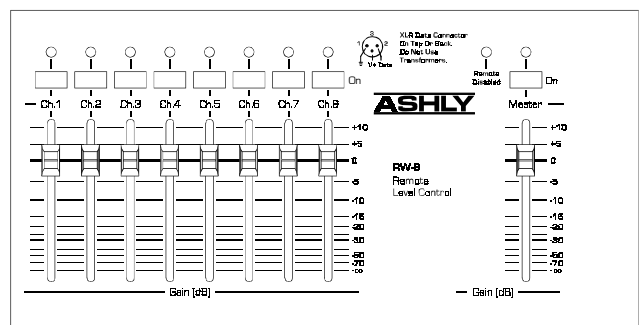
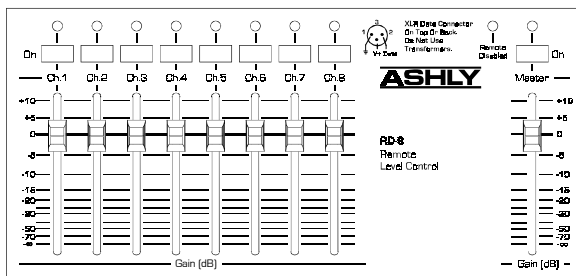
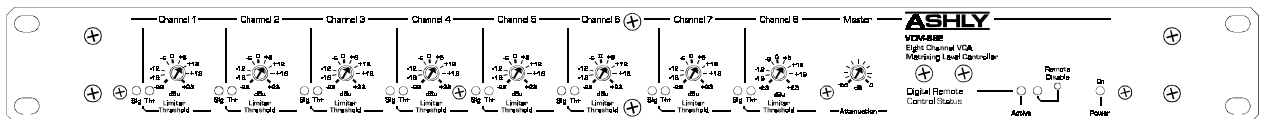
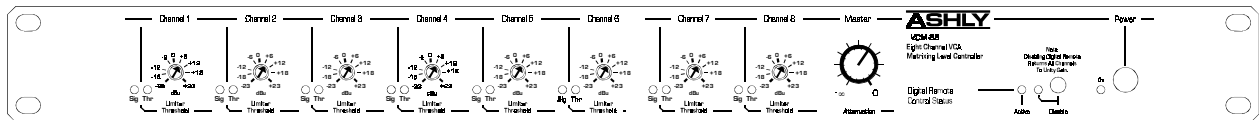


ASHLY

VCM-88 VCM-88E

Eight Channel Matrixing Level Controllers RD-8 Desktop Remote RW-8 Wall Mount Remote

Operating Manual



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The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying the device.

TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

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

TO REDUCE THE RISK OF FIRE, REPLACE ONLY WITH SAME TYPE FUSE. REFER REPLACEMENT TO QUALIFIED SERVICE PERSONNEL.

**WARNING:
THIS APPARATUS MUST BE EARTHED**

1. Introduction

One of the many useful circuits to be developed for audio use is the VCA, or voltage controlled amplifier. A VCA circuit allows for accurate, low distortion level control without signal degradations encountered when using mechanical controls or long signal paths. VCA circuits can be found in compressor/limiter/expanders, noise gates, noise reduction systems, automatic mixers, VCA-Bus consoles, and other places where remote control or fast automatic system response is required. Designers at Ashly felt there was still a need for high quality VCA control which could be incorporated into professional sound systems without unnecessarily high cost or complication.

The Ashly VCM-88 and the similar VCM-88E (euro-block connector model) provide eight fully-independent VCA channels in a single unit capable of limiting, remote level control, and mixing. When connected to the Ashly RD-8 (desktop) or RW-8 (wall-mount) remote controller, direct DC control, or Ashly's Protea System Software, the VCM-88(E) controls individual channel and master levels with a range of -75dB to +20dB. Each VCA channel has separate input and output jacks for patching into line-level signal paths, and can be reconfigured to use single connector insertion for patching into mixing consoles. When using the VCM-88(E) as a mixer (using the master output), each channel's input can be configured to "pass-through" to its output for daisy chaining multiple units together.

The Ashly VCM-88E maintains the features of the VCM-88 while replacing 1/4" jacks with Euroblock connectors. It also adds bi-directional data communications, non-volatile memory of level settings, and uses all recessed face panel controls specifically for fixed installations.

The RD-8 remote controller is a compact slidefader remote level controller which can be desk-top situated or rack-mounted into two rack spaces (3.5 inches) using the RD8-RM optional mounting bracket. This remote controller is also available as the RW-8 for wallmounting into a standard 4-gang electrical box. The RD-8 controls the audio levels of the VCM-88(E) over a standard XLR snake cable or shielded twisted pair. As it is powered entirely by the VCM-88(E), no batteries or remote power supply are necessary for either RD-8 or RW-8. The RD-8 can communicate to the VCM-88(E) over a 24 gauge snake cable in excess of 1/4 mile (400m). The RD-8 also pulse-shapes the digital waveform to eliminate digital crosstalk noise into adjacent audio channels.

2. Unpacking

As a part of our system of quality control, every Ashly product is carefully inspected before leaving the factory to ensure flawless appearance. After unpacking, please inspect for any physical damage. Save the shipping carton and all packing materials, as they were carefully designed to reduce to minimum the possibility of transportation damage should the unit again require packing and shipping. In the event that damage has occurred, immediately notify your dealer so that a written claim to cover the damages can be initiated.

The right to any claim against a public carrier can be forfeited if the carrier is not notified promptly and if the shipping carton and packing materials are not available for inspection by the carrier. Save all packing materials until the claim has been settled.

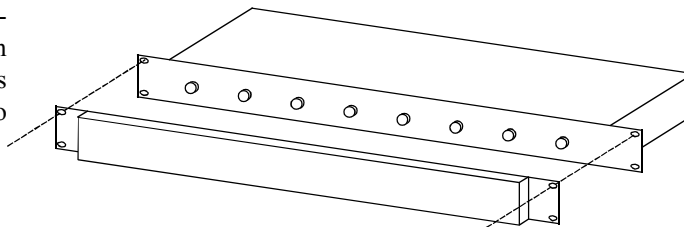
3. AC Power Requirements

A standard IEC-320 AC inlet is provided on the rear panel to accept the detachable power cord shipped with the unit. Units distributed within the United States are preselected for 120VAC, 60Hz and should be plugged into a standard NEMA 5-15 3-wire grounded AC receptacle. Most units distributed outside the US are preselected and labeled for 240VAC, 50-60Hz and are shipped with the appropriate power cord.

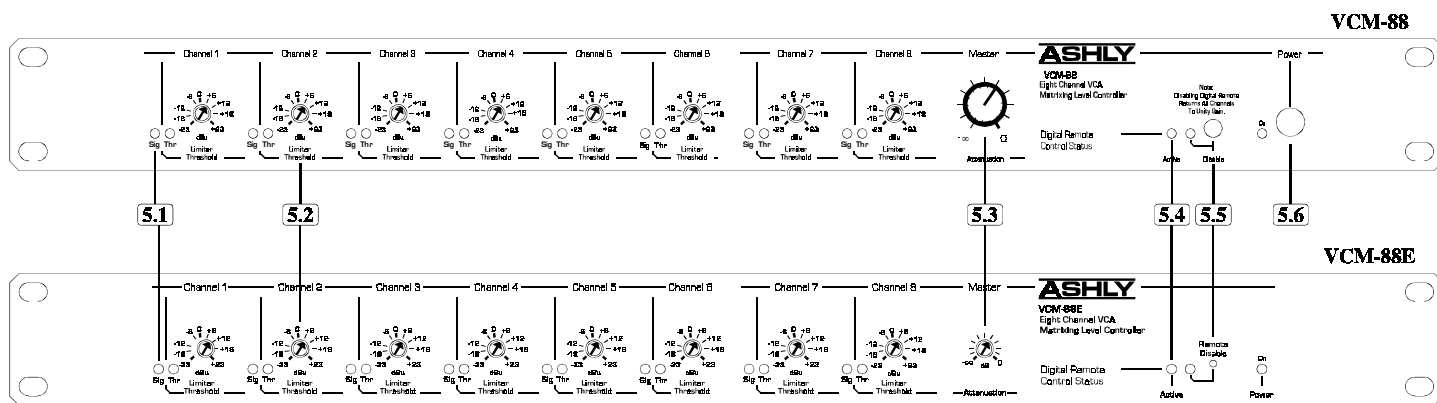
The VCM-88(E) will perform normally from 100 to 125 volts AC. An internal line fuse is used. In the event of fuse failure, refer to a qualified service technician for servicing. Maximum power consumption of the VCM-88(E) is 18 watts.

4. Security Covers

For installations where it is desirable to protect the front panel controls from tampering or accidental misadjustment, use the Ashly security cover, which is available in both single and double rack space sizes. Installation is simple and does not require removal of the equipment from your rack. See your Ashly dealer for details.



Ashly Security Cover Installation



5. VCM-88, VCM-88E Features

5.1 Signal Present LED

Each channel has a green LED to indicate input signal present (app. -20dBu). Since the LED is referencing the audio signal prior to the VCA circuit, the LED will continue flashing even if the channel level is turned down.

5.2 Limiter Threshold Control and Indicator

The recessed Limiter Threshold trimpot adjusts the signal threshold above which the limiter will become active. The units of this threshold dial are dBu where 0dBu = 0.775Vrms. The limiter is a peak-detecting true VCA type limiter with very low distortion. The input to output ratio of the limiter is approximately 10 to 1 with a relatively fast attack and moderate release time behavior. The adjacent yellow threshold LED indicates when the limiter circuit has been activated by an audio signal above the threshold level. To disable the limiter on any given channel, simply rotate its threshold adjustment fully clockwise to +23dBu, which is the maximum input signal of the unit.

