

# Carvin

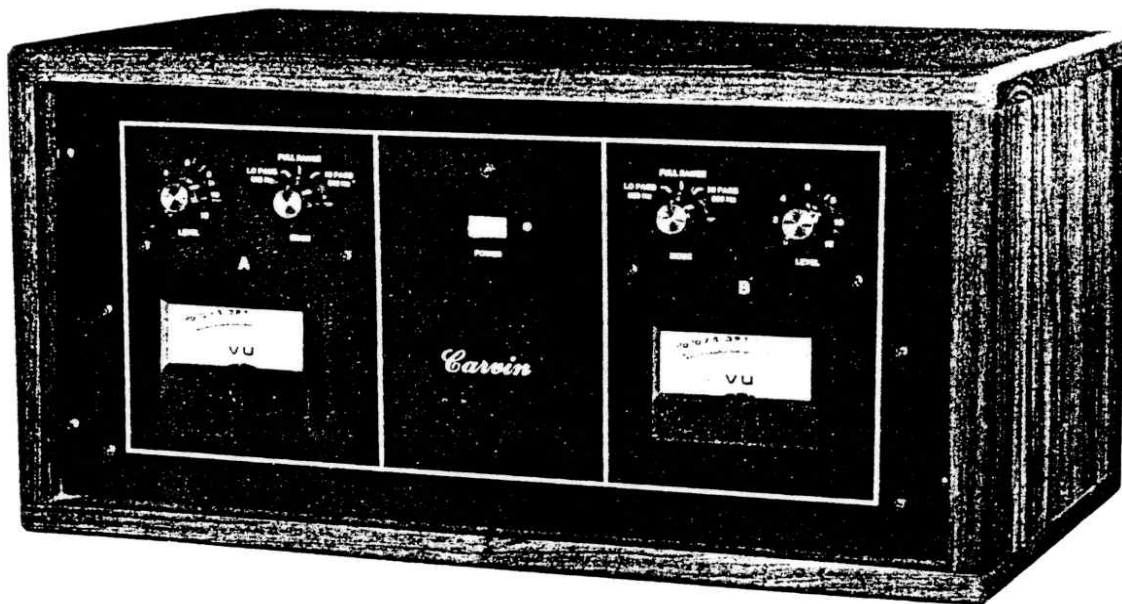
## ASG SERIES POWER AMPLIFIERS

### OPERATING/SERVICING MANUAL

The ASG series amplifiers are high-powered, dual-channel units designed to provide high reliability under the stress of commercial sound reinforcement conditions. The standard of quality (reflected in the specifications) makes the ASG an excellent choice for disco, studio or home applications as well.

Active electronic crossover networks have been included in the input circuitry of each channel, providing the user with the choice of standard stereo operation or high-power monaural bi-amping.

Two models are available, both 19" wide (standard rack configuration) and housed in a rugged Tolex covered cabinet or Solid Walnut Cabinet. The ASG250 produces 125W RMS per channel. The ASG600 is identical, but delivers 300W RMS/channel and may be loaded down to 2 Ohms for professional sound reinforcement applications.



Shown with optional Walnut Cabinet.

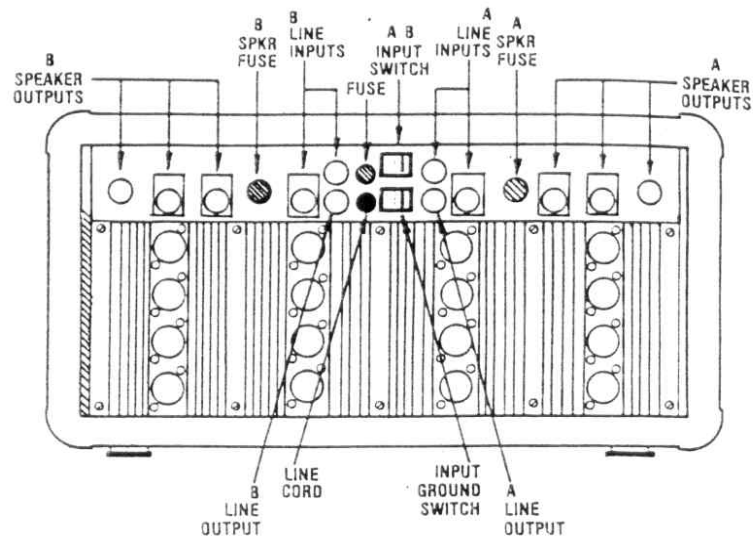
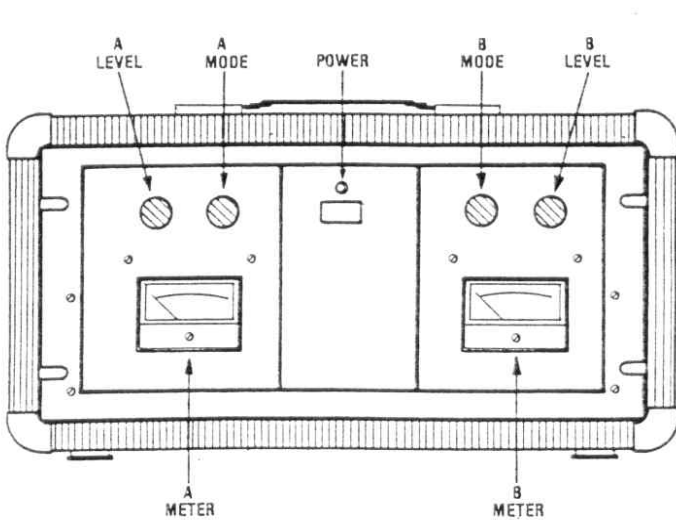
The manual contains specifications, front and rear panel descriptions and practical operating notes.

Note: An amplifier's rated output is specified at some low value of distortion. By overdriving the amplifier, substantially higher wattages are produced, and caution must be exercised to prevent damage to speaker systems and ears.

ASG 600 ASG 250-A

ASG-79

# PANEL DESCRIPTION



## FRONT PANEL DESCRIPTION

### LEVEL (A & B)

These controls regulate the input level (hence the output volume) of their respective channels.

### MODE (A & B)

A three-position switch offers the operator a choice of a FULL RANGE (flat), HI PASS or LO PASS response.

For normal stereo operation, both MODE switches must be set at FULL RANGE.

When Bi-Amping, one channel should be switched to HI PASS, while the other channel is set at LO PASS. Complete details are provided after the "Panel Descriptions."

### POWER

The Power Switch is located in the center of the front panel. Pushing the switch to the right turns the amplifier ON, illuminating the L.E.D. Power Indicator as well as the two level meters.

### OUTPUT LEVEL METERS

Each channel is provided with an illuminated level meter. The meters are calibrated to read +3 dB at full output, providing headroom for transients.

Normally, the meters should read below 0 dB to prevent excessive distortion.

## REAR PANEL DESCRIPTIONS

### SPEAKER OUTPUTS (A & B)

Two locking D3M connectors and one 1/4" phone jack are used for each channel. Pins 2 & 3 of the D3M are wired together as the "hot" lead, while pin 1 maintains ground. The heavy-duty 1/4" phone jack is wired in the standard manner. All three jacks are wired in parallel.

### SPEAKER FUSE (A & B)

A 15 amp fuse protects the speakers from severe malfunction conditions, such as high DC offset voltages, etc. Protection may be increased under normal operation by reducing the fuse size to 10 amps. However, for continuous high-power applications, the fuse must be left at 15 amps.

### IN (A & B)

Each channel offers both a D3F connector (for balanced lines) and a 1/4" phone jack (for standard, single-ended sources). The grounds may be isolated from the chassis (see GROUND Switch).

### LINE OUT (A & B)

Located below the 1/4" input jack, the LINE OUT jack can drive additional power amps, tape decks, etc. This is a post-preamp jack, which means that the signal has been processed by the LEVEL control and/or the MODE switch. In other words, when the Level control is fully counter-clockwise, no signal is present at the LINE OUT jack. Further, if the Channel's MODE switch is set at HI PASS, the signal from the LINE OUT jack is filtered to a high-pass response.

### PRIMARY FUSE

A 10 amp fuse protects the amplifier and power supply from excessive current draw. Access to the fuse is gained by pushing the fuseholder inwards, and turning counter-clockwise. Should the fuse fail, replace it with an identical fuse. If the second fuse also fails, a problem is indicated, and the amp should be serviced. To prevent unnecessary damage to the amplifier, NEVER USE A FUSE WITH A HIGHER RATING.

