



# 510

## 500 SERIES SUBHARMONIC SYNTHESIZER



# OWNER'S MANUAL

## Warranty

1. Please register your product online at [www.dbxpro.com](http://www.dbxpro.com). Proof-of-purchase is considered to be the responsibility of the consumer. A copy of the original purchase receipt must be provided for any warranty service.
2. dbx warrants this product, when purchased new from an authorized U.S. dbx dealer and used solely within the U.S., to be free from defects in materials and workmanship under normal use and service. This warranty is valid to the original purchaser only and is non-transferable.
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 first be obtained from dbx. 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.

## Technical Support & Service

If you require technical support, contact dbx Technical Support. Be prepared to accurately describe the problem. Know the serial number of your device – this is printed on a sticker attached to the chassis.

Before you return a product to the factory for service, we recommend you refer to this manual. Make sure you have correctly followed installation steps and operating procedures. For further technical assistance or service, please contact our Technical Support Department at (801) 566-8800 or visit [www.dbxpro.com](http://www.dbxpro.com). If you need to return a product to the factory for service, you MUST first contact our Technical Support Department to obtain a Return Authorization Number.

**NO RETURNED PRODUCTS WILL BE ACCEPTED AT THE FACTORY WITHOUT A RETURN AUTHORIZATION NUMBER.**

Please refer to the Warranty information, which extends to the first end-user. After expiration of the warranty, a reasonable charge will be made for parts, labor, and packing if you choose to use the factory service facility. In all cases, you are responsible for transportation charges to the factory. If the product is still under warranty, dbx will pay the return shipping.

Use the original packing material if it is available. Mark the package with the name of the shipper and with these words in red: DELICATE INSTRUMENT, FRAGILE! Insure the package properly. Ship prepaid, not collect. Do not ship parcel post.

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## Overview

### **Introduction**

The 510 is a 500 series compliant subharmonic synthesiser that has been specifically optimized to enhance the low frequencies in audio material. The 510 was designed for use in a variety of professional audio applications, including nightclub and dance DJ mixing, theatre and film sound, music recording, sound design, live music performance, and broadcasting.

The 510's patented Modeled Waveform Synthesis™ process builds a synthesized waveform using the wave shapes of the original bass material, producing a new waveform modeled bass note exactly one octave below the bass in the original audio signal. dbx subharmonic synthesis produces smooth, musical low frequencies that do not interfere with mid and high-band information, even when the maximum amount of synthesis and boost are applied. The result is a low-end punch that people really feel!

Using traditional EQ to enhance this extremely low frequency region doesn't always provide desirable results and can increase noise potential. Another problem is that the audio source may not have sufficient information in this low-end region to boost or the mic used to capture the sound may not capture these extremely low frequencies.

The 510's two independently adjustable bands of subharmonic synthesis (24 Hz–36 Hz and 36 Hz–56 Hz) provide the best combination of smoothness and control. The SUBHARMONICS control adjusts the overall amount of effect applied to the signal. The LF BOOST control can then be used to fill in the “gap” between the modeled waveform and the lower midrange of the source, for a deep, smooth low-end response.

We hope the 510 serves as an indispensable creative tool for your sound processing and music production needs. Thank you for choosing dbx.

### **Features**

- *dbx Patented Modeled Waveform Synthesis™ Circuitry Ensures that Mid & High Frequencies are not Affected*
- *Synthesis Controls and Level LED Indicators for Two Separate Subharmonic Frequency Ranges*
- *Global Subharmonics Level Control*
- *Additional Low-Frequency Boost Circuit*
- *Bypass Button w/ Hard-Wired Bypass*

## Installation

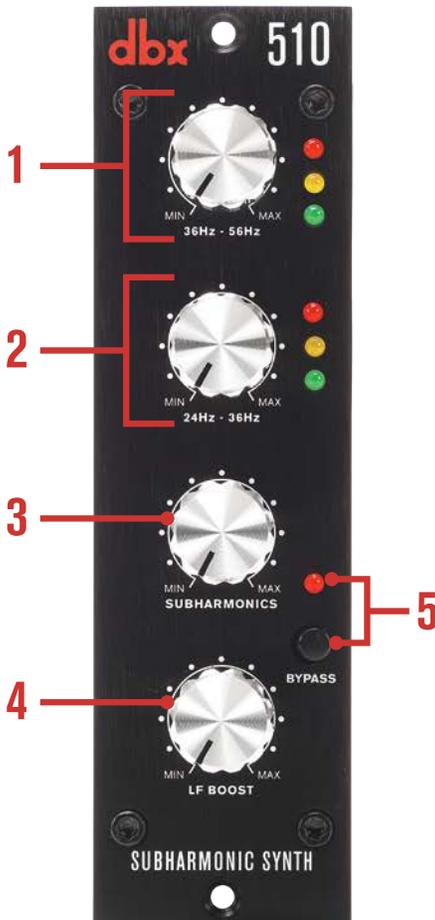
**FOR 500 SERIES CHASSIS MOUNT USE ONLY!**

