

G.A.P. 1

INSTRUCTION MANUAL

U.S. Patents #4647876, 4696044, 4745309
Other patents pending.
Foreign patents pending.



INTRODUCTION

The Rocktron Guitar Amplifier Processor system is a single rackspace system allowing the user to simulate virtually any processed guitar amplifier sound. The G.A.P. 1 incorporates Rocktron's new AGX system (Automatic Gain Expansion), which provides noise free performance when using high gain distortion. The G.A.P. 1 is equipped for optional external footswitching.

This operating manual will introduce you to the G.A.P. 1 and its various functions. After reading this manual carefully, keep it for future reference.

PRECAUTIONS

NOTE: IT IS VERY IMPORTANT THAT YOU READ THIS SECTION TO PROVIDE YEARS OF TROUBLE FREE USE. THIS UNIT REQUIRES CAREFUL HANDLING.

All warnings on the equipment and in the operating instructions should be adhered to and all operating instructions should be followed.

Do not use this equipment near water. Care should be taken so that objects do not fall and liquids are not spilled into the unit through any openings.

DO NOT ATTEMPT TO SERVICE THE EQUIPMENT. THIS EQUIPMENT SHOULD BE SERVICED BY QUALIFIED SERVICE PERSONNEL ONLY. DO NOT REMOVE THE COVER FROM THIS EQUIPMENT AT ANY TIME. DO NOT MAKE ANY INTERNAL ADJUSTMENTS OR ADDITIONS TO THIS EQUIPMENT AT ANY TIME. DO NOT TAMPER WITH INTERNAL ELECTRONIC COMPONENTS AT ANY TIME. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY VOID WARRANTY SERVICE TO THIS EQUIPMENT, AS WELL AS CAUSING SHOCK HAZARD.

VOLTAGE RATINGS

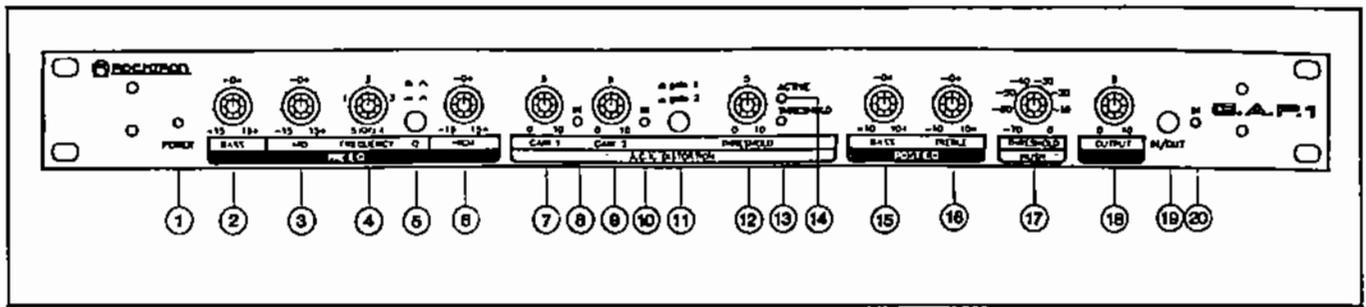
Make sure your AC outlet satisfies the voltage rating to avoid damage to this unit. The back of this unit will be rated one of the following:

JAPAN:	100 V 50/60Hz
US/CANADIAN:	115 V 50/60Hz
GERMANY/FRANCE/FINLAND:	220-240 V 50/60Hz

OPERATING TEMPERATURE

Do not expose the unit to excessive heat. This unit is designed to operate between 32 F and 104 F (0 C and 40 C). This unit may not function properly under extreme temperatures.

FRONT PANEL DESCRIPTION



(1) . . **POWER LED:**

This LED indicates the G.A.P. 1 is powered on.

(2) . . **BASS LEVEL CONTROL:** Variable

The Bass control features a cut or boost of 15dB at low frequencies.

(3) . . **MID LEVEL CONTROL:** Variable

The Mid control features a cut or boost of 15dB at mid frequencies. However, the mid frequencies effected are adjustable.

(4) . . **FREQUENCY CONTROL:** Variable

The Frequency control selects a range of frequencies between 500Hz and 4KHz that are to be effected by the mid control.

(5) . . **Q:** Switch

The Q switch selects between a broad or narrow frequency curve. The Q switch works in conjunction with the center frequency of the mid band.

(6) . . **HIGH LEVEL CONTROL:** Variable

The High control features a cut or boost of 15dB at high frequencies.