### LINE CORD

All Carvin equipment is supplied with 3-conductor line cords, ending in grounding-type plugs. This arrangement will greatly reduce the possibility of electrical shock, provided the equipment is used with 3-conductor grounding-type outlets, and provided those outlets have been properly wired.

Under some circumstances, "ground loops" can contribute unnecessary hum, and "breaking" the loop by using a 2-conductor/3-conductor adaptor may reduce the hum. However, the ASG series amplifiers incorporate isolated input jacks with a special GROUND switch (described below) which eliminates the need of such adaptors.

## A & B INPUTS

When in the "commoned" position, the input jacks of Channel A & Channel B are tied together. As a result, any input source plugged into either channel is fed to both channels simultaneously. This position is used for monaural applications such as Bi-Amping.

By switching to the "Indep." position, the channel inputs are made independent, allowing normal stereo operation.

## GROUND

The GROUND switch enables the operator to reference the inputs to chassis ground when set to CHASSIS, or to the ground of the driving source (such as a mixer, pre-amp, etc.) when set to EXT.

Normally, the GROUND switch is left in the CHASSIS position. However, the operator should try both positions and use whichever offers the lowest hum.

# OPERATING NOTES

## STEREO SET-UP

The Left mixer or pre-amplifier line is inserted into Channel A, and the Right line into Channel B. Use the 1/4" phone jack for standard lines, or the D3F connector for balanced lines.

Both MODE switches are set at FULL RANGE. The A & B INPUT switch must be set at "Indep.", while the GROUND switch should be set for minimum hum.

The Left speaker system is plugged into CH A SPEAKER OUTPUT, and the Right system into CH B SPEAKER OUTPUT. Either the 1/4" phone jacks or the D3M connectors may be used.

Output level (volume) is adjusted by the LEVEL controls.

## BI-AMPING SET-UP

A single monaural line source is used. (Stereo Bi-Amping requires 2 ASG amplifiers). The line input may be inserted into either CH A or CH B inputs. Use the 1/4" phone jack for normal sources or the D3F connector for balanced lines.

Channel A MODE switch must be set at HI PASS, and Channel B at LO PASS. The A & B INPUT switch is set at "Commoned", while the GROUND switch should be set for minimum hum.

The high-frequency drivers (horns) are plugged into the CH A SPEAKER OUTPUTS, and the low-frequency speakers are plugged into CH B SPEAKER OUTPUTS. Either the 1/4" jacks or the D3M connectors may be used.

Output levels are adjusted by the LEVEL control. Note that the CH B level will often be set higher than CH A because high-frequency drivers are generally more efficient than bass speakers.

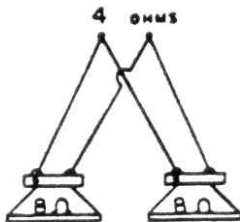
As discussed earlier, the LINE OUT jacks provide a signal that has been "processed" by the electronic crossover and level controls. Hence, Channel A LINE OUT would be a low-frequency signal, and Channel B is a high-frequency signal. These signals may be fed into standard power amplifiers for additional Bi-Amping power without the increased cost of another electronic crossover.

If a full range signal is needed to drive additional equipment, the Line Input connector not used may be employed as output jacks. For example, if the monaural source has been plugged into the Channel A D3F connector, then the Channel B D3F connector may be used as a line output, carrying the original, unaltered signal.

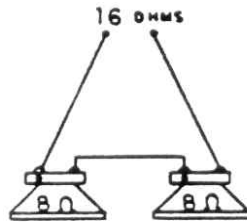
## HOW TO DETERMINE SPEAKER IMPEDANCE

Single speakers and speaker systems are always rated by the manufacturer. Common impedances are two, four, eight and sixteen Ohms, although other values are sometimes used.

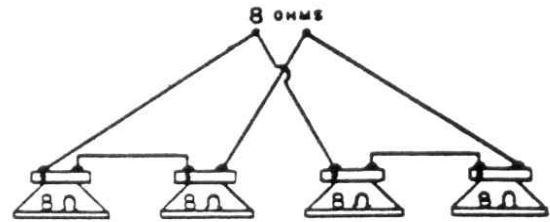
When more than one speaker or speaker system is combined, however, the impedance changes. The three basic interconnecting methods are shown below, with the changes in impedance each method causes. Although the drawing shows single speakers, the same is true of speaker systems.



PARALLEL



SERIES



SERIES-PARALLEL

The actual formula for calculating parallel impedances is  $Z_{\text{parallel}} = \frac{1}{\frac{1}{Z_1} + \frac{1}{Z_2} + \frac{1}{Z_3} + \dots + \frac{1}{Z_n}}$

The formula for series impedance is  $Z_{\text{series}} = Z_1 + Z_2 + Z_3 + \dots + Z_n$

## BI-AMPING THEORY

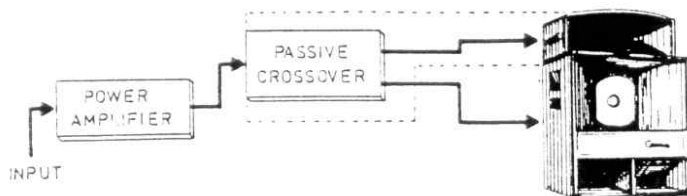
Bi-amplification is a method of sound reinforcement that provides increased sound levels and decreased distortion per watt of power. This system requires two separate power amplifiers for each channel required. (Stereo bi-amping requires four power amps). The advantages of bi-amping may be best understood by considering a conventional sound system first.

Each channel of sound is normally boosted by a single amplifier, which in turn drives the speaker system. However, most speaker systems contain a bass speaker and a high-frequency speaker (usually a horn in a sound-reinforcement system). A third component, known as a passive crossover, divides the powerful signal so that the bass speaker receives only the bass frequencies and the horn gets the high frequencies.

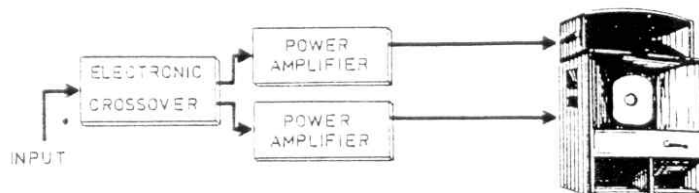
The bi-amped system on the other hand, utilizes an "electronic crossover" ahead of the amplifier to split each channel into Hi and Lo signals. Each signal is boosted by a separate amplifier, and each amp drives its own speaker. Thus, the bass speaker and horn are amplified separately, and the passive crossover is eliminated. The result is increased

acoustical output with lower intermodulation distortion, and distortion added by the passive crossover is totally eliminated.

The Carvin electronic crossover incorporated in the ASG-series amplifiers utilize low-noise op amps in a multiple-feedback configuration to provide active high and low pass filters. The filter slope is 12 dB/octave, and the crossover point is 800 Hz (generally accepted as the industry standard).



CONVENTIONAL SYSTEM



BI-AMP SYSTEM

As noted in *Sound System Engineering* (an excellent reference book by Don & Carolyn Davis):

Bi-amplification systems offer significantly lower distortion, much easier control of acoustic levels, and greater versatility regarding number and type of drivers used at any one time. Today, this method is virtually the only choice for high-level rock entertainment systems.

CAUTION: Since the passive crossover is eliminated, the high-frequency driver is susceptible to damage from heavy pulses, etc. The Carvin high-frequency drivers incorporate a protective capacitor to reduce the danger of such damage.

ASG600 Output	800W RMS 300W RMS per ch at 2 Ohms—200W RMS per ch at 4 Ohms—120W RMS per ch at 8 Ohms.	Input Sensitivity	.8 VAC for Full Output.
ASG250 Output	250W RMS 125W per ch at 4 Ohms—80W RMS per ch at 8 Ohms.	Indicators	Precision V.U. Meters display full output at 0 dB—half output at -3 dB—1/4 output at -6 dB. Illuminated.
SPEC for Both Models	Note: Maximum Wattage levels at lower output impedances help protect Horn Drivers. Adding speaker components reduces total impedance for increased power levels—also protects your speakers.	A & B Inputs	Bal Inputs with XLR connectors and 1/4" phone jack. Designed to accept source impedances from 150 to 10K Ohms.
Slew Rate	35V/us	A & B Line Outputs	600 Ohms impedance with 1/4" phone jack.
Frequency Response	10 Hz to 80K Hz $\pm$ 1 dB	A & B Spk Outputs	2 XLR Connectors per channel plus 1 1/4" phone jack.
Distortion (THD)	.08% at Full Power.	Short-Circuit Protection	Electronic Current Limiter per channel, which automatically engages under any adverse operating conditions plus Fused Spk Outputs.
S/N Ratio	Better than 90 dB	Power Requirements	110-120 VAC 50-60 Hz Grounded (3 Wire) plug.
Channel Separation	60 dB or Better.	Construction	19" Rack Mountable. Solid 3/4" Wood Cabinet (not veneer). 12 gauge front steel plate—Black finish.
Damping Factor	Greater than 100.	Dimensions	Width 21 1/2", Height 10", Depth 12".
Bi-Amp Filters	800 Hz Low Pass, 800 Hz HI Pass Active Filters with 12 dB per/oct roll-off. Each channel selectable for Full Range, HI Pass or Lo Pass.	Weight	ASG250: 47 lbs. ASG600: 55 lbs.
Level Control	Each channel has its own Output Volume Control.	WARRANTY	2 YEARS Parts & Labor.

