Vaux Electronics, Inc.

Aris MediaMation System

510/520 Series Owner's Manual

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Introduction

Thank you for selecting a Vaux Aris MediaMation System. These systems have been designed for the utmost in performance and reliability. There are currently two models in the Aris MediaMation System family:

AR-510A	8-source by 8-zone, audio-only, IR-Learning, IR and RS-232 control
AR-520A	8-source by 8-zone, audio-only, IR-Learning, RF, IR and RS-232 control

Each of the systems provides high-fidelity stereo line-level switching, zoned volume/bass/treble/muting, programmable min/max/mute/initial-volumes, and other customizable features. The systems may be controlled using infrared remote controls, keypads, and/or RS-232 serial control from a computer or other control system (e.g. AMX, Crestron…). The source inputs are driven from any line-level source, while the volume-controlled zone outputs connect to power amplifiers for each stereo zone. In the case of video options, the video switching is line-level composite video, for NTSC or PAL systems.

Matrix Switching and Zone Expansion

The Aris MediaMation System is a multi-source/multi-zone audio (or audio/video) distribution and control system. An Aris system allows multiple audio (or audio/video) sources to be routed to multiple zones (one or more rooms). Each zone of the system has independent control over source-selection, volume/bass/treble levels, muting, etc.

Multiple Aris MediaMation Systems may be combined to expand the number of zones. For example, two 8x8Aris AR-520A switchers may be use to provide an 8-source by 16-zone system. The units are simply programmed to respond to different "Base-Zones," (1 and 9) allowing contiguous zone numbers from 1 to 16. A Vaux system may expand this way to a total of 255 zones. The audio sources may simply use "Y-cables" to split to two or three Aris inputs, or a "Distribution-Amp" (DA) may be used to buffer each source for driving multiple Aris MediaMation Systems. For video sources (e.g. using an Aris video option), a DA is mandatory to maintain proper 75-ohm video line impedance.

You may also mix and match Aris switchers to provide different features. For example, an 8x8 audio-only AR-510A may be combined with an 8x8 audio/video AR-510A-44C, providing eight sources by sixteen zones (eight of these zones have video).

IR and RF Remote Control and Keypad Operation

Aris MediaMation Systems may be operated by hand-held Vaux RC-8 infrared (IR) remote controls. The Aris model AR-520A may also be operated using a radio-frequency version of the remote, the RC-8-RF. The remote controls allow selection of A/V source, adjustment of each zone's Volume/Bass/Treble levels, infrared (IR) source control, Macros, X10 lighting, as well as some system setup functions. The Vaux RC-8 remote control is easily programmed to control one specific numbered zone – the remote's zone number may easily be changed to move the remote to a different room. IR control from multiple rooms will require a wired or wireless IR-Repeater system, which uses IR sensors in each room. The Vaux RC-8-IR remote may also be used to teach the Vaux control codes (for one zone) to a third-party hand-held "learning" remote. Vaux programmable keypad systems may also be used to control Aris systems. Additionally, third-party IR-learning keypads may also be employed, using a Vaux RC-8-IR remote to teach the Aris commands to the keypad.

Computer Control Systems

The Aris MediaMation System may be completely controlled by an attached computer, or other control system (such as AMX or Crestron) which communicates over a serial, RS-232 connection. The host computer has complete control over A/V zone switching, volume/bass/treble levels for each zone, etc. The Aris system sends messsages to the control system confirming actions for not only RS-232 commands, but also for RF-, IR-, or keypad-generated commands, closing the loop on the whole system. The control system may optionally poll periodically for system status, or may simply ignore messages for a basic command-only interface. Serial communication uses the VauxProtocol standard, presented later in this manual.

Aris MediaMation System Front Panel
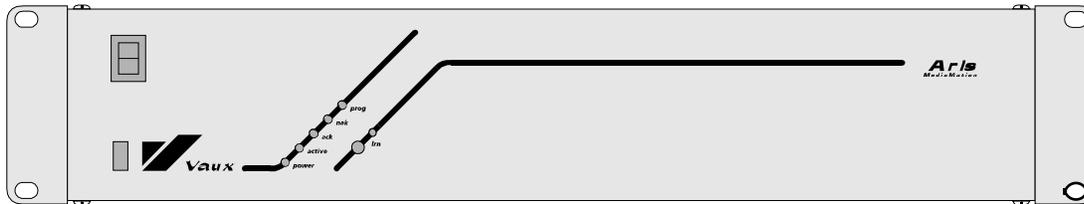
Power Switch
Infrared Contol Sensor (below switch, left of logo)
Power light
Active light (one or more zones on)
Ack light (acknowledge)
Nak light (negative acknowledge)
Prog light (programming)
Lrn light and sensor (IR Learning target)

Aris MediaMation System (AR-520A-88C) Rear Panel
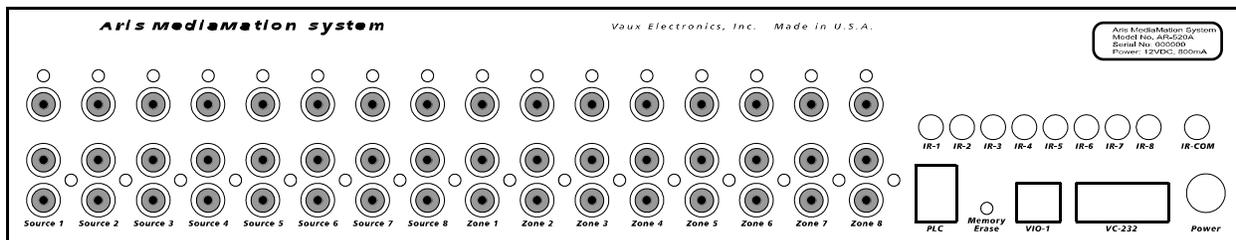
Audio/Video Source Inputs (phono jacks) Ñ 8 input sources for line-level stereo audio and composite video.
Audio/Video Zone Outputs (phono jacks) Ñ 8 output sources for line-level stereo audio and composite video.