(7) . . **GAIN 1:** Variable

The Gain 1 control gives the user the ability to adjust the amount of gain of the pre-amp in Gain 1 setting.

(8) . . **GAIN 1 LED:**

When lit, indicates that Gain 1 control is operational.

(9) . . **GAIN 2:** Variable

The Gain 2 control offers another setting of adjustable gain of the pre-amp, in Gain 2 setting.

(10) . . **GAIN 2 LED:**

When lit, indicates that Gain 2 control is operational.

(11). . . **GAIN 1 - GAIN 2 SWITCH:**

This switch allows selection of either Gain 1 or Gain 2 control. The switch is by-passed with the use of an optional external footswitch accessible via the rear panel. LEDs for each gain setting indicate which one is activated.

(12). . . **THRESHOLD CONTROL:** Variable

The Threshold control sets a point where the automatic gain expander can work at maximum performance. It is adjustable for input signals covering a wide range.

(13). . . **THRESHOLD LED:**

This LED indicates the AGX circuit is below the threshold point and full expansion is taking place.

(14). . . **ACTIVE LED:**

This LED indicates the AGX circuit is activated and is reducing the gain of the pre-amplifier stage. When the LED is not lit, full gain is resumed.

(15). . . **BASS LEVEL CONTROL:** Variable

The Bass control features a cut or boost of 10dB at low frequencies after the pre-amp stage.

(16). . . **TREBLE LEVEL CONTROL:** Variable

The Treble control features a cut or boost of 10dB at high frequencies after the pre-amp stage.

(17). . . **HUSH THRESHOLD CONTROL:** Variable

The Threshold control of the HUSH circuit adjusts the level at which expansion takes place and the sensitivity of the dynamic filter.

(18). . . **OUTPUT LEVEL CONTROL:** Variable

The Output control adjusts the final level of the signal at the units output.

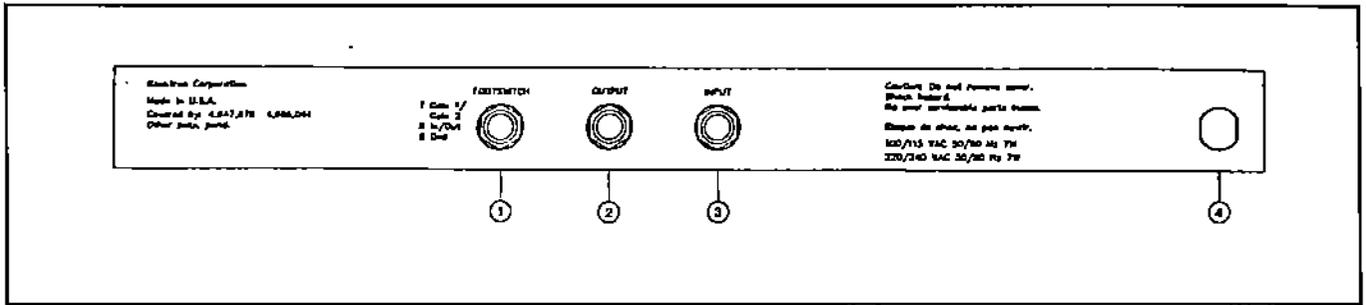
(19). . . **IN/OUT:** Switch

This switch selects processed or by-passed signal. This switch is by-passed with the use of the footswitch.

(20). . . **IN/OUT LED:**

This LED indicates what mode the in/out switch is in.

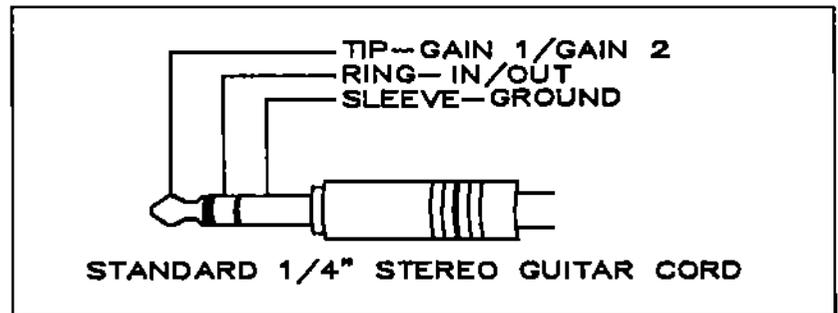
REAR PANEL DESCRIPTION



(1). . .STEREO FOOTSWITCH JACK:

This standard 1/4" stereo jack accepts a dual function optional external footswitch for selection of Gain 1 or Gain 2 and in/out switching of the unit.

