



# **VDA-102**

**Precision Analog Video  
Distribution Amplifier**



## **Statement of Warranty**

The ISIS Group, Inc. warrants its products for a period of seven (7) years from the date of shipment to be free from defects in materials and workmanship and meets applicable published specifications. Equipment which has been operated within its ratings and has not been subjected to mechanical or other abuse or modification by the purchaser, its agents, and/or employees, will, at the option of The ISIS Group, be replaced or repaired if it is returned, freight prepaid, to ISIS. Equipment that fails under conditions other than described herein will be repaired at the price of components and labor in affect at the time of repair.

This warranty is in lieu of all other warranties, expressed or implied, with respect to the condition or performance of any ISIS Group product, its merchantability or fitness for a particular purpose. ISIS is not liable for any consequential damages.

## **FCC Compliance**

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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January 2006

Part Number 71-0027

# Installation and Operation Manual

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## SECTION I

### VDA-102

#### General Description

The VDA-102 is a modular, high performance video distribution amplifier intended for studio quality video distribution systems. It is designed to be operated from the ISIS VMF-100 mounting frame, and it is also pin-compatible with the Leitch\* FR-6801 and FR-6802 video mounting frames. The module can be used for high quality distribution of NTSC and PAL analog composite and component video signals.

The module is configured as a one-input by eight-output amplifier, using 75Ω BNC connectors.

There are two jumpers present on the module. One is used to select whether the input signal is looping or internally terminated in 75 ohms, and the other selects the range of cable equalization.

Each module has its own on-board voltage regulators with fuse protection. Any failure of a single module will not affect any other module in the frame.

\*Leitch is a trademark of Leitch Technology International, Inc.

## SECTION II

### VDA-102

#### Specifications

##### Input:

Number	1, Differential
Impedance	75 $\Omega$ bridging or terminated (jumper select)
Video Input Level	1V p-p
Input Return Loss	>40dB to 10MHz, 30dB to 30MHz
Input Coupling	DC
Maximum DC on Input	$\pm 15V$ (AC coupled)
Common Mode Rejection	>60dB to 10KHz

##### Outputs:

Number	8
Impedance	75 $\Omega$
Output Return Loss	>37dB to 10MHz
Output Isolation	>30dB to 10MHz
Response Variation	<0.1dB, 1 to 8 loads, to 10MHz

##### Performance:

Gain range	-3dB to +3dB
Frequency Response	< $\pm 0.05$ dB to 20 MHz -3dB bandwidth to 35 MHz
Line Rate Window Tilt	<0.25%
Field Rate Window Tilt	<0.25%
50/60Hz Square Wave Tilt	<0.5%
Differential Gain (10-90% APL)	<0.15%
Differential Phase	<0.15 $^\circ$
S/N Ratio	65dB to 20MHz unweighted
Hum	1mV p-p
Stability w/ $\pm 10\%$ Line Volt Change	0.05%

**Cable Equalization:**

Equalizer A 8281 to 1000', ±0.5dB to 20MHz  
8263 (RG-59) to 600'

Equalizer B 8281 to 1000' ±0.25dB to 10 MHz  
8263 (RG-59) to 600'

Performance temperature 5 - 40° C`

Maximum Operating temperature 0 - 50° C

Power Consumption 2 W

## SECTION III

### VDA-102

#### Installation and Operation

The VDA-102 analog video distribution amplifier is designed to be mounted in either the ISIS VMF-100 video mounting frame, (up to ten modules), or a Leitch\* video frame (such as the FR-6801 or FR-6802). There are no special cooling requirements, although care should be taken to ensure that extremely hot equipment is not installed directly beneath the frame.

It is recommended that when redundant power supplies are included in the frame, the two power cords be connected to different AC supplies. In this way the frame will continue to operate even if there is a partial failure of plant power.

Before installing the module in the frame, it is necessary to set the internal jumpers to the desired mode. Jumper H1 selects either internal 75 $\Omega$  termination or high impedance looping mode, and jumpers H2 selects the cable equalization range. Position 10 of H2 sets the equalization flat to 10MHz, and position 30 sets for flat to 30MHz. Final adjustment is accomplished with the front-adjustable potentiometer, VR3. For optimal amplifier performance, high quality coaxial cables and connectors (e.g. Belden 8281, 1694A or equivalent) should be used.

\*Leitch is a trademark of Leitch Technology International, Inc.