The audio outputs are volume/bass/treble/mute controlled within the Aris MediaMation System and connect to zone power amplifiers (sized appropriately for each zone).
Memory-Erase button. Careful Ñ will restore all factory settings, etc.
VC-232 connector (9-pin DB-9-F) RS-232 serial control port. Keypad Hubs also connect to this port.
VIO-1 connector (6P6C) Future use.
VC-Exp connector (6P6C) Future use.
Power connector (2.1mm connector, auto-polarity) For 12 VDC, 500mA adapter.
Antenna jack (Phono) RF remote control receive antenna.
IR-1 to IR-8 Infrared Emitter jacks (3.5mm mono)
IR-Common jack (3.5mm mono) and indicator light.

Parts Checklist

When unpacking your Aris system, ensure that you have received the following:
- Aris MediaMation System (AR-510A or AR-520A)
- 12 VDC, 500 mA AC Adapter
- Owner's Manual

Other components you may need:
- Vaux RC-8-IR infrared remote control(s)
- Vaux RC-8-RF infrared remote control(s) (AR-520A only)
- Infrared repeater system
- Keypad control system
- Source components, zone power amplifiers, speakers
- Audio/Video connecting cables
- RS-232 connecting cable
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Installation

The Aris MediaMation System is quite flexible, in that it can integrate with a variety of A/V devices and control systems, and may be configured a variety of ways. Installation of the Aris MediaMation System is described below:

1. System Power: Place the Aris MediaMation System near your audio/video components. Turn off the Aris front panel switch and plug the AC power adapterÕs cable into the rear panel Power connector on the Aris MediaMation System. Plug the adapter into a standard electrical outlet Ñ select an outlet which is not controlled by a wall switch.

2. Optional Connection of Vaux Wired Keypads: If you are installing Vaux wired keypads, plug the Vaux Data cable from the keypad connecting hub into the VC-232 connector.

3. Optional IR Input from Repeater Systems or Keypads: <u>Affix an IR emitter on the front-panel sensor.</u>

4. Optional RS-232 Computer or Control System Connection: Connect your computer or control system, using a properly wired RS-232 cable, to the 9-pin VC-232 connector on the rear panel of the Aris MediaMation System. For more information on the VC-232 interface, refer to a later manual section.

5. Connection of A/V Source components: Plug your Audio/Video source components into the Aris Source inputs using appropriate cabling.

6. Connection of Infrared Emitter Cables: Connect EC-1 IR Emitter cables from the IR-1 to IR-8 ports, and affix each emitter over the appropriate component's IR sensor window. The ports are normally in Device-Specific mode, requiring the following connections between the emitter ports and the equipment (as the equipment is labeled on the RC-8 remote control): IR-1 (Source-1) is Tuner, IR-2 is CD, IR-3 is Cab/Sat, IR-4 is VCR-1, IR-5 is VCR-2, IR-6 is DVD/Laser, IR-7 is Tape-1, and IR-8 is Tape-2.

7. Connection of A/V Zone amplifiers: Connect the Aris Zone audio outputs to power amplifiers appropriate for each zone. For video-capable switchers, connect the video outputs to video monitors, or, for longer runs, to composite buffer amplifiers or video modulators. Run the speaker wiring and video cables to each zone. NOTE: Do not use level-sensing amp-powering options Ñ low volumes may turn the amp off.

8. Power-up the system: Turn on the Aris MediaMation System using the front-panel switch Ñ a string of front-panel lights indicates that the Switcher is running.

9. Install Three (3) ÒAAAÓ batteries in the RC-8 remote control(s) (alkaline preferred).

RC-8 Remote Control

The Vaux RC-8-IR Remote Control may be used to operate the Aris MediaMation System. The Aris AR-520A may also use an RC-8-RF radio-frequency remote.

When the batteries are first installed, the remote control will use Òfactory settingsÓ for the programmable features it stores. Upon battery insertion, the red light flashes twice to indicate that the factory settings have been loaded. The user may at any time change these settings.

The factory settings are:

- Current A/V Device: 01 (Tuner)
- Default A/V Zone: 01

Batteries should be changed when the low-battery indication is given, that is the red and green lights flashing simultaneously when a button is pressed. Although you may continue to operate the remote control, operating range will be reduced and remaining battery life is short. The Remote uses three (3) ÒAAAÓ batteries; alkaline preferred.

The remote control has a three-position slide switch which selects the operating mode; Audio/Video, Lights/App, or MACROs. The Audio/Video mode is used to operate the Aris MediaMation System, to select A/V sources, adjust zone volume/bass/treble/mute, etc. The Lights/App and the MACRO positions are not used with the Aris MediaMation System

There are several special buttons on the remote control; the SHIFT button, eight Device buttons (Tuner, CD, etc.), the Zone button, the Sec button, and the Learn button. These are used for multi-button commands or system programming tasks. The <u>Zone</u> button allows you to change the ÒdefaultÓ zone stored in the RC-8 Remote Control, allowing you to access different zones. This default zone is used to uniquely identify different remotes, since the zone information is included in the transmitted commands. For example, if you will be leaving the RC-8 in the room(s) for zone 03, you would set the default zone to 03. Then, when you press buttons on the RC-8, it tells the Aris MediaMation System that you are Òin zone 03.Ó

