



LINE 2 - REPAIR MANUAL

SONIC FRONTIERS warranty repair work shall be performed only by qualified electronics technicians. Work done by non-authorized SONIC FRONTIERS service locations and/or dealers is not covered under the SONIC FRONTIERS warranty. Damage caused by service attempted by one other than our authorized service bureaus is not covered under the warranty.

Please read these instructions before attempting any service work. They are intended to aid the electronics technician in making the proper diagnosis in repairing the Line 2 preamplifier.

Normal Operation

The following points have been found to be the most frequent areas of concern from customers, **no fault exists in the Line 2 in each case.**

1. Some hiss in speakers.
 - The Line 2 incorporates 6 vacuum tubes and will inherently make more hiss noise than a solid state product. Typical noise output is no more than 120 μ V per phase with the volume control fully counter-clockwise.
 - Sensitive amplifiers and sensitive speakers will reveal this hiss more readily than average sensitivity amplifiers and speakers, example: an amplifier with an input sensitivity of 0.775V_{rms} and speakers with a sensitivity of 90dB SPL @1W, 1m anechoic would be considered moderately sensitive.

All components listed in the text will have the same designation for both channels but with an 'L' prefix for Left channel components. For this reason, all parts will be referred to by Left channel only. Example: resistors LR43 and R43; the resistor LR43 is found in the Left channel and R43 is in the Right channel.

Filament Supply Voltages

1. Filament voltage should be measured across pins 4 and 5 of the following tubes: LV1 and LV3. A reading of 6.0Vdc to 6.3Vdc is acceptable, any voltages higher or lower must be
2. If one channel has no filament voltage present, check the bridge rectifier for the filament section, LBR1 in the Power Supply chassis. Replace if needed and place a heat sink on both the filament bridge rectifier devices; this will improve heat dissipation.
3. If only tubes LV1 and LV2 are not lighting, check regulator LIC2 in the Power Supply chassis. If only tubes LV3 and LV4 are not lighting, check regulator LIC1.

High Voltage Supplies

Note: The following voltages are measured referenced to chassis ground or an audio ground (RCA jack sleeve is sufficient).

1. With the Power supply switched to ON and the STANDBY position, check the voltages

| Power Supply | Mode of Operation | | |
|--------------|-------------------|---------|-------|
| Pin Number | Standby | Operate | Muted |

| | | | |
|----|-------|-------|-----|
| 1 | 6.1 | 5.4 | |
| 2 | -12.1 | -12.1 | |
| 3 | 18.3 | 18 | |
| 4 | 5.1 | 1.5 | 5.3 |
| 5 | -0.1 | -123 | |
| 6 | 0 | 0 | |
| 7 | 10.9 | 0.1 | |
| 8 | 9.9 | 9.2 | |
| 9 | -4.7 | 270 | |
| 10 | -1 | 146 | |
| 11 | 0.2 | 1.5 | 5.3 |
| 12 | 6.15 | 6.15 | |
| 13 | 6.15 | 6.15 | |
| 14 | 6.15 | 6.15 | |
| 15 | 0 | 0 | |
| 16 | 0 | 0 | |

Front View

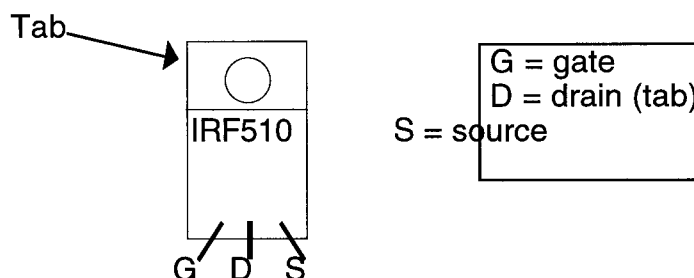


Figure 1

2. Place a voltmeter probe on the tab (drain) of Q3 or LQ3 and switch the Power supply to the OPERATE position. The voltage should ramp up to approximately 285Vdc $\pm 10V$ within 40 seconds. If the voltage goes immediately to 300Vdc after switching to OPERATE, there is a problem in the first High Voltage regulation stages at LQ2 and LQ5. Check these components as well as each string of Zener diodes from LZD1 to LZD15. (If the circuit board is a REV.0 board, refer to Ed's Tech Notes - Power Supply Update for the SFL-2).

3. Measure the voltage on the tab of LQ6, the voltage should be approximately 155Vdc $\pm 10V$.

4. Measure the voltage at the source pin of LQ3, the voltage should be exactly 10Vdc less than the voltage measured on the tab. If this voltage is not 10V less, there is a problem in the buffer regulator. Check diodes LZD10 and D4-D6. Check LQ3 and replace LIC1 if necessary.

5. Measure the voltage on the source of LQ6, the voltage should be exactly 10Vdc less than the voltage measured on the tab. If this voltage is not 10V less, check LZD16, LD10 and LD14. Check LQ6 and replace LIC2 if necessary.

