# Owner's Manual

**Model 85**

**Broadcast Power Amplifier**

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- 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.
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 IXMer 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.
DESCRIPTION

The BGW Model 85 is one of the most advanced solid state, full complementary, bridgeable, stereo power amplifiers available.

Features of the Model 85 include Magnetic Circuit Breaker/Power Switch, Input Level Controls, Headphone Jack, and Power Indicator, ¼" input connectors, separate circuit and chassis grounds, and small size.

The Front Panel includes two Input Level Controls, Power Switch, Headphone Jack, and Green LED Power Indicator.

The Rear Panel includes AC Input Cord, two ¼ Phone Jack Input Connectors, Mono/Stereo Switch to convert amplifier to a fully bridged Mono amplifier and a 6 point screw terminal strip for the output of each amplifier and ground circuits.

Both the circuit and chassis grounds are connected to separate barrier strip terminals on the rear of the amplifier. They are connected together by a removable link. By removing the link, 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.

The size of the Model 85 is convenient for a wide variety of applications. However, please note the following precautions:

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

2) Do not stack Model 85 amplifiers. A minimum of 1 3/4 inches above each amplifier should be provided for free air circulation.

The output voltage follower stage of your amplifier uses the most advanced type of transistors available. These large geometry, 150 watt complementary power devices have large safe operating areas and extended power bandwidth. Electrostatic and other highly reactive speaker systems present no difficulties for the Model 85.

All of the semiconductors in the output area are in intimate contact with the heat sink. The bias stage is mounted on the same heat sink as the output transistors and provide temperature compensated bias current to the output stage.

The input stage utilizes NPN matched low noise transistors connected as a differential pair. This stage drives two common emitter voltage stages in Push Pull. The output of the voltage amplifier stage is loaded by a current mirror stage, bias stage and the complementary Darlington output stage.

The Model 85 is wired for use at 120 VAC only
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.
OPTIONS FOR THE MODEL 85

The Model 85 may be ordered with the following options:

- **85-01** Dual Channel Active Balanced Inputs (with 70 dB CMRR)
- **85-06** Dual Channel Transformer Balanced Inputs
- **85-20** XLR Unbalanced Inputs
THE BGW 85
BROADCAST POWER AMPLIFIER

Exacting design standards and unique features establish the BGW amplifier as the industry leader in power amplifier technology. Features such as all steel chassis and covers, metal-case output transistors, totally modular construction and large aluminum heat-sink have set the industry standard in audio power amplifiers.

Delivering at least 35 watts per channel into 8 ohm loads and using the latest in full complementary circuitry techniques, the Model 85 offers reliability and performance unparalleled in the industry.

SPECIFICATIONS: BGW MODEL 85

OUTPUT POWER

35 watts minimum sine wave continuous average power output per channel with both channels driving 8-ohm loads over a power band from 20Hz to 20kHz. The maximum Total Harmonic Distortion at any power level from 250-milliwatts to 25 watts shall be no more than .05% from 20Hz to 5kHz then rising linearly to a maximum of .10% at 20kHz.

45 watts minimum sine wave continuous average power output per channel with both channels driving 4-ohm loads over a power band from 20Hz to 20kHz. The maximum Total Harmonic Distortion at any power level from 250-milliwatts to 45 watts shall be no more than .10% from 20Hz to 5kHz then rising linearly to a maximum of .20% at 20kHz.

90 watts minimum sine wave continuous average power output monoaural driving an 8-ohm load over a power band from 20Hz to 20kHz. The maximum Total Harmonic Distortion at any power level from 250-milliwatts to 90 watts shall be no more than .10% from 20Hz to 5kHz then rising linearly to a maximum of .20% at 20kHz.

