Allan Holdsworth's

Juice Extractor™

INSTRUCTION MANUAL

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

ROCKTRON CORPORATION

INTRODUCTION

I started experimenting around 1970 when I worked in a Top 40 band. I realized that my amp sounded good when it was turned up but I didn't like the volume and neither did anyone else. I figured that if I could turn down the speaker then I could use the amp turned up. I suppose that was my first power attenuator. I kept on working with tube amplifiers and various devices until around 1978 when I started using Hartley Thompson amps which were solid state.

Then started my interest in signal processing which was easy to interface with solid state amps, but later I started thinking how great it would be to interface a 50 watt Marshall with the signal processing that I wanted to use. I started experimenting with various gadgets beginning with a basic load resistor, but there was something ratty about that approach. I just kept working on it, changing component values etc. to try and get closer to the sound and feel of the original.

It was always obvious to me that the bulk of the tone of a distorting tube amp comes from the output section, so I just kept working on capturing the sound from the speaker output of the amp and turning it into something usable, something that could be patched right into the rig.

I used variations of this idea live from 1980 on. I didn't really think of it as being of much use to anyone else until I loaned versions of the box to friends and they all seemed to like it, so I figured it could be put to good use by other people. The last few versions of the box sounded pretty good to me. I called the chaps at Rocktron, because I really like their products and feel they are an adventurous company, to see if they would be interested in hearing the Juice Extractor. This Juice Extractor evolved from these earlier versions.

Allan Holdsworth

ALLAN HOLDSWORTH

The Rocktron/Allan Holdsworth Juice Extractor has been designed to allow the user to interface virtually any guitar amplifier with line/level signal processing equipment, or directly connect to a mixing console. The Juice Extractor will operate with amplifiers having a power output of up to 100 watts.

The Juice Extractor allows selection of a flat frequency response or allows the user to select between two pre-set speaker frequency response curve settings. In addition, a three band parametric equalizer allows the user to tailor frequency response characteristics for a desired sound. The Juice Extractor also includes Rocktron's renowned Hush single-ended noise reduction to insure the quietest sound possible, and provides six multiple outputs for driving multiple effects if required.

This operating manual will introduce you to the Juice Extractor 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 this 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 THIS 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

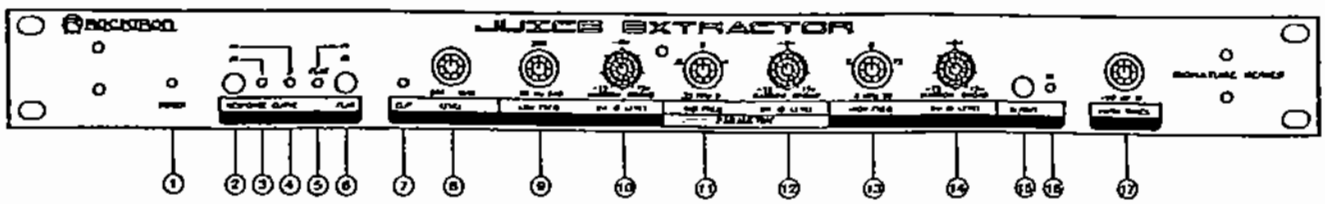
Make sure your AC outlet satisfies the voltage rating to avoid damage to this unit. The back of this unit will be rated one of the following:

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 104F (0 C and 40 C). This unit may not function properly under extreme temperatures.

FRONT PANEL DESCRIPTION



(1). . .**POWER ON/OFF LED:**
This LED indicates power On/Off.

(2). . .**RESPONSE CURVE:** Switch
This switch allows the user to select between Curve 1 and Curve 2.

(3). . .**RESPONSE CURVE LED 1:**
When the Response Curve switch is out a response curve designed by Allan Holdsworth will be selected, allowing a subtle roll off of high frequencies.

(4). . .**RESPONSE CURVE LED 2:**
When the response Curve switch is in, a response curve is selected which replicates that of a guitar speaker. This is specifically designed for direct recording applications.

(5). . .**FLAT LED:**
When lit indicates the Flat switch is switched In.

(6). . .**FLAT SWITCH:**
Bypasses the filtering curves to receive directly the signal from your amplifier. When engaged, it overrides the Response Curve switch.