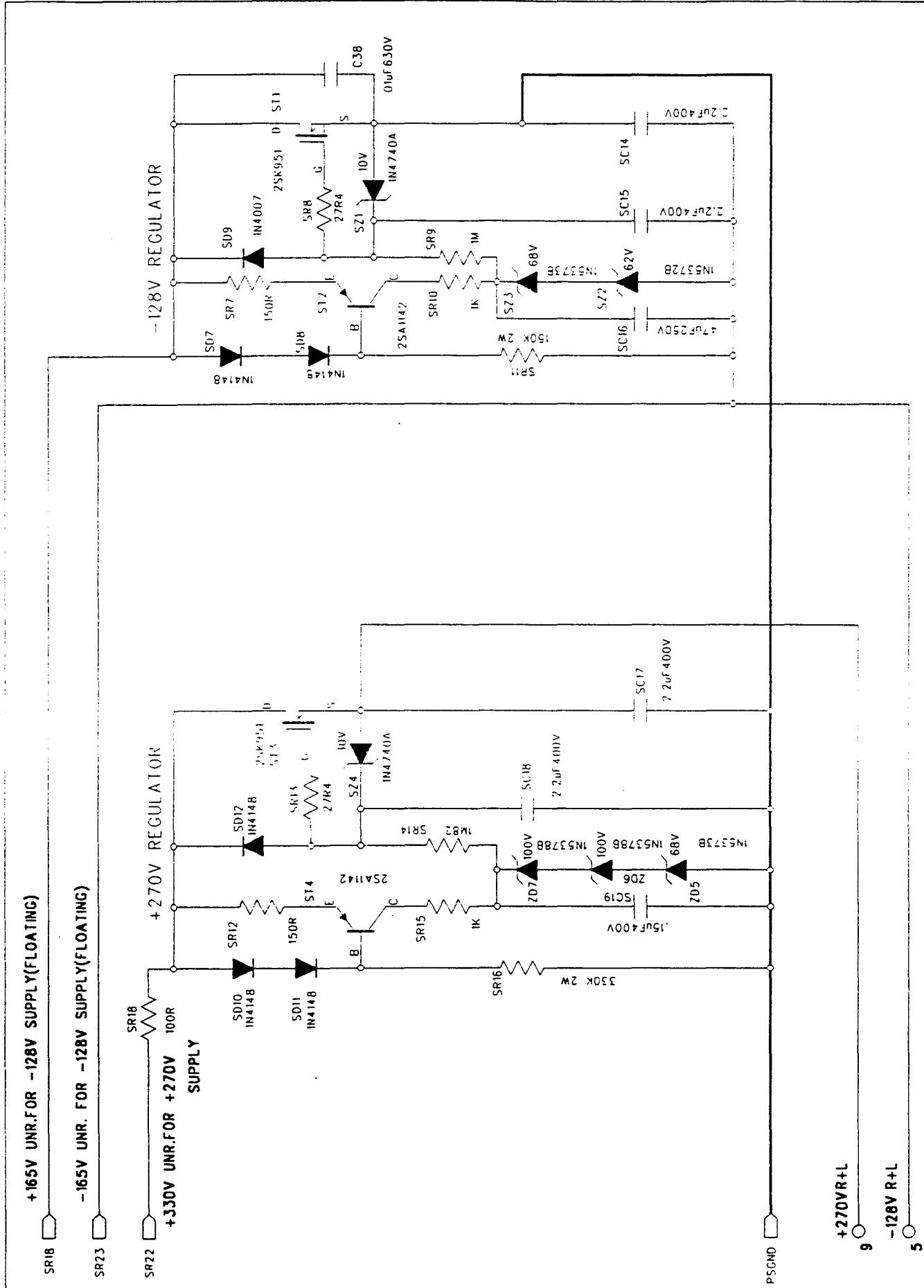
Noise (Example case for noise in Left channel)



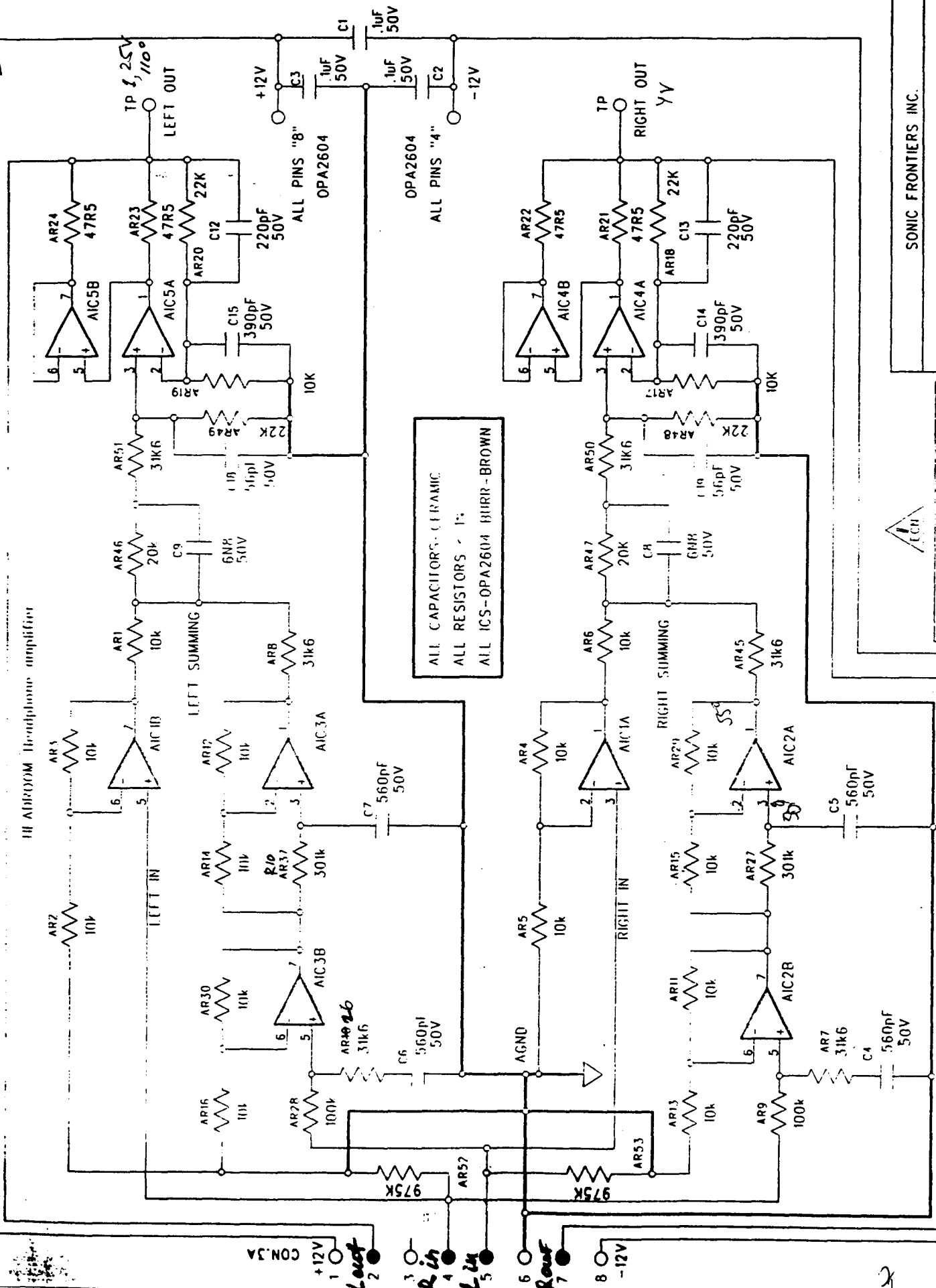
1. Reverse tubes LV1 and V1. If the noise is no longer in the Left channel but now in the Right channel, the noise problem was noisy tube LV1. If the noise remained in the Left channel, switch tubes LV2 and V2. If the noise is no longer in the Left channel but now in the Right channel, the noise problem was noisy tube LV2.