### LIMITED WARRANTY

Your Carvin Instrument Amplifier is protected against failure for 2 YEARS. The amplifier will be serviced by Carvin free of charge should anything go wrong within the warranty period (excluding tubes, if so equipped).

While Carvin suggests you utilize the specialized technicians of the Carvin Service Dept. Non-factory repairs will not void the warranty, although all charges for such repairs must be paid by the customer. Furthermore, Carvin will supply amp parts (at no charge) upon receipt of defective parts. Naturally, any damages caused by improper outside repairs will not be covered by the warranty. All Shipping charges are to be paid by the Customer.

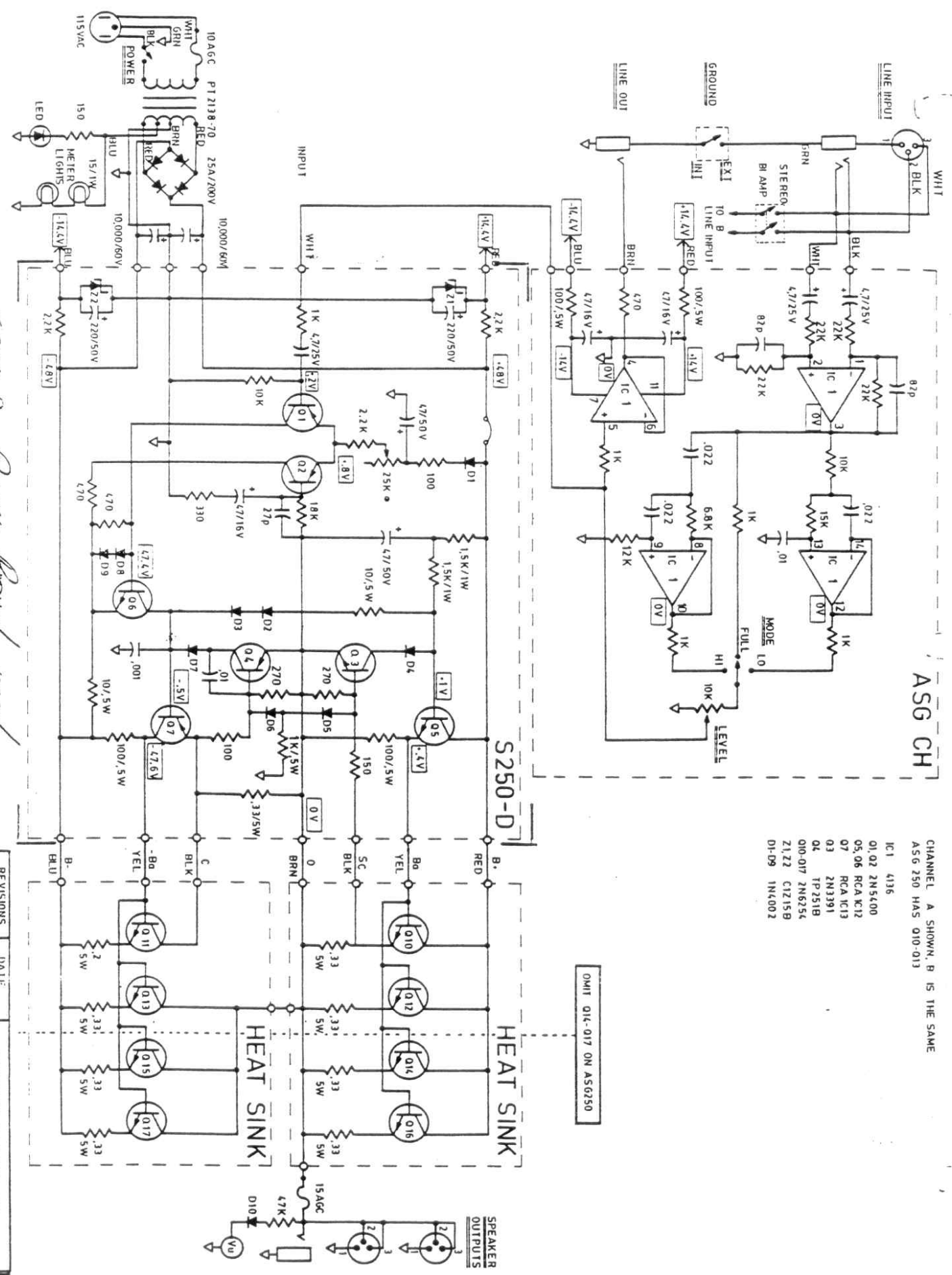
Carvin Speaker Systems are warrantied for a period of 1 Year. All JBL speakers are warrantied by JBL for 5 Years—Any repairs should be sent directly to JBL Service Centers.

Speakers are not warrantied against damage caused by excessive power levels. (Open Voice Coils are not covered by warranty as they are the result of excessive power applications). The description of an open voice coil is: A speaker that will give no sound. NOTE: An amplifier's rated output is specified at a low value of distortion. By overdriving the amp, substantially higher wattages are produced, so caution is advised to prevent damage to the speaker system.

All above warranties are extended to the Original Purchaser Only, by the Carvin Co., and do not cover failures caused by misuse or natural disasters.

**Carvin**

1155 Industrial Ave., Escondido, Calif. 92025



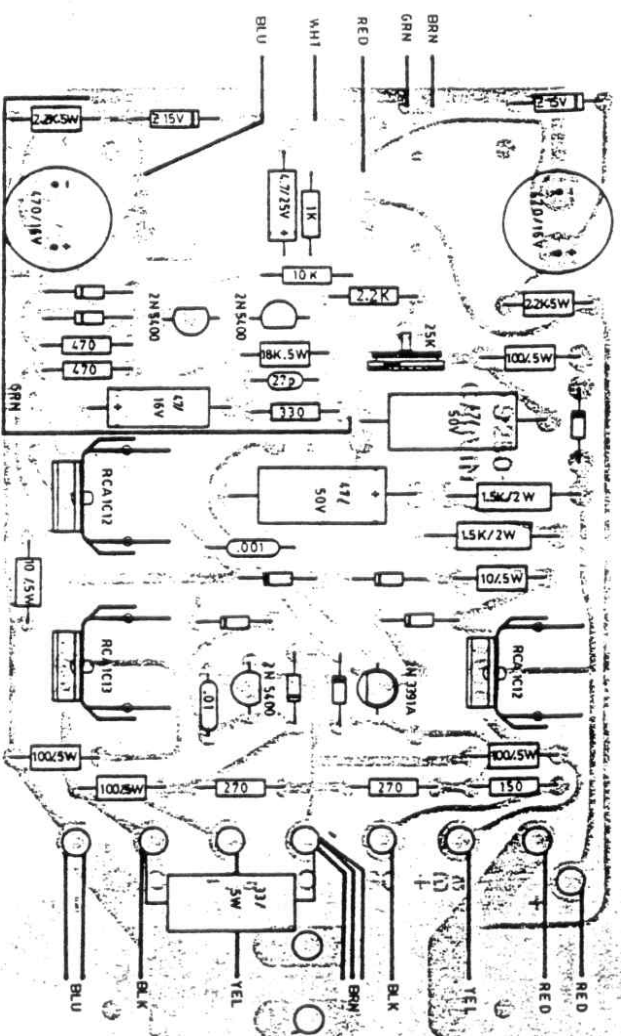
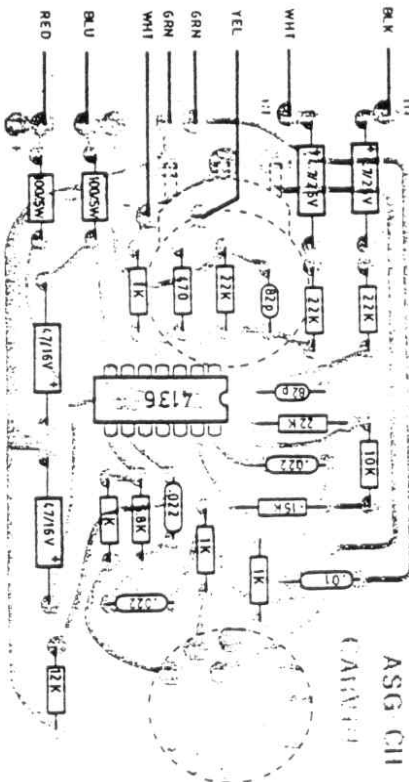
CHANNEL A SHOWN, B IS THE SAME  
 ASG 250 HAS 010-013