5.3 Master Attenuation Control

This control (fully recessed on the VCM-88(E)) attenuates all eight channels uniformly, and was designed as a simple means of turning down all eight audio channels at the VCM-88(E) location in the event of feedback or other sound system problems. *Normally this control should be set fully clockwise at 0dB attenuation.*

5.4 Digital Remote Control Status Indicator

This green LED indicates when the VCM-88(E) is receiving data from the RD-8, RW-8, or computer control. In the event of remote control data interruption, the VCM-88(E) will lock all settings just before the data reception

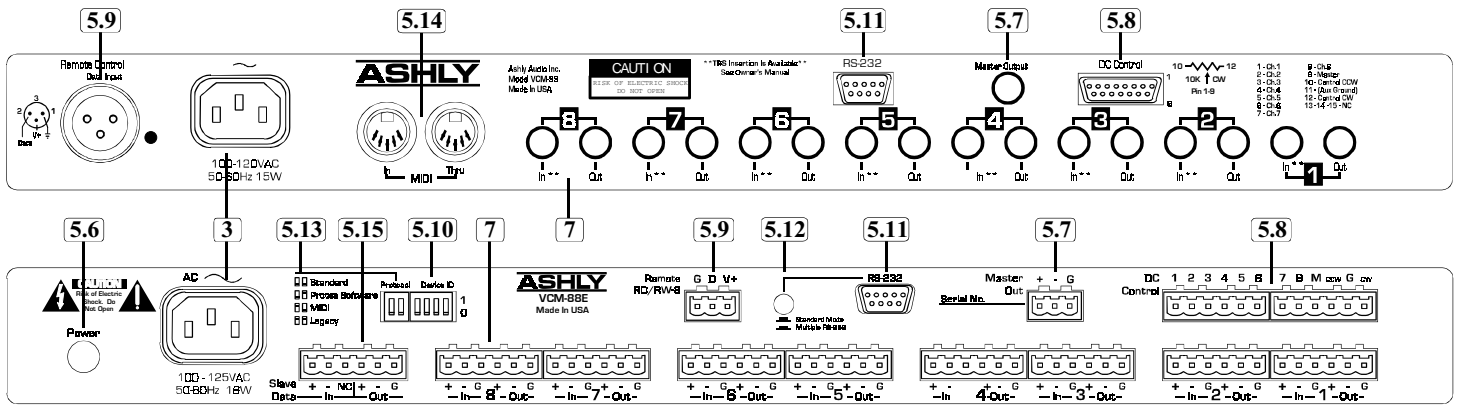
stopped and continue to operate as if there were no changes happening. Reconnecting the remote data signal with the VCM-88(E) still operating will instantly change the channel level settings to wherever the controller is currently set. *Note: If the VCM-88 AC power is switched on with no data reception, all eight channels and the master level will default to unity gain (0dB). The VCM-88E will remember the last level settings when the AC power is switched off and will restore these settings on power-up.*

5.5 Digital Remote Control Disable Switch

This switch disables the RD-8 remote controller and returns all eight channels to unity gain. *On the VCM-88E, this switch is Protea Software selectable to provide either unity gain or the last level settings before the remote is disabled.* The adjacent red LED indicates when this switch is depressed. The nearby green Remote Active indicator will go off when the remote is disabled because the RD-8 does not send any data when it is disabled. After releasing the remote disable switch, all channels return to their respective levels set by the RD-8 remote controller or software control.

5.6 Power Switch

On the VCM-88, this front-panel push-button switches the AC power to the unit. The switch is located on the back panel of the VCM-88E. A green LED indicates when the unit is powered on. If the green LED does not light, check to see if the unit is plugged into a live outlet, and that the removable AC cord is firmly plugged into the VCM-88(E). If there is still no light, refer the unit to a qualified service technician.



5.7 Master Output and Channel Pass Through

The VCM-88(E) can be used as an eight-in/one-out remote level control for personal monitor mixing using the Master Output. Multiple VCM-88(E) units can be daisy chained to produce several unique mixes from the same program source. To simplify cabling for this application, the VCM-88(E) has the ability to internally pass each channel's input signal directly to its output jack, disabling that channel's direct VCA output but eliminating the need for special "Y" cables. The passed-through channel's VCA output is automatically summed to the 200 Ohm pseudo-balanced Master Output along with other channels for final output. The gain from any one input channel to Master Output is -6dB so that a mix of several audio channels will have approximately the same volume as one of the input channels. See section 8.2 for channel pass-through details.

5.8 DC Control

A 15 pin female D-Sub connector on the back panel (12-position Euroblock on the VCM-88E) is used for DC control of the eight VCA channels and Master Attenuation, providing a simple and cost-effective method for custom control of the VCM-88(E). Most electronics hardware stores will have the male connector complement. The reference DC voltage is also provided, thus requiring only the male connector, wire, and a 10K ohm potentiometer for each channel to control audio levels from any reasonable distance. See section 9.3 for DC Control details.

5.9 Remote Control Data Input

This connector is used for remote control by the Ashly RD-8 or RW-8, or other third party controllers. AMX and Crestron are companies which manufacture touch-screen computer interfaces for a variety of control applications, including the VCM-88(E). AMX and Crestron provide a hardware interface which uses the XLR Data In con-

necter on the VCM-88 and the Remote RD/RW-8 Euroblock connector on the VCM-88E. See section 9.1 for AMX and Crestron interface details.

5.10 Device ID Select

Each VCM-88(E) can be addressed to one of 16 devices, allowing for control of up to 128 channels (16 x 8) from a single data line. The device ID on the VCM-88E is selected in binary format from the Device ID DIP switch on the rear panel. The device ID on the VCM-88 is internally selected with jumpers. See section 9.5 for Device ID Select DIP switch settings or internal jumper locations.

5.11 RS-232 Input

RS-232 is a bi-directional serial communications connection which allows computer devices to control other hardware. Ashly Protea System Software (see section 9.4) uses RS-232 to control the VCM-88(E), and other third party sources may use RS-232 as well.

While both the VCM-88 and the VCM-88E have dedicated RS-232 input jacks, only the VCM-88E RS-232 input is truly bidirectional. RS-232 data is read into the memory of the VCM-88E and stored, then read back from memory to get an actual snapshot of the current data settings. This is especially useful to upload to Protea System Software the current settings of a VCM-88E.

The VCM-88 data is unidirectional in receiving data only, meaning there is no RS-232 data out from the unit.

5.12 RS-232 Mode Switch (VCM-88E only)

The RS-232 mode switch is pushed in only when the VCM-88E RS-232 Input is connected to a PC, and another unit is connected to the Slave Data connector.

5.13 Data Protocol Selector (VCM-88E only)

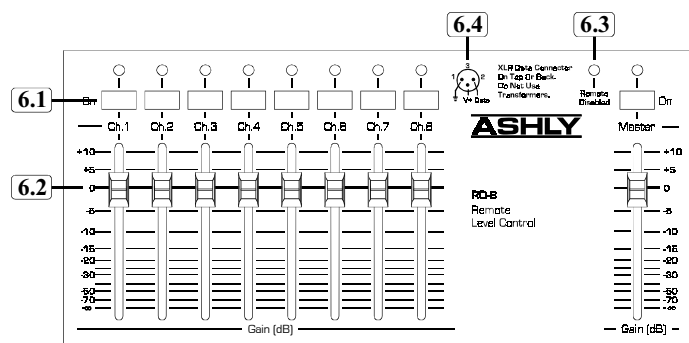
These two DIP switches allow selection of four data protocols. The Standard protocol is selected for use with current Ashly, AMX, or Crestron controllers. The Protea Software protocol is selected for use with Ashly's Protea System Software. The MIDI protocol is used for control by a MIDI device. The Legacy protocol is selected for control by a legacy Ashly or AMX device. On the VCM-88, protocols are selected using internal jumpers. See fig. 9.2 for VCM-88 data protocol details.

5.14 MIDI (VCM-88 only)

MIDI In and MIDI Thru jacks allow complete implementation of the VCM-88 in a MIDI network. An internal jumper selection is required to operate under MIDI control. For specific details regarding internal selection, as well as continuous controller numbers and values, see section 9.5.

5.15 Slave Data In/Out (VCM-88E only)

Multiple VCM-88E units can be placed in the same control loop using the Slave Data In/Out euroblock connectors. Control data originates from another unit under RS-232 or MIDI control. (See fig. 9.5)



6. RD-8/RW-8 Remote

The RD-8 and RW-8 are functionally the same. The difference is the RW-8 is designed to mount as a wall plate using a standard 4-gang electrical box. Both the VCM-88 and VCM-88E respond identically to the RD-8 or RW-8.

6.1 Channel and Master On Switch

These push-buttons switch the respective VCM-88(E) channel on or off. When switched on, the channel gain is controlled by the setting of the respective channel fader on the RD-8. When switched off, the respective VCM-88(E) channel is muted to approximately -75dB by the internal VCA circuit. The adjacent green LED is lit when the channel is switched on.

6.2 Channel and Master Fader

The slide faders on the RD-8 and RW-8 control the gain (volume) in dB of their respective channel in the VCM-88(E). The Master fader controls the gain of all eight channels together. That is to say, the master fader can raise or lower all eight channels uniformly without affecting the "mix" just like the master fader on a mixing console.

