ROCKTRON

TECHNOLOGY FOR GUITARISTS

TRU-BYPASS

HUSH 2X

Instruction Manual

Compliance

Your HUSH 2X™ pedal has been tested and complies with the following Standards and Directives as set forth by the European Union:

Council Directive(s):	89/336/EEC	Electromagnetic Compatibility
Standard(s):	EN55013, EN50082-1	

This means that this product has been designed to meet stringent guidelines on how much RF energy it can emit, and that it should be immune from other sources of interference when properly used. Improper use of this equipment could result in increased RF emissions, which may or may not interfere with other electronic products.

To insure against this possibility, always use good shielded cables for all audio input and output connections. This will help insure compliance with the Directive(s).

For more information about other Rocktron products, please see your local dealer or one of our importers closest to you (listed on the Rocktron website (www.rocktron.com).

Read all instructions contained in this manual.
Keep these instructions
Heed all warnings
Follow all instructions.
Do not use this apparatus near water.
Clean with dry cloth

Precautions

Refer all service to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply or plug is damaged, liquid has been spilled or objects have fallen into the apparatus or if the apparatus has been exposed to rain or moisture, does not operate normally or has been dropped.

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

OPERATING TEMPERATURE

Do not expose this 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.

Do not block any ventilation openings (if applicable). Install in accordance with the manufacturer's instructions.
Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
This product is not equipped with a plug or cable. This unit runs on a 9 Volt Battery, if a 9Volt DC adapter is the used please follow adapter manufacturer's operation instructions.
Only use attachments/accessories specified by the manufacturer.
Do not use this product with any case, stand tripod, bracket or table that is not specified by the manufacturer. Insure that the case, stand, tripod, bracket etc. is properly adjusted and setup (follow all instructions). Extra care and caution should be taken to avoid tip over and injury.
Unplug this apparatus during lightening storms or when unused during long periods of time.

Introduction

Got hiss? Get HUSH!

Rocktron provides a new twist on the world famous HUSH guitar noise reduction with the HUSH 2X. Essentially a "double HUSH", the 2X offers two completely separate channels of HUSH noise reduction in a single small unit designed to sit right on top of your guitar amp/head or in a rack drawer, freeing up space on your pedal board. The HUSH 2X is also TRUE BYPASS.

This unique design allows you to choose if you want to run HUSH after your pedal board and into the input of your head with one circuit, and into the effects loop with the other circuit offering new versatility in a single HUSH unit. You get total HUSH control both in front, and in the effects loop, of your amp! The HUSH 2X will also allow you to use one HUSH circuit before, and another after, a single pedal or with two different pedal chains on your pedal board/rack drawer. Selector switches allow you to turn each HUSH circuit on or off.

The same great HUSH signal cleanup is provided with up to 65dB of effective noise reduction for eliminating hiss, unwanted feedback and noise from pickups and stage lighting.

Guitar Player Magazine wrote that a "HUSH" pedal will work for all guitar-related noise problems: it's perfect" and "its potent noise-killing abilities will be fully appreciated."

Introduction continued....

For maximum noise reduction results, place the HUSH after your distortion and modulation effects (chorus, flanger, phaser, etc.) but before any delay or reverb effects. If you are already comfortable rolling back your guitar's volume pot, simply turn your distortion and other effects in the chain before the HUSH to "ON", roll back your volume pot, adjust the HUSH Threshold control to remove any hiss you hear, and you are ready to go!

Make sure you pay attention to the proper setup by placing the HUSH AFTER your noisy stomp boxes or in your amp's effects loop. The HUSH is NOT designed to take the input directly from your guitar WITHOUT some processing happening between the guitar and the noise reduction. When setup correctly, with your signal going from your preamp and effects, or from your distortion and effects, into the HUSH, you will love how it cleans up the excess noise, including pickup buzz! The HUSH can also be used in your amplifier's effects loop. However, if you are running multiple effects through this loop, the HUSH should always be the last dynamic device in the signal chain, but before digital delays or reverbs.

The HUSH will give you the same great HUSH noise reduction used by thousands of high profile artists for years!

The switches on the HUSH 2X controls On/Off status of each channel as shown by the LED indicator. The HUSH 2X runs on a 9V Alkaline battery, or may also be powered by Rocktron's DC OnTap Universal Power Supply adaptor.

Descriptions

Descriptions continued.....

1 CHANNEL 1 - THRESHOLD Control determines the minimum input level at which the HUSH filter and downward expander will begin to operate. Setting this control too high will result in a loss of sustain, as notes will tend to die out much faster than they should. Conversely, when set too low, the expander will close too late (if at all) and the noise floor will remain audible

2 CHANNEL 1 - SWITCH - This switch allows for the HUSH to be bypassed when noise reduction is not required.

3 CHANNEL 1 - ON/OFF Led - When lit, the LED indicates that the HUSH is currently active in the signal path.

4 CHANNEL 1 - INPUT Jack - Using a standard 1/4” guitar cable, plug into this jack AFTER any noisy pedal/effect or from an “effects send”.

5 CHANNEL 1 - OUTPUT Jack - Using a standard 1/4” guitar cable you can plug in another pedal from this jack or plug directly into your amplifier or to the “effects return.”

Descriptions continued.....

6 CHANNEL 2 - THRESHOLD Control determines the minimum input level at which the HUSH filter and downward expander will begin to operate. Setting this control too high will result in a loss of sustain, as notes will tend to die out much faster than they should. Conversely, when set too low, the expander will close too late (if at all) and the noise floor will remain audible

7 CHANNEL 2 - SWITCH - This switch allows for the HUSH to be bypassed when noise reduction is not required.

8 CHANNEL 2 - ON/OFF Led - When lit, the LED indicates that the HUSH is currently active in the signal path.

9 CHANNEL 2 - INPUT Jack - Using a standard 1/4” guitar cable, plug into this jack AFTER any noisy pedal/effect or from an “effects send”.

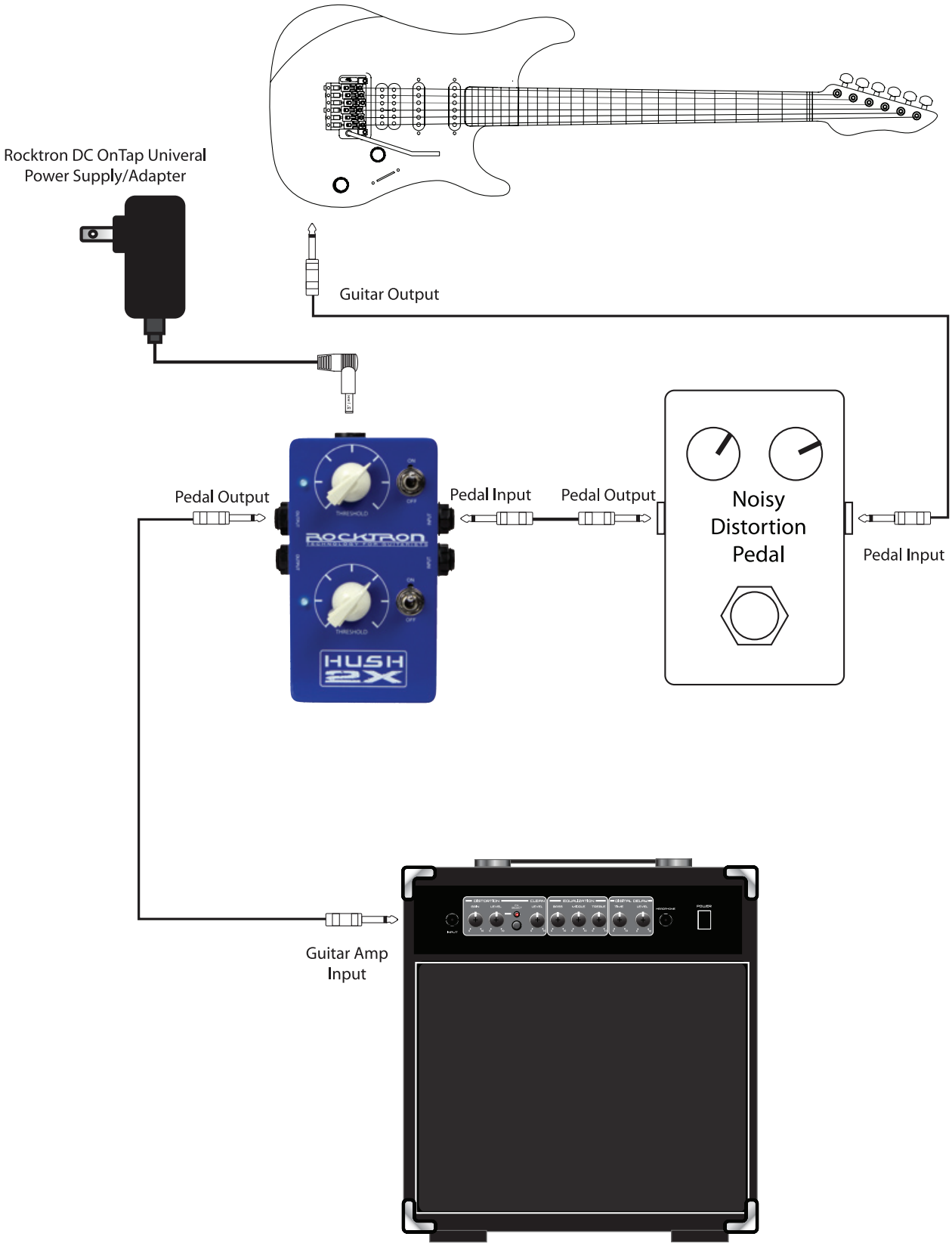
10 CHANNEL 2 - OUTPUT Jack - Using a standard 1/4” guitar cable you can plug in another pedal from this jack or plug directly into your amplifier or to the “effects return.”