*All specifications and features are subject to change without notice.
### SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intermodulation Distortion</td>
<td>Less than 0.04% from 250 milliwatts to rated power.</td>
</tr>
<tr>
<td>Small Signal Frequency Response</td>
<td>+0, -3dB, 1Hz to 100kHz, +0, -0.25dB, 20Hz, to 20kHz.</td>
</tr>
<tr>
<td>Hum and Noise Level</td>
<td>Better than 105dB below rated 8 ohm output (unweighted, 20Hz to 20kHz).</td>
</tr>
<tr>
<td>Input Sensitivity</td>
<td>0.84 volts for rated 8 ohm power output. Voltage gain 26dB (20 times).</td>
</tr>
<tr>
<td>Input Impedance</td>
<td>15k ohms.</td>
</tr>
<tr>
<td>Damping Factor</td>
<td>Greater than 300 to 1 at 8 ohms below 1kHz.</td>
</tr>
<tr>
<td>Output Impedance</td>
<td>Designed for any load impedance equal to or greater than 4 ohms.</td>
</tr>
<tr>
<td>Slew Rate</td>
<td>18 V/u S</td>
</tr>
<tr>
<td>Rise Time</td>
<td>2.4 u S</td>
</tr>
<tr>
<td>Power Requirements</td>
<td>120 volts A.C., 50-60 Hz at 2.5 amps</td>
</tr>
<tr>
<td>Semiconductor Complement</td>
<td>2 Ultra-low noise matched differential pairs, 18 transistors, 12 diodes, 1 LED.</td>
</tr>
<tr>
<td>Dimensions</td>
<td>1 3/4&quot; by 19&quot; standard rack front panel. Depth behind front panel 11 1/2&quot;. (4.45cm x 48.26cm x 29.21cm)</td>
</tr>
<tr>
<td>Weight</td>
<td>14 Lbs. Net, 18 Lbs. shipping. 6.36 Kg. Net, 8.18 Kg. shipping.</td>
</tr>
</tbody>
</table>
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 around 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.

The size of the amplifier is convenient for a wide variety of applications. However, please note the following precautions:

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

2.) Do not stack amplifiers. A minimum of 1 3/4" above each amplifier should be provided for free air circulation.

DO NOT PLUG THE AMPLIFIER IN YET!

All connections should be made before power is applied.
KEEPING IT COOL

A power amplifier draws energy from a primary electrical service, usually a 120 VAC outlet, to drive loudspeaker systems with an audio signal. Typically, only half of the energy can be delivered to the loudspeakers; 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 impeded, 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. Power amplifiers using convection cooling require spacing between amplifiers to permit air flow between them. Power amplifiers using forced-air cooling, on the other hand, can usually be stacked closer to each other and may not need any blank panel spacing between amplifiers.

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 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.

INSTALLING THE UNITS

Use care when mounting equipment in a rack. Place the heaviest units near the bottom of the rack and fill in all unused rack spaces with blank panels. 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 are required. Angle brackets either attached to the bottom, side rails or rear panel are practical approaches.
STEREO INPUT CONNECTIONS

1/4 inch phone jacks are provided on the rear of the amplifier for input connections.

1/4 INCH PHONE JACKS

The 1/4" phone jacks are for unbalanced lines only (single conductor, shielded). Simply connect the shield to the outer sleeve of the plug and the inner conductor to the tip, or buy ready-made cables. See diagram below.

CONNECT SHIELD HERE

CONNECT INNER CONDUCTOR HERE

FOR MONO (BRIDGED) OPERATION

To operate the unit as a mono amplifier, use the left channel input only. DO NOT use the right channel input. Remember to place the stereo/mono switch in the mono position.
STEREO OUTPUT CONNECTIONS

A six (6) station screw barrier block on the rear panel, serves as output connectors, with one plus (+) and one minus (-) for each channel. Left Channel leads go to barrier stations marked LEFT; right channel, to those marked RIGHT.

Output leads are best connected to the amplifier with the use of tinned wires.

Make certain that the speakers are properly phased. Connect the black or minus (-) terminal on the speaker cabinet to the appropriate minus (-) barrier on the amplifier. Connect the red or plus (+) terminal to the plus (+) barrier. Check to see that the stereo-mono switch on the rear of the amplifier is in the stereo position.

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, 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 to select the correct value. (MFRM 03530)

To use the chart, take a straightedge, such as a ruler, and line up the speaker's 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 indicated value.

WIRE SIZE AND DAMPING FACTOR

The high damping factor of BGW amplifiers results in a very clean bass response. Excessively long, and small diameter speaker wires 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.

The relationship between wire length and diameter, and damping factor can be calculated using the chart (MFRM 03510) on the following page. Proceed as follows:

1. Using a straight-edge, 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 manufacturer's impedance* of the speaker system. The damping factor can now be read.