**To install the 510 into a 500 series chassis:**

1. Turn off the power to the 500 series chassis.
2. Unpack the module and ensure the rear connector is free of debris.
3. Align and slide the module into the 500 series chassis, ensuring the connectors on the back properly seat with the connectors in the chassis.
4. Install the included screws to secure the 510 to the chassis. Both metric and standard screws are included. Use the correct screw type for your chassis.
5. Power on the chassis.
6. Enjoy!

**WARNING!** Do not hot swap 500 series modules! Doing so can potentially cause damage to the 500 series module or chassis. Always power down the chassis when installing or removing 500 series modules.

## The User Interface



### 1. 36 Hz-56 Hz Control w/ Synthesis Level Indicator LEDs

This control adjusts how much of the subharmonic synthesis effect is applied in the 36 Hz-56 Hz frequency band.

The LEDs to the right of the control indicate the signal level of the effect within the band, with green indicating signal present, amber indicating the signal is approaching clipping, and red indicating clipping. If the red LED lights, the 36 Hz-56 Hz control or output level of the previous device should be reduced to prevent distortion.

### 2. 24 Hz-36 Hz Control w/ Synthesis Level Indicator LEDs

This control adjusts the subharmonic synthesis level applied in the 24 Hz-36 Hz frequency band.

The LEDs to the right of the control indicate the signal level of the effect within the band, with green indicating signal present, amber indicating the signal is approaching clipping, and red indicating clipping. If the red LED lights, the 24 Hz-36 Hz control or output level of the previous device should be reduced to prevent distortion.

### 3. SUBHARMONICS Control

Where the 24 Hz-36 Hz and 36 Hz-56 Hz controls adjust the level of the respective frequency bands, this control adjusts the overall amount of subharmonic synthesis effect applied to the signal. Adjust it until the desired amount of overall effect is achieved.

### 4. LF BOOST Control

This control is used to even out the total apparent bass output of the processed signal. Use it to fill in the “gap” between the synthesized low bass (below 56 Hz) and the mid bass of the original program. Be careful that you don't apply excessive boost, especially if the SUBHARMONICS control is past its midpoint or if you are using bass equalization somewhere else in the signal chain.

Note that the LF BOOST control can also be used alone when no subharmonic synthesis effect is applied (this is achieved by setting the SUBHARMONICS control to its full counter-clockwise position).

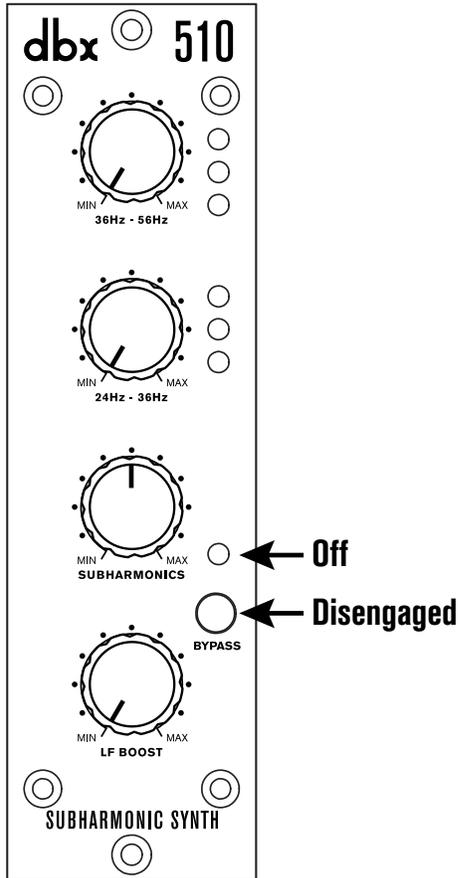
### 5. BYPASS Button & LED

When this button is disengaged, the LED will not light and the signal will pass through the 510's processing circuit. When engaged, the LED will light and processing will be bypassed. Note that this is a hard-wired bypass for optimum signal integrity when bypassing the processor. Use this button to audition the difference between the processed and unprocessed signals.

## Using The 510

***To set the 510, follow these steps:***

1. Start by setting the controls as shown below.



2. Ensure the signal has sufficient bass content to process. While monitoring the signal, raise the **36 Hz–56 Hz** control until the desired amount of low-end enhancement is achieved within the frequency range.
3. Raise the **24 Hz–36 Hz** control until the desired amount of low-end enhancement and roll-off is achieved within the frequency range.
4. Adjust the **SUBHARMONICS** control to fine tune the amount of subharmonic processing applied to the signal.
5. Raise the **LF BOOST** control to fill in the “gap” between the generated subharmonics and the program material’s lower-midrange frequencies. Note that the **LF BOOST** control can be used by itself if required. To do so, simply lower the **SUBHARMONICS** control to the MIN setting to prevent generated subharmonics from being added to the processed signal.
6. Use the **BYPASS** button to compare the processed and unprocessed signals to ensure the desired results have been achieved.

# Technical Information

## Specifications

### INPUT

Type:	Electronically balanced/unbalanced, RF filtered
Impedance:	20 k $\Omega$ balanced, 10 k $\Omega$ unbalanced
Maximum Input Level:	+22 dBu
CMRR:	>40 dB; typically >55 dB at 1 kHz

### OUTPUT

Type:	Electronically balanced/unbalanced, RF filtered
Impedance:	Balanced 30 $\Omega$ , unbalanced 15 $\Omega$
Maximum Output Level:	+22 dBu

### PERFORMANCE

Frequency Response:	20 Hz – 20 kHz, + 0/-0.5 dB 14 Hz – 120 kHz, +0/-3 dB
Noise:	<-99 dBu, Unweighted (22 Hz – 22 kHz)
THD+N:	<0.003% typical from 22 Hz – 22 kHz at 0 dBu
Dynamic Range:	>120 dB

### SUBHARMONIC SYNTHESIS PROCESSING

Synthesis Frequency Range:	26-56 Hz (from 54-110 Hz input signal)
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### POWER

Requirements:	+/- 16V DC
Current Draw:	85 mA per power rail
Power Draw:	2.7 watts

### PHYSICAL

Rack System:	500 Series Compatible Power-frame
Rack Space	1 Slot
Dimensions (H x W x D)	5.25" x 1.5" x 6" (13.34 cm x 3.81 cm x 15.24 cm)
Weight:	1.3 lbs (0.59 kg)
Shipping Weight:	1.7 lbs (0.77 kg)

Notes: Noise and frequency response specifications are at unity gain.  
0 dBu=0.775V rms

Specifications are subject to change without notice.

# 510 RECALL SHEET

DATE: \_\_\_\_\_

PROJECT: \_\_\_\_\_

**dbx 510**

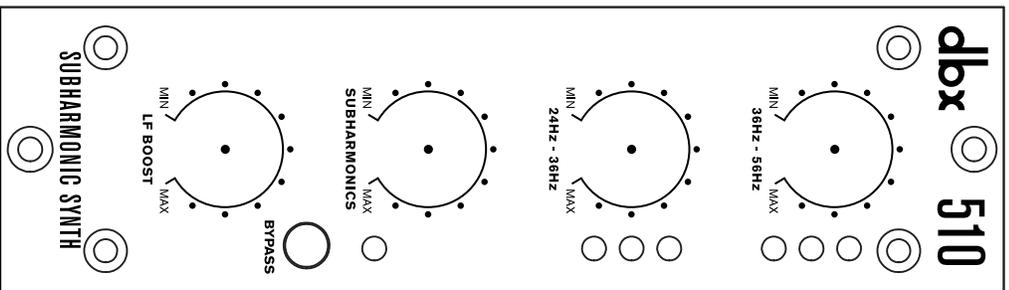


Diagram of the dbx 510 EQ control panel. It features four frequency sliders: 36Hz - 56Hz (MIN/MAX), 24Hz - 36Hz (MIN/MAX), LF BOOST (MIN/MAX), and SUBHARMONIC SYNTH (MIN/MAX). A BYPASS button is located at the bottom right.