## SECTION IV

### VDA-102

#### Circuit Description

The VDA-102 is a differential input, eight output video distribution amplifier, with clamping, white clip and cable equalization. The input may be terminated with 75Ω or high impedance as selected by H1. The input passes via differential amplifier U2 to the clamp circuit consisting of sync separator U4 and clamp U3. The output of the clamp circuit connects, via the gain control RV1, to the white clip circuit consisting of U1, Q1 and U5. Clip level is set by RV2. The output from the clip circuit connects to the cable compensation circuit which has two modes selected by H2. Equalizer A is optimized for a bandwidth of approximately 30MHz. Equalizer B is optimized for a bandwidth of 10MHz. Equalizer B is preferred for NTSC applications while Equalizer A is preferred for wideband component signals. Both equalizers will compensate up to 1000ft of 8281. The amount of compensation is adjustable by RV3. To disable compensation remove the jumper at H2. The output of the compensation circuit connects to the output driver consisting of U7 and U8.

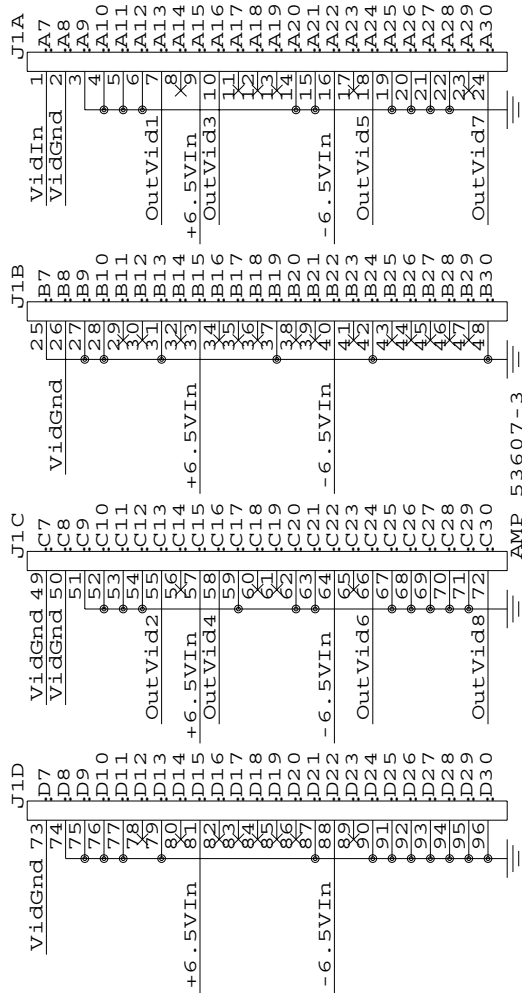
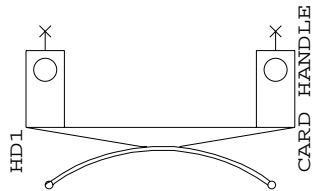
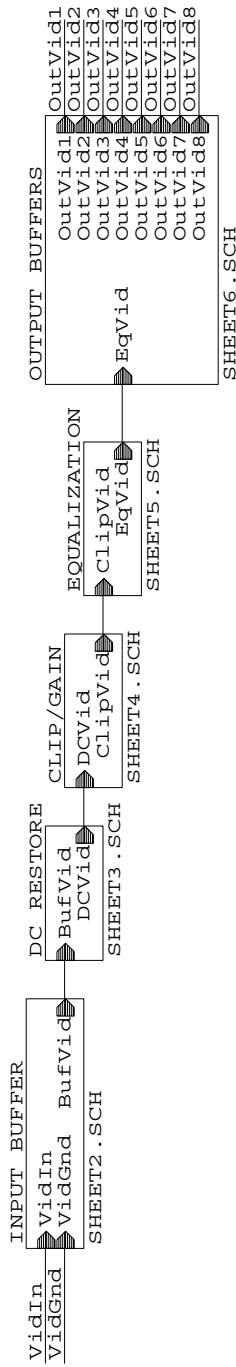
VR1 and VR2 provide regulated  $\pm 5V$  supplies.

**SECTION V**

**VDA-102**

**Diagrams**

**VDA-102 VIDEO DISTRIBUTION AMPLIFIER**



R1 - Reversed polarity of C19, C8, C6.