- IC 1 4136
- 01, 02 2N5400
- 05, 06 RCA KC12
- 07 RCA KC13
- 03 2N3391
- 04 TP 251B
- 00-017 2N6254
- Z1, Z2 C1215B
- D1-D9 1N4002

OMIT 016-017 ON ASG250

*S250-D Power Board used  
 9-7-77 to June 1, 78*

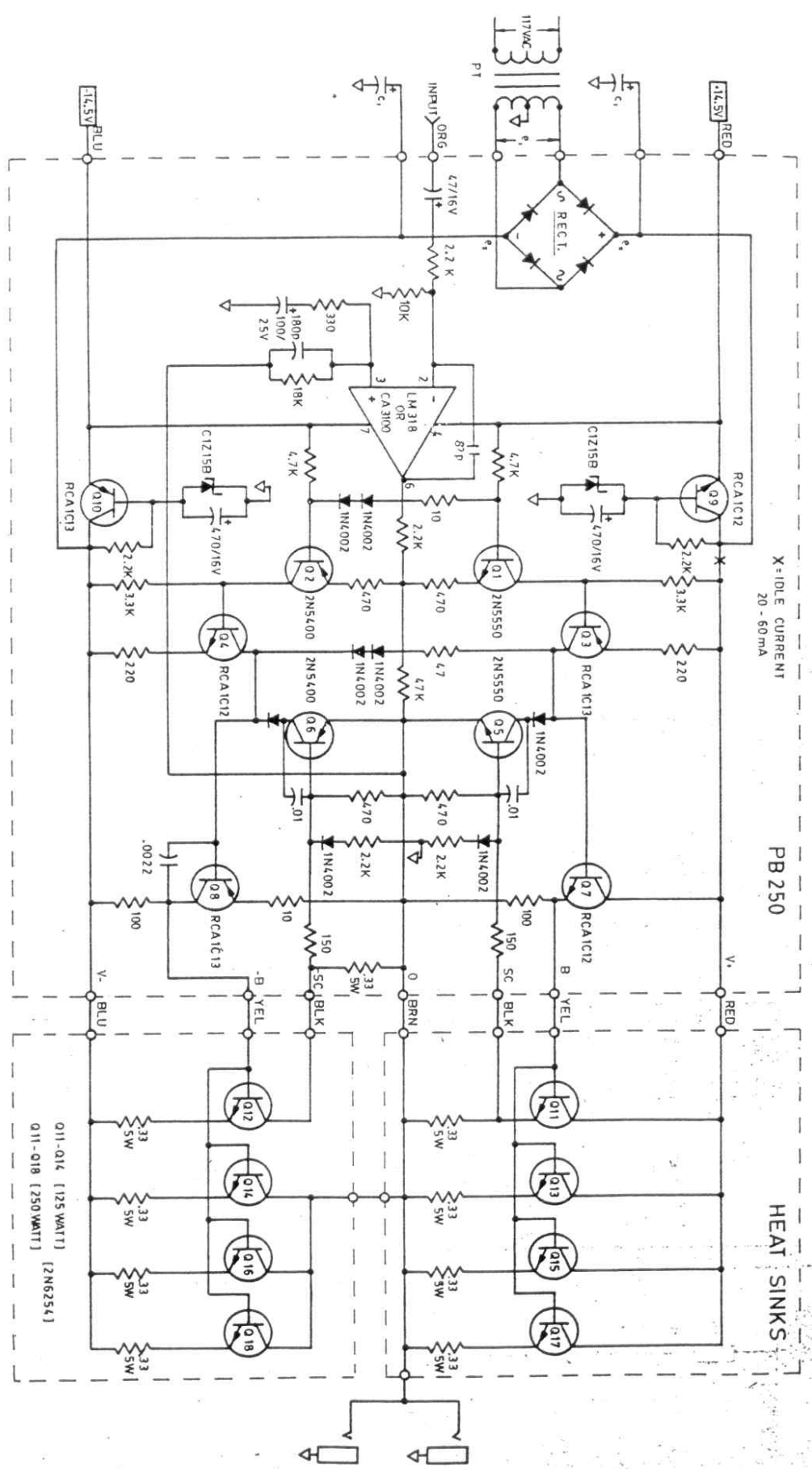
REVISIONS	DATE	DRAWN BY	CARVIN MUSIC CO
1-2-77	9/27/77	W. Flarity	ASG 500/ASG 250
6-8-78			DRIVER S250-D
8-8-78			BI AMP CROSSOVER
			ASG CH
			POWER SUPPLY



*52500 used only 9-7-77*  
 To 6-1-78

REVISIONS	DATE	CARVIN MUSIC CO
	6/12/78	S 250-D, ASG-CH P.C. LAYOUT
	DRAWN BY W. P. M...	

MODEL	PT	C <sub>1</sub>	E <sub>1</sub>	E <sub>2</sub>
125W RMS	PT1150 64	4,000/50V	-44 VDC	-44 VDC
250W RMS	PT1113 67	4,000/50V	-48 VDC	-48 VDC
AS6 500	PT2138A	10,000/60V	-49 VDC	-49 VDC



