Service Manual

Micro Bass Series

GK GALLIEN-KRUEGER

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A WORD FROM BOB GALLIEN AND RICH KRUEGER

We want to personally introduce you to our labor of love: The Microamplifier Series. They symbolize our continuing effort to make the musician's life easier and more fulfilling. Everything, from the input stage to the speaker outputs, has been redesigned and refined for one purpose: the ultimate bass sound.

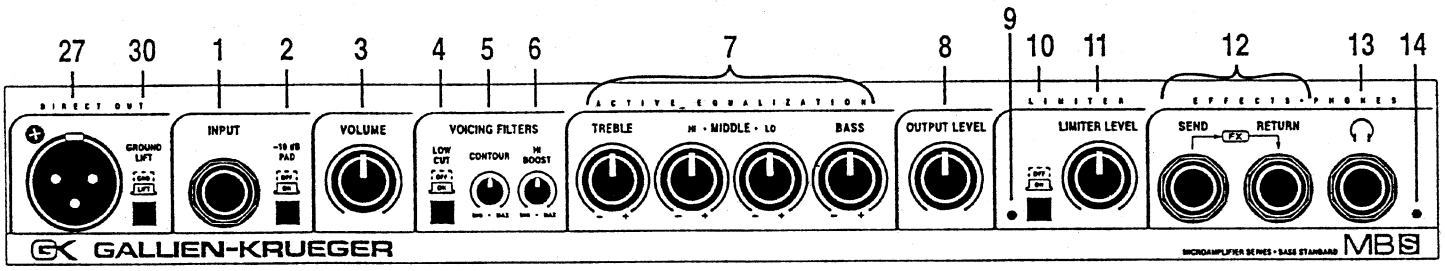
After getting accustomed to the fact that this little package puts out an unbelievable amount of power, the first thing you'll notice is how quiet the amp is. That's due to a newly designed input stage that reduces noise at it's most prominent source. And the hum that is normally induced into your bass pickups from a typical amplifier is gone, thanks to our advanced power supply design.

Every inch of panel space is packed with features that give you more flexibility in sound than any GK bass amp in history. For the first time, our classic Contour is variable, our Bright switch has given way to a variable, more useful Hi Boost control, and our 4-Band EQ has parametric midbands. And if it's possible to improve on the GK bass sound, these amps have done it.

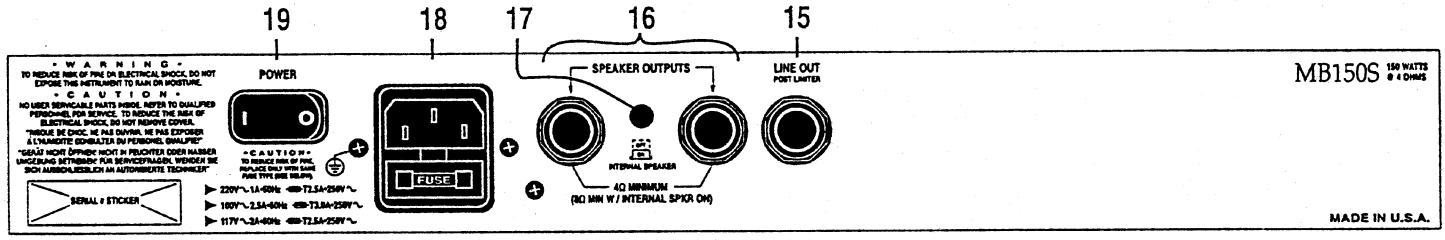
As you read through this manual, we hope you will gain an understanding of the care that went into the design and manufacture of your new amplifier. Each feature has been designed to give you as much control over your sound as possible and with a little experimentation you should easily obtain your ultimate sounds.

We are proud of these amplifiers and feel they have passed their final test with your purchase. We hope you enjoy this great instrument and wish you the best in your musical endeavors.

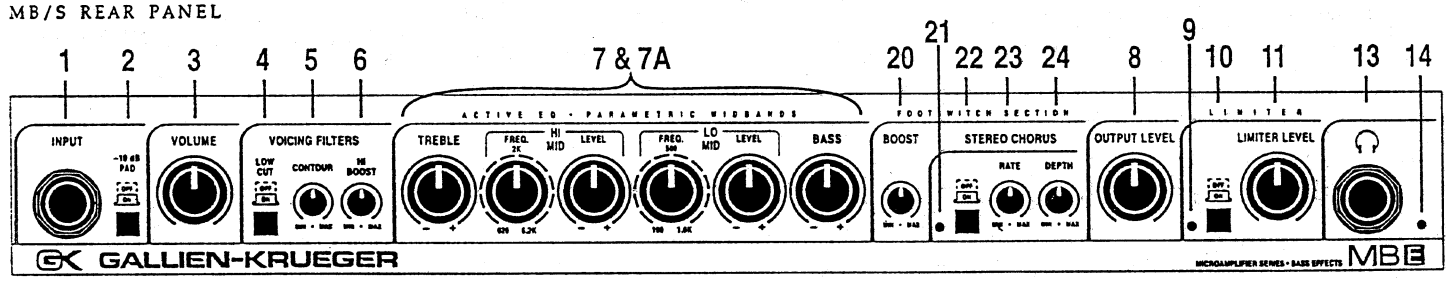
Bob Gallien & Rich Krueger



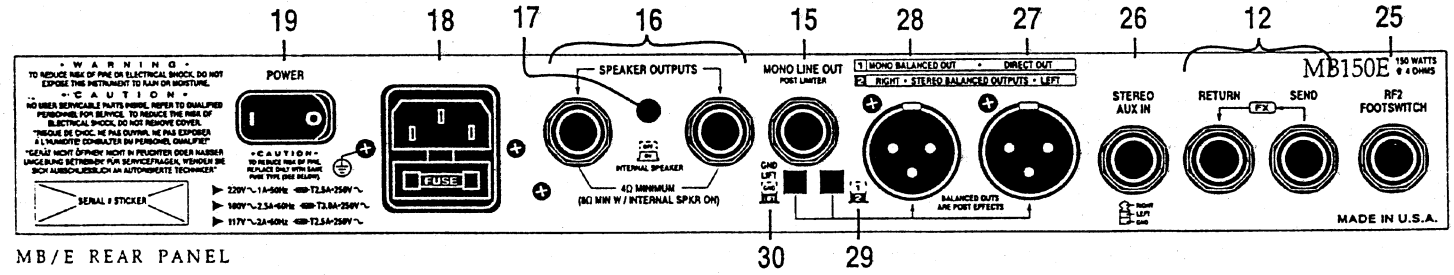
MB/S FRONT PANEL



MB/S REAR PANEL



MB/E FRONT PANEL



MB/E REAR PANEL

DETAILED DESCRIPTIONS

(1) Input Jack
Accepts a 1/4" phono plug and can be driven by a variety of electronic instruments; however, the internal electronics have been optimized for use with an electric bass guitar.

(2) –10 dB Pad Switch
In the "in" position, allows you to use a strong instrument signal without distorting the input. It reduces the gain of the input to prevent clipping.

(3) Preamp Volume Control
Controls the input signal volume as it goes through the preamp section of the amplifier. If clipping (distortion) occurs in the preamp, this control can bring the signal down to a "clean" range.

(4) Low Cut Filter
Rolls-off the low end and gives a more "vintage" GK bass sound, reminiscent of the 400B.

(5) Contour Control
"Rounds out" your sound by cutting the middle frequencies while boosting both the high and low frequencies. Many players use this control set between half and maximum in their basic sound setup. (see "Setting Up Your Sound")

(6) Hi-Boost Control
Adds brightness to your sound by increasing frequencies in the 2KHz area. At minimum setting it is flat and adds gain similar to a 2KHz graphic band as it is turned up. (see "Setting Up Your Sound")

(7) 4-Band Active Equalization
Provides boost and cut over four different frequency bands in the audio range.

(7A) Parametric Midbands (MB/E Only)
Allows you to sweep the frequency of both the Hi-Mid and Lo-Mid EQ controls. When set at 12 o'clock, the frequency is the same as the MB/S.

(8) Output Level
Adjusts the level of the signal being sent to the internal power amplifier as well as to the headphones. Does not affect the level of the Direct Out.

(9)Limiter On/Off Indicator
When lit, the Limiter is on.

(10) Limiter On/Off Switch
Turns the Limiter on and off.

(11) Limiter Adjustment Knob
Varies the power amp output from 20 watts to 150 watts. When using the limiter, start with the adjustment knob turned fully clockwise. If the amplifier is clipping (distorting), turn the knob counter-clockwise to decrease distortion.

(12) Effects Loop
Provides a means of adding in-line effects after the Equalization stage. The Send can drive most standard foot and rack mountable effects.

If the Send signal should overdrive the outboard effects (causing distortion), the preamp Volume (3) may be lowered to send a smaller signal to the effect and the Master (8) raised to maintain the same overall volume.

(13) Headphone Output
Accepts a 1/4" plug for private listening. The MB/E provides a stereo signal in the headphones, and using the Stereo Aux In, you can easily mix in recorded music for practicing. (see "Sample Hookups")

(14) Power "On" Indicator
When lit, the power is on.

(15) Mono Line Out
Provides a line level signal (post Limiter Level) for interfacing with outboard power amplifiers. (see Sample Hookups)

(16) External Speaker Outputs
Allows external speaker(s) to be driven by the internal 150 watt power amp. For optimum performance, use the following minimum external speaker loads:
112 Combo:
Internal speaker "on" with 8Ω external load
Internal speaker "off" with 4Ω external load
(4Ω = 2 ea. 8Ω speakers)
Head:
4Ω total speaker load
(4Ω = 2 ea. 8Ω speakers)
NOTE: Although the MB/S and MB/E are equipped with protection circuitry, optimum performance is achieved using a total speaker load no lower than 4Ω.

AUTO AMPLIFIER SHUTDOWN:
To protect against failure, the MB/S and MB/E heads and combos are equipped with an Auto Shutdown feature that is enabled when the Speaker Outputs are overloaded or when the temperature of the unit exceeds safe operation. The power dissipation in the outputs is actually computed to determine if it is within safe operating conditions and the unit will automatically shutdown when limits are exceeded. When shutdown occurs, the unit will appear to be on and all functions and LED's will work; however, there will be no power output to speakers.

To reset the amplifier, turn the power switch off, wait 3 seconds, verify that the output load of 4Ω is not exceeded, remove or lower the input signal, and turn the amplifier back on. If you experience more shutdowns, even after correcting the cause of the initial shutdown, check all speakers and cables. If further action is necessary, please call your local GK Service Center.

(17) Internal Speaker Switch (112 Combo only)
Allows the internal speaker to be disconnected for private headphone listening or to allow the internal power amplifier to drive an external speaker load of 4 ohms at 150 watts.

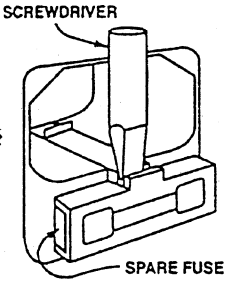
(18) AC Receptacle and Fuse Holder
This combination grounded AC jack and fuse holder is designed to accept a detachable power cord. If a replacement cord is needed, it should be UL rated at 10 amps/125vac or 5 amps/240vac.

Never operate this amplifier with any other than the recommended fuse type: 5mm x 20mm, slow blow, 250V with amp ratings as follows:

Line Voltage	Fuse Rating	Fuse #
117VAC	2.5 Amps	T2.5A • 250V
220VAC	2.5 Amps	T2.5A • 250V
100VAC	3 Amps	T3.0A • 250V

The fuse can be easily removed with a screwdriver as shown on the right.

A spare fuse is located in a sliding compartment.



(19) Power Switch
Turns the unit on (1) and off (0). Unplug the unit if it is not being used for an extended period.