Descriptions continued.....

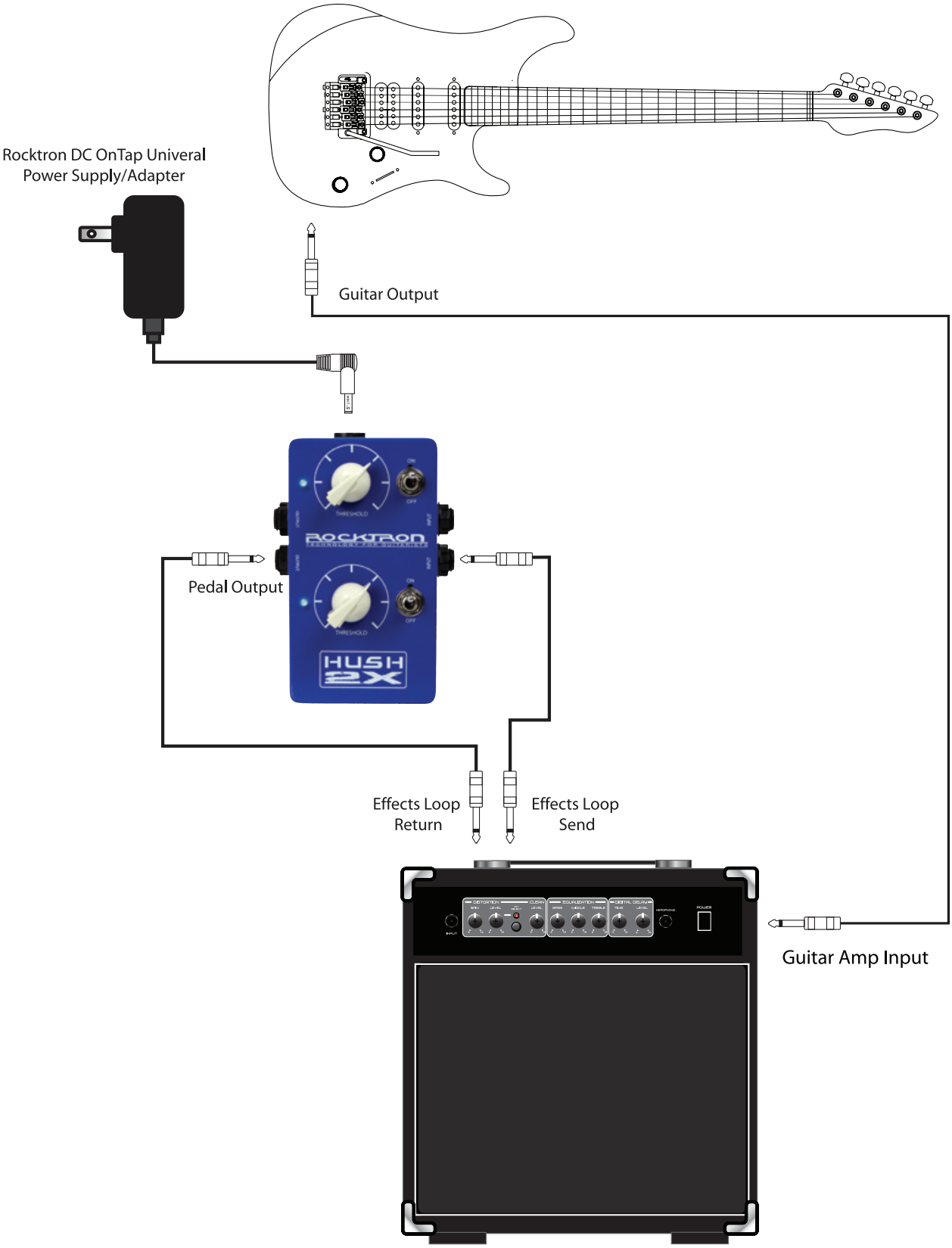
11 9VDC Input - This input jack requires 9VDC from the Rocktron DC OnTap power supply (sold separately).

