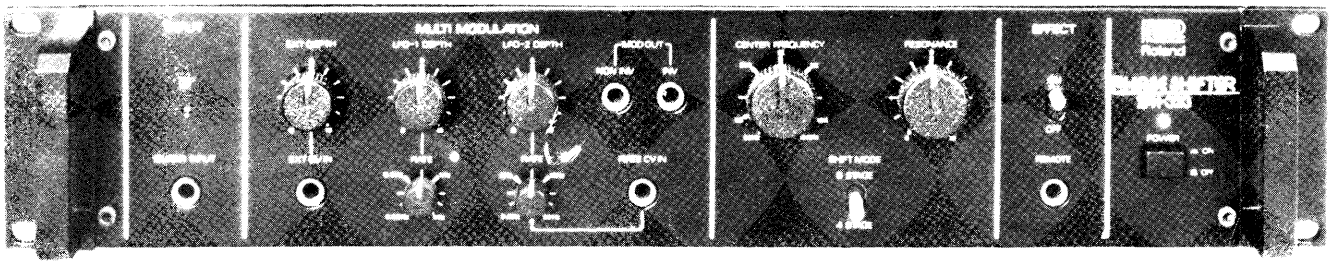
Roland

PHASE SHIFTER SPH-323 OWNER'S MANUAL



The Roland Rack

PHASE SHIFTER

The SPH-323 is a 19" rack mount type phase shifter designed to produce multiple phase shifting effects by means of dual internal low frequency oscillators in combination with an optional external control voltage source. It is a high quality unit designed for professional use and includes both balanced and unbalanced inputs and outputs, as well as a special guitar level input and output.

FEATURES

- Equipped with a SHIFT MODE switch which allows a choice between four- and eight-stage phase shifting.
- Modulation from three separate sources is possible for phase effects not normally possible with other phase shifters.
- The LFO-2 rate can be controlled with an external control voltage. A foot pedal can be connected to the LFO-2 RATE jack or EXT CV jack for manual control of the phase shift effect.
- Equipped with both balanced and unbalanced inputs and outputs
- Equipped with guitar level input and output.

BEFORE STARTING

- Make sure that the line voltage in your area meets the requirements given in the specifications.
- Check with your local Roland dealer if you want to use the SPH-323 in a foreign country.
- Plug the SPH-323 in before turning on the power switch.

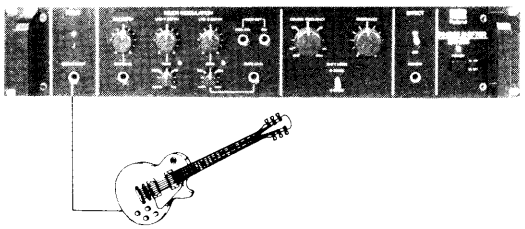
PRECAUTIONS

- Do not open this unit.
- Unplug this unit when it is not to be used for long periods of time. Unplug by grasping the plug rather than pulling on the cord.
- Be careful not to place heavy objects on the power cord.
- Avoid using this unit in very high or low temperature locations. Also keep away from heaters and coolers since this type of equipment will affect circuit stability.
- Avoid using this unit in very dusty or humid places.
- If it is necessary to use this unit in an area with neon or fluorescent lights, keep it as far away from these lights as possible since they will induce high levels of noise. Sometimes changing the angle of this unit in relation to the lights will help reduce noise.
- To clean this unit, wipe with a cloth dampened with a neutral cleanser. Do not use solvents such as paint thinner.

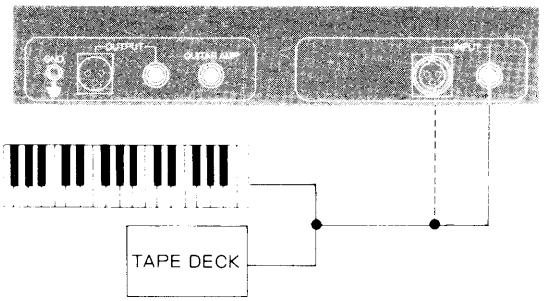
CONNECTIONS

•INPUT **If inputs are used simultaneously, the GUITAR input will have priority over the other two inputs; if the GUITAR input is not used, the UNBALANCED input will have priority over the BALANCED input.**