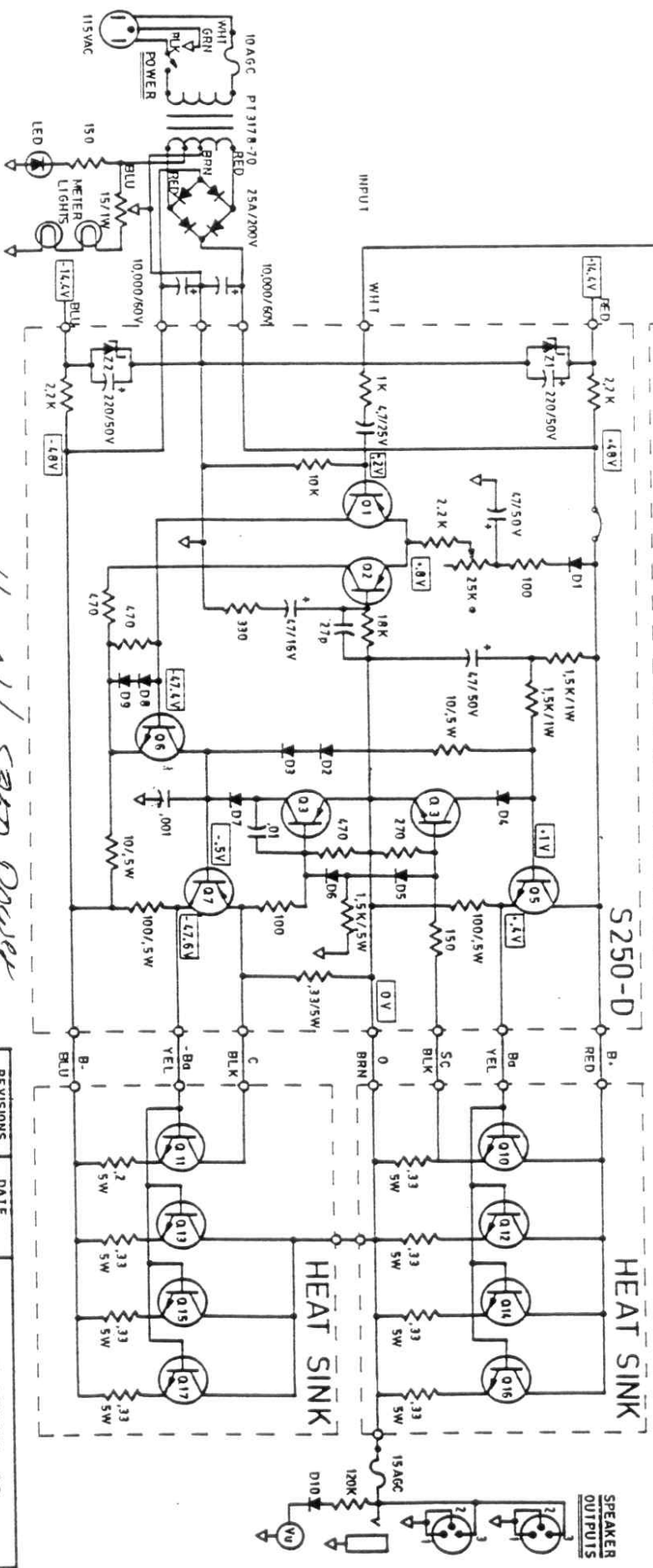
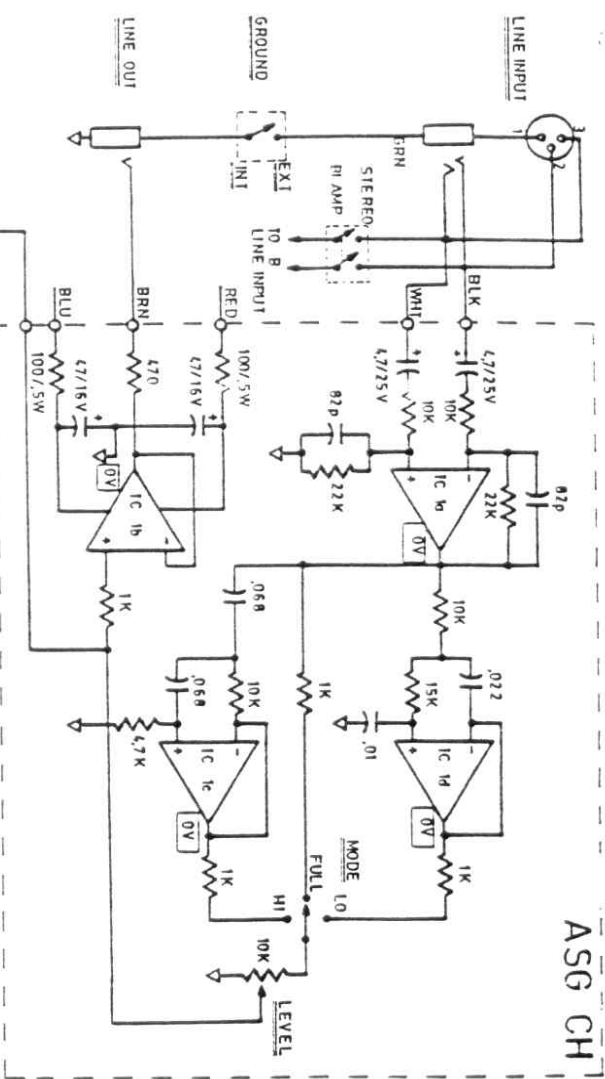
X = IDLE CURRENT  
20 - 60 mA

PB 250

HEAT SINKS

011-014 [125 WATT] [2N6254]  
011-018 [250 WATT]

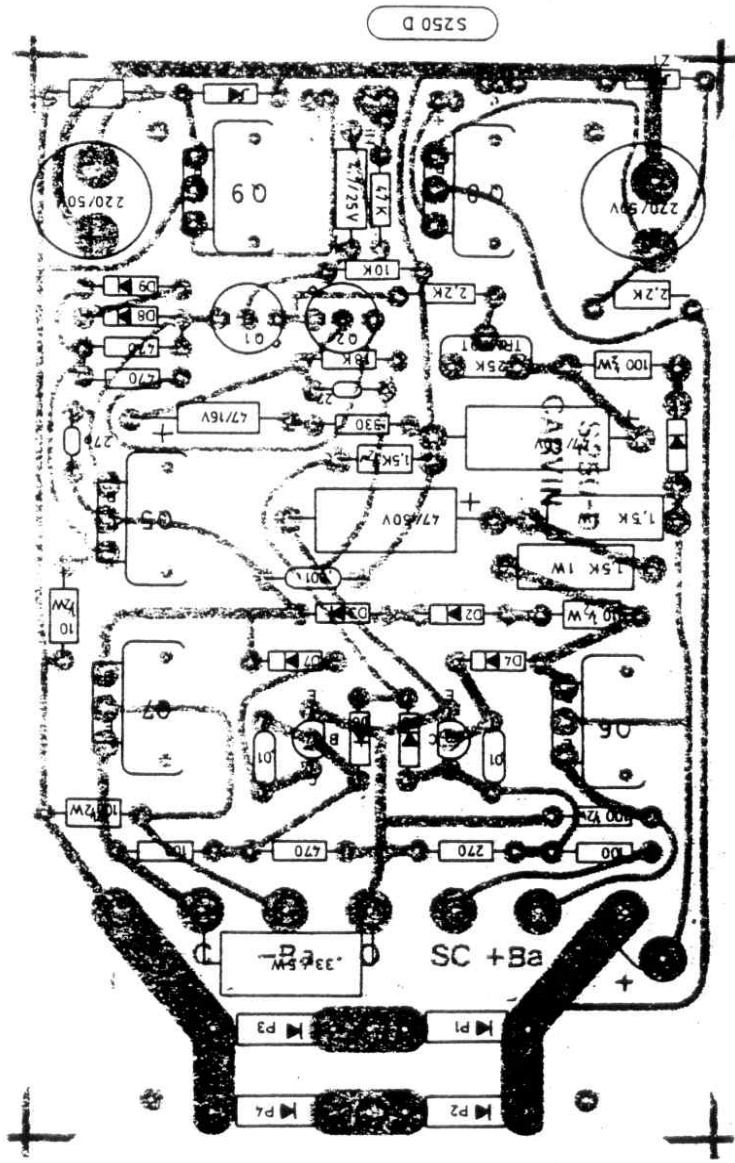
REVISIONS	DATE	CARVIN MUSIC CO
7/27/78 WJ/Bak	1-4-78	POWER AMP PB 250
OK 7/31/78 J.R.H.	DRAWN BY	
WJ/Fawc	WJ/Fawc	