6.3 Remote Disable Indicator

This red LED illuminates when the RD-8 has been disabled by the Remote Disable Switch on the VCM-88(E). When the Remote Disable LED goes off, the RD-8 remote controller will resume normal operation. *Avoid dramatically changing the level settings of the controller when disabling it or disconnecting the data line, as the VCM-88(E) master will immediately respond to any changes made to the controller upon re-connecting.*

6.4 Data Connection

The male XLR jacks on the side and bottom of the RD-8 are wired in parallel so that an XLR plug may be inserted into the side for desktop operation or into the bottom for rack-mount operation. Pin 2 is the data output, pin 3 is the positive DC voltage input, and pin 1 is ground. This XLR data output may be "split" with an XLR Y-cable to feed two VCM-88(E) units to give stereo 8-channel capability. Also, by installing factory customized firmware into the device ROM, the RD-8 slide faders can be assigned to any (or several) arbitrary VCM-88(E) channels. Contact a factory technical service representative for details.

7. Audio Connections and Cables

7.1 Balanced and Unbalanced Signals

Balanced signal connections are preferred in pro audio applications because of their improved immunity to induced hum and noise. A properly shielded and wired balanced input stage on any product will by design reject most unwanted noise picked up by the cable as well as minimize ground loop problems. Therefore it is always advantageous to use balanced connections when running signal more than ten or fifteen feet, although particularly noisy environments (high RFI, EMI, etc.) may require that even short cabling be balanced. Ashly TRS (tip-ring-sleeve) balanced connections use the tip as (+) and the ring as (-) signal, with sleeve used for ground. Ashly XLR connectors use pin 2 (+) and pin 3 (-) with pin 1 ground.

Unbalanced connections are used mostly for short distance, high level signals (0dBu nom). Most external EMI noise pick-up will be masked under the noise floor of the signal, assuming there is little or no gain following the unbalanced signal. If a gain stage does follow a signal, or if externally sourced noise persists, use balanced connectors.

The VCM-88 and the VCM-88E are factory configured for separate input and output connectors. Used this way, inputs and outputs can be wired balanced or unbalanced. An internally selected single connector insert is also available (see section 8.1).

7.2 Input Connections

The VCM-88 uses balanced 1/4" input jacks (see fig. 7.1), while the VCM-88E uses Euroblock connectors (see fig. 7.2). Both unit's inputs are 20K ohm active balanced and 10K ohm unbalanced. If the VCM-88E uses unbalanced inputs, connect the input signal to (+) and connect the (-) pin to ground. *Note: If the single connector insert mode is selected (see section 8.1), the In jack serves as the TRS insert on the VCM-88 and the (+) and (-) euroblock connections serve as the input and output respectively on the VCM-88E.*

7.3 Output Connections

The VCM-88(E) audio outputs are 200 ohm pseudo-balanced (balanced impedance but signal drive on tip or (+) only). For unbalanced euroblock outputs on the VCM-88E, connect the signal wire to (+) and the shield to ground (see fig. 7.3).

Note: If the single connector insert mode is selected (see section 8.1), the output signal is taken from the ring or (-) of the Input jack, while the Output jack is not used.

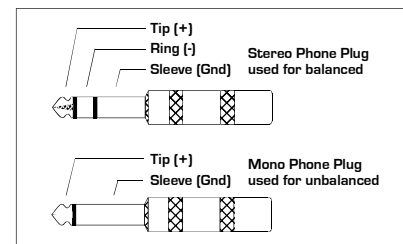


Fig 7.1

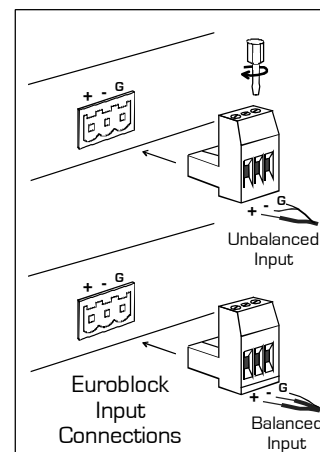


Fig 7.2

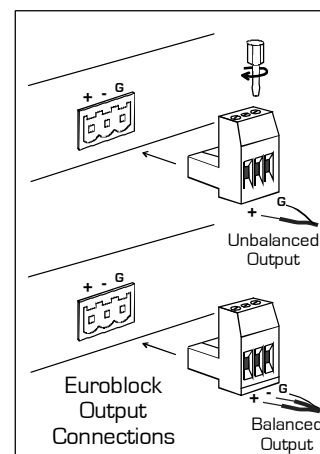
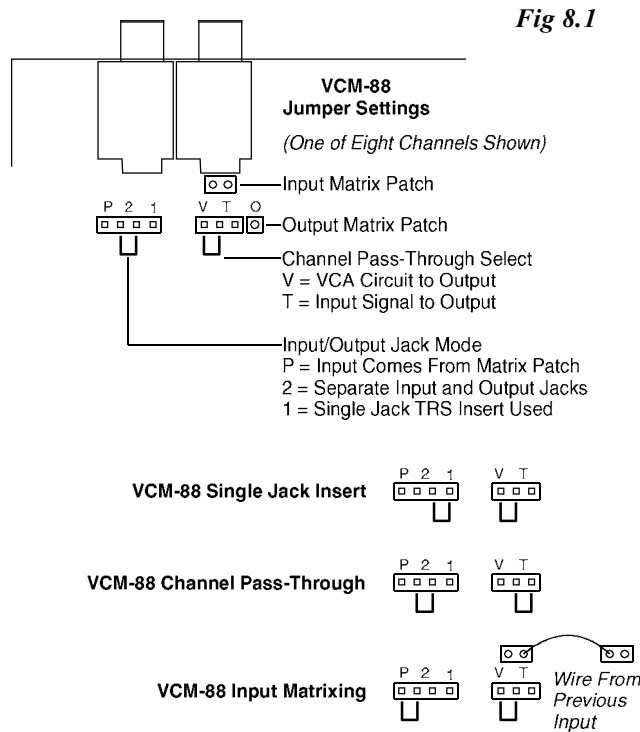


Fig 7.3

8. Input and Output Configuration Options:

8.1 Single Connector Insert

To use a mixing console's single jack insert capabilities with the VCM-88, an internal jumper must be selected to properly configure the input and output connections.



The jumper must be placed in the "1" position (see drawing at top of page) for single jack in/out operation. With the jumper set to "1", the input is on the tip and the output is on the ring of the In jack. The Out jack is not used. This convention is compatible with most mixing consoles equipped with single TRS insert jacks, but check your mixer specifications before assuming this to be true.

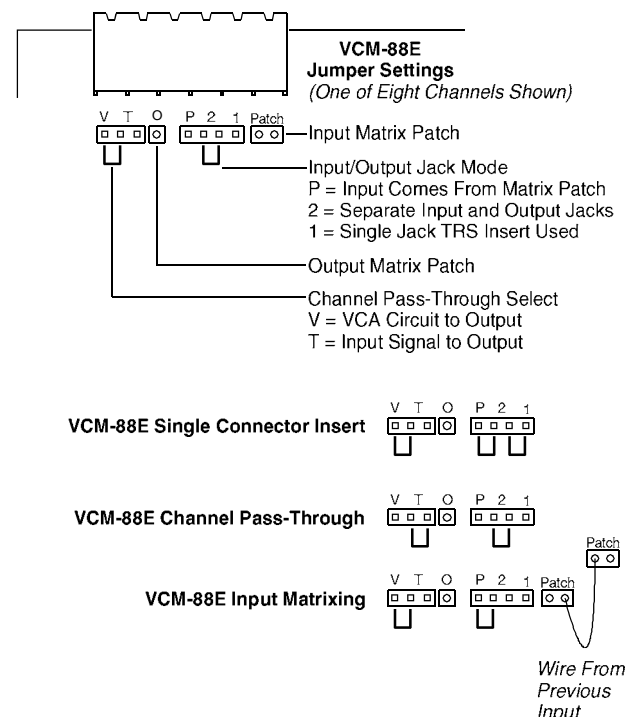
On the VCM-88E, the single connector insert capability can be selected by placing jumpers in both the "1" position and the "P" position. The (+) input pin becomes the input connection and the (-) input pin becomes the output connection. The out jack is not used.

8.2 Single Channel Pass-Through

When Using Master Output for personal monitor mixing or other application, it is possible to pass a channel's input directly to its output jack, eliminating the need for extra "Y" cables when daisy-chaining several VCM-88(E) units together. Place the internal jumper in the "T" position to select individual channel pass-through. The VCA circuit's output signal is still summed to the Master Output, but is removed from the channel output jack.

8.3 Input/Output Matrixing

Input Matrixing means that an input can be internally routed to one or more additional channel inputs, particularly useful in distributed zone applications. Each of the matrixed VCA channels share a common input signal but retain their distinct level controls via the RD-8, RW-8, or other hardware or software controllers.



There are two steps required for input/output matrixing. First, the internal jumper must be set to the "P" position (see fig. 8.1) for each channel being patched into. The actual input or output channel used to connect to the input source remains in either the "2" position if separate input and output jacks are used, or the "1" position if using single jack TRS insertion.

The second step is to insert 22 gauge solid insulated "bell wire" from the input or output Patch holes of the source channel to the Patch socket of the channel being patched into. Strip 1/4" of insulation from each end after cutting to the appropriate length, and firmly press the bare wire end straight into either side of the Patch hole, avoiding any kinks along the strip length. Daisy chain the Patch holes, one into the next, until all shared input requirements are met. Those channels which have received the internal patch input should all be set to the "P" position, and the input jack on each of those channels cannot be used, since each patched channel's input is derived internally.

