

BI-PHASE

QUICKSTART MANUAL



CONTROLS AND OPERATION

The Bi-Phase consists of two LFOs (Low Frequency Oscillators) or 'Sweep Generators', two separate phase sections, and controls for determining both audio signal flow and how the LFOs interact with the phasing sections. Each function section: SWEEP GENERATOR 1, SWEEP GENERATOR 2, PHASOR A and PHASOR B - is separated by outlines to clarify the association between related controls.

INPUT OUTPUT SECTION:

1. **IN A** - A standard 1/4"(TS) output jack receiving a mono input signal to whatever comes previous in your signal chain.
2. **OUT A** - A standard 1/4"(TS) output jack ending a mono output signal to whatever comes next in your signal chain.
- 3a. **CV IN:** A 1/8" (TRS) jack used to connect an expression pedal. We recommend an expression pedal that employs a 10k or 50k linear pot. This allows you to manually sweep either Phasor or to control the rate of either or both Phasors like a Leslie speaker.
4. **9-12v DC** - 9VDC (300mA current minimum) or 12VDC (200mA current minimum) negative center power supply. A 12VDC power supply is the 'ideal' (to minimize internal temperatures), however 9VDC will also work fine. The supply should use a 2.1mm barrel plug.
5. **IN B** - A standard 1/4"(TS) output jack receiving a mono input signal to whatever comes previous in your signal chain.
6. **OUT B** - A standard 1/4"(TS) output jack ending a mono output signal to whatever comes next in your signal chain.

ROUTING SECTION:

7. **PHASOR B INPUT** – Three-way toggle switch used for selecting one of three input signal options:
 - **IN A** - The input signal to both PHASOR B and PHASOR A is the same, commonly selected for stereo use of the Bi-Phase.
 - **OUT A** - Audio is passed through both PHASOR A and PHASOR B in series; if you have a monophonic instrument and a single amplifier then you'll probably use this setting.
 - **IN B** - Different input signals to be processed by PHASOR A and PHASOR B independently (although possibly still sharing a modulation source).

SWEEP GENERATOR SECTIONS:

PHASOR A:

- 7a. **EFFECT FOOTSWITCH** – Determines whether the PHASOR A effect is engaged or bypassed.
- 7b. **EFFECT ON-OFF LED** – When the LED is OFF, the PHASOR A is bypassed. When the LED is ON, PHASOR A is engaged.

PHASOR B:

- 8a. **EFFECT FOOTSWITCH** – Determines whether the PHASOR B effect is engaged or bypassed.
- 8b. **EFFECT ON-OFF LED** – When the LED is OFF, the PHASOR B is bypassed. When the LED is ON, PHASOR B is engaged.

SWEEP GENERATOR SECTION (EITHER PHASOR)

- 10 **DEPTH:** Continuously-adjustable control that determines the width of the frequency range swept by the modulation source. The greater the depth, the greater the frequency range that is swept, and the more noticeable the phasing effect.
11. **FEEDBACK:** Continuously-adjustable control that, when turned up from the minimum setting clockwise, progressively adds more feedback to the phased audio signal. More feedback means more of a noticeable phasing effect and less feedback means a more subtle phasing sound.
12. **RATE:** Continuously-adjustable control that determines the rate at which LFO oscillates; adjustable from approximately 1 cycle per 10 seconds to 18 cycles per second.
13. **SHAPE:** Toggle switch that selects between sine-wave (smoothly varying) or square-wave (varying from one extreme to the other) modulation.
14. **RATE:** Toggle switch that allows for the modulation rate of PHASOR A Sweep Generator to be controlled by rate knob(MAN) or by pedal(PED).
15. **SWEEP:** Toggle to determine modulation source of PHASOR A Sweep Generator to be controlled by depth knob(MAN) or by pedal(PED).
- 15b. **SWEEP:** Toggle to determine modulation source of PHASOR B Sweep Generator.
 - **PED:** Modulation source of PHASOR B Sweep Generator to be controlled by pedal.
 - **1:** Modulation source of PHASOR B Sweep Generator to be controlled by PHASOR A Sweep Generator.
 - **2:** Modulation source of PHASOR B Sweep Generator to be manually set by PHASOR B depth and rate knobs..
16. **SYNC:** If both PHASOR A and PHASOR B have selected the same modulation source, then their sweeps will be time-synchronized. Conversely the reverse synchronization is the inversion of the modulation source signal. For stereo phasing effects, where both PHASOR A and PHASOR B are modulated by GEN 1, you will likely want to place this switch in the REVERSE SYNC position.

BI-PHASE SETTINGS AND USAGE

'Phasing' or 'phase shifting' involves creating animated notches at certain frequencies by filtering the source signal, then mixing this processed signal with the original (unprocessed) source signal. The Bi-Phase processes the audio signal using a series of all-pass filters, i.e. filters that pass all frequencies, BUT change the phase relationship of these frequencies. By combining the phase-changed audio signal with the original signal, cancellation of certain frequencies (and reinforcement of others) occurs and hence produces a number of 'notches'. The movement of these 'notches' is what provides the characteristic phasing sound. No special extra foot-switch is necessary to operate your Bi-Phase; optical(bleed-bypass) foot-switching for each individual phase channel is built into the pedal. An external 'standard' expression pedal can be connected to the rear PEDAL input socket for control of the LFO speeds and/or manual SWEEP of the phase sections.

QUICK START SETTING PHASE MADNESS



Connect a recommended power supply to the power socket at the rear of the Bi-Phase. Connect your instrument to the [PHASOR A INPUT] socket at the rear of the pedal. Connect the [PHASOR B OUTPUT] to your amplifier. Using the visual guide below, set the controls to the above template. Make sure both phase channels are turned on – both channel LEDs should be lit – then play something and turn up your amp.

CASCADED DUAL PHASERS TWO-SPEED PHASING



For a different program, one that utilizes GEN 2 to modulate PHASOR B, try setting the controls like template. Connect your instrument to the [PHASOR A INPUT] jack and the [PHASOR B OUTPUT] jack to your amplifier. Using this setting you can switch PHASOR A and PHASOR B on or off to create a phased signal with two different modulation types layered, or with the audio processed by a single phase section.

INSTRUMENT INTO AMPLIFIER SUPER PHASING



Connect your instrument to [PHASOR A INPUT] on the rear of the pedal, and your amplifier to [PHASOR B OUTPUT]. The signal from [PHASOR B OUTPUT] is processed by all 12-phase stages within your Bi-Phase for the deepest and lushest sound; note that both PHASOR A and PHASOR B are modulated by the same control signal, that being GEN 1. Experiment with different settings within this program, for example turning the [FEEDBACK] controls of both PHASOR A and PHASOR B down to minimum, or by adjusting the [DEPTH] controls for both sections for a more subtle effect.

TWO AMPLIFIERS STEREO PHASING



Connect your instrument to [PHASOR A INPUT] on the rear of the pedal, your primary amplifier to [PHASOR B OUTPUT], your secondary amplifier to [PHASOR A OUTPUT], then set the controls like template. There is a noticeable 'movement' of the input audio signal between the two amplifiers. Reducing either or both of the [DEPTH] and [FEEDBACK] settings on each channel will make this movement more subtle, whilst placing the GEN 1 [SHAPE] control in the SQUARE position will make the audio 'jump' from side to side. If you are processing, for example, synth strings or cymbals track you might want to reduce the [FEEDBACK] for both phase sections to the minimum value, then experiment with the [DEPTH] controls. Remember to adjust the [DEPTH] and [FEEDBACK] controls from each phase section to be equal if you wish to keep the stereo image symmetrical.

TWO INSTRUMENTS AND TWO AMPLIFIERS

The Bi-Phase may also be used to process two separate instruments or stereo output from the same instruments. In this mode the two respective instrument inputs should be connected to [PHASOR A INPUT] and [PHASOR B INPUT] on the rear of the pedal, with [PHASOR A OUTPUT] and [PHASOR B OUTPUT] being connected to the output amplifiers or mixer. Most importantly, the [PHASOR B INPUT] toggle switch should be set to the IN B setting. You may then select the GEN 1 position with the [PHASOR B SWEEP] toggle switch if you wish both instruments / input channels to be modulated by the same source (i.e. GEN 1), or select the GEN 2 position for each instrument

SYNTHESIZERS, DRUM MACHINES, LINE-LEVEL INSTRUMENTS, OUTBOARD

High headroom – internally the audio processing section runs from +/-15VDC with a maximum signal range capacity of approximately, 25VRMS - allows you to experiment with processing signals from your mixer, synthesizers and drum machines without need for concern over unwanted clipping or distortion.

SAFETY INFORMATION

FOR YOUR PROTECTION, PLEASE READ THESE SAFETY INSTRUCTIONS COMPLETELY BEFORE OPERATING THE PRODUCT AND KEEP THIS MANUAL FOR FUTURE REFERENCE.

CAREFULLY OBSERVE ALL WARNINGS, PRECAUTIONS AND INSTRUCTIONS ON THE PRODUCT AND DESCRIBED IN THE OPERATING INSTRUCTIONS SUPPLIED WITH THE PRODUCT.

POWER SOURCE - CONNECT THE PRODUCT TO A POWER SUPPLY ONLY OF THE TYPE DESCRIBED IN THE OPERATING INSTRUCTIONS OR AS MARKED ON THE PRODUCT.

POWER-CORD PROTECTION - ROUTE THE POWER CORD SO THAT IT IS NOT LIKELY TO BE WALKED ON OR PINCHED BY HAVING OBJECTS PLACED ON IT, PAYING PARTICULAR ATTENTION TO THE PLUGS, RECEPTACLES, AND THE POINT WHERE THE CORD EXITS FROM THE PRODUCT.

WHEN NOT IN USE - UNPLUG THE POWER ADAPTER CORD OF THE PRODUCT FROM THE OUTLET WHEN LEFT UNUSED FOR A LONG PERIOD OF TIME. TO DISCONNECT THE CORD, PULL IT OUT BY GRASPING THE POWER ADAPTER. NEVER PULL THE POWER ADAPTER PLUG OUT BY THE CORD.

DC RECEPTACLE - CHECK TO MAKE SURE THAT THE DC RECEPTACLE HOLDS THE POWER ADAPTER PLUG FIRMLY AND SECURELY. IF THE POWER ADAPTER IS LOOSE, CONTACT YOUR ELECTRICIAN TO REPLACE THE DEFECTIVE AND UNSAFE DC CONNECTION.

FOREIGN OBJECTS - BE CAREFUL THAT FOREIGN OBJECTS AND LIQUIDS DO NOT ENTER THE ENCLOSURE THROUGH OPENINGS.

CLEANING - UNPLUG THIS PRODUCT FROM THE WALL OUTLET BEFORE CLEANING. DO NOT USE LIQUID CLEANERS OR AEROSOL CLEANERS. USE A DAMP CLOTH FOR CLEANING.

WARNING TO PREVENT FIRE OR SHOCK HAZARDS, DO NOT EXPOSE THE UNIT TO RAIN OR MOISTURE. ATTENTION: RISK OF SHOCK, DO NOT OPEN.

CAUTION THE LIGHTNING FLASH WITH ABBREVIATED SYMBOL, WITHIN AN EQUILATERAL TRIANGLE, IS INTENDED TO ALERT THE USER TO THE PRESENCE OF UNMANIPULATED "DANGEROUS VOLTAGE" WITHIN THE PRODUCT. IT DOES NOT CONSTITUTE A RISK OF ELECTRIC SHOCK TO PERSONS.

CAUTION THE EXCLAMATION POINT, WITHIN AN EQUILATERAL TRIANGLE, IS INTENDED TO ALERT THE USER TO THE PRESENCE OF IMPORTANT OPERATING AND MAINTENANCE INSTRUCTIONS. REFER TO THE LITERATURE ACCOMPANYING THE APPLIANCE.

CAUTION RISK OF ELECTRIC SHOCK DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

SERVICE

UNPLUG THE PRODUCT FROM THE WALL OUTLET AND CONSULT QUALIFIED SERVICE PERSONNEL WHEN:

- THE POWER CORD OR THE PLUG HAS BEEN DAMAGED.
- A SOLID OBJECT OR LIQUID HAS FALLEN INTO THE ENCLOSURE.
- THE PRODUCT HAS BEEN EXPOSED TO RAIN OR MOISTURE.
- THE PRODUCT DOES NOT APPEAR TO OPERATE NORMALLY OR EXHIBITS A MARKED CHANGE IN PERFORMANCE.
- THE PRODUCT HAS BEEN DROPPED, OR THE ENCLOSURE DAMAGED.

DO NOT ATTEMPT TO SERVICE THE PRODUCT BEYOND THAT DESCRIBED IN THE OPERATING INSTRUCTIONS. FOR ALL OTHER SERVICING, REFER TO QUALIFIED SERVICE PERSONNEL ONLY.

WARRANTY INFORMATION

MU-TRON OFFERS A ONE-YEAR LIMITED WARRANTY ON ALL OF OUR PRODUCTS.

IN THE UNLIKELY EVENT OF A MALFUNCTION DUE TO COMPONENT FAILURE OR DEFECTIVE WORKMANSHIP, CONTACT US AT MU-TRON.COM FOR RETURN AUTHORIZATION. WE WILL QUICKLY RESPOND WITH ASSISTANCE AND WILL THEN REPAIR OR REPLACE YOUR PRODUCT AND SEND IT BACK.

PLEASE NOTE THAT WE CANNOT REPLACE A PRODUCT UNTIL WE HAVE RECEIVED IT HERE AT THE FACTORY.

USER-GENERATED MALFUNCTIONS DUE TO DROPPING, INTENTIONALLY BREAKING, ATTEMPTING TO REPAIR DURING THE WARRANTY, OR OPENING THE PRODUCT WILL NOT BE COVERED BY THE WARRANTY. YOU MAY SEND THE UNIT TO US AND WE WILL GIVE YOU AN ESTIMATE REPAIR CHARGE, AND UPON YOUR AUTHORIZATION WE WILL REPAIR AND RE-CALIBRATE THE PRODUCT.

LIMIT OF LIABILITY REGARDING THE PRODUCT AND ITS POWER SUPPLY

MU-TRON ASSUMES NO RESPONSIBILITY FOR DAMAGE TO THE PRODUCTS, OTHER EQUIPMENT THEY MIGHT CONNECT TO BY ANY MEANS, OR ANY OTHER PROPERTY DAMAGE, INJURY OR DEATH RESULTING FROM ITS USE OR MISUSE.

IT IS POSSIBLE THAT CONNECTING THE TRANSFORMER TO AN INCORRECT VOLTAGE MAY RESULT IN INJURY OR DEATH TO ANYONE OPERATING THE EQUIPMENT.