

OWNERS MANUAL
&
APPLICATIONS

SPL - EX 5 PSYCHOACOUSTIC PROCESSOR

The EX 5 is engineered for sophisticated application in professional audio recording and sound reinforcement providing advanced technology to eliminate any additional noise and to guarantee natural psychoacoustic processing.

The EX 5 is suitable for both corrective and creative processing. A sound lacking upper harmonics can be brightened with effective restoration of clarity, presence and intelligibility.

The EX 5 effect is much more of a textural effect than an EQ-change. In contrast to the boost and cut functions of an EQ that only work on frequencies already existing, the EX 5 PSYCHOACOUSTIC PROCESSOR works on the whole frequency response. The EX 5 recreates the harmonic structure, which is of enormous importance for the specific sound character of instruments and vocals without adding any extra level.

Even and odd harmonics can be regenerated separately with the HARMONIC A and HARMONIC B controls.

The harmonics can be generated in two degrees:

1. PROCESSOR SOLO switch off: the HARMONIC A and HARMONIC B controls work as a very precise high frequency equalization with about 20% regenerated harmonics.
2. PROCESSOR SOLO switch pushed: the processor adds about 80% regenerated harmonics to the high frequency EQ. The EX 5 recreates up to the 7th harmonic. If the TRANSITION LEVEL is set to 100%, the pure processor signal can be monitored for external mixing.

A VU IN/OUT switch is provided for continuous monitoring and instant comparison of input and output levels.

APPLICATIONS: The EX 5 is used typically in stereo mixdown situations, effect-loop applications and tape duplications as well as sample enhancement. Vocals and instruments will "stand out". The stereo image will literally "open up". Tape copies will sound as good as the original or even better. P.A. systems become more intelligible. Discos, theaters and clubs will have a more penetrating sound and clearer sound which is easier to perceive

thus reducing the listener ear fatigue. HiFi system will sound "bigger" and the spreading stereo image will be enhanced.

INSTALLATION

The EX 5 PSYCHOACOUSTIC PROCESSOR is designed for rack mounting in a standard EIA nineteen inch rack and occupies one vertical rack position (1.75 inches high).

As with any rack mount equipment, especially single high units, care should be taken to support the rear of the unit if the rack might be subjected to mechanical shock (in a touring case for example).

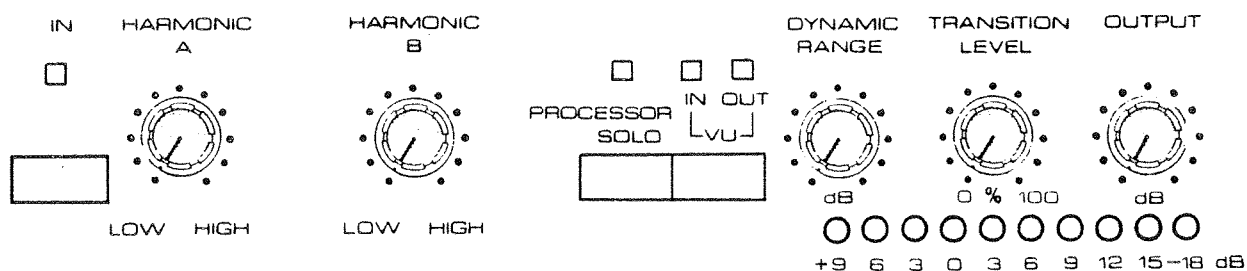
The mounting location is not critical, but for greater reliability we recommend that you not place the unit to power amps, power supplies, or sources of heat, as well as neon light and dimmer.

Note: Throughout the rest of this manual, whenever we refer to actual labels, we'll indicate them by using all upper case letters (e.g. HARMONIC A).

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1. THE FRONTPANEL



1.1 HARMONIC A/ HARMONIC B

The HARMONIC A/B controls determine the fundamental frequency for the harmonical restoration. Lower frequencies are adjusted in left positions. Moving clockwise will set higher fundamental frequencies.

Each HARMONIC control has its own processor allowing separate regeneration of odd and even harmonics. Pure even harmonics will sound warm, smooth and round, while pure odd harmonics will sound sharper, emphasising the percussive edges of the signal.

HARMONIC A is responsible for the regeneration of even harmonics and HARMONIC B is mainly working on the restoration of odd harmonics.

The settings of both controls will depend greatly on the harmonic structure of the particular instrument or voice being processed and its part in the mix. A most effective setting is always subject to experimentation.

