BROADCAST tools INC

Installation and Operation Manual

AVR-8

Alarm Voice Response & Remote Control

Firmware version 1.10 and above

Manual update 02/11/2004

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INTRODUCTION

Thank you for your purchase of the Broadcast Tools® AVR-8, Alarm Voice Response and Remote Control, which we will refer to through out the manual as the AVR-8. We're confident this product will give you many years of dependable service. This manual is intended to give you all the information needed to install and operate the unit.

SAFETY INFORMATION

Only qualified personnel should install Broadcast Tools® products. Incorrect or inappropriate use and/or installation could result in a hazardous condition.

WHO TO CONTACT FOR HELP

If you have any questions regarding your product or you need assistance, please contact your distributor from whom you purchased this equipment.

If you would like more information about Broadcast Tools® products, you may reach us at:

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THANK YOU FOR CHOOSING BROADCAST TOOLS® BRAND PRODUCTS!

CAUTION!

Broadcast Tools® Products, as with any electronic device, can fail without warning. Do not use this product in applications where a life threatening condition could result due to failure.

NOTE:

This manual should be read thoroughly before installation and operation.

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PRODUCT DESCRIPTION

The AVR-8 is a voice remote control system that automatically reports changes detected on any one of its eight digital inputs to a remote telephone and/or pager. After speaking a greeting message that may identify the source of the call, the AVR-8 then speaks a unique message for each input change. Each message comes factory programmed, but may easily be re-recorded with your own customized messages. After reporting, the AVR-8 is ready to receive commands through your telephone keypad. Functions include telling the AVR-8 to report on the input state of any of the eight digital inputs, commanding the AVR-8 to pulse any one of its four SPDT relays for 750 ms and/or turning any one of the relays on or off. When a relay command is given, the AVR-8 speaks the relay 'name' followed by the 'on' or 'off' message. For instance, commanding relay 4 on causes the AVR-8 to turn the relay on and then report "Relay 4 ... is on." As with the greeting and input messages, the relay 'name', 'on' and 'off' messages may be re-recorded if desired.

In addition to initiating a call out when inputs change, the AVR-8 monitors its telephone line to receive a call-in from a remote location. When a call is received, the AVR-8 speaks a greeting message, and is then ready to receive and execute commands to report on its inputs, or change to its relay outputs.

APPLICATIONS

Silence Monitor III alarm notification, Tower Light malfunction and/or operation, Transmitter site and Studio security/burglar/fire/equipment alarm notification, Inexpensive remote control system, Remote reset of file server computers, Station ID playback, PA system announcing or Store Casting.

INSPECTION

Please examine your AVR-8 carefully for any damage that may have been sustained during shipping. If any is noted, please notify the shipper immediately. Retain the packaging for inspection by the shipper. The package should contain the AVR-8, this manual, 7 foot modular cable and the 12 VAC @ 1 Amp transformer.

PROGRAMMING

To program the AVR-8, follow the instructions below. Remove the top cover and locate the modular RJ-11 jack in the left top corner of the circuit board. Plug in a standard TT telephone into the programming RJ-11 jack. Press the program button followed by the address of the desired operation followed by the data to be stored or the message to be recorded followed by pressing the program button. For example, to program a dial out number of 8540808 in the number 1 slot: Press the program button, enter 118540808 and press the program button again. When the program button is pressed the green PWR led will blink to confirm that it has been placed in program mode.

Dial Out Numbers/Messages	**Keypad entry**
Dial out number **(1)**	11nnnnnnnnnnnnnnn
Example:	**1113608549559**
Dial out number **(2)**	12nnnnnnnnnnnnnnn
Example:	**125551212**
Dial out number **(3)**	13nnnnnnnnnnnnnnn
Example:	**1315415551111**
Dial out number **(4)**	14nnnnnnnnnnnnnnn
Example:	**1417605551234**
Dial out number (5)	15nnnnnnnnnnnnnnn
Example:	**155415559876**
Dial out number (6)	16nnnnnnnnnnnnnnn
Example:	**1619545553418**
Dial out number (7)	17nnnnnnnnnnnnnnn
Example:	**175554321**
Dial out number (8)	18nnnnnnnnnnnnnnn
Example:	**1812025555678**
Pager Dial out (9)	21nnnnnnnnnnnnnnnnnnnnnnnnnnnnnnn
Example:	**2118007597243***123456789#**
Pager Data	22nnnnnnnnnnnnnnn
Example:	**22**9876#**
Security Code	23nnnnnnnnn (Default 123)
Example:	**232580**