T Gain 1/Gain 2
 R In/Out
 S Ground T R S



(2). . .OUTPUT JACK:

This standard 1/4" mono jack provides the output of the unit.

(3). . .INPUT JACK:

This standard unbalanced mono 1/4" jack is used to provide input to the unit. The input is high impedance. Read the specifications to determine the maximum input level. Failure to do so will overdrive the unit and may damage the internal circuitry.

(4). . .POWER CORD:

NOTE: VERIFY YOUR AC WALL OUTLET'S VOLTAGE RATING AGREES WITH THAT OF THE UNIT.

This cord is provided to connect the unit to your AC wall outlet. **DO NOT RUN THIS UNIT FROM CAR BATTERIES OR ANY OTHER EXTERNAL POWER SOURCE.**

OPERATION

For optimal use of the G.A.P. 1 a basic understanding of the controls and the basic format of the unit is required. The G.A.P. 1 is divided into five basic sections:

— PRE-EQ (PRE-DISTORTION EQUALIZATION) SECTION

— AGX (AUTOMATIC GAIN EXPANSION) SYSTEM

The AGX circuit works in conjunction with the gain selected via Gain 1/Gain 2.

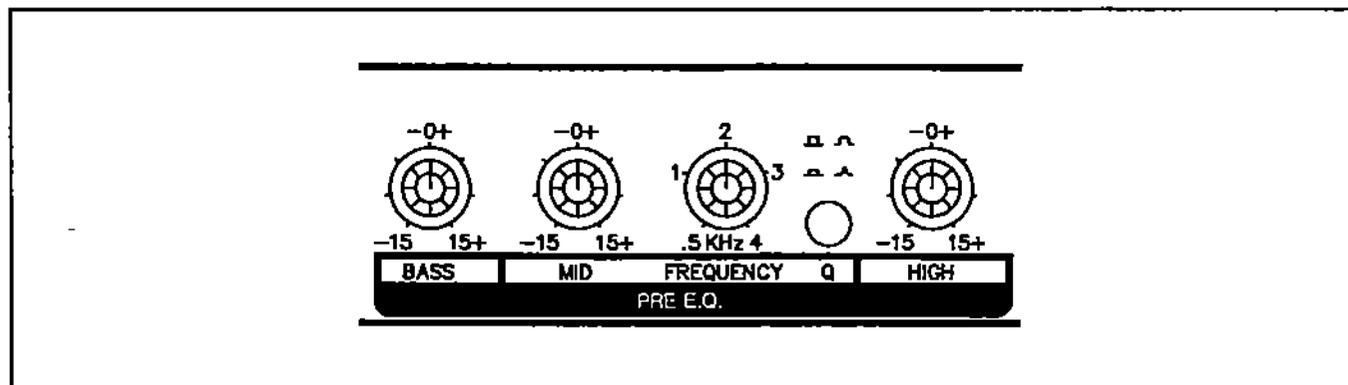
— POST EQ (POST DISTORTION EQUALIZATION) SECTION

— HUSH SINGLE ENDED NOISE REDUCTION SYSTEM

— OUTPUT (MASTER OUTPUT CONTROL)

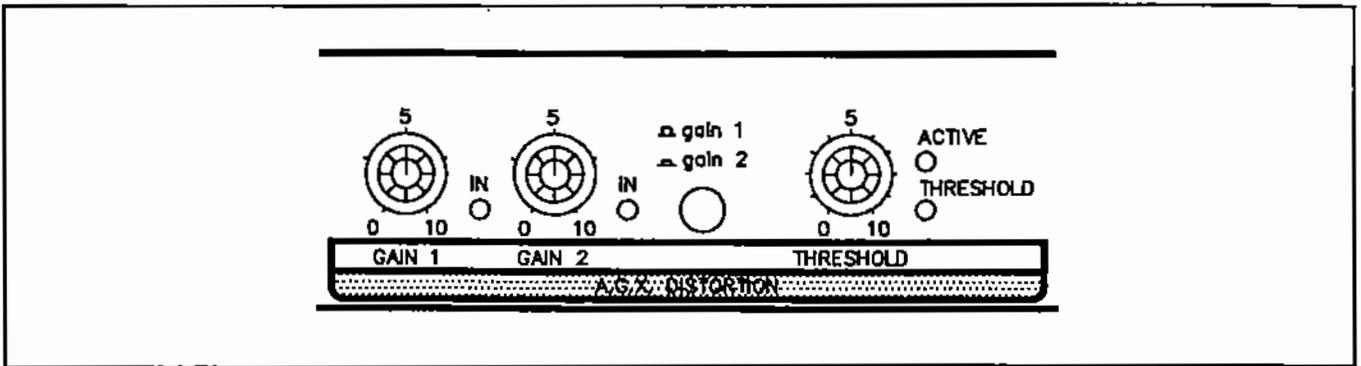
To understand the basic format of the G.A.P. 1 it becomes clear that the Pre-EQ section selects the tone of the instrument prior to distortion. The AGX section determines the gain of the distortion circuit and determines the active points of the Automatic Gain Expansion System. The Post EQ varies the bass and treble content after the distorted signal is derived. The HUSH section is variable to provide additional noise reduction for optimal noise free operation. The output determines the output signal from the G.A.P.1 pre-amplifier.