1.2 DYNAMIC RANGE

The DYNAMIC RANGE control sets the proper input signal level. The EX 5 effect is level dependent and sufficient DYNAMIC RANGE is necessary for proper harmonical regeneration. Because of the special circuit design, it is not possible to overload the processor. The processor will create different harmonical sound images at different DYNAMIC RANGE settings. The most effective setting is subject to experimentation. The DYNAMIC RANGE control interacts with the TRANSITION LEVEL control.

1.3 TRANSITION LEVEL

The TRANSITION LEVEL control sets the amount of harmonically processed filter signal added back into the total output. Moving clockwise will add more effect.

It is part of experimentation to find out, if a reduction or an intensification of the TRANSITION LEVEL will sound better than a reduction or an intensification of the DYNAMIC RANGE.

1.4 PROCESSOR SOLO

The EX 5 provides two degrees of regenerating the harmonical structure. In many cases it might be sufficient to work on the harmonical structure with sophisticated highpass filtering to emphasize the harmonics that are still a faint part of the program material. This first degree of harmonical processing is realized with the HARMONIC A and HARMONIC B controls. In some cases it might be necessary to have a greater amount of harmonics, regenerated up to the seventh harmonic, at one's disposal. This second degree of harmonical processing is activated when depressing the PROCESSOR SOLO switch. The program material will be enriched with self-processed harmonics.

At the max. TRANSITION LEVEL the output provides the pure harmonic effect, when the PROCESSOR SOLO function is activated. This position can be used for external mixing (e.g. aux sends/returns).

Before a final setting is adjusted, both degrees of harmonical processing should be basis for the sound creation!

1.5 VU IN/OUT and LED-Bar

The VU IN/OUT switch is provided for continuous monitoring and instant comparison of input and output levels.

The LED-Bar is calibrated from -18dBm to +9dBm in 3dB steps.

Both input and output levels can be calibrated with the OUTPUT control.

1.6 OUTPUT

The OUTPUT control determines the total output level. If the VU IN/OUT switch is switched on OUT (orange LED on), the LED-Bar displays the output level.

The OUTPUT control is used to calibrate input and output levels. The boost characteristic allows compensating the -10dB homerecording level.

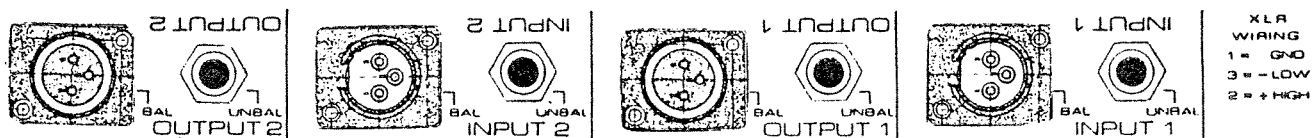
The EX 5 is suitable for all common levels (e.g. -10dB, 0dB, +4dB, +6dB, +8dB).

1.7 IN

The IN/OUT switch disables the harmonic filtering and processing for instant comparison between processed and unprocessed signal.

The IN function represents a hard bypass switch. Only the OUTPUT control remains in function.

1.8 INPUTS/OUTPUTS



The EX 5 is equipped with balanced XLR-connectors and unbalanced 1/4" jack plugs.

The XLR-INPUTS and OUTPUTS are electronically balanced, transformerless designed and configured for optimum low noise performance. Electronic balancing reduces the degradation of signal quality which is introduced by the more normal transformer coupled designs, and ensures superior transient response, minimal phase shift, and excellent common mode rejection. The XLRs are calibrated on +6dB.

The INPUT impedance is greater than 10kOhms, which is enough to interface to any normal professional equipment, without loading the source.

The OUTPUT impedance is lower than 75 Ohms.

The 1/4" jack plugs are calibrated on a reference level of 0dB. The INPUT impedance is greater than 10kOhms and the OUTPUT impedance is lower than 100 Ohms.

When working with -10dB homerecording level, the OUTPUT control can be used to compensate the 10dB gap.