(7). . .**CLIP LED:**
Indicates overdriving of the parametric circuit. NOTE: Clipping begins at +20dB.

(8). . .**LEVEL CONTROL:** Variable
Adjusts the input level over approximately a 60dB range.

(9). . .**LOW FREQUENCYCONTROL:** Variable
Selects the low band frequency, from 26Hz to 640Hz.

(10). . .**LOW BANDWIDTH CONTROL/LEVEL CONTROL:** Concentric Variable
The outer control adjusts the frequency bandwidth for the low band section. The inner control allows 15dB of cut or boost at the frequency selected by the Low Frequency control.

(11). . .**MID FREQUENCY CONTROL:** Variable
Selects the mid band frequency from .25 to 5KHz.

(12). . .**MID BANDWIDTH CONTROL/LEVEL CONTROL:** Concentric Variable

The outer control adjusts the frequency bandwidth for the mid band section. The inner control allows 15dB of cut or boost at the frequency selected by the Mid Frequency control.

(13). . .**HIGH FREQUENCY CONTROL:** Variable

Selects the high band frequency, from .8 to 20KHz.

(14). . .**HIGH BANDWIDTH CONTROL/LEVEL CONTROL:** Concentric Variable

The outer control adjusts the frequency bandwidth for the high band section. The inner control allows 15dB of cut or boost at the frequency selected by the High Frequency control.

(15). . .**IN/OUT SWITCH:**

The In/Out switch determines if the 3 band parametric equalizer is in the signal path or not. In the IN position the equalizer is active, in the OUT position it is bypassed.

(16). . .**IN LED:**

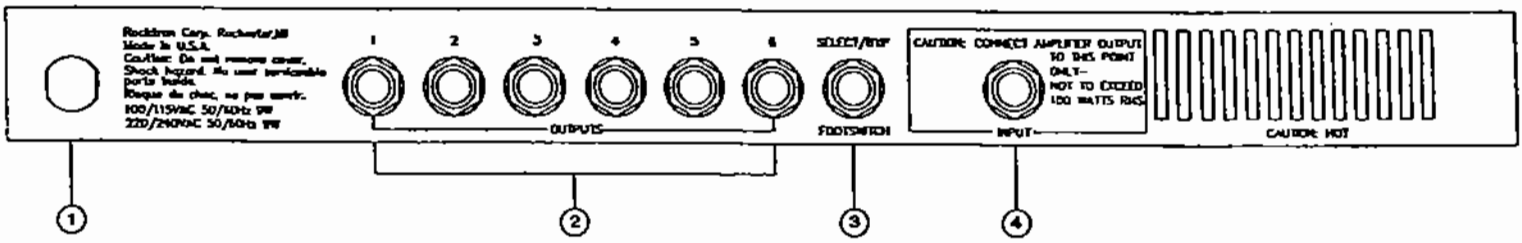
Indicates that the 3 band equalizer is in the signal path.

(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.

The Threshold control sets the point at which downward expansion begins to take place. It is adjustable over approximately a 50dB range.

REAR PANEL DESCRIPTION



(1). . .**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.

(2). . .**OUTPUT JACKS 1-6:**

These standard unbalanced 1/4" mono jacks are used to provide the outputs of the unit.

(3). . .**RESPONSE CURVE/FLAT FOOTSWITCH JACK:**

This standard 1/4" stereo jack accepts a dual function optional external footswitch for a choice between the response curve mode and the flat mode.