PRE EQ SECTION:



This section of the G.A.P. 1 allows the user to shape the tone of the guitar signal before it gets to the pre-amp stage. Considerable tone variations can be achieved using the cut/boost controls from this section. By also having an adjustable mid-frequency control, even more variations can be obtained.

AGX SECTION:



The new AGX™ system (Auto Gain Expansion) solves the long standing problem encountered by guitar players when using high gain distortion. No more noise! No more amplification of extraneous signals such as AC line hum, light interference, RF pick-up, and uncontrolled feedback. The guitar player no longer has to sacrifice high gain or volume to achieve a quiet signal. The AGX circuit expands the gain of the amplification circuit only when required based on the input level. When no signal is present, the AGX circuit expands down the amplification level to a point where hum and noise are eliminated. Playing softly allows a clean guitar sound without any noise or distortion that is typically encountered with high gain amplification. Playing with more intensity increases the amplification factor, thus creating more distortion and sustain. The AGX circuit will accurately track the dynamics of the guitar while providing the solution to the noise problem.

HOW TO USE THE AGX:

The AGX circuit is simple to use. Start by turning the threshold pot full c.c.w. Now, create the sound you want and the volume you wish to play at. With the volume pot on your guitar up all the way, mute the strings with your hand so that no signal is present. Simply turn the AGX threshold control c.w. just past the point where both the active and threshold LEDs light. All signs of gain and related noise should disappear. The AGX circuit is now set. (Note: some experimenting with the threshold control may be needed to achieve the desired effect.)

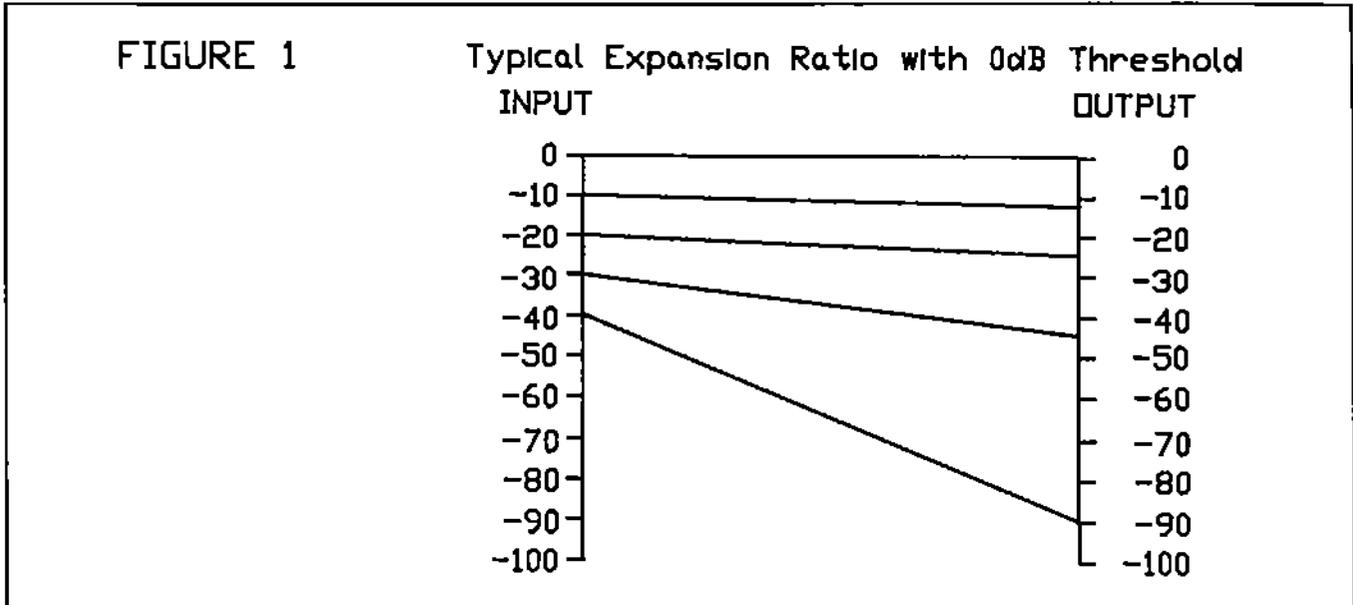
HUSH:

Rocktron's patented HUSH noise reduction circuit is also included on the G.A.P. 1, making it the quietest guitar pre-amp ever. Before exploring the control, we need a basic understanding of how this module works.

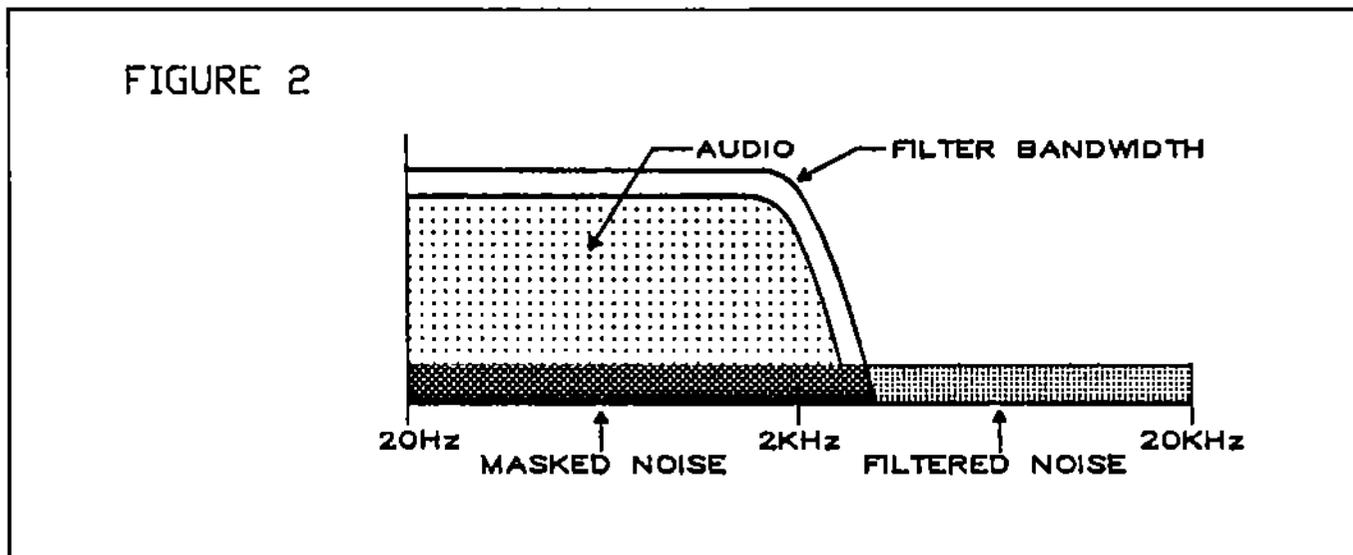
The circuit is comprised of two parts; the expander and the dynamically controlled low pass filter.

The expander operates like an electronic volume control. The design utilizes a voltage controlled amplifier (VCA) circuit which can control the gain between the input and output from unity to 30, 40, or even 50dB of gain reduction. When the input signal is above the user pre-set threshold point the VCA circuit is at unity gain. This means the amplitude of the output signal will be equal to the input signal. As the input signal amplitude drops below the user pre-set threshold point, downward expansion begins. At this point the VCA operates like an electronic volume control and gradually begins to decrease the output signal level relative to the input signal. For example, if the input signal were to drop below the threshold point by 10dB, the output would drop approximately 12dB. As the input signal drops further below the threshold point, downward expansion increases

exponentially. For example, if the input signal dropped 20dB below the threshold point, the output level would drop by approximately 30dB. A drop in the input level by 30dB would cause the output to drop by approximately 60dB, i.e. 30dB of gain reduction. In the absence of any input signal, the expander circuit will reduce the gain so that the noise floor becomes inaudible (Figure 1).