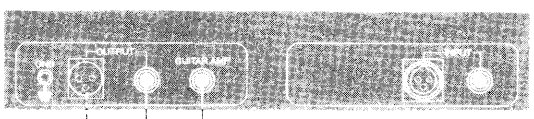
[A] GUITAR. BASS GUITAR



[B] SYNTHESIZER or other electronic instrument

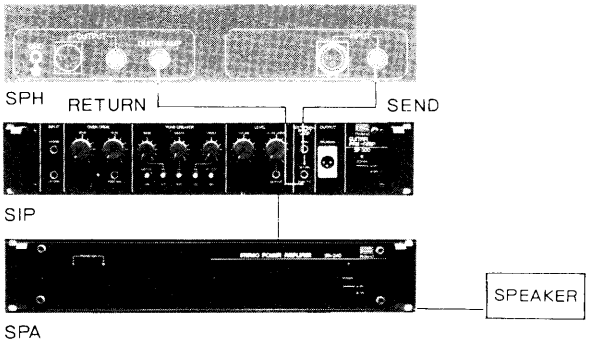


•OUTPUT (All three outputs may be used simultaneously, if desired)

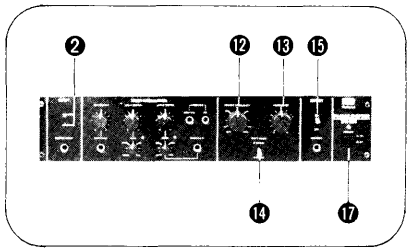


In use, the volume of the phase shifter sound will be controlled by the volume control of the amplifier connected at the phase shifter output.

•SIP series guitar amp effect loop connections.



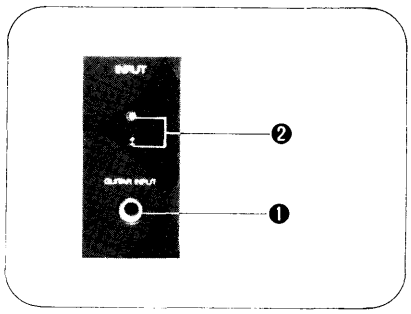
OPERATION



1. After making the connections as shown, turn the POWER switch ⓱ ON.
2. While producing sound, set the output level of the instrument or device connected at the phase shifter input so that the green LEVEL INDICATOR ❷ lights. The red indicator lights when the input level is high enough to produce distortion.
3. With the EFFECT switch ⓯ OFF, set the volume control of the external amplifier for the desired listening level.
4. Set the EFFECT switch ⓯ ON, then set the remaining controls for the desired phase shift effect as explained in the following.

NAMES AND FUNCTIONS OF THE CONTROLS

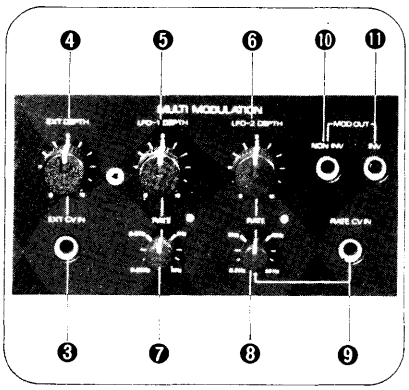
INPUT SECTION



❶ GUITAR INPUT Jack
For low level instruments such as electric guitars, etc.

❷ LEVEL INDICATORS
The red indicator lights when the input level is high enough to cause distortion.

MULTI-MODULATION SECTION



❸ EXT CV (external control voltage) INPUT Jack
For external control of the phase shifter center frequency by means of a control voltage (±5 volts) or a foot pedal (FV-2; sold separately). Positive voltage or depression of the foot pedal causes the center frequency to rise.

❹ EXT DEPTH Control

❺ LFO-1 DEPTH Control

❻ LFO-2 DEPTH Control
These controls control the amount of center frequency change which will occur as a result of the related control influence.