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Title

VDA-102 Precision Video Distribution Amp

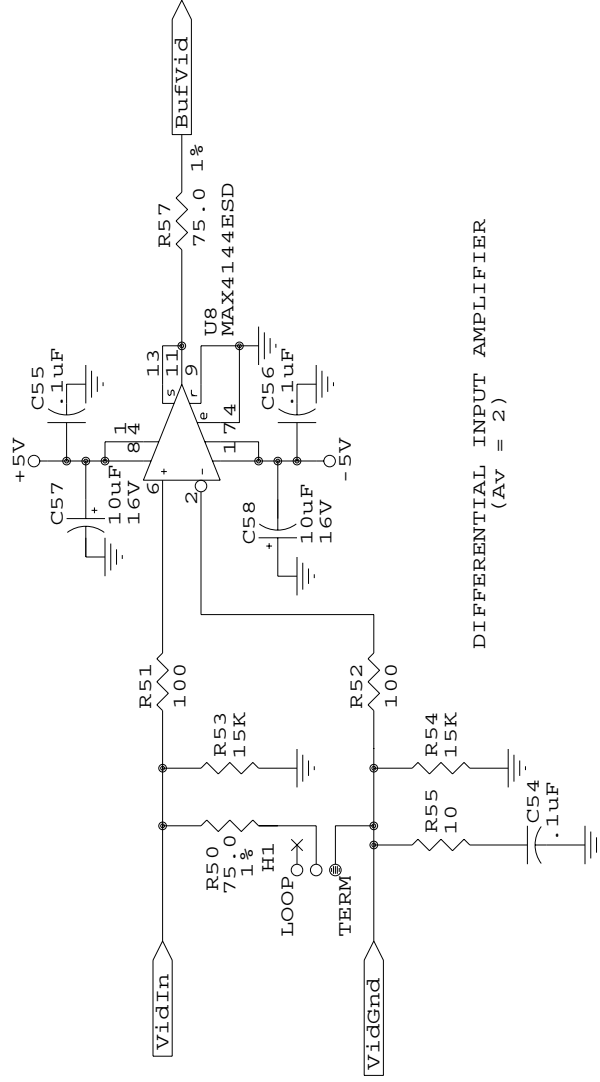
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Date: October 8, 2003 Sheet 1 of 8

MISCELLANEOUS PC LAYOUT ITEMS  
SHEET8.SCH



DIFFERENTIAL INPUT AMPLIFIER  
(AV = 2)

