



MODEL 8500T

- IMPORTANT -

PLEASE READ THIS PAGE BEFORE OPERATING

YOUR

BGW POWER AMPLIFIER

Your new BGW amplifier is designed to provide years of trouble free performance. Observing these few precautions will insure proper operation:

Read all Instructions before connecting any AC power to your power amplifier.

Retain this Manual for future reference.

Heed all warnings on the top or rear of the power amplifier.

The amplifier should not be used near water - for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc.

The amplifier should be situated so that its location or position does not interfere with its proper ventilation. For example, it should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings; or, placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.

The amplifier should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances that produce heat.

The amplifier should be connected to a power supply only of the type described in the operating instructions or as marked on the rear panel.

Precautions should be taken so that the grounding means of the amplifier is not defeated.

The power supply cord should be routed so that it is not likely to be walked on or pinched by items placed upon or against it, paying particular attention to cord at the plug, convenience receptacles, and the point where they exit from the amplifier.

Care should be taken so that objects do not fall into, and liquids are not spilled into the amplifier through openings.

SPECIFICATIONS - MODEL 8500T

FTC POWER OUTPUT

300 watts minimum sine wave continuous average power per channel with both channels driving 8 ohm loads. The maximum total harmonic distortion at any level from 1 watt to 300 watts and at any frequency from 20 Hz to 20 kHz is .2%.

600 watts minimum sine wave continuous average power into a 4 ohm load driven in bridge connected monaural operation. The maximum total harmonic distortion at any power level from 1 watt to 600 watts and at any frequency from 20 Hz to 20 kHz is .2%.

Small Signal Frequency Response:	3 Hz - 85 kHz +0 -3 dB 20 Hz - 20 kHz +0 -.2 dB
DC Offset Voltage:	less than +10 mV
Hum and Noise:	106 dB below 300 watts/8 ohms 20Hz-20kHz unweighted. 110 dB below 300 watts/8 ohms, A weighted.
Input Sensitivity:	1.6 Vrms for rated 8 ohm output
Voltage Gain:	31.6 or 30 dB
Input Impedance:	15 k ohms from + to - input.
Damping Factor:	300:1
Input Connectors:	Six pin barrier strip. One screw terminal each for (+) signal, (-) signal, and common. Strap supplied ties signal (-) to common.
Output Connectors:	Six pin barrier strip. One screw terminal each for (+) output and (-) output.
Ground:	Signal ground and chassis ground connected by removable strap on rear barrier strip.
Indicators:	Lighted rocker power switch.
Rear Panel Controls:	Input attenuators One 41 position detented rotary control per channel

Fusing:

One time-delay element fuse in externally accessible holder on rear panel.

Turn-On/Turn-Off:

No transients on turn-on or turn-off. 3 second time delay prevents signals from appearing at amplifiers output terminals during turn-on sequence.

Dimensions:

5.25" x 19" Standard Rack Front Panel.

Chassis: 5.25"H x 19"W x 14.1"D

The amplifier should be serviced by qualified service personnel when:

The power supply cord or the plug has been damaged; or objects have fallen into, or liquid has been spilled into the amplifier; or has been exposed to rain; or does not appear to operate normally or exhibits a marked change in performance; or has been dropped, or the enclosure has been damaged.

All connections should be made to the power amplifier with the power OFF.

Speaker fuses should be used to afford maximum speaker protection.

Never connect the output of one channel to that of another.

Connect the power cord to the proper voltage mains as indicated on the rear of the amplifier. Conversion to another voltage requires internal rewiring.

Do not remove the amplifier's cover. Amplifiers may not be covered under warranty if they are tampered with. There are NO adjustments within. Potentially lethal voltages exist within the amplifier. Refer all service work to an authorized BGW service station.

UNPACKING AND SET-UP

Your BGW Power Amplifier is shipped in an advanced packing container.

SAVE THE CONTAINER AND ALL PACKING MATERIAL!

The container should be saved in the event the unit is moved or shipped at some future date. Replacement containers are available from BGW Systems.

Inspect the unit for damage in transit immediately upon receipt. If damage is found, notify the transportation company immediately. Only the consignee may institute a claim with the carrier for shipping damage. BGW will cooperate fully in such an event. Be sure to save the container as evidence of damage for the shipper to inspect.

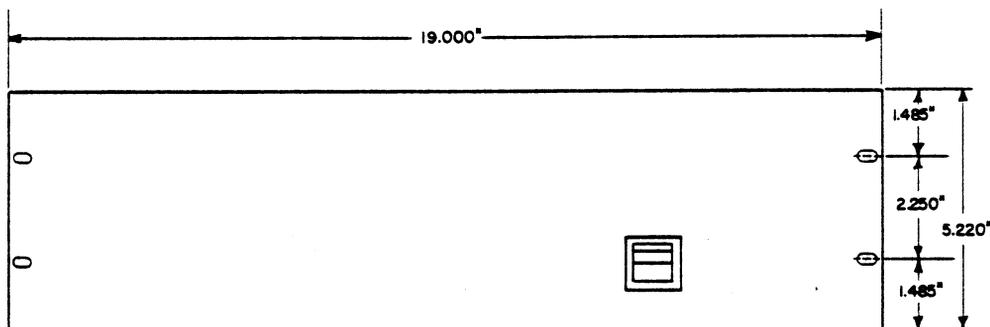
The amplifier's mounting position must be chosen carefully, so that the air flow to the front and rear of the unit is not restricted. Inadequate ventilation may cause failure of the amplifier. For rack mounting, the four rubber feet on the bottom of the unit may be removed and no hardware will be loosened inside the unit.

Do not, however, use the front panel as the sole support for the amplifier. Side rails or rack shelves should be employed.

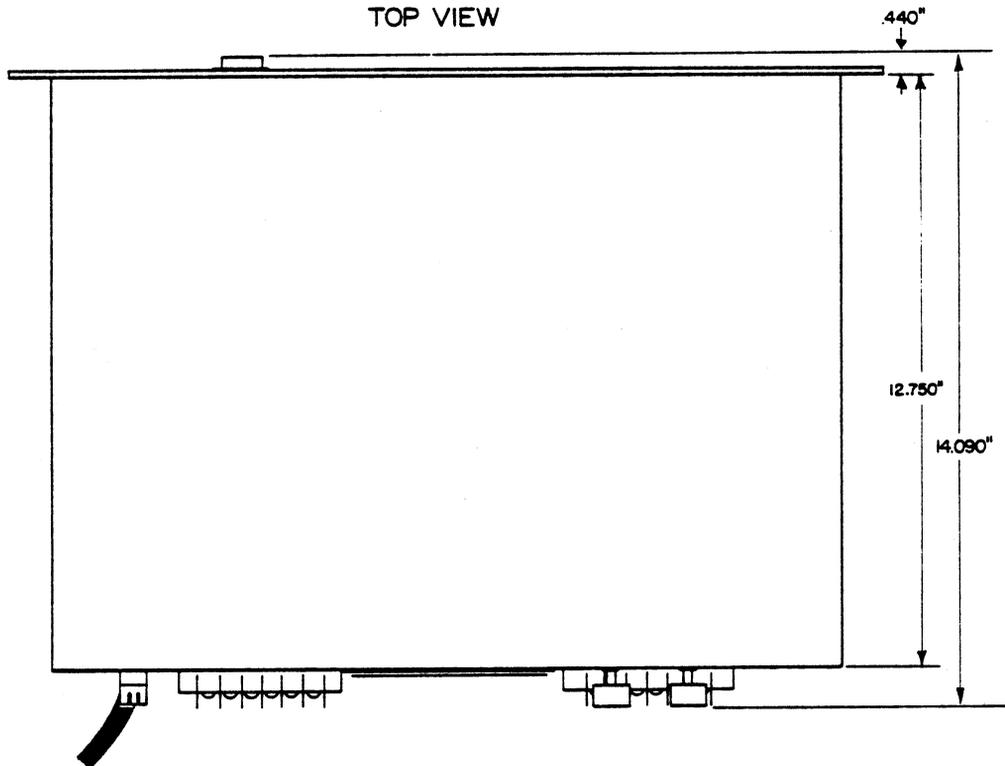
DO NOT PLUG THE AMPLIFIER IN YET!

All connections should be made before power is applied.

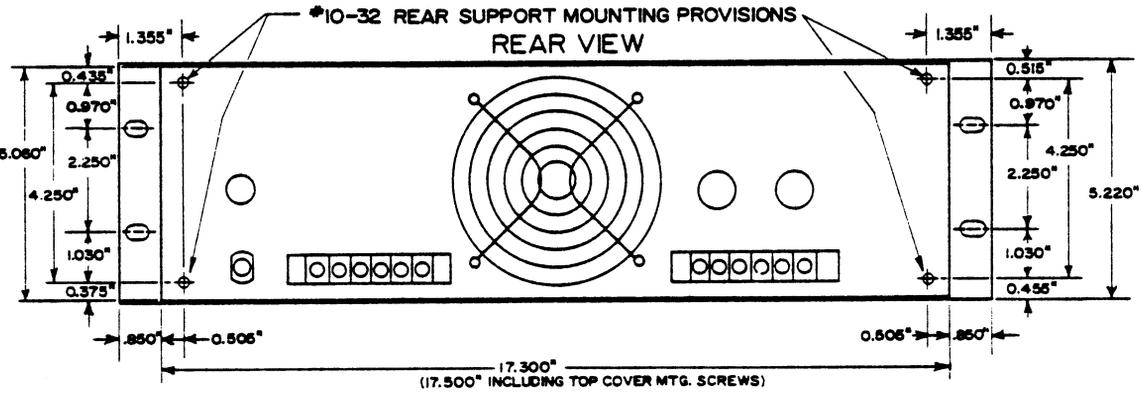
REVISIONS	DATE	APPROVED



FRONT VIEW



TOP VIEW



REAR VIEW

BGW SYSTEMS 13130 SOUTH YUKON AVE. HAWTHORNE, CA 90250 (213) 973-8050		BGD SYSTEMS	
TITLE 8500T CHASSIS DIMENSIONS AND REAR SUPPORT DETAIL			
DRAWN <i>H. D. Johnson</i> 11-21-86	CHECKED <i>S. J. S. O'Connell</i> 11-29-86	PROJECT ENGR <i>H. D. Johnson</i> 1/27/87	REV ~
DRAWING NUMBER 9512-8500			SCALE RELATIVE
SIZE C			SHEET / OF 2

UNLESS OTHERWISE SPECIFIED
 DIMENSIONING AND TOLERANCING
 PER USAS1 Y14.1.
 DIMENSIONS ARE IN INCHES
 AND APPLY AFTER PLATING.
 TOLERANCE ON DECIMALS:
 .XX = ± .03 .XXX = ± .010.
 TOLERANCE ON ANGLES = ± 0° 30'
 BREAK SHARP EDGES .010 MAX.
 SURFACE ROUGHNESS 12.5

DO NOT SCALE DRAWING

NOTES: UNLESS OTHERWISE SPECIFIED.

EQUIPMENT INSTALLATION

RACK MOUNTING HINTS

Use care when mounting equipment in a rack enclosure. Place the heaviest units near the bottom of the rack. Equipment cannot always be supported by Front Panels alone. This is especially true of amplifiers whose depth is more than twice their height. Uniform support can be insured by installing bottom or side rails.

When racks are to be transported or used in a mobile installation, some means of securing the rear of the equipment is required. This will restrict movement of the equipment in any direction in the rack enclosure. Likewise, equipment weighing more than 50 lbs require rear support to prevent distorting or breaking the Front Panel. BGW Power Amplifiers are fitted with Rear Panel Support provisions for this purpose. Please refer to the CHASSIS DIMENSIONS AND REAR SUPPORT DETAIL drawing in this manual. Angle brackets attached to the sides or bottom of the rack enclosure, and fitted to mate up with the mounting holes on the Rear Panel is one suggestion.

NOTE: DO NOT ALLOW MORE THAN 1/2" OF SCREW SHANK INSIDE CHASSIS. Select a screw length of about 1/4" greater than the bracket/washer thickness.

To protect the Front Panel finish from deep scratches occurring around the rack mount slotted holes, use NYLON Finishing Washers between the mounting screws and the Front Panel. #10-32 hardened machine screws are recommended, and is the size required for the rear support provisions. (Avoid "packaged" hardware found in consumer discount lumber/hardware stores, as most of it is too soft and can shear off easily. Hex-key style hardware, in general, has the proper hardness ratings).