(20) Boost Control (MB/E only)
The Boost is a post-EQ gain stage which can add low end "bite" to your sound. It can be footswitched in and out with the RF2 Footswitch.

(21) Chorus On/Off Indicator LED (MB/E only)
When lit, the Chorus effect is on.

(22) Chorus On/Off Switch (MB/E only)
Turns on the Stereo Chorus effect. It is overridden when the RF2 footswitch is plugged in.

(23,24) Chorus Rate and Depth (MB/E only)
Allows for variation of the internal chorus effect from a very subtle "doubling" to a more dramatic "spatial" effect. The Rate varies the speed of the effect and the Depth its intensity.

(25) Footswitch Input (MB/E only)
Connects the GK RF2 footswitch to the MB/E using a Stereo Cord with a 1/4" plug (available a an accessory from GK). The RF2 controls the Boost (on/off) and the Stereo Chorus (on/off).

(26) Stereo Aux Input (MB/E only)
Accepts a stereo 1/4" phone plug to allow a stereo signal to be mixed with the internal preamp signal (post internal effects, pre Output Level). This input can be used in place of the Return when using stereo outboard effects through the Effects Loop. It can also accept a stereo signal from other outside sources such as tape machines, stereo receivers, etc., for playing along with prerecorded music through speakers or privately through headphones. (see "Sample Hookups")

(27) Direct Out/Left Balanced Output
Provides a "direct box" balanced output straight from the Input (1) and unaffected by any front panel controls. On the MB/E, provides the "left" side of a stereo balanced signal (post Output Level) when the 1–2 Switch (28) is in the "2" position.

(28) Mono/Right Balanced Output (MB/E only)
Provides a mono balanced signal when the 1–2 Switch is in the "1" position. Provides the "right" side of a stereo balanced signal when the 1–2 Switch is in the "2" position. Note that all balanced signals are pre Output Level.

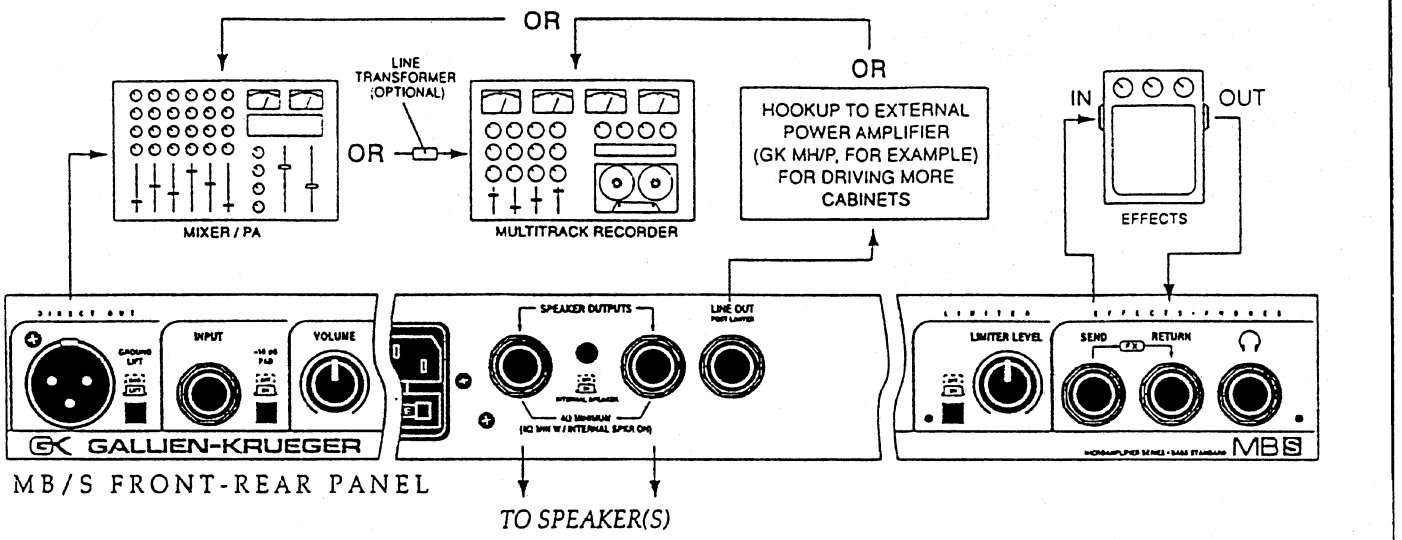
(29) "1–2" Switch (MB/E only)
Affects the XLR Outputs. When in the "1" position, the XLR's provide one Direct Out and one Mono Balanced Output. When in the "2" position, the XLR's are Stereo Balanced Outputs (the right and left using the internal Stereo Chorus effect to give you a stereo signal).

(30) Ground Lift Switch
Disconnects the ground from both the Balanced Outputs and the Direct Out. There may be situations where a ground loop occurs when using the Balanced or Direct Outs, resulting in a noticeable hum. By disconnecting the ground, the hum may be reduced or eliminated.

SPECIFICATIONS

Max Input (before clipping):		.35Vrms/2.2Vrms with –10dB switch in
Output:		150W into 4Ω (mono) @<1% THD
Headphones:		1.4Vrms max into 8Ω (.25 watt)
Signal to Noise Ratio:		>74dB (referenced to max input; EQ flat)
Active Equalization:		Bass: ±8.5dB @ 80Hz
		Lo Mid: +7.5dB/–10dB @ 500Hz
		(MB/E Frequency Control: 160Hz – 1.6KHz)
		Hi Mid: +10.5dB/–7dB @ 2KHz
		(MB/E Frequency Control: 620Hz – 6.2KHz)
		Treble: +5dB/–22dB @ 5KHz
Low Cut Filter:		–17.5dB @ 40Hz
Contour Filter:		+8.5dB @ 40Hz, –10dB @ 600Hz, +10dB @ 8KHz
Hi Boost Filter:		+13.5dB @ 2KHz
Impedances:	(Input):	Input.....1MΩ
		Return (MB/S).....12KΩ
		Return (MB/E).....70KΩ
		Stereo Aux In.....12KΩ
	(Output):	Send.....1KΩ
		Line Out.....1KΩ
Chorus (MB/E):		Crossover Filter: 6dB/oct @ 150Hz
		Modulation Rate: .35Hz–2.4Hz
		Maximum Width (delay time): 17.5ms–22.5ms
Dimensions:		Heads: 13.75"W x 1.9"H x 7"D (7.2 lbs)
		112 Combos: 13.75"W x 15"H x 8"D (24 lbs.)
Footswitch (MB/E):		GK model RF2 and standard 3-connector stereo cord (1/4" plugs)

MB/S & MB/E SAMPLE HOOK-UPS



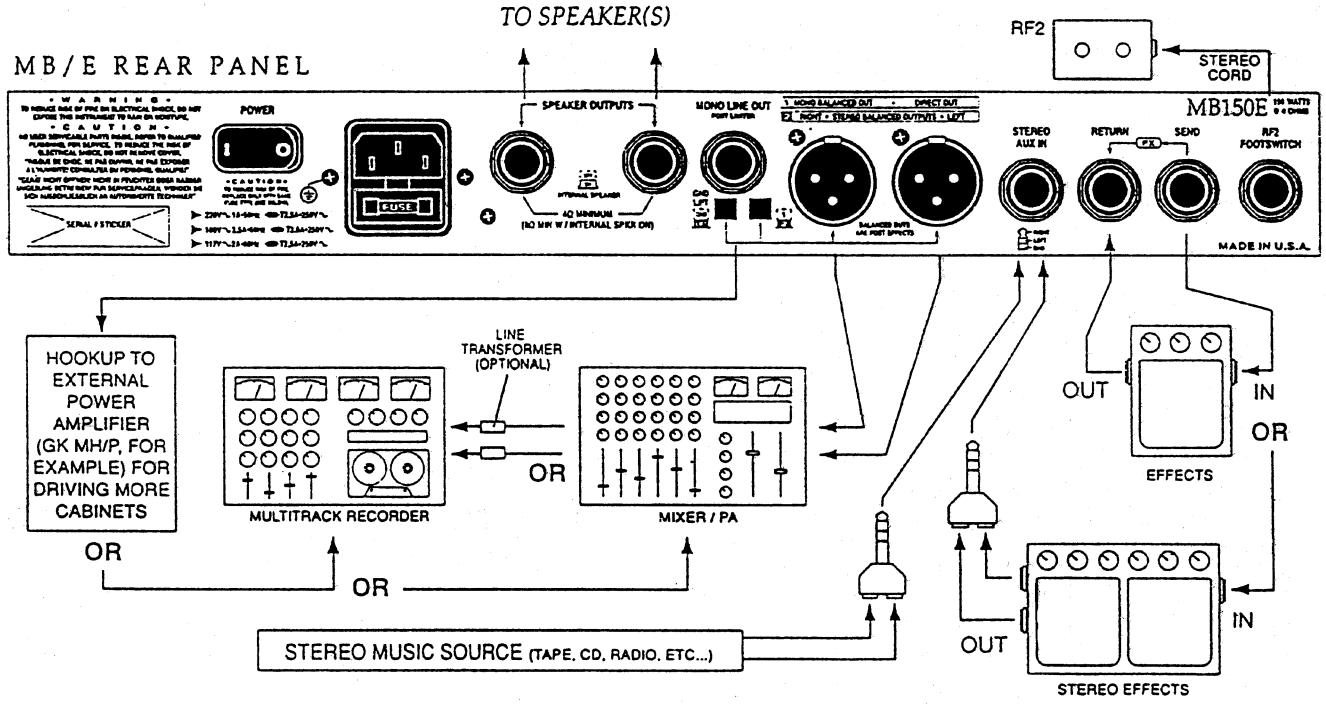
MB/S FRONT-REAR PANEL

TO SPEAKER(S)

SEE "SUGGESTED SYSTEMS" BELOW

TO SPEAKER(S)

MB/E REAR PANEL

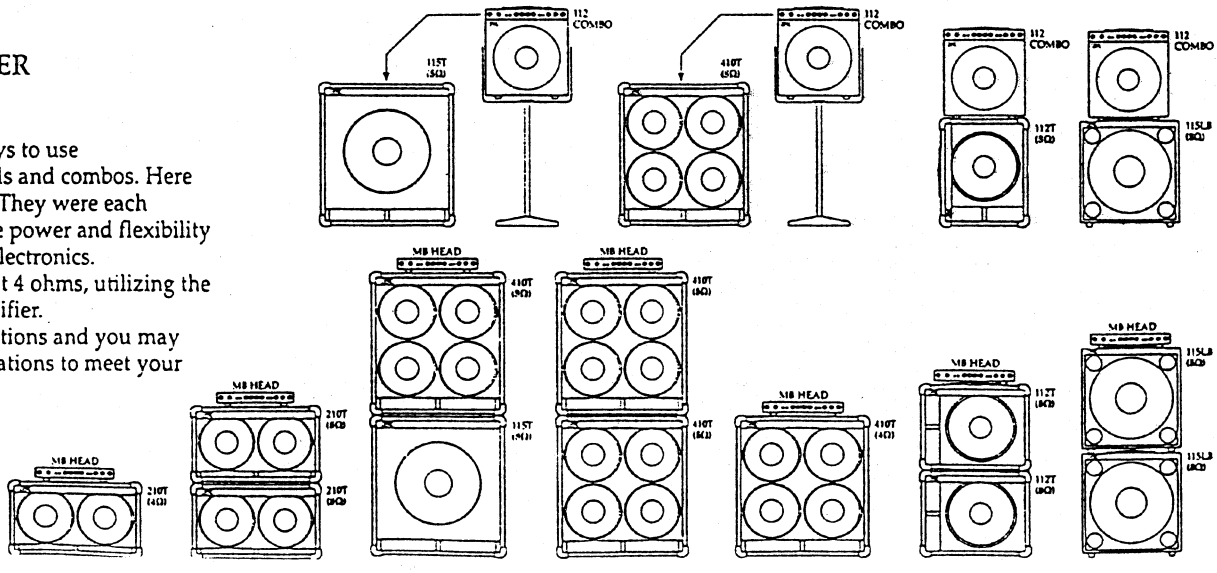


SUGGESTED GALLIEN-KRUEGER SYSTEMS

There are a variety of ways to use Gallien-Krueger MB heads and combos. Here are our favorite systems. They were each designed to maximize the power and flexibility of the MB/S and MB/E electronics.

