

902
de-Esser

dbx[®]

PROFESSIONAL PRODUCTS

H A Harman International Company

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WARRANTY

1. The warranty registration card that accompanies this product must be mailed within 30 days after purchase date to validate this warranty. Proof-of-purchase is considered to be the burden of the consumer.
2. dbx warrants this product, when bought and used solely within the U.S., to be free from defects in materials and workmanship under normal use and service.
3. dbx liability under this warranty is limited to repairing or, at our discretion, replacing defective materials that show evidence of defect, provided the product is returned to dbx WITH RETURN AUTHORIZATION from the factory, where all parts and labor will be covered up to a period of two years. A Return Authorization number must be obtained from dbx by telephone. The company shall not be liable for any consequential damage as a result of the product's use in any circuit or assembly.
4. dbx reserves the right to make changes in design or make additions to or improvements upon this product without incurring any obligation to install the same additions or improvements on products previously manufactured.
5. The foregoing is in lieu of all other warranties, expressed or implied, and dbx neither assumes nor authorizes any person to assume on its behalf any obligation or liability in connection with the sale of this product. In no event shall dbx or its dealers be liable for special or consequential damages or from any delay in the performance of this warranty due to causes beyond their control.

INTRODUCTION

Congratulations on your purchase of the dbx 902 De-Esser. This manual provides you with the steps needed to install and operate the 902 module. The manual also includes information on completing the registration card, as well as customer support telephone numbers.

FEATURES

The dbx model 902 De-Esser is designed for use in the F900A mainframe or the FS900 miniframe. The 902's unique features make it possible to achieve the exact amount of de-essing desired regardless of variations in signal levels.

Log-Domain Processing: The 902 examines the differences in dB between the high frequency and full-bandwidth portions of the signal, allowing de-essing of signals which change in level by as much as 60 dB. Conventional de-essers require readjustment of their threshold control when a vocalist drops from singing voice to a whispering voice. By contrast, the 902 does not even have a threshold control to require adjustment.

User-Defined Crossover Frequency/HF Only or Broadband Operation: The two-pole, maximally flat filter design used by the 902 in separating high frequencies from low frequencies can be user adjusted over a range of 800 Hz to 8 kHz. This, in conjunction with the HF only mode, enables the 902 to be used for special, non-vocal applications such as removing "clicks" from a close-mic'd guitar.

RMS Level Detection: dbx patented RMS level detectors enable the 902 to sense level on the same basis as the human ear -- providing a natural and accurate response to audio waveforms.

Other features include:

- Control Voltage Inputs and Outputs
- Expanded Scale LED Metering
- Hard-Wired Bypass Switch

INSPECTION

Your dbx 902 was carefully manufactured, inspected and tested at the factory. If obvious physical damage is noticed contact the carrier immediately to make a damage claim.

If the 902 appears to malfunction during use, refer to the connections section of this manual to ensure proper connections, then contact your dealer or our factory service personnel for advice on how to proceed.

We suggest saving the shipping carton and packaging materials for safely transporting your 902 in the future.

Packed in the carton you should find the following:

- 902 unit
- operations manual (this is it)
- warranty registration card

Take the time now to fill out your warranty registration card and send it to us.

CONNECTING THE 902 TO YOUR AUDIO SYSTEM

Terminating resistors are not necessary for the 902's audio input to provide proper operation, but they may be required if the input is fed from a device designed for a specified load impedance, such as a passive equalizer. The 902 has an actual input impedance of 20 kΩ in balanced mode and >10 kΩ if unbalanced. This makes the 902 audio input suitable for use with virtually any source impedance, low or high.

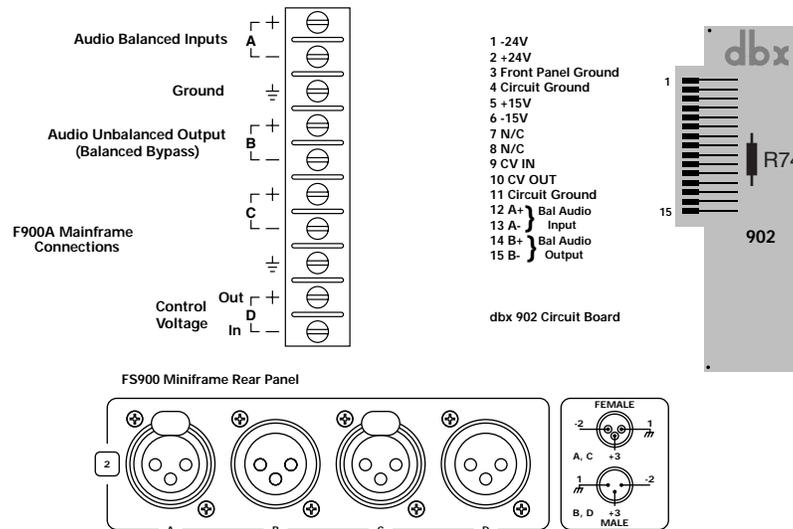
BALANCED

If you are using the F900A mainframe, connect the signal leads to the A+ and A- terminals; if you are using an FS900 miniframe, connect the hot (+) signal lead to pin 3 of the XLR connector, and the cold (-) signal lead to pin 2 of the XLR connector. For custom installations refer to the 902 diagram in Figure 1. If hum develops, try attaching the shield to the ground connection at the 902 input.