To change the remote's Default-Zone: Press and release the Learn key, then press and hold the Zone key, until the green led lights; now press two digits corresponding to the desired zone (eg: 02, or 15). To select a source, press one of the source selection keys (only the first eight sources are available when using the RC-8 remote). To turn off the zone, press the Off key. The On key selects the previous source.
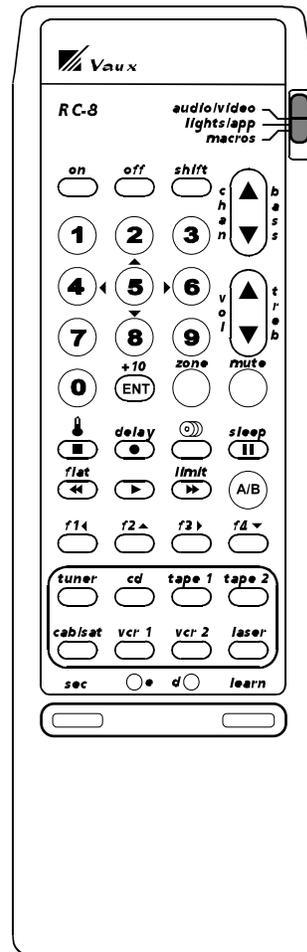
Source	RC-8 Label	Source	RC-8 Label
1	Tuner	5	VCR-2
2	CD	6	Laser
3	Cab/Sat	7	Tape-1
4	VCR-1	8	Tape-2

Volume is adjusted using the Volume-Up/Dn keys, and the Mute key toggles the zone's audio mute. To adjust bass, first press the Shift key, and then press the Channel-Up/Dn keys, also labeled Bass. Treble if adjusted similarly using shifted volume keys. Bass and treble adjustment may only be performed in single up or down steps (you cannot press and hold, as with the volume adjustment). Finally, you may set the zone's Initial-Volume (the level the zone turns on at, by first adjusting the volume to the desired level, and then pressing Shift-Limit (the shifted FFD key).

Programming the System

Aris Infrared (IR) Learning

For each of the eight input sources, there is a bank of infrared codes associated with the control buttons on the RC-8 remote. The Aris system can "learn" commands from your existing source device remotes, and allow you to control the system from a single RC-8 remote – in fact, the RC-8 may easily move from room to room (ie: an RF remote or an IR remote in conjunction with an IR repeater system) for control of you whole house.

1. The RC-8 Mode switch must be in the *Audio/Video* position.

2. Press and hold the RC-8 *Learn* button for a couple of seconds, until the RC-8's green light turns on, then release the *Learn* button -- the Aris *Prog* light turns on indicating IR learning mode.

3. Select which IR source bank you will be programming by pressing a Source button on the RC-8 (e.g. *CD*) -- the Aris *Nak* light will flash since this is not a learnable button.

4. Press a Source-Command button (e.g. *Play*) on the RC-8 -- the Aris *Ack* light turns on. Note: if you do not continue within 15 seconds, learning for this button will time-out, and the *Ack* light will turn off -- you must then repeat this step.

5. Hold the original source device IR remote a couple of inches from the Aris *Learn-Sensor* and press and hold the button for the code you are teaching to the Aris system. The Aris *Learn* light will flash when the source remote is positioned properly. When the Aris *Ack* light flashes and then turns off, you may release the button on the source device IR remote -- the code has been stored in the Aris system.

6. If you wish to continue to learn codes for in the same IR source bank, repeat steps 4 & 5. If you need to change to a different bank, return to step 3, and then repeat steps 4 & 5.

7. When you are finished learning, press and hold the RC-8 Learn button for a couple of seconds, until the RC-8's green light turns on, then release the Learn button -- the Aris *Prog* light turns off, and the *Ack* light flashes.

Auto-Source-Powering

You may optionally program the Aris system to automatically power source devices as needed. To enable this feature on a source, you simply enter IR learning mode, select the source page of interest (e.g. *CD*), and learn the IR power code(s) on both the *On* and *Off* buttons. If the device has only one power code (as many do) simply learn the code in both button positions.

Programming Macros

Macros are sequences of IR and/or X10 commands which may be used to simplify certain tasks. For example, you may want a lighting scene with various dim levels around the house, or you may want to configure a CD jukebox.

There are 10 general macros, 1 to 10:

1. The RC-8 Mode switch must be in the *Macros* position.

2. Press the *Learn* button, then press-and-hold a *digit* corresponding to the Macro sequence to be stored (1,2...9, 0=10) for a couple of seconds, until the RC-8's green light turns on, then release the *digit* button -- the Aris *Prog* light turns on indicating Macro Programing mode.

3. To enter an IR command as the next step, slide the RC-8 Mode switch to *Audio/Video* and press the desired command button (eg: *Play*). If there is an IR code stored in this location, the Aris *Ack* light will flash, and the IR code will be sent (during Macro programming). If the IR location is empty, the Aris *Ack* and *Nak* lights will both flash -- you may continue programming your Macro, and finish the IR learning at a later time (the code will still be placed in the Macro, but will be an empty step until you learn the IR code).

4. To enter an X10 Lighting command in the Macro, slide the RC-8 Mode switch to *Lights/App* and press the command button (eg: *On*). The lighting command will be performed as you build the Macro.

5. Repeat any combination of steps 3 and 4 to finish building the Macro (to a maximum of 25 steps).

6. To end the Macro, slide the RC-8 Mode switch to the *Macros* position and press any of the Macro buttons (numeric *digits*).

There are 10 special macros, 11 to 20:

These are used automatically for source-selection according to the following chart. You simply program these macros as desired to initialize a source device (e.g. automatically put a CD in Play mode, with a specific music file selection).