9. Data Connections and Configurations

9.1 Standard Remote Data Control

To connect the RD-8 or RW-8 remote controller, the VCM-88 uses a rear panel female XLR jack, while the VCM-88E uses a three pin euroblock connector. The controller data can be sent through one channel of a standard audio snake without affecting adjacent audio channels. **Do not use an isolation transformer in the data line.**

The Standard data protocol is compatible with current RD-8 and RW-8 remote controllers, AMX (VCM-88 and VCM-88E drivers), and Crestron controllers. Both AMX and Crestron provide hardware which interfaces with the VCM-88(E) through the XLR or euroblock Data In connector. To learn more about their integrated control systems, visit their websites at <www.amx.com> and <www.crestron.com>.

The details of the Standard VCM-88(E) digital format are as follows: Pin 1 is ground, Pin 2 is used for the data input signal to the VCM-88(E), and Pin 3 is used as a +26VDC power supply signal for powering the RD-8 remote controller. **Do not use pin 3 with 3rd party hardware such as AMX or Crestron.**

A valid message consists of two bytes with no break between byte1 and byte 2.

1 Byte = start bit + 8 data bits + stop bit (10 bits total, no parity)

Baud rate: 9600 bps

Start bit: logical 0 (current on)

Stop bit: logical 1 (current off)

Byte 1: Channel ID Character:

hex 80 - hex FF = Channels 1 - 128

Byte 2: Channel Level Character:

hex 7F = full on = +20.25dB

hex 64 = unity gain = 0dB

hex 00 = off = -75dB

(step size = 0.75dB)

9.2 AMX and Legacy

Using older RD-8 and RW-8 remote controllers, as well as retired AMX products using the VCX-88 driver, requires the Legacy data protocol. To know whether Ashly hardware controllers require the Legacy or Standard protocol, look at the first three numbers in the Serial Number sticker affixed to the unit.

Product	Legacy (old) Prefix	Standard (new) Prefix
RD-8	708-****	794-****
RW-8	709-****	797-****

VCM-88 Data Protocol Jumpers

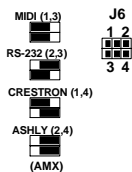


Fig. 9.2

To set the data protocol on a VCM-88 for Legacy controllers, set the internal jumpers (J6) to Ashly/AMX. To set the data protocol on a VCM-88E for Legacy controllers, DIP switches on the back panel must be set to the Legacy configuration.

9.3 DC Control Voltage Connection

Direct DC voltage control of internal VCA circuits is available on the VCM-88(E). On the VCM-88, a D-Sub 15 pin female connector is used, while the VCM-88E uses a 12 pin euroblock connector. DC control meets the remote control objectives with minimal hardware requirements and allows for custom “low-tech” hardware interfaces. Two wires are used to supply positive and negative DC voltage to ordinary 10K ohm linear-taper potentiometers, and a wire is used to return the wiper of each control to its respective channel (see pinout below). Telephone wire with eleven conductors or more is a good choice for this application, and since only DC voltage is used, control line distance is not a major concern.

Pin 1 Channel 1 DC control input

Pin 2 Channel 2 DC control input

Pin 3 Channel 3 DC control input

Pin 4 Channel 4 DC control input

Pin 5 Channel 5 DC control input

Pin 6 Channel 6 DC control input

Pin 7 Channel 7 DC control input

Pin 8 Channel 8 DC control input

Pin 9 Master DC control input

Pin 10 +15VDC - Connect to pot CCW

Pin 11 (Ground for data input)

Pin 12 -4VDC - Connect to pot CW

Pin 13-15 Not Used

9.4 RS-232 Control and Protea System Software

Protea System Software is Ashly’s custom Windows program for controlling the Protea family of digital audio processors, as well as the VCM-88(E). Using the software extends the capabilities of the VCM-88 by allowing storage of channel and scene settings to disk. The program interface has the look and feel of the RD-8 remote control, and can control up to 16 devices for a total of 128 audio channels. (See fig. 9.3)

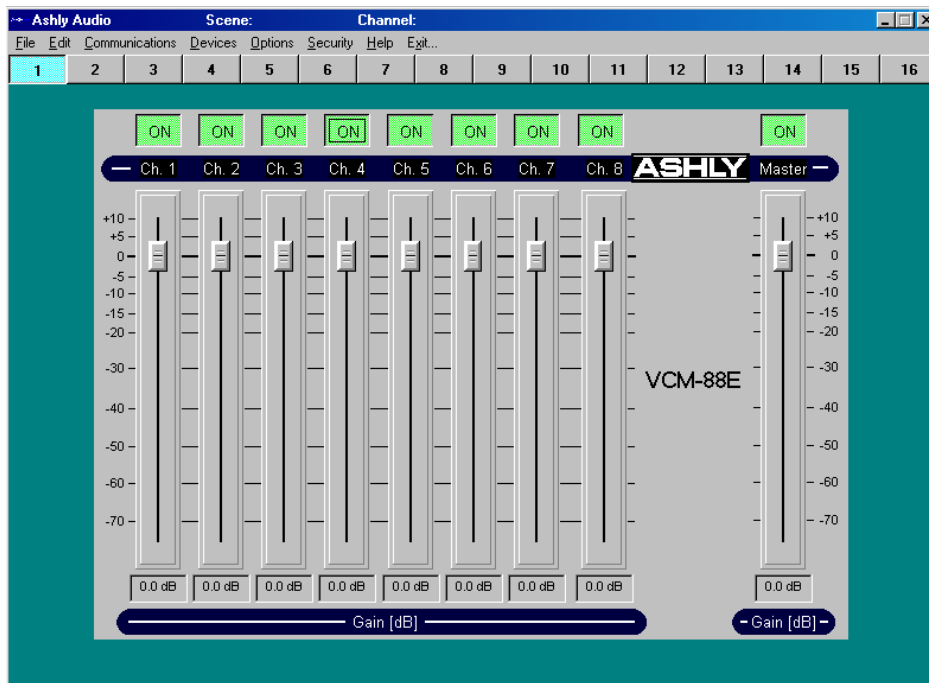


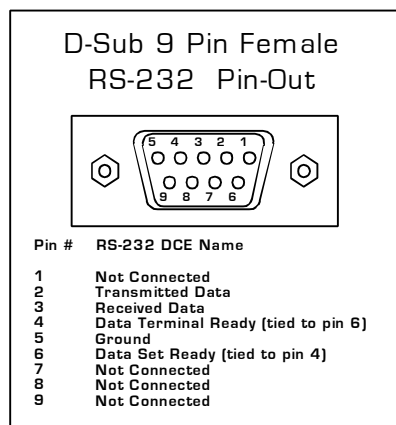
Fig. 9.3

To use the VCM-88 with Protea Software, internal data jumpers (see fig. 9.2) must be placed in the RS-232 position on the printed circuit board.

On the VCM-88E, the Standard protocol selection is used for Ashly RD-8, RW-8, AMX, and Crestron. To control the VCM-88E with Protea System Software, select the Protea Software protocol on the back-panel DIP switches.

The RS-232 Input connector to a VCM-88(E) is a D-Sub 9 pin female, and connects to an unused Com port on a PC. See fig. 9.4 for custom RS-232 wiring. Protea System Software allows Com Port assignment (1-16) in its setup menu. If the only available port on a PC is a USB port, a USB to RS-232 converter can be purchased from computer suppliers. Protea System Software is available free of charge on the Ashly website <www.ashly.com>.

Fig. 9.4



9.5 MIDI Implementation

Both the VCM-88 and the VCM-88E can be fully implemented in a MIDI system as a slave unit, that is, able to receive data without being able to generate new data. On the VCM-88, the MIDI Thru jack is a buffered reflection of the MIDI input, and is used to connect to other MIDI devices in the network. On the VCM-88E, use the Slave Data In and Out to connect to a MIDI controller. The quality and accuracy of MIDI control is limited only by the quality of the MIDI Master device.

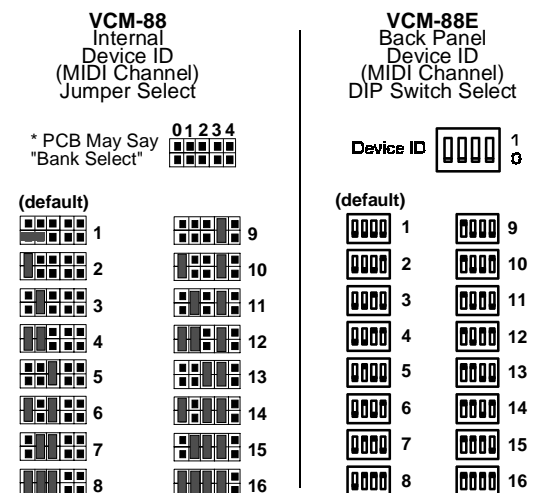
To use the VCM-88 in a MIDI network, two circuit board jumpers must be placed in the MIDI position (see fig. 9.2) to select the MIDI communications

protocol. To use the VCM-88E in a MIDI network, set the back panel Protocol DIP switch to the MIDI configuration.

Set the VCM-88 to the desired MIDI Channel (VCM-88 device 1-16) using the Bank ID Select jumpers found on the circuit board (see fig. 9.5). Device 1 equals MIDI channel 1, device 2 equals MIDI channels 2, and so on, up to device 16.