12 BATTERY COMPARTMENT (not shown in photo) - The battery compartment is found on the back/ bottom of the HUSH 2X. Use a 9V battery.

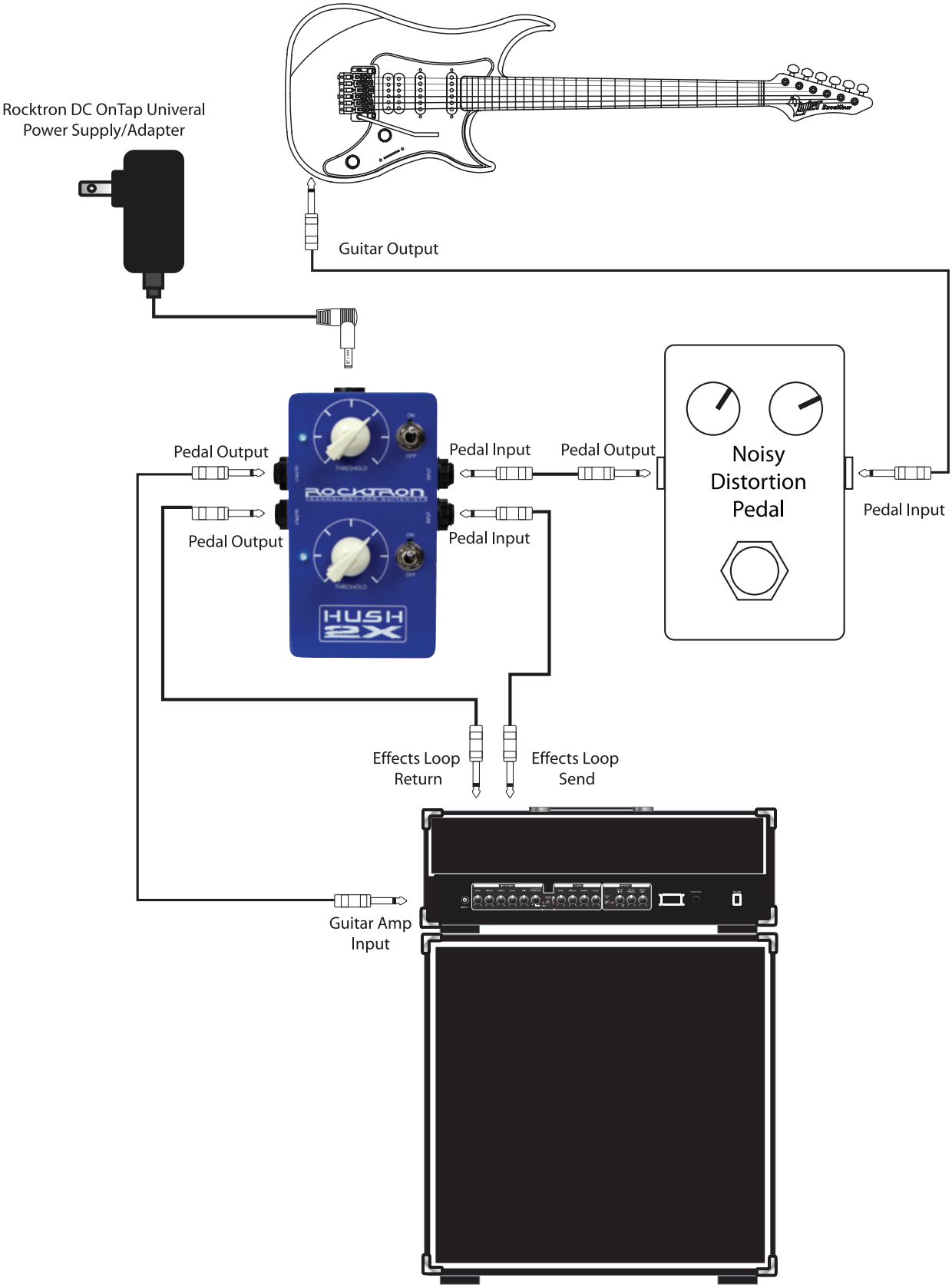
Typical Connection - Noisy Pedal



Typical Connection - Effects Loop



Typical Connection - Noisy Pedal & Effects Loop



HUSH Information

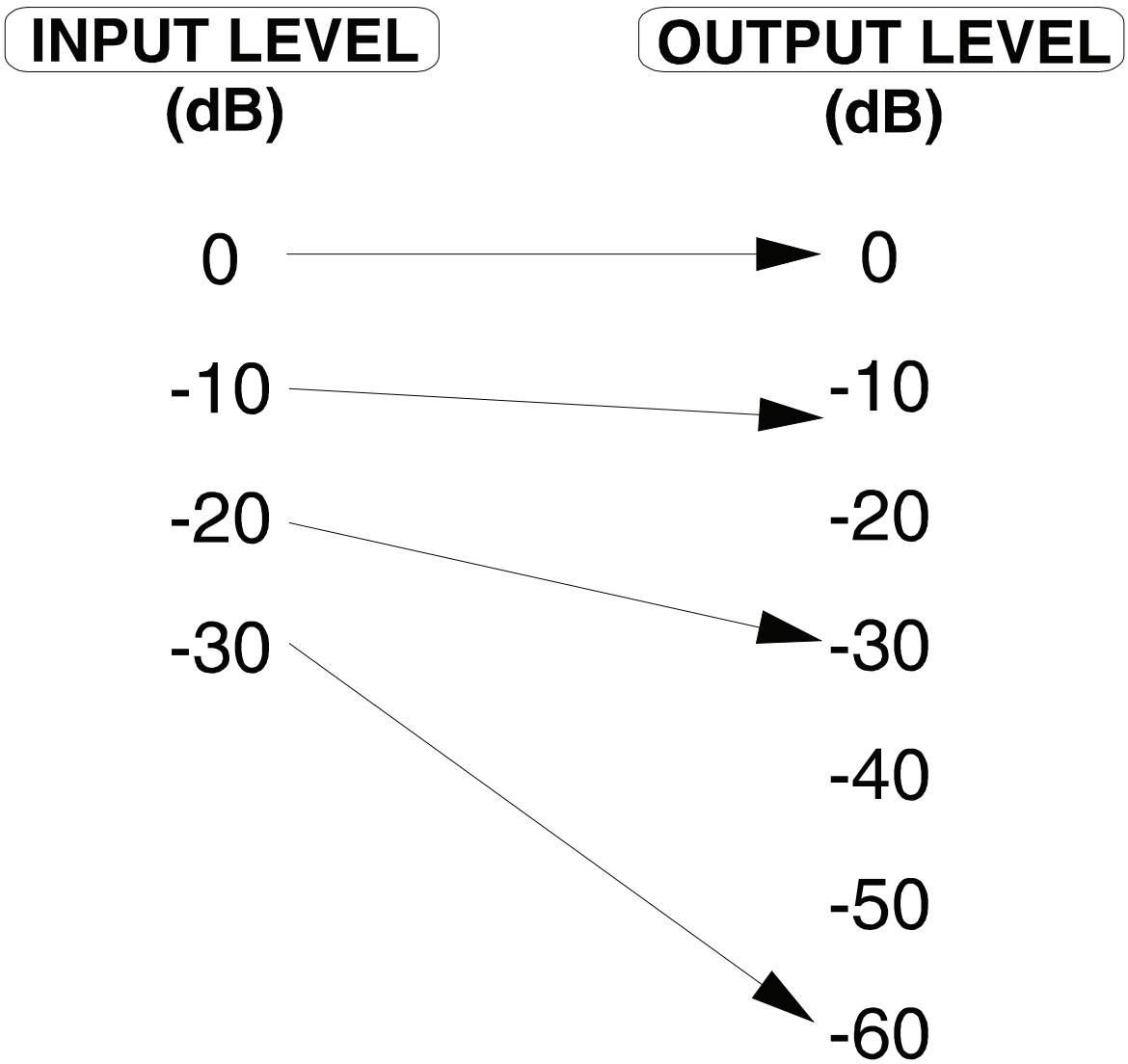
In most applications, the signal from an instrument being played is much louder than the noise level. Therefore, much of the noise is not heard when an instrument is being played. However, when you stop playing or let a note decay, the instrument level drops below the noise level and the noise becomes much more audible. Setting the THRESHOLD controls just above the level of the noise causes the HUSH 2X to begin to decrease the output level so that the noise is never heard.