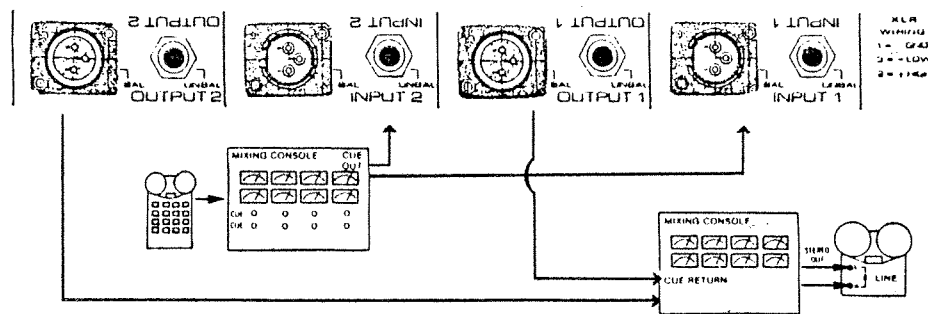
IMPORTANT!

The EX 5 is equipped with switchable jack plugs. If the EX 5 is hooked up with the balanced XLRs, they do not have to be removed when using the jack plugs. A jack plug connection will always be preferred and the XLR INPUTS and OUTPUTS are switched off.

2. EX 5 APPLICATIONS

2.1 Using the EX 5 in the Effect Loop

The EX 5 can be used in the effect loop exactly like a reverb or echo unit is used. A cue, echo or monitor send on each channel of the board can be used to add varying amounts of the EX 5 process to different instruments or vocals. If two sends are available, one can go to each channel of the EX 5. The EX 5 channels can be set the same and returned to the console left and right in stereo, or, each EX 5 channel can be set differently and independently returned to the console center or split. Connect the cue, echo or monitor output(s) of the console (one or two) to the INPUT(S) of the EX 5. Connect the OUTPUT(S) of the EX 5 either to the corresponding send return input(s) on the console, or return it to an open channel(s) on the console.

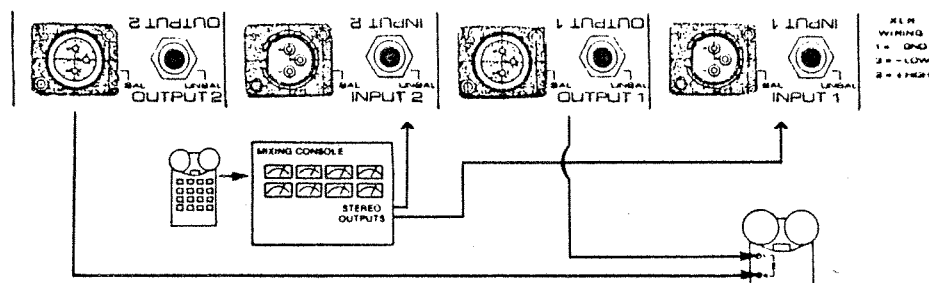


The EX 5 can also be used in the effect loop when working in the PROCESSOR SOLO mode. In this case, it might be useful to connect the OUTPUT(S) of the EX 5 with two channels of the console. This allows a more precise adjustment of the mix between processed and unprocessed signal.

2.2 Using the EX 5 on the Overall Mix of a Multi-Track Mixdown

The EX 5 can be connected between the console and master stereo recorder and the EX 5 Process can be added to the overall mix. The EX 5 can be used to enhance the overall mix and eliminate generation loss. Once the EX 5 is connected and controls are set, you can go on with your mix as usual. You will notice that you will have much better separation, clarity and presence yet will be using less upper mid and high frequency equalization. If you want to check the amount of EX 5 Process being added to the mix simply push IN switch in and out. Do not do this on final mix because it will be on the tape. Your final mix will master onto disk far better by using the EX 5 for presence, clarity and intelligibility instead of equalization.

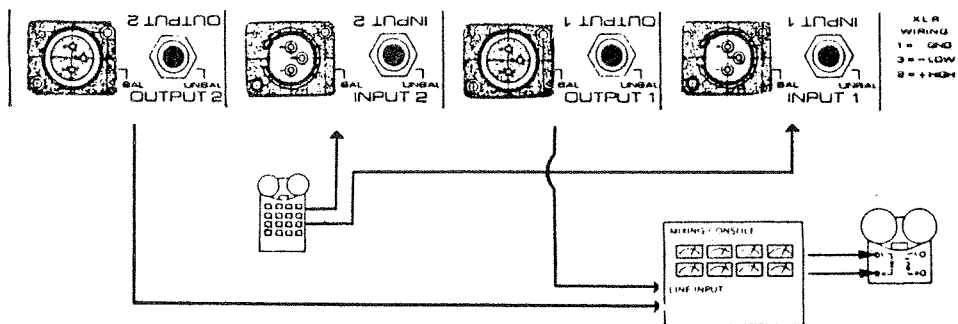
Connect the console's stereo outputs to the corresponding INPUTS of the EX 5. Connect the EX 5 OUTPUTS to the corresponding line inputs of the master 2-track recorder:



2.3 Using the EX 5 In-Line on a Track during Mixdown

If a single track (or two tracks) is to be EX 5 processed during mixdown it should be connected to the EX 5 before it goes to the console input, if possible. This will allow the EX 5 to enhance the track before additional console noise and distortion is present. (NOTE: Whenever possible, to preserve delicate aspects of the original that would otherwise be lost, critical basic tracks should be cut using the EX 5.)

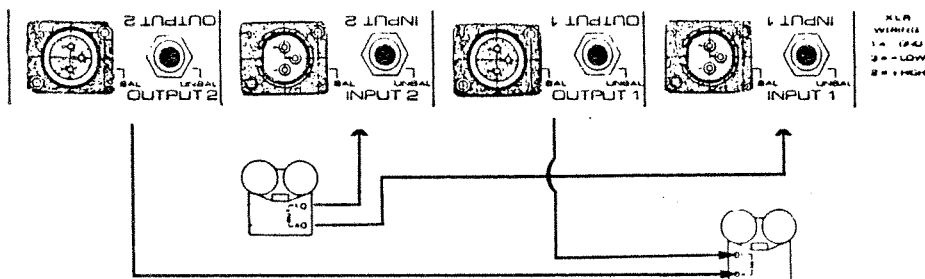
The multi-track channel line output should be connected to the EX 5 INPUT. The EX 5 OUTPUT should be connected to the assigned channel line input of the console. If the direct line output of the multi-track recorder is inaccessible, patch the EX 5 into the console's channel right after the input amp of the channel. If no EQ is to be used, patch the EX 5 OUTPUT back into the console channel right after the equalizer. This will avoid unnecessary noise.



2.4 Using the EX 5 on Tape Transfers

The EX 5 will bring back the clarity, presence and separation caused by generation loss during tape to tape transfer. For optimum results do not go through the mixing console.

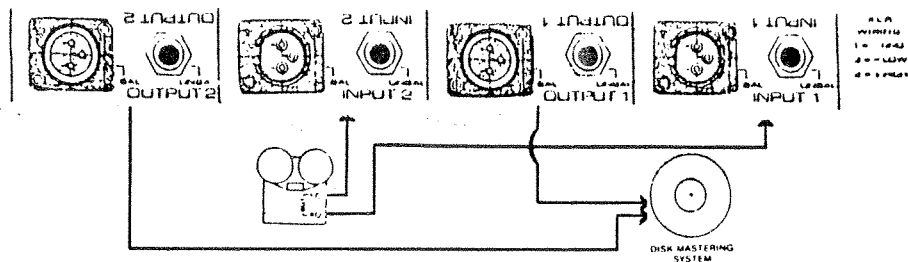
Connect the line outputs of the tape player to the INPUTS of the EX 5. Connect the OUTPUTS of the EX 5 to the line inputs of the 2nd tape recorder:



2.5 Using the EX 5 in Disk Mastering

The EX 5 can be used during disk mastering to restore the natural presence, clarity and intelligibility that is lost during the tape (or digital) recording process.

Connect the line outputs of the two track master tape player to the INPUTS of the EX 5. Connect the OUTPUTS of the EX 5 to the line inputs of the disc mastering system:



2.6 Using the EX 5 on Keyboards, Guitars or other Instruments

The EX 5 will give keyboards or guitars a crystalline clarity, presence and separation never possible before. The EX 5 can be used both in live concert or in recording studio. It will give the instrument a natural brilliance yet drastically reduce the listener ear fatigue and harshness. The EX 5 will allow you to separate your instrument from the wall of sound both on and off stage.

String synthesizers will project forward yet not be overpowering. When using the EX 5 on an instrument use less high frequency equalization to avoid harshness caused by EQ. The EX 5 also improves digital samplings that are in most cases lacking of the specific harmonical structure. When using the EX 5 with e.g. a guitar it can be interesting to use the EX 5 Process for the reverb sound or distortion sound only. The reverb sound will open up and will sound much clearer.

Connect the pre amp output (or outputs, if stereo) of the instrument to the INPUT(S) of the EX 5. Connect the EX 5 OUTPUTS to the inputs of the mixing console:

