segurança. Estas palavras significam o seguinte:

ADVERTÊNCIA : (WARNING) Informação relacionada que alerta sobre condições que poderão resultar em lesões sérias ou prejuízo, se as instruções não forem seguidas adequadamente.

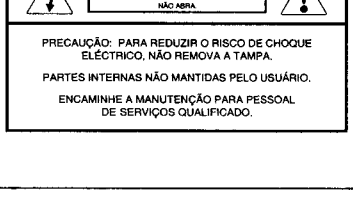
PRECAUÇÃO : (CAUTION) Informação relacionada que instrúi como prevenir danos no equipamento ou como evitar condições que poderão resultar em lesões leves, se os passos não forem seguidos adequadamente.

As etiquetas do produto e do manual de operações podem usar os símbolos internacionalmente reconhecidos definidos abaixo para advertir mensagens de segurança.

símbolo do relâmpago com uma seta, dentro de um triângulo, tem o fim de alertar o usuário a presença de "voltagem perigosa" sem isolação dentro da caixa isolamento do aparelho ou nos terminais de ligação que podem ter a magnitude suficiente que constitui um risco de choque eléctrico.

ponto de exclamação, dentro de um triângulo, tem o fim de alertar o usuário sobre instruções importantes de instalação, operação e manutenção (serviços) na literatura que acompanha o aparelho.

ADVERTÊNCIA : (WARNING) PARA REDUZIR O RISCO DE INCÊNDIO OU CHOQUE ELÉCTRICO, NÃO EXPONHA ESTE APARELHO A CHUVA OU HUMIDADE.

PRECAUÇÃO : (CAUTION) A instalação deste aparelho deve ser feita por um profissional qualificado e deve obedecer a todos os códigos locais aplicáveis.

Modificação e informação sobre equipamento adicional citados neste manual são para o uso exclusivo do pessoal qualificado de instalação e manutenção.