

Radio Modifications



Realistic DX-394

bhi NEDSP-KBD Installation

Introduction

The bhi DSP processes the incoming audio signal and then differentiates the speech from the noise. The unwanted noise and interference is then attenuated to leave only the speech. All functions of the NEDSP1061-KBD are controlled by a single button. The mode of operation is indicated both visually and audibly.

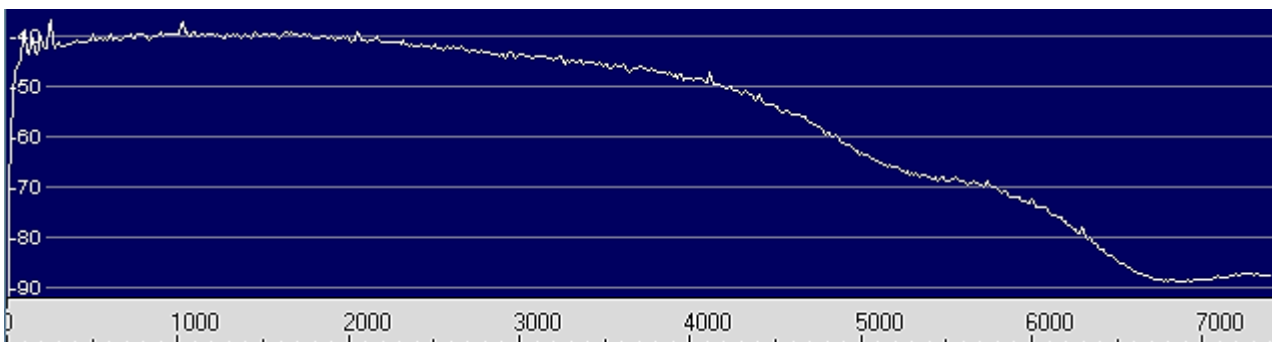
Note: This install guide is a third party instruction and is not produced by bhi Ltd. Users make the modifications at their own risk and no responsibility can be attributable to bhi Ltd.

bhi NEDSP1061-KBD module features:

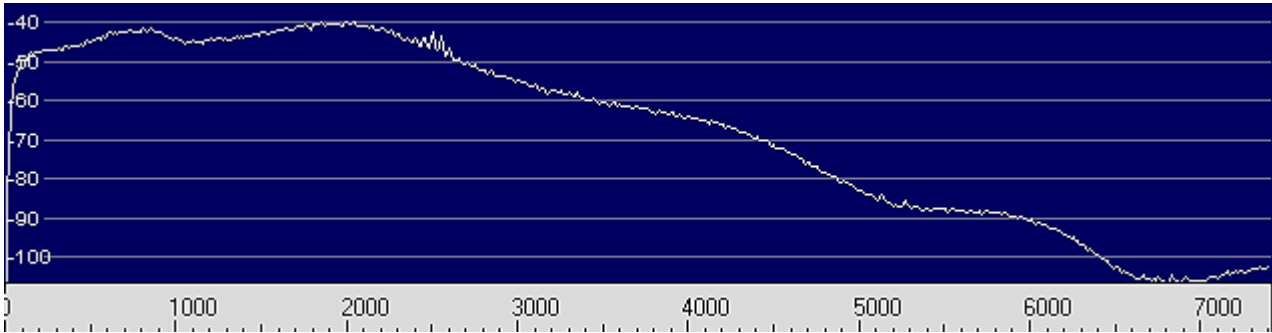
- Fully adaptive to changing noise environments
- Input and output level controls
- Input overload indication
- Virtually no distortion to speech signal
- Up to 35dB of noise cancellation
- 4 levels of noise reduction
- 5 – 15V supply range
- 4.6dB on board gain
- Single key operation of all functions
- LED indication of DSP level and status
- Small size 26mm x 37mm

[bhi Home Page](#)