Each system is rated at 4 ohms, utilizing the full 150 watts of the amplifier.

These are only suggestions and you may want to try other combinations to meet your exact needs.



SETTING UP YOUR SOUND

Your MB/S – MB/E is capable of producing a wide range of great bass sounds. Below you will find the basic procedures needed to get started. We have also provided several sample settings that can be used as starting points for various bass sounds.

SUGGESTED PROCEDURES

1) Turn the volume and any tone controls on your guitar to "10" before making adjustments on the amplifier. These will be fine tuned later.

2) Set the Output Level (8) at the 2 o'clock position, turn off the Limiter (10). Then, while playing, set the Volume (3) to desired level.

3) Set all EQ controls to 12 o'clock (flat). Now, try each Voicing Filter (4,5,6) alone and in combinations, and leave on if they produce the basic sound you wish to achieve.

- Low Cut: In the "in" position, this filter gives the amplifier the characteristics of the classic GK 400B, rolling off the extreme low end.
- Contour: Most players set this control between 12 o'clock and 2 o'clock in their basic setup. At minimum, it is useful for fretless bass sounds and for bright sounds when using the bridge pickup.
- Hi Boost: When turned up, accentuates "slap and pop" styles and can add life to old, worn strings.

4) You'll find that the Equalization (7) is quite responsive and will take some trial and error to get to know. From the flat (12 o'clock) position, take each EQ level control one at a time and turn it all the way up and all the way off while playing your bass through the unit.

For the MB/E, try sweeping each midband frequency as well. After you have become familiar with each control, set to the desired position.

5) With your tone roughly set, familiarize yourself with the Stereo Chorus (22,23,24) the same way as with the tone controls. If you choose to use the Chorus, set to desired level.

6) The final adjustment on the amplifier is the volume level. Turn up the Volume (3) to your desired playing level. If distortion occurs while playing, try turning on the Limiter and adjusting the Limiter Level. This should effectively eliminate distortion without losing apparent volume. If distortion is still apparent, you may need to use the –10dB Pad.

7) Finally, fine tune your level and tone with adjustments on your bass.

Note: When using outboard effects, lowering the Volume (3) and raising the Output Level (8) may be necessary to avoid overdriving the effect.

Final note: Once the Volume (3) has been set, use the Output Level (8) to control your overall stage level.

ACCESSORIES

A variety of accessories are available for the MB Heads and Combos, each designed to blend perfectly with the Microamplifier Bass Series.

Footswitch

With the addition of the RF2 Foot Control, you can take control of the Stereo Chorus (On/Off) and Boost (On/Off) on the MB/E with a tap of your toe. A standard 1/4" phone stereo cord is included for hookup to the MB/E.

Mic Stand Kit

The 112 Combo can be mounted on a standard mic stand with the addition of a Mic Stand Mounting Kit.

Rack Mounting Kits

All ML/S and ML/E Heads and Combos can be rack mounted with the addition of optional rack mounting kits.
Heads (2 rack spaces)
Combo (10 rack spaces)

Rack Box 4

Put your rack mount gear together with this 4-rack space box. It's constructed using 9-ply Alder, is covered inTolex vinyl, and incorporates durable interlocking corners.

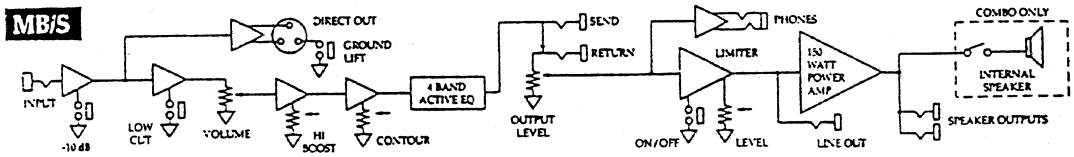
Road Bags

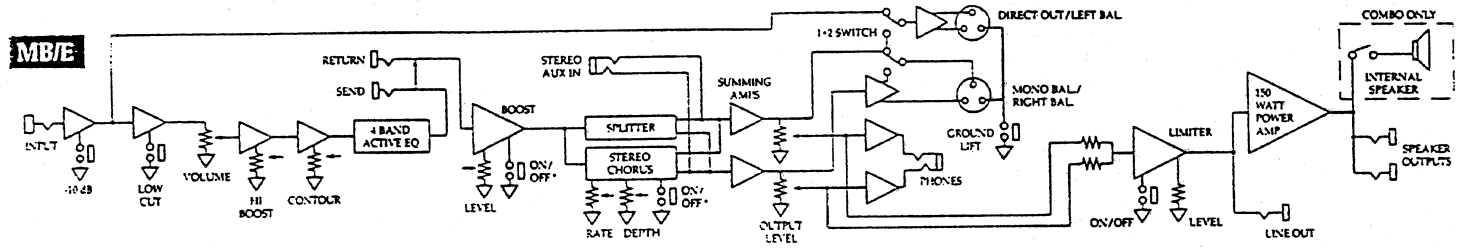
Custom fitted Road Bags are available for every model. They feature a fully padded lined interior with a shell made of Cordura Nylon. Cordura is waterproof, colorfast, self-healing and grease resistant.

There is also a front zipper pocket for your cords and footswitches. An adjustable shoulder strap lets you carry your amp and instrument together easily.

They are recommended for unracked traveling protection.

BLOCK DIAGRAMS





TROUBLESHOOTING

Your new amp, if kept in a well constructed rack, road case, or GK Road Bag and handled with care, should give you trouble-free performance. If operated with care your only maintenance should be occasional external cleaning.

Often when an electrical component provides poor, erratic, or no performance, it is due to minor problems or irregularities which may be corrected easily by someone knowing very little about electronics.

We have provided the accompanying chart for your reference. If you have any problems at all, please check this first. If your problem is major and there is definitely something wrong with the unit, please refer to the list of Service Centers included with the paperwork in the packing box. If necessary, call your local GK Dealer for your nearest Authorized GK Service Center. You may also call our Service Department at (408) 379-3344 for reference to your nearest Authorized GK Service Center.

PROBLEMS:	PROBABLE CAUSES/SOLUTIONS:
LEDs light but no signal from Speaker Outputs, Headphones, Line Output, or Balanced Outputs.	Be sure all tone controls and volumes are turned up at least part way.
LEDs light, tone and volumes turned up but no sound.	Auto Amplifier Shutdown may have tripped. Reset by turning the Power Switch (19) off, wait 3 seconds, then turn the Power switch back on. If the condition still exists, check interconnections with speakers.
LEDs light, tone and volumes up, external speakers OK, but no signal from output.	Reset amplifier with Power Switch as described above. If condition still exists, check guitar volume, pick-ups, cord, and repair or replace if necessary.
LEDs light, tone and volumes up, external speakers OK, guitar cord OK, guitar volume up and still no sound.	Call your Authorized GK Service Center.
Distortion occuring, even when Volume is low.	The –10dB Pad Switch may need to be used to prevent overdriving the input.
Boost and Chorus not functioning with footswitch plugged in and appropriate LED indicator "on".	Be sure the effect parameters are up and front panel ON/OFF buttons are "in". Check footswitch cable and be sure it a stereo cable.
External effects hooked up through Effects Loop are distorting.	Effects Loop Send too "hot", overdriving the effect. Keeping the Output Level (8) above the 2 o'clock position will, in most cases, solve the problem.
Loud hum.	Check grounding of the unit and any effects going through the effects loop. Proper grounding is mandatory.
Excessive noise.	Repair or replace guitar cord. Make sure external effects are patched into the Effects Loop and not before the Input. Test guitar pick-ups.
No LEDs on front panel are lit and no signal from Speaker Outputs, Headphones, Line Output, or Balanced Outputs.	Check power cord, AC outlet and fuse. If all are OK or fuse is blown, call your local Authorized GK Service Center. Note: Be sure the correct fuse is being used.

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MB150S Preamp Turn-On Procedure

GK Document # 420-0061-A / Preamp Board #206-0061-C

Model- MB150S- All Options Revised 7/26/99

SETUP

1) Power switch off- connect power cord.
2) Connect "power" 3-pin connector to P1 on MB-S board so that it clicks into position. Colors should read (L-R)- black, violet, brown. (P1 is furthest from front of panel.)
3) Connect "signal" 3-pin connector to P2 on MB-S board. Colors should read (L-R)- white, black and red. (P2 is closer to front of panel.)
4) Connect either output to Load Box (Load A).
5) Resistance loads open (switch in center).
6) Load Box to scope-B and AC-VM.
7) Set scope switch on Load Box to look at Load A(down).
8) Probe (1:1) to scope-A and DVM. – No Gnd lead required.
9) Connect oscillator to input.
10) Set oscillator on 100Hz sine wave @ 0.5 Vrms (-6dBV).
11) DVM on 20V range.
12) AC voltmeter on 30V range.
13) Scope-A on 5V/cm, scope-B on 10V/cm.
14) Scope sweep on 2ms/cm, scope trigger on A. **On MB-S Preamp set:**
15) Output level to 0, switches out.
16) Contour, hi-boost to 0.
17) Volume, tones and limiter level to 10.

POWER AND LIMITER TEST

1) Turn on power switch.
2) Power LED on front panel should be lit.
3) Look at output- should be a clean sine wave w/ no crossover distortion, and be about 1.2Vp-p.
4) Flip scope switch to look at Load B (up) and see it is also 1.2Vp-p w/ no crossover distortion.
5) **For Combo units:** Switch internal speaker on, make sure disconnected. Switch off.
6) Change scope to 10V/cm scale.
7) Increase oscillator output to 160mVrms (-16dBV). Output = 14Vrms.
8) Engage limiter. Output falls to 11Vrms.
9) Decrease limiter level to 0. Output falls to 7.5Vrms.
10) Increase output level to 10. Output goes to 10Vrms.
11) Disengage limiter. Output hits rails hard.
12) Switch both loads to 4 ohms- signal should clip on top and bottom and then shut off after a few seconds. (May have to add 8.2 ohms resistance).
13) Remove loads (switches to center) and set output level to 12 o'clock.
14) Turn unit off and then on again. Note how long it takes before output reappears on scope- should be no more than 2-3 seconds.

INPUT SET-UP AND SYSTEM GAIN TEST

1) Turn on power switch- power LED only should light.
2) Look at U1-U7 with probe. Adjust R13 (1K trim pot) so the signal hits the rails evenly on both sides. Signal should be about 22 V p-p.
3) Engage –10dB switch. Signal becomes 1.7Vrms.
4) Direct Out pins 2 & 3= 1.7Vrms. Disengage –10dB switch.
5) Oscillator to –46dBV (500mVrms).
6) Scope trigger to B.
7) Increase output level. Output should hit rails at about 3-4 o'clock.
8) Engage limiter. Limiter LED should light (output raises slightly).

INPUT SET-UP AND SYSTEM GAIN TEST (contd.)

9) Decrease limiter level to 0. Output drops to 12Vrms.
10) Disengage limiter.
11) Look at tip of headphone jack (J4). Output should be about 4.2Vrms at this point.
12) Repeat step 11 looking at ring of headphone jack.