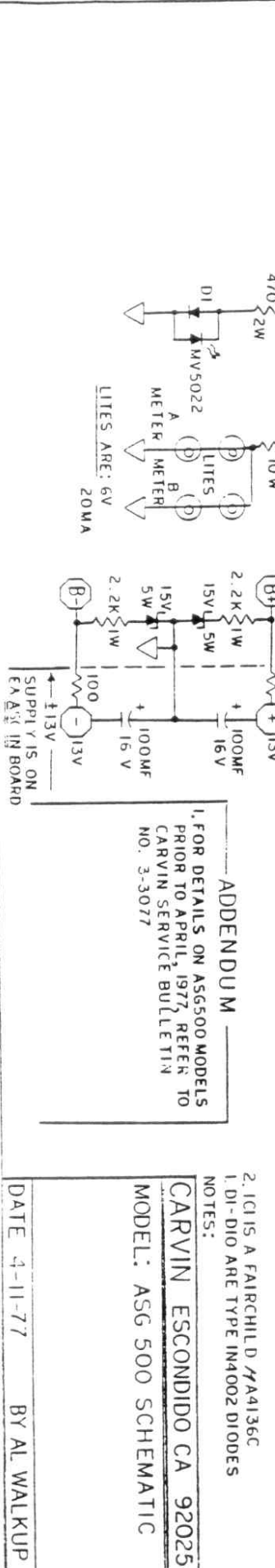
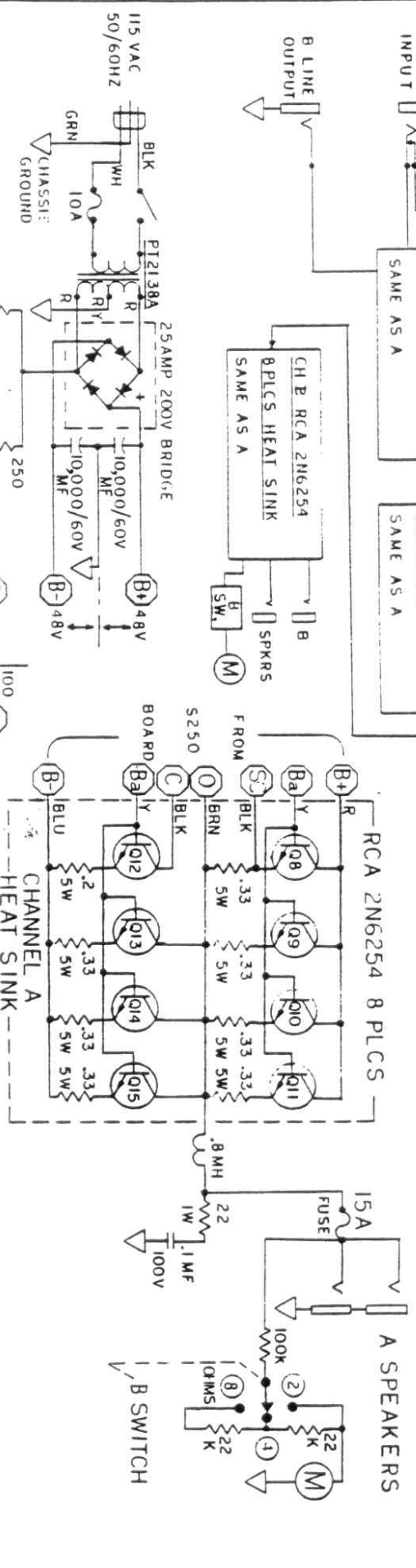
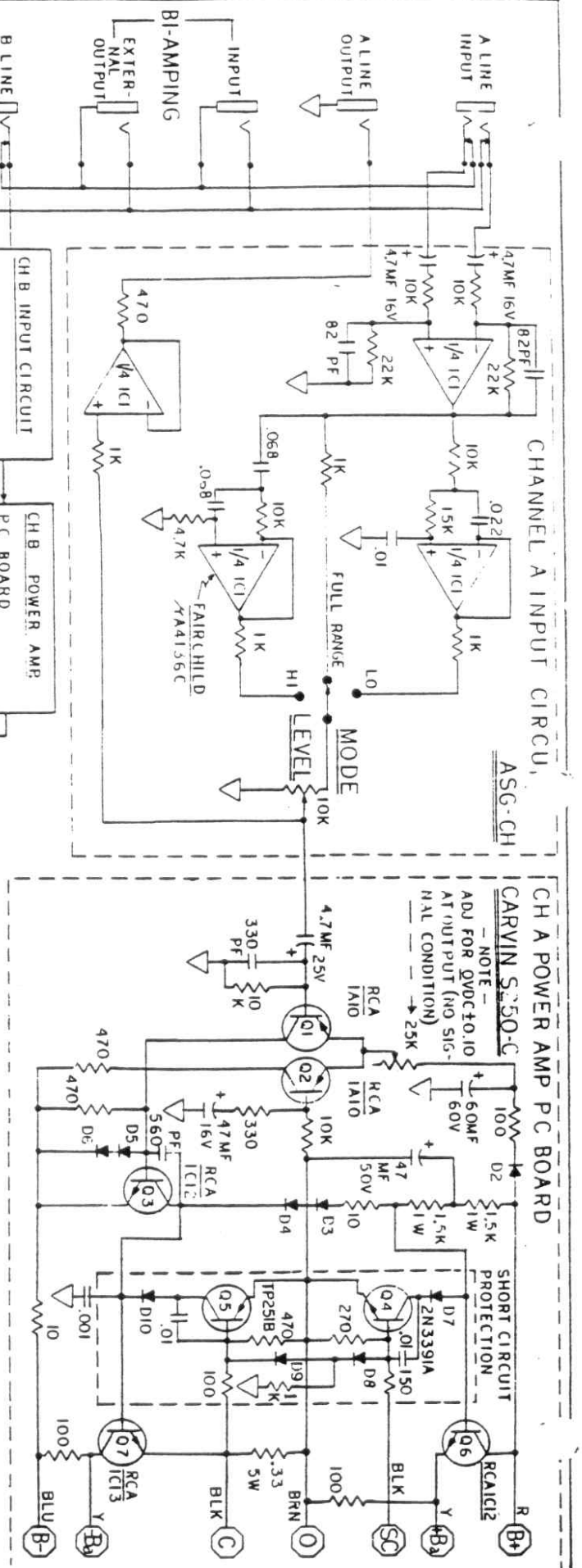
*ASG 500 with old S250 Power Amp Board. Production Speed 7-1-78*

REVISIONS	DATE	CARVIN MUSIC CO
	9/27/77	
DRAWN BY <i>W. Flaming</i>		ASG 500 / ASG 250
		DRIVER S 250-D
		BI AMP CROSSOVER ASG CH
		POWER SUPPLY





Old S250 D Power Board used in  
 Most All 1977 Amp & Mixer Models  
 Production Stopped 6-1-78



# CARVIN MFG. CO.

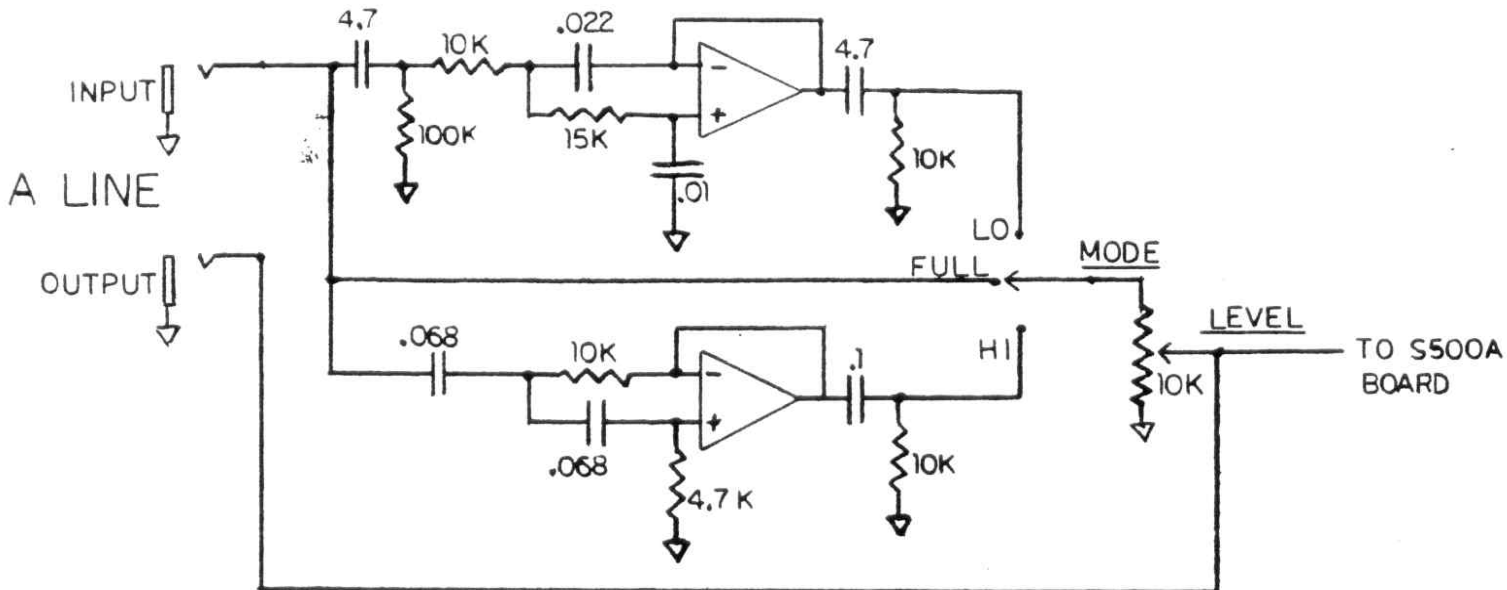
1155 INDUSTRIAL AVE.  
ESCONDIDO, CALIF. 92025  
(714) 747-1710