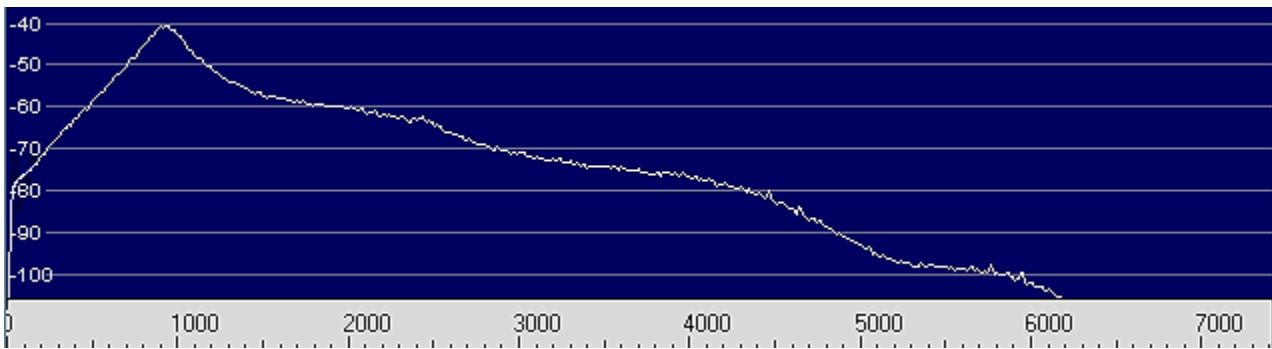
DX-394 DSP Audio Frequency Response Curves



AM DSP Audio Frequency Response



SSB DSP Audio Frequency Response



CW DSP Audio Frequency Response

Mounting The bhi DSP Module

The DSP module has four mounting holes that are used to retain the unit inside the DX-394. Two holes need to be drilled in the front panel for the keyboard. Hole sizes and positions can be found in the bhi installation manual. The keyboard is retained using the supplied (modified) 'Z' bracket and the keyboard holes in the front panel are covered by a self adhesive label.



Mount the DSP module using four M2.5 nylon bolts, washers and nuts.



The 0V connection is formed using the M3 ring tag. A suitable 0V point is the PCB retaining screw shown in the photo.