TONE CONTROLS TEST

1) Set all large knobs to center (12 o'clock), switches out, small knobs to 0.
2) Set scope-B to 2V/cm and 2ms/cm
3) Set oscillator to 100Hz square wave at –46dBV.
4) Look at output, compare to Figure 1.
5) One at a time turn tone control knobs and compare outputs (resetting to center after finishing):
   A) Treble to 10- Fig. 2; Treble to 0- Fig. 3
   B) Hi-mid to 10- Fig. 4; Hi-mid to 0- Fig. 5
   C) Lo-mid to 10- Fig. 6; Lo-mid to 0- Fig. 7
   D) Bass to 10: Fig. 8; Bass to 0- Fig. 9

VOICING FILTERS TEST

1) Engage low-cut switch- compare to Fig. 10. Disengage.
2) Increase contour to 10- compare output to Fig. 11. Reset to 0.
3) Increase hi- boost to 10- compare output to Fig. 12. Reset to 0.

NOISE TEST

1) Remove oscillator input.
2) Turn large front panel knobs to 10, small knobs to 0, switches out.
3) Connect speaker to output and listen for noise, sound should be clean, no crackling or distortion.
4) Change AC voltmeter range to 0.1V.
5) Noise should measure less than 60mV.
6) AC voltmeter to 0.3V range.
7) Engage low-cut, hi-boost and contour to 10. Noise < 300 mVrms.

RETURN KNOBS TO ZERO- READY FOR BURN-IN.

MB-S WAVEFORMS

100 Hz square wave @ -46dBV (5mVrms) input
All large knobs to 12:00, small knobs to 0, switches out
Look at output with scope set on 2ms/div and 2V/div

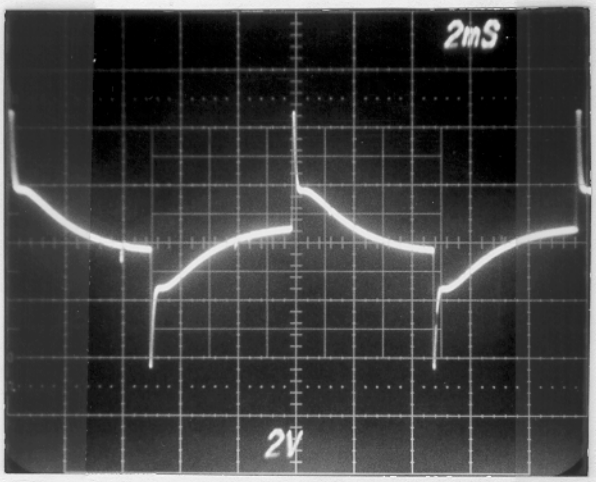


Fig. 1. Tones Center, Filters Off.

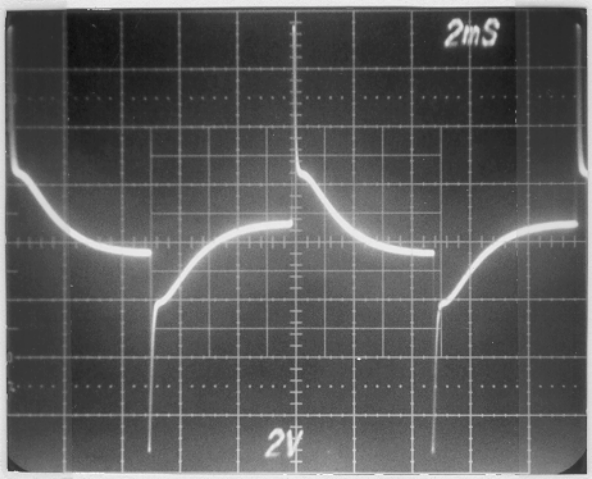


Fig. 2. Treble to 10.

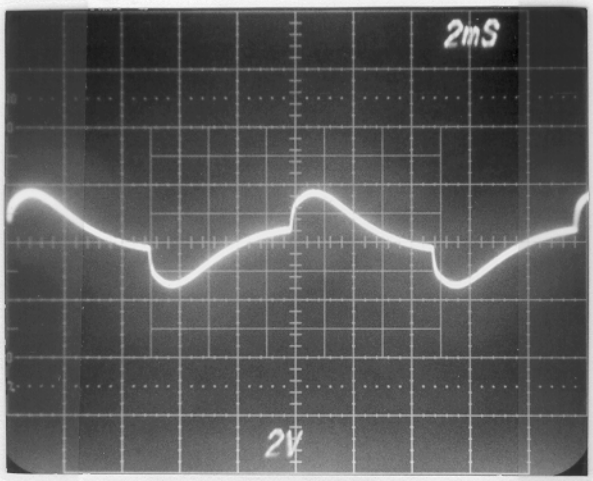


Fig. 3. Treble to 0.

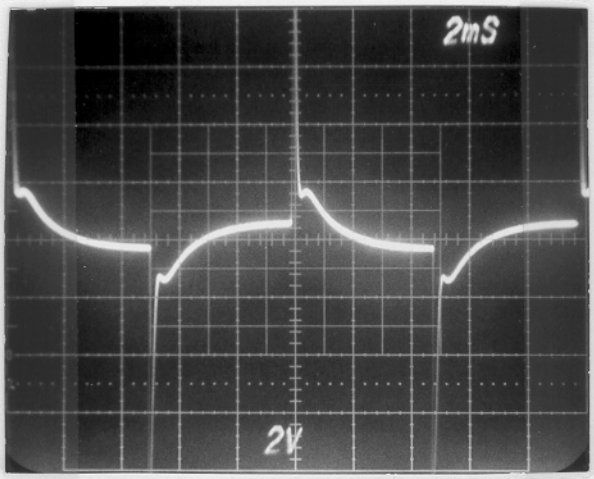


Fig. 4. Hi-Mid to 10.

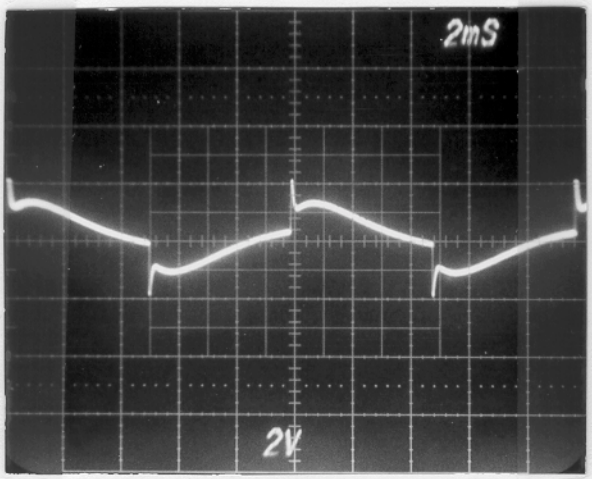


Fig. 5. Hi-Mid to 0.

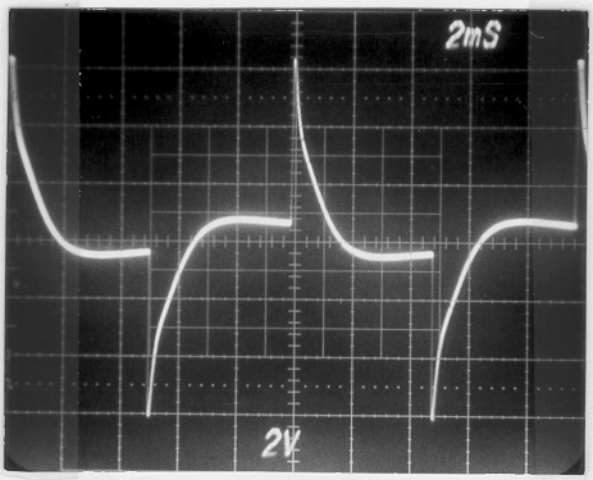


Fig. 6. Lo-Mid to 10.

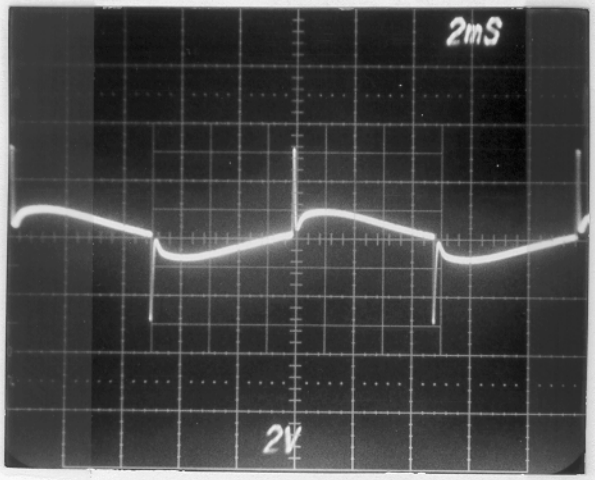


Fig. 7. Lo-Mid to 0.

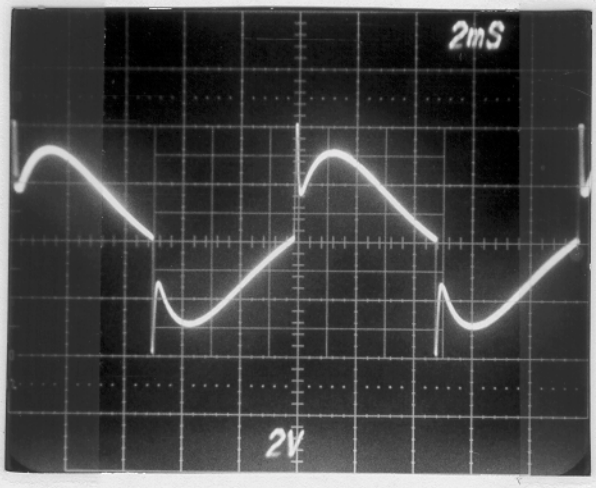


Fig. 8. Bass to 10.

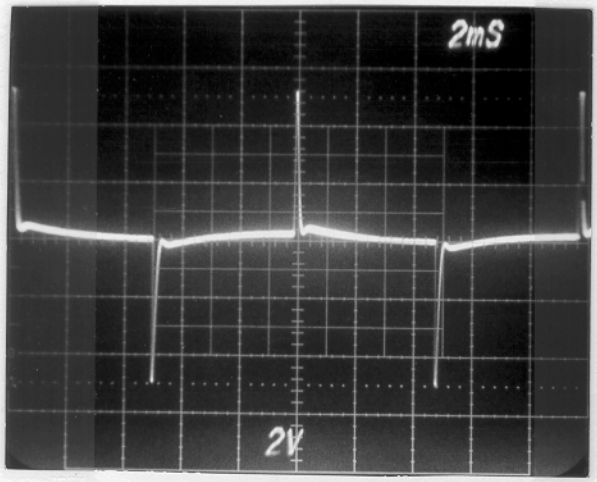


Fig. 9. Bass to 0.

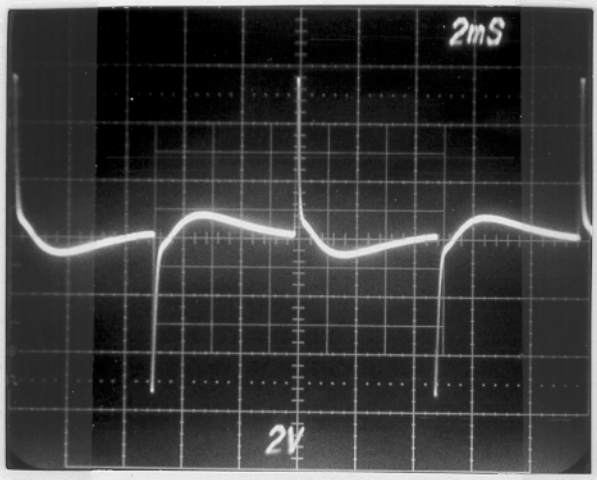


Fig. 10. Lo-Cut in.