Set the VCM-88E to the desired MIDI Channel by using the Device ID DIP switches on the back panel. The VCM-88E Slave Data signals, which are located on a 6-pin euroblock style connector, may be used to interface other VCM-88E units for software or MIDI control. The Slave Data jack may also be used to interface Ashly Protea products, via their MIDI In/Out jacks, (see pin compatibility

Fig. 9.5



below). The Slave Data Out from the first unit is connected to the Slave Data In on the next unit, and so on, with the Slave Data Out from the last unit returning to the Slave Data In on the first. A serial RS-232 cable is then connected to the first unit, and the RS-232 switch is set to Multiple RS-232 mode on this first unit only. (Note: the RS-232 switch must be set to standard mode on all other units.) All units must be set to the same Protocol, such as Protea Software, if that is the control method implemented.

The Slave Data signals are fully MIDI hardware compliant, and standard MIDI controller messages may be implemented when MIDI Protocol is selected. MIDI Continuous Controller #42-49 are used to control the level of VCM-88(E) channels 1-8 respectively. Controller level (0-127) yields a channel level of -75dB to +20.25dB, in 0.75dB steps, where 100 = 0dB. MIDI 5-pin DIN compatibility is as follows:

<u>Slave Data Pin</u>	<u>MIDI signal</u>	<u>5-pin MIDI DIN</u>
Slave In +	MIDI In +	pin #4
Slave In -	MIDI In -	pin #5
Slave In NC	(MIDI shield - float at input, per MIDI spec)	
Slave Out +	MIDI Out +	pin #4
Slave Out -	MIDI Out -	pin #5
Slave Out G	MIDI Shield	pin #2

Note: whenever Ashly Protea System Software is used the Protocol must be set to Protea Software on *all* units.

If problems occur, be sure to check that the protocol is selected to MIDI, that the VCM-88(E) has been selected to the correct device (MIDI Channel), that the correct continuous controller number is being used for the desired audio channel, and that the controller value is correct.

10. Troubleshooting Tips

10.1 No Output

Check AC power - is green power LED indicator on? Check input/output connections - are they reversed? Is the Master Attenuator control turned fully up? Are remote controller channels switched on? Are the input/output jacks configured correctly (one jack insert versus two jacks) for the application?

10.2 Very Little Output Signal

Are the yellow Limiter Threshold indicators on often? Rotate the recessed Threshold controls clockwise to allow greater output signals to pass unlimited. Check the Master Attenuator control - normally this control should

be fully clockwise at 0dB. Check the RD-8 remote controller - the fader levels should normally be operated around 0dB.

10.3 Distorted Sound

The maximum input signal level is +23dBu = 10.95Vrms. Above this input level, input clipping distortion will occur. Also, if the input signal level plus the gain set by the remote controller goes above +23dBu, output clipping distortion will result.

10.4 Excessive Hum or Noise

Hum and buzz noise is usually caused by a "ground loop" between audio components. Try using balanced input and output connections between the VCM-88(E) and other components in the system. Also, try to power all components in the system from a single AC branch circuit.

Noise can also be caused by a large amount of gain applied to an insufficiently low input signal. The VCM-88(E) is not designed to feed microphones directly into the inputs without a mic preamp first. The VCM-88(E) is essentially a line level unity-gain device, meaning it is designed to be fed by a nominal 0dBu line level signal and its output should typically be 0dBu in level. To ensure proper gain structure in your sound system, press the remote disable switch in and rotate the Master Attenuator control fully clockwise so that all VCM-88(E) channels are at unity gain. Adjust your signal source which precedes the VCM-88(E) for nominal 0dBu signal levels, then push the Remote Disable switch out for remote controllability.

If you still have problems, contact your Ashly dealer or call Ashly direct at (800) 828-6308.

11. Warranty Information

We thank you for expression of confidence in Ashly products. The unit you have just purchased is protected by a limited five year warranty. To establish the warranty, you must first complete and mail the warranty card attached to your product.

Fill out the information below for your records.

Model Number _____

Serial Number _____

Dealer _____

Date of Purchase _____

Dealer's Address _____

Dealer's Phone _____

Salesperson _____

12. SPECIFICATIONS:

12.1 Input
 Input Type: 1/4" TRS (VCM-88), Euroblock (VCM-88E)
 Input Impedance: 20K ohm balanced, 10K ohm unbalanced
 Max input level: +23dBu
 Input jack may be internally selected as a single in/out insert

12.2 Channel Outputs
 Output Type: 1/4" TRS (VCM-88), Euroblock (VCM-88E)
 Output Impedance: 200 ohm pseudo-balanced,
 100 ohm unbalanced
 Max output level: +22dBu

12.3 Master Output
 Output Type: 1/4" TRS (VCM-88), Euroblock (VCM-88E)
 Output Impedance: 200 ohm pseudo-balanced
 100 ohm unbalanced
 Max output level: +22dBu

12.4 Audio Performance
 Nominal Gain: 0dB +/-0.5dB
 Gain Range: +20dB to -75dB
 Frequency Response: +/-0.2dB 20Hz-20KHz
 THD: <0.05% at 0dBu, 20Hz-20KHz
 Output Hum & Noise:
 <-94dBu 20Hz-20KHz unweighted
 Crosstalk: <-80dB at 20KHz

12.5 Signal Present
 Green LED turns on at -20dBu

12.6 Limiter
 Threshold Range: -23dBu to +22dBu
 Compression Ratio: 10:1

12.7 RD-8 Data Input
 Input Type: XLR (VCM-88), Euroblock (VCM-88E)
 pin 2=data, pin 3=+V, pin 1=ground
 Data Format: 2Vp raised-cosine,

12.8 RS-232 Input
 Input Type: D-Sub 9 pin female
 pin 3=data, pin 5=ground
 1 start, 9 data, 1 stop bits at 9600 baud

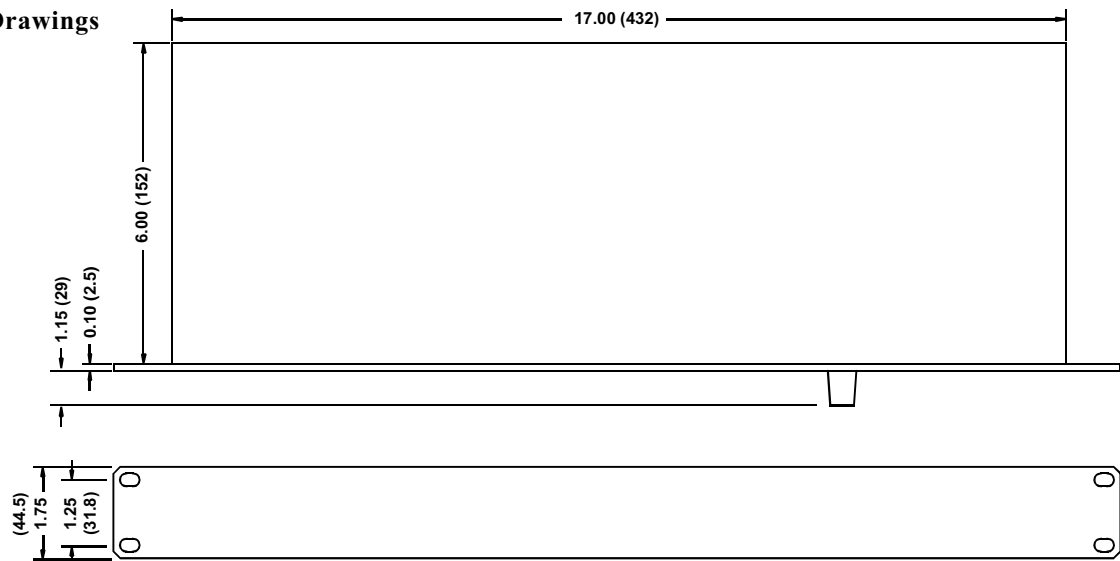
12.9 DC Control Inputs
 Input Type: DB 15-pin female connector (VCM-88)
 Euroblock (VCM-88E)
 Control Voltage: -4V to +15V provided for
 external 10K ohm potentiometers

12.10 Overall
 Size: 19" x 1.75" x 6"
 (483mm x 44mm x 152mm)
 Power Requirements: 100-125VAC, 50-60Hz 18W
 (240V available)
 Shipping Weight: 10 lbs. (4.5kg)
 Net weight: 6.9 lbs. (3.1kg)

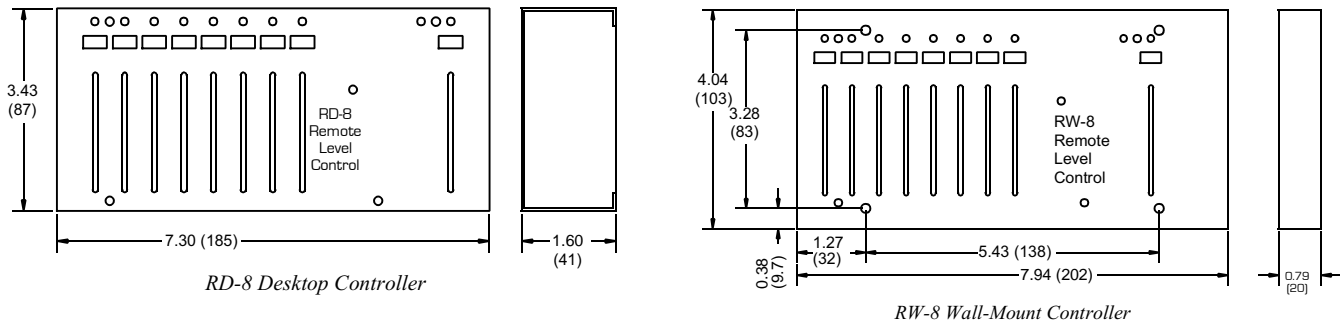
12.11 RD-8, RW-8 Specifications
 Fader Range: +10dB to -75dB
 (master fader at 0dB)
 Data/Power Connector: Male XLR jack
 Max Data Cable Length:
 1500 ft. of 24 ga. twisted pair
 Data Format: 9600 baud, 2Vp raised cosine
 Data crosstalk to audio:
 <-110 dB along 1000' of 150 ohm shielded cable

Power Requirements:
 Phantom powered by VCM-88(E)
 Shipping Weight: 3 lbs. (1.4kg)

13. Dimensional Drawings



Dimensional Drawing for VCM-88 and VCM-88E in Inches (mm)



14. Common Applications

- **Eight In, Eight Out Individual Channel Remote Control**

Use for individual mixer channel or subgroup remote control, especially suited for situations where the audio equipment rack is installed away from an adequate listening point. Also useful to control monitor levels/mixes from the front-of-house position. Separate input/output connectors or single jack TRS patch available. Control with RD-8, RW-8, Custom DC Voltage Controller, AMX or Crestron Touch Screen Systems, or Ashly Protea System Software.