Unless the rack enclosure is small, and/or light enough in weight to lay down on its' back, allowing the amplifier(s) to be easily positioned and "bolted in" by yourself, LET SOMEONE ASSIST YOU! While lighter weight equipment can be installed by one person into vertical rack enclosures (by performing a "circus balancing act" sometimes), attempting the same with 50 lbs-PLUS amplifiers can lead to VERY PAINFUL PERSONAL INJURY or DAMAGE to the equipment (OR BOTH)! Again, LET SOMEONE ASSIST YOU ! Very little intelligence is involved in one person on each side of a 50 to 80 lb amplifier and, together, slipping it into position and start the mounting hardware threading into the proper rack rail holes ("Does your side line up? Mine neither. Let's slide it up one position."), and share the tool to tighten the mounting hardware. Within moments, the amplifier is in place.

The better quality (and more expensive) rack mount enclosures provide (or have provisions for) front-to-back, right angle steel

support brackets, in addition to identical, aligned rack-mount rails at the rear of the enclosure. (At least, they are supposed to be aligned with the front rack rails). If the bottom support brackets are used, a blank rack panel will be required between the bottom of most BGW products and the top of the next unit, as the chassis bottom is very close to being flush with the bottom of the front panel.

A most clever arrangement we have seen for the rear support made use of #10-32 threaded, tapered guide pins bolted into the Rear Support Provision holes, and mating bushings installed into aligned right angle brackets attached to the enclosure side walls. Front panels were secured with (quality) standard hardware. This made installation and removal of the amplifiers easy, once the input, output and power cord connections were detached.

KEEPING IT COOL

A power amplifier draws energy from a primary electrical service, usually a 120 Volt service, to drive loudspeaker systems with an audio signal. Typically, only half of the energy can be delivered to the loudspeakers; the remaining energy is converted into heat, and must be dissipated (ventilated) into the air.

Air circulating past heat-producing components absorbs the heat and carries it away. To accomplish this, low and medium power amplifiers rely on natural convection currents, while most high power amplifiers use fans. If the air flow is obstructed, the resulting rise in heat may cause an amplifier to stop working or fail.

Circulating air currents must not be cut off when installing power amplifiers in Racks or small cases. Power amplifiers using convection cooling require spacing between each other to permit air flow between them. Power amplifiers using forced-air cooling, on the other hand, can usually be stacked close to each other and may not need any blank panel spacing between them.

To improve natural convection currents within a rack, a 'chimney' can be created by closing the back of the rack and venting the rack at the bottom to let in fresh cool air, and at the top to exhaust hot air. Vents should be large rectangular slots approximately 19" wide by 4" high.

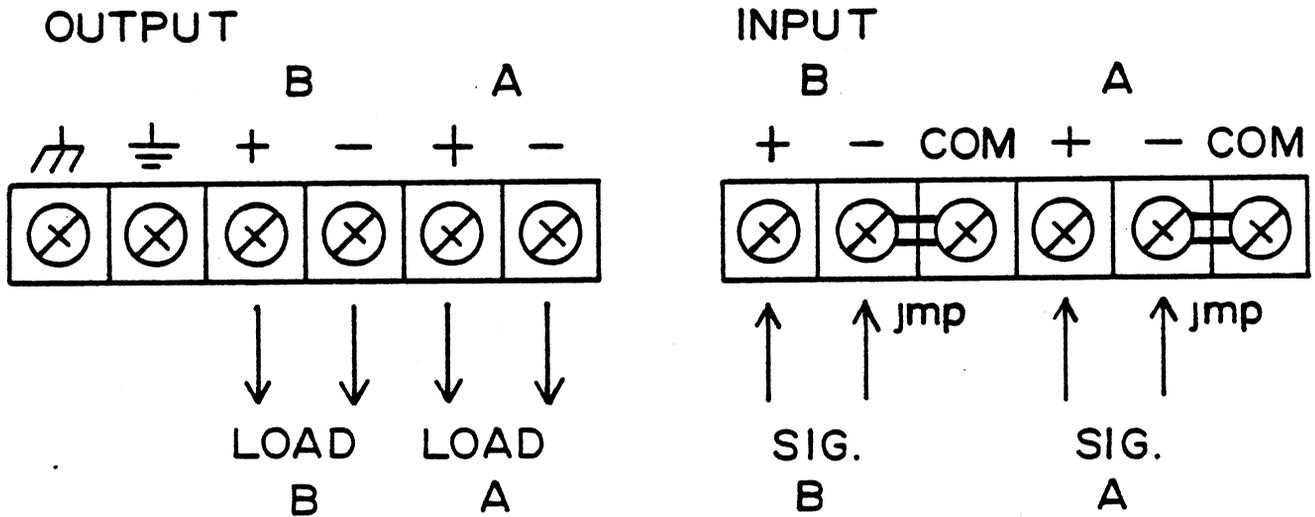
The Rack cabinet will require some type of blower if a large air-flow is required. It is best to exhaust air from the top of the rack rather than to blow it in from the bottom. There will be less dust and dirt in the rack this way, if the bottom vent is sufficiently large. It is advisable to provide dust filters at both the air inlet and exhaust outlets of the rack. Likewise, periodic maintenance is required to clean the filters. If no filters are used, then similar maintenance should be performed on the amplifiers to prevent heat buildup or failure from conductive elements that may be in the dust.

The 8500T Power Amplifier is fan cooled with a single speed 70 CFM unit, and is configured to pull cool air in thru the side vents (across the heatsinks), and exhaust the hot air out the back.

INPUT/OUTPUT CONNECTIONS

STEREO

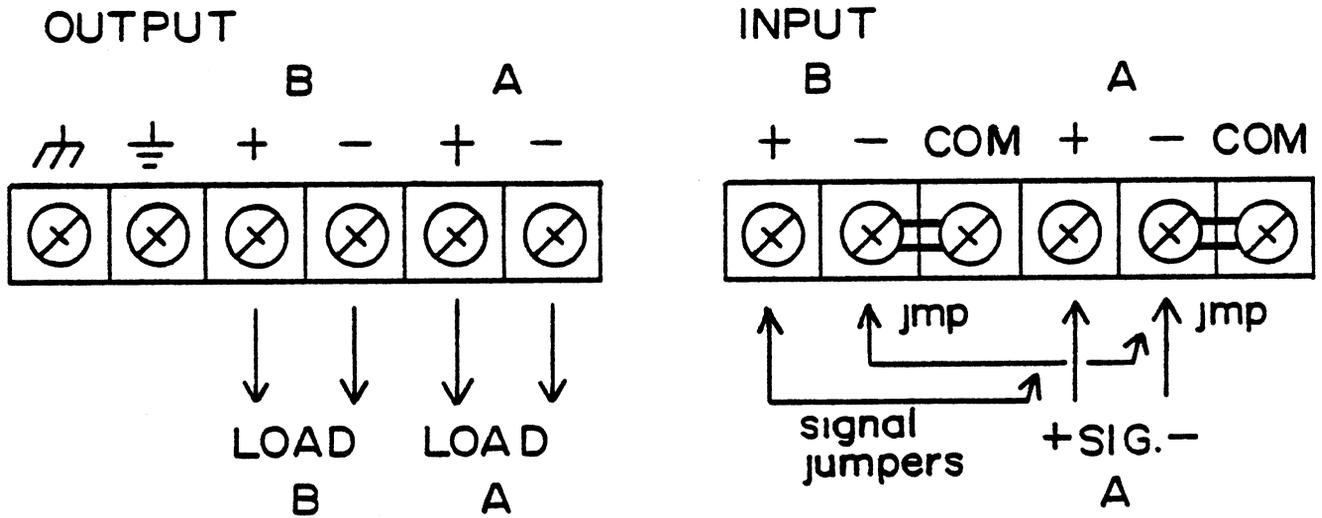
Input and output connections are provided by the pair of six-terminal barrier strip located on the rear panel, which accept spade lug terminations. Standard input configuration is unbalanced, with a removable jumper provided to tie signal (-) to signal ground. Balanced mode operation can be obtained with the transformer balanced input option (Option 06). In this case the input grounding jumper is removed and balanced inputs are between (+) and (-) terminals. In either case, stereo output connection is taken separately, with each channel being driven from (+) to (-) output terminals.



DUAL MONO

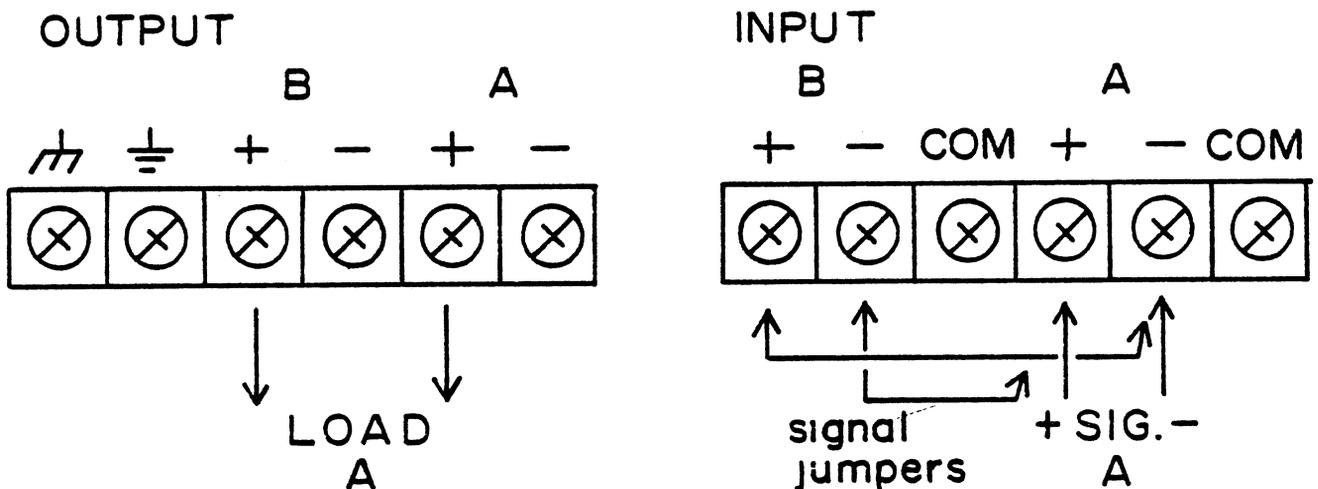
The unit may be wired for dual mono operation in either balanced or unbalanced configuration. When using standard unbalanced inputs, one jumper is required from channel A + terminal to channel B + terminal. This is a short spade lug jumper mounted externally. If transformer balanced inputs are used, two jumpers are required. One will connect channel A (+) to channel B (+), The other will connect channel A (-) to channel B (-). Outputs are taken individually, as in the stereo mode, from (+) to (-) of each output.

DUAL MONO - UNBALANCED remove (-) to COM jumpers when using dual transformer balanced input option



BRIDGE MONO - two transformer option

To increase output power, the unit may also be wired for bridged mono operation, provided there are input transformers used. First we will consider the case in which two input transformers provided. Input connections are made as before with grounding strap lifted, but must be out of phase with each other. This means that channel A will be wired with the HOT lead to the (+) input, and channel B will be wired with the HOT lead connected to the (-) input. Output connection is taken BETWEEN the channel A (+) and channel B (+), with channel A (+) being HOT and NO connection made to either ground terminal. This allows twice the voltage swing into a single load.



IMPEDANCE-COUPLED SOURCE TERMINATIONS

When interfacing with equipment having an output transformer, or is a passive filter or equalizer, proper loading must be provided to prevent non-linearities. To accomplish the task of selecting the proper resistance value to add across the input line, you must determine two things first:

1. Total Input Impedance of the amplifier(s) : Z total;
2. Source Impedance driving the amplifier(s) : R_s ;
(or Required Load Impedance)

STEP 1. Z total = Input Z of Amps / Number of Amps

STEP 2. Check documentation of Signal Source for Output Impedance (or Required Load Impedance).

STEP 3. K (Impedance Factor) = $(Z$ total - R_s) / R_s

STEP 4. Termination Resistor Req'd = $(1+1/K)(R_s)$

EXAMPLE :

Input Impedance of Amplifiers = 15,000 ohms

Number of Amplifiers = 4

R_s = 600 ohms

STEP 1. $15,000/4 = 3,750$ ohms

STEP 2. R_s given as 600 ohms

STEP 3. $(3,750-600)/600 = 5.25$

STEP 4. $(1+1/5.25)(600) = (1.19)(600) = 714.29$ ohms

Closest value is 715 ohms 1% metal film resistor.

SPEAKER PROTECTION

All speakers can be damaged by having too much power applied to them. Fuse protection is an effective and inexpensive way of preventing this from occurring. If your speaker system does not contain a fuse or a circuit breaker (or other means), a fuse should be placed in series with each speaker and the wire going to the Red terminal on the rear of the Amplifier.