T = FLAT R = RESPONSE CURVE S = GROUND

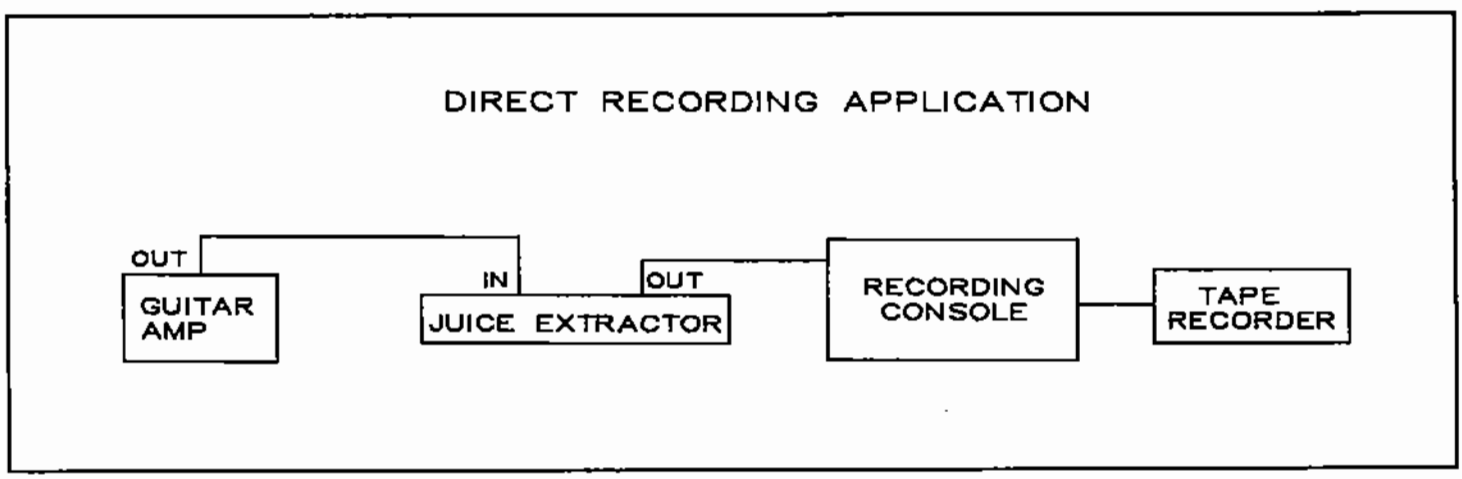
NOTE: When using a stereo cable or footswitch, the front panel Response and Flat switches become inoperable.