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Title

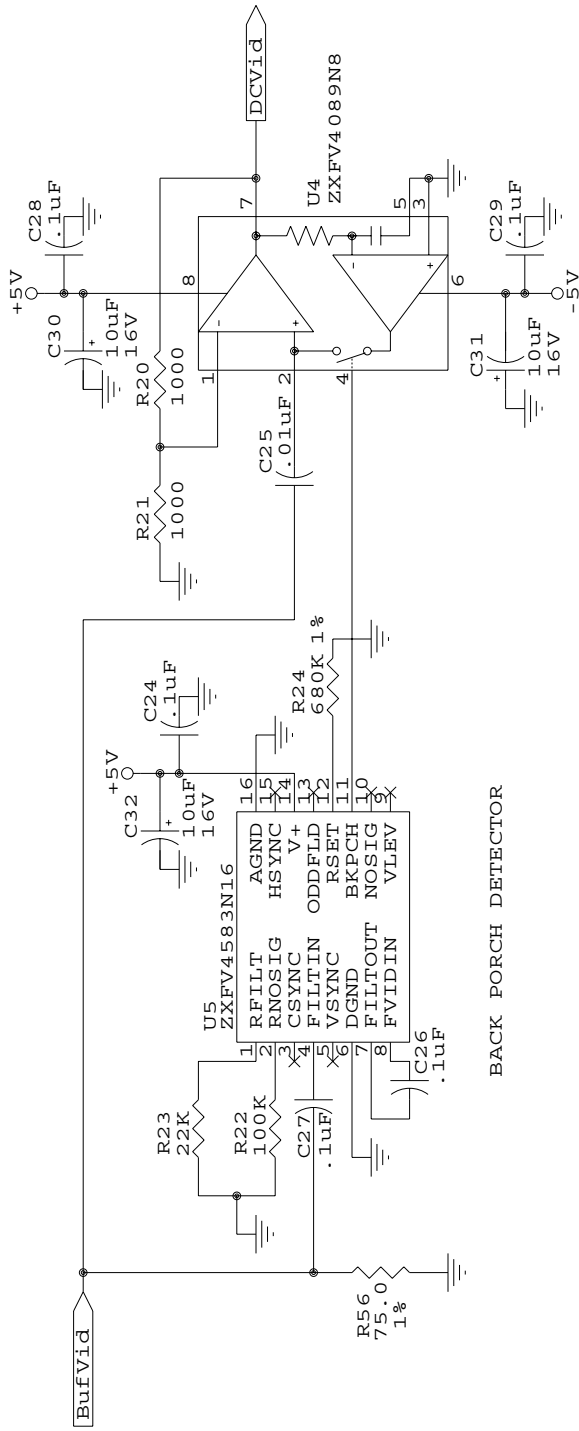
VDA-102 Input Buffer

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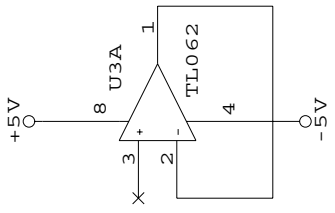
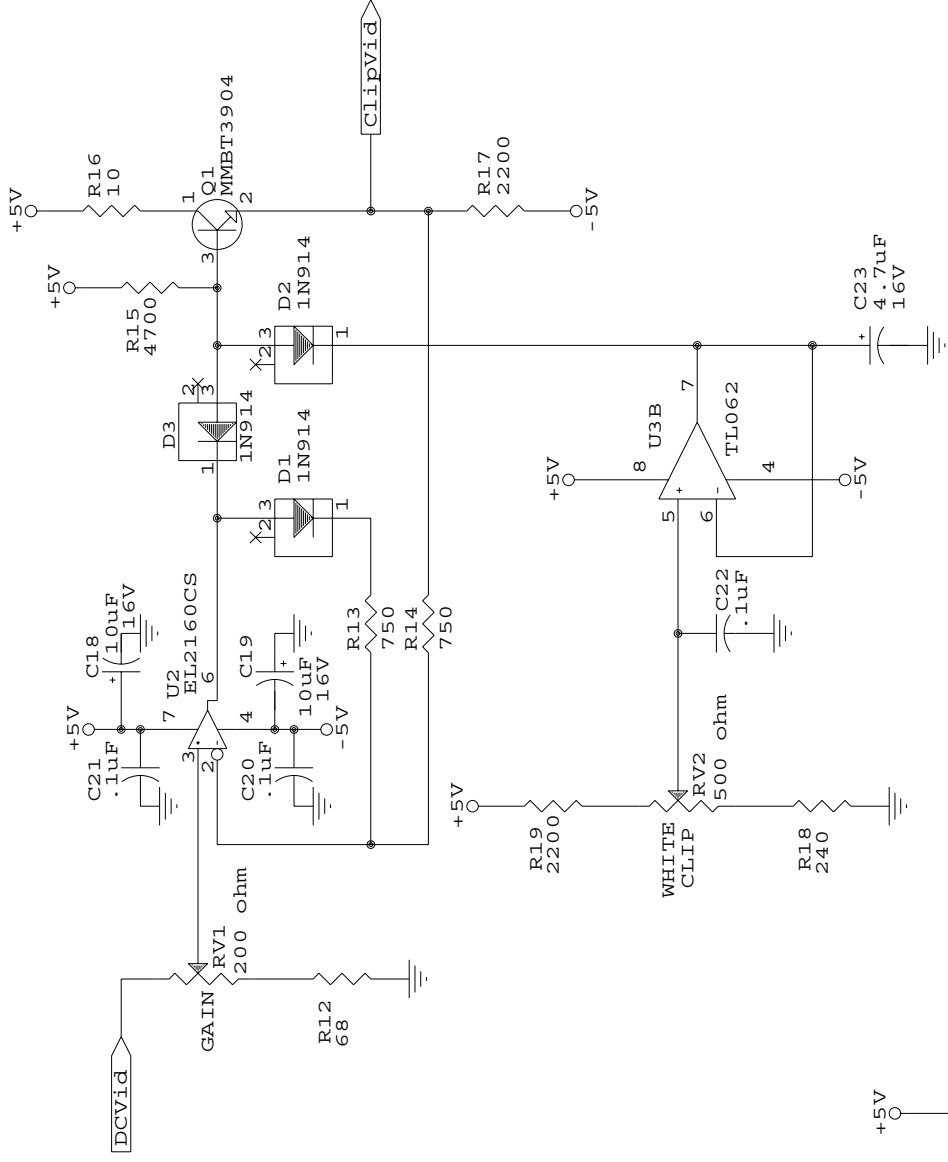
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CLAMP