Maximum protection can be obtained with fast-acting fuses. Use the value recommended by the manufacturer. If no value is specified, use the chart provided in the following pages to select the correct value (MFRM-03530A).

To use the chart, take a straightedge, such as a ruler, and line up the Speaker's Minimum Impedance with its' Peak Music Power rating. The proper fuse value can then be read from the center column. Choose a fuse that is closest to, and below, the value indicated.

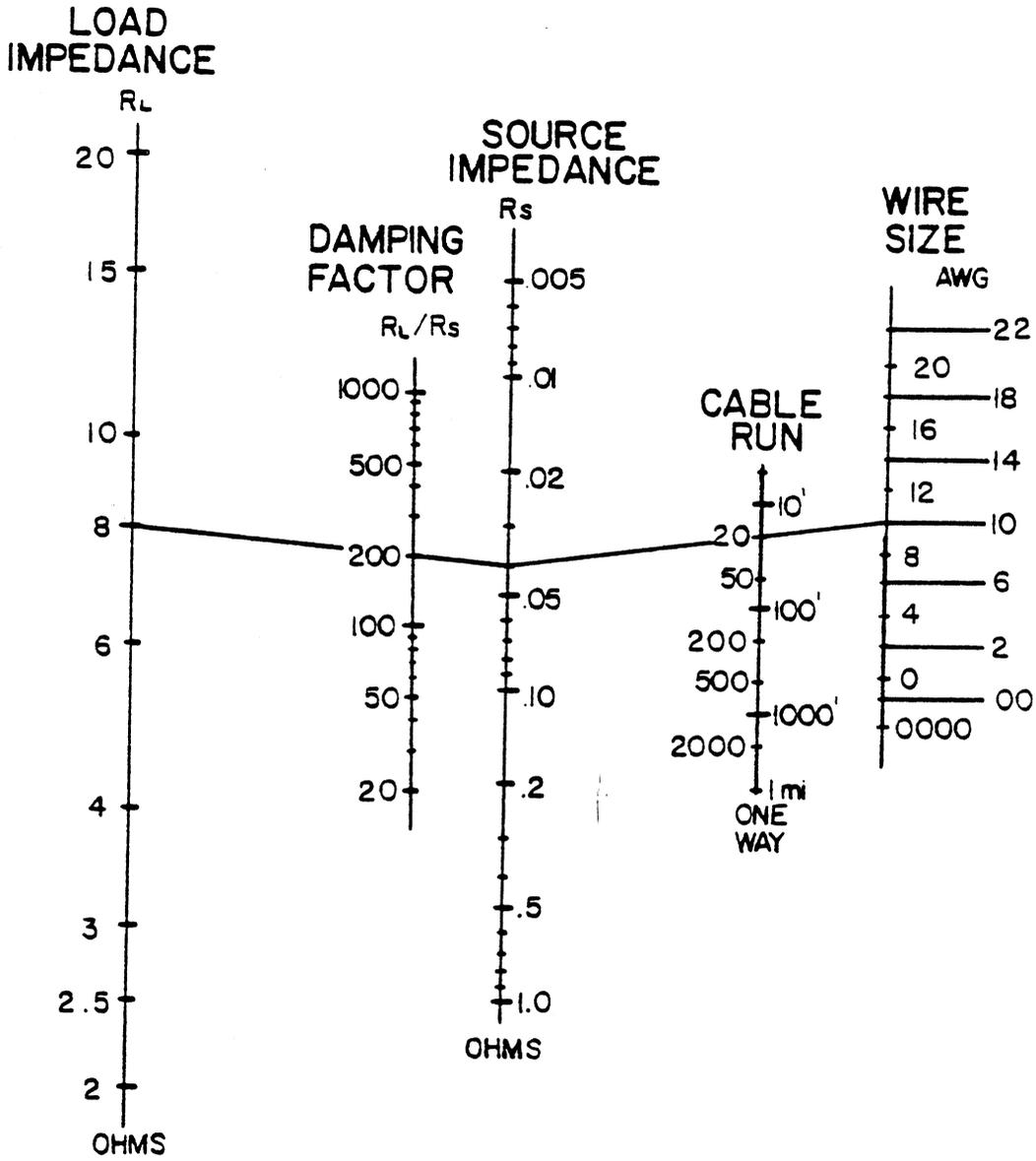
WIRE SIZE AND DAMPING FACTOR

The high damping factor of BGW Amplifiers results in a very tight, clean bass response. Excessively long, and/or small diameter (AWG) speaker lines can lower the damping factor and distort the lower frequencies. A damping factor of at least 50 should be maintained to insure good audio quality. (Damping Factor of this Amplifier may be found in the Specification Sheet at the front of the manual).

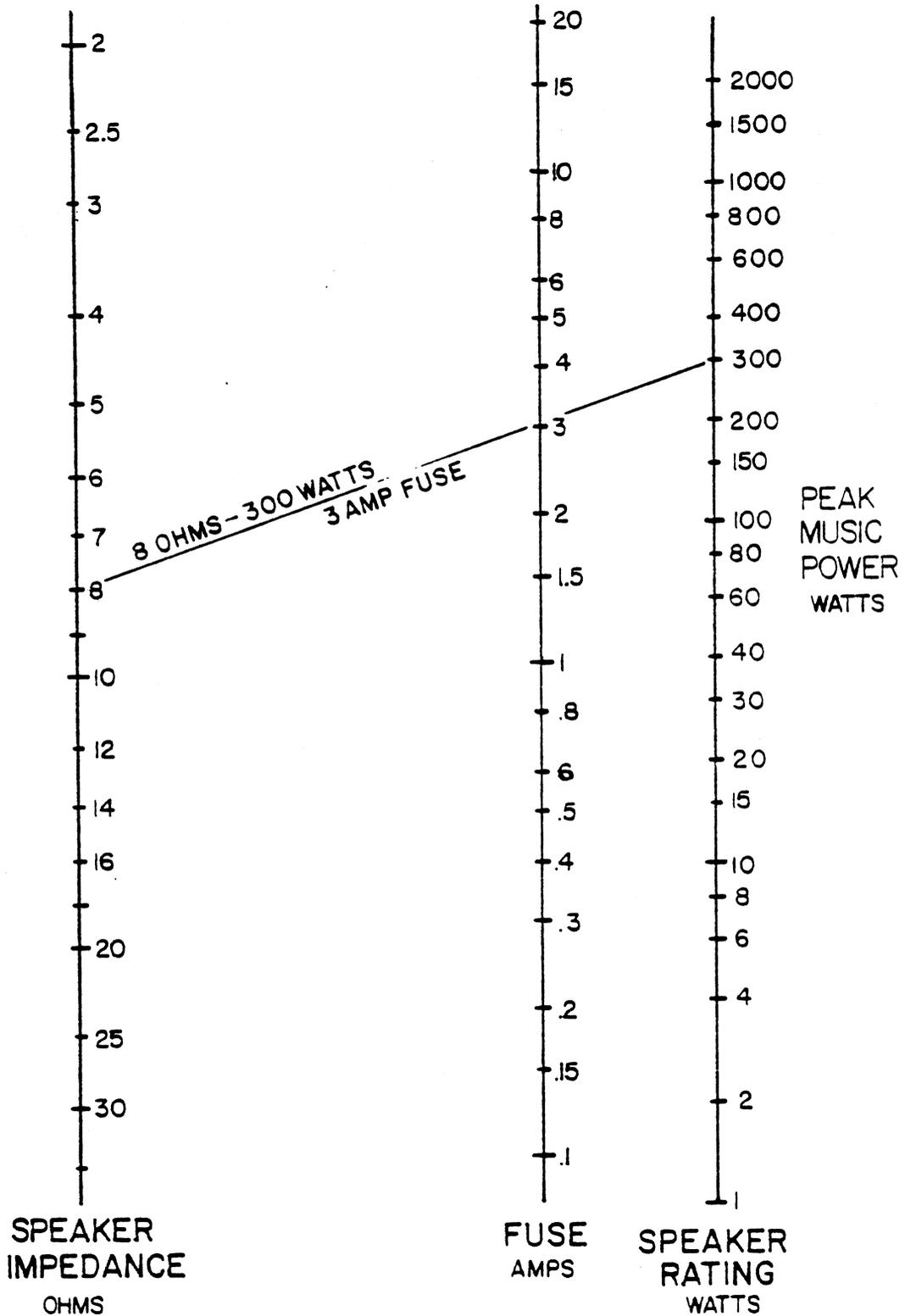
The relationship between wire length and wire gauge, and damping factor can be calculated using the chart (MFRM-03510A) found next to the other chart mentioned above. Proceed as follows:

1. Using a straightedge, line up the gauge of the speaker wire with its' length. Mark off the resulting source resistance where this line crosses the center column.
2. Line up the source resistance, determined in step #1, with the manufacturers' impedance of the speaker system. The damping factor can now be read.

NOTE: The impedance of a cone-type speaker can be approximated by measuring the resistance across the speaker terminals, with the amplifier disconnected. Multiplying this result by 1.33 gives you the approximate minimum impedance. This method should NEVER be used on HORN COMPRESSION DRIVERS!



DAMPING FACTOR & WIRE SIZE NOMOGRAPH (see text)



FUSE SELECTOR NOMOGRAPH FOR LOUDSPEAKER PROTECTION

MFRM-03530A

POWER MAINS CONNECTIONS

The unit should be plugged in only when it has been established that it is wired for the correct power mains voltage and after all other connections have been made.

The mains (AC line) voltage is indicated on the serial number label on the rear of the unit. Products supplied for use in the United States and Canada are factory wired for 120 volts. Only the indicated mains voltage should be used. If the mains voltage must be changed, see POWER MAINS VOLTAGE CONVERSION.

A molded, parallel blade, U-ground plug is supplied. This connector is standard in the United States and Canada. For use elsewhere, the plug must be replaced with the correct connector. The color-code of the cord is as follows:

HI (switched Leg) - Brown (or Black)

LO (neutral Leg) - Blue (or White)

EARTH (Chassis ground) - Green with Yellow tracer (or Green)

POWER MAINS VOLTAGE CONVERSION

CAUTION: These servicing instructions are for use by qualified personnel only. To avoid electric shock, do not perform any servicing other than that contained in the Operating Instructions, unless you are qualified to do so. Refer all servicing to qualified service personnel.

NOTICE: Voltage conversion should be done by a BGW Authorized service station only.

This unit is shipped from the factory wired for correct operation in the country in which it is to be sold.

CHASSIS AND CIRCUIT GROUNDS

Both chassis and circuit grounds are connected together internally. They can be separated by moving the amplifier ground switch to "floating". The circuit grounds of all active units (amplifiers, preamplifiers, mixers, etc.) can be tied to earth ground at a common point. This aids in eliminating ground loops.

OPERATION

PRECAUTIONS

1. Speaker destruction is often due to improper equipment operation. This often occurs when someone without the proper appreciation for the components of a high power, high quality music system, has the opportunity to change records or adjust levels. The best protection here is caution. Keep the equipment out of reach of untrained adults and children. Make sure the speaker is properly protected with fuses (Output Connections Section).
2. Never parallel the two amplifier outputs together.
3. If the amplifier continuously blows fuses, something is wrong - do not increase fuse size.
4. Do not connect an input ground lead to an output ground lead; to do so may cause a ground loop and oscillations.
5. Do not operate the amplifier from power mains which exceed the indicated mains voltage by more than 10%.
6. Never connect the output of the amplifier to another power source such as a battery or power main.
7. Do not expose the amplifier to corrosive chemicals such as lye, soft drinks, salt water, etc. Also, never immerse the amplifier in any liquid.
8. Do not remove the amplifier's cover during operations.
9. The amplifier is not intended for high frequency-high power use and should not be used for high power at above 20 kHz.
10. Neither the amplifier nor any of its leads should be exposed to areas likely to be struck by lightning.