- **Eight In, One Out For Remote Control Sub-Mixing**

Use up to eight inputs and the Master Output to allow mixdown of all VCM-88(E) inputs. Individual channel pass through is available to daisy-chain multiple VCM-88(E) units together for personal monitor mixes. Control with RD-8, RW-8, Custom DC Voltage Controller, AMX or Crestron Touch Screen Systems, or Ashly Protea System Software.

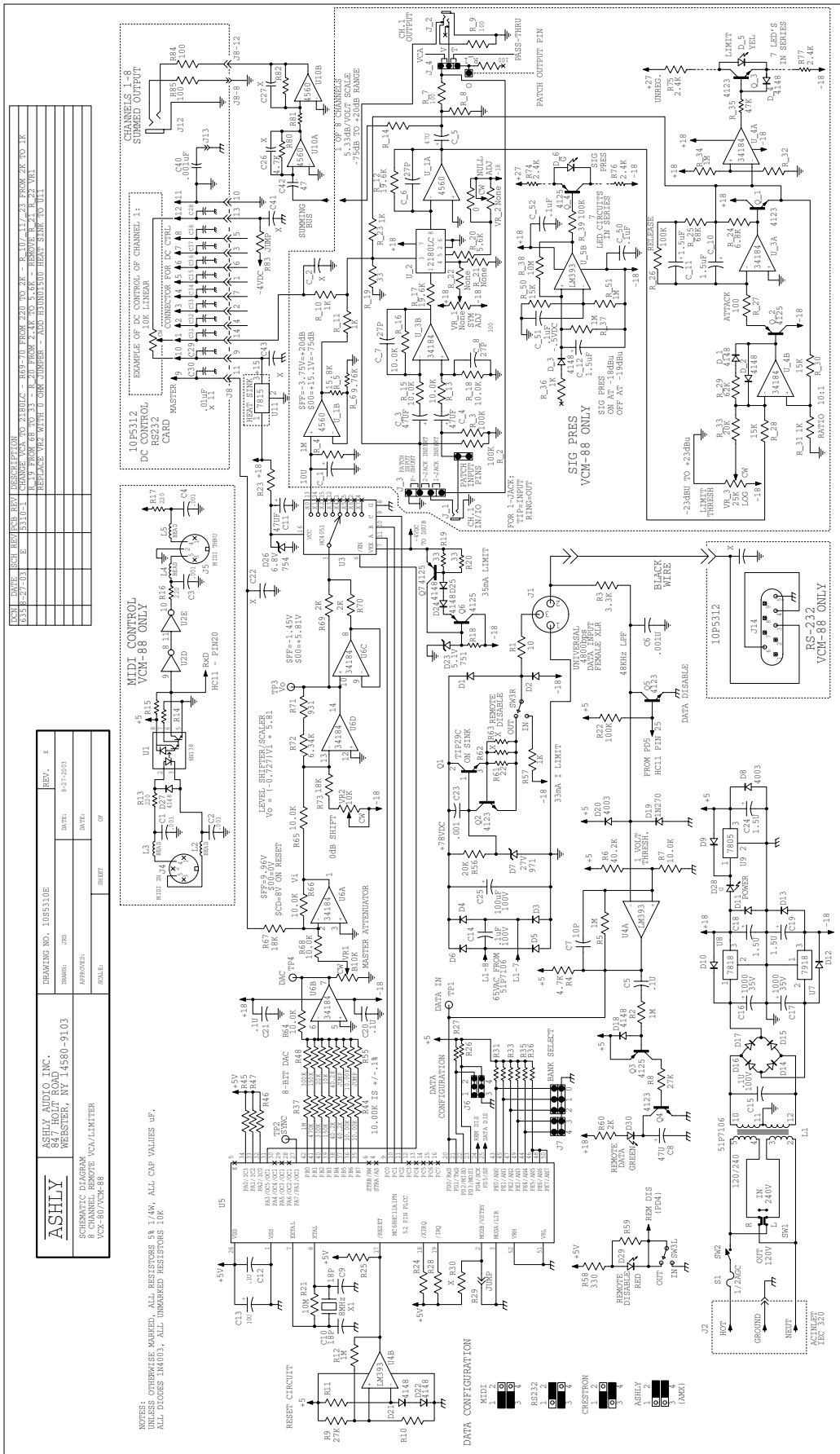
- **One In, Eight Out For Remote Control of Distributed Zones**

Use Input Channel Patch to internally jump one channel's input into one or more other inputs for distribution of single audio signal. Control with RD-8, RW-8, Custom DC Voltage Controller, AMX or Crestron Touch Screen Systems, or Ashly Protea System Software.

- **Limiters With Threshold Control On All Eight Channels**

Use VCM-88(E) as stand-alone eight channel, true VCA peak limiter, with adjustable threshold on each channel. No controller is required.