UNBALANCED

If you are using an F900A mainframe, wire the hot lead to the A+ terminal, and the shield to the A- terminal; if you are using an FS900 miniframe, wire the hot lead to pin 3 of the XLR connector, and wire the shield to pin 2 of the XLR connector. For custom installations refer to the 902 circuit board diagram in figure 1. If hum develops, try connecting a jumper between the A- terminal and the 902's input ground. Reversing the wires to the input terminals will result in the output signal from the 902 being 180 degrees out of phase with the input signal.

Figure 1: 902 Audio Connections



For maximum hum rejection avoid common grounding at the 902's input and output. The best starting point is to ground the shield of the input cable at the source device, leaving it unconnected to the 902, and to ground the shield of the output cable to the ground terminal of the 902, leaving it unconnected at the receiving device.

CONNECTING THE AUDIO OUTPUTS

The output of the 902 is designed to feed balanced or unbalanced loads of 600 Ω or greater. The output stage is single-ended; in normal operation the B- terminal is connected internally to the circuit ground. When the bypass switch is engaged, the signal inputs are directly connected to the signal output (i.e. A+ to B+, and A- to B-) and the internal jumper between B- and the circuit ground is removed.

The IN/OUT switch on the 902 introduces no noise into the signal path when it is switched. Switching back and forth between processed and unprocessed signal may reveal a level difference, depending upon the degree to which the program material is being de-essed. If a pop or click is apparent when the IN/OUT switch is activated, there is probably a grounding problem in the signal processing system. Compare the grounding of the signal shields to and from

the 902 with the grounding methods described in the previous sections. If the problem persists, try connecting a jumper wire between B- and ground. This should cure the popping sound, but the signal will now be unbalanced in the OUT, or BYPASS mode and hum may increase.

CONNECTIONS FOR SPECIAL APPLICATIONS

Skip this step if you do not intend to use any of the 902 special applications listed below. Refer to the listed page for information and installation steps for each application.

FRONT PANEL OPERATIONS

Figure 2: 902 Front Panel



GAIN REDUCTION LEDs: Indicate the amount of de-essing in dB.

IN/OUT SWITCH: Allows the user to hardwire bypass the 902 for before/after comparisons. Controls and indicators continue to function in the bypass mode. For de-essing it should be left in the normal mode.

MODE SWITCH: Allows the 902 de-essing action to affect either the entire audio bandwidth, or the high frequencies only. For de-essing it should be left in the normal mode. For “de-edging” and “de-clicking” of some instrumental material it should be put in the HF ONLY mode.

FREQUENCY CONTROL: Selects the frequency at which the 902 splits the audio signal into high and low frequency portions for evaluation. The 902 detects sibilant material by comparing (in dB) the high frequency level of an audio signal and the full bandwidth level of the signal. When the high frequency level is excessive relative to the full bandwidth level, the 902 will de-ess. For normal vocal de-essing, this control should be set around the 12:00 position (2.5 kHz) position. For special processing of instrumental material, the control should be swept back and forth until the optimum setting is obtained.

RANGE CONTROL: Sets the amount of de-essing effect produced when a sibilant is detected. For normal vocal de-essing, leave this control in the NORMAL region. Turning the RANGE control clockwise beyond the NORMAL region will cause vocal sibilants to be excessively attenuated or “swallowed.” More extreme settings are useful for special effects and for processing instrumental material.

Since the 902 is effectively inaudible in normal “de-essing” operation (sibilants simply sound normal) there may be a tendency to turn the range control clockwise beyond the normal region. Prolonged listening will, however, reveal the extra de-essing effect as unnatural for vocals.

APPLICATIONS

One of the primary design goals for the 902 de-esser is to eliminate the need for any adjustments when de-essing a wide variety of vocal material. However, several other interesting and worthwhile effects can be obtained with the user controls provided. By adjusting the filter cutoff frequency and the maximum amount of gain reduction, the high end of certain percussive source material can be altered on a dynamic basis. For example, the pick noise on a guitar track can be completely eliminated without affecting the timbre of the guitar. When a guitar string is struck, the first sound produced is a high level, high frequency “click”, with the amplitude of the fundamental string vibration building up relatively slowly. By processing a guitar track through the de-esser, the track can be brightened considerably via normal high-frequency boost equalization without exaggerating annoying pick noises.