2. If after reversing tubes LV1 and V1 or LV2 and V2 did not find the noise, listen to the output of the Line 2 through the unbalanced outputs only for this next test. Switch between 0° Phase and 180° Phase, if the noise is only present in the 0° Phase, replace resistor LR. If the noise is only in the 180° Phase, replace resistor LR. If the noise is in both Phases of the output replace resistors LR and LR.





III HEADROOM Headphone amplifier



SONIC FRONTIERS INC.

HEADROOM-Headphone amplifier

LINE 1,2,3

SIZE

A

C14.15 IN PCB (K14.56.792.10)

ARE 150pf + 220pf (370pf)

REDESIGNER: ZDENKO ZIVKOVIC

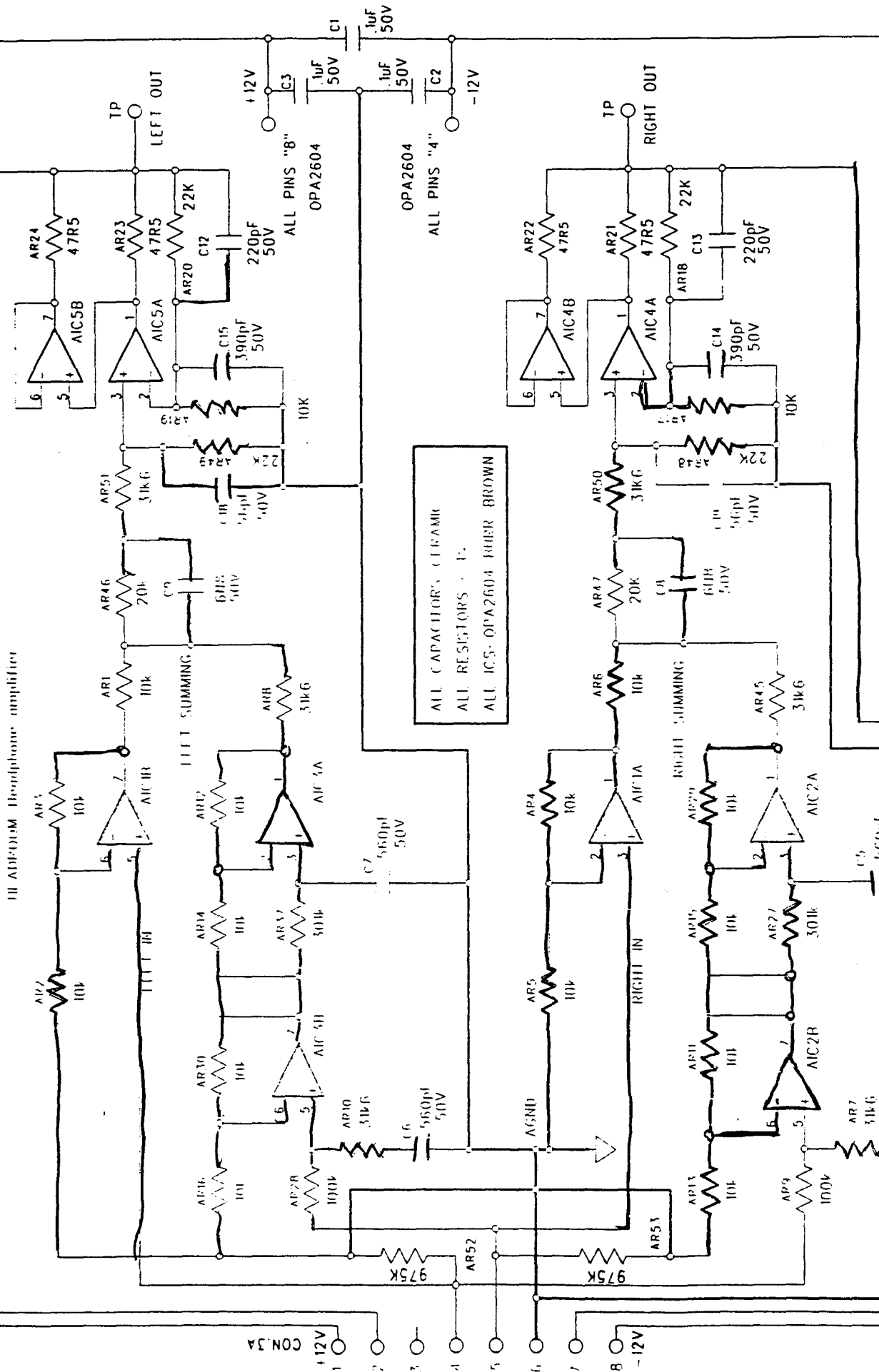
REV

DATE: NOV.1995

SHEET

9

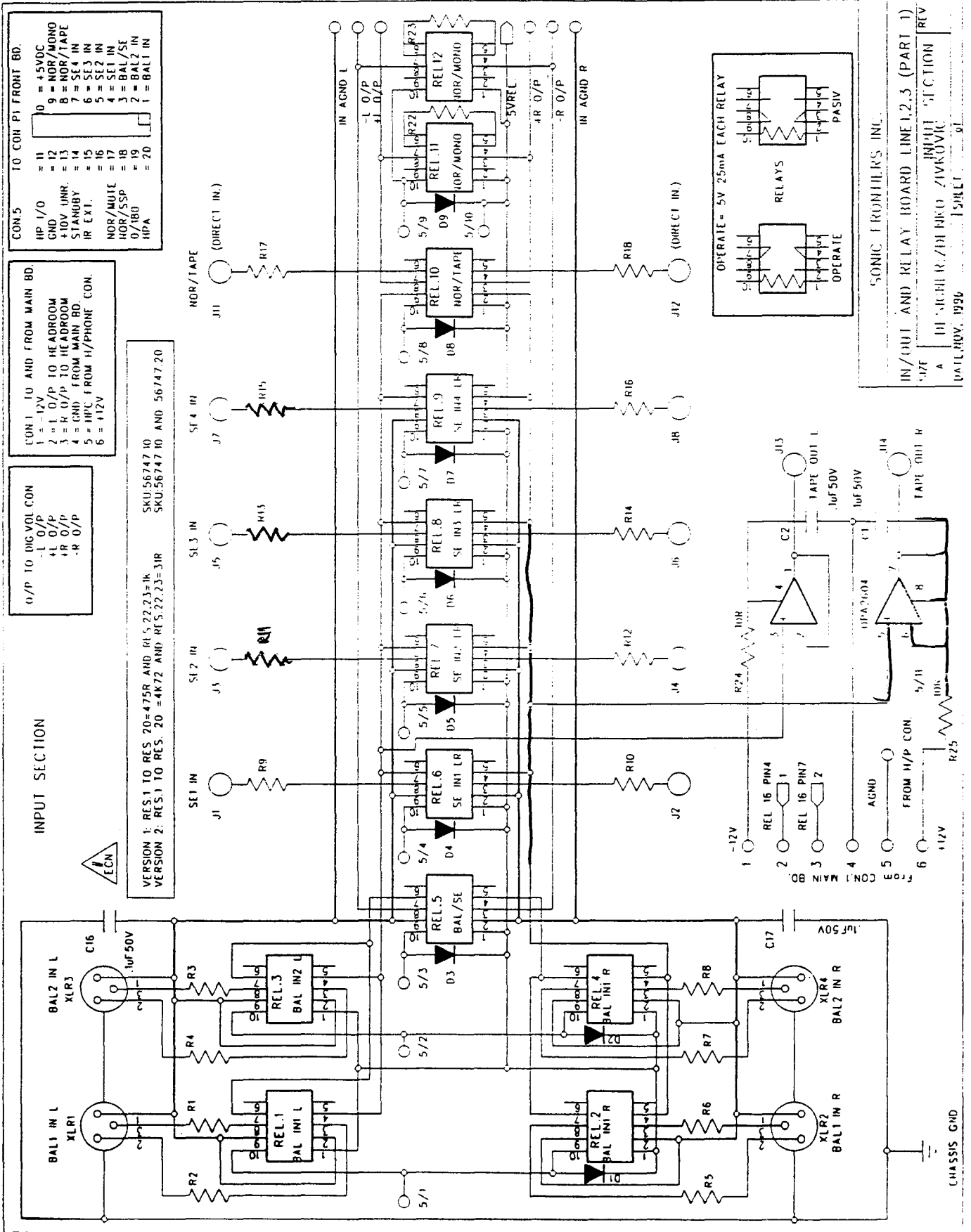
III HEADROOM Headphone amplifier



ALL CAPACITORS: CERAMIC
ALL RESISTORS: 1%
ALL IC'S: OPA2604 FULLER BROWN

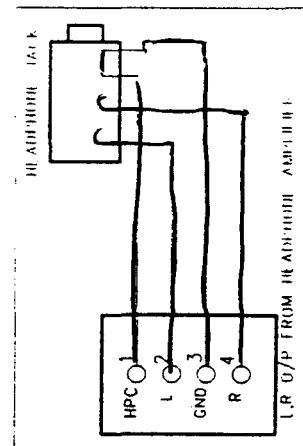
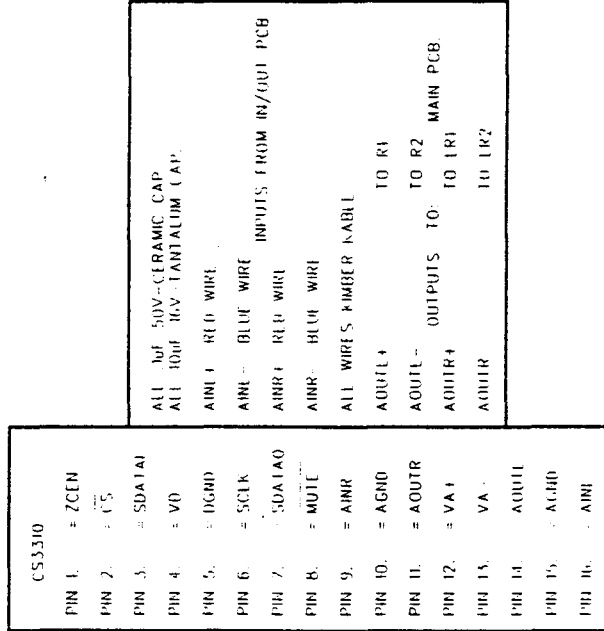
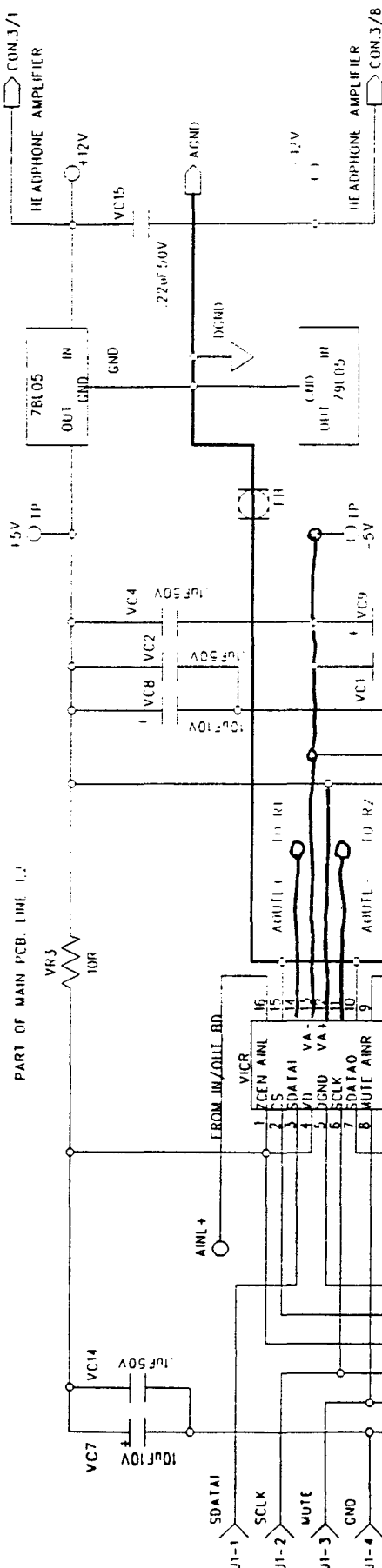
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|------------------------------|-----------------|
| SONIC FRONTIERS INC. | |
| HEADROOM-Headphone amplifier | LINE 1,2,3 |
| SIZE A | REV |
| REDESIGNER: ZDENKO ZIVKOVIC | DATE: NOV. 1996 |
| SHEET 9 | |

C14, C15 IN PCB: 5K15/92.10
ARE 150pf + 220pf (370pf)



LEFT AND RIGHT CHANNEL

PART OF MAIN PCB. LINE L2



SONIC FRONTIERS INC.

DIGITAL VOLUME CONTROL FOR LINE L2 PREAMPLIFIER

DOCUMENT NUMBER

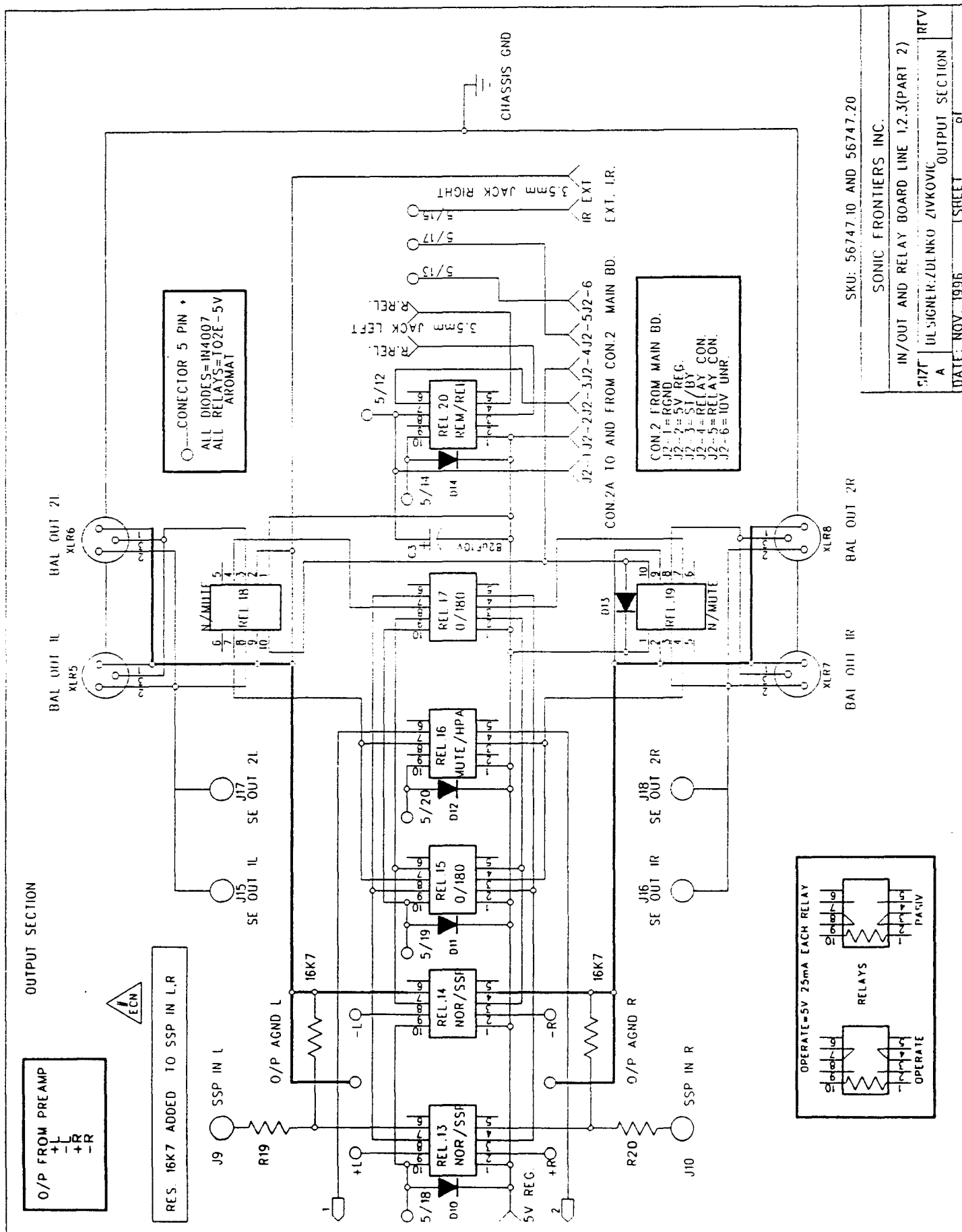
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REV

1-1011

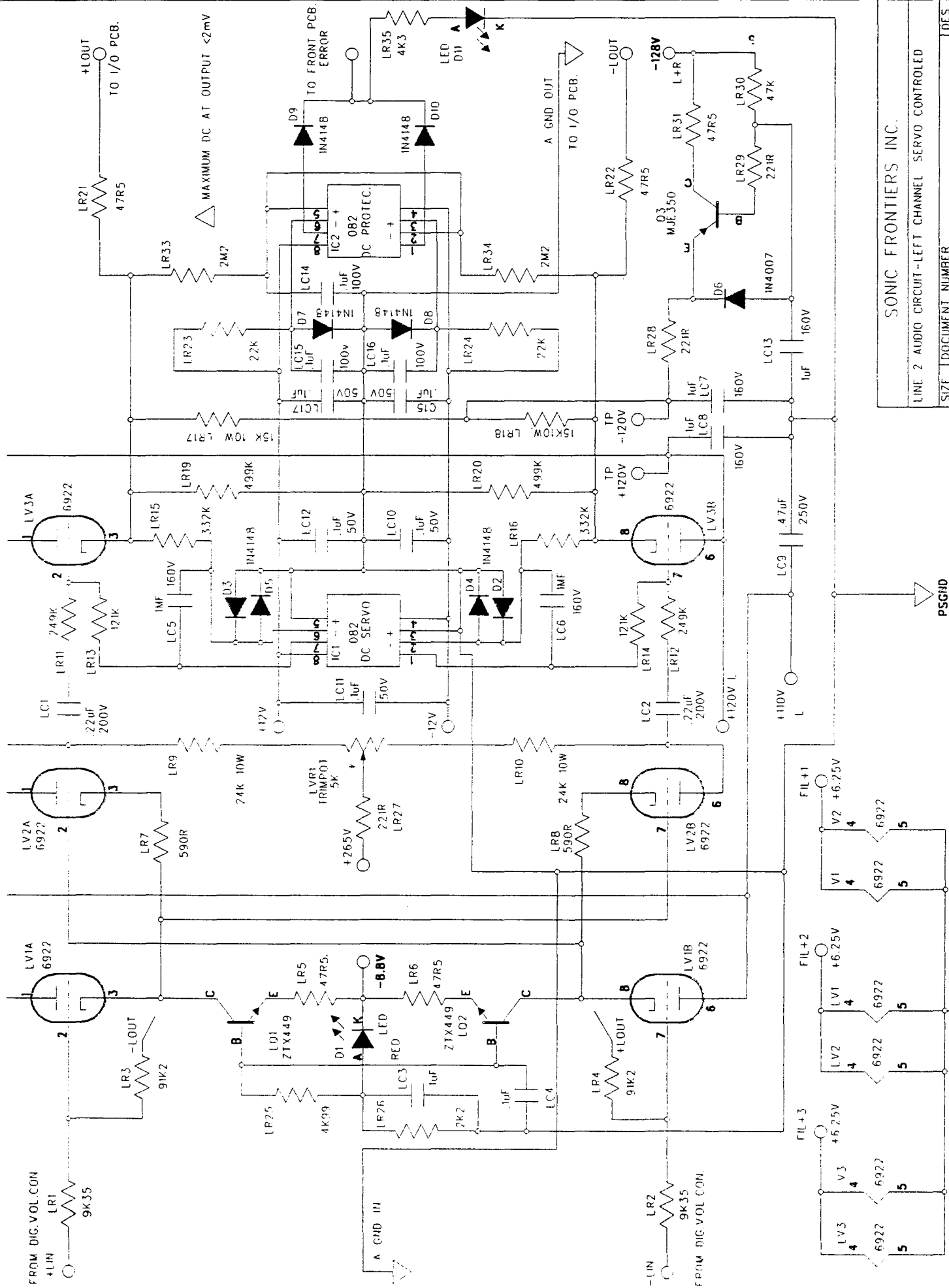
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LEFT CHANNEL SHOWN

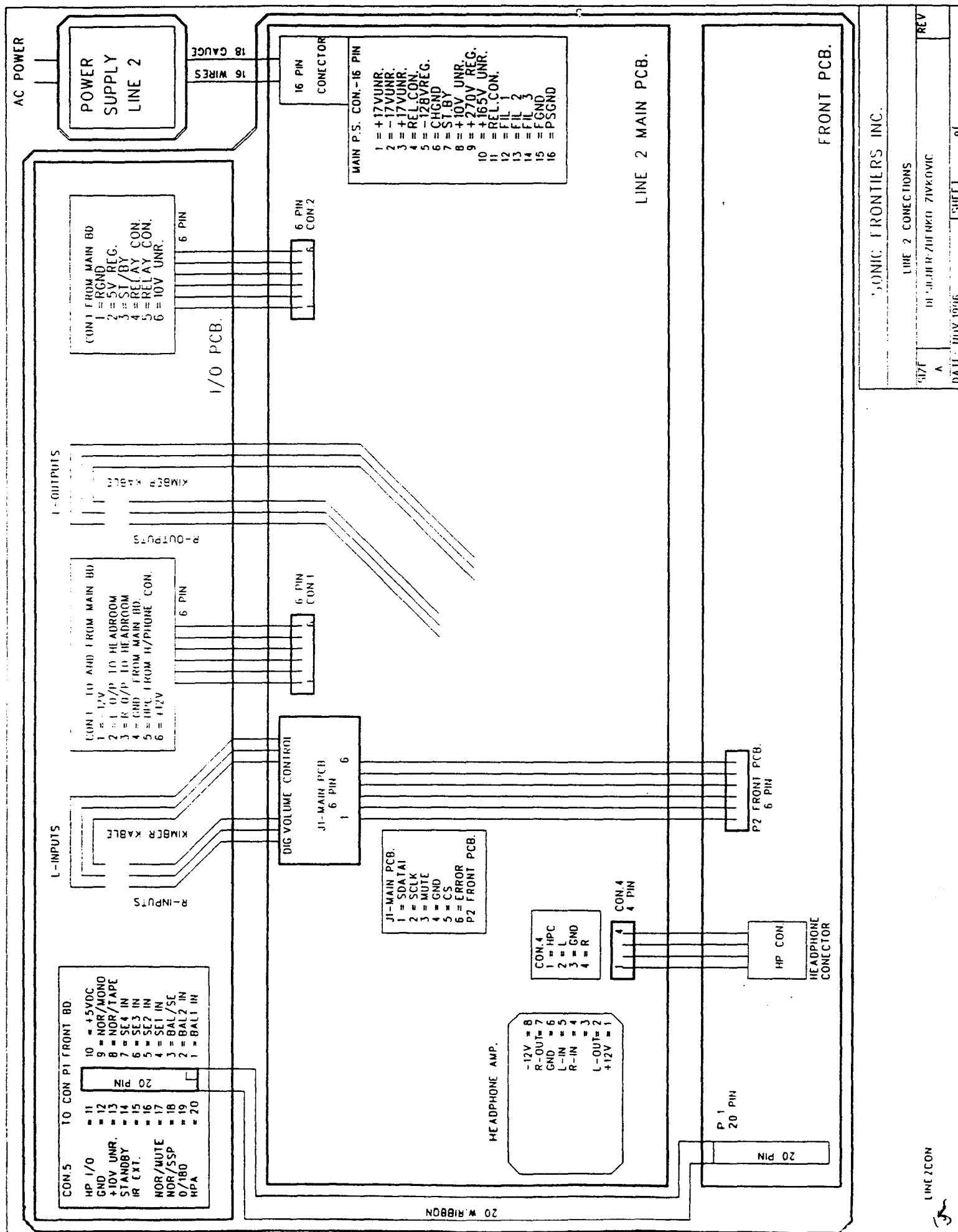
Duplicate this for Right Channel

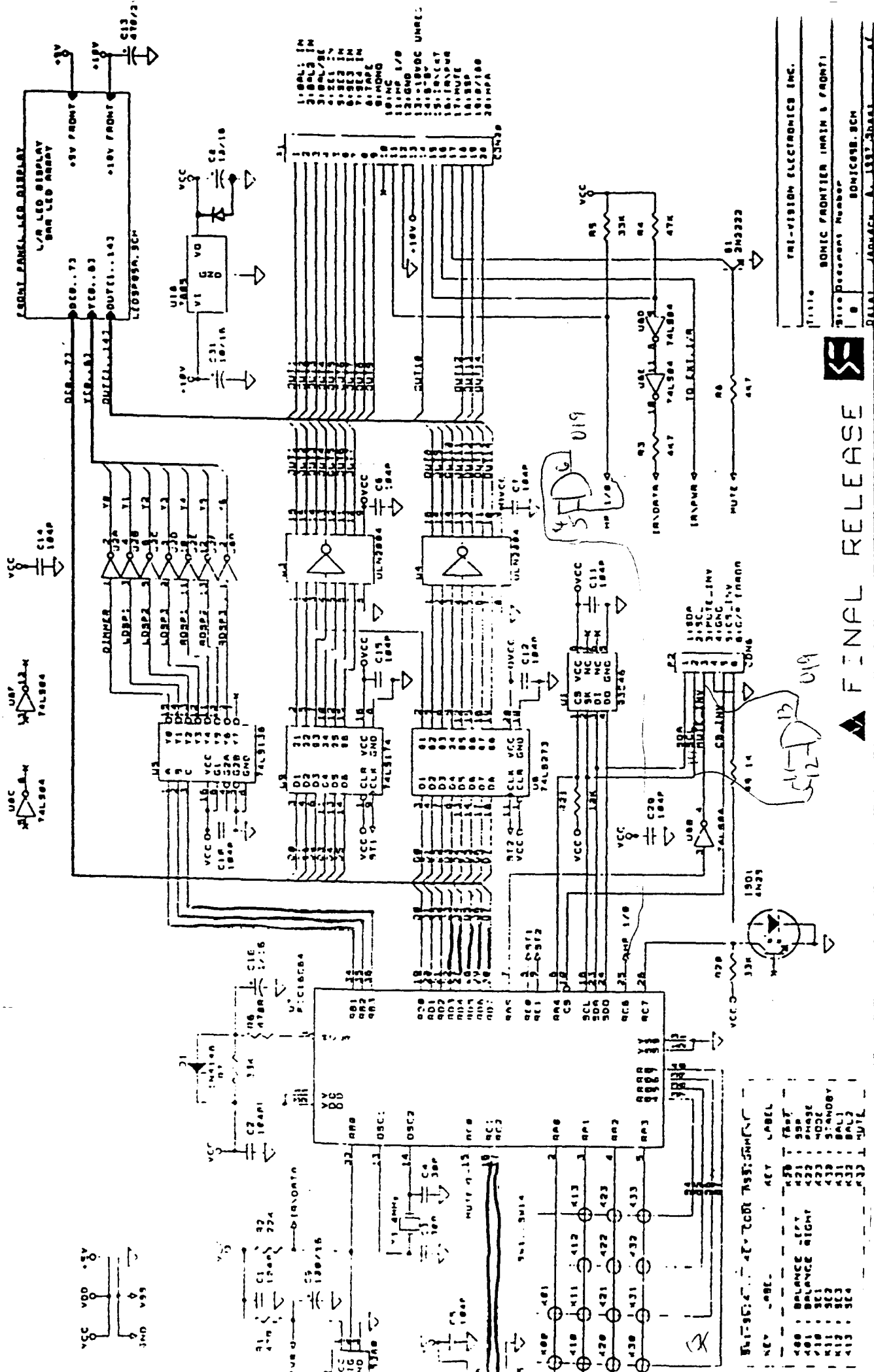


SONIC FRONTIERS INC.

LINE 2 AUDIO CIRCUIT-LEFT CHANNEL SERVO CONTROLLED

| | | |
|-----------------|---------------------------|--------|
| SIZE | DOCUMENT NUMBER | DES |
| A | DESIGNER: ZDENKO ZIVKOVIC | 7.2 |
| DATE: mar. 1997 | SHEET | 1 of 1 |



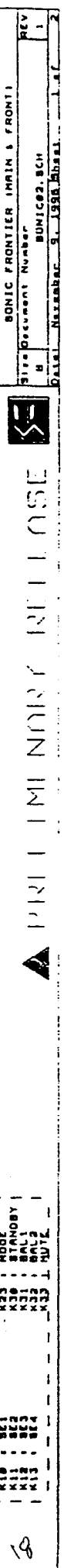


FINAL RELEASE



SONIC FRONTIER ELECTRONICS INC.
 SONIC FRONTIER MAIN & FRONT
 SONIC FRONTIER
 SONIC FRONTIER

| REV | DATE | BY | DESCRIPTION |
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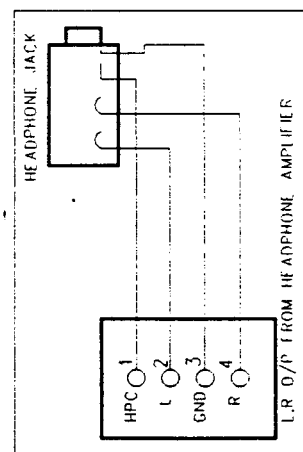


E.C.N.# : PRODUCT :

ENGINEERING CHANGE NOTICE

| | | | |
|--|---------------|--|---------------|
| PRODUCT(S) AFFECTED <u>Change or modification</u> Temporary () Permanent () | | DATE OF ISSUE: ISSUED BY : APPROVED BY : | |
| PURPOSE OF CHANGE(S): <i>Line 2 Headphone Horn Reduction</i> | | | |
| DESCRIPTION OF CHANGE(S): | | | |
| <u>PART(S) AFFECTED :</u> | <u>PART #</u> | <u>LOCATION :</u> | <u>SKU# :</u> |
| <u>ADD :</u> | <u>PART #</u> | <u>LOCATION :</u> | <u>SKU# :</u> |
| MODIFICATION DIAGRAM : See attached sheet | | C.C I. Driver T. Nguyen A. Jez K. Wilk N. Platsis | CONFIRMED : |

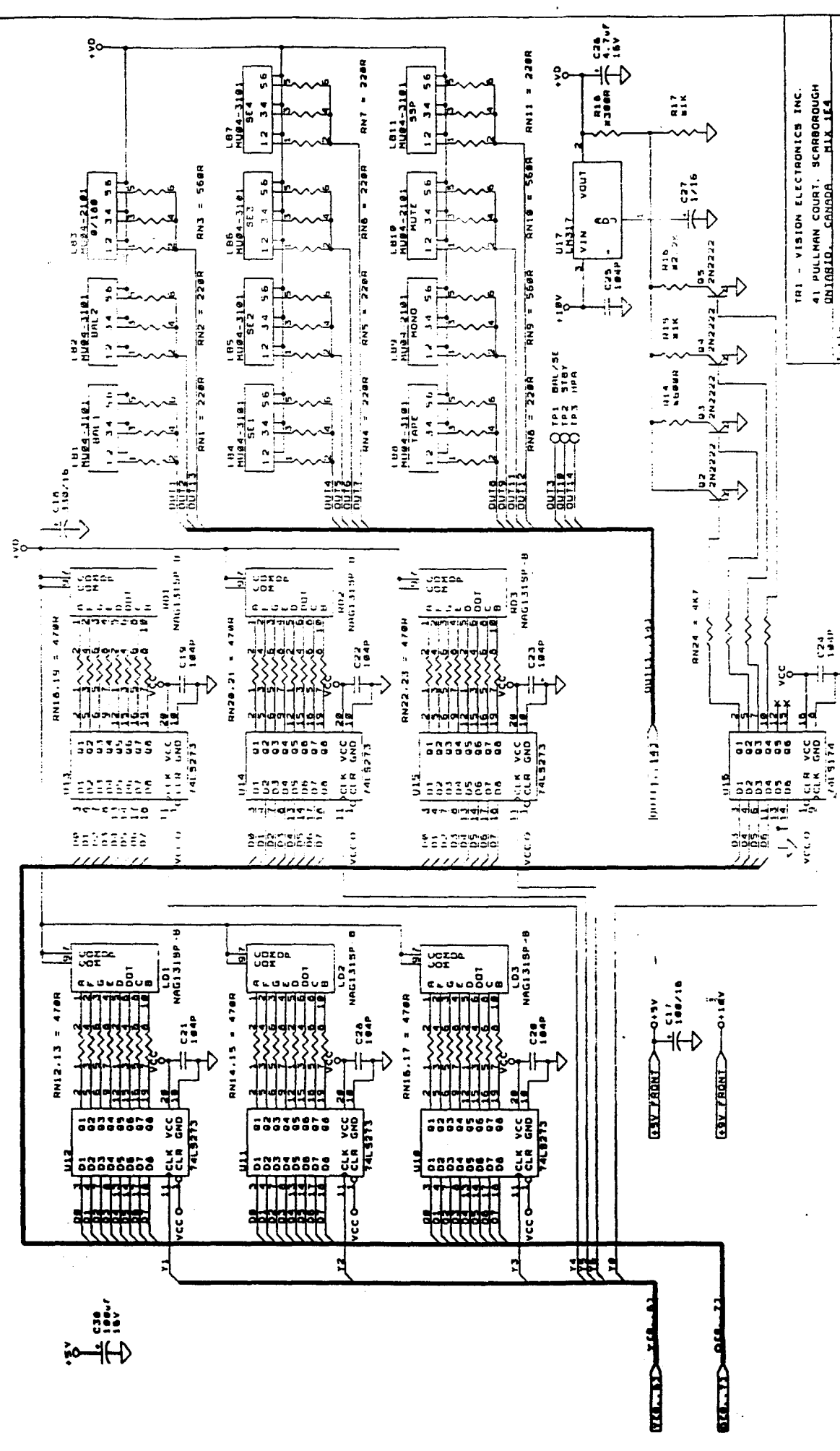
DATE OF MAIL 1911 12



DIGITAL VOLUME CONTROL FOR LINE 1.2 PREAMPLIFIER

A DESIGNER: ZDENKO ZIVKOVIC

DATE: NOV, 96



101 - VISION ELECTRONICS INC.
 41 PULLMAN COURT, SCARBOROUGH
 ONTARIO, CANADA M1X 1E4
 Part Number: 1109922-001
 Revision: 1
 Date: November 9, 1995 Sheet 2 of 2

