

## Key Benefits:

- Comprehensive set of filtering plug-ins for audio forensics
- Powerful noise reduction and voice clarification algorithms
- Dual-trace spectrum analysis to compare before and after
- Reporting function to document and preserve all settings
- Support for multiple host platforms

## Best Uses:

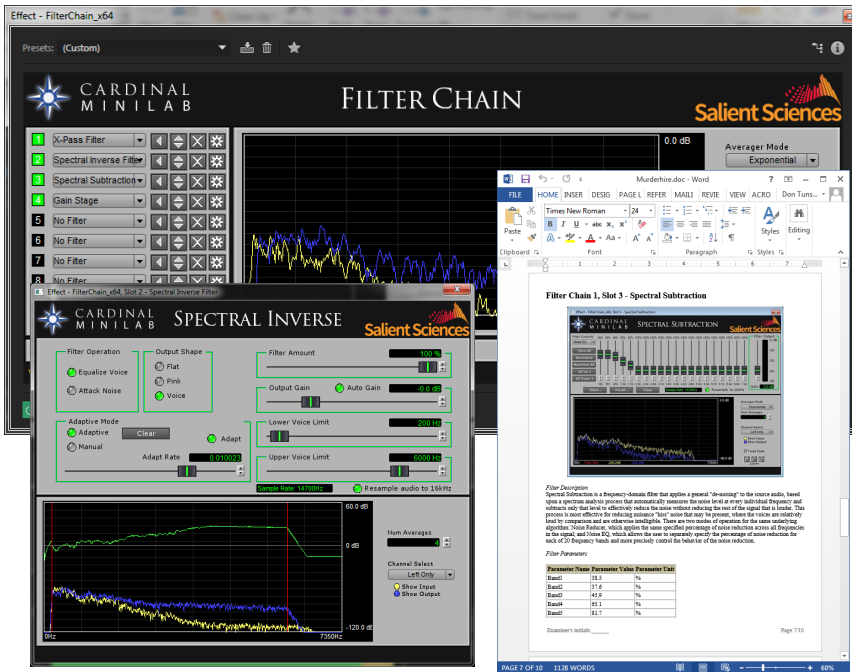
- Forensic audio / video workstations
- Laptop audio / video rigs

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# CARDINAL MiniLab Suite

## Comprehensive Plug-In Package for Audio Forensics



CARDINAL MiniLab Suite is a set of ten plug-ins that provide a comprehensive toolset for cleaning and clarifying noisy audio recordings that contain speech.

With a familiar user interface to audio forensics experts throughout the world who have been trained on "DAC" filtering products, the MiniLab Suite operates within your favorite audio / video editing software, and is capable of reducing many different types of noises in voice recordings, including tonal noises, room "rumble", hum, engine noises, motors and fans, static, hiss, and background interferers such as radio or television. Certain MiniLab plug-ins can also reverse acoustical and equipment effects that degrade voice intelligibility, such as muffling, spectral coloration, echo/reverberation, near/far distances and microphone concealment issues, and poor frequency response of the recording equipment.

Unique to the MiniLab Suite, the Filter Chain plug-in allows combinations of multiple filters to be previewed and applied by the editing software simultaneously, and includes numerous preset solutions to common noise problems to save time vs. configuring every filter manually. Additionally, a reporting function details the complete filtering arrangement and settings in a single, printable document (HTML or Word), complete with screen captures for all filters.