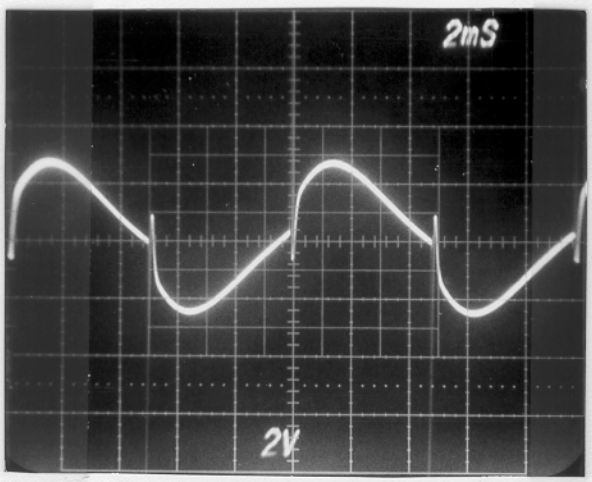


Fig. 11. Contour to 10.

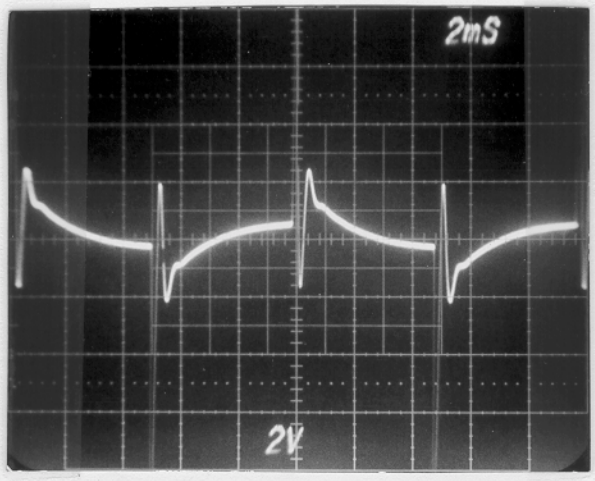


Fig. 12. High Boost to 10.

MB150E Preamp Turn-On Procedure

GK Document #: 420-0087-A / Preamp Board # 206-0087-B

Model #'s: MB150E- All options

Rev. 7/27/99

SETUP

1) Power switch off - connect power cord.
2) Connect "power" 3-pin connector from power amp to connector P1 on MB-E board. The colors should read (bottom-top): black, violet, and brown. (P1 is closest to front of panel.)
3) Connect "signal" 3-pin connector from power amp to connector P2 on MB-E board. These colors should read (bottom-top): white, black and red. (P2 is furthest from front of panel). Colors should be clearly marked on board.
4) Connect either output to load box (Load A).
5) Resistance loads open (switch in center).
6) Load box to scope-B and AC-VM.
7) Set scope switch on load box to look at Load-A (down).
8) Probe (1:1) to scope-A and DVM. (No GND lead required.)
9) Connect oscillator to input.
10) Set oscillator on 100Hz sine wave @ 0.5Vrms.
11) DVM on 20V (AC) range.
12) AC voltmeter on 30V range.
13) Scope-A on 5V/cm, scope-B on 10V/cm.
14) Scope sweep on 1ms/cm, scope trigger on A.
15) Output level to 0,, switches out.
16) Contour, hi-boost, boost to 0.
17) Volume, tones, and limiter to 10.

POWER AND LIMITER TEST

1) Turn on power switch.
2) Disengage switches on RF2 so that LED's are off. Only the power LED should be lit.
3) Look at output- should be clean sine wave w/ no crossover distortion, and be about 0.6Vp-p.
4) **For Combo units:** switch on internal speaker and make sure it's connected. Turn off.
5) Change scope to 10V/cm scale.
6) Increase oscillator output to 160mVrms (-16dBV). Output = 21Vrms.
7) Engage limiter. Output falls to 14Vrms.
8) Decrease limiter level to 0. Output falls to 8.5Vrms.
9) Increase output level to 10. Output goes to 11.5Vrms.
10) Disengage limiter. Output should hit rails hard.
11) Switch both loads to 4 ohms- signal should clip on top and bottom, and then shut off after a few seconds. (May have to add 8.2 ohms resistance.)
12) Remove loads (switches to center) and set output levels to 12 o'clock.
13) Turn unit off and then on again. Note how long it takes before output appears on scope- should be no more than 2-3 seconds.

INPUT SET-UP AND SYSTEM GAIN TEST

1) Turn on power switch- power LED only should light.
2) Look at U1-1 with probe. Adjust R13 (1K trim pot) so signal hits the rails evenly on both side. Signal should be about 22Vp-p.
3) Engage –10dB switch. U1-1 becomes 1.7Vrms. Disengage –10dB switch.
4) Scope trigger to B. Set oscillator to –46dBV (5mVrms).
5) Output level to 10. Output should be about 8Vrms.
6) Engage limiter. Limiter LED should light. (Output raises slightly.)
7) Decrease limiter to 0. Output drops to 6Vrms.

INPUT SET-UP AND SYSTEM GAIN TEST(contd.)

8) Disengage limiter.
9) Look at tip of headphone output jack (J4). Output should be about 1Vrms at this point.
10) Repeat step 9 looking at ring of headphone output jack.

TONE CONTROLS TEST

1) Set all large knobs to center (12 o'clock), switches out, small knobs to 0.
2) Set scope-B to 1V/cm and 2ms/cm.
3) Set oscillator to 100Hz square wave at –46dBV.
4) Look at output, compare to Fig. 1.
5) One at a time, turn tone control knobs and compare output to figures (resetting each to center after finishing):
   A) Treble to 10- Fig. 2; Treble to 0- Fig. 3.
   B) Hi-mid freq. and level to 10- Fig. 4.
   C) Hi-mid to 0, level 10- Fig. 5.
   D) Hi-mid to 0, freq. on 0- Fig. 6.
   E) Lo-mid freq. and level to 10- Fig. 7.
   F) Lo- mid freq. to 0, level on 10- Fig. 8.
   G) Lo-mid level to 0, freq. on 0- Fig. 9.
   H) Bass to 10- Fig. 10; Bass to 0- Fig. 11.

VOICING FILTERS TEST

1) Engage low-cut switch- compare to Fig. 12. Disengage.
2) Increase contour to 10- compare to Fig. 13. Turn to 0.
3) Increase hi-boost to 10- compare to Fig. 14. Turn to 0.

BOOST / CHORUS / BALANCED OUTPUTS TEST

1) Increase boost to 10- compare to Fig. 15. Turn to 0.
2) Change scope trigger to A and scope-A to 0.1V/cm range.
3) Look at direct out (J4) pins 2,3 - compare to Fig. 16.
4) Engage chorus switch with rate and depth to 0.
5) Look at balance out-R(J3) pin 3 (center), compare to Fig. 17.
6) It should have a small spike that moves back and forth approx. 1 division every 2-3 seconds.
7) Increase rate to max. and spike travel should speed up to about once every .7 seconds. Rate to 0.
8) Increase depth to max. and the spike should travel back and forth about 5 divisions. Depth to 0.
9) Look at balance out-R pin 2(left). Spike should be slightly smaller than that in Fig. 17.
10) Engage 1-2 switch (S5)- J3 pin 3 changes, J3 pin 2 stays the same.
11) Compare balance out-L(J4) pins 2-3 to Fig. 17.

FOOTSWITCH TEST

1) Set scope-B to 2V/cm, trigger to B.
2) Connect RF2 to footswitch jack (J8) using stereo cord.
3) Set boost to max and chorus switch in on front panel.
4) Set RF2 switches so LED's are off - compare to Fig. 1.
5) Engage boost switch. Boost LED should light on footswitch.
6) Compare output to Fig. 15. Disengage boost switch.
7) Engage chorus switch. LED should light on RF2 and on front panel.
8) Compare output to Fig. 18. Disengage chorus switch.
9) Remove footswitch, set boost to 0.

RETURN AND STEREO AUX IN TEST

1) Set AC-VM to 10V scale.
2) Set oscillator to 100 sine wave at –26dBV (50mV).
3) Insert plug from oscillator into return jack (J6).
4) Set output to 10. Output = 2Vrms.
5) Insert plug from oscillator half-way into stereo aux. in jack (J5). Output = 3.5Vrms.
6) Push plug in rest of way. Output should be same as above.

NOISE TEST

1) Remove oscillator input.
2) Turn large knobs to 10, small knobs to 0, switches out.
3) Connect speaker to output, listen for noise. It should be clean with no crackling or distortion.
4) Change AC-VM range to 0.1V.
5) Noise should measure less than 30mV.
6) Engage low-cut, hi-boost and contour to 10. Noise < 150mVrms.
7) Voicing filters off or to 0, boost to 10, chorus on.
8) Noise < 200mVrms.

RETURN KNOBS TO ZERO- READY FOR BURN-IN

MB-E WAVEFORMS

100 Hz square wave @ -46dBV (5mVrms) input
All large knobs to 12:00, small knobs to 0, switches out
Look at output with scope set on 2ms/div and 1V/div

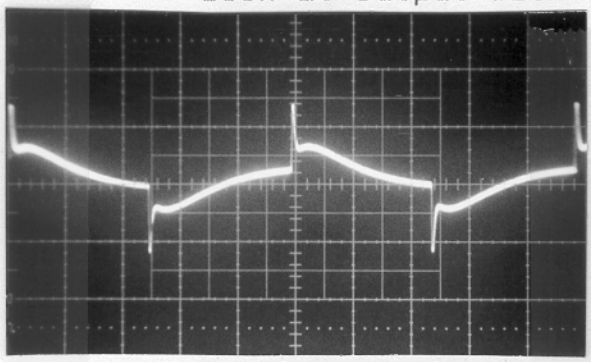


Fig. 1. Tones Center, Filters Off.

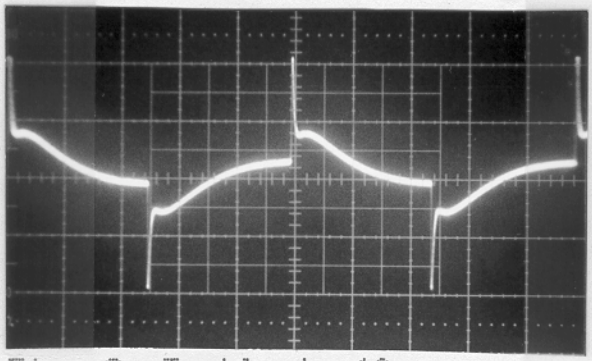


Fig. 2. Treble to 10.

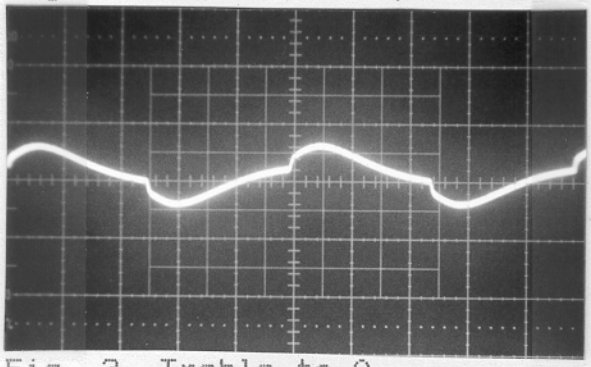


Fig. 3. Treble to 0.