Source	RC-8 Label	Macro
1	Tuner	11
2	CD	12
3	Cab/Sat	13
4	VCR-1	14
5	VCR-2	15
6	DVD/Laser	16
7	Tape-1	17
8	Tape-2/TV	18

1. The RC-8 Mode switch must be in the *Macros* position.

2. Press the *Learn* button, then press the *Shift* button, then press-and-hold a *digit* corresponding to the Macro sequence to be stored (1,2...9, 0=10) for a couple of seconds, until the RC-8's green light turns on, then release the *digit* button -- the Aris *Prog* light turns on indicating Macro Programing mode.

3. To enter an IR command as the next step, slide the RC-8 Mode switch to *Audio/Video* and press the desired command button (eg: *Play*). If there is an IR code stored in this location, the Aris *Ack* light will flash, and the IR code will be sent (during Macro programming). If the IR location is empty, the Aris *Ack* and *Nak* lights will both flash -- you may continue programming your Macro, and finish the IR learning at a later time (the code will still be placed in the Macro, but will be an empty step until you learn the IR code).

4. To enter an X10 Lighting command in the Macro, slide the RC-8 Mode switch to *Lights/App* and press the command button (eg: *On*). The lighting command will be performed as you build the Macro.

5. Repeat any combination of steps 3 and 4 to finish building the Macro (to a maximum of 25 steps).

6. To end the Macro, slide the RC-8 Mode switch to the *Macros* position and press any of the Macro buttons (numeric *digits*).

Setting each Zone's Initial Volume Level

When you have the system running, you will likely wish to tailor each room's initial volume level (the level to which it first turns on). You can also set the maximum volume of the amplifier at this point.

- Turn down the power amp's level control to perhaps 25%
- Select a source such as a CD in the zone of interest.
- Using the RC-8 remote control, turn the zone's volume up to maximum.
- Adjust the power amp's level control to the loudest level you wish the zone to reach.
- Using the RC-8 remote, turn the volume down to the desired initial level.
- Press *Shift-Limit* on the RC-8 (Shift followed by the FF key, also labeled Limit).
- Repeat for other zones.

Audio/Video Operation

For all operations below, change the RC-8 remote control to the desired zone, if needed.
Also, the RC-8 Mode switch must be in the *Audio/Video* position.

Selecting a Source:

- Press an RC-8 Source button (*Tuner*, *CD*...)
- The Aris *Ack* and/or *Nak* lights flash (as the source-select macros and auto-source powering codes are going through their sequence), and the source is routed to the zone at the programmed Initial-Volume-Level for the zone.
- The Aris *Active* light will be on when any zone is in use.
- If the Aris *Nak* light flashes, the requested zone is not valid for this Aris unit.   (eg: selecting zone 9 when only 1 to 8 are valid).

Turning the Zone Off:

- Press the RC-8 *Off* button -- the Aris *Ack* light flashes, and the zone turns off (note: the adjacent *On* button turns the zone on with the last source).
- If the Aris *Nak* light flashes, the requested zone is not valid for this Aris unit.

Adjusting Zone Volume:

- Press the RC-8 *Volume-Up/Down* button, and release at desired volume level.
- The Aris *Ack* light is on during volume adjust. If the Aris *Nak* light flashes, the requested zone is not valid for this Aris unit, or the zone is not currently on.

Adjusting Zone Bass/Treble:

- Press the RC-8 *Shift* button, and then press a *Channel-Up/Down* button to adjust Bass, or a *Volume-Up/Down* button to adjust Treble. Each Shift-button-press adjusts up or down one step (can not press-and-hold for Bass/Treble adjustment)
- The Aris *Ack* light flashes as the level is adjusted. If the Aris *Nak* light flashes, the requested zone is not valid for this Aris unit, or the zone is not currently on.
- You may restore *Flat* Bass/Treble by pressing Shift and then Rewind on the RC-8.

Muting the Zone:

- Press the RC-8 Mute button -- the zone volume lowers to the programmed Mute-Volume-Level for the zone. Pressing Mute again will restore original volume.
- The Aris *Ack* light flashes as the zone mutes/unmutes. If the Aris *Nak* light flashes, the requested zone is not valid for this Aris unit, or the zone is not currently on.

Controlling your Sources (IR Playback)

When you have selected a source (pressing RC-8 *Tuner*, *CD*...), commands for controlling the source are usually available on the approriate RC-8 buttons (*Play*, *Pause*...). This presumes that the IR codes from the original source device remote controls were "learned" by the Aris controller during installation.

- The RC-8 Mode switch must be in the *Audio/Video* position.
- Press an RC-8 control button (eg: *Play*) -- the Aris *Ack* light will flash indicating that a stored IR code has been played. If the *Ack* and *Nak* lights flash, no code was stored in this particular button location.

Macros

Macros are sequences of IR and/or X10 commands which may be used to simplify certain tasks. For example, you may want a lighting scene with various dim levels around the house, or you may want to configure a CD jukebox.

There are 10 general macros, 1 to 10:

- The RC-8 Mode switch must be in the *Macros* position.
- Press a *digit* corresponding to the Macro sequence stored (1,2...9, 0=10)
- Aris *Ack* and/or *Nak* lights will flash one or more times, depending upon what the Macro is doing as it executes its sequence. The *Nak* light will flash for an empty Macro.

There are 10 special macros, 11 to 20

These are normally used automatically for source-selection, but they may be tested manually.

- The RC-8 Mode switch must be in the *Macros* position.
- Press the *Shift* button then press a *digit* corresponding to the Macro sequence stored (1=11,2=12...9=19, 0=20).
- Aris *Ack* and/or *Nak* lights will flash one or more times, depending upon what the Macro is doing as it executes its sequence. The *Nak* light will flash for an empty Macro.

VauxProtocol Commands & Messages (RS-232)

Connection of a computer or control system to the VC-232 serial port allows you to fully control the system using a selection of Commands, and to obtain immediate feedback on system status by listening to Messages. This Command/Message language is called VauxProtocol.