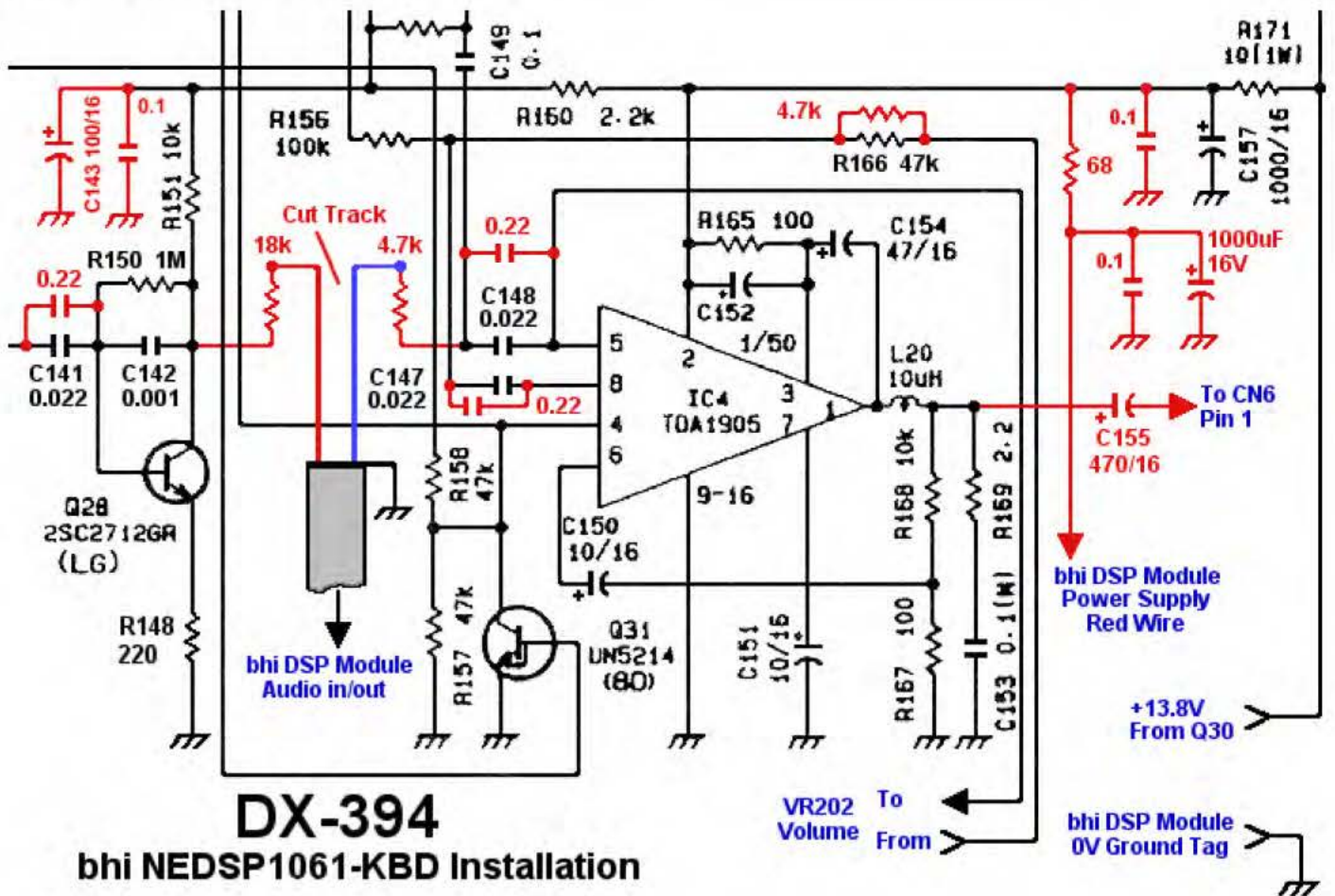


Modified Z Bracket and Keyboard Location



bhi DSP Keyboard

DX-394 Audio Amplifier Circuit Diagram



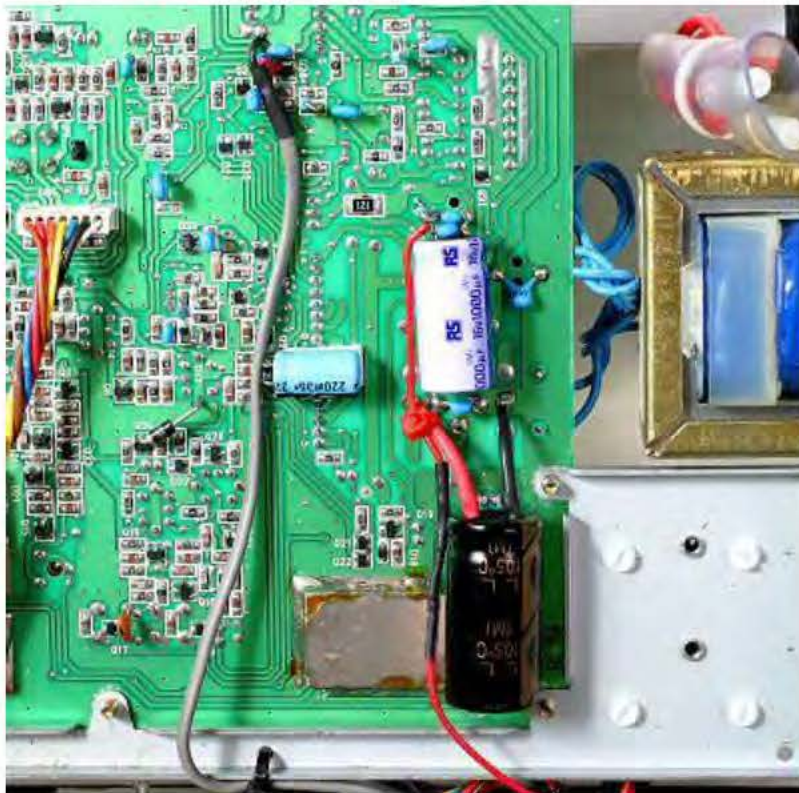
Parts List

Component Type	Value	Quantity
Resistor	68R 0.6W	1
Resistor	4.7k 0.6W	2
Resistor	18k 0.6W	1
Ceramic Capacitor	0.1uF (104) 50V	3
Ceramic Capacitor	0.22uF (224) 50V	3
Electrolytic Capacitor	470uF 16V	1
Electrolytic Capacitor	1000uF 16V	1
DSP Module	bhi NEDSP1061-KBD	1