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PROGRAMMING

Repeat, Lap, Ring	24rlp (Ring) (program all three at once, single digits 1-9)
Example:	**24342**
Input 1 Dial List	31nnnnnnnnn
Example:	**31915** (When input 1 changes state, the AVR-8 will dial the pager number stored in location 21 followed by the paging data stored in 22, then dial out in sequence the phone number stored in location 11, then location 15)
Input 2 Dial List	32nnnnnnnnn
Example:	**321347** (When input 2 changes state, the AVR-8 will dial the number stored in location 11, then the numbers in 13, 14 and 17)
Input 3 Dial List	33nnnnnnnnn
Example:	**335** (When input 3 changes state, the AVR-8 will dial the number stored in location 15.
Input 4 Dial List	34nnnnnnnnn
Example:	**349** (When input 4 changes state, the AVR-8 will dial the pager number stored in 21 followed by the paging data stored in 22.
Input 5 Dial List	35nnnnnnnnn
Example:	**3578** (When input 5 changes state, the AVR-8 will dial the number stored in location 17, then the number in 18)
Input 6 Dial List	36nnnnnnnnn
Example:	**3692** (When input 6 changes state, the AVR-8 will dial the pager number stored in 21 followed by the paging data stored in 22, then the number stored in 12)
Input 7 Dial List	37nnnnnnnnn
Example:	**37345** (When input 7 changes state, the AVR-8 will dial the number stored in location 13, then the number in 14, and 15)
Input 8 Dial List	38nnnnnnnnn
Example:	**382** (When input 8 changes state, the AVR-8 will dial the number stored in location 12.)

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PROGRAMMING

To record a voice message to be associated with relay number one: press the program button, 41; the record led will turn on. Then speak your message into the telephone and press the program button when done.

Messages	Keypad entry	Time (Seconds)
Relay 1 Description	41 (Record Relay Message)	4.2
Example:	41 **"Microwave transmitter"**	
Relay 2 Description	42 (Record Relay Message)	4.2
Example:	42 **"Building light"**	
Relay 3 Description	43 (Record Relay Message)	4.2
Example:	43 **"Security System"**	
Relay 4 Description	44 (Record Relay Message)	4.2
Example:	44 **"Surveillance Camera "**	
On	45 (Record Closed Message)	4.2
Example:	45 **"Is on"**	
Off	46 (Record Open Message)	4.2
Example:	46 **"Is off"**	
Input 1 Description	51 (Record Input Message)	7.2
Example:	51 **"Right channel Silence"**	
Input 2 Description	52 (Record Input Message)	7.2
Example:	52 **"Left Channel Silence"**	
Input 3 Description	53 (Record Input Message)	7.2
Example:	53 **"Generator"**	
Input 4 Description	54 (Record Input Message)	7.2
Example:	54 **"Transmitter door"**	
Input 5 Description	55 (Record Input Message)	7.2
Example:	55 **"Plate voltage"**	
Input 6 Description	56 (Record Input Message)	7.2
Example:	56 **"AC power"**	
Input 7 Description	57 (Record Input Message)	7.2
Example:	57 "Tower lights normal"	
Input 8 Description	58 (Record Input Message)	7.2
Example:	58 **"Tower lighting alarm"**	
Greeting Message	59 (Record Sign on Message)	7.2
Example:	59 **"KKFS Transmitter site monitor, enter your password after the tone"**	

Restoring to factory defaults:

Hold down both the RST and PGM buttons. Release the RST button first and then the PGM button a second or two later.