VauxProtocol Commands begin with an asterisk (*), followed by two letters, then one or more comma-delimited decimal number parameters, and finally a carriage-return and/or line-feed char (CR/LF). The numbers are ascii-encoded-decimal number strings which may range from 0 to 255. The decimal numbers may be one, two, or three digits total, and may include leading zeroes, or not, as desired (ie: 001, 01, and 1, are all equivalent).
A comma must be used to delimit fields, and the command requires a CR, LF, or CR/LF as termination delimiter -- indicated by <cr>. Spaces may be removed, or inserted if desired (they are ignored).

> Note: the following commands are all identical:
> *PW,001,017 <cr>
> or: * P W, 001 , 017 <cr>   (extra spaces are ignored)
> or: *PW,1,17 <cr>   (leading zeros also optional)

Similarly, VauxProtocol Messages begin with an exclamation (!), followed by two letters, and then one or more comma-delimited decimal number parameters, and a terminating CR/LF.

Control-Command & Status-Message Summary:

- For zones 1 to 255, Status-Messages are sent in response to Control-Commands.
- Many commands return the same status message – simplifying message parsing programming.
- For zone 0 (all zones), no messages returned (multiple controllers would be responding together).
- Note that volume/bass/treble/mute commands will only affect zones that are not off, even if the requested zone is 0.
- A muted zone will be unmuted if 1) a new route command is received, or 2) a stereo volume command (*CW,20/23/24/25/35/36) is received.

Coding Tip: You will likely only need to implement a handful of commands/messages in a typical application!

Coding Tip: Status messages are also sent in response to remote-control or keypad control – by parsing the messages independently of the command programming, and updating internal variables in your program, you will close the loop on the whole system. You may then send commands blindly, and allow you message-handler to update your variables/displays. If you wish to ensure that your command resulted in an action, you may monitor internal variables after sending your command (instead of waiting for the actual message), and implement timeout/retry/alert code as desired for your application. This is a more generalized technique than simply sending a command and then waiting to parse an ack mssg.

Control-Cmd Description	*Command*	*Status-Message*
Route Audio/Video ssa/ssv (ZONE-0 OK)	***CW,10,zon,ssa,ssv <cr>**	**!S,10,zon,ssa,ssv <cr>**
Route Audio Source ssa (ZONE-0 OK)	***CW,11,zon,ssa <cr>**	**!S,11,zon,ssa <cr>**
Route Video Source ssv (ZONE-0 OK)	***CW,12,zon,ssv <cr>**	**!S,12,zon,ssv <cr>**
Route Audio/Video src (ZONE-0 OK)	***CW,13,zon,src <cr>**	**!S,10,zon,ssa,ssv <cr>**
Set L & R Volumes vvl/vvr (ZONE-0 OK)	***CW,20,zon,vvl,vvr <cr>**	**!S,20,zon,vvl,vvr <cr>**
Set Left Volume vvl	***CW,21,zon,vvl <cr>**	**!S,21,zon,vvl <cr>**
Set Right Volume vvr	**CW,22,zon,vvr <cr>**	**!S,22,zon,vvr <cr>**
Set Volume (-64 to 0 dB) (ZONE-0 OK)	***CW,23,zon,vol <cr>**	**!S,20,zon,vvl,vvr <cr>**
Volume-Up (2-dB/step) (ZONE-0 OK)	***CW,24,zon <cr>**	**!S,20,zon,vvl,vvr <cr>**
Volume-Dn (2-dB/step) (ZONE-0 OK)	***CW,25,zon <cr>**	**!S,20,zon,vvl,vvr <cr>**
Left Volume-Up (2-dB/step)	***CW,26,zon <cr>**	**!S,21,zon,vvl <cr>**
Left Volume-Dn (2-dB/step)	***CW,27,zon <cr>**	**!S,21,zon,vvl <cr>**
Right Volume-Up (2-dB/step)	***CW,28,zon <cr>**	**!S,22,zon,vvr <cr>**
Right Volume-Dn (2-dB/step)	***CW,29,zon <cr>**	**!S,22,zon,vvr <cr>**
Balance to Left (L-up/R-dn)	***CW,30,zon <cr>**	**!S,20,zon,vvl,vvr <cr>**
Balance to Right (R-up/L-dn)	***CW,31,zon <cr>**	**!S,20,zon,vvl,vvr <cr>**
Start Ramping Volume Up	***CW,35,zon <cr>**	**!S,20,zon,vvl,vvr <cr> (per step)**
Start Ramping Volume Down	***CW,36,zon <cr>**	**!S,20,zon,vvl,vvr <cr> (per step)**
Stop Ramping Volume	***CW,37,zon <cr>**	**(none)**

 NOTE: volume ramps at 2-dB/120-msec until stopped, or Max-Vol reached!

Set Bass/Treble levels bas/trb	***CW,40,zon,bas,trb <cr>**	**!S,40,zon,bas,trb <cr>**
Flat Bass/Treble (0-dB) (ZONE-0 OK)	***CW,41,zon <cr>**	**!S,40,zon,bas,trb <cr>**
Bass-Up, relative (3-dB/step)	***CW,42,zon <cr>**	**!S,40,zon,bas,trb <cr>**
Bass-Down, relative (3-dB/step)	***CW,43,zon <cr>**	**!S,40,zon,bas,trb <cr>**
Treble-Up, relative (3-dB/step)	***CW,44,zon <cr>**	**!S,40,zon,bas,trb <cr>**
Treble-Down, relative (3-dB/step)	***CW,45,zon <cr>**	**!S,40,zon,bas,trb <cr>**
Audio Mute Toggle	***CW,50,zon <cr>**	**!S,50,zon,sta <cr>**
Audio Mute On (ZONE-0 OK)	***CW,51,zon <cr>**	**!S,50,zon,sta <cr>**
Audio Mute Off (ZONE-0 OK)	***CW,52,zon <cr>**	**!S,50,zon,sta <cr>**

Request-Command & Status-Message Summary:

Status-Message are sent in response to above Control-Commands, but system status may also be determined at any time (by polling) using these optional Request-Commands (zon=0 not allowed).