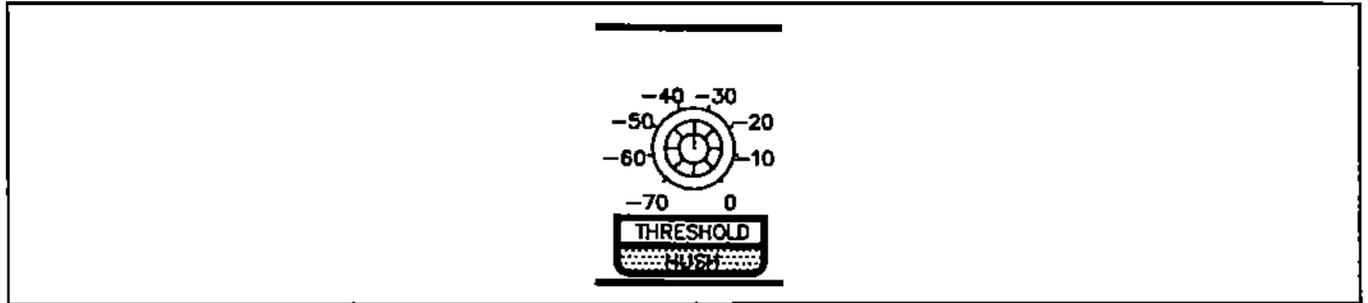
The dynamically controlled low pass filter operates as follows. In the absence of any audio signal, the dynamic filter will close down to the factory pre-set cut-off point of 800Hz. This means the filter is only allowing frequencies of 800Hz and below to pass through. If an input signal had a bandwidth of from 20Hz to 1KHz the filter would open far enough to pass up to the 1KHz frequency and its harmonics, while reducing any noise present from approximately 2KHz to 20KHz. If a broad band signal, with frequency components up to 20KHz appears at the input, the dynamic filter would open to its full extreme allowing the bandwidth to open all the way to 40KHz. In simple terms, what this means is that if a signal is present at the input which is primarily bass components, the dynamic filter will reduce any mid or high band noise. However, if the input signal has high frequency components present, the dynamic filter will open to its full extreme to pass the signal and eliminate the possibility of a loss of high end frequency response (see Figure 2).



These two processes of downward expansion and dynamic filtering work in unison to produce the highly proficient HUSH noise reduction system.

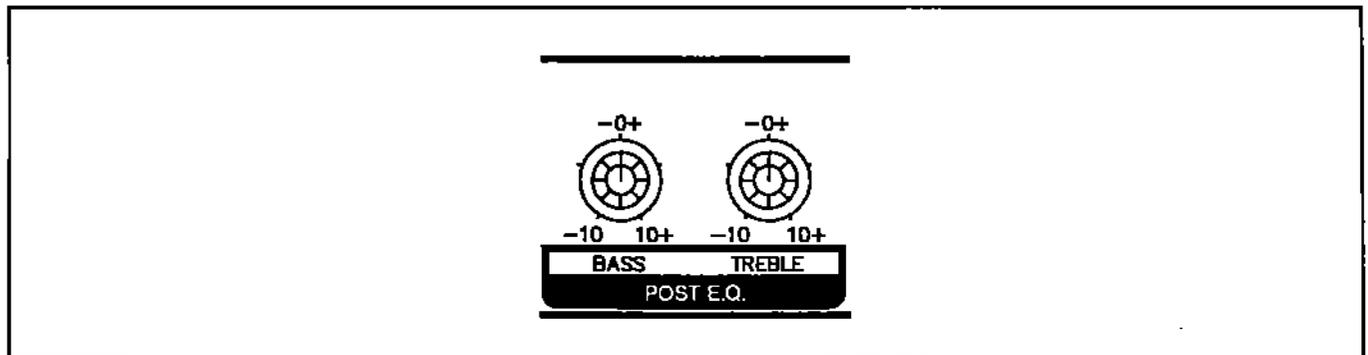
Now that we have an understanding of the workings of the HUSH unit, let's check out the control.