❼ LFO-1 RATE Control (0.02Hz to 5Hz)

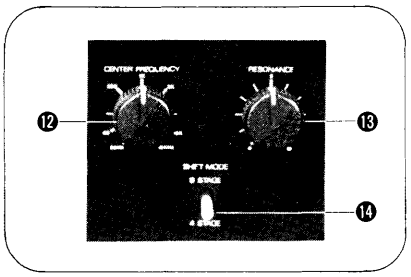
❽ LFO-2 RATE Control (0.2Hz to 50Hz)
For adjustment of the speed of the effects produced by LFO (low frequency oscillator) modulation. The LED to the right of each of these controls gives a visual indication of the rates.

❾ LFO-2 RATE CONTROL Jack
This jack allows control of the LFO 2 rate by means of an external control voltage (±5 volts) or foot volume (FV-2; sold separately). A positive voltage or depression of the pedal causes the LFO-2 rate to increase.

❿ NON-INV MOD (non-inverted modulation) OUTPUT Jack
The output at this jack consists of a mixture of the three modulation sources (EXT CV, LFO-1, and LFO-2). This can be used to control a second SPH-323 Phase Shifter to produce stereo effects.

⓫ INV MOD (inverted modulation) OUTPUT Jack
The output at this jack is the inverted version of the three modulation soures and is used for stereo phase shifting effects with a second SPH-323.

PHASE SHIFT SECTION

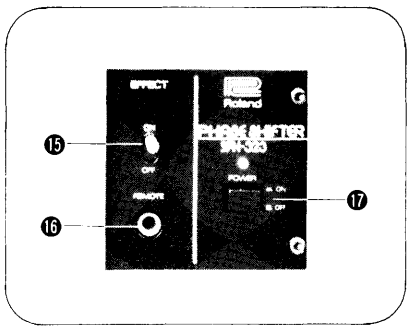


⑫ CENTER FREQUENCY Control
This control sets the initial center frequency of the phase shift effect.

⑬ RESONANCE Control
By means of this control, feedback can be induced in the circuit to accent the phase shift effect.

⑭ SHIFT MODE Switch
The 8-STAGE position produces the strongest phase shift effect while the 4-STAGE position produces soft phase shift effects.

EFFECT SECTION/POWER

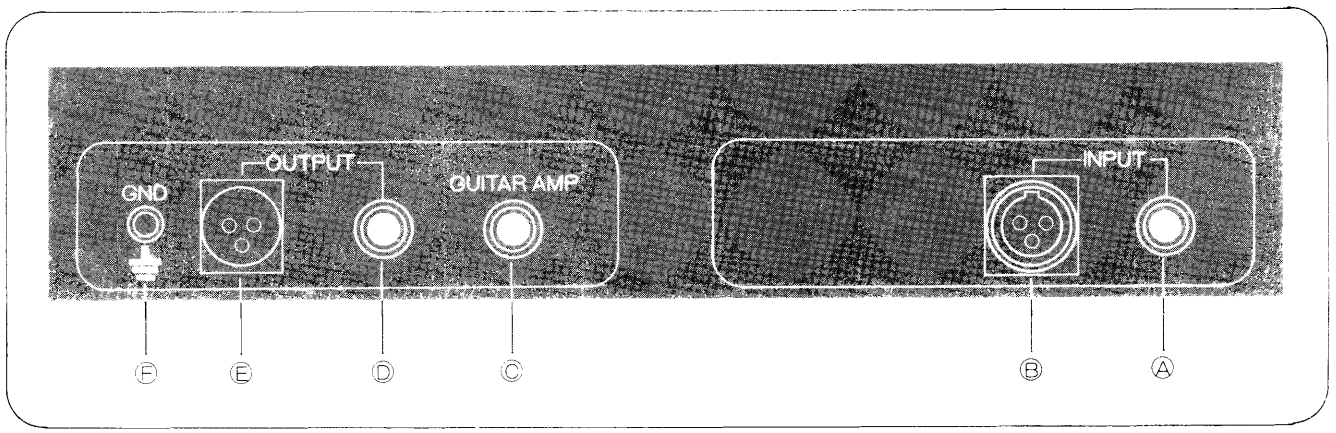


⑮ EFFECT Switch
Controls the ON/OFF function of the effect.