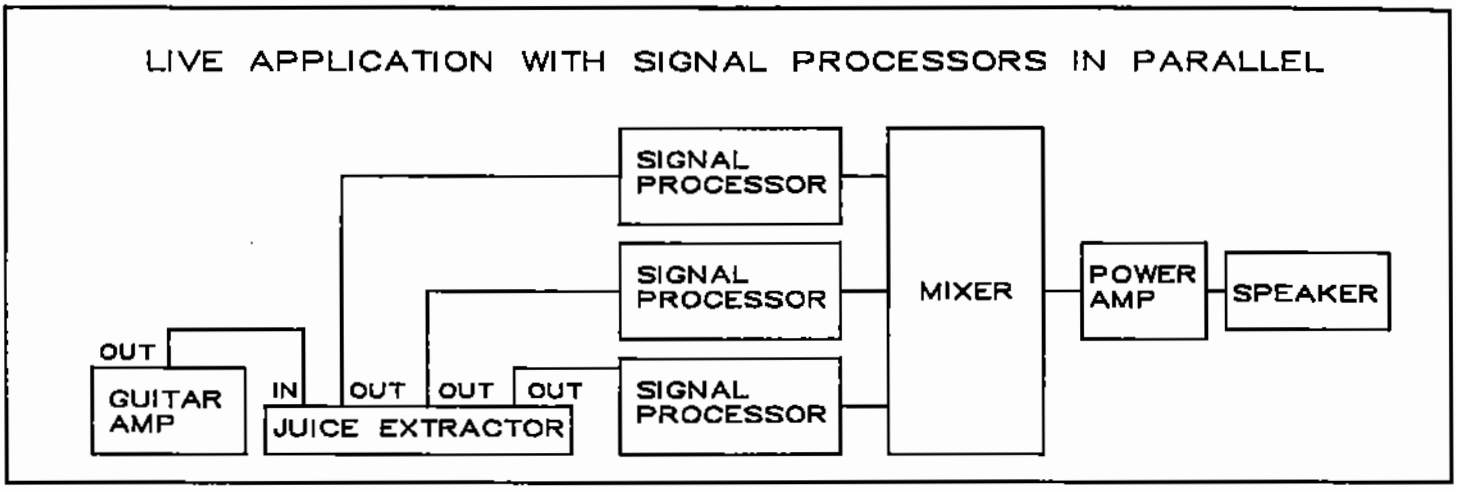
(4). . .**INPUT JACK:**

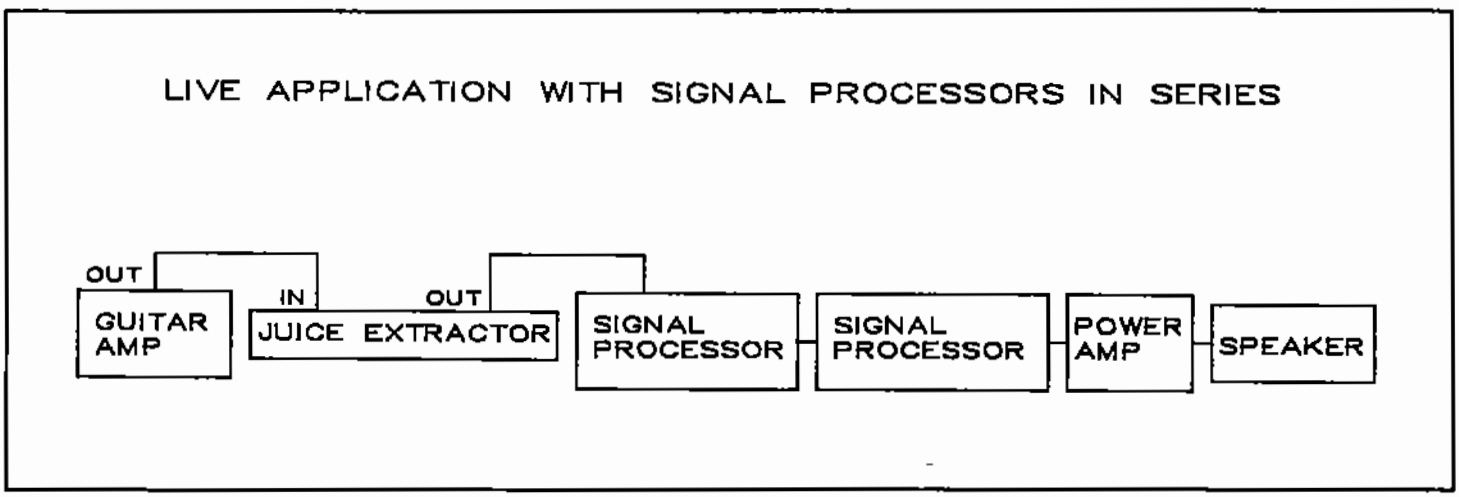
This standard unbalanced 1/4" mono jack provides input to the unit. NOTE: Input will only handle amplifiers up to 100 watts. Do not exceed 100 watts. It is also very important that the speaker output be plugged ONLY into the Input jack of the Juice Extractor. If the speaker output is plugged into one of the output jacks, or the footswitch jack, the Juice Extractor's internal circuitry can be damaged.

CONNECTIONS

The Juice Extractor may be directly connected to a mixing console, tape deck, power amplifier, or other signal processing equipment.







OPERATION

For amplifier users, the normal method for creating a specific sound is to either play straight through an amplifier, or to play through the amplifier and to set a mike in front of the speaker cabinet. This specific sound has then been created under very specific circumstances (a specific mike distance and angle from the speaker, a specific location in a specific room, etc.). Several problems become apparent immediately, such as the inconsistancy of exact mike location, use of different rooms having different ambient characteristics, no two speaker cabinets reacting exactly alike, depending on one specific amplifier and specific speaker, as well as getting the amplifier level to a usable level (line level) by miking the speaker cabinet or by going through a load box.

The Juice Extractor was designed to solve these problems for the amplifier user. The Juice Extractor has a reactive load. This reactive load simulates and replaces a speaker physically. In other words, it reacts as the speaker would in a physical sense, moving in response with changes in amplitude. The response curve selected in the Juice Extractor provides the frequency response of the simulated speaker. Two curves are provided for selection. These curves can be used as is, or as a starting point for modifying the curve. Also selectable is a Flat curve. This bypasses the provided response curves, and allows the user to create a totally independent curve setting. To either modify the provided response curves, or to create an independent curve setting, a three band parametric section is provided for tailoring the speaker response curves.

NOTE: If you are creating your own curve from the Flat curve, start with the High Frequency of the

parametric cut back and then add as desired.