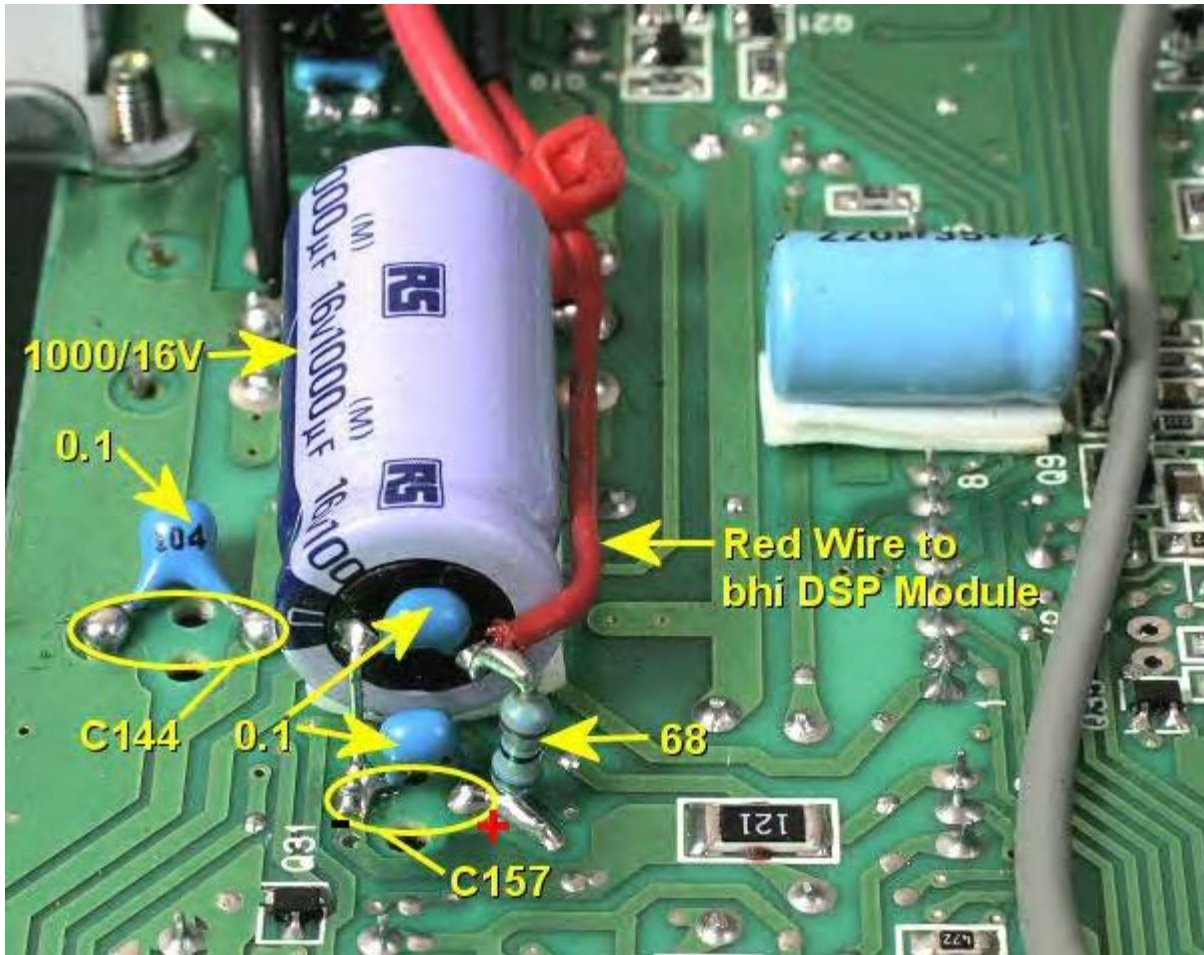
The resistors are Metal Film 1% 0.6W. Dimensions: 6.5mm x 2.5mm dia. However, you can use 2% or 5% resistors at 0.5W or 0.25W.

The small blue capacitors are resin-dipped high quality multilayer plate ceramic.

Procedure



Audio and Power Connections



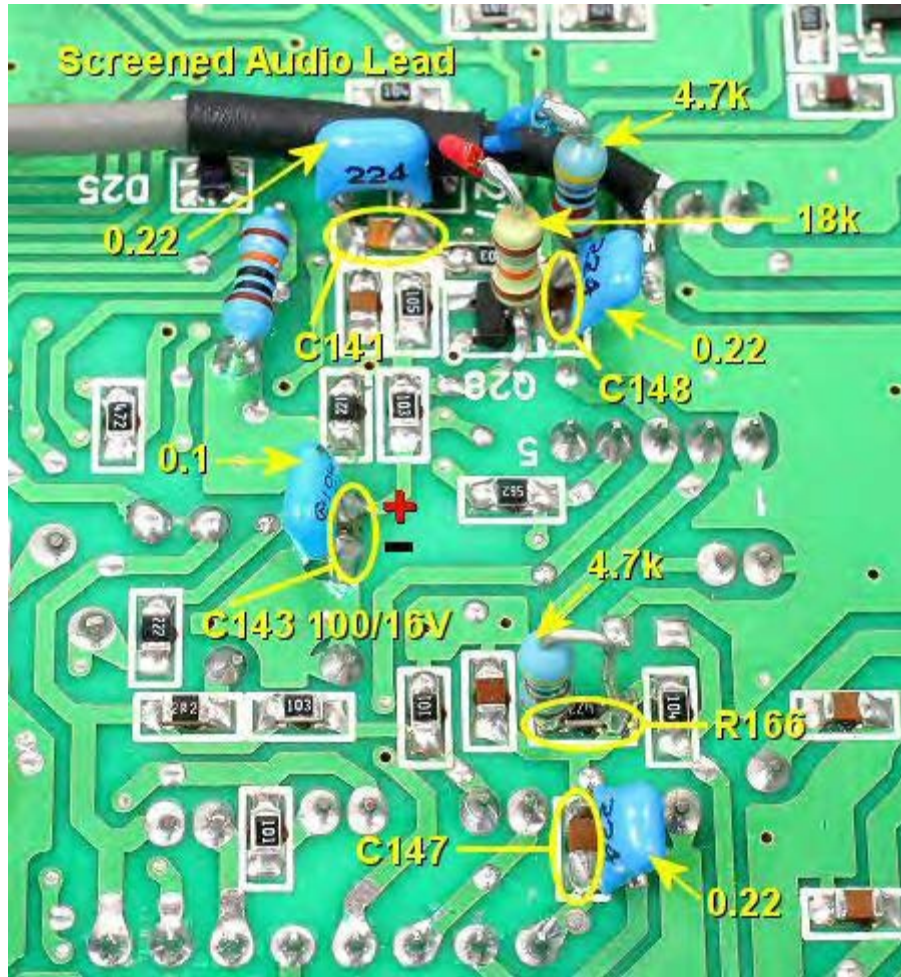
bhi NEDSP1061-KBD Power Connection

Using a double layer of 'Quick Stick' pads mount a 1000uF 16 Volt capacitor at the position shown in the photo. With its negative lead to the negative connection of C157. From the positive side of C157 fit a 68 ohm 0.6W resistor to the positive lead of the 1000uF capacitor. Place a 0.1uF (104) ceramic capacitor across the positive and negative leads.

The 0.1uF (104) ceramic capacitor across C144 and C157 are fitted during the power supply and audio amplifier modifications.

From the positive lead of the 1000uF capacitor connect the red power wire to the bhi DSP module, see photo.