THE THRESHOLD CONTROL



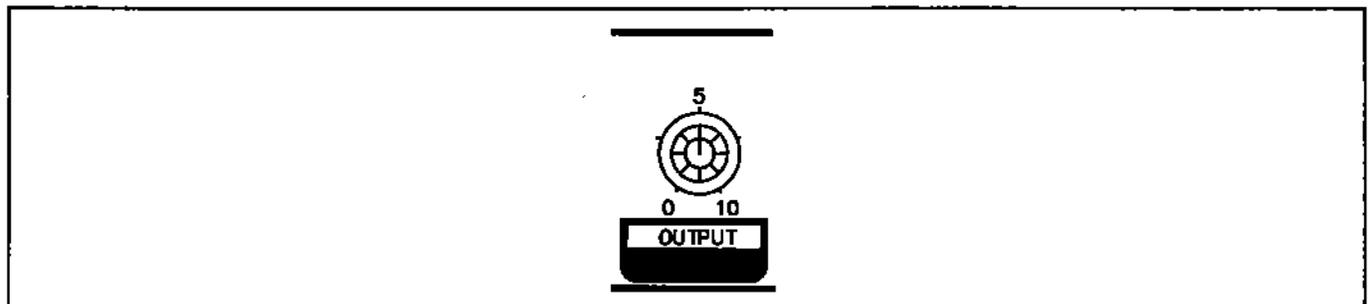
At full counter clockwise position the expander threshold is set at -40dB. As we turn the knob to the right we raise the level of threshold to as high as 0dB. At this same time we are also increasing the filter threshold from -60dB to -40dB.

POST EQ SECTION



This section of the G.A.P. 1 allows the user to shape the sound after the pre-amp stage. With cut or boost controls for both bass and treble frequencies, the user has a wide tonal range that can be reached when using this section in conjunction with the Pre-EQ section.

OUTPUT



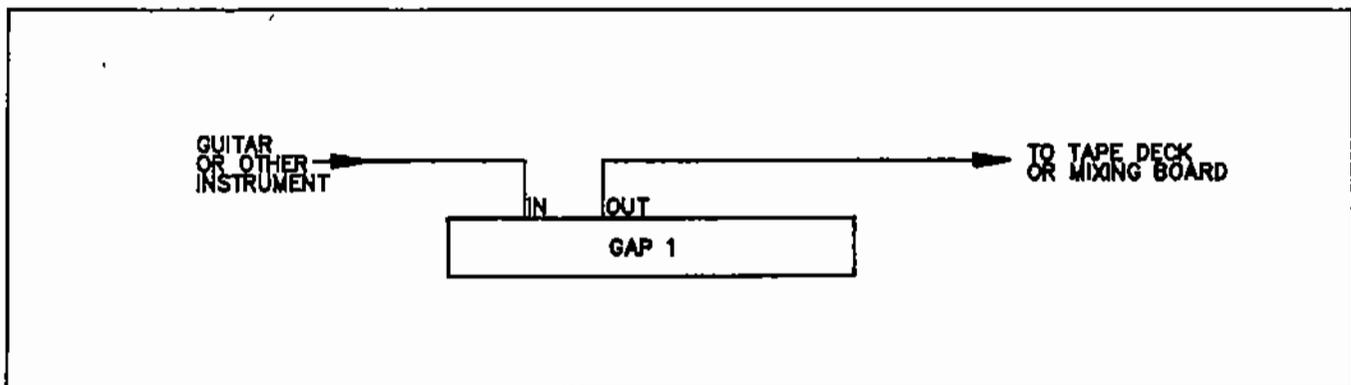
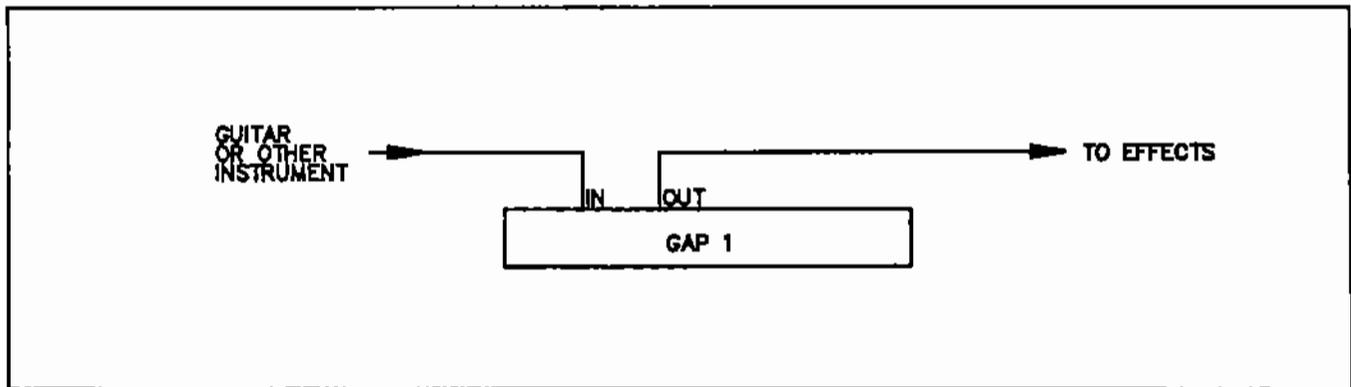
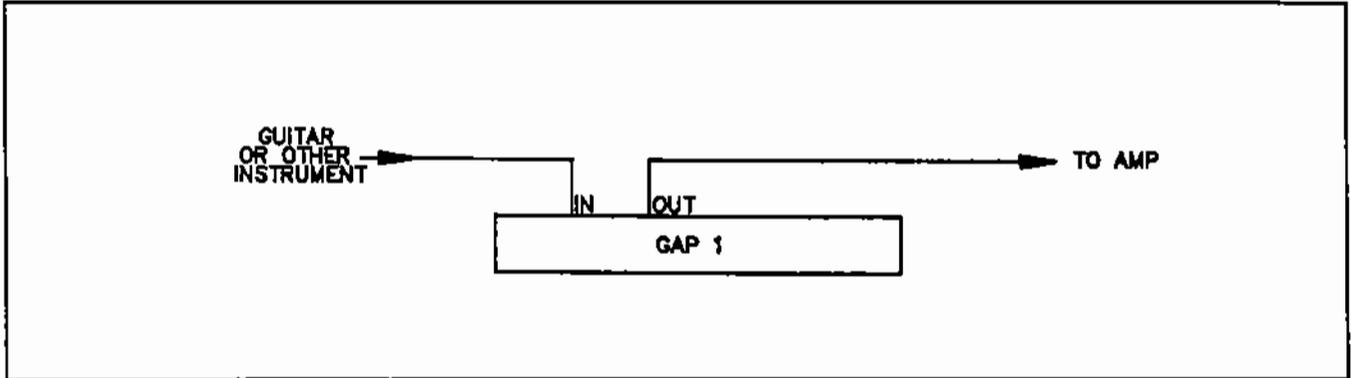
This section simply adjusts the overall volume level of the G.A.P. 1.