SPECIAL APPLICATIONS

USING THE EXTERNAL CONTROL VOLTAGE INPUT (D-)

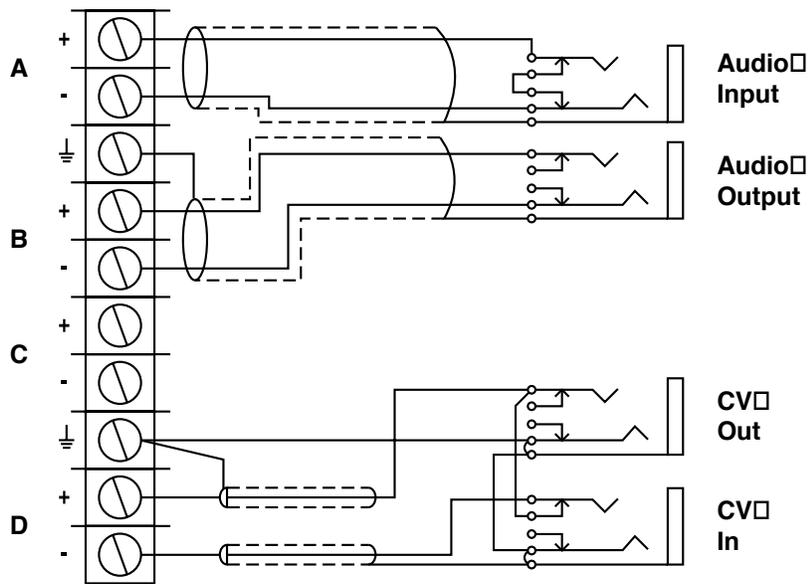
The CV input and output connections come from the factory jumpered together for normal de-esser operation. To use the CV input, this jumper (R74) must be removed. Jumper R74 is shown in figure 1 on page 3. Figure 3 on page 5 illustrates a way of setting up the external wiring to the 902 using normalizing type connectors so the CV input can be accessed when necessary.

The CV input provides direct access to the control port of the dbx VCA of the 902 for gain control. This provides the user with the ability to use the 902 as an automatable level control. The dbx VCA provides linear-gain tracking in decibels over a range of -100 to +40 dB with 1% accuracy. An output of 0 V produces 0 dB of gain through the VCA. The control port should be driven by an op-amp or other low-impedance source. A bypass capacitor may be required between the CV input and ground to prevent the audio signal from bleeding into this control port and causing modulation distortion.

USING THE CONTROL VOLTAGE OUTPUT

The control voltage output is a DC voltage which changes in proportion to the amount of gain change being produced by the 902. The relationship between this voltage and the amount of gain change is expressed as CV=50mV/dB gain change. The CV output is low impedance and capable of driving bridged loads of more than 10 kΩ and less than .01μf without affecting the operation of the 902.

Figure 3: Control Voltage Connections



SPECIFICATIONS

Input Impedance:	20 kΩ balanced, >10 kΩ unbalanced
Output Impedance:	22 kΩ, into 600 Ω or greater
Maximum Input Level:	+24 dBu
Maximum Output Level:	+24 dBu into 600 Ω or greater
Frequency Response:	20 Hz - 20 kHz (+0/-3dB)
Dynamic Range:	115 dB
Distortion:	Typically .008 % at 1 kHz
Equivalent Input Noise:	-90 dBu, 20 Hz - 20 kHz Bandwidth, unweighted
Attack Rate:	Program-dependent, 2 ms for 10 dB above threshold, 600μs for 20 dB above threshold, to achieve 63% gain reduction
Release Rate:	925 dB/sec
De-Essing Range:	Operates uniformly over input range of -40 dBu to +24dBu without requiring adjustment
Maximum "Ess" Attenuation:	Variable 0 to 20 dB
De-Ess Crossover Point:	Variable 800 Hz to 8 kHz
Filter Type:	12 dB/octave, phase coherent
Gain:	Unity
Controls:	Frequency, Range
Switches:	IN/OUT, Mode (HF ONLY/NORMAL)
Indicators:	IN/OUT, HF ONLY
Metering:	LED Column: 1, 2, 3, 4, 6, 8, 10, 12, 15, 20 dB gain reduction
Power Supply Requirements:	±15 V Regulated at 60 mA; ±24 V unregulated at 30 mA
Dimensions:	Front Panel: 3U high (5¼", 13.4 cm) x 1½" W, (3.8 cm); card depth behind front panel: 9½" (24.2 cm)

Note: specifications subject to change.



PROFESSIONAL PRODUCTS

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