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# **CARDINAL MiniLab Suite Specifications**

## **Plug-In Specifications:**

### **Common to all plug-ins in MiniLab Suite:**

- Dual-trace, zoomable 460-line spectrum analyzer to facilitate before/after audio comparison
- Optional resampling to 14.7/16kHz sample rate to optimize processing for speech (except Filter Chain)

### **1CH Adaptive:**

- Adjustable filter size, prediction span, adapt rate and output
- Maximum number of taps: 8192 taps
- Auto Normalize adapt rate
- Conditional adaptation
- Coefficient display graph

### **Spectral Inverse:**

- Adaptive Spectral Inverse Filter (ASIF)
  - Adjustable lower and upper voice limits
  - Selectable filter operation (Equalize Voice or Attack Noise)
  - Selectable output shape (Flat, Pink, Voice, Custom)
  - Adjustable adapt rate, filter output and gain
  - Auto gain feature
- Spectral Inverse Filter (SIF)
  - Adjustable lower and upper voice limits
  - Selectable filter operation (Equalize Voice or Attack Noise)
  - Selectable output shape (Flat, Pink, Voice, Custom)
  - Adjustable filter output and gain

### **Multi-Band:**

- Multiple Notch
  - Independently adjustable notch frequency, width and depth
  - No restriction on number of notches
  - Minimum notch frequency: 10Hz
  - Maximum notch depth: 120dB
- Multiple Slot
  - Independently adjustable slot frequency, width and depth
  - No restriction on number of slots
  - Minimum slot frequency: 10Hz
  - Maximum attenuation: 120dB

### **Comb:**

- Adjustable comb frequency, limit and depth
- Auto Tracking feature for frequency setting
- Maximum depth: 120dB
- Minimum notch limit: 120Hz
- Selectable harmonics: All, Even or Odd

### **Spectral Subtraction:**

- Noise EQ
  - 20 adjustable frequency bands
  - Normalize feature
  - Adjustable output gain
  - Output level graph
- Noise Reducer
  - Adjustable attenuation and output gain
  - Maximum output gain: 30dB
  - Output level graph

### **"X-Pass", incorporating the following six filters within a single tool (maximum attenuation: 120dB):**

- Lowpass
  - Adjustable cutoff frequency, attenuation and slope
- Highpass
  - Adjustable cutoff frequency, attenuation and slope
- Bandpass
  - Adjustable lower and upper cutoff frequency, attenuation and slope
  - Minimum width: 10Hz
- Bandstop
  - Adjustable lower and upper cutoff frequency, attenuation and slope
  - Minimum width: 10Hz
- Notch
  - Adjustable notch frequency, width and depth
  - Minimum notch frequency: 10Hz
- Slot
  - Adjustable slot frequency, width and stopband attenuation
  - Minimum slot frequency: 10Hz

## **Plug-In Specifications (continued):**

### **Graphic EQ:**

- 20-Band Graphic EQ
  - 20 adjustable frequency bands
  - Maximum attenuation per band: 100dB
  - Normalize feature
- Hi-Res Graphic EQ
  - User-defined shape using control points
  - Maximum number of control points: 460 points
  - Normalize feature

### **Parametric EQ:**

- Variable number of stages
- Adjustable center frequency, width factor, boost/cut for each stage
- Output gain/attenuation

### **Gain:**

- AGC
  - Adjustable release time and maximum gain
  - Maximum gain: 100dB
  - Output level graph
- Limiter/Compressor/Expander
  - 3 adjustable regions: limiter, compressor, expander
  - Adjustable compression ratio and expansion ratio
  - Adjustable attack and release times
  - Adjustable Look ahead time

### **Reference Canceller:**

- Adjustable filter size, delay, delay channel, adapt rate, and output selection
  - Maximum number of taps: 8192 taps
  - Auto Normalize adapt rate
  - Conditional adaptation
  - Coefficient display graph
- ### **Filter Chain:**
- Can arrange any combination of 8 MiniLab plug-ins in series to preview or render the cumulative effect in a single pass
  - Includes multiple factory "preset" combinations to common noise problems; user can also save any combination as a new preset
  - Reporting function documents the complete arrangement, including detailed parameters and screen captures for all filters applied, to either Word or HTML file format; also saves a preset file for future repeatability

## **CARDINAL MiniLab Suite**

Contains the following filtering plug-ins:

- 1CH Adaptive
- Spectral Inverse
- