

# SL SERIES

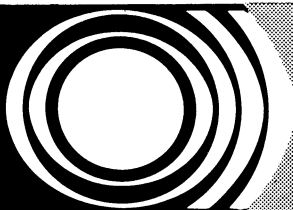
SL 160 SL 260

## guitar amplifiers



# operators manual

**sunn**



## INTRODUCTION

THE SL CONCEPT. The main idea behind the SL series amplifiers was to design a high technology, medium power, portable guitar amplifier with the features and flexibility required by today's musicians.

ELECTRONIC CHANNEL SWITCHING. The SL series features electronic channel switching which will allow switching between two different drive and volume settings. Channel "A" has been optimized for a clean, rhythm sound while Channel "B" has been designed for sustained overdrive sound. This channel switching is quiet and instantaneous thanks to IC logic control and CMOS electronic switches. No audio signals are sent out to the footswitch where they would be susceptible to noise and hum. All switching is done on the printed circuit board where it belongs. LEDs on the footswitch and amplifier keep you informed of your signal path at all times.

CASCADED CMOS OVERDRIVE. At the start of the SL project many different types of guitar amplifiers were tested including tube, hybrid and solid-state. After thorough testing it was found that the basic element behind the Sunn sound, CMOS, was as good as any electronic device for musical instrument amplification. We refined the CMOS sound, introduced in the Sunn Beta series, and are using the technology to its best advantage in the SL series by cascading the CMOS overdrive stages. The SL series has three separate CMOS overdrive sections located at critical points in the signal path. This insures that any overload takes place in a CMOS stage where it is controlled and harmonically enriched. This gives the SL series a smooth, singing quality which a single overdrive stage cannot duplicate.

EQUALIZATION. The tone controls are optimized for the frequency range of the guitar and are designed to be effective and easy to use. The Bass, Mid and Treble controls are all active cut and boost type. The controls were designed such that in the center click position they will yield a smooth, pleasing sound you can adjust to your taste. The Mid Frequency control in conjunction with the Mid control gives the SL amps a variable Q, sweeping notch or boost filter which expands the sounds this amp can create.

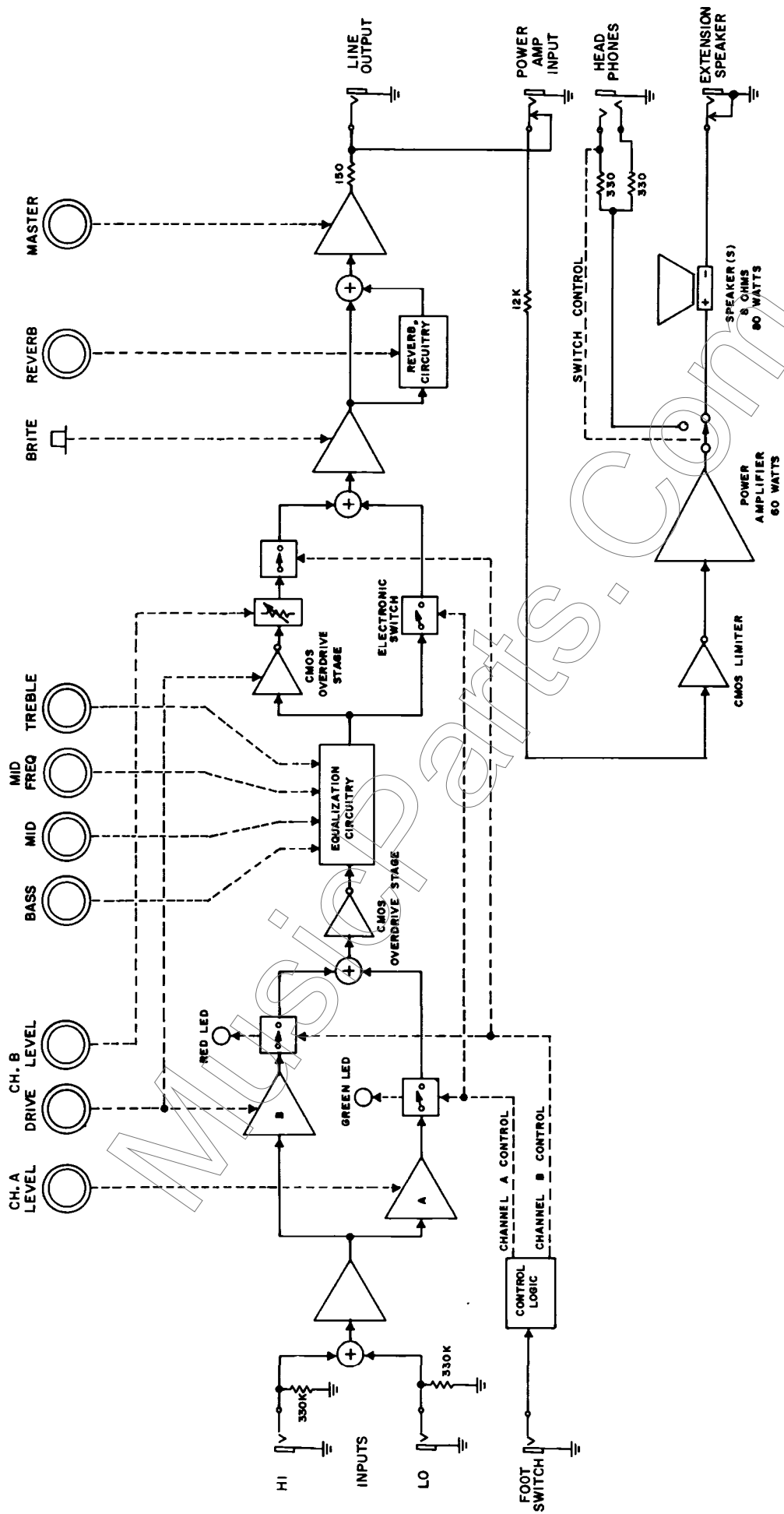
AND THERE'S MORE. The back panel has a full complement of features including a headphone jack, an accessory patch loop and an extension speaker jack. The internal speaker is a special design for the SL amps and includes a chrome dust cap, 30 Oz. magnet and a 160 watt program rating.

The reverb system designed for the SL series uses a CMOS stage to prevent spring slap and a special, high power op-amp to drive the reverb pan. This results in not only a greater quantity of reverb but a better quality sound with more high frequency response.

You will find that your SL amp is a versatile piece of audio equipment capable of complementing your playing style.

SL 160, SL 260 AMPLIFIERS  
SPECIFICATIONS

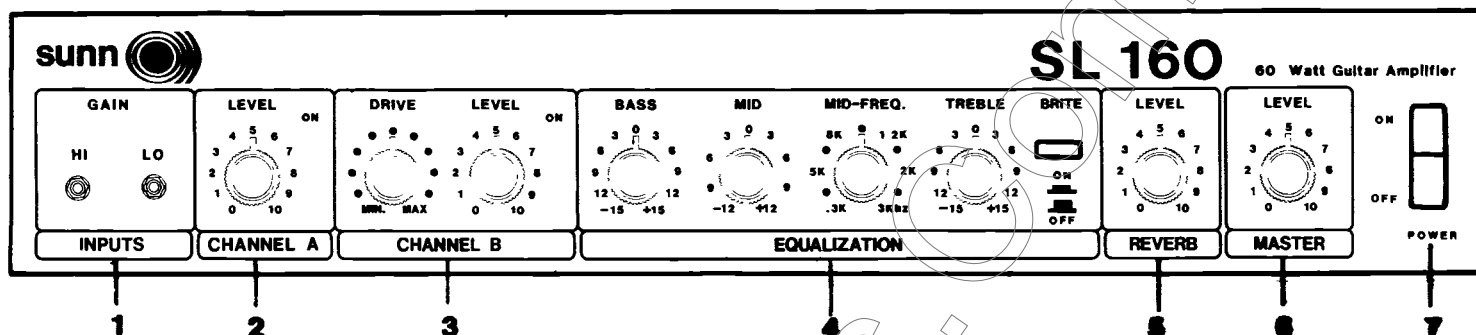
	SL 160	SL 260
POWER:	60 Watts RMS, 90 Watts maximum continuous [square wave]	60 Watts RMS, 90 Watts maximum continuous [square wave]
LOAD:	8 ohms	8 ohms
CHANNELS:	2	2
EQUALIZATION:	Bass, Mid, Mid-Freq, Treble	Bass, Mid, Mid-Freq, Treble
SIZE & NUMBER OF SPEAKERS:	1-12 inch	2-12 inch
SPEAKER MODELS:	126	226
INPUT SENSITIVITY:	560 Microvolts at 1Khz	560 Microvolts at 1Khz
INPUT IMPEDANCE:	High Gain: 330K ohms Low Gain: 330K ohms Power Amp 12K ohms	High Gain: 330K ohms Low Gain: 330K ohms Power Amp: 12K ohms
OUTPUT IMPEDANCE:	Line Out: 150 ohms Headphones: 330 ohms	Line Out: 150 ohms Headphones: 330 ohms
WEIGHT:	38 lbs, 17.2 kg.	53 lbs, 24 kg
DIMENSIONS		
HT X DEPTH X WIDTH:	18 X 9-1/2 X 19-3/8 In. 45.7 X 24.13 X 49.21 Cm.	18 X 19-1/2 X 26-1/8 In. 45.7 X 24.13 X 66.36 Cm.



SL SERIES BLOCK DIAGRAM

*Ferris*

SL 160 AND SL 260  
FEATURES AND OPERATION  
[Front Panel]



NOTE: Use block diagram for reference when reading operating descriptions.

1. INPUTS - HI & LO GAIN: These jacks allow the SL amps to produce similar operating conditions with a wide range of guitar pickups. The jack used most often should be the one which allows you to use the rest of the front panel controls over their full range and set your sound with the fewest amount of adjustments. The HIGH GAIN jack will add 12db more gain than the LO GAIN jack. There are no other differences in the two inputs.
2. CHANNEL "A" LEVEL: The "A" channel operation is selected by the footswitch. A green LED will light on both the footswitch and front panel when the "A" channel is active. The "A" channel is typically used for developing a clean sound. To obtain the cleanest sound, turn the master volume up relatively high and turn the "A" channel level control up to your desired operating level. An overdrive sound can be obtained in Channel "A" by turning up the "A" channel level control to a high position [overdriving a CMOS stage before the EQ section] or by driving the power amp over 60 watts where a CMOS limiter adds an overdrive sound.
3. CHANNEL "B" DRIVE AND LEVEL: "B" channel operation is selected via the footswitch. A red LED will light on both the footswitch and front panel when "B" channel is active. The "B" channel is typically used to achieve varying types of overdrive sounds. The overdrive characteristics can be created at 3 points in the circuitry; before the EQ, after the EQ and in the power amp. Experiment with the DRIVE, LEVEL and EQ settings to obtain the different overdrive sounds which the SL amp can achieve. The "B" channel can also be used to develop a clean sound by rotating the drive control to the left and keeping the operating levels below 60 watts.

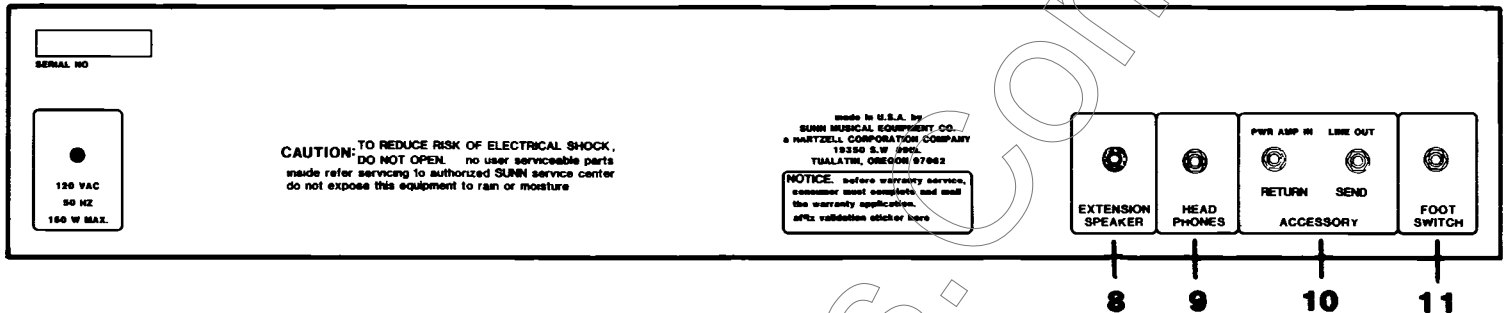
NOTE: Both channels may be used simultaneously by removing the footswitch. The channels will operate as before. The signals can be mixed in various amounts by using the "A" LEVEL and "B" DRIVE and LEVEL controls. To obtain an undistorted sound in channel "A", both the channel "B" controls must be at a minimum setting.

4. EQUALIZATION: The EQ section consists of the BASS, MID, MID-FREQ, and TREBLE controls as well as a BRITE switch. The BASS control will cut or boost the low frequencies, 80HZ to 200HZ, by up to 15dB. The MID controls will cut or boost the midrange frequencies by up to 12dB. The MID-FREQ control varies the effective band of frequencies that the MID control affects. It can change the midrange control center frequency from 300HZ to 3KHZ as indicated on the front panel. The TREBLE control will cut or boost the high frequencies, starting at 2.5KHZ, by up to 15dB. The BRITE switch will add 10dB of boost to the high frequencies above 3KHZ.

The EQ section is where the coloration of your sound is developed so the selection of these settings is very important to your sound. The EQ can be used to select whichever range of frequencies you want to overdrive and how much overdrive is present. Most of the fundamental notes of the guitar lie in the range covered by the BASS, MID and MID-FREQ controls. The TREBLE control and BRITE switch affect the harmonics [bite]. Adjust the BASS, MID and MID-FREQ controls to get the warmth and sustain you want. Then adjust the TREBLE control in conjunction with the BRITE switch to give the desired presence or "edge" to the sound. The BRITE switch affects the frequencies just above the TREBLE control, so adjustment of these controls can create many types of harmonic characteristics. Try turning down the TREBLE control with the BRITE switch in or vice-versa for different character to the "bite". The MID control is also capable of affecting the sound in this range when the MID-FREQ control is rotated to the far right.

5. REVERB: This control is used to adjust the amount of reverb signal which is added to the "dry" signal.
6. MASTER LEVEL: This controls the overall operating level of the amp. Adjust the desired level of the "A" and "B" channels. Then use the MASTER level to adjust the amount of power delivered to the speaker.
7. POWER SWITCH: Turns on and off the AC power. The power switch will light in the ON position to indicate that the amplifier is receiving power.

[Back Panel]



8. EXTENSION SPEAKER JACK: If desired, an external speaker cabinet can be used with the SL amps by patching a speaker cable from this jack to the speaker cabinet. You may use any number of speakers of any impedance without risking damage to the power amplifier. The relative loudness of the speakers will depend upon their impedance and sensitivity.
9. HEADPHONES JACK: The headphone jack can be used with any set of mono or stereo headphones. When used, the speaker[s] will be disconnected from the power amp. This is especially useful for practicing or for tuning instruments quietly.
10. ACCESSORY SEND [LINE OUT]: This jack can be used to patch a signal from the preamp section to external units such as an effect unit, mixing board, recorder or to another power amplifier for additional power.

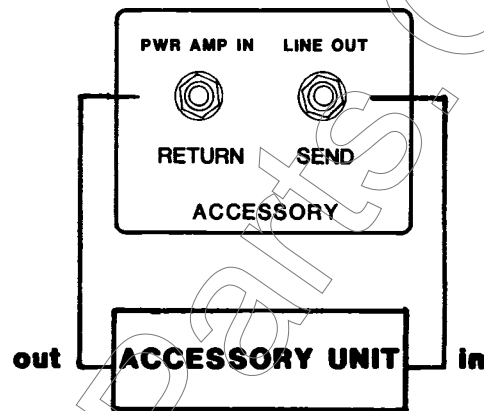
ACCESSORY RETURN [POWER AMP IN]: This jack allows a signal from an external source to be sent to the power amp and speaker[s] in the SL amp. When this jack is used, the signal path from the preamp to the power amp will be disconnected. The preamp signal will still be present at the ACCESSORY SEND [LINE OUT] jack.

ACCESSORY PATCH LOOP: The ACCESSORY SEND and RETURN jacks can be used to patch some accessory effect units into the signal path between the preamp and power amp sections in the SL amps. The ACCESSORY SEND jack should be patched to the input on the effect unit.

[Continued]

## ACCESSORY PATCH LOOP - Continued

The output signal from the effect unit is patched back to the ACCESSORY RETURN jack. Effect units patched into this accessory loop should be able to accept line level signals of .3 volts to 3 volts. If the effect sounds distorted when patched into this accessory loop, use it between your guitar and the HI or LO input jack. Use single conductor shielded cable when patching to and from the ACCESSORY SEND and RETURN jacks.



11. **FOOTSWITCH:** With the footswitch plugged in, "A" channel or "B" channel can be selected using the footswitch. Without the footswitch both channels operate simultaneously.



## LIMITED WARRANTY

SUNN Musical Equipment Company warrants new products to be free from defective materials and workmanship for one year from date of purchase to the original owner when purchased from an AUTHORIZED SUNN DEALER according to the following conditions:

The purchaser is responsible for completing and mailing to SUNN, within 15 days of purchase, the warranty application enclosed with each product. Upon receipt of the warranty application, SUNN will issue a warranty validation sticker that must be affixed to the product. Where a warranty validation area has not been provided on a few SUNN products, the validation sticker is to be affixed to your original proof of purchase and presented at the time of warranty service. PROOF OF PURCHASE ON UNREGISTERED EQUIPMENT IS NOT SUFFICIENT FOR RECEIVING IN-WARRANTY SERVICE. In the event you do not receive your validation sticker within 60 days of mailing, you are to notify SUNN Musical Equipment Company in writing immediately. The purchaser has the sole responsibility of completing and mailing the warranty application.

Light bulbs and meters carry a 90 day warranty from date of purchase.

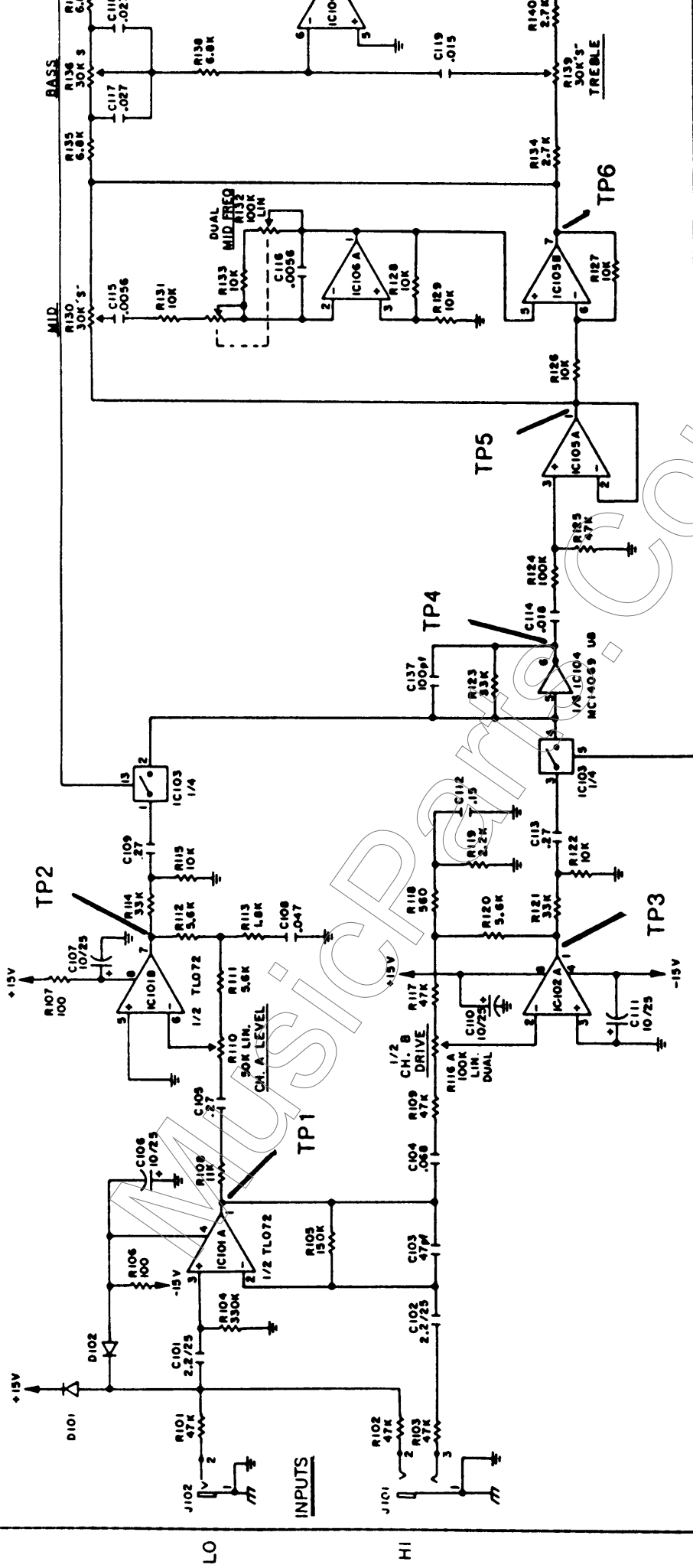
SUNN products that have been subject to accident, alterations, abuse, rental, or defacing of the serial number are not covered by this warranty. Loudspeakers and drivers misuse due to overpowering or improper installation resulting in torn, burned or charred components will not be covered by this warranty.

The normal wear and tear of appearance items such as handles, corners, casters, and knobs are not covered under this warranty.

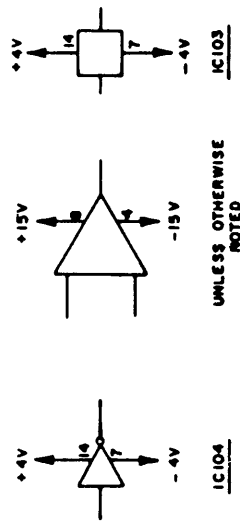
If your SUNN product requires service during warranty period, SUNN will repair or replace, at its option, defective materials provided you have identified yourself as the owner of the validated product to any SUNN authorized service center or contact SUNN for service assistance. Transportation charges to and from an authorized service center or factory for SUNN products and components to effect repairs shall be the responsibility of the owner. In the event a product is to be returned to SUNN for repairs, a written return authorization from SUNN must be obtained prior to shipping.

SUNN is not liable for any incidental or consequential damages resulting from any defect or failure of this instrument other than the repair of the SUNN product subject to the terms of this warranty. This warranty gives you specific legal rights, and you may have other rights which vary from state to state. This warranty is expressly in lieu of all other agreements and warranties, expressed or implied, except as may be otherwise required by law.

# SL160 & SL260 SCHEMAT



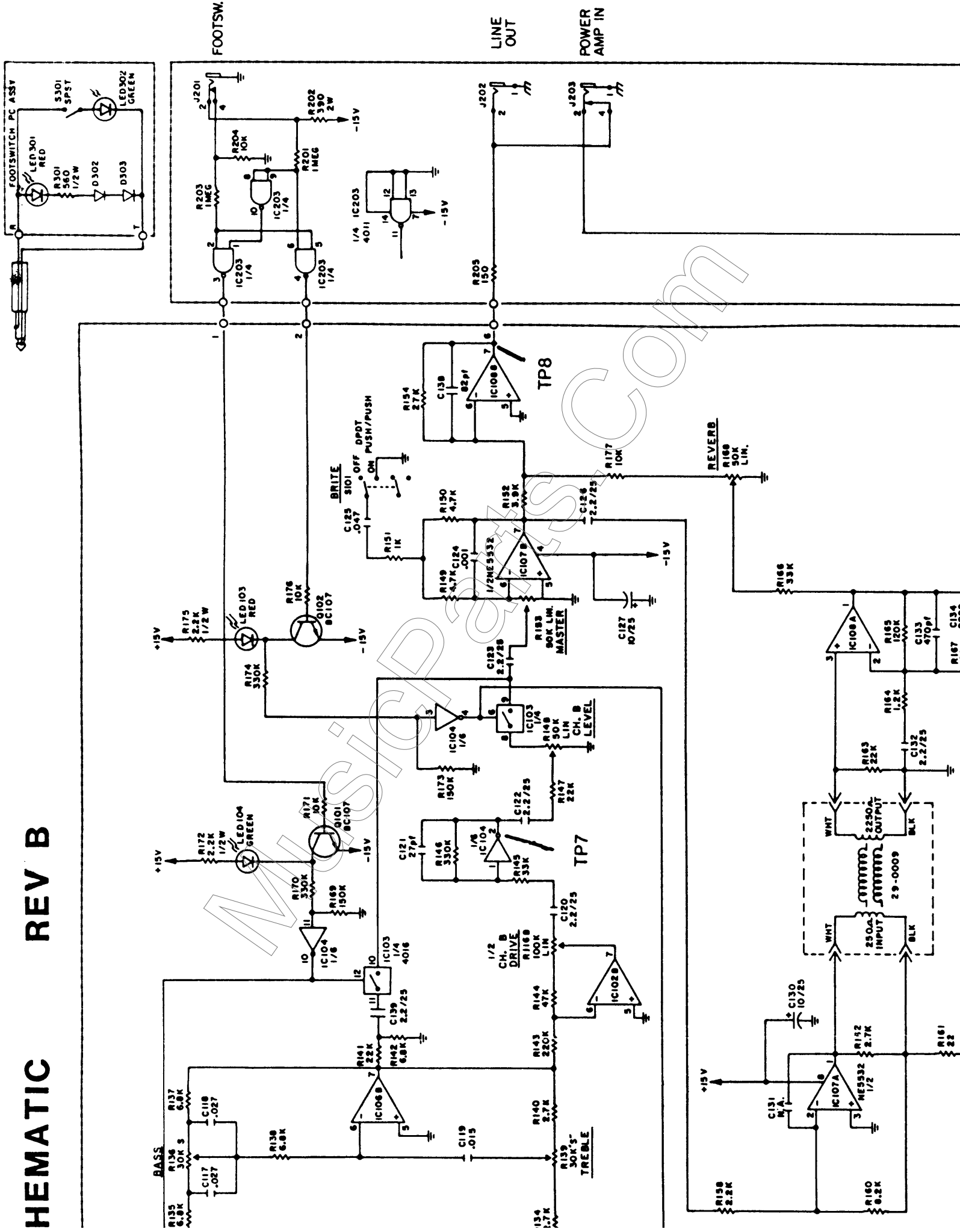
NOTES: UNLESS OTHERWISE NOTED.  
 1 ALL RESISTORS ARE 1/4W 5%, RATED IN OHMS  
 2 ALL CAPACITORS ARE IN MICROFARADS, NON-POLAR 10%, RATED  $\mu$ F/VOLTS  
 3 ALL DIODES ARE IN458A  
 4 ALL IC'S ARE 4558

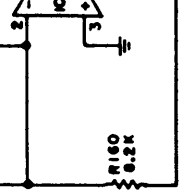


www.CircuitSchematic.com

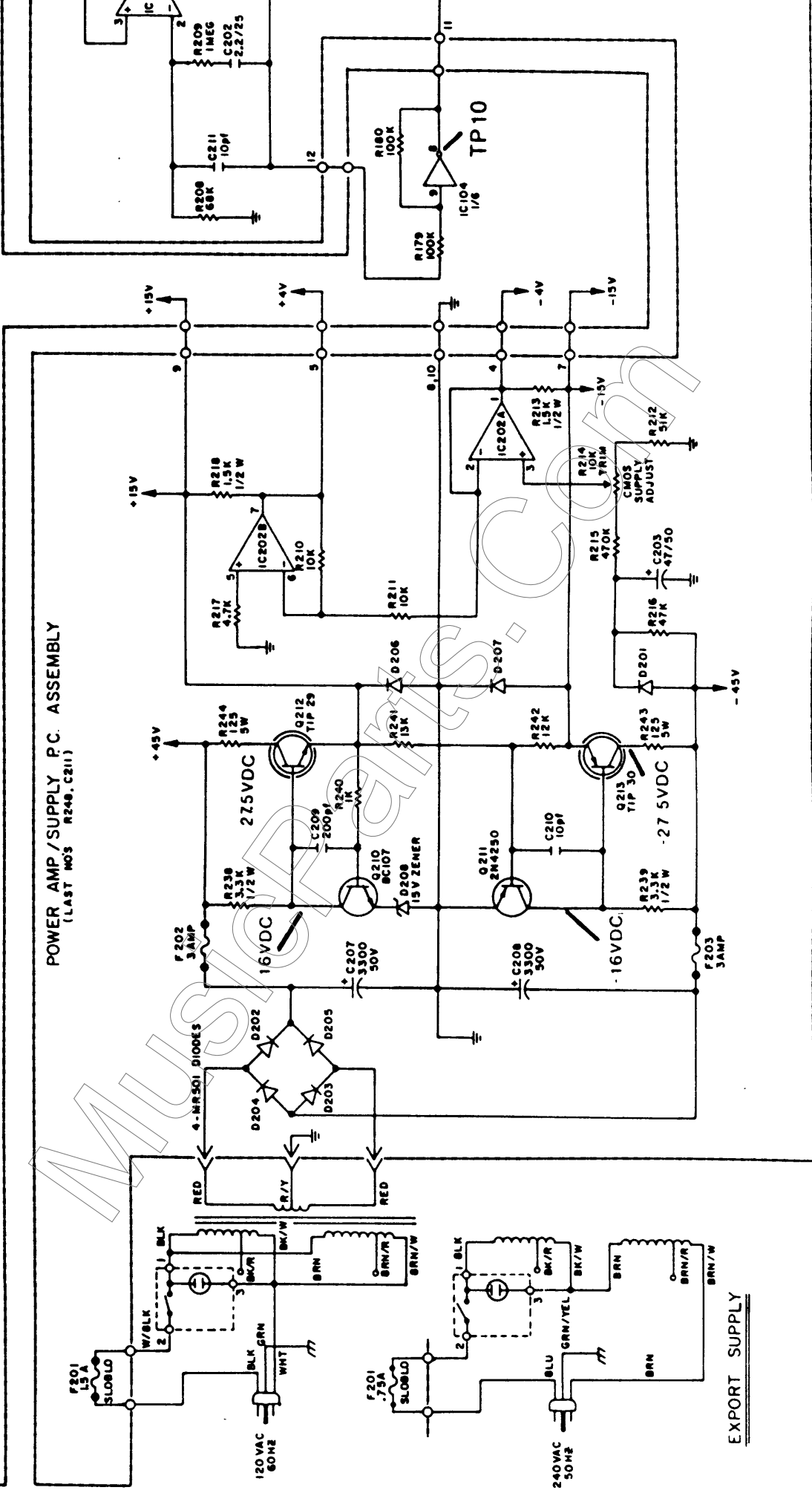
# HEMATIC

# REV B

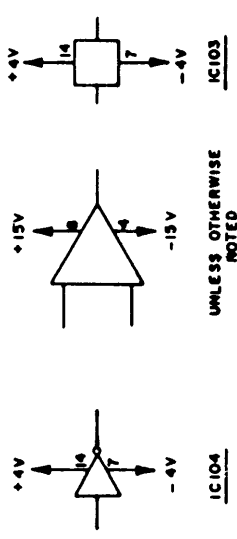




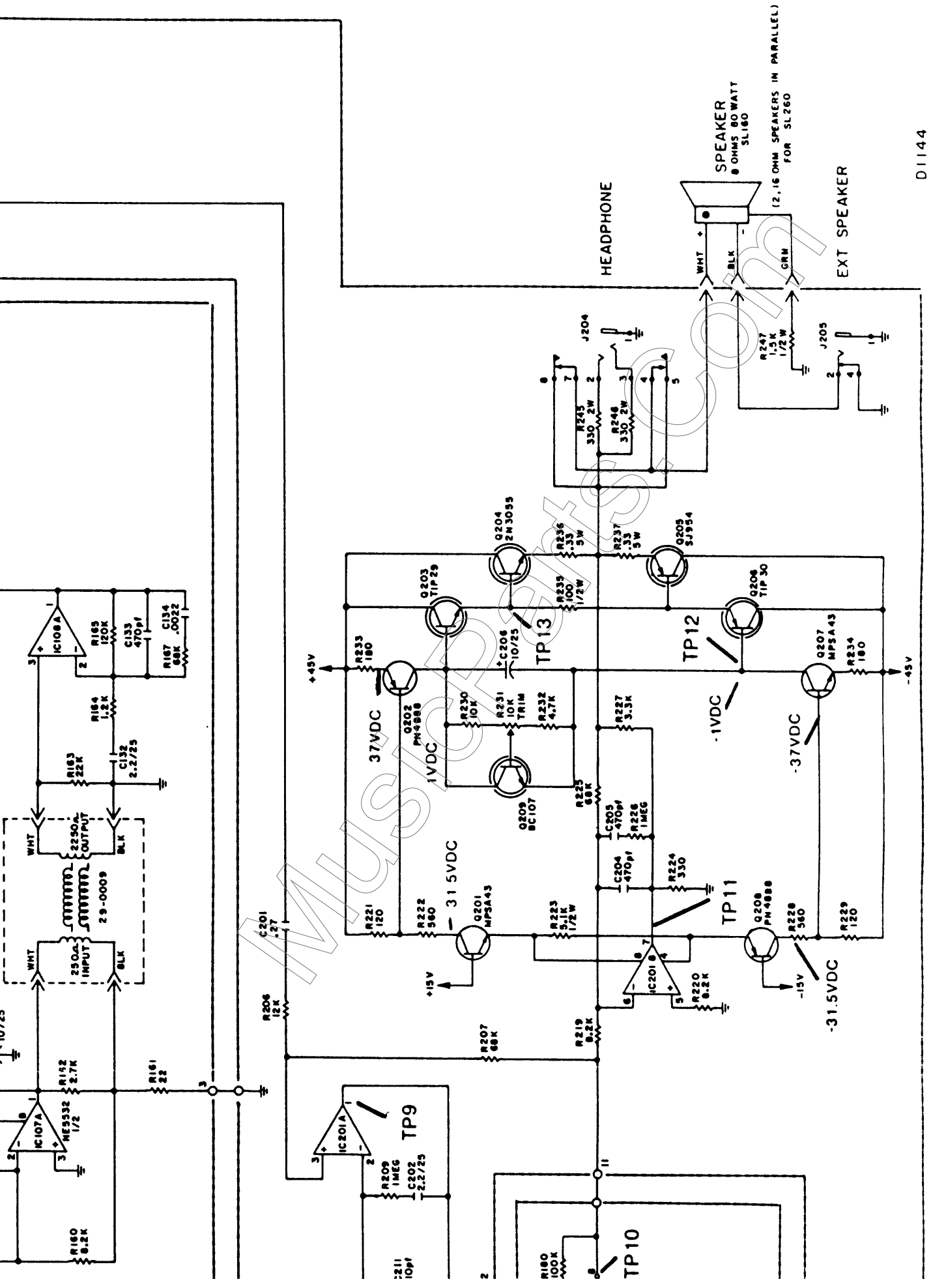
**PREAMP PC ASSEMBLY**  
(LAST NOS R160, C138)



**POWER AMP/SUPPLY PC ASSEMBLY**  
(LAST NOS R248, C211)



**EXPORT SUPPLY**



SL 160/260 PARTS LIST

	<u>DESCRIPTION</u>	<u>SUNN PART NO.</u>
DIODES	IN4744 15V Zener	22-0150
	LED Red	22-0228
	LED Green	22-0229
	IN458A	22-0458
	MR501, 3A 100V	22-0501
TRANSISTORS:		
Q203, 212	TIP 29B	22-0229
Q206, 213	TIP 30B	22-0030
Q101, 102, 209, 210	BC 107	22-0107
Q205	SJ954	22-0954
Q204	2NB055	22-3155
Q211	2N4250	22-4250
Q202, 208	PN4888	22-4888
Q201, 207	MPS A43	22-5184
IC's	TLO 72	22-4002
	MC14011	22-4011
	MC14016	22-4016
	MC14069	22-4069
	RC4558	22-4558
	NE5532	22-5532
CONTROLS:		
Channel A level, Channel B level		
Reverb, master level	50K Lin	23-1400
Channel B Drive, Mid Freq.	100K dual lin	23-1401
Bass, Mid, Treble	30K S Curve	23-1402
SWITCHES:		
Footswitch		24-0110
Brite		24-0130