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INSTALLATION

Installation of the AVR-8 in high RF environments should be performed with care. Shielded cable is suggested for all control, audio inputs and outputs. All shields should be tied to the EGND terminals. The station ground should be connected to the chassis ground screw located on the far right side of the AVR-8 as viewed from the rear. It is recommended that all cables connected to the AVR-8 be looped through ferrite cores to suppress RF. Surge protection with RF filtering such as the Tripp Lite "ISOBAR 4 or 6" is also suggested for the wall transformer. The purchase of an inexpensive UPS will provide back-up power in case of a power outage.

INPUTS

Note: The 5-vdc TTL/CMOS compatible inputs are configured as a divider. A low input must be between 0 and + .6vdc, while a high must be between + 4.00 and + 5.00 vdc. This should help in noisy (RF, etc) environments.

Function	Terminal A	Terminal B	JP-A	JP-A	JP-B
Optically Isolated Dry Contacts	Ground	Cathode of Opto-Isolator	1 & 2	3 & 4	2 & 3
Optically Isolated Wet Contacts	Anode of the Opto-Isolator	Cathode of the Opto-Isolator	2 & 3		2 & 3
TTL/CMOS compatible 5 volt logic	Ground	Logic input with pull-ups	1 & 2	3 & 4	1 & 2

The eight inputs can be set up to be either normally open or normally closed. Upon power up or by pressing the reset button, the state of the inputs will be read and accepted as the normal non-alarm state. When any particular input changes state, it will be considered an alarm and initiate a call out. The AVR-8 will then look at the call-out list associated with the alarmed input and begin calling the first number on the list. If you want that input to first call a pager then be sure to list "9" first in your call out list. For example, if you want a page to be called out and then call number 1 on the dial out list for input 5 then program 91 into the input 5-dial list. The first number will be called on the dial list and the alarm message will be played the number of times that is programmed into the "repeat" memory. If there is no acknowledgment the AVR-8 will go on to the next number and so on until all numbers stored in that inputs dial list have been called. This process will then be repeated for the number of times stored in the "lap" memory. The repeat and lap memories are global and are the same for all inputs.

NOTE:

All inputs must be equal to or greater than 100ms in duration.

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To acknowledge an input alarm you must enter the "*" key when called. You will hear a beep and the AVR-8 will hang up. Once an input has been acknowledged a new alarm will be generated if that input goes back to its normal state and returns again to its alarm state. No new alarm will be generated if it stays in its alarm state.

If you have designated inputs 7 and 8 to be used to monitor tower lighting conditions by using DIP switches 7 and/or 8, then these inputs will be inactive as far as normal alarm call outs.

PAGING

Save your pager number in location 21 and the data you want to send in location 22. Use the "*" key to program a wait period of 3 seconds. For example, if you want to call a pager with a number of 543-1234, wait 6 seconds after dialing and then send 1234 to identify the source of the page, press the program button, enter 215431234 and press the program button again. Next, press the program button and enter 22**1234 and the program button again. The "*" can be used in either the pager calling number or the pager data string. There is space for 32 characters for the pager number, waits and access codes and 16 characters for the pager data. The AVR-8 will automatically append the number of the input to the beginning of the data string after any initial "*" wait characters. This allows you to identify on your pager which input generated the alarm. For example, if input 5 caused an alarm and your pager data is 22**1234, as in the above example with two "*" wait periods, the AVR-8 will dial the pager number, wait six seconds then send 51234. A "9" must be programmed in the Dial List in order to cause a pager to call out.

ALARMS

When an alarm is generated, the AVR-8 will call the first number on the call out list, play the message and wait for a DTMF "*" as an acknowledgment. If no "*" is received it will hang up and call the other numbers on the calling list. Once an alarm has been acknowledged it will beep and remain off hook for relay control or input/output polling. If another alarm is generated while it is off hook, the AVR-8 will wait until the current session is finished and the call is disconnected and will then dial out the new alarm. The call will be disconnected after the calling party hangs up and the "wink" is received from the central office or after the time-out, if operating on a PBX and the 1-minute time-out option is selected on DIP switch number 6.