*The impedance of a speaker system 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 impedance.

Note: This method cannot be used with electrostatic speakers.
EXAMPLE: $z = 8\Omega$, PEAK POWER = 150W. ANSWER: FUSE = 2 AMPS

FUSE SELECTOR NOMOGRAPH FOR LOUDSPEAKER PROTECTION

MFRM-03530
EXAMPLE: $R_L = 8\Omega$, $R_S = 0.04\Omega$ OR D.F. = 200
CABLE LENGTH OF 20 FT. ANSWER: #10 WIRE

SOURCE RESISTANCE AND DAMPING FACTOR VS. LENGTH AND SIZE OF OUTPUT LEADS

MFRM-03510
STEREO HEADPHONE CONNECTIONS

The Model 85 provides a stereo headphone jack for your use. It is wired in the standard configuration (left-tip, right-ring, common-sleeve). There is a 270 ohm resistor in series with each channel to protect the headphones. This will provide about 60 mW per channel for 16 ohm headphones.

OTHER METHODS

Some headphone monitoring systems connect the headphones directly to the output terminals of an amplifier. Plugging in headphones in such a system, when using a stereo amplifier, will short circuit the outputs of the two channels together. This often results in blown fuses in amplifiers without current limiting. Also, contacts on jacks and plugs may burn or lose their spring action, causing intermittent connections.

Solution

Resistors of at least 4 ohms, placed in series with each channel of the amplifier and the headphone or headphone system, will prevent a short circuit at the amplifier. The resistors should be able to handle the full rated power of the amplifier for several seconds, although certain applications allow the use of a lower wattage resistor.

If several headphone jacks are connected as shown above, when someone inserts or removes the headphone from any jack, all other headphones will have temporary loss of signal. This can be eliminated by installing resistors at every headphone jack.
The output power of the amplifier can be increased by operating it in the mono (bridged) mode. The correct procedure for mono operation is as follows:

1. Set Stereo/Mono switch to mono (IN) position.
2. Use left channel input only. DO NOT use the right channel input.
3. Connect the output across the two Plus (+) Terminals. DO NOT use the Minus (-) Terminals. DO NOT reference the load (speaker) to ground. Designate the left channel as Plus (+) and the right channel as minus (-). Fuses, when necessary, should be placed in series with one of the Plus (+) Terminals.

NOTE: Minimum load impedance for mono operation should be 8 ohms.

CIRCUIT DESCRIPTION

In the mono mode, the output of the left channel is fed into the inverting input of the right channel. The two channels work opposite each other; when one goes positive, the other goes negative, thus doubling the output voltage swing. The single output is referenced between the two adjacent terminals as shown.
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)
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.
MODEL 85 CIRCUIT DESCRIPTION

POWER SUPPLY

The AC mains are connected directly to the primary of the toroidal power transformer, T501 with the On/Off switch-circuit breaker, S501 in series with the "HOT" lead. The secondaries of T501 are connected to a full wave bridge rectifier D301 through D304 to capacitor input filter C302 and C303, to give the plus and minus power supplies. C301 across the bridge rectifier suppresses any high frequency noise that might be coupled through the transformer or generated by the bridge rectifier.

AMPLIFIER

The input signal from J101 is applied to left input level control, VRI01. The output of VRI01 is applied to the input of Q101 through the coupling network, C101, C102, C103, R101, and R102. This network provides a high input impedance to the amplifier and filters out DC and radio frequency interference.

Q101 is a low noise matched dual transistor connected as a differential input stage. The output of Q101 is Push Pull. This signal drives Q102 and Q104. Q102 and Q104 are common emitter voltage gain stages. The output of Q104 (positive phase) drives the driver stages Q103 and Q107.

Q105 is a Vbe multiplier stage to provide bias voltage for the output stage to keep idle bias current at a constant level as the temperature changes.

Q103 and Q106 form a current mirror stage that acts as load for Q102 and Q104. The current mirror stage uses base emitter diode only of Q103 to match base emitter diode of Q106. As more collector current is pulled from the collector of Q106, (Q104 is turning on harder) an equal and opposite amount of current is removed from Q103. Hence, the current of Q103 plus the current of Q106 is constant level of current.