PROCEDURES

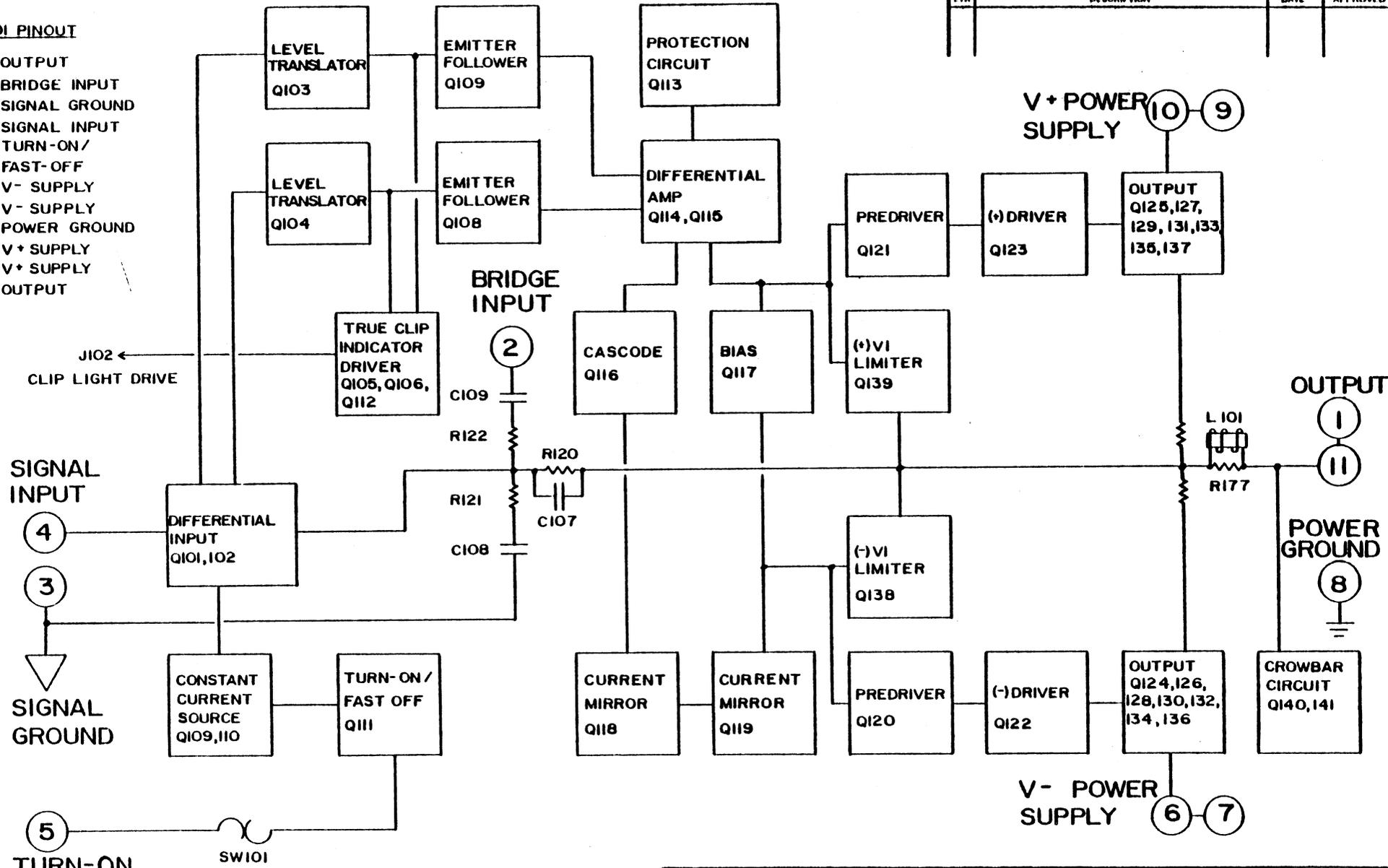
After all connections have been made to the power amplifier, turn the gain controls fully counter-clockwise. Turn on the preamplifier, then turn on the power amplifier. The LED over the circuit breaker or marked IDLE should light. If it does not, check to see that the amplifier is plugged in to a live power outlet.

With the preamplifier gain controls fully off, advance the left and right power amplifier gain controls about half way clock-wise (slit in knob facing upwards). There should be no audible hum; if a hum is heard, check the connections between the power amplifier and preamplifier. Now advance the preamplifier gain controls until the desired maximum volume is achieved. Should the preamplifier gain control be in excess of the $3/4$ setting, decrease it to half volume and increase the gain controls of the power amplifier to the desired level.

Often, turn-on transients originate in the pre-amp or tuner. This is especially true of tube-type units. If this situation arises, turn the amplifier on after the other units have had adequate time to stabilize.

J101 PINOUT

- 1 OUTPUT
- 2 BRIDGE INPUT
- 3 SIGNAL GROUND
- 4 SIGNAL INPUT
- 5 TURN-ON/
FAST-OFF
- 6 V- SUPPLY
- 7 V- SUPPLY
- 8 POWER GROUND
- 9 V+ SUPPLY
- 10 V+ SUPPLY
- 11 OUTPUT



REVISIONS		DATE	APPROVED
LTR	DESCRIPTION		

NOTES: UNLESS OTHERWISE SPECIFIED

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED		MODEL 750		 BGW SYSTEMS 13130 SOUTH YUKON AVE HAWTHORNE, CA 90250 (213) 973-8050	
DIMENSIONING AND TOLERANCING PER USAS1 Y14.5.		DRAWN <i>E. Zamboni</i> 10-20-88		TYPE	
DIMENSIONS ARE IN INCHES AND APPLY AFTER PLATING.		CHECK <i>S.W. Salberg</i> 10-24-88		AMPLIFIER BLOCK DIAGRAM FOR HEATSINK MODULE	
TOLERANCE ON DECIMALS: XX - ± 0.3 XXX - ± 0.10		PROJECT ENGR <i>S.W. Salberg</i> 2-18-89		SIZE	
TOLERANCE ON ANGLES = ± 0° 30'				C	
BREAK SHARP EDGES .010 MAX.				DRAWING NUMBER	
SURFACE ROUGHNESS 125 ✓				9008-0760	
				REV	
				SCALE	
				SHEET 05	

8500T CIRCUIT DESCRIPTION

Refer to Schematic 9008-0760 and Block Diagram 9008-0760.

The Model 8500T is a discrete, full complementary amplifier.

The input signal is supplied from the wiper of the level control through the input network to the differential pair, Q101/102. The input network consists of C102 to minimize RF interference, C101 used to prevent DC inputs, and R102-106 which with D104, D105, and C103, allow the small DC offsets to be corrected. R105 is adjusted at the factory to bring the DC output voltage to less than .010V.

Q101/102 is a high speed, low noise, matched differential pair. Q101/102 drives R117 and R118 through the cascode stage: Q103 and Q104. Cascoding improves the speed and linearity of Q101/102. C104 and R119 set the dominant open loop pole. R113, R114, R117 and R118 set the gain of this stage.

Q110 is the current source for the differential stage. R109 sets the current at 200uA per device. Q109 is a cascode stage to improve power supply rejection. When +5VDC is supplied to D109 from the display board, Q111 turns on and charges C117 through R110. After this short delay, Q110 turns on and the amplifier operates normally. When Q110 is off, the amplifier will not pass signal: the output appears as a resistor to ground. Q107 and 108 are emitter followers which "unload" or isolate the differential stage from the following stage.

Q114 and Q115 are the second voltage gain stage. Q114 drives the inverted signal in this push-pull stage. This drive is reflected in the current mirror: Q118 and Q119. The collectors of Q115 and Q119 are connected through the bias transistor Q117. Q117 is set up as a V_{be} multiplier which allows the bias to be set by selecting the proper value for R136. When the amplifier gets hot, the voltage across Q117 is reduced and thus, the bias current does not increase and thermal runaway is prevented. The bias is set at the factory for Class AB+B operation with 0.400 VDC across R141 and R142. Q116 serves as a voltage translator for Q118 from Q114 in the current mirror, connected as a common-base, cascoded amplifier.

Q120 and Q121 drive the output stage which is in a full-complementary, triple-Darlington configuration. Q121 and Q123 are the NPN drivers and Q125, Q127, Q129, Q131 and Q133 are the NPN output devices. Q120 and Q122 are the PNP drivers and Q124, Q126, Q128, Q130 and Q132 are the PNP output devices. R137, R138, C118 and C119 stabilize the output stage against current driven (Miller) oscillations. L101, R177, R178 and C128 form the output network that provides stable high frequency loading and allow any reactive load to be driven safely. Feedback is provided by returning the output signal to the differential pair through the feedback

network. R120 and R121 set the AC gain at 31.6 (30dB). C120 sets the dominant closed loop pole at 100kHz. C108 ensures that the DC gain is unity. (Dominant low frequency pole set by R121/C108 is 2.2Hz. Second LF pole is set by C101/R102, R103, at 0.07 Hz).

Protection Circuits:

There are four different protection circuits in the Model 8500T.

Q140 and Q141 are combined to provide DC speaker protection. If there is a DC fault in the amplifier, C129 will charge through R179. At 8 VDC, Q140 will conduct and turn on the triac Q141, thus, shorting the output to ground and protecting the speaker. If this circuit is false triggered, it will reset during any pause in the output signal.

Q138 and Q139 are the V-I (Short-Circuit) limiters. R171 senses the current through R145 emitter resistor of Q125 (NPN) output transistor. If the voltage value seen at the base of Q139 is greater than 0.6V, current limit is exceeded, Q139 turns on and diverts the drive current from the output drivers. R175 and D113 "fold back" the bias so that as much as 10 amps per device can flow into speaker loads. C123 delays this circuit to allow transients to pass. Highly inductive 2 ohm loads can be driven without turning on the V-I limiters. Q138 is the V-I limiter for the PNP side in a similar circuit.

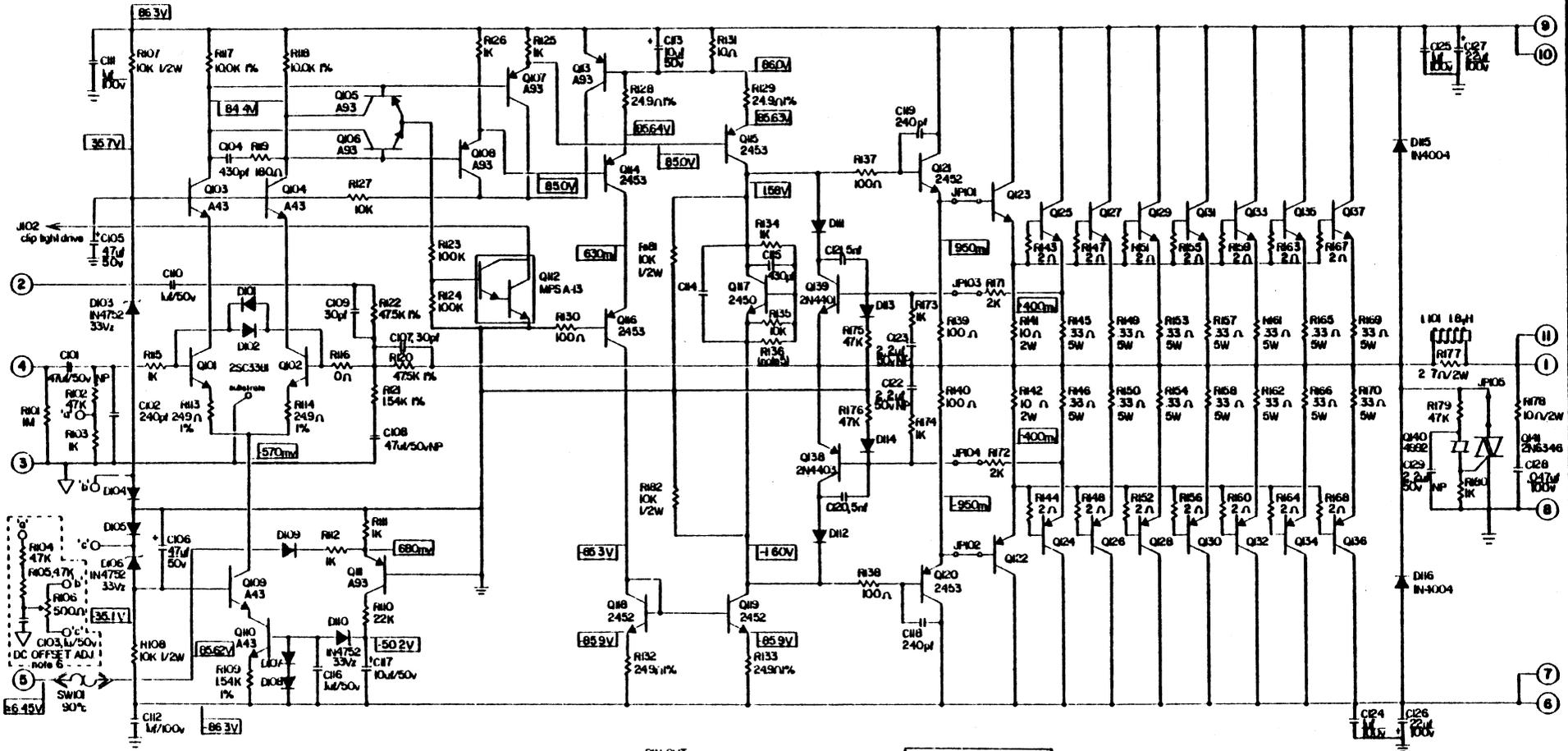
Q113 is an over-current protector for the pre-driver stage. If a DC fault occurs, the extra current will be sensed across R131 and Q113 will turn on, pulling up the collectors of Q107 and Q108 and thus, turning off and protecting all the transistors in the pre-driver stages.