Coding Tip: You probably do not need to need to use these commands, in most applications!

Request-Command Description	Command	Status-Message
Get Zone-Status	*CR,1,zon <cr>	!S,1,zon,sta,stv,ssa,ssv,vvl,vvr,bas,trb <cr>
Get Audio/Video ssa/ssv route source	*CR,10,zon <cr>	!S,10,zon,ssa,ssv <cr>
Get Audio Source ssa route source	*CR,11,zon <cr>	!S,11,zon,ssa <cr>
Get Video Source ssv route source	*CR,12,zon <cr>	!S,12,zon,ssv <cr>
Get Left/Right Volumes vvl/vvr	*CR,20,zon <cr>	!S,20,zon,vvl,vvr <cr>
Get Left Volume vvl	*CR,21,zon <cr>	!S,21,zon,vvl <cr>
Get Right Volume vvr	*CR,22,zon <cr>	!S,22,zon,vvr <cr>
Get Bass/Treble bas/trb	*CR,40,zon <cr>	!S,40,zon,bas,trb <cr>
Get Audio Mute state	*CR,50,zon <cr>	!S,50,zon,sta <cr>

Configuration-Commands & Configuration-Message Summary:

Coding Tip: In many applications, the factory settings are just right – you may want to tweak Initial Volumes.

Config-Write-Cmd Description	Command	Factory setting
Write controller's Base Zone	*PW,1,bzn <cr>	1
Write Minimum-Volume-Level	*PW,10,zon,vll <cr>	0 (-64 dB)
Write Maximum-Volume-Level	*PW,11,zon,vhh <cr>	32 (0 dB)
Write Initial-Left-Vol-Level	*PW,12,zon,vil <cr>	22 (-20 dB)
Write Initial-Right-Vol-Level	*PW,13,zon,vir <cr>	22 (-20 dB)
Write Mute-Volume-Level	*PW,14,zon,vmm <cr>	0 (-64 dB)
Write Bass-Level	*PW,15,zon,bas <cr>	4 (0 dB)
Write Treble-Level	*PW,16,zon,trb <cr>	4 (0 dB)
Write Zone Mode	*PW,17,zon,mod <cr>	1 (stereo)
Write Taper-Up-Delay	*PW,18,zon,tud <cr>	20 (ms/2-dB-step)
Write Taper-Down-Delay	*PW,19,zon,tdd <cr>	5 (ms/2-dB-step)
Write Config-Table	*PW,30,zon,vll,vhh,vil,vir,vmm,bas,trb,mod,tud,tdd <cr>	

Config-Read-Cmd Description	Command	Config-Message
Read controller's Base Zone	*PR,1 <cr>	!C,1,bzn <cr>
Read Minimum-Volume-Level	*PR,10,zon <cr>	!C,10,zon,vll <cr>
Read Maximum-Volume-Level	*PR,11,zon <cr>	!C,11,zon,vhh <cr>
Read Initial-Left-Vol-Level	*PR,12,zon <cr>	!C,12,zon,vil <cr>
Read Initial-Right-Vol-Level	*PR,13,zon <cr>	!C,13,zon,vir <cr>
Read Mute-Volume-Level	*PR,14,zon <cr>	!C,14,zon,vmm <cr>
Read Bass-Level	*PR,15,zon <cr>	!C,15,zon,bas <cr>
Read Treble-Level	*PR,16,zon <cr>	!C,16,zon,trb <cr>
Read Zone Mode	*PR,17,zon <cr>	!C,17,zon,mod <cr>
Read Taper-Up-Delay	*PR,18,zon <cr>	!C,18,zon,tud <cr>
Read Taper-Down-Delay	*PR,19,zon <cr>	!C,19,zon,tdd <cr>
Read Config-Table	*PR,30,zon <cr>	
		!C,30,zon,vll,vhh,vil,vir,vmm,bas,trb,mod,tud,tdd <cr>

Command/Message Parameter Notes:

zon is zone	**0 to 255 (0=all)**	**(or 1 to 255, depending on command)**
		(no !S mssg returned for zon=0 cmds)
src is audio/video source	**0 to 8 (0=off)**	**(or 0 to 16, depending on controller)**
ssa is audio source	**0 to 8 (0=off)**	**(or 0 to 16, depending on controller)**
ssv is video source	**0 to 8 (0=off)**	**(or 0 to 16, depending on controller)**

vol is volume (left and right)	**0 to 32 (2-dB/increment)**
vvl is left volume level	**0 to 32 (2-dB/increment)**
vvr is right volume level	**0 to 32 (2-dB/increment)**

32	**0 dB**	**(max/passthrough volume level)**
31	**-2 dB**	
30	**-4 dB**	
...		
2	**-60 dB**	
1	**-62 dB**	
0	**-64 dB**	**(min volume level)**

bas is bass level	**0 to 8 (3-dB/increment)**
trb is treble level	**0 to 8 (3-dB/increment)**

8	**+12 dB**	**(max bass/treble level)**
7	**+9 dB**	
6	**+6 dB**	
5	**+3 dB**	
4	**0 dB**	**(flat bass/treble level)**
3	**-3 dB**	
2	**-6 dB**	
1	**-9 dB**	
0	**-12 dB**	**(min bass/treble level)**

sta is audio-state code	**0=off, 1=on, 2=on/muted-audio**
stv is video-state code	**0=off, 1=on**