Q108 and Q107 are connected common collector to provide the current gain necessary to drive the output transistors Q109 and Q110. The output appears across flyback clipping diodes D103, and D104, then passes through compensation networks L101 and C112/R124 to appear at the output terminals.

To maintain overall amplifier stability, linearity, and low distortion, negative feedback is used throughout the amplifier. Voltage divider R116/R117 applies the correct amount of feedback to the non-inverting input of Q101. Except for the input, the amplifier uses direct coupling throughout. The right channel works in the same way; parts are numbered the same, except in the 200 series.

BRIDGED MODE

When the mono/stereo switch S301 is set to mono, it converts the right channel amplifier to a unity gain inverting power amplifier.

S301 Mono/stereo switch grounds the normal input to the right channel and connects the output of the left channel amplifier to drive the right channel summing point R230.
REFER TO MFRM-12575 FOR INPUT TRANSFORMERS WIRING

I REFER TO PARTS LIST MFRM-15790.

NOTES: UNLESS OTHERWISE SPECIFIED.

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED

REFERENCE: OPTION 06/07 TRANSFORMER INPUT MODEL 85

DRAWING NUMBER: C MFRM-15741

SCALE: NTS

SHEET 1 OF 1
3. REFER TO INPUT MODULE SCHEMATIC MFMR-12340.
2. REFER TO AMP SCHEMATIC MFMR-15730.
1. REFER TO PARTS LIST MFMR-15790.