D101 and 102 prevent Q101/102 from latching due to very high input signals.

If load and amplifier current-output are of sufficient magnitude to cause thermal switch SW101 to open, positive bias voltage keeping Q111 in conduction is removed, immediately "ramping-off" the input stage...which, in turn shuts down the amplifier (quietly). Much earlier, prior to this unlikely occurrence, thermal switch SW102 (SW202 for the Right channel) had closed, placing cooling fan in its high speed mode. With the amplifier circuit turned off, the heat sink cools down to where SW101 closes, re-applying turn-on voltage to Q111, restarting the amplifier, and output is restored. (If load conditions are so excessive to have initiated this thermal shut-down, re-occurrence of this shut-down event is quite likely.)

Power transformer T1 also employs an internal thermal switch, which under constant, hi-current demands from the power supply, would shut down both amplifier channels for a period not usually to exceed 13 minutes.

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED



- 8) XXXV DC VOLTAGES REFERENCED TO GROUND
- 7) ALL RESISTORS 1/4 WATT EXCEPT AS NOTED
- 6) DC OFFSET CKT. FACTORY OPTION
- 5) R136 FACTORY SELECTED FOR 400mV ACROSS R141 OR R142
- 4) Q101, Q102 are DUAL MATCHED PAIR X51R
- 3) Q23, 25, 27, 29, 31, 33, 35, 137 are 2SC3858 POWER XSTR
- 2) Q12, 24, 26, 28, 30, 32, 34, 36 are 2SA494 POWER XSTR
- 1) ALL DIODES IN448 EXCEPT AS NOTED.

NOTES: UNLESS OTHERWISE SPECIFIED

PIN OUT

1	OUTPUT
2	SENSE IN+VT
3	SIGNAL GROUND
4	SIGNAL INPUT
5	TURN-OFF/FAST OFF
6	V1 SUPPLY
7	V2 SUPPLY
8	POWER GROUND
9	Q4 SUPPLY
10	V3 SUPPLY
11	OUTPUT

J102 CLIP LIGHT DRIVE

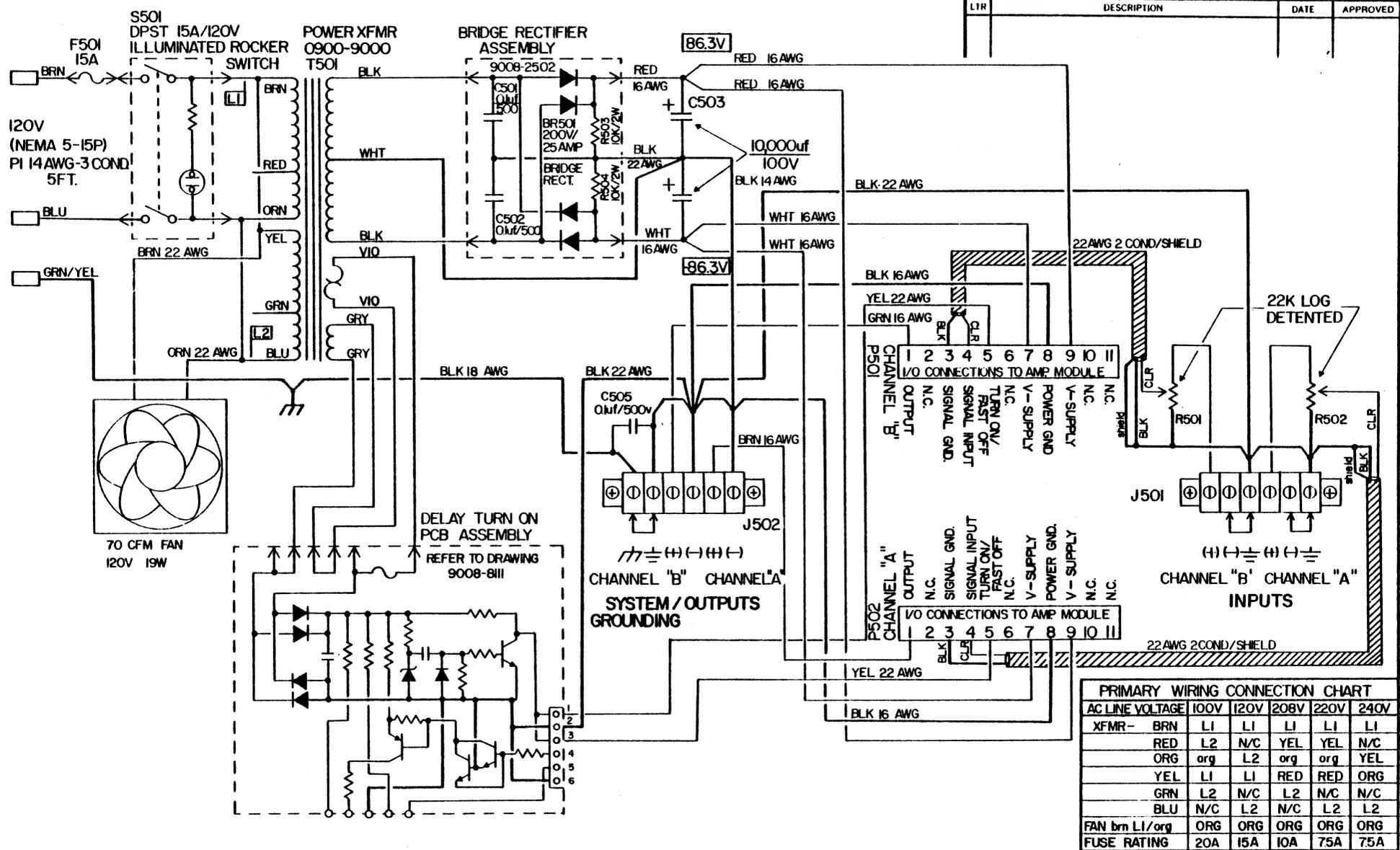
COMPONENT DESIGNATION		
NUMBERS LAST NOTIFIED		
TYPE	LAST USED	DESIGNATION NUMBER
R	R12	R10, R13, R16, R17, R18, R19, R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R30, R31, R32, R33, R34, R35, R36, R37, R38, R39, R40, R41, R42, R43, R44, R45, R46, R47, R48, R49, R50, R51, R52, R53, R54, R55, R56, 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
C	C29	C84
D	D16	D16
Q	Q41	Q35, Q36, Q37, Q38
J	J102	J102

UNLESS OTHERWISE SPECIFIED
DIMENSIONS AND TOLERANCING PER USAS114
DIMENSIONS ARE IN INCHES AND APPLY AFTER PLATING.
TOLERANCE ON DECIMALS:
0.1 - ± 0.01 0.05 - ± 0.005
TOLERANCE ON ANGLES - ± 0.5°
BREAK SHARP EDGES ON MAX SURFACE ROUGHNESS 125

MODEL 750 F/G	
DATE	REV
2/1/80	2-0-80
DESIGNED BY	PROJECT ENG
A. J. Johnson	S. J. Sisk

		BOW SYSTEMS 11015 S. HAYHURST AVE LAWRENCE, CA 94548 (415) 947-7300
TITLE POWER AMPLIFIER SCHEMATIC, MODELS GTA, GTB, 750 F/G		
DATE D	DRAWING NUMBER 9008-0760	REV -
SCALE	SHEET	OF

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



PRIMARY WIRING CONNECTION CHART					
AC LINE VOLTAGE	100V	120V	208V	220V	240V
XFMR -	BRN L1	LI	LI	LI	LI
	RED L2	N/C	YEL	YEL	N/C
	ORG org	L2	org	org	YEL
	YEL L1	LI	RED	RED	ORG
	GRN L2	N/C	L2	N/C	N/C
	BLU N/C	L2	N/C	L2	L2
FAN brn LI/org	ORG	ORG	ORG	ORG	ORG
FUSE RATING	20A	I5A	10A	75A	75A

3. DC VOLTAGES MEASURED W/ 3 1/2 DIGIT DMM, NO SIGNAL, 120VAC
 2. P501, P502 ARE OCTAL PLUGS, MATING WITH J101 ON AMPLIFIER ASSEMBLY 1001-8762
 1. J501, J502 ARE REAR PANEL-MOUNTED BARRIER STRIP TERMINAL

NOTES: UNLESS OTHERWISE SPECIFIED.

UNLESS OTHERWISE SPECIFIED
 DIMENSIONING AND TOLERANCING PER USAS1 Y14.5.
 DIMENSIONS ARE IN INCHES AND APPLY AFTER PLATING.
 TOLERANCE ON DECIMALS:
 .XX = ± .03, .XXX = ± .010.
 TOLERANCE ON ANGLES = ± 0° 30'
 BREAK SHARP EDGES .010 MAX.
 SURFACE ROUGHNESS 125 ✓

DRAWN <i>P. O. Johnson</i>	11-22-88
CHECK <i>S. W. Selberg</i>	11-22-88
PROJECT ENG <i>P. O. Johnson</i>	11-24-88

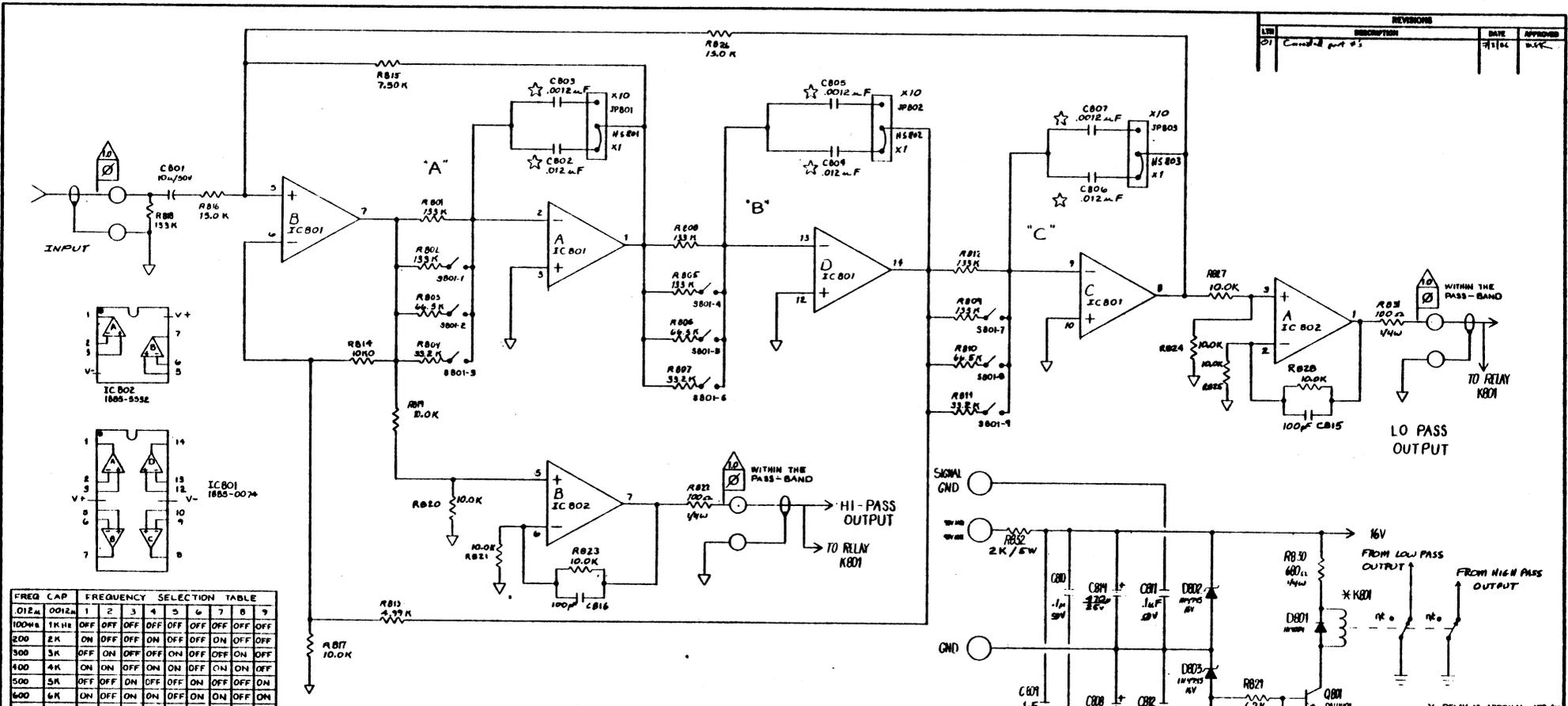
BGW SYSTEMS
 BGW SYSTEMS
 13130 SOUTH WUKON AVE
 HAWTHORNE, CA 90250
 (213) 973-8080

