

Preliminary Technical Service Manual

MODEL 1531 P/PM/X

Graphic Equalizer

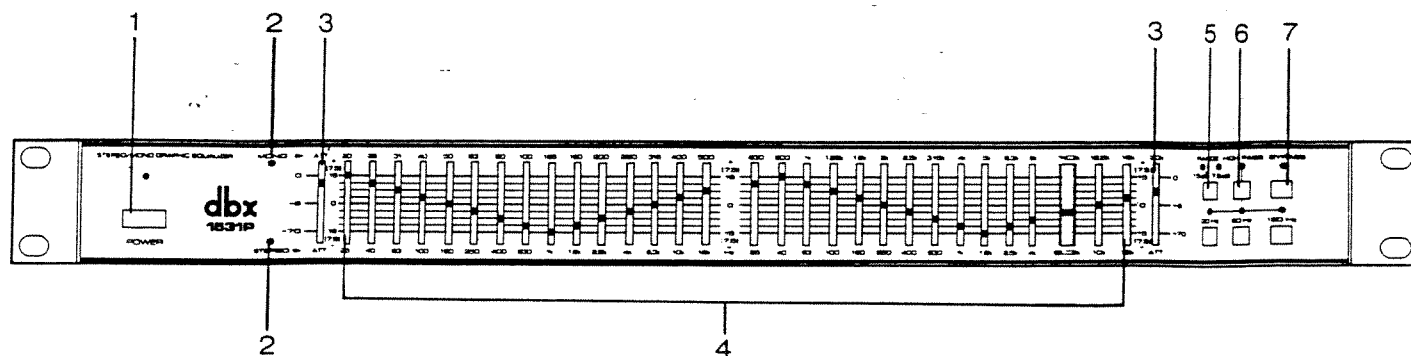
dbx Professional Products

May 1, 1991

dbx[®]

User/Operator Description

FRONT



- 1 POWER turns the unit on and off.
- 2 MONO and STEREO LEDs show the channel and filter-bandwidth configuration -- mono 1/3-octave vs. stereo 2/3-octave -- chosen on the back.
- 3 ATTENUATION. These sliders set the overall "throughput" level in dB from unity gain (0) through -6 down to virtually full off (-70). In MONO the right Attenuation slider becomes the 20 kHz boost/cut control, while the left one stays as is.
- 4 SLIDER FREQUENCIES. 1/3-octave on top, 2/3-octave below. Actual dB values are as follows, approximately -- 15-dB range: +2.5 dB for the first incremental line, +9 dB for the second, and +13 dB for the third; 7.5-dB range: +1 dB for the first, +4.5 for the second, and +6.75 dB.
- 5 RANGE button and LEDs. This changes the boost/cut strength of the sliders from over 15-dB maximum to half that. The 7.5-dB setting allows finer tuning, as noted above. Except for the potential maximum at the extreme settings, the sonic behavior of the 1531P does not much change with this switch; constant-Q filters have the same overall shape (skirt steepness) in dB/octave regardless of the amount of boost or cut.
- 6 HIGHPASS button and LED and 20/60/120 Hz (-3 dB point) buttons and LEDs. This set of buttons lets you use the 1531P as a partial crossover as well as an equalizer, with three steep lowcut (highpass) frequency choices. The rolloff is 18 dB/octave. It is wise to use the 20 Hz setting all the time, as an infrasonic ("subsonic") filter to prevent power-robbing inaudible frequencies from getting to your amps and speakers. The other two settings may be called for with biamped/triamped PA systems.
- 7 BYPASS button and LED. This is a balanced hardwire bypass, for instantaneous comparisons of EQ/no-EQ conditions, or in case of 1531P power loss or failure.

SPECIFICATIONS

Filter type	ISO centers $\pm 6\%$, 1/3-octave or 2/3-octave bandwidths, constant-Q, symmetrical peak/dip
Control range	+15 or +7.5 dB nominal
Switchable highpass filters	-3 dB @ 20, 60, or 120 Hz, 18 dB/octave
Sliders centered:	
Frequency response	20 Hz-20 kHz ± 0.5 dB
Equivalent input noise	-90 dBVA
Total harmonic distortion (THD)	0.01% (0 dBV input)
Intermodulation distortion (IMD) SMPTE	0.05%
Maximum input	+24 dBv
Maximum output	+20 dBv into 600 ohms single-ended, +21 dBv into 600 ohms balanced
Input impedances	30 k-ohms balanced, 18.8 k-ohms single-ended
Output impedance	22 ohms

Notes

- 1) Specifications are subject to change.
- 2) Attenuators are set to maximum (unity gain).
- 3) All voltages are rms (root-mean-square). 0 dBv is defined as 0.775 V regardless of load impedance. Subtract 2.2 from the dBv figure to convert to dBV (i.e., referred to 1 V). When the load impedance is 600 ohms, this particular dBv is also known as "dBm."
- 4) SMPTE IMD is measured with 60 and 7k Hz mixed 4:1.
- 5) Inputs and outputs have identical polarity.
- 6) "dbx" is a registered trademark of dbx, Newton, Mass. USA, a division of BSR North America Ltd.

WARRANTY and FACTORY SERVICE

All dbx products are covered by a limited warranty (warranties for products purchased outside the USA are valid only in the country of purchase and the USA). For details, consult your warranty/registration card or your dealer/distributor.

dbx Customer Service will help you use your new product. For answers to questions and information beyond what's in this manual, write to:

dbx
71 Chapel St.
PO 100C
Newton, Mass. 02195 USA
Attn: Customer Service

You also may call 617/964-3210 between 9:30 and 4:30 Eastern time (USA). The Telex is 92-2522.