NOTES:
- UNLESS OTHERWISE SPECIFIED.
- DO NOT SCALE DRAWING.
ITEM NUMBER | DESIGNATOR
---|---
NL85 | C105.205
0060-0030 | C110.210
0060-0430 | C104.111.204.211
060-0820 | C103.203
0990-0240 | C108.107.208.209.306
0129-0100 | C301
099-0100 | C304.305.114.214
0456-0047 | C102.107.106.202.206
076-0010 | C207.215
0533-0006 | C101.201
091-0400 | C302.303
060-0680 | S501
0700-1114 | S301
0720-1001 | T8301
021-0001 | BARRIER PAPER INPUT JACKS
0721-1175 | FISH PAPER, MODEL 75
0723-0077 | MICA INSULATOR DISC .5 IN.
023-3448 | SHOULDER INSULATOR LONG SHANK
0723-5603 | MICA INSULATOR T03
0723-5666 | MICA INSULATOR T066
0100-0085 | XFMR PWR MOD85
001-0005 | T501
0901-0007 | TOROID HOLD DOWN DISC 3.5IN
0101-0085 | HEAT SINK ASSY MODEL 85
00-2021 | SOCKET MOLEX 22-01-2021
1205-2005 | STEREO PH JACK INSU 3/8 LONG
1105-0005 | J501
131-1101 | MOLEX CHAIN LUG.02-08-1101
1231-2218 | CLOSED END SPLICE 22-18GA
1335-5004 | STRAIN RELIEF SRSN-4 18-35VT
1121-5305 | 1/4 IN X .032 BLUE INS FASTON
1349-0114 | PIN MOLEX 08-50-0114
1349-9312 | PIN MOLEX R93-12A
153-2453 | Q102.104.202.204
1953-6468 | Q107.207
1853-9216 | SJ9216 PNP T03 POWER TRANS
1154-0074 | Q110.210
154-2450 | Q101.201
154-2452 | Q105.205
154-4252 | Q103.106.203.206
154-3583 | 2N3583 TRANSISTOR NPN 67570 EQ
154-9215 | Q108.208
1900-0501 | SJ9215 NPN T03 POWER TRANS
1900-0404 | Q109.209
1900-4745 | Q301.302.303.304
1900-4752 | D106.107.206.207
1900-5000 | D103.104.203.204
1900-4745 | D105.205
1900-4752 | D305
1900-5000 | LED GREEN RECTANGULAR
2111-5500 | D501
2115-2500 | 10-32X1/2 PH MS PHIL BLK
2115-2500 | 4-40X1/2 PH MS PHIL CAD
2115-3625 | 6-32X5/8 PH MS PHIL CAD
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<th>ITEM NUMBER</th>
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<tr>
<td>2231-5375</td>
<td>10-32X3/8 FH MS ALLEN BLK</td>
<td>R131,231</td>
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<td>3111-3312</td>
<td>6X3/8 PH SMS PHIL BLK</td>
<td>R132,232</td>
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<tr>
<td>4020-2701</td>
<td>WIRE WOUND RES 270R 2W 10% BWH</td>
<td>R127,227,228</td>
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<td>4020-3300</td>
<td>33 OHMS 2WATTS WW RESISTOR</td>
<td>R129,229,230</td>
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<td>4025-1001</td>
<td>WIRE WOUND RES 10R 2W 5% BWH</td>
<td>R116,216</td>
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<td>RES 1R 2W 5% WIRE WOUND BWH</td>
<td>R117,217</td>
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<td>RES 2.49KR RN60D 1%</td>
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<td>RES 47.5KR RN60D 1%</td>
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<td>ZERO OHM RESISTOR</td>
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<td>RES 100R 1/2W 5%</td>
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<td>RES 10 KR 1/2W 5%</td>
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<td>RES 1.8KR 1/2W 5%</td>
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<td>49.9R RN55 1%</td>
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<td>RES,100R.1/4W,5%</td>
<td>R111,115,211,215</td>
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<td>RES 1KR 1/4W 5%</td>
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<td>RES 2KR,1/4W,5%</td>
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<td>RES 22R 1/4W 5%</td>
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<td>RES 3.6KR,1/4W,5%</td>
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<td>RES 4.7KR 1/4W 5%</td>
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<td>5065-4703</td>
<td>RES 47KR 1/4W 5%</td>
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<td>6010-2702</td>
<td>RES 22KR 1W 10%</td>
<td>VR101,201</td>
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<td>100K TRIM POT LINEAR TAPER</td>
<td>R104,204</td>
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<td>WASHER LEVEL CONTROL 8MM</td>
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<td>COMPRESSION WASHER FOR CASE 77</td>
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<td>1/8 ID 1/2 OD FIBER WASHER</td>
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<td>#8 FLAT WASHER</td>
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<td>#8 FLAT WASHER FOR METRIC POTS</td>
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<td>AWG 22 19 STR PVC BLUE</td>
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<td>AWG 22 19 STR,GREY,PVC</td>
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<td>8MM HEX NUT,10MM CD.,.75 THREAD</td>
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<td>8-32X1/4 HEX KEP NUT</td>
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<td>8-32X5/16 HEX KEP NUT</td>
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<td>PANEL SPACER 1/4ID X 1/2OD X</td>
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<td>AC PWR USA 18/3 SVT 8 FEET AC501</td>
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<td>FRONT PANEL 85</td>
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<td>COVER PLATE,XLR MODEL 85</td>
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<td>PC BOARD MODEL 85</td>
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<td>TIE WAP S 1/2&quot; WRR S 1/2</td>
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<td>9999-5003</td>
<td>FEET RUBBER ADH 3M</td>
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LIMITED 90 DAY WARRANTY

BGW SYSTEMS, INC., (BGW), 13130 Yukon Avenue, Hawthorne, California, 90250, warrants to the original owner all parts, except front panels, knobs, cases and cabinets, of every new product to be free from defects in materials or workmanship, as hereinafter provided, for 90 days from the original date of purchase.

BGW will, at its option, repair or replace any equipment covered by this warranty which becomes defective, malfunctions or otherwise fails to conform with this warranty under normal use and service during the term of this warranty, at no charge for parts or labor.

To obtain warranty service, the equipment, together with the original or a machine reproduction of the Bill of Sale or other dated, proof-of-purchase document describing the equipment, must be delivered to BGW Systems at the above address at the owner's expense. Collect shipments to BGW will be refused unless previously authorized. Any evidence of alteration, erasing or forgery of proof-of-purchase documents will be cause to void the warranty.

This warranty does not cover defects, malfunctions or failure resulting from shipping or transit accidents, abuse, misuse, operation contrary to furnished instructions, operation on incorrect power supplies, operation with faulty associated equipment, modification, alteration, improper servicing, tampering or normal wear and tear. Equipment on which the serial number has been defaced or removed shall not be eligible for warranty service. Should any equipment submitted for warranty service be found ineligible therefore, an estimate of repair cost will be furnished and the repair will be accomplished if requested by the owner upon receipt of payment or acceptable arrangement of payment.