TITLE
**CHASSIS WIRING SCHEMATIC
 MODEL 8500T POWER AMP**

SIZE C	DRAWING NUMBER 9512-8500	REV —
SCALE	SHEET 2 OF 2	

DO NOT SCALE DRAWING

REV	DESCRIPTION	DATE	APPROVED
01	Cancelled part of 5	7/1/64	WJK

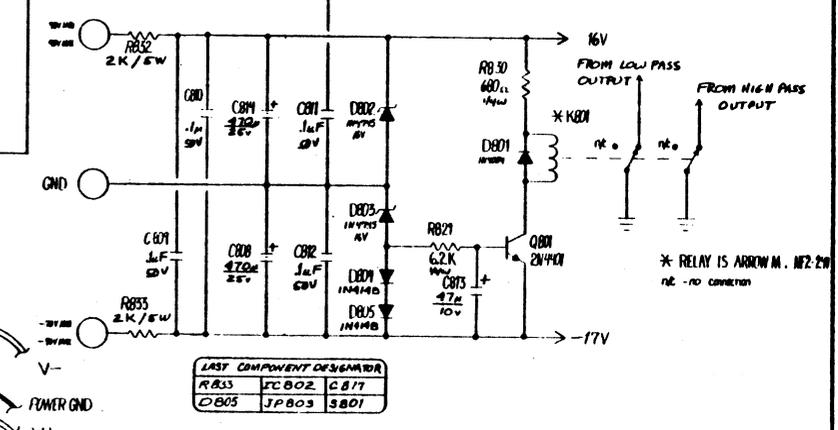
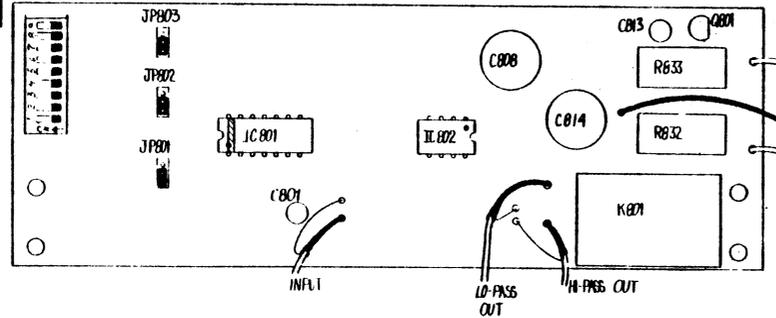


FREQ CAP	FREQUENCY SELECTION TABLE									
012M	0012M	1	2	3	4	5	6	7	8	9
100M	1K	OFF								
200	2K	ON	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF
300	3K	OFF	ON	OFF	OFF	ON	OFF	OFF	ON	OFF
400	4K	ON	ON	OFF	ON	ON	OFF	ON	ON	OFF
500	5K	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF	ON
600	6K	ON	OFF	ON	ON	OFF	ON	ON	OFF	ON
700	7K	OFF	ON	ON	OFF	ON	ON	OFF	ON	ON
800	8K	ON								

WARNING: TURN AMPLIFIER OFF BEFORE CHANGING FREQUENCY SETTINGS. OSCILLATIONS WILL OCCUR WHEN SWITCHES ARE IMPROPERLY SET. ALL THREE JUMPERS MUST BE IN THE SAME POSITION. X1 OR X10

- 5-Δ = AC VOLTS FROM GROUND USING ANACDVM IN THE PASS BAND.
- 4-□ = DC VOLTS FROM GROUND NO SIGNAL APPLIED USING A DVM
- 3- SEE TEXT FOR FREQUENCY SELECTION AND WARNINGS.
- 2-★ SELECTED 2% PARTS.
- 1- ALL RESISTORS 1/4W 1% UNLESS NOTED.

NOTES: UNLESS OTHERWISE SPECIFIED

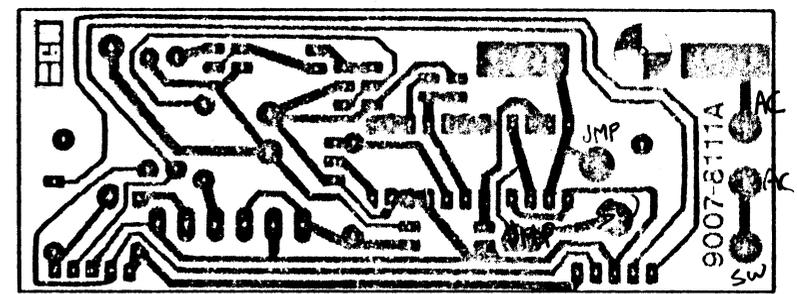
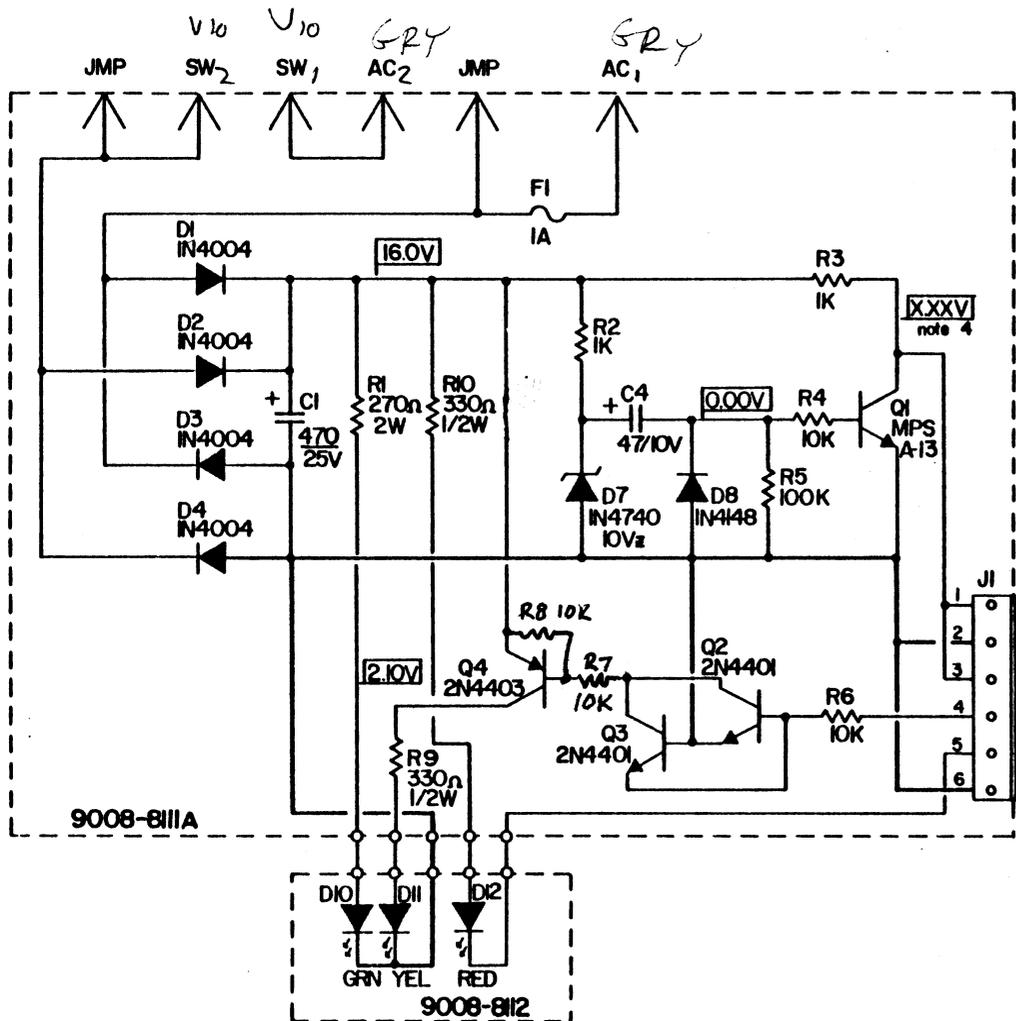


LAST COMPONENT OFS/AMPER		
R833	IC 802	C 817
C805	JP 803	S 801

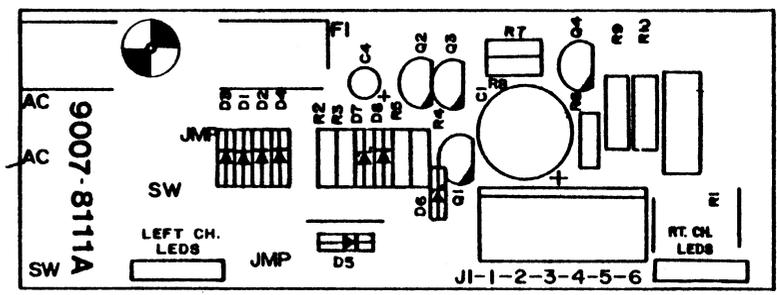
UNLESS OTHERWISE SPECIFIED		DRAWN		TITLE	
DIMENSIONS AND TOLERANCES PER UNAS1 Y14.1		GRIFFIN, C		ELECTRONIC CROSSOVER MODULE	
DIMENSIONS ARE IN INCHES AND APPLY AFTER PLATING. TOLERANCE ON DECIMALS: .XX = .0030 ± .0004		7/24/64		9008-8003	
TOLERANCE ON ANGLES = ± 0.5°		7/20/64		MFRM-13671	
GREAT CORNER EDGES AND SURFACE FINISHES SEE		7/20/64		REV ~	
SURFACE FINISHES SEE		7/20/64		SCALE N.T.S.	
DO NOT SCALE DRAWING		XA		SHEET 1 OF 1	

HOW SYSTEMS
15130 SOUTH YUKON AVE
HAWTHORNE, CA 90250
(213) 873-0000

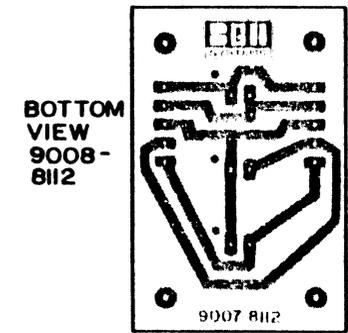
REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



BOTTOM VIEW 9008-8111A



TOP VIEW 9008-8111A



BOTTOM VIEW 9008-8112

- 5. DOT DENOTES CATHODE ON 9008-8112.
- 4. FOR MODELS GTA/GTB, VOLTAGE IS 10.0V NOMINAL.
- 4. FOR MODEL 8500T, VOLTAGE IS 6.40V NOMINAL.
- 3. MODEL 8500T DOES NOT USE THE 9008-8112 (led) PCB.
- 2. ALL CAPACITORS IN μ F/WORKING VOLTAGE.
- 1. ALL RESISTORS ARE 1/4W UNLESS OTHERWISE NOTED.

NOTES: UNLESS OTHERWISE SPECIFIED.

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED				BGW SYSTEMS 13130 SOUTH YUKON AVE. HAWTHORNE, CA 90250 (213) 973-8090	
DIMENSIONING AND TOLERANCING PER USASI Y14.5. DIMENSIONS ARE IN INCHES AND APPLY AFTER PLATING. TOLERANCE ON DECIMALS: XX = $\pm .03$ XXX = $\pm .010$ TOLERANCE ON ANGLES = $\pm 0^\circ 30'$ BREAK SHARP EDGES .010 MAX. SURFACE ROUGHNESS 125 ✓				DRAWN <i>R.D. Johnson</i> CHECK <i>E. Mansfield</i> PROJECT ENGR	11-10-80 12-1-80
SIZE	C	DRAWING NUMBER		REV	
SCALE		9008-8111		A	
SHEET		OF			

8500T CHASSIS ASSEMBLY 9512-8500

Qty. or
Schematic
Ref. No.