Power		24-0134
MISCELLANEOUS:		
Power Transformer		28-2117
Filter Capacitors	3300uf 50V	10-3090
Reverb Pan		29-0010
Push Button Knob		59-5549
Pointer Knob		59-6160
Lo Input Jack		67-0011
Hi Input Jack		67-0016
Footswitch, Line out, Power Amp In		
Ext. Speaker Jacks		67-3610
Headphone Jack		67-3620

SL 160/260 REVISION B

TEST POINTS

TEST CONDITIONS: Line voltage - 120v AC, input signal - 38mv into HIGH GAIN or 161mv into LO GAIN at 1kHz, load - 8 ohm, control settings - channel A level, channel B level set at 5, channel B drive set at mid position, bass, mid and treble set at 0, mid frequency set at 1kHz, brite switch out, reverb off, master set to 10.

TP1	320mvp-p	TP 8	2.5vp-p
TP2	600mvp-p	TP 9	13.5vp-p
TP3	1.75vp-p	TP10	250mvp-p
TP4	1.3vp-p	TP11	6.4vp-p
TP5	450mvp-p	TP12	6.4vp-p
TP6	450mvp-p	TP13	64vp-p
TP7	630mvp-p		

BIAS SETTING: Place a DC volt meter across R235 and R237, with no load and no input signal, and with the unit at room temperature, adjust R231 for a DC voltage of 6mvDC after the unit has been on for a minute.