## SERVICE BULLETIN 3-3077

RE: ASG500 Circuitry

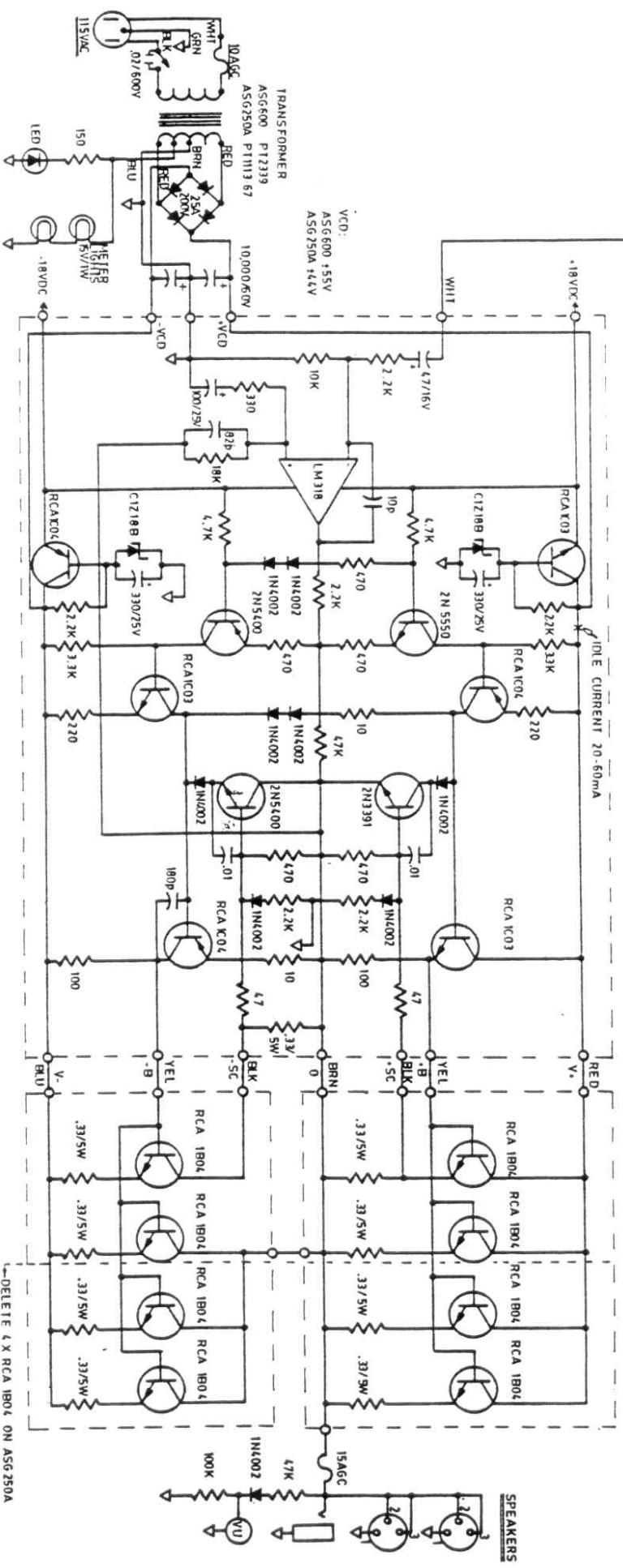
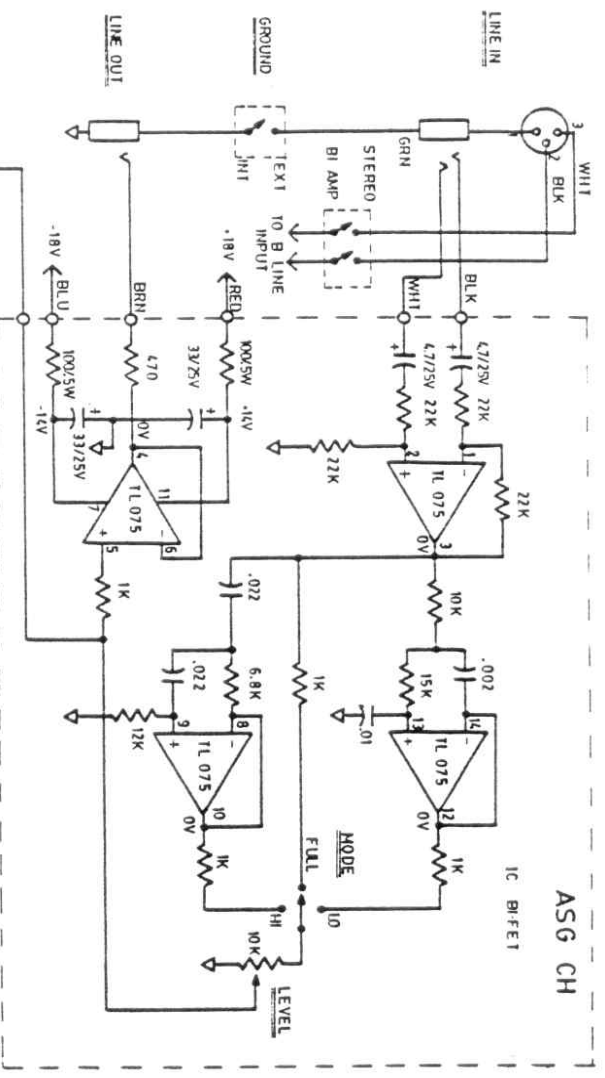
The Carvin ASG500 power amplifiers produced prior to April 1977 do not correspond to the ASG500 schematic in the following respects:

- 1) Both Input and power drive circuitry for each channel are combined on one P.C. board, the "S500A".
- 2) Input circuitry differs from that shown on the schematic. The correct circuitry is shown below:



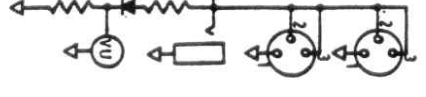
NOTE: During the production shift to the newer circuitry, some models were released with the updated input circuitry installed on the single S500A board.

Address any questions to:  
Carvin Amplifier Service Dept.  
1155 Industrial Avenue  
Escondido, CA 92025