NOTE: Independent Audio Left and Right Volume Commands:
Source is always the same for L&R channels, but these commands
allow you to provide independent volume for two mono rooms, if
the zone is programmed for mono operation.
If the zone is programmed for stereo operation, you may use these
left and right commands to balance the zone, or you may use the
balance commands.
The left and right volumes may be different -- the volume up/down
commands operate on both channels, relative to the volume of each.

bzn is Base-Zone	**1 to 248 for 8-zone controller (1 to 240 for 16-zone ctrl)**
	(typical bzn: 1, 9, 17...)
	NOTE: Only connect to one controller when programming

mod is Zone Audio Mode   0=mono, 1=stereo, 3=spatial-stereo

tud is Taper-Up-Delay   0 to 30 (ms/2-dB-step)
tdd is Taper-Down-Delay   0 to 30 (ms/2-dB-step)

vll is Minimum-Volume-Level   0 to 32 (2-dB/increment)
vhh is Maximum-Volume-Level   0 to 32 (2-dB/increment)
vmm is Mute-Volume-Level   0 to 32 (2-dB/increment)
vil is Initial-Left-Volume-Level   0 to 32 (2-dB/increment)
vir is Initial-Right-Volume-Level 0 to 32 (2-dB/increment)

NOTE: **Min-vol has priority over mute-vol and init-vol, and is the absolute min volume zone will reach.**
            If min-vol incorrectly set above max-vol, then min-vol will be presumed to be zero.

NOTE: **Max-vol has priority over all other settings, and is the absolute max volume zone will reach.**

NOTE: **Min-Vol and Max-Vol must be set before setting Initial-Volumes.**
            If init-vol incorrectly set above max-vol, then init-vol will be presumed to be max-vol.
            If init-vol incorrectly set below min-vol, then init-vol will be presumed to be min-vol.

NOTE: **Min-Vol and Max-Vol must be set before setting Mute-Volume.**
            Mute always acts upon both L&R channels, even though L&R volume levels may differ; balance is preserved when zone is unmuted.
            Mute-vol is a ceiling, not a hard level. If mute-vol set above min-vol, zone volume levels may go below mute-vol level. When muting, volumes above mute-vol will lower to mute-vol level, but volumes below mute-vol will not change. If mute-vol incorrectly set above max-vol, then mute-vol will be presumed to be max-vol. If mute-vol incorrectly set below min-vol, then mute-vol will be presumed to be min-vol.

VC-232 Serial Port (EIA/RS-232)

The VC-232 Port is designed to connect directly to any computer or control system which has a standard RS-232 serial port. For the record, instead of RS-232 (RS stands for Recommended Standard), the proper term is actually EIA-232 or EIA/TIA-232 (for the standards bodies concerned). However, the EIA/TIA designation never really caught on, and virtually everyone retains the RS-232 terminology.

A cable (not supplied) is needed to connect the VC-232 Port to the control system or computer serial port. The VC-232 Port is a DB-9 F (female) connector – the connector pinout is defined below. Typically, only three wires are needed: TX, RX, and Ground. Depending on the setup of your control system serial port, you may need to connect other signals before the port becomes active. If your serial port expects handshake inputs (on CTS, DSR, and/or DCD), you may be able to either change your port configuration to ignore these signals, or you may provide the appropriate signals from the Vaux VC-232 connector. The Vaux end does not need special treatment Ñ the VC-232 handshake input pins (RTS and DTR) are not used.

Vaux systems communicate at 9600 baud (bits-per-second) using 8 bits of data, no parity, and one stop bit.

The serial port on the controlling computer must be configured according to its manufacturer's instructions. Information transfer between the controlling computer and the Vaux system is in the VauxProtocol format Ñ a Vaux-defined command language comprised of various commands and messages.

VC-232 Port (RS-232 Interface) (DB-9 F Connector):

Pin	Description	Signal Direction	Vaux Use
1	DCD (Data Carrier Detect)	Computer <Ñ Vaux	"Active" level output *
2	RXD (Receive Data)	Computer <Ñ Vaux	Data Out
3	TXD (Transmit Data)	Computer Ñ> Vaux	Data In
4	DTR (Data Terminal Ready)	Computer Ñ> Vaux	[not used]
5	Signal Ground	Ñ	Signal Ground
6	DSR (Data Set Ready)	Computer <Ñ Vaux	"Active" level output *
7	RTS (Request To Send)	Computer Ñ> Vaux	[not used]
8	CTS (Clear To Send)	Computer <Ñ Vaux	"Active" level output *
9	IRU (private Vaux signal)	DO NOT CONNECT	(special) **

- Typical Connections: TXD, RXD, and Signal Ground.
- Minimal Connections: TXD, and Signal Ground (commands only)
- * One or more of CTS/DSR/DCD may need to be connected to your serial port, if expected.
- ** Pin 9 should not be connected to a computer serial port, as it is sometimes used for the Ring Indicator (RI) input – the Vaux IRU (unmod IR) signal should be left open for proper system operation.
- Pins listed as not used, are not connected (to anything) in the Vaux system.
- The DB-9 shield rim (the "D") is connected to signal ground.

Maintenance and Service

Vaux systems are designed to be maintenance-free, but do contain sensitive electronic parts. Avoid rough treatment to assure best performance. If you must ship the system, use the original packaging (or equivalent) for protection. The enclosures may be cleaned with a soft, slightly-damp soft cloth. Never use detergents, excess water, treated cloths, harsh cleaning agents, or sprays.

This product is to be serviced only by the manufacturer or its authorized service agents. For instructions on how to obtain service, call the Vaux Electronics Service Department. Attach your sales receipt to this manual for future reference, should service be required during the warranty period. Also, record your Serial Number(s) on the cover of this manual.   Serial Numbers can be found on rear-panel labels.