Schematic Diagram: VCM-88

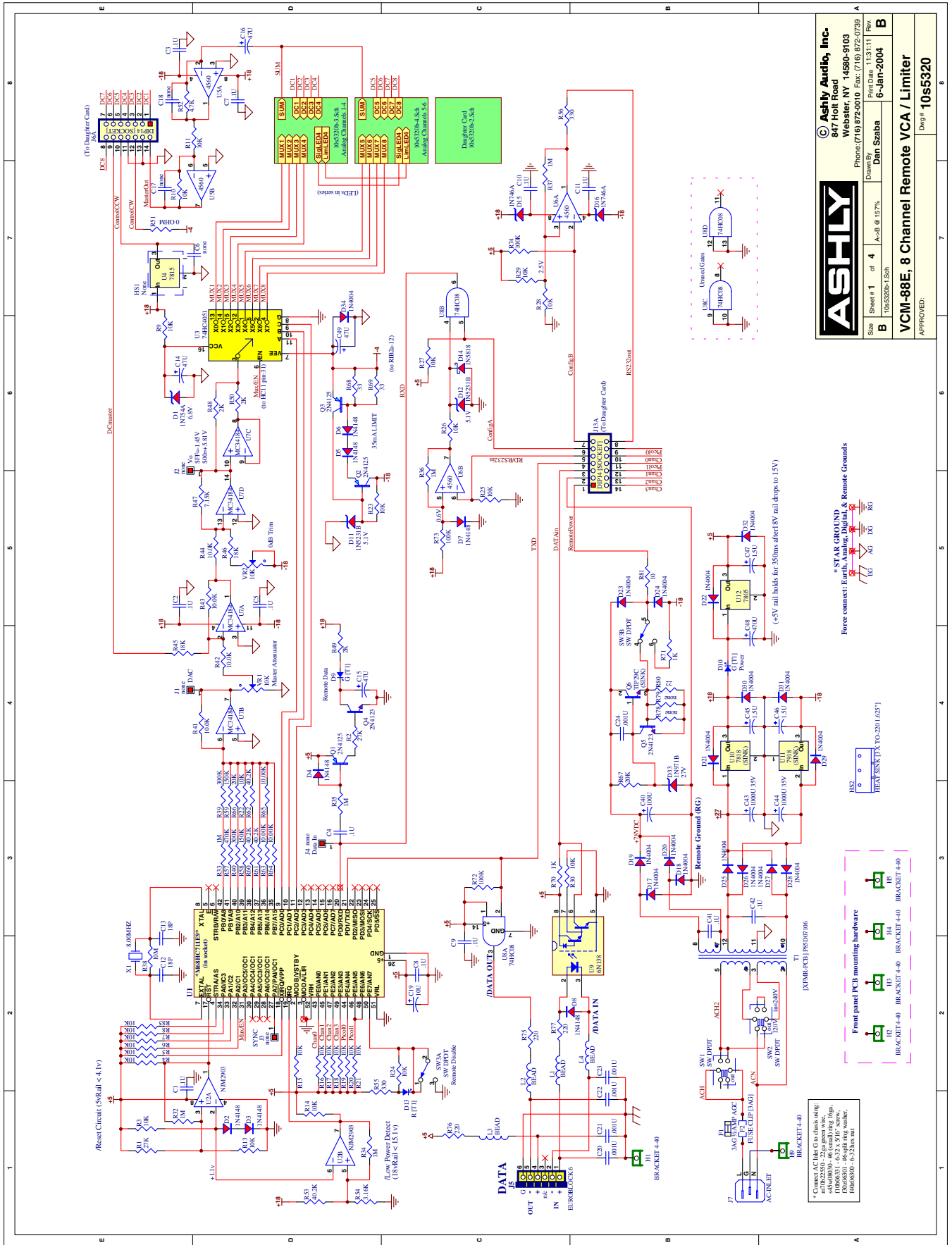


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5312	2/73	5	5311	1	5311	REVISION FROM 5311 TO 5312 - R20 FROM 2.2K TO 5.2K - REMOVE R24, R28, R29, R30, R31, R32, R33, R34, R35, R36, R37, R38, R39, R40, R41, R42, R43, R44, R45, R46, R47, R48, R49, R50, R51, R52, R53, R54, R55, R56, R57, R58, R59, R60, R61, R62, R63, R64, R65, R66, R67, R68, R69, R70, R71, R72, R73, R74, R75, R76, R77, R78, R79, R80, R81, R82, R83, R84, R85, R86, R87, R88, R89, R90, R91, R92, R93, R94, R95, R96, R97, R98, R99, R100
5312	2/73	5	5311	1	5311	REVISION FROM 5311 TO 5312 - R20 FROM 2.2K TO 5.2K - REMOVE R24, R28, R29, R30, R31, R32, R33, R34, R35, R36, R37, R38, R39, R40, R41, R42, R43, R44, R45, R46, R47, R48, R49, R50, R51, R52, R53, R54, R55, R56, R57, R58, R59, R60, R61, R62, R63, R64, R65, R66, R67, R68, R69, R70, R71, R72, R73, R74, R75, R76, R77, R78, R79, R80, R81, R82, R83, R84, R85, R86, R87, R88, R89, R90, R91, R92, R93, R94, R95, R96, R97, R98, R99, R100
5312	2/73	5	5311	1	5311	REVISION FROM 5311 TO 5312 - R20 FROM 2.2K TO 5.2K - REMOVE R24, R28, R29, R30, R31, R32, R33, R34, R35, R36, R37, R38, R39, R40, R41, R42, R43, R44, R45, R46, R47, R48, R49, R50, R51, R52, R53, R54, R55, R56, R57, R58, R59, R60, R61, R62, R63, R64, R65, R66, R67, R68, R69, R70, R71, R72, R73, R74, R75, R76, R77, R78, R79, R80, R81, R82, R83, R84, R85, R86, R87, R88, R89, R90, R91, R92, R93, R94, R95, R96, R97, R98, R99, R100
5312	2/73	5	5311	1	5311	REVISION FROM 5311 TO 5312 - R20 FROM 2.2K TO 5.2K - REMOVE R24, R28, R29, R30, R31, R32, R33, R34, R35, R36, R37, R38, R39, R40, R41, R42, R43, R44, R45, R46, R47, R48, R49, R50, R51, R52, R53, R54, R55, R56, R57, R58, R59, R60, R61, R62, R63, R64, R65, R66, R67, R68, R69, R70, R71, R72, R73, R74, R75, R76, R77, R78, R79, R80, R81, R82, R83, R84, R85, R86, R87, R88, R89, R90, R91, R92, R93, R94, R95, R96, R97, R98, R99, R100

ASHLY		REV. #
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CHECKED:		DATE:
DESIGNED:		DATE:
DRAWN:		DATE:

NOTES: OTHERS MARKED. ALL RESISTORS 1/4W. ALL CAP VALUES .1UF. ALL DIODES 1N4003. ALL UNMARKED RESISTORS 10K.





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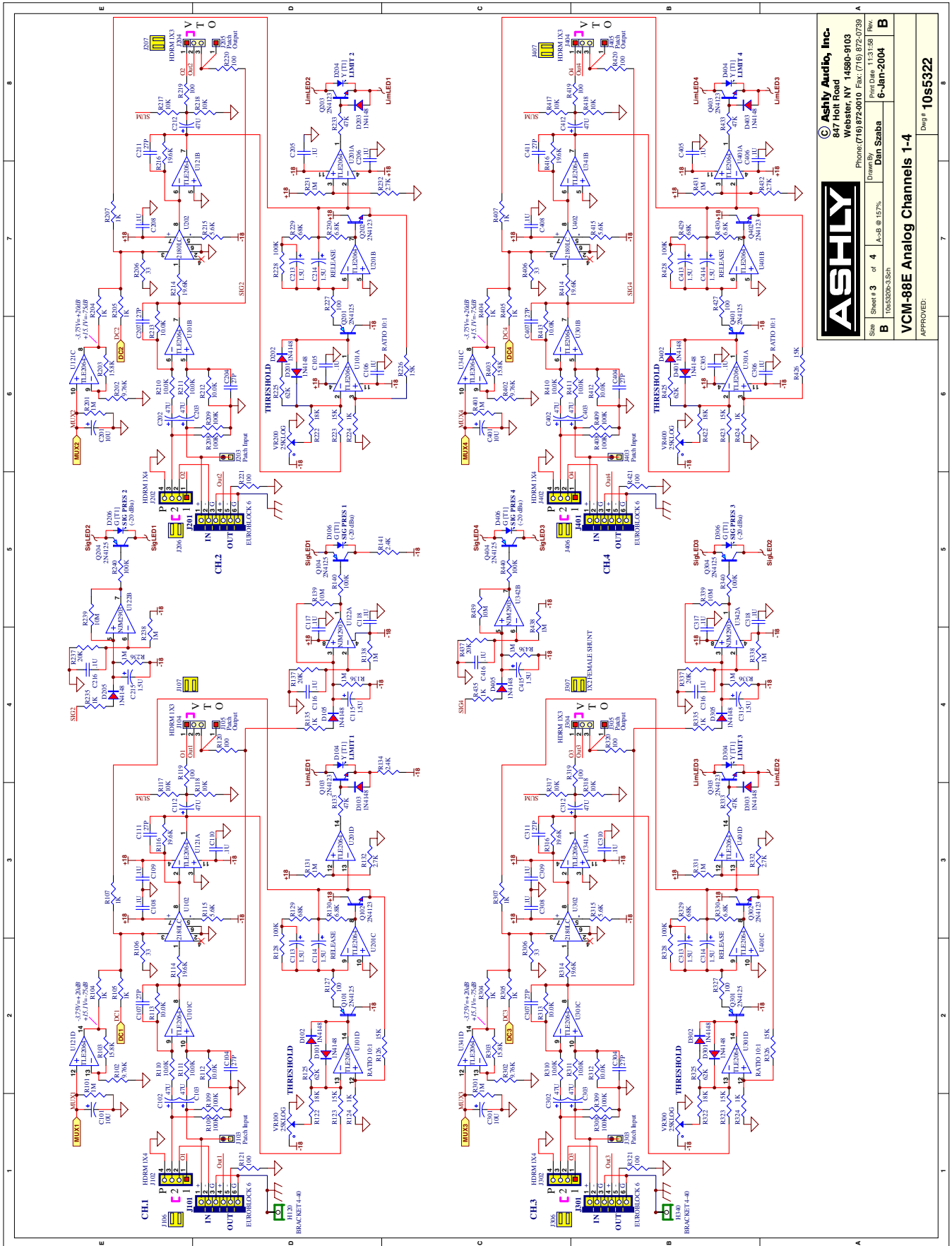
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Print Date: 11/31/11 Rev: B
104532001-1.Sch
6-Jan-2004