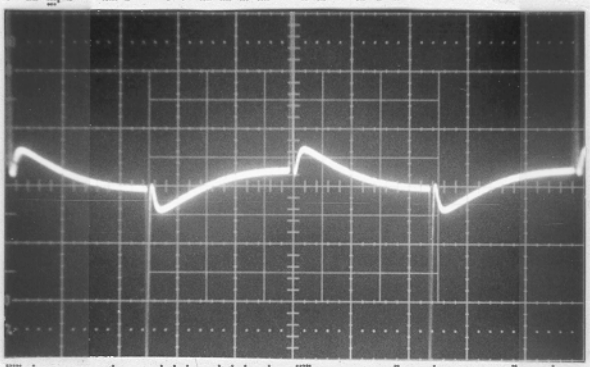


Fig. 4. Hi-Mid Freq & Level to 10.

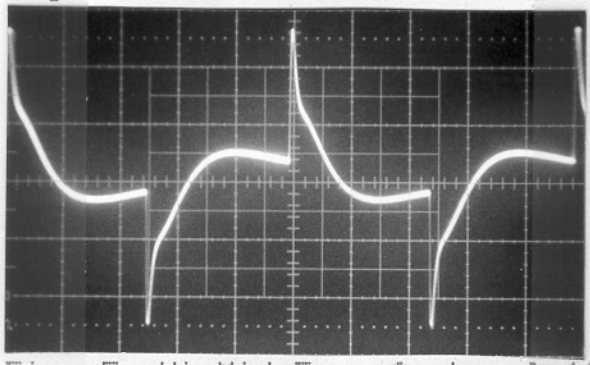


Fig. 5. Hi-Mid Freq-0, Level-10.

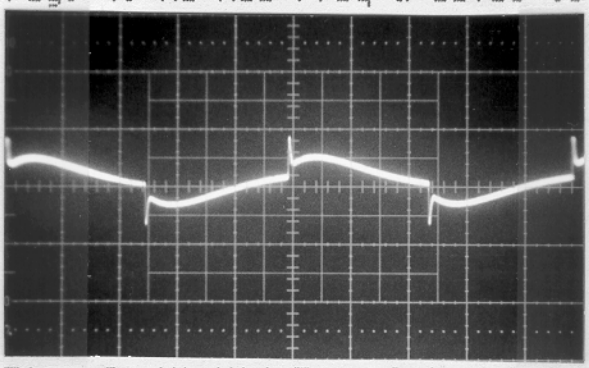


Fig. 6. Hi-Mid Freq & Level to 0.

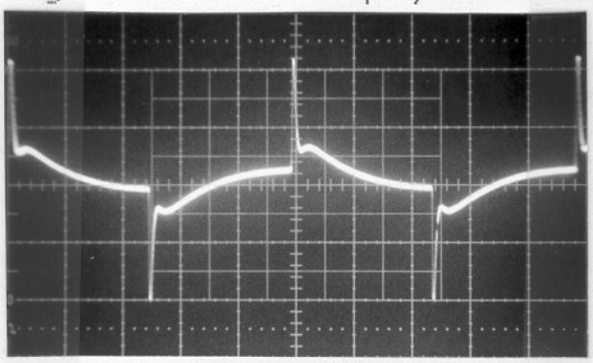


Fig. 7. Lo-Mid Freq & Level to 10.

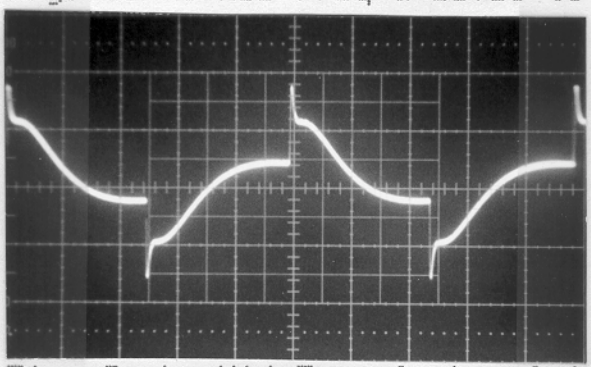


Fig. 8. Lo-Mid Freq-0, Level-10.

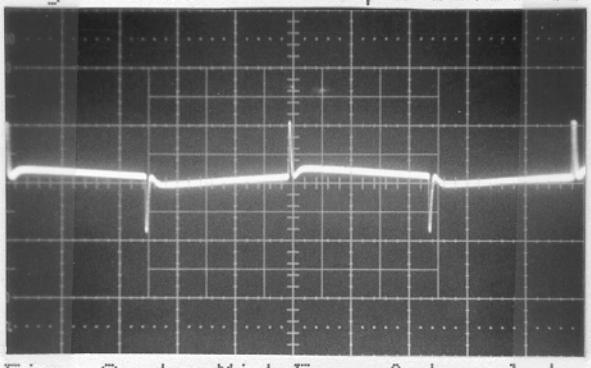


Fig. 9. Lo-Mid Freq & Level to 0.

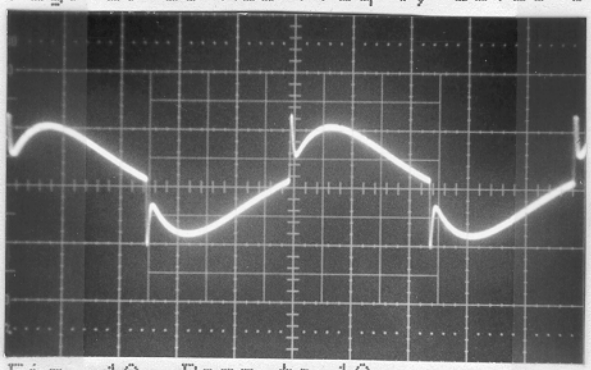


Fig. 10. Bass to 10.

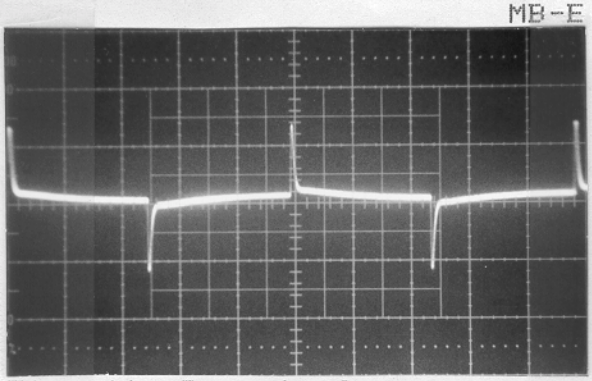


Fig. 11. Bass to 0.

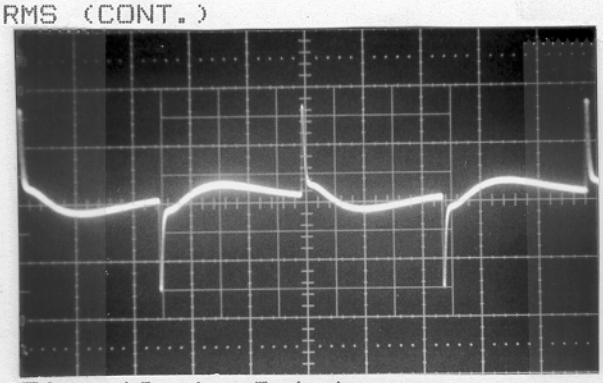


Fig. 12. Lo-Cut in.

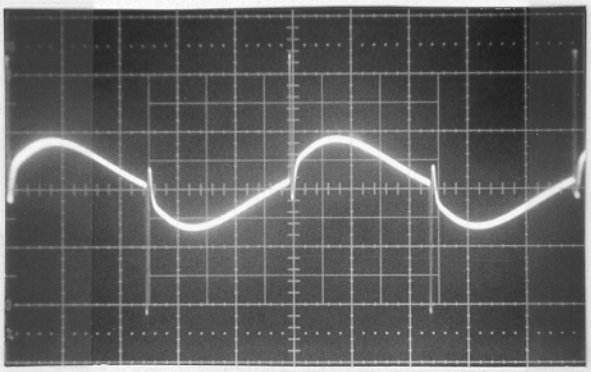


Fig. 13. Contour to 10.

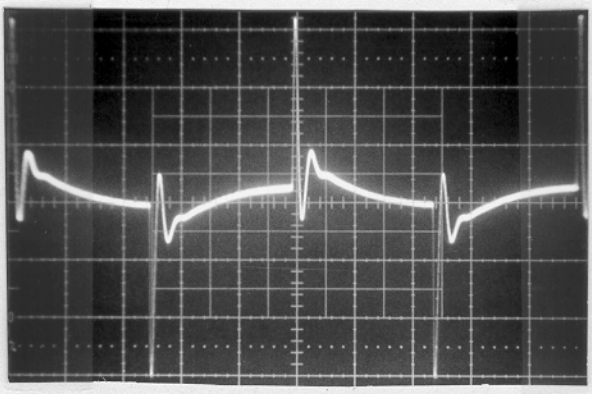


Fig. 14. Hi-Boost to 10.

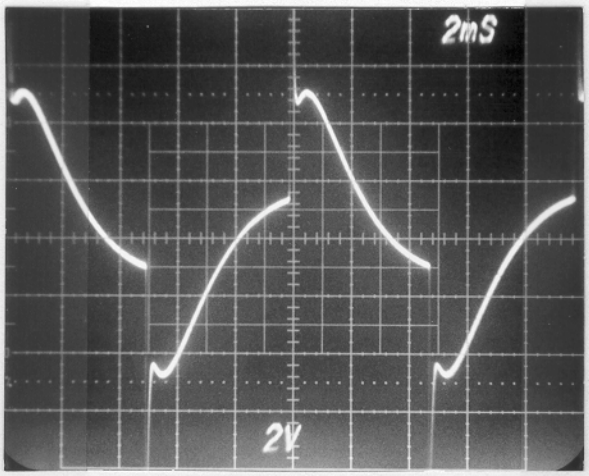


Fig. 15. Boost to 10.

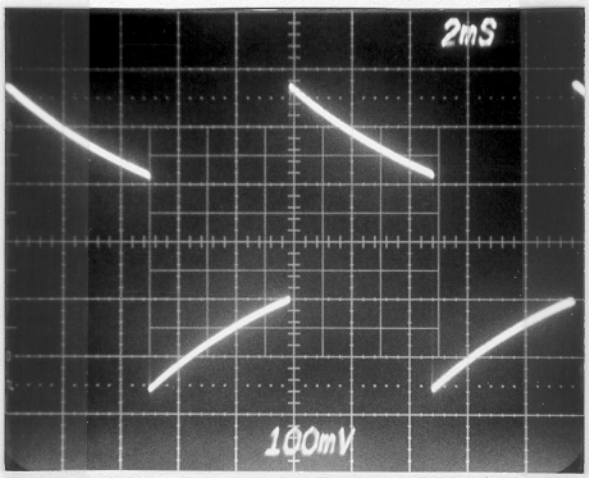


Fig. 16. Direct Out (J4) pins 2&3

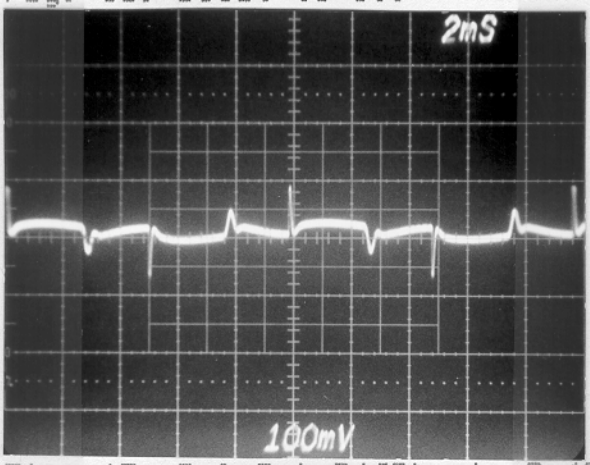


Fig. 17. Bal Out-R(J3) pin 3 (S5 out)