Procedure



Modified PCB and Additional Components

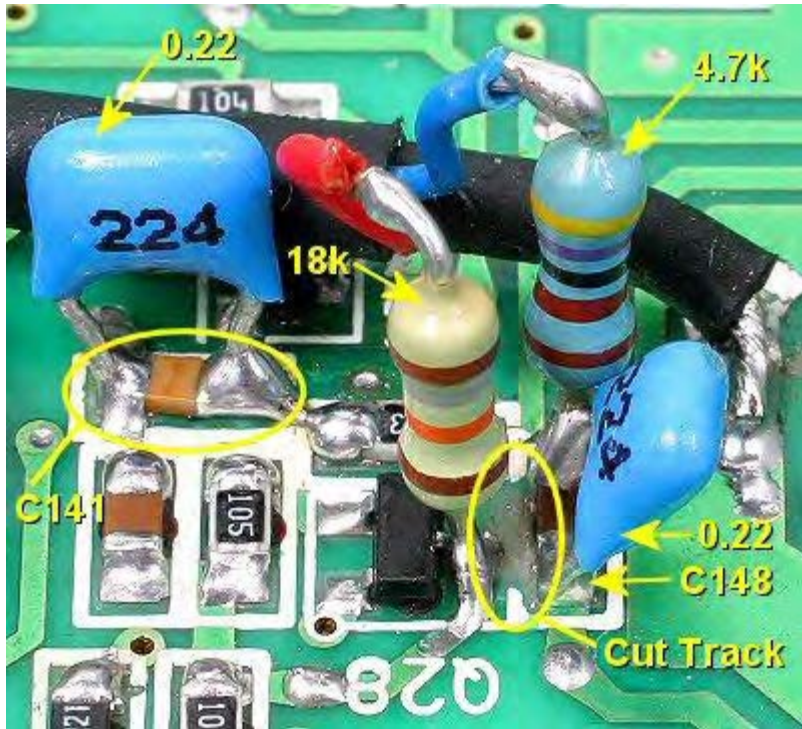
Place a 4.7k 0.6W standard resistor across the 47k surface mount resistor R166.

The 0.22uF (224) ceramic capacitors across C141, C147, C148 and the 0.1uF (104) ceramic capacitor across C143 are fitted during the audio amplifier modifications. The value of C143 is also changed to a 100uF at 16 Volt during these mods.

Mount vertically one end of a 4.7k resistor at C148, see photo.

Mount vertically one end of a 18k resistor to the collector of Q28, see photo.

Cut the PCB track from the collector of Q28 to the ceramic capacitor C148 at the position shown in the photo.



Screened Audio Connections

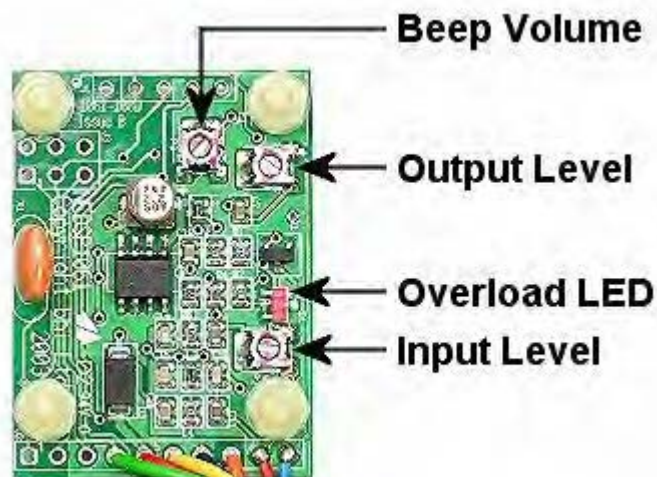
Fit the screened audio lead:

- Red Audio Input via the 18k resistor to the collector of Q28
- Blue Audio Output via the 4.7k resistor to C148
- Black Audio Screen to 0V track on the PCB

You must scrape away some of the green solder-resist coating from the PCB to expose the copper track for the audio screen ground connection.

[bhi DSP AM Noise Blanker Modifications](#)

bhi NEDSP1061 Adjustments



bhi NEDSP1061 Level Controls

Adjust the Output Level to its maximum position.

Adjust the Beep Volume to give the desired level, or off if required.

Set the Input Level to the halfway position. The Overload LED should not illuminate on loud signals. If it does back off the pot slightly.

bhi NEDSP1061 Operation

All functions of the NEDSP1061-KBD are controlled by a single button.

- **Single press turns the noise cancellation on/off.**
- **Holding down the button changes the DSP filter level.**

The mode of operation is indicated both visually and audibly. The front panel LED is illuminated red when the noise cancellation is off. When the noise cancellation level is changed the LED will flash green to indicate which level has been selected. Simultaneously the DSP will beep to give audible indication of DSP level. This allows the operator to change the DSP level without having to look at the LED to see which level has been selected. A short beep is emitted to acknowledge a button press. The module will store the current DSP level, and will return to this level when the equipment is switched on. When the DX-394 is switch on the LED will illuminate red to indicate the noise cancellation is off. The unit will flash/beep to indicate the DSP filter level last used.