CONTROLLING RELAYS

There are four relays that can be turned on and off by calling the AVR-8. Call the AVR-8, it will answer and play the sign-on message. Enter your access (security) code. You can now control relays and poll inputs and outputs and listen to any audio on the balanced audio input. To turn a relay on, enter the relay number, 1-4 followed by a (*). To turn it off, enter 1-4 and #. The message associated with that relay will be played, followed by the "ON" message or the "OFF" message. To trigger the output with a momentary pulse (750ms) enter the relay number 1-4 followed by "0"

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POLLING

Relays: Enter the relay number followed by "9". The relay message followed by "ON" or "OFF" will be spoken.

Inputs: Enter the input number followed by "8". The input message will be spoken, followed by "ON" or "OFF" depending on the current state of the input. If the input is normally closed and it is in an open state when you poll, it will respond with "ON". If it is normally open and is closed when you poll it, the respond will speak "ON".

MONITORING THE AUDIO INPUT

To monitor audio on the balanced input, the AVR-8 must first have been unlocked by entering the access (security) code. Then enter 77. The audio will be un-muted for about 6 seconds.

OPEN COLLECTOR OUTPUTS

The following are Open Collector outputs that go active low:

Tone	When any valid DTMF tone is detected.
Alarm	When any alarm input is activated. It will stay low until the alarm is acknowledged.
Access	When a valid access (security) code has been received.
Ring	When a ring signal is detected on the phone line.
Off Hook DC low	This is the same output that drives the hook relay. There will be about 15 volts DC present on this pin when on-hook. It will go active when in an off-hook state.

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INSTALLATION - continued

Status LED's

K1 - K4 are four red LED's that correspond to the four relays. They will be on when any of the relays are activated.

HK - Yellow Hook LED. On when the hook relay is off-hook.

REC - Red Record LED. Is turned on when recording voice messages.

ALM - Red Alarm LED. It is on as long as there is an unacknowledged alarm input.

TONE - Red tone present LED. It is on as long as there is a valid DTMF tone detected.

VAL - Red Valid Access LED. It is on after a valid access (security) code has been received.

RNG - Red Ring LED. It turns on when a ring signal is detected on the phone line.

PWR - Green Power and Status LED. It will turn on when the AVR-8 is powered. It will blink when in program mode and will turn off when playing or recording voice messages.

STORE CASTING

The Store Casting mode is set by turning on DIP switch number 1. In this mode, the message associated with an input will play whenever that input is closed. Alarms will not be generated. One message is played for each transition of the input. All four relays close when a message is played, which may be used as an audio switch between the normal programming and the output of the AVR-8.

SPECIAL FUNCTION RELAY CONTROL

If DIP switch number 2 is turned on, the relays become single digit momentary. For example, as long as the DTMF digit 1 is being received, relay 1 will stay on. Voice message responses are not generated in this mode, neither can inputs be polled.

If DIP switch number 3 is turned on, the relays become interlocking with relay 1 on as default on power up or reset. In this mode only one relay is on at a time. Pressing a 2, for example, will turn off relay 1 and latch on relay 2. The number 5 will turn off all relays and play the "off" message. Normal voice message responses are not generated in this mode, neither can inputs be polled. Relays can be polled, but since single digits are used to activate a relay, the act of polling it will also turn it on. For example, if you enter 19 to poll relay one, the 1 will select relay one and the 9 will poll it to confirm that it is on.

If DIP switch number 4 is turned on, the relays become trailing edge 750ms pulses. The relay will not turn on until the end of the DTMF digit. Voice message responses are not generated in this mode, neither can inputs be polled.

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INSTALLATION

If DIP switch number 5 is turned on, a beep will be added after each of the above relay commands, except in the case of the trailing edge relay, in which case, the beep will be placed between the DTMF tone and the pulsed relay.

If DIP switch number 6 is turned on, the 1-minute timer will hang up the line if no touch-tone issued within the 1 minute. This would be used if no CPC or the AVR-8 were used behind a PBX. Note: 99* will hang up the AVR-8 with this switch OFF or ON.