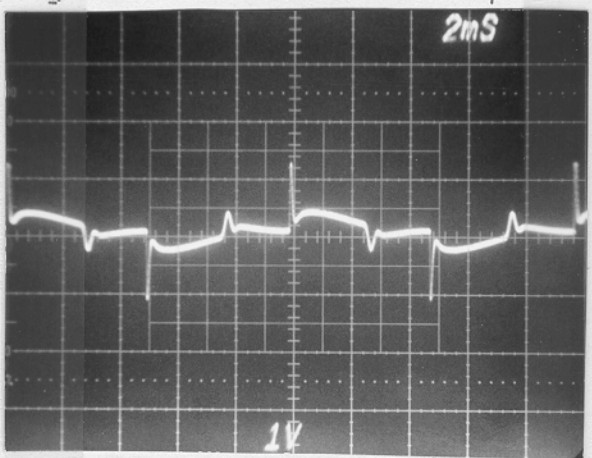
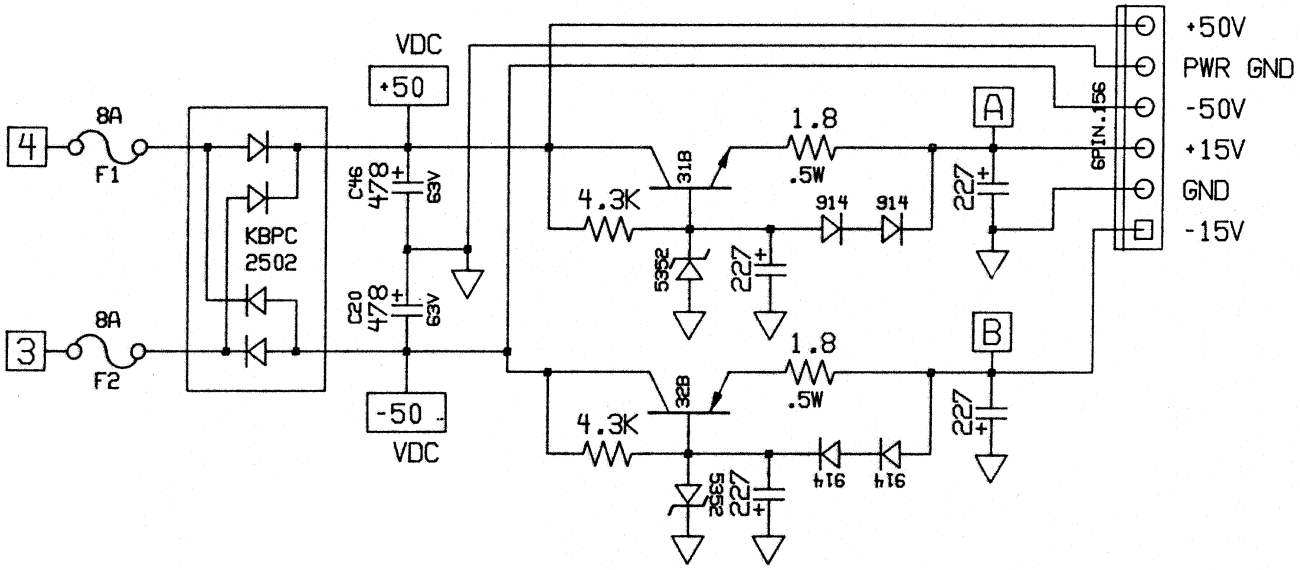
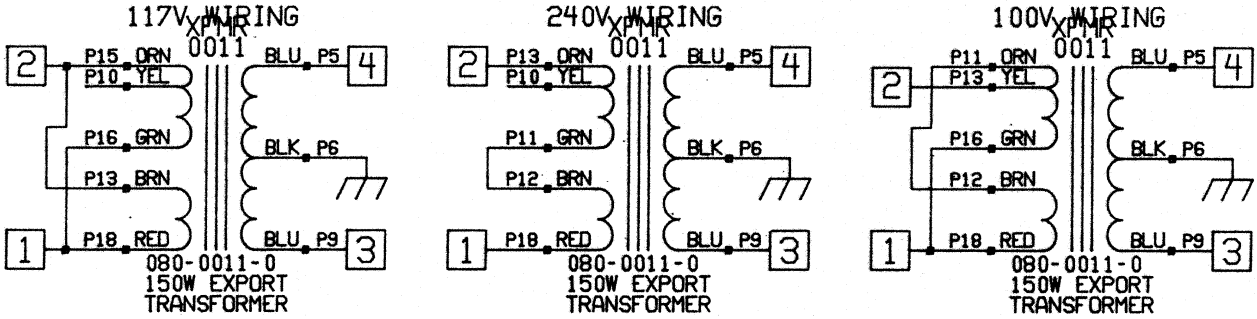
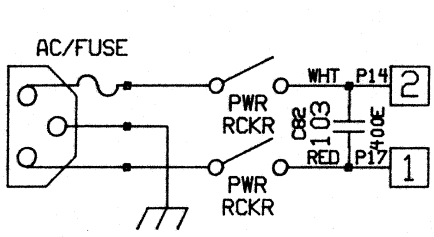


Fig. 18. Output with Chorus on.

NOTE: Refer to ECO #'s 28 and 37 for changes that may not be indicated on the schematics.

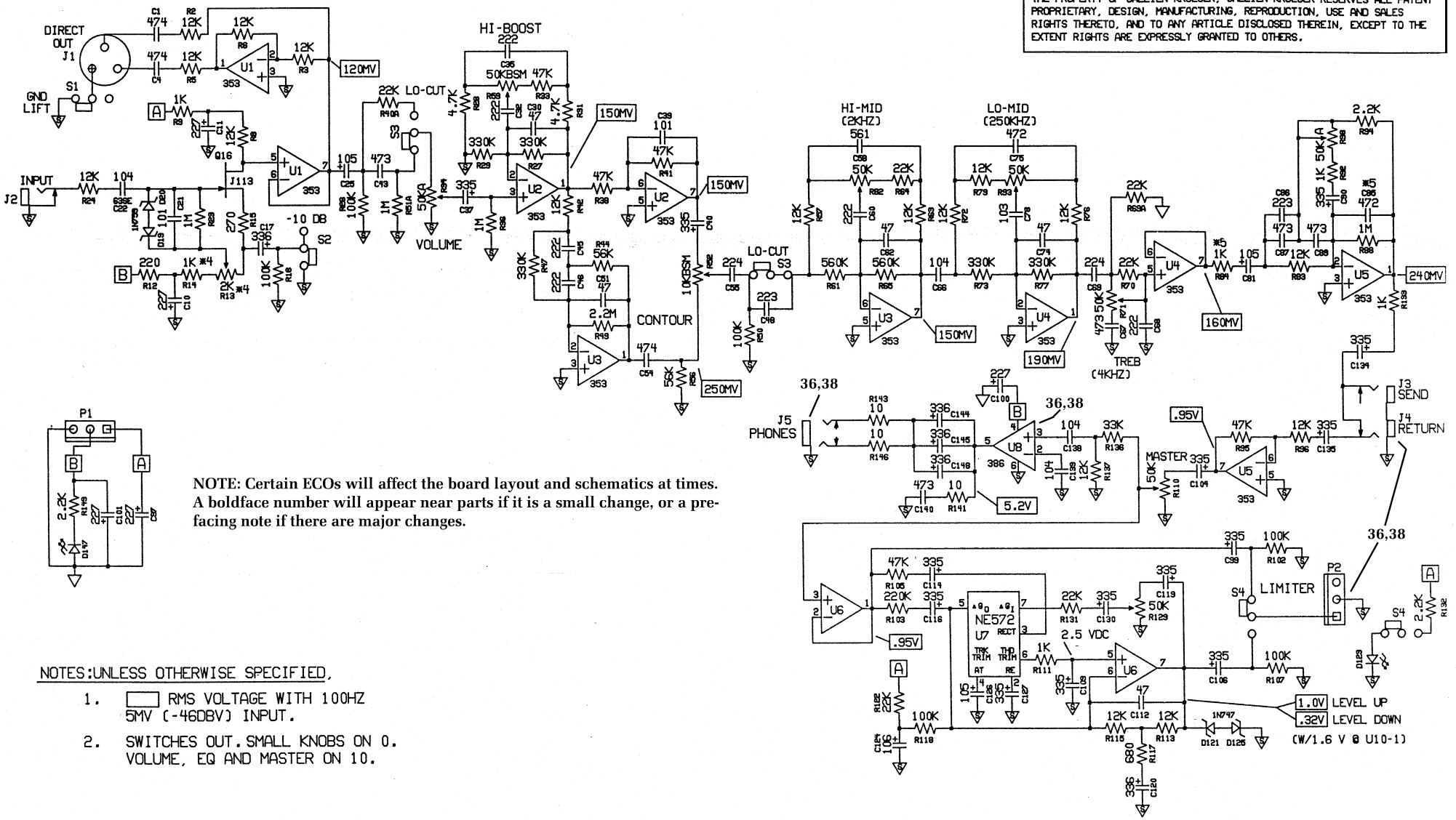






SEE ABOVE FOR CORRECT TRANSFORMER WIRING FOR EACH MODEL DEPENDING ON VOLTAGE.

GALLIEN-KRUEGER		DATE: 5/3/94	DESCRIPTION: PWR SUPPLY BOARD		
SCHEMATIC PG: 1 OF: 1	MODEL #: MB150-E/S	DESIGNED BY: M. JOHNS	BOARD #: 406-0084A	FROM SN:	TO SN:



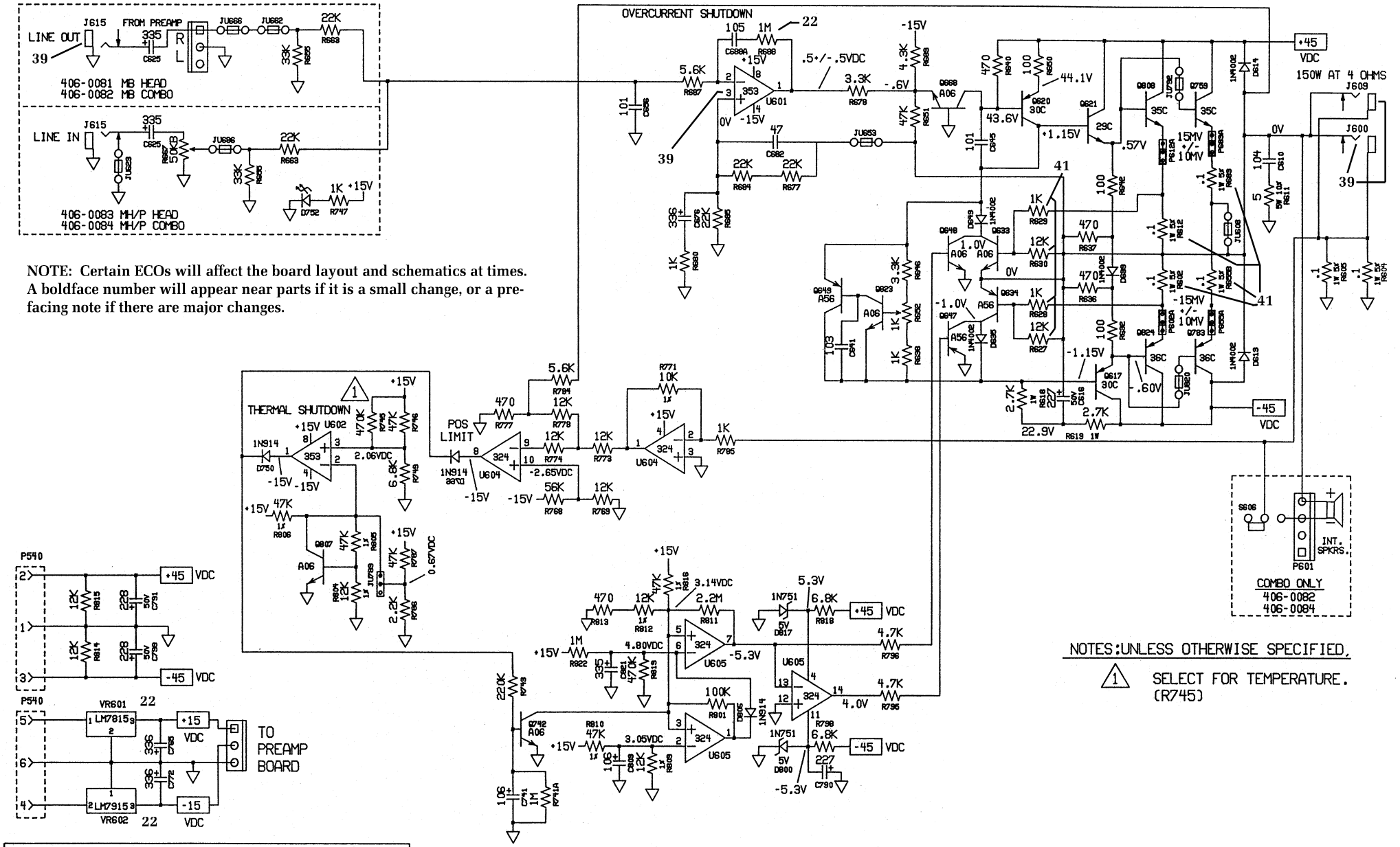
NOTE: Certain ECOs will affect the board layout and schematics at times. A boldface number will appear near parts if it is a small change, or a prefacing note if there are major changes.