ANY IMPLIED WARRANTIES INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL BE LIMITED IN DURATION TO THE PERIOD OF TIME SET FORTH ABOVE. BGW SHALL NOT BE RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. SOME STATES DO NOT ALLOW LIMITATION ON HOW LONG AN IMPLIED WARRANTY LASTS OR THE EXCLUSION OR THE LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU. This warranty gives you specific legal rights and you may also have other rights which vary from state to state. This is the only expressed warranty applicable to BGW products. BGW neither assumes nor authorizes anyone to assume for it any other expressed warranty.

Completion and the return of the owner registration card enclosed with the equipment is not a condition for obtaining warranty service under the above conditions, but will, upon receipt, automatically extend the warranty period to a full one (1) year under the extended warranty options explained on the EXTENDED WARRANTY OPTIONS POLICY STATEMENT.

BGW reserves the right to make changes or improvements in design or manufacturing without incurring any obligation to change or improve products manufactured prior thereto.
BGW OPTIONAL EXTENDED WARRANTY

All BGW Systems products are covered by a LIMITED 90 DAY WARRANTY as detailed in the warranty policy statement enclosed in the equipment manual. We are, however, pleased to offer the following optional EXTENDED WARRANTY OPTIONS as outlined below.

OPTION A.
Upon receipt of the completed Warranty Registration Card, the terms and conditions of the basic warranty will be extended to a period of one (1) year from the date of purchase by the original owner at NO additional charge.

OPTION B.
The terms of the basic warranty may be extended to a full THREE (3) years by returning the Warranty Registration Card along with a nominal payment of $25.00 per unit purchased, prior to the expiration of the basic 90 day warranty period.

OPTION C.
The terms of the basic warranty may be extended to a full SIX (6) years by returning the Warranty Registration Card along with a nominal payment of $125.00 per unit purchased, prior to the expiration of the basic 90 day warranty period.
BGW SYSTEMS
WARRANTY REGISTRATION CARD

Company Name: ____________________________
Address: ________________________________
City: __________________ State: ______ Zip: ______
Primary Contact: __________________ Title: ______
Secondary Contact: ______________ Title: ______
Telephone: (____) Fax: (____)
Primary Business: _________________________
Equipment Model #: __________________ Serial #: ______
Date Purchased: ______________ Purchased From:

Application Information:

In which of the following applications are these amplifiers being used?

Touring Sound Reinforcement
Studio Monitors
Club Installation
Rental
Other Fixed Installation

What other brands of Power Amplifiers do you use? ___________________________

Why did you select BGW for this application? _____________________________

How many Power Amplifiers do you purchase in an average year? _________
1 to 5 ______, 5 to 10 ______, 10 or more ______

What is the primary factor in determining which Power Amplifiers you purchase?

Price
Sonic Performance
Ease of Service
Warranty
Long Term Reliability
Physical Size
Weight
Other Features

- i.e., input attenuators, input connectors, circuit breakers, speaker protection.

PLEASE EXTEND MY WARRANTY TO ONE (1) FULL YEAR.

I HAVE ENCLOSED $25.00. PLEASE EXTEND MY WARRANTY TO THREE (3) FULL YEARS.

I HAVE ENCLOSED $125.00. PLEASE EXTEND MY WARRANTY TO SIX (6) FULL YEARS.
STereo Power Output - 8 Ohms
- Channel A: 42 W
- Channel B: 41 W

Stereo Power Output - 4 Ohms
- Channel A: 62 W
- Channel B: 61 W

Bridged Mono Power Output at 8 Ohms = 125 W

Unbalanced Input Noise Level
- Channel A: 104 uV
- Channel B: 49 uV

Balanced Input Noise Level
- Channel A: 106 uV
- Channel B: 125 uV

High Frequency -3dB Point
- Channel A: 20 kHz
- Channel B: 20 kHz

Quiescent Power: 20 W
BGW SYSTEMS
WARRANTY REGISTRATION CARD

Name: __________________________ Title: __________________________
Company Name: __________________________
Address: __________________________
City: __________________________ State: __________________________ Zip: __________________________
Secondary Contact: __________________________ Title: __________________________
Telephone: ( )________________ Fax: ( )________________
Primary Business: __________________________
Equipment Model #: __________________________ Serial #: __________________________
Date Purchased: __________________________ Purchased from: __________________________