For more information on product service, see the Limited Warranty section.

Limited Warranty

What does your warranty cover?
Any defect in material or workmanship.

For how long after the original purchase?
Three-year limited warranty on Aris MediaMation Systems. One-year limited warranty on Vaux Remote Controls.

What will we do?
If your Vaux product is defective and returned within 30 days of the date it was purchased, we will replace it at no charge to you. If your Vaux product is returned after 30 days, but within the warranty repair period, we will repair it, or, at our option, replace it at no charge to you. If we repair your Vaux product , we may use new or reconditioned replacement parts. If we choose to replace your Vaux product, we may replace it with a new or reconditioned unit of the same or similar design. The repaired or replacement unit will be warranted for either (a) 90 days or (b) the remainder of the original warranty period, whichever is longer.

How do you make a warranty claim?
To get warranty service for your Vaux product, you must provide proof of purchase. The "Purchase Date" is the date shown on your invoice. Within 30 days of the Purchase Date, return your Vaux product to your place of purchase for immediate replacement. After 30 days of the date it was purchased, call the Vaux Service Department to obtain a Return Materials Authorization (RMA) Number and ship the Vaux product standard UPS or equivalent to the Vaux Electronics Service Dept. Provide necessary additional shipping insurance. Most shipping companies' basic insurance coverage is only $100.00. Include in the package a copy of the sales receipt or other evidence of date of original purchase. Also print your name, shipping address (no PO boxes), phone number and a description of the defect. Write the RMA number on the shipping label or prominently on the outside of the box. Properly pack your unit, include any cables, etc., which were originally provided with the product. Please use the original carton and packing materials, or equivalent. Pay any charges billed to you by the Vaux Service Department for service not covered by the warranty. Your repaired unit will be shipped to you prepaid freight.

What does your warranty not cover?
This warranty does not cover any upgrades of system hardware or software to revisions later than that which shipped with the system when originally purchased. If this Vaux product includes infrared learning, this warranty does not cover incompatibility with third-party remote controls, such as, but not limited to: wired-remote controls, RF remote controls, ultrasonic remote controls, pre-programmed universal remote controls (third-party codes are sometimes distorted), products that operate over 100kHz, products that use obscure or multi-frequency infrared signals. This warranty does not cover defects resulting from accidents, damage while in transit to the Vaux Service Department, alterations, products which have been modified or incorporated into other products, unauthorized repair, tampering, failure to follow instructions, neglect, misuse, fire, flood, lightning damage, meteorite bombardment, regional or global warfare, or acts of God. This warranty does not cover customer instruction, installation and set-up, or batteries.

If your product is not covered by our warranty, call the Vaux Service Department for advice as to how we may repair your Vaux product, and other repair information, including charges. At our option, we may replace, rather than repair, your Vaux product with a new or reconditioned one of the same or similar design. The repaired or replacement product will be warranted for 90 days. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

Limitations
Implied warranties, including those of fitness for a particular purpose and merchantability (an unwritten warranty that the product is fit for ordinary use), are limited to one year from date of purchase. We will not pay for loss of use (eg: during warranty repair), inconvenience, loss or theft of your Vaux product, or property damage caused by your Vaux product or its failure to work, or any other incidental or consequential damages.

Safety Information

- As with any product, basic safety precautions should be observed during handling and use of this system.
- Before using your system, please follow and adhere to all warnings, safety and operating instructions located on the product and in this owner's manual. Retain this manual for future reference.
- All warnings on the system components and in the instruction manual should be adhered to. Really.
- Do not expose the system to extreme temperatures, such as found near a hot radiator or stove.
- Do not locate AC-powered equipment near water, for example, near a bathtub, shower or pool. Immersion of the system in water could cause an electrical shock. Keep hands out of toasters.
- The components should be mounted only as directed in the instruction manual. Provide proper ventilation for any components which generate heat. Do not situate a component such that its ventilation openings are blocked or impeded. Components are to be situated away from heat sources such as amplifiers, heat registers, and stoves. Avoid radioactive fallout, when possible.
- Components are to be connected to a power supply only of the type described in the instruction manual, or as marked on the component. Polarities must be observed as necessary. Any grounding or polarization means of the component should not be defeated. Power cords should be routed such as to provide protection against pinching, abrasion, excess flexing, etc.
- Do not place lighted candles, cigarettes, cigars, etc. on the system. No smoking when fueling.
- Never install or modify wiring during a lightning storm. Dust storms are not a problem.
- Care should be taken so that objects do not fall onto, or liquids do not spill into, the system.
- Do not attempt to disassemble the enclosures. There are no customer serviceable components inside.
- If this system operates on batteries, adhere to the following precautions:
- Any battery may leak electrolyte if mixed with a different battery type, if inserted incorrectly, or if all batteries are not replaced at the same time.
- Any battery may leak electrolyte or explode if disposed of in fire or an attempt is made to charge a battery not intended to be recharged.
- Discard leaky batteries immediately. Leaking batteries can cause skin burns or other personal injury., and can damage electronic components.
- Always dispose of batteries properly Ñ please recycle when possible. Do not eat.
- Remove batteries from your system if it will not be used for an extended period of time.

This equipment generates and uses radio frequency energy which may interfere with residential radio and television reception if not properly installed and used in accordance with instructions contained in this manual. Reasonable protection against such interference is ensured, although there is no guarantee this will not occur in a given installation. If interference is suspected, and verified by powering this equipment on and off, try to correct the interference by one or more of the following measures: re-orient the radio/television receiver's antenna; relocate the television or radio equipment with respect to the Vaux equipment; plug the equipment into separate electrical outlets.