Should problems arise, consult your dealer or distributor. If it becomes necessary to have your equipment serviced at the factory, repack the unit, including a note with a description of the problem, your name, address, and phone, and the date of purchase, and send the unit freight prepaid to the above street address, marking it Attn: Repairs.

Test Procedures



Supplement to dbx Model 1531P Owner's Manual
July 1988
NOTICE OF CHANGE IN SPECIFICATIONS

This unit has been modified, tested, and improved since its original design and manufacture. In order to minimize hum and noise (when the boost/cut sliders are set to their extreme positions), the signal path gain structure has been modified. The test and measurement conditions are as follows:

<u>Test</u>	<u>Measurement</u>
. Stereo Mode and Mono Mode	. 0 dBV = 1.0 volt rms
. Single Ended (1/4" jack) output	. 0 dBV = .775 volt rms (= dBm into 600 ohms)
. 120 volt, 60 Hz mains	. Output noise band limited to 20 KHz
. Attenuators full up position	

Test results show that the modification results in new specifications:

- Typical Output Noise (Boost/cut sliders mid-position): -95 dBV, A weighted
-85 dBV, flat
- Typical Output Noise (15 dB boost at 160 Hz): -85 dBV, A weighted
-75 dBV, flat
- Typical Output Noise (15 dB boost all bands): -75 dBV, A weighted
-65 dBV, flat
- Maximum Input Level: +18 dBV

Please note that the above specifications may be different from those printed in our owner's manual or product literature.

All other specifications remain unchanged.

We hope that you use and enjoy your dbx Model 1531P Switchable Graphic Equalizer for many years to come. The above modification is part of our continuing commitment to bring you the best performance from our products. If you require further assistance or would like information on our other products, please contact:

dbx Customer Relations
Department 1531P
71 Chapel Street
Newton, MA 02195 USA

Thanks!

Schematics, Assembly Drawings, Parts List

Rev. AK-01

10/15/92

DBX 1531X TEST PROCEDURE

A. INSTRUMENTS REQUIRED

1. Sweep generator, 20-20kHz, <50 output impedance.
2. Ac rms voltmeter with dBm calibration, 20-20kHz.
3. Dual channel oscilloscope.

B. INSPECTION AND WARMUP

1. Inspect the unit for any sign of external damage such as a cut in line cord broken fader and switches.
2. Check the voltage setting on the rear of the unit for correct voltage setting.
3. Let unit warm up for at least 10 minute before making test and adjustments.

B. POWER SUPPLY CHECK

1.	TEST POINT	SPEC.	TOLERANCE	RIPPLE
	Jumper J97	+15V	+/- .1vdc	<10mVrms
	Jumper J96	-15V	+/- .1vdc	"

C. PRESETTING

1. All switches in released positions.
2. All fader sliders in topmost position.
3. MONO/STEREO switch in STEREO position.

D. GAIN CHECK

1. Connect the 1 kHz, 0dBu signal from the sweep generator to both input jacks of the DUT.
2. Connect the output of the DUT to both channels of the scope and to the dB meter.
3. Verify that the outputs of the DUT are about 19 (16) +/- 1dBu.
4. GAIN SWITCHES: Press the 7.5/15 dB gain switch in. The output should drop to approximately 11 (8) +/- 2dBu.
5. ATTENUATION CONTROLS: Slide the Attenuation knobs of the faders downward. The gain should drop to -50 (-55) +/- 3dB.

E. BYPASS SWITCHES

1. Press Bypass switch. The output of the channels should be 0

dBu.

2. Release all switches and return the Attenuation controls to 0 dB positions.

F. FREQUENCY RESPONSES

Stereo mode:

1. Switch the generator to sweep mode.
2. The response curves should have 15 humps of $2/3$ octave separation, with about 15 dBu \pm 1dBu on each of the humps.

Mono mode:

1. Set the MONO/STEREO switch to MONO.
2. The frequency response curves should have 31 humps of $1/3$ octave separation on each curve. The humps on the left side are usually 3-5 dB higher gain than the right side ones. This is considered to be acceptable for the early designed models.

G. HI-PASS FILTERS CHECK:

1. Press the 120, 60, and 20 Hz high-pass filter knobs in consecutive sequence in the sweep frequency run. Start with pressing in the 120Hz knob, observing the sweep in progress. After the curve rolls past -3 dB of the mid-frequency value, press in the 60 Hz knob. Let the curve roll down to -3dB again. Switch in the 60 Hz filter and finish the run.
2. Check that the cut-off frequency of the filters are 120, 60 and 20 Hz \pm 10% at -3dB point respectively.
3. Reset the MONO/STEREO switch to stereo.
4. Reset the generator to 1 kHz 0dBu.

H. NOISE CHECK

1. Set all the knobs, except the 2 attenuation controls, to the 0 dB boost (detend positions) positions.
2. Remove the input signal from the input of both channels.
3. With the noise meter, check that the noise floor is < 90 dBu in the 20-20k noise band-width.
4. Set the 160 Hz fader to 15 dB boost. check that the noise is < -85 dBu.

5. set all the bands to 15 dB boost. The noise should be <-75 dB.

I. DISTORTION CHECK

1. Connect the 1 kHz 0 dBu signal back to the input jacks of the channels.
2. With a distortion analyzer, check that the THD is $<.01\%$.

NOTE:

In this test procedure, the dBu is approximated to be equal to dBm and dBv because the dbx equipment has lower output impedance and higher input impedance and to avoid confusion.

End of the test.