SOURCE: \_\_\_\_\_  
NOTES: \_\_\_\_\_

**dbx 510**

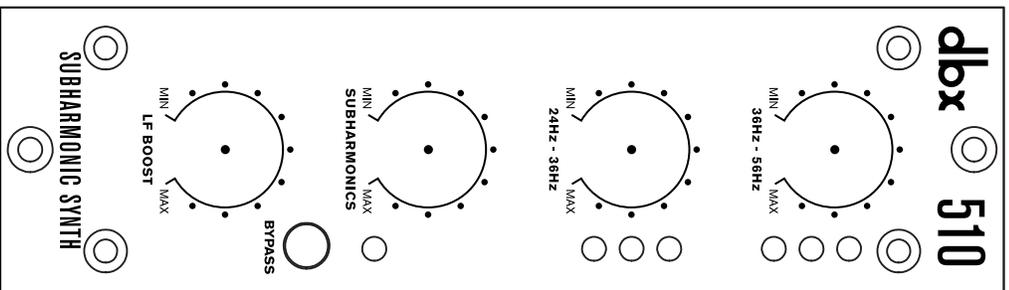


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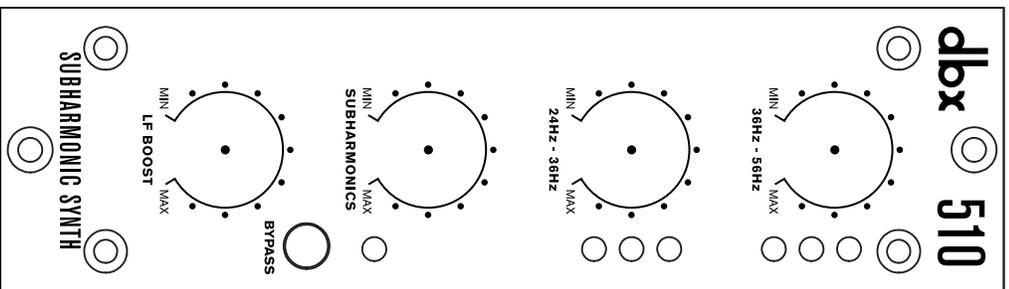


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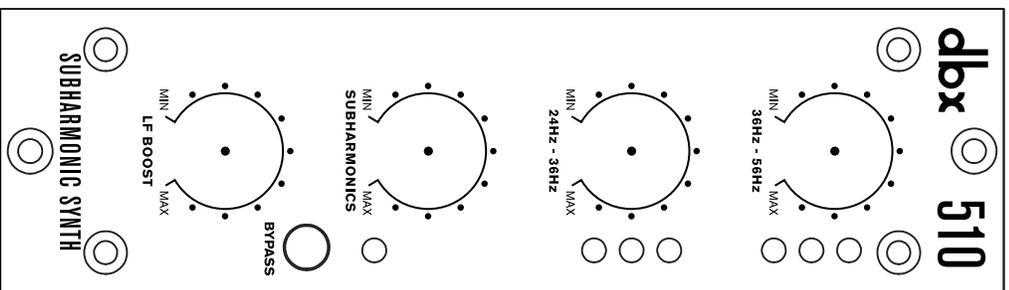


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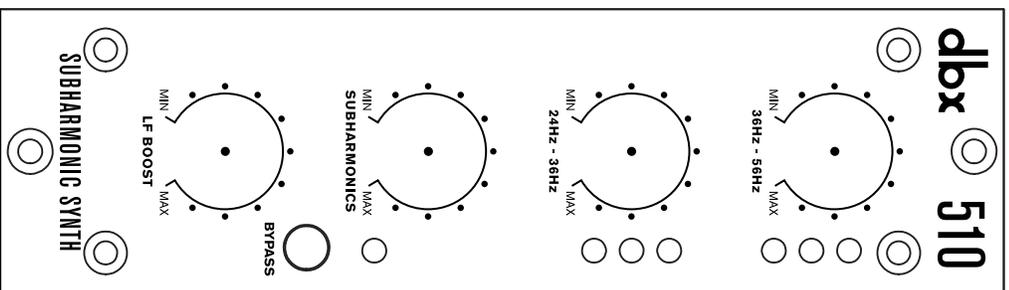


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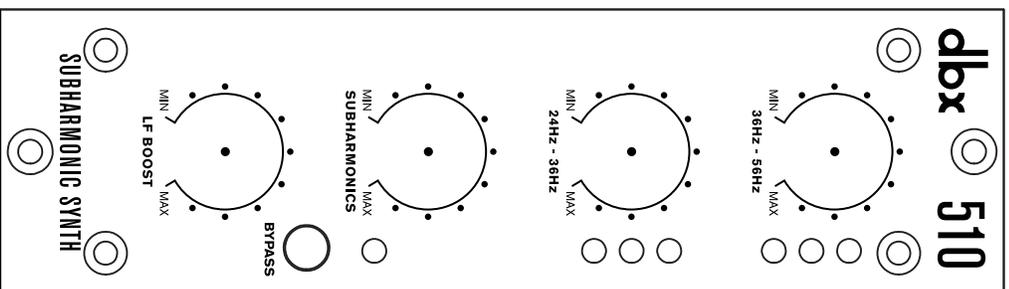


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NOTES: \_\_\_\_\_



**Phone:** (801) 566-8800  
**Website:** [dbxpro.com](http://dbxpro.com)  
**Support:** [dbxpro.com/en-US/support](http://dbxpro.com/en-US/support)

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510 Owner's Manual  
Rev A

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