TOWER LIGHT MONITORING

DIP Switches 7 and 8 are used to set a time-out value for tower light monitoring. If 7 & 8 are off, then this function is disabled and the inputs can be used the same as the others. If either 7 or 8 are on, then these inputs are dedicated to the tower light monitoring function. Input 7 is used to input day/night information from a photo detector, and input 8 is used to input whether the tower lights are on or off. When a photo detector senses a night condition, the output contacts should be connected between ground and input 7 so that it is brought low when in a night condition. This starts a timer that is set by using the settings of DIP switches 7 & 8 as follows:

7	**8**	
0	0	OFF
0	1	10 minutes
1	0	20 minutes
1	1	30 minutes

When a closure is sensed on input 7, the timer will begin counting. After the assigned time out period has expired, the AVR-8 will look at input 8. If input 8 is closed, then the tower lights are considered to be on, and everything is normal. In this case, the AVR-8 will call the call-out list for input 7 and play the message associated with input 7. This should be something like: “Tower lights operating normally”. If input 8 is not closed, then an alarm will be called out using input 8's call-out list and message. Something like: “Tower lights are off” should be recorded for input 8.

DIP Switch Settings

1 - Store Casting mode
2 - Single Digit Momentary
3 - Interlocking
4 - Trailing Edge 750 ms pulse
5 - Acknowledgment Beep
6 - One-minute hang-up timer
7 - Tower light monitoring bit 1
8 - Tower light monitoring bit 0

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CONNECT YOUR EQUIPMENT

The AVR-8 interfaces to your equipment through the rear panel screw terminals. Follow the legends for the desired relays, inputs, open collectors and audio input and output connections, which appear on the lip of the printed circuit board. Remove each screw terminal, strip each conductor and insert the conductor into the terminal and screw down the capture screw. The terminals accommodate wire sizes from 18 - 28 AWG solid or stranded wire.

MOUNTING

Mount the unit in a rack, rack panel, shelf or desktop, allowing adequate airflow for cooling. The optional RM-2 & RM-3 are available for this use.

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SPECIFICATIONS

Control:	Flash Microprocessor, non-volatile memory
Relays:	SPST contacts, 30 Vdc @ 1 Amp with LED indicators.
Digital inputs:	Momentary or sustained, optically isolated (5 to 28 vdc) or 5 volt CMOS/TTL compatible inputs, open collector or contact closures to ground.
Open Collectors:	15 vdc @ 100ma.
Balanced audio output:	From telco, 0dbu @ 100 ohms
Balanced audio input:	To telco, -20 to +18dbu @ 10K ohm.
Telephone Line Connector:	RJ-11C. Cable supplied
Programming Phone Connector:	RJ-11C.
Connectors:	Screw terminals.
FCC registration:	Complies with FCC parts 15 & 68. Reg # BRDUSA-36042-OT-T
Canadian registration:	Complies with Industry Canada CS-03 Part 1. Reg # 3929-11388A
Ringer equivalence:	0.4B
Power:	12 Vac @ 1 Amp. /w Green LED. 2.1mm, coaxial. Wall transformer supplied. CE 220 Vac Optional.
Size:	7.75" x 4.00” x 1.25", Aluminum Chassis w/ 4 – 6-32 mounting holes
Weight:	2.0 lb.
Options:	RM-3, Rack Shelf. 1 RU or RM-2, Rack Panel. 3 RU

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LIMITED WARRANTY

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Broadcast Tools warrants to each Buyer of any item manufactured by Broadcast Tools that the item will be free from defects in materials and workmanship at the time it is shipped by Broadcast Tools if the item is properly installed, used and maintained.

EXCLUSIVE REMEDIES

If Broadcast Tools is notified, in writing, of a failure of any item manufactured by Broadcast Tools to conform to the foregoing Limited Warranty within one (1) year following the date of the Buyer's acquisition of the item, and if the item is returned to Broadcast Tools in accordance with Broadcast Tools' instructions for confirmation by inspection of the defect (which at Broadcast Tools' election may include, without limitation, a requirement that the Buyer first obtain a Return Authorization number from Broadcast Tools, that the Buyer furnish proof of purchase in the form of an invoice and/or receipt, and that the Buyer prepay all freight charges associated with any return of the item to Broadcast Tools using such freight service as Broadcast Tools reasonably may specify), Broadcast Tools will repair or replace the defective item, or will refund the purchase price paid by the Buyer for the item. Broadcast Tools shall have the exclusive right to choose between these alternative remedies.

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