BACK PORCH DETECTOR

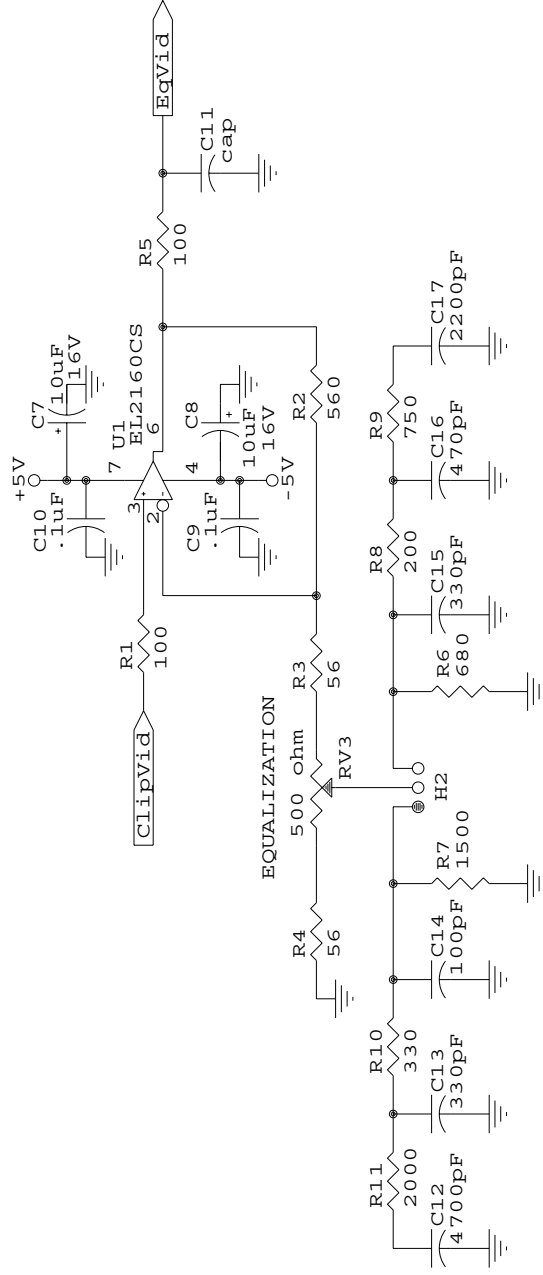
The ISIS Group, Inc. Grass Valley, Ca.	
Title VDA-102 DC Restoration	
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Date: July 12, 2003	Sheet 3 of 8



R1 - Reversed polarity of C19.

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Title	
VDA-102 Video Clip and Gain	
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A	1
Date:	October 8, 2003
Sheet	4 of 8
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R1 - Reversed polarity of C8.