⑯ REMOTE Jack
A foot switch (FS-1; sold separately) can be connected here for remote control of the EFFECT ON/OFF function. For this, the EFFECT switch ⑮ must be left at ON.

⑰ POWER Switch and Pilot Lamp

REAR PANEL



Ⓐ UNBALANCED INPUT (Standard 1/4" phone jack)
Ⓑ BALANCED INPUT (XLR connector)
If both are used simultaneously, the UNBALANCED INPUT Ⓐ has priority.

Ⓒ GUITAR AMP OUTPUT Jack

Ⓓ UNBALANCED OUTPUT Jack (Standard 1/4" phone jack)

Ⓔ BALANCED OUTPUT Connector (XLR connector)

All three outputs may be used simultaneously.

Ⓕ GROUND Terminal
For making common ground connections with other equipment.

ABOUT THE PHASE SHIFTER

When a sound is passed through an electronic phase shifting network, then combined with the original sound using a mixer, the result is a cancellation of one or more very narrow bands of frequencies. The number of cancellations is directly related to the number of stages in the phase shift network. With eight stages, four bands are canceled and with four stages, two bands are canceled. The canceled bands are relatively even in spacing from the point of view of musical pitch and are centered on what is called the *center frequency*. The CENTER FREQUENCY control ⓬ on the front panel is used to set the initial center frequency of the canceled bands, after which a control input is used to sweep the center frequency above and below the initial center frequency. The SPH-323 uses a combination of two internal sources (LFO-1 and LFO-2) and one external source (EXT CV) to control the sweep. The sweeping of the center frequency produces the familiar phase shifting effect.

USING THE PHASE SHIFTER

The SHIFT MODE switch ⓮ gives the choice between two types of phase shifting: a hard effect produced by 8-stage phase shifting and a soft effect produced by 4-stage shifting. The RESONANCE control ⓭ introduces feedback into the circuit which broadens the canceled frequency bands to intensify the effect.

The initial parameters of the phase shift network are determined by the CENTER FREQUENCY control ⓬, the RESONANCE control ⓭, and the SHIFT MODE switch ⓮. The controls in the MULTI-MODULATION section of the panel determine how the center frequency will be swept.

Standard phase shift effect patterns can be produced by leaving the EXT DEPTH control ❹ and either the LFO-1 DEPTH control ❺ or the LFO-2 DEPTH control ❻ at "0". The remaining DEPTH control (❺ or ❻) will determine how far away from the initial center frequency setting the center frequency will sweep, and the related RATE control (❼ or ❽) will determine the speed of the sweeping.

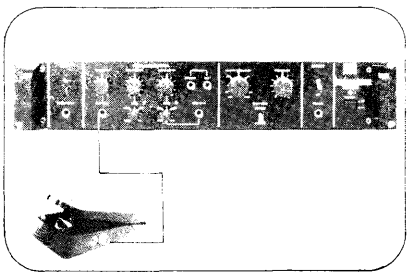
The SPH-323 can produce very complex sweep patterns because of the three sources available for sweeping. When using more than one source, think of the DEPTH controls (❹, ❺, and ❻) as mixer level controls which determine the amount of each control source to be used for sweeping the center frequency.

EXAMPLE:

If a high level of slow LFO (LFO-1 DEPTH ❺) is combined with a low level of fast LFO (LFO-2 DEPTH ❻), the result will be a compound modulating wave like that shown below:

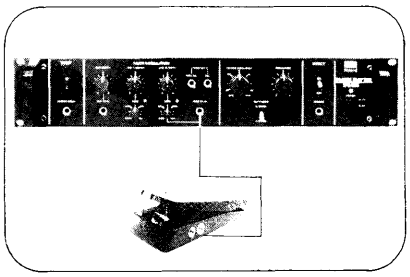
REMOTE CONTROL

1. EXT CV



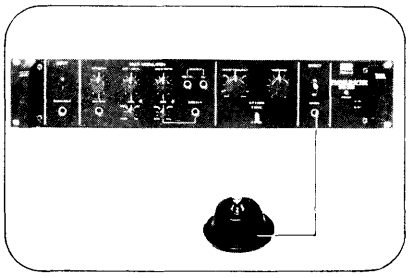
If a foot volume pedal (FV-20) is connected to the EXT CV jack ❸, the pedal can be used to raise the center frequency above the initial value set by the CENTER FREQUENCY control ⓬. The CENTER FREQUENCY control ⓬ can be used to set the lower limit desired when using the foot pedal and the EXT DEPTH control ❹ can be used to set the upper limit.

2. RATE CV



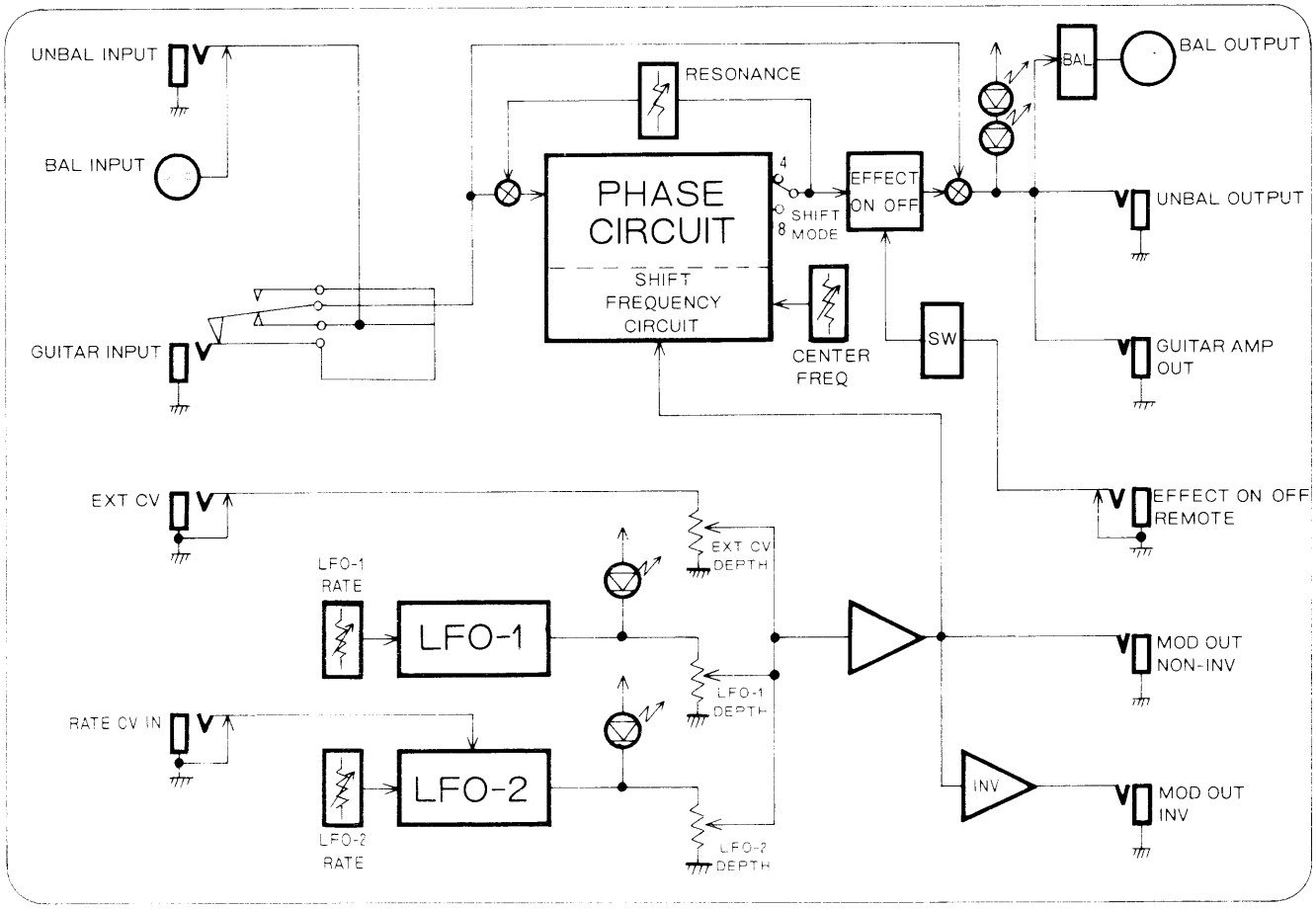
If a foot volume pedal (FV-20) is connected to the LFO-2 RATE CONTROL jack ❾, the pedal can be used to raise the LFO-2 rate above the rate set by the LFO-2 RATE control ❽. As above, the LFO-2 RATE control ❽ will determine the lower limit of the LFO-2 rate.

3. EFFECT ON/OFF



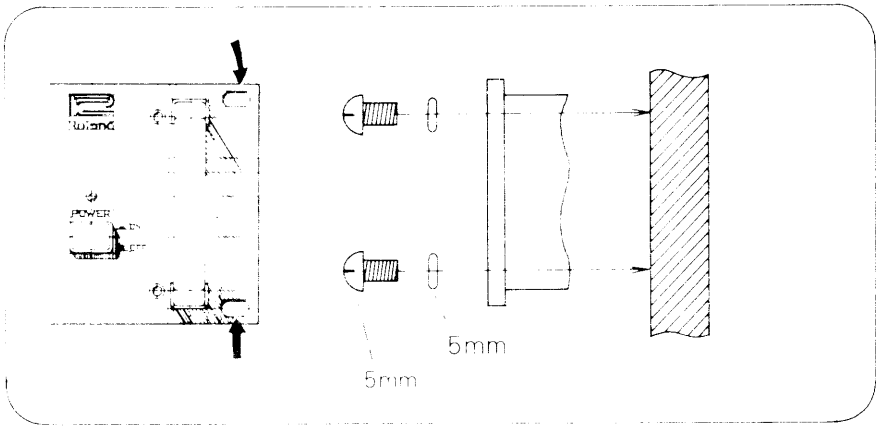
By connecting a foot switch (FS-1) to the EFFECT ON/OFF jack ⓰, the phase shift effect can be turned on and off from a remote position. **When using this function, leave the EFFECT ON/OFF switch ⓯ ON.**

BLOCK DIAGRAM



● Rack Mounting the SPH-323

The SPH-323 can be mounted in a standard 19" rack using 5mm screws (not included) as shown.



SPECIFICATIONS

■ PHASE SHIFTER ■ SPH-323

Maximum Input Level/ Impedance
Balanced: +20dBm/15kΩ
Unbalanced: +20dBm/15kΩ
Guitar: +20dBm/1MΩ

Maximum Output Level/ Impedance
Balanced: +20dBm/200Ω
Unbalanced: +20dBm/600Ω
Guitar Amp: +20dBm/3kΩ

Phase Shift
4-stage: approx 700°
8-stage: approx 1400°

Center Frequency Sweep Range:
50Hz-15kHz

Frequency Response, effect OFF:
20Hz-30kHz; ±1dB

Harmonic Distortion
Effect OFF: 0.004%
4-stage: 0.015%
8-stage: 0.02%

Residual Noise (JIS "A"Weighting)
Balanced Output, effect OFF:
−100dBm
Balanced output, effect ON:
−80dBm
Guitar Output, effect OFF:
−100dBm

Low Frequency Oscillators
LFO-1: 0.02Hz to 5Hz;
triangle wave @10Vp-p
LFO-2: 0.2Hz to 50Hz;
triangle wave @10Vp-p

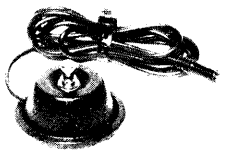
Power Consumption: 7W

Dimensions:
482(W) x 92(H) x 240(D)mm
19"(EIA-2U) rack mount

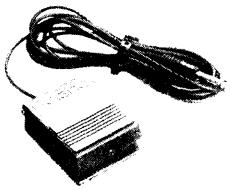
Weight: 4.2kg

Specifications subject to change without notice.

OPTIONAL ACCESSORIES



FOOT SWITCH
FS-1



PEDAL SWITCH
DP-2

FOOT VOLUME
EV-20