NOTES:UNLESS OTHERWISE SPECIFIED,

1. ☐ RMS VOLTAGE WITH 100HZ 5MV (-46DBV) INPUT.
2. SWITCHES OUT. SMALL KNOBS ON 0. VOLUME, EQ AND MASTER ON 10.

PCO#	DATE	FIRST SN	PCO#	DATE	FIRST SN	PCO#	DATE	FIRST SN	PCO#	DATE	FIRST SN
4	1/91										
5	1/91										

GALLIEN-KRUEGER	MODEL #: MB-S PREAMP	DATE: 1-24-91	DESCRIPTION: MICRO BASS - STD. PREAMP		
SCHEMATIC PG: 1 OF: 1	DESIGNED BY: M.P.J.	BOARD #: 406-0061C/D	PCO#-DATE: 5 - 1/91	FROM SN#:	TO SN:

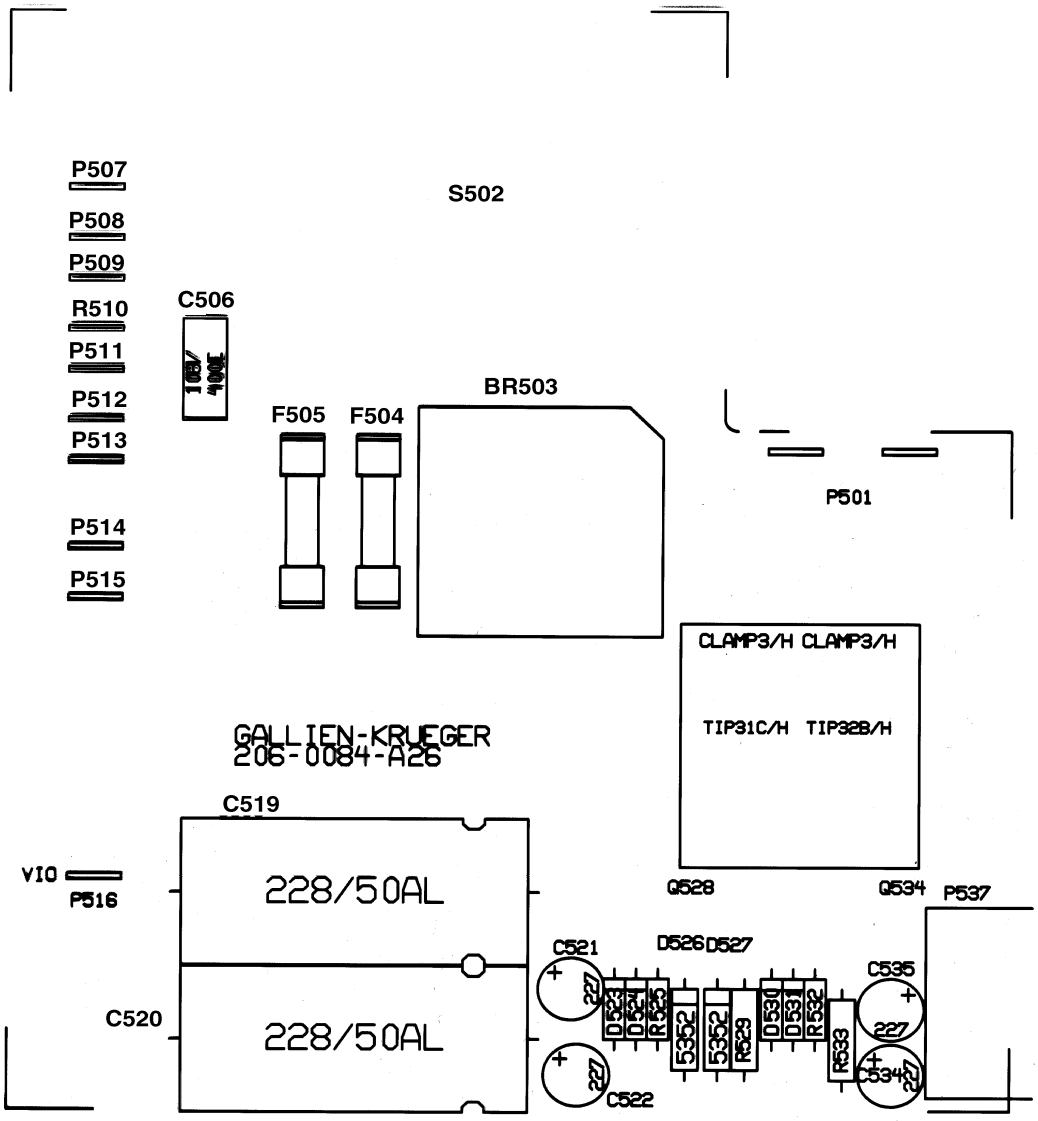


NOTE: Certain ECOs will affect the board layout and schematics at times. A boldface number will appear near parts if it is a small change, or a prefacing note if there are major changes.

NOTES:UNLESS OTHERWISE SPECIFIED,

1 SELECT FOR TEMPERATURE. (R745)

GALLIEN-KRUEGER	MODEL #: MB PWR AMP	DATE: 1-30-91	DESCRIPTION: MONO HIGH DAMPING POWER AMP, 150W		
SCHEMATIC PG: 1 OF: 1	DESIGNED BY: A.MIHALKA	BOARD #: 406-0081D 0082D 0083D 0084D	PCO#-DATE: -	FROM SN:	TO SN:

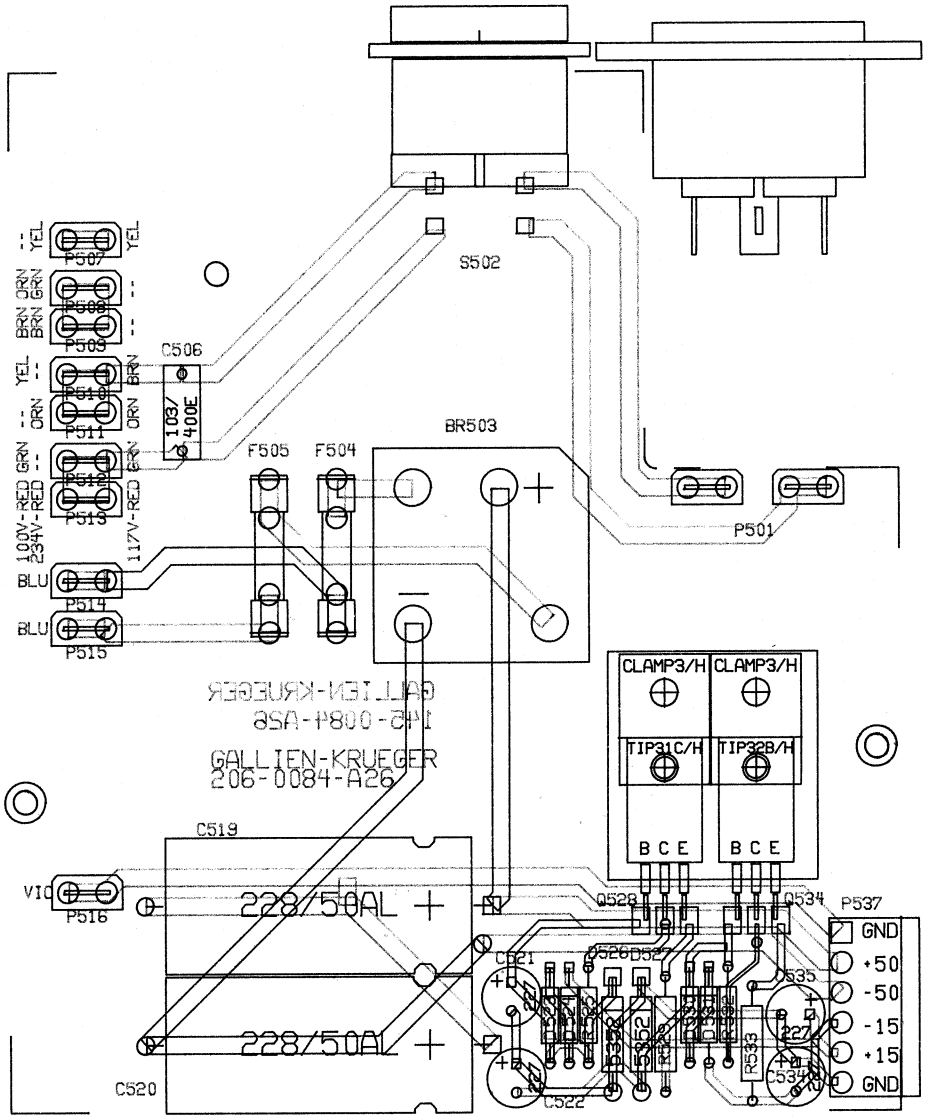


145-0084 REV A 24

COMPONENT SIDE SHOWN SILKSCREEN LEGEND

GK DOC #:	PCO#	DATE									
	24	5/94									

GALLIEN TECHNOLOGY 2240 PARAGON, SJ, CA 95131 408-441-8081		MODEL #: MB150	DATE: 5/13/94	DESCRIPTION: LINEAR POWER SUPPLY	
PCB LAYOUT	DBF: 50084A24	DESIGNED BY: MPJ/RAG	BOARD #: 2060084A24	PCO#-DATE: 24- 5/94	FOR: (COMPANY) GALLIEN-KRUEGER



PADMASTER
COMPONENT TRACE

145-0084 REV A 26
COMPONENT SIDE SHOWN

GK DOC #:	PCO#	DATE	26	6/94						
	24	5/94								

GALLIEN TECHNOLOGY 2240 PARAGON, SJ, CA 95131 408-441-8081		MODEL #: MB150	DATE: 6/1/94	DESCRIPTION: LINEAR POWER SUPPLY	
PCB LAYOUT	DBF: 50084A26	DESIGNED BY: MPJ/RAG	BOARD #: 145-0084A26	PCO#-DATE: 26- 6/94	FOR: (COMPANY) GALLIEN-KRUEGER