The HUSH 2X incorporates the latest advancements in HUSH noise reduction technology. HUSH 2X's discrete threshold control circuit utilizes a voltage-controlled amplifier (VCA) as a downward expander which can control the gain between the input and output of the HUSH 2X from unity to over 60dB of gain reduction. When the input signal is above the threshold level set by the THRESHOLD control, the VCA will remain at unity gain (i.e. the output level will remain equal to the input level). As the amplitude drops below the threshold point, downward expansion will begin.

HUSH Information

When downward expansion begins, the VCA acts like an electronic volume control and gradually begins decreasing the output signal 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. This means that if the input signal dropped 20dB below the threshold point, the output level would drop approximately 30dB. A 30dB drop below the threshold would result in a drop of 60dB of the output signal (30dB of gain reduction). The absence of any input signal will result in the expander reducing the gain so that the noise floor is inaudible.

TYPICAL EXPANSION RATIO
(with a 0dB threshold)

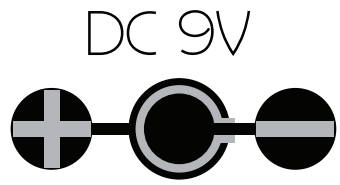


As the input signal level decreases further below the threshold point, the output signal drops more rapidly.

The Variable Integrated Release (V.I.R.) technology contained in each HUSH circuit automatically adjusts the release rate of the expander based on the dynamic decay rate of the incoming signal. If the input signal stops suddenly, downward expansion will occur rapidly (similar to a gate). If the input signal decays slowly, expansion will occur slowly without disrupting the dynamic decay of the input signal.

The THRESHOLD control should be adjusted by listening to the noise floor while not playing. Turn the THRESHOLD control clockwise to the point where the noise floor becomes inaudible. Turning too far past this point will cause the downward expander to attenuate the output level too quickly and not allow the signal to decay as long as it should.

Specifications:

Maximum Input	7dBu
Maximum Output	-1dBu
Input Impedance	220kΩ
Output Impedance	1kΩ
Current Consumption	30mA
Power Requirements	9V Alkaline Battery or Rocktron DC OnTap Universal Power Supply (sold separately). Negative Tip 
Dimensions	125mm x 78mm x 61mm 5” x 3.25” x 2.5”
Weight	0.7kg 1.5lbs

How to change the battery:

To change the battery, remove the battery compartment cover on the back/bottom of the unit. Remove the old battery and replace it with a new 9V Alkaline battery. Replace battery in the same area as the old battery was located. Replace the battery compartment cover on the unit.

The HUSH 2X can also run on a 9V DC power supply for operation (not included). We recommend any of these:

Rocktron DC OnTap 110V USA Plug - Model: 006-2017
Rocktron DC OnTap 220V Euro Plug - Model: 006-2018
Rocktron DC OnTap 240V UK Plug - Model: 006-2022
Rocktron DC OnTap 100V Japan - Model: 006-2033
Rocktron PowerTap (powers your whole pedalboard)

The HUSH 2X jack accepts a 2.1mm Plug - Tip Negative/Barrel Positive

(All Rocktron DC OnTap adapters are “switching power supplies and can be used world wide with the right plug adapter)

Save yourself tons of money in batteries by using the Rocktron DC OnTap Universal Power Supply to power this pedal (sold separately). The Rocktron DC OnTap provides a constant flow of power to the pedal, unlike a battery that will degrade over time. The Rocktron DC OnTap Universal Power Supply can also power up to 20 pedals and can be used with both 110V and 220V power sources.

Check, www.rocktron.com for more information on the DC OnTap and where to purchase.

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