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Title

VDA-102 Output Equalization

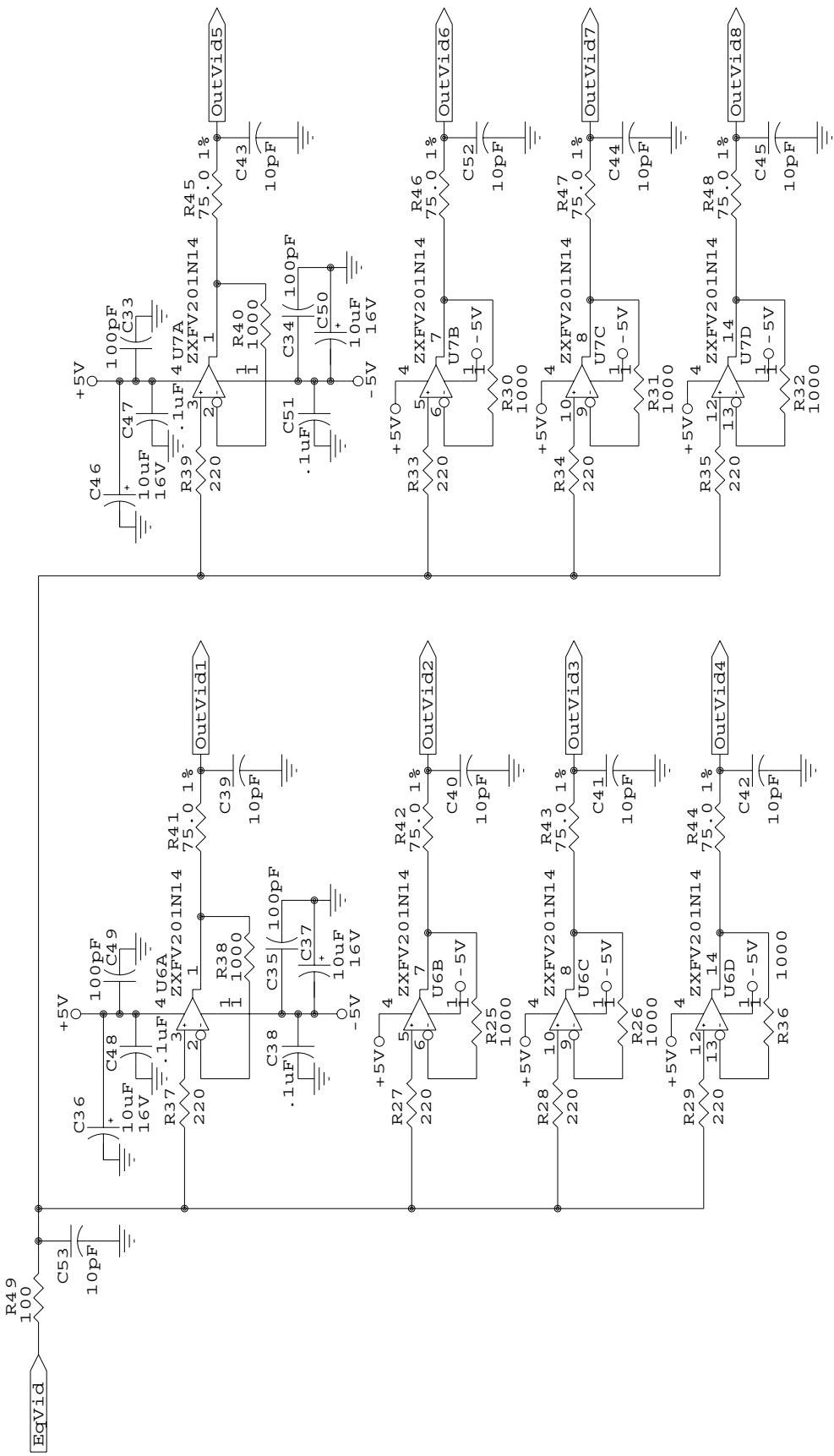
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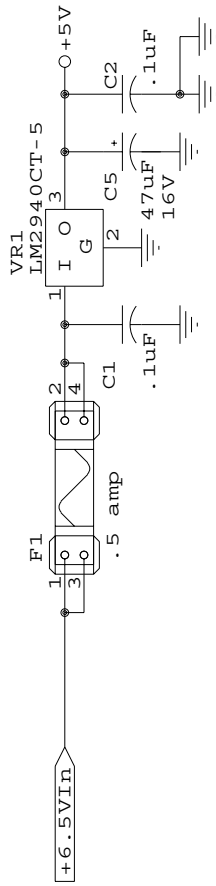
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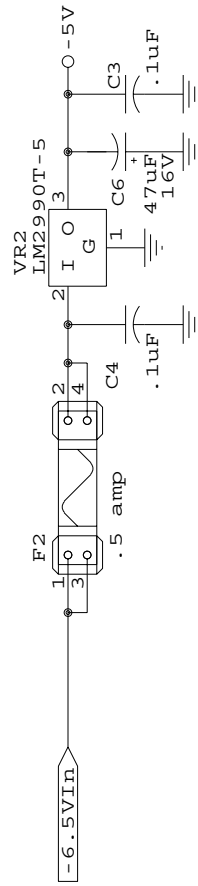
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VDA-102 Output Buffers	
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- VR1 ⌈ Screw 4-40 x 5/16
- VR1 ⊙ #4 Lock Washer Internal Tooth
- VR1 ⊙ Hex Nut 4-40 Small Pattern St1



- VR2 ⌈ Screw 4-40 x 5/16
- VR2 ⊙ #4 Lock Washer Internal Tooth
- VR2 ⊙ Hex Nut 4-40 Small Pattern St1



NOTE: The tab is not GND on this regulator.

R1 - Reversed polarity of C6.

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Title

VDA-102 Power Regulators

Size Document Number

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