How are these amplifiers being used?
- Touring Sound Reinforcement
- Studio Monitors
- Club Installation
- Rental
- Other Fixed Installation

What other brands of Power Amplifiers do you use? __________________________

Why did you select BGW for this application? __________________________

How many Power Amplifiers do you purchase in an average year?
- 1 to 5
- 5 to 10
- 10 or more

Please rate from 1 to 8 the order of importance of each (1 being the most important):
- Price
- Sonic Performance
- Ease of Service
- Warranty
- Long Term Reliability
- Physical Size
- Weight
- Other Features
  - i.e. input attenuators, input connectors, circuit breakers, speaker protection

Please Extend my Warranty to Six (6) Years @ $100.00
BGW OPTIONAL EXTENDED WARRANTY

All BGW Systems products are covered by a LIMITED ONE (1) YEAR WARRANTY as detailed in the warranty policy statement. It is very important that you complete and return to BGW Systems, Inc. your warranty registration form. It is also necessary in order to extend your amplifier warranty for the free Three (3) Year Warranty upgrade, and to keep you informed of new product information and updates. In addition, we are pleased to offer the following optional EXTENDED WARRANTY OPTIONS as outlined below.

OPTION A:

Upon receipt of the Warranty Registration Card, the terms and conditions of the basic warranty will be extended to the original owner for a period of three (3) years from the date of purchase at NO additional charge.

OPTION B:

You may extend the terms of the basic warranty may to (6) years by returning the Warranty Registration Card along with a payment of $100.00 per unit purchased.
Limited One Year Warranty

BGW SYSTEMS INC., (BGW), 13130 Yukon Avenue, Hawthorne, California, 90250, warrants to the original owner all parts of every new product to be free from defects in materials or workmanship, as hereinafter provided, for One Year from the original date of purchase.

BGW will, at its option, repair or replace any equipment covered by this warranty which becomes defective, malfunctions or otherwise fails to conform with this warranty under normal use and service during the term of this warranty, at no charge for parts or labor.

In order to obtain warranty service, the equipment, together with the original or a machine reproduction of the Bill of Sale or other dated, proof-of-purchase document describing the equipment must be delivered to BGW Systems at the above address at the owner’s expense. Collect shipments to BGW will be refused unless previously authorized. Any evidence of alteration, erasing or forgery of proof-of-purchase documents will be cause to void the warranty.

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Completion and return of the owner registration card enclosed with the equipment is not a condition for obtaining warranty service under the above conditions, but will, upon receipt, automatically extend the warranty period to Three (3) years under the extended warranty options explained on the EXTENDED WARRANTY OPTIONS POLICY STATEMENT.

BGW reserves the right to make changes or improvements in design or manufacturing without incurring any obligation to change or improve products manufactured prior thereto.
IMPORTANT!

FREE - 2 YEAR EXTENDED WARRANTY COVERAGE!

Simply complete and return the enclosed Warranty Registration Card
Name:__________________________Title:__________________________
Company Name:______________________________________________
Address:_____________________________________________________
City:____________________State:_________Zip:__________________
Secondary Contact:____________________Title:____________________
Telephone: (_____)_________Fax: (_____)______________
Primary Business:_____________________________________________
Equipment Model #:_____________Serial #:_____________________
Date Purchased:__________________Purchased from:_________________

How are these amplifiers being used?
Touring Sound Reinforcement
Studio Monitors
Club Installation
Rental
Other Fixed Installation

What other brands of Power Amplifiers do you use?_________________

Why did you select BGW for this application?_____________________

How many Power Amplifiers do you purchase in an average year?
1 to 5 ______ 5 to 10 ______ 10 or more ______

Please rate from 1 to 8 the order of importance of each (1 being the most important):

Price
Sonic Performance
Ease of Service
Warranty
Long Term Reliability
Physical Size
Weight
Other Features
- i.e. input attenuators, input connectors, circuit breakers, speaker protection

Please Extend my Warranty to Six (6) Years @ $100.00 _____
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