VCM-88E, 8 Channel Remote VCA / Limiter

APPROVED: _____
Dwg # - 10S5320

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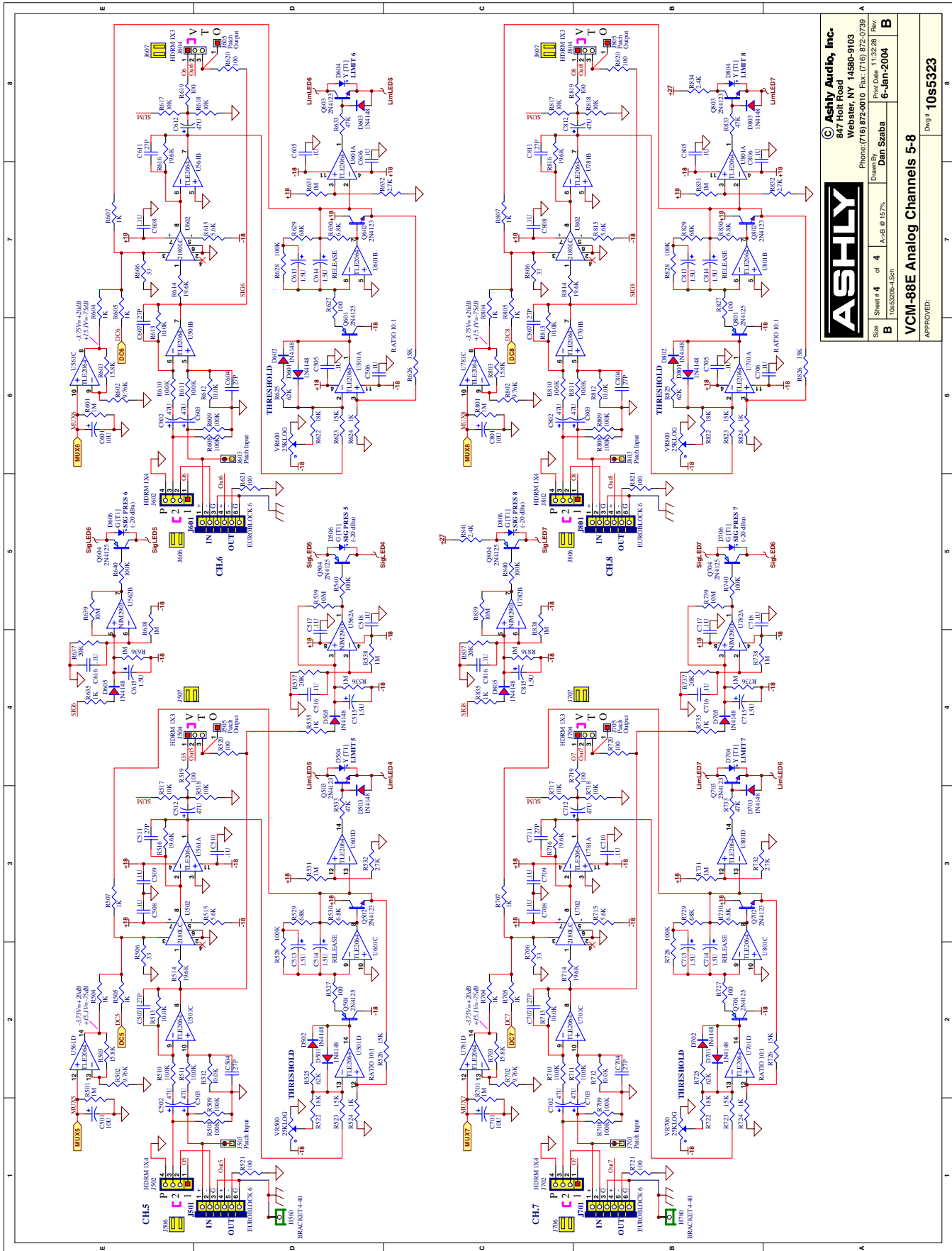
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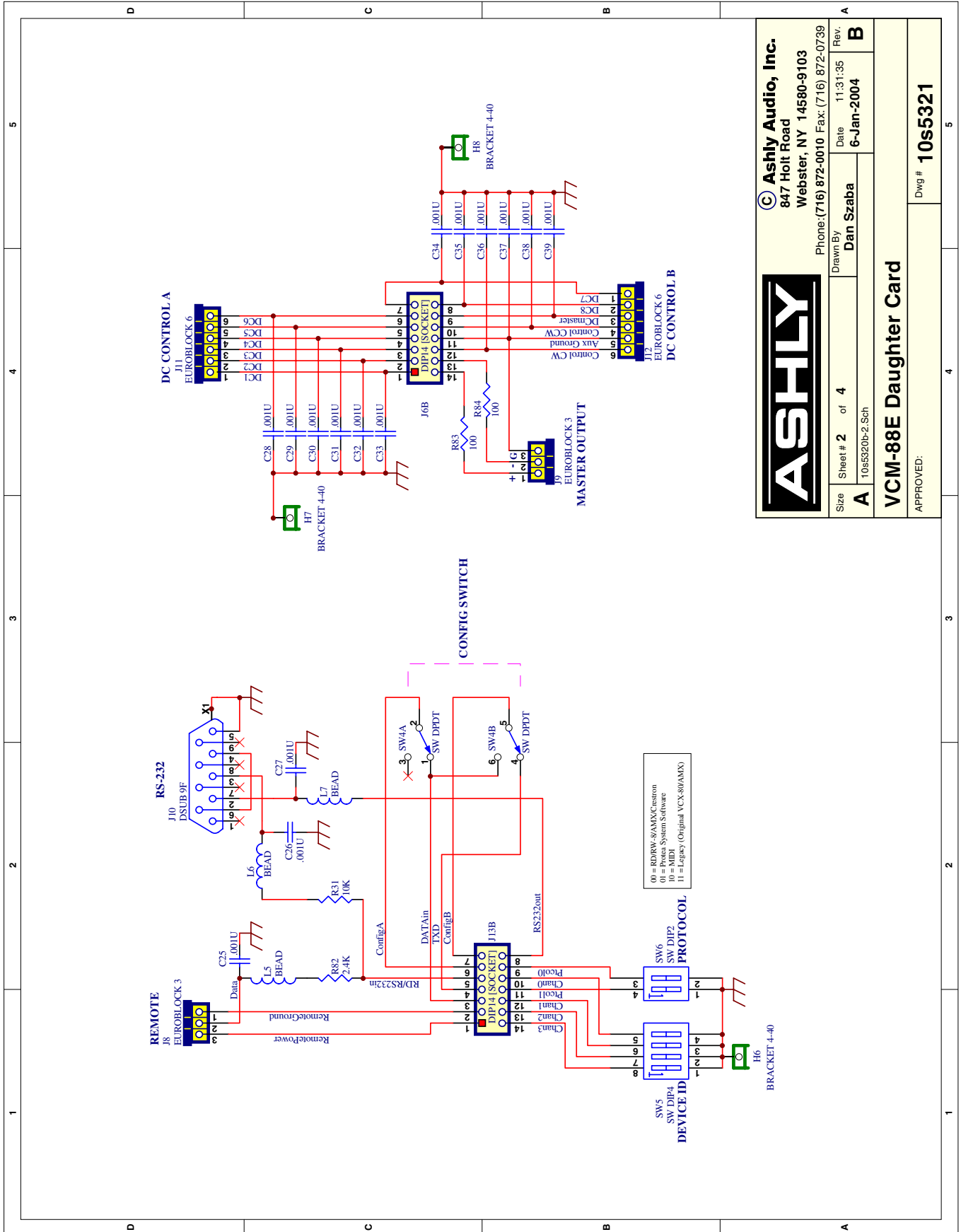
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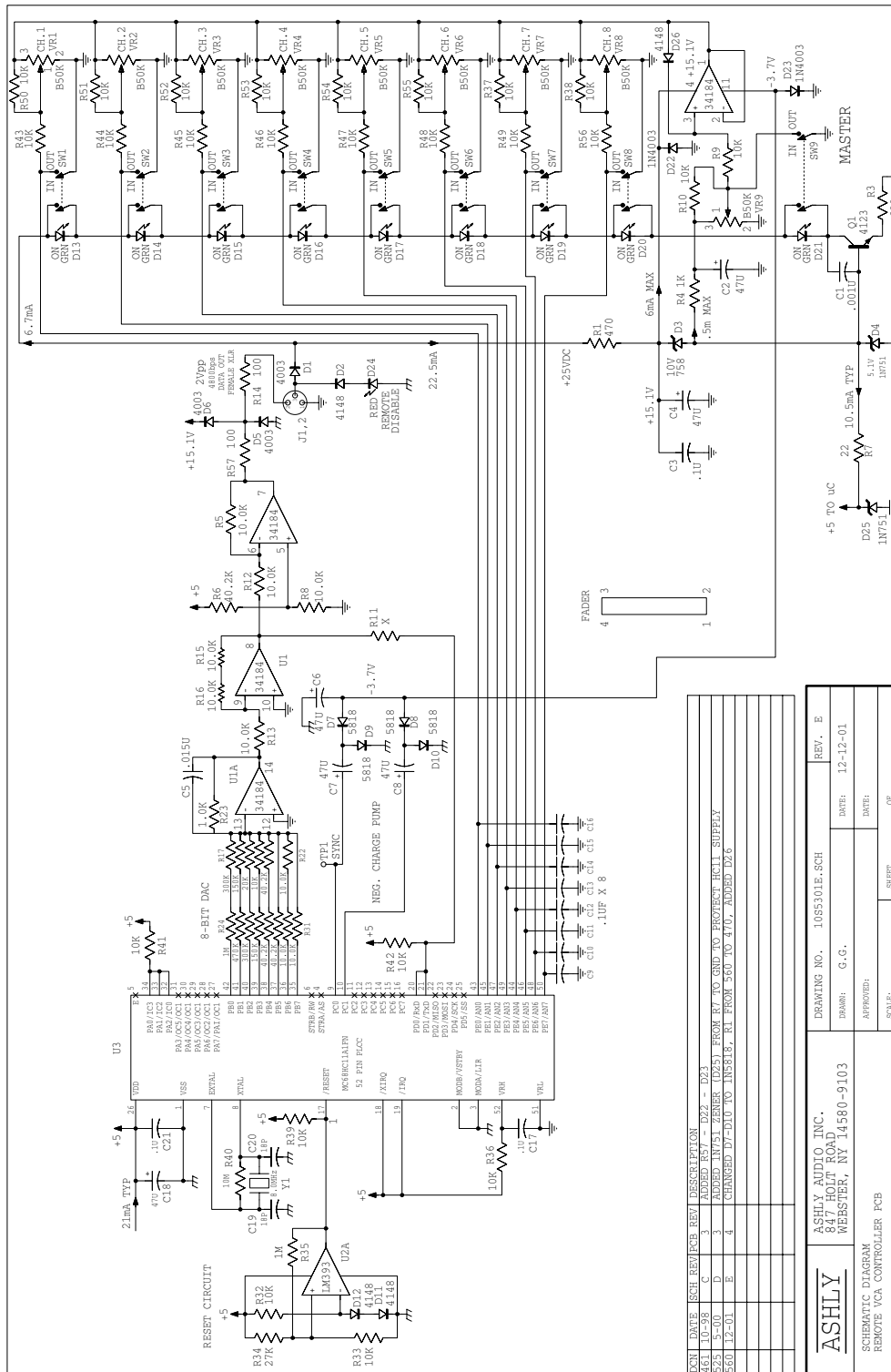
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Schematic Diagram: RD-8, RW-8



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