The Juice Extractor can simulate any individual speaker cabinet characteristics and can be used to duplicate a specific speaker, with a specific sound, time and time again without any inconsistencies due to equipment positioning and set-up, as well as changes in rooms, etc.

The Juice Extractor also automatically provides six outputs at line level. Another feature incorporated in the Juice Extractor is the inclusion of Rocktron's HUSH II single ended noise reduction circuit. This circuit is comprised of two parts: an Expander and a 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 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. (See fig. 1)

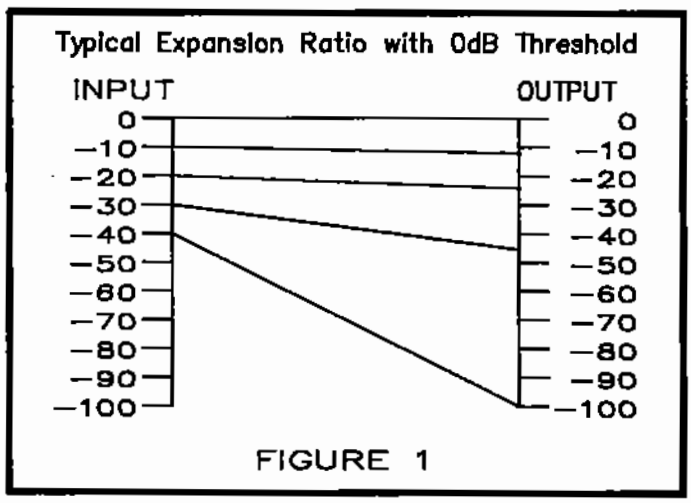
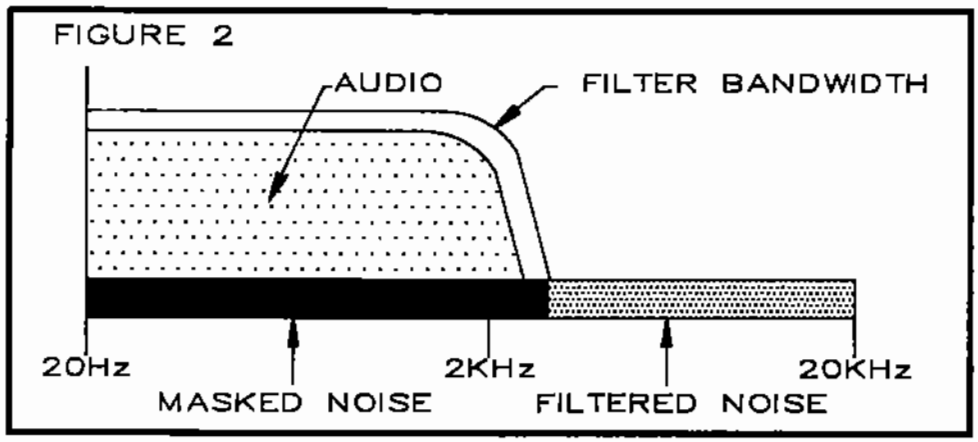


FIGURE 1

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 has a bandwidth of 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 frequency response. (See fig. 2)



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

The Threshold control at the full counter clockwise position, sets the expander threshold at -50dB. As we turn the knob to the right, we raise the level of the threshold to as high as 0dB. At this same time, we are also increasing the filter threshold from -60dB to -40dB.

The Juice Extractor also features two footswitch functions that can be used with an optional footswitch. One function chooses between Response Curve 1 or Response Curve 2, and the other for selecting the Response Curves or the Flat Curve.

SPECIFICATIONS

INPUT

Input Impedance	8 Ohms
Max. Input	+20dB
Input Jack	1/4" Mono
Footswitch Jack	1/4" Stereo

DYNAMIC RANGE Greater than 110dB

OUTPUT

Max. Output Level	+20dB
Output Impedance	Less than 150 Ohms
Output Jack	1/4" Mono

3 BAND PARAMETRIC CUT/BOOST LEVELS

	+/-15dB
Low Frequency	26Hz to 640Hz
Mid Frequency	250Hz to 5KHz
High Frequency	800Hz to 20KHz

DISTORTION Less than .015% @1KHz @0dB

NOISE FLOOR -90dB

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 for 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 prepaid.

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.

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