PART DESCRIPTION

BGW P/N

CASE:

1	70 CFM 120V Fan	8800-3000
1	8500T Front Panel	9000-8500
1	8500T Chassis	9002-8500
1	8000 Top Cover	9005-8000
1	Fan Grill	9999-6039

POWER:

C13	10K UF 100V Computer Grade Electronic Cap.	0566-0010
C14	10K UF 100V Computer Grade Electronic Cap.	0566-0010
T1	Power Transformer, Type EI	0900-9000
1	8500T Wiring Harness	1100-8500
2	12-10 AWG Closed End Wire Splice	1231-1210
2	22-18 AWG Closed-End Splice	1231-2218
1	Capacitor Buss/Strap	1235-0007
1	Strain Relief Clamp SR6N3-4	1235-6034
1	Capacitor Hold Down Strap	0722-0005
P1	USA Standard Power Cable	8709-0143
SW1	Lighted Power Switch	0620-8200
1	15A Slow Blow Fuse	0600-1502
2	6 Pin Barrier Strip	0720-1697

ELECTRONIC:

2	8500T Heatsink Assembly	1001-8762
1	Bridge Board Assembly	9008-2502
1	Turn-On/Fast-Off Assembly	9008-8111

HARDWARE

<u>Qty. or Schematic Ref. No.</u>	<u>PART DESCRIPTION</u>	<u>BGW P/N</u>
2	Push-On Knob	0700-1114
1	Fish Paper	0721-0003
3	Cable Tie Mount	0722-0005
4	Fan Clip IMC 512-011	1235-0407
1	#10 Crimp Lug, 16-14 AWG	1313-4123
4	Molex Pins, Female	1231-1101
1	12-10 AWG #10 Crimp Lug	1313-3457
7	1/4 in. Blue Insulated Faston	1321-5305
3	1/4 in. Faston Lug	1331-5085
2	1/4 in. Yellow Insulated Faston	1321-5306
4	10-32 X 1/2 Socket Head Machine Screw, Black	2561-5500
8	6-32 X 5/8 Phillips Pan Head Machine Screw, Black	2111-3625
4	8-1/2 Phillips Pan Head Sheet Metal Screw, Cad. Plated	3115-4500
5	10-32 X 3/8 SEMS Phillips Machine Screw, Cad. Plated	2115-5375
9	10-32 X 3/8 Hex Kep Nut	8553-0375
6	6-32 X 1/4 Hex Kep Nut	8533-0250
5	#10 Split Lock Washer	8154-0000
0.750 ft	16 AWG Blue UL1429 Wire	8216-1160
2.150 ft	16 AWG Brown UL1429 Wire	8216-1110
1.440 ft	22 AWG Blue UL1429 Wire	8222-1160
1.440 ft	22 AWG Brown UL1429 Wire	8222-1110
0.100 ft	1/8 in. Heat Shrink Tubing	8901-0125
4	1/4-20 Locking Hex Nut	8565-0437
4	3/8-32 Hex Nut	8574-0500
4	#6 Spacer Smith 8501	8605-0937
2	Spacer	8605-0250
2	#6 Nylon Spacer, .312"	8606-0250
2	1/8 in Pop Rivet	8699-0001
1	L.A. Building & Safety Label	9700-1753
1	Label 120V/10A	9990-0021
1	Yellow 120V Tag	9991-0120
1	Fuse Label 1.5A	9992-1500
6	5 1/2" Tie Wrap	9999-0550
1	Serial Number Plate	9999-0999
4	Rubber Feet #2085 S	9999-2085
1	Panel Mount Fuse Holder	9999-4500

8500T WIRING HARNESS 1100-8500

QTY. OR
SCHEMATIC
REF. NO.

PART DESCRIPTION

BGW P/N

-HARDWARE-

2	11 PIN PLUG	1350-0011
10	1/4" FEMALE FASTON LUG, BLUE	1321-5305
2	1/4" FEMALE FASTON LUG, YELLOW	1321-5306
3	CRIMP ON RING LUG	1313-3457
1	6 PIN HEADER	1231-0006
3	SINGLE CONTACT INSERT	1349-0006
2	22K POTENTIOMETER	7006-0020
.3 FT	3/8" HEATSHRINK TUBING	8901-0375
.2 FT	CLEAR INSULATION TUBING	8902-0018
1	.1 UF/500V DISC CAPACITOR	0199-1000
35	TIE WRAPS	9999-0550

-WIRING-

14 AWG 19 STR BLACK WIRE	8214-1100
16 AWG 19 STR BLACK WIRE	8216-1100
22 AWG 19 STR BLACK WIRE	8222-1100
16 AWG 19 STR RED WIRE	8216-1120
22 AWG 19 STR RED WIRE	8222-1120
16 AWG 19 STR WHITE WIRE	8216-1190
16 AWG 19 STR BROWN WIRE	8216-1110
16 AWG 19 STR GREEN WIRE	8216-1150
22 AWG 19 STR YELLOW WIRE	8222-1140
2- CONDUCTOR 22 AWG SHIELDED CABLE	8222-1291

8500T TRANSFORMER OPTION

-HARDWARE-

3	1/4" FEMALE FASTON LUGS, BLUE	1321-5305
2	1/4" MALE FASTON LUGS, PINK	1322-5078
1	8 PIN OCTAL SOCKET, SOLDER LUG	1203-0008
1	.1 UF/50V DISC CAPACITOR	0129-0100
4	MALE/FEMALE STANDOFF	0722-4501
2	6-32 1/4" HEX KEP NUT	8533-0250
2	INPUT TRANSFORMERS	0900-9250

-WIRING-

22 AWG 19 STR BLACK WIRE	8222-1100
22 AWG 19 STR RED WIRE	8222-1120
22 AWG 19 STR WHITE WIRE	8222-1190

9008-8762 HEATSINK ASSEMBLY

QTY. OR
SCHEMATIC
REF. NO.

PART DESCRIPTION

BGW P/N

-RESISTORS-

R101	1M 1/4 W 5% Carbon Film	5065-1006
R102	47K 1/4 W 5% Carbon Film	5065-4703
R103	1K 1/4 W 5% Carbon Film	5065-1003
R104	-Not Used-	
R105	-Not Used-	
R106	-Not Used-	
R107	10K 1/2 W 5% Carbon Film	5005-1004
R108	10K 1/2W 5% Carbon Film	5005-1004
R109	1.54K 1/4W 1% Metal Film	5011-1541
R110	22K 1/4 W 5% Carbon Film	5065-2203
R111	1K 1/4 W 5% Carbon Film	5065-1003
R112	1K 1/4W 5% Carbon Film	5065-1003
R113	24.9 ohm 1/4W 1% Metal Film	5011-24R9
R114	24.9 ohm 1/4W 1% Metal Film	5011-24R9
R115	1K 1/4W 5% Carbon Film	5065-1003
R116	Jumper	5000-0400
R117	10K 1/4W 1% Metal Film	5011-1002
R118	10K 1/4W 1% Metal Film	5011-1002
R119	180 ohm 1/4W 5% Carbon Film	5065-1801
R120	47.5K 1/4 W 1% Metal Film	5011-4752
R121	1.54K 1/4W 1% Metal Film	5011-1541
R122	47.5K 1/4W 1% Metal Film	5011-4752
R123	100K 1/4W 5% Carbon Film	5065-1005
R124	100K 1/4 W 5% Carbon Film	5065-1005
R125	1K 1/4W 5% Carbon Film	5065-1003
R126	10K 1/4W 5% Carbon Film	5065-1004
R127	1K 1/4W 5% Carbon Film	5065-1003
R128	24.9 ohm 1/4W 1% Metal Film	5011-24R9
R129	24.9 ohm 1/4 W 1% Metal Film	5011-24R9
R130	100 ohm 1/4 W 5% Carbon Film	5065-1002
R131	10 ohm 1/4W 5% Carbon Film	5065-1001
R132	24.9 ohm 1/4 W 1% Metal Film	5011-24R9
R333	24.9 ohm 1/4 W 1% Metal Film	5011-24R9
R134	1K 1/4 W 5% Carbon Film	5065-1003
R135	10K 1/4W 5% Carbon Film	5065-1004
R136	Factory Select Value	5011-XXXX
R137	100 ohm 1/4W 5% Carbon Film	5065-1002
R138	100 ohm 1/4W 5% Carbon Film	5065-1002
R139	100 ohm 1/4W 5% Carbon Film	5065-1002
R140	100 ohm 1/4W 5% Carbon Film	5065-1002
R141	10 ohm 2W Metal Oxide	4025-1001
R142	10 ohm 2W Metal Oxide	4025-1001
R143	2 ohm 1/4W 5% Carbon Film	5065-2R00
R144	2 ohm 1/4W 5% Carbon Film	5065-2R00

R145	.33 ohm 5W Wirewound	4050-0330
R146	.33 ohm 5W Wirewound	4050-0330
R147	2 ohm 1/4 W 5% Carbon Film	5065-2R00
R148	2 ohm 1/4 W 5% Carbon Film	5065-2R00
R149	.33 ohm 5W Wirewound	4050-0330
R150	.33 ohm 5W Wirewound	4050-0330
R151	2 ohm 1/4 W 5% Carbon Film	5065-2R00
R152	2 ohm 1/4 W 5% Carbon Film	5065-2R00
R153	.33 ohm 5W Wirewound	4050-0330
R154	.33 ohm 5W Wirewound	4050-0330
R155	2 ohm 1/4 W 5% Carbon Film	5065-2R00
R156	2 ohm 1/4 W 5% Carbon Film	5065-2R00
R157	.33 ohm 5W Wirewound	4050-0330
R158	.33 ohm 5W Wirewound	4050-0330
R159	2 ohm 1/4 W 5% Carbon Film	5065-2R00
R160	2 ohm 1/4 W 5% Carbon Film	5065-2R00
R161	.33 ohm 5W Wirewound	4050-0330
R162	.33 ohm 5W Wirewound	4050-0330
R163	NOT USED	
R164	NOT USED	
R165	NOT USED	
R166	NOT USED	
R167	NOT USED	
R168	NOT USED	
R169	NOT USED	
R170	NOT USED	
R171	2K 1/4 W 5% Carbon Film	5065-2003
R172	2K 1/4 W 5% Carbon Film	5065-2003
R173	1K 1/4 W 5% Carbon Film	5065-1003
R174	1K 1/4 W 5% Carbon Film	5065-1003
R175	47K 1/4 W 5% Carbon Film	5065-4703
R176	47K 1/4 W 5% Carbon Film	5065-4703
R177	2.7 ohm 2W Wirewound	4025-2070
R178	10 ohm 2 W Metal Oxide	4025-1001
R179	47K 1/4 W 5% Carbon Film	5065-4703
R180	1K 1/4 W 5% Carbon Film	5065-1003
R181	10K 1/2W 5% Carbon Film	5005-1004
R182	10K 1/2W 5% Carbon Film	5005-1004

-CAPACITORS-

C101	47 UF/50V Non-Polar Electrolytic, Radial	0421-0047
C102	240 PF/500V MICA	0090-0240
C103	-Not Used-	
C104	430 PF/500V MICA	0060-0430
C105	47 UF/50V Electrolytic, Radial	0476-0047
C106	47 UF/50V Electrolytic, Radial	0476-0047
C107	30 PF/100V MICA	0060-0030
C108	47 UF/50V Non-Polar Electrolytic, Radial	0421-0047
C109	30 PF/100V MICA	0060-0030
C110	1 UF/50V Non-Polar Electrolytic, Radial	0564-0001
C111	.1 UF/100V Mylar	0368-1000
C112	.1 UF/100V Mylar	0368-1000
C113	10 UF/50V Electrolytic, Radial	0476-0047
C114	-Not Used-	
C115	430 PF/500V MICA	0060-0430
C116	.1 UF/50V Disc	0129-0100
C117	10 UF/50V Electrolytic, Radial	0476-0047
C118	240 PF/500V MICA	0090-0240
C119	240 PF/500V MICA	0090-0240
C120	5 nF/1000V Disc	0100-0005
C121	5 nF/1000V Disc	0100-0005
C122	2.2 UF/50V Non-Polar Electrolytic, Axial	0564-0000
C123	2.2 UF/50V Non-Polar Electrolytic, Axial	0564-0000
C124	.1 UF/100V Mylar	0368-1000
C125	.1 UF/100V Mylar	0368-1000
C126	22 UF/100V Electrolytic, Axial	0486-0020
C127	22 UF/100V Electrolytic, Axial	0486-0020
C128	.047 UF/100V Mylar	0368-0470
C129	2.2 UF/50V Non-Polar Electrolytic, Axial	0564-0000