FOOTSWITCH FUNCTIONS

The G.A.P. 1 features two footswitch functions. One for choosing between two pre-set gain settings, and the other for bypassing the unit. Rocktron offers a dual function footswitch as well as the footswitch cable to use with the G.A.P. 1. This set up plugs into the rear panel of the unit.

CONNECTIONS

The G.A.P. 1 is designed to be used in either line or instrument level. Make the appropriate connections as shown below. (Make a habit of turning ON the power of the G.A.P. 1 before turning on the power of the output amplifier or mixing board, etc.)



SPECIFICATIONS

INPUT

Input Impedance	470K
Max. Input Level	+10dB
Input Jack	1/4" mono

NOISE FLOOR

-95dB A weighted

DYNAMIC RANGE

Greater than 100dB

EFFECTIVE NOISE REDUCTION

Up to 55dB

OUTPUT

Output Impedance	Less than 100 Ohms
Max. Output Level	+10dB
Output Jacks	1/4" mono

POWER REQUIREMENTS

110/120 VAC @ 50/60Hz

DIMENSIONS

19" x 6" x 1 3/4"

MAINTENANCE

This unit is designed to provide years of trouble-free service but requires careful handling. To maintain this unit in proper working condition read the safety instructions. If any problem is encountered do not return the unit to your dealer. Rocktron will accept full responsibility for all warranty repairs.

WARRANTY

All parts and workmanship of this Rocktron product are fully guaranteed to be free of defects under normal use and service of a period of THREE years from date of purchase.

The warranty will remain in effect until the original expiration date, regardless of whether or not the product is re-sold in the interim.

It is not required that you fill out a form for warranty registration. We would, however, recommend that the dated proof of purchase be retained throughout the warranty period.

Any damage resulting from mis-use or failure to follow instructions and precautions as stated in the product manual will void this warranty.

Should this Rocktron product require repair, Rocktron will assume responsibility for repair service. Do not return the product to the dealer. Simply repack the unit, sending along a description of the problem to: Rocktron Corporation, 1633 Star Batt Drive, Rochester, Mi 48309. All shipping charges must be fully pre-paid.

This warranty is void if the original serial number has been altered or removed, or if this unit has been altered in any way.

Rocktron Corporation reserves the right to make changes in design and/or improvements upon their products without any obligation to include those changes in any products previously manufactured.

There is no other express warranty on goods covered by this agreement.