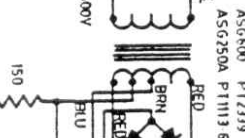


DELETE 4X RCA 1B04 ON ASG250A

SPEAKERS



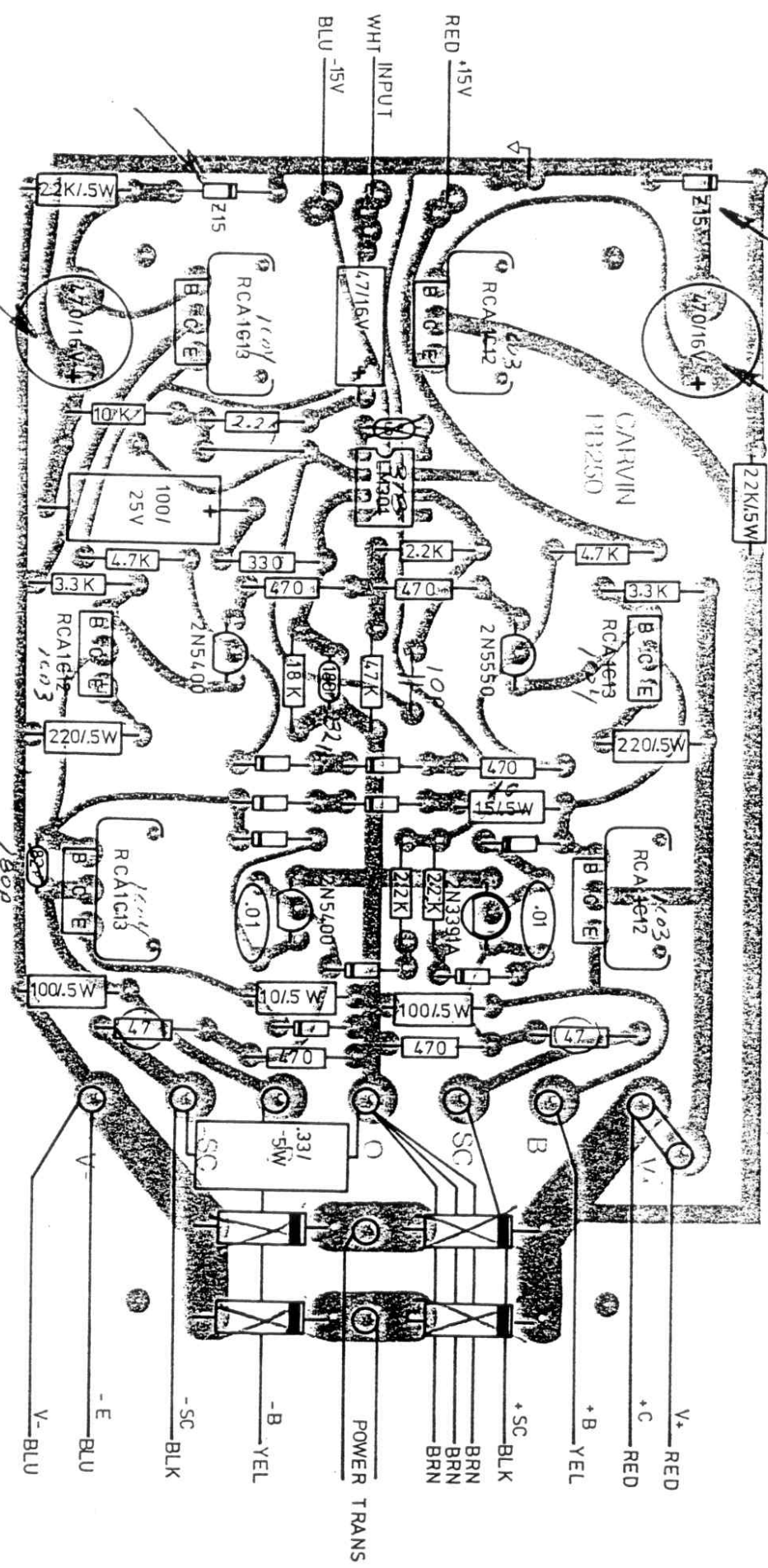
TRANSFORMER



VCD:  
ASG600 +55V  
ASG250A +44V



connect to 15V  
 above out of spec  
 change to 330/25V

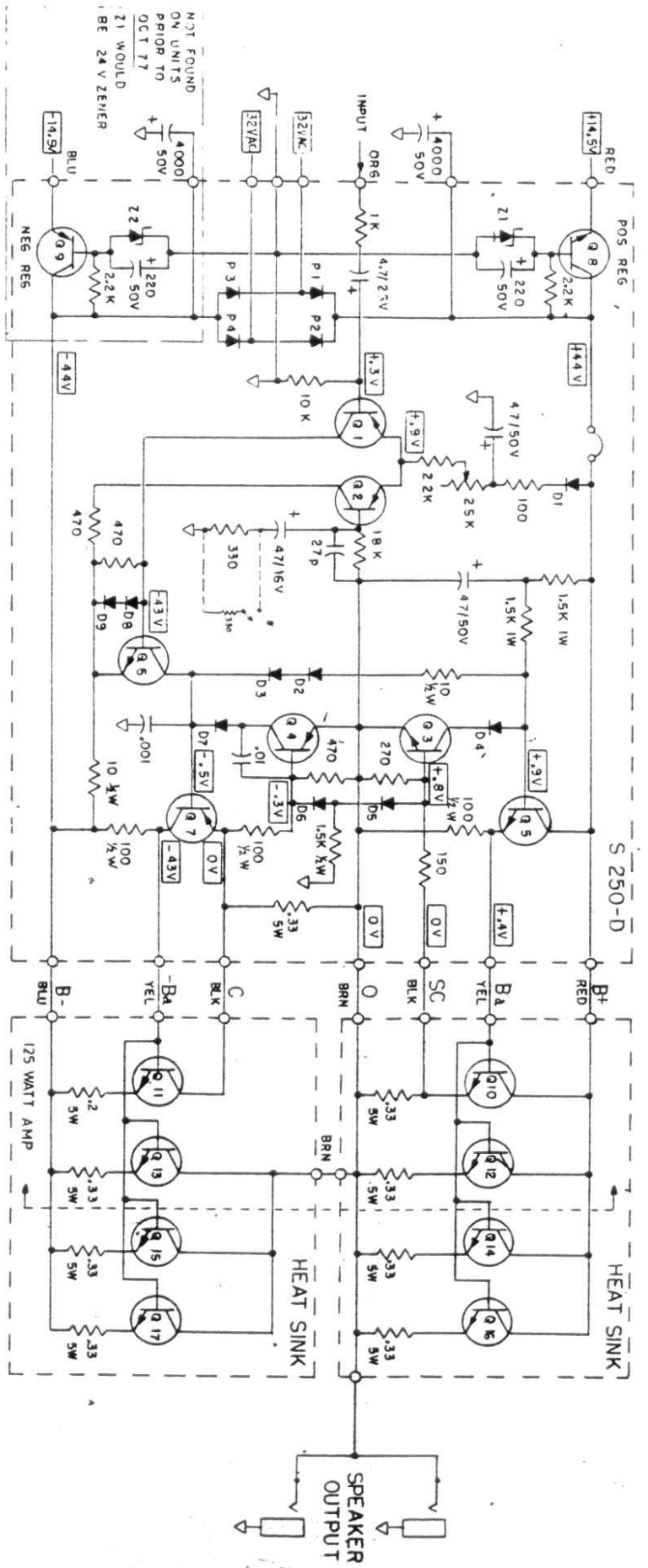


1979 ASG Models  
 using new...

PB 250

ASG600 ASG250-A

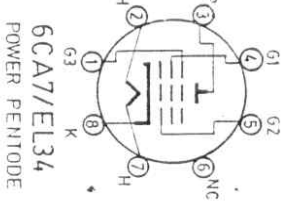
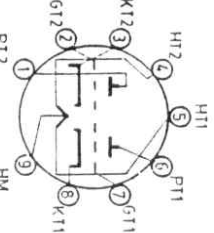
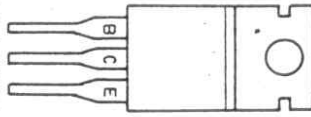
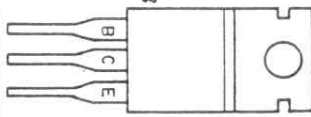
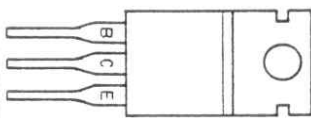
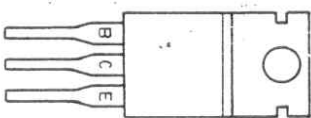
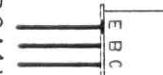
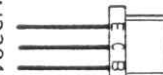
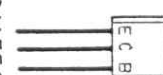
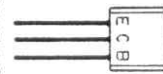
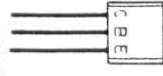
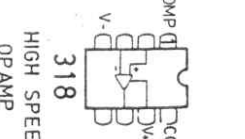
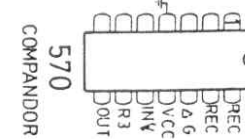
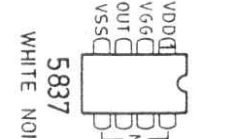
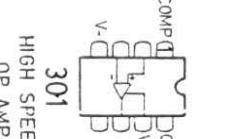
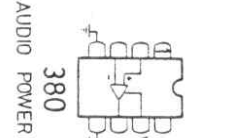
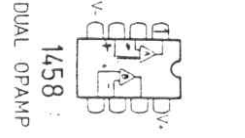
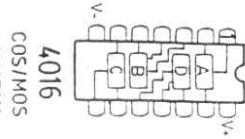
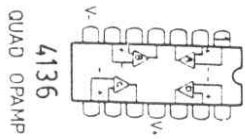
Production stop 8-1-79  
 using previously because of  
 High Failure Rate. AS  
 2-1-79  
 H: Start Models New con  
 Dos 38V



125 WATT AMP	250 WATT AMP
Q10 - Q13	Q10 - Q17
P1-P4 CR3 020	P1-P4 MR 752
PT 1150-64	PT 1113-67

Q10 - Q17	2N6254
Q5, Q6, Q8	RCA IC12
Q7, Q9	RCA IC13
Q1, Q2	RCA 1A10
Q3	2N3391
Q4	TP251 B
Z1, Z2	C 1215B
P1-P4	CR3 020 or MR 752
D1-D9	IN5392

REVISIONS	DATE	CARVIN MUSIC CO POWER AMPLIFIER DRIVER BOARD S250-D HEAT SINKS
	8-24-77	
	DRAWN BY	W. Flady



**DIODES**

- \* 1N 5392 100V, 1A
- 1N 4002 100V, 1A
- \* CR3-020 200V, 3A
- MR 502 200V, 3A
- MR 752 200V, 6A
- CR 100 1000V, 1A
- CBR25-020 200V, 25A BRIDGE

**ZENER DIODES**

- \* C1Z24B 24V, 1W
- C1Z15B 15V, 1W

**L.E.D.'S**

- MV 5022
- R15054

**RESISTORS**

EXCEPT WHERE NOTED, ALL RESISTORS ARE 1/4W, 5%, FILM. VALUES ARE LISTED IN OHMS.

**CAPACITORS** —|—  
EXCEPT WHERE NOTED, ALL CAPACITORS ARE TANTALUM, ELEC. OR MYLAR FILM. VALUE ARE IN MFD. CURVED ELEMENT = LOWEST POTENTIAL.

**DC VOLTAGES** ±10%

REFERENCED TO GROUND, SIMPSON 464, DVM, 10M

**AC VOLTAGES** ±10%

REFERENCED TO GROUND, HP 400H, 1M METER

**GROUND LOOPS**

IMPROPER GROUNDING CAN CAUSE HUM. FOLLOW ORIGINAL WIRING!

\* USED IN EARLIER UNITS

REVISIONS	DATE	CARVIN MUSIC CO
	7-7-78	
	DRAWN BY	
	<i>W. Stanley</i>	
		SCHEMATIC NOTES