-SEMICONDUCTORS-

Q101,Q102	NPN Si Small Sig., Matched Pair 2SC3381	1854-3381
Q103	NPN Si Small Sig., TO-92 MPS A43	1854-0043
Q104	NPN Si Small Sig., TO-92 MPS A43	1854-0043
Q105	PNP Si Small Sig., TO-92 MPS A93	1853-0093
Q106	PNP Si Small Sig., TO-92 MPS A93	1853-0093
Q107	PNP Si Small Sig., TO-92 MPS A93	1853-0093
Q108	PNP Si Small Sig., TO-92 MPS A93	1853-0093
Q109	NPN Si Small Sig., TO-92 MPS A43	1854-0043
Q110	NPN Si Small Sig., TO-92 MPS A43	1854-0043
Q111	PNP Si Small Sig., TO-92 MPS A93	1853-0093
Q112	NPN Si Small Sig., TO-92 MPS A13	1854-0013
Q113	PNP Si Small Sig., TO-92 MPS A93	1853-0093
Q114	PNP Med.Pwr., Plastic TO-126 SJE2453	1853-2453
Q115	PNP Med.Pwr., Plastic TO-126 SJE2453	1853-2453
Q116	PNP Med.Pwr., Plastic TO-126 SJE2453	1853-2453
Q117	NPN Med.Pwr., Plastic TO-126 SJE2450	1854-2450
Q118	NPN Med.Pwr., Plastic TO-126 SJE2452	1854-2452
Q119	NPN Med.Pwr., Plastic TO-126 SJE2452	1854-2452
Q120	PNP Med.Pwr., Plastic TO-126 SJE2453	1853-2453
Q121	NPN Med.Pwr., Plastic TO-126 SJE2452	1854-2452
Q122	PNP Si Power MT-200 2SA1494	1853-1494
Q123	NPN Si Power MT-200 2SC3858	1854-3858
Q124	PNP Si Power MT-200 2SA1494	1853-1494
Q125	NPN Si Power MT-200 2SC3858	1854-3858
Q126	PNP Si Power MT-200 2SA1494	1853-1494
Q127	NPN Si Power MT-200 2SC3858	1854-3858
Q128	PNP Si Power MT-200 2SA1494	1853-1494
Q129	NPN Si Power MT-200 2SC3858	1854-3858
Q130	PNP Si Power MT-200 2SA1494	1853-1494
Q131	NPN Si Power MT-200 2SC3858	1854-3858
Q132	PNP Si Power MT-200 2SA1494	1853-1494
Q133	NPN Si Power MT-200 2SC3858	1854-3858
Q134	-Not Used-	
Q135	-Not Used-	
Q136	-Not Used-	
Q137	-Not Used-	
Q138	PNP Si Small Sig. TO-92 2N4403	1853-4403
Q139	NPN Si Small Sig. TO-92 2N4401	1854-4401
Q140	Si Bi-Directional Switch MBS 4992	1884-4992
Q141	Triac 2N6346	1884-6346
D101	Si Diode 1N4148	1900-4148
D102	Si Diode 1N4148	1900-4148
D103	33V Zener Diode 1N4752	1900-4752
D104	Si Diode 1N4148	1900-4148
D105	Si Diode 1N4148	1900-4148
D106	33V Zener Diode 1N4752	1900-4752
D107	Si Diode 1N4148	1900-4148
D108	Si Diode 1N4148	1900-4148
D109	Si Diode 1N4148	1900-4148
D110	33V Zener Diode 1N4752	1900-4752

-SEMICONDUCTORS-

D111	Si Diode 1N4148	1900-4148
D112	Si Diode 1N4148	1900-4148
D113	Si Diode 1N4148	1900-4148
D114	Si Diode 1N4148	1900-4148
D115	Rect. Diode 1N4004	1900-4004
D116	Rect. Diode 1N4004	1900-4004

-INDUCTOR-

L101	1.8 UH	9999-2405
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-MISCELLANEOUS-

J101	11 - P/N Octal Socket	1202-0011
J102	Molex P/N R93-12A	1349-9312
SW101	Thermal Switch, 90 C O.O.R.	0630-0001
SW102	Thermal Switch, 55 C C.O.R.	0630-3441
JP101	Jumper, 1.3" Long	
JP102	Jumper, 1.3" Long	
JP103	Jumper, 1.3" Long	
JP104	Jumper, 1.3" Long	
1	P.C. Board	9007-0760
1	Heat Sink/Transistor Insulator	0723-0760

-HARDWARE-

24	4-40 X 1/2 PHMS	2155-2500
9	4-40 X 1/4 PHMS	2115-2250
8	#4 Compression Washer, Case 77	8130-0000
1	T0220 Insulated Bushing	8130-0001
4	6-32 X 1/4 PHMS, Blk.	2111-3250
4	#6 ITL Washer	8132-0000
1	Heatsink	1000-0760

- BRIDGE BOARD ASSEMBLY - 9008-2502

<u>Qty. or Schematic Ref. No.</u>	<u>PART DESCRIPTION</u>	<u>BGW P/N</u>
C11	.1 UF 500 V Ceramic Disc Capacitor	0199-0100
C12	.1 UF 500 V Ceramic Disc Capacitor	0199-0100
1	25A/400V Bridge Rectifier	1886-2502
R11	10K 2W 5% Carbon Film Resistor	6025-1004
R12	10K 2W 5% Carbon Film Resistor	6025-1004
0.5 ft	22 AWG Black UL1429 Wire	8222-1100
1	Bridge Rectifier PC Board	9007-2502

PARTS LIST- TURN-ON/FAST-OFF 9008-8111

<u>Qty. or Schematic Ref. No.</u>	<u>PART DESCRIPTION</u>	<u>BGW P/N</u>
RESISTORS		
R1	200 Ohm 1/2W 5% Carbon Film	5005-2002
R2	1K 1/4W 5% Carbon Film	5065-1003
R3	1K 1/4W 5% Carbon Film	5065-1003
R4	10K 1/4W 5% Carbon Film	5065-1004
R5	100K 1/4W 5% Carbon Film	5065-1005
R6	10k 1/4W 5% Carbon Film	5065-1004
R7	10K 1/4W 5% Carbon Film	5065-1004
R8	10K 1/4W 5% Carbon Film	5065-1004
R9	330 Ohm 1/2W 5% Carbon Film	5005-3301
R10	330 Ohm 1/2W 5% Carbon Film	5005-3301
CAPACITORS		
C1	470 UF 25V Polarized Electrolytic	0416-0470
C2	47 UF 10V Radial Polarized Electrolytic	0456-0047
TRANSISTORS		
Q1	2N4401 NPN Small Signal Si	1854-4401
Q2	2N4401 NPN Small Signal Si	1854-4401
Q3	2N4401 NPN Small Signal Si	1854-4401
Q4	2N4403 PNP Small Signal Si	1853-4403
DIODES		
D1	1N4004 1A 400V Rectifier Diode	1900-4004
D2	1N4004 1A 400V Rectifier Diode	1900-4004
D3	1N4004 1A 400V Rectifier Diode	1900-4004
D4	1N4004 1A 400V Rectifier Diode	1900-4004
D5	1N4148/1N914 Si Diode	1900-4148
D6	1N751A 5.1V 1/2W Zener Diode	1900-0751
D7	1N4740A 10V Zener Diode	1900-4740
D8	1N4148/1N914 Si Diode	1900-4148
MISCELLANEOUS		
6	Molex Pins R93-12A	1349-9312
J1	6 Pin Header	1350-0006
2	.400 in. Jumper	5000-0400
1	PC Board	9007-8111
2	Fuse Clips	0601-0003
1	Fuse, 1A	0600-1000

PARTS LIST CROSSOVER CARD 9008-8003

<u>Schematic Description No.</u>	<u>Part Description</u>	<u>BGW Part Number</u>
- CAPACITORS -		
C801	1 UF/50 V Electro. Rad.	0564-0001
C802	.012 UF/100 V Mylar, 2%	0369-0120
C803	1200 PF/100 V Mica, 2%	0362-0020
C804	.012 UF/100 V Mylar, 2%	0369-0120
C805	1200 PF/100V Mica, 2%	0362-0012
C806	.012 UF/100 V Mylar, 2%	0369-0120
C807	1200 PF/100 V Mica, 2%	0362-0012
C808	470 UF/25 V Electro., Rad.	0416-0470
C809	.1 UF/50 V Disc	0129-0100
C810	.1 UF/50 V Disc	0129-0100
C811	.1 UF/50 V Disc	0129-0100
C812	.1 UF/50 V Disc	0129-0100
C813	47 UF/35V Electro., Rad.	0450-4700
C814	470 UF/25 V Electro., Rad.	0416-0470
C815	100 PF/500 V Mica	0090-0100
C816	100 PF/500 V Mica	0090-0100

- RESISTORS -		
R801	133 K 1% Metal Film	5011-1333
R802	133 K 1% Metal Film	5011-1333
R803	66.5 K 1% Metal Film	5011-6652
R804	33.2 K 1% Metal Film	5011-3322
R805	133 K 1% Metal Film	5011-1333
R806	66.5 K 1% Metal Film	5011-6652
R807	33.2 K 1% Metal Film	5011-3322
R808	133 K 1% Metal Film	5011-1333
R809	133 K 1% Metal Film	5011-1333
R810	66.5 K 1% Metal Film	5011-6652
R811	33.2 K 1% Metal Film	5011-3322
R812	133 K 1% Metal Film	5011-1333
R813	4.99 K 1% Metal Film	5011-4991
R814	10.0 K 1% Metal Film	5011-1002
R815	7.50 K 1% Metal Film	5011-7501
R816	15.0 K 1% Metal Film	5011-1502
R817	10.0 K 1% Metal Film	5011-1002
R818	133 K 1% Metal Film	5011-1333
R819	10.0 K 1% Metal Film	5011-1002
R820	10.0 K 1% Metal Film	5011-1002
R821	10.0 K 1% Metal Film	5011-1002
R822	10.0 OHM 1/4 W 5% Carbon Film	5065-1002
R823	10.0 K 1% Metal Film	5011-1002
R824	10.0 K 1% Metal Film	5011-1002
R825	10.0 K 1% Metal Film	5011-1002

<u>Schematic Description No.</u>	<u>Part Description</u>	<u>BGW Part Number</u>
R826	15.0 K 1% Metal Film	5011-1502
R827	10.0 K 1% Metal Film	5011-1002
R828	10.0 K 1% Metal Film	5011-1002
R829	6.2K 1/4 W 5% Carbon Film	5065-6202
R830	680 Ohm 1/4 W 5% Carbon Film	5065-6801
R831	100 Ohm 1/4 W 5% Carbon Film	5065-1002
R832	2 K 5W 5% Wirewound	4050-2002
R833	2 K 5W 5% Wirewound	4050-2002

- SEMICONDUCTORS -

D801	Rect. Diode 1N4004	1900-4004
D802	16 V Zener Diode 1N4745	1900-4745
D803	16 V Zener Diode 1N4745	1900-4745
D804	Si Diode 1N4148	1900-4148
D805	Si Diode 1N4148	1900-4148
IC801	Quad Bi-Fet Op Amp IC TL074	1885-0074
IC802	Dual Low Noise Op Amp IC NE5532AN	1885-5531

- MISCELLANEOUS -

JP801	Header Plug, 3 Pin	1350-0983
JP802	Header Plug, 3 Pin	1350-0983
JP803	Header Plug, 3 Pin	1350-0983
HS801	Header Socket, 2 Pos.	1200-1532
HS802	Header Socket, 2 Pos.	1200-1532
HS803	Header Socket, 2 Pos	1200-1532
K801	2 PDT 24 V PC Mount Relay	0800-2024
S801	9 Pos. Dip Switch	0620-0010
1	PC Board, Electronic Crossover	9007-8003
4	Component Spacer, nylon 3/8	8605-0002

8500T CROSSOVER CARD OPTION

QTY. OR
SCHEMATIC
REF. NO.

PART DESCRIPTION

BGW P/N

1	CROSSOVER CARD	9008-8003
2	3/8" MALE/FEMALE STANDOFF	0772-0376
2	6-32 1/4" PHILLIPS PAN HEAD SCREW, BLACK	2111-3250
2	#6 SPLIT LOCK WASHER	8134-0000
2	RUBBER GROMMET	0722-2174
2	10-32 1/4" FLAT HEAD ALLEN MACHINE SCREW, BLACK	2331-5500
4	1/4" FEMALE FASTON LUGS, BLUE	1321-5305
2	1/4" MALE FASTON LUGS, PINK	1322-5078
3 FT	2-COND. 22 AWG SHEILDED CABLE	8222-1291
.2 FT	3/8" HEAT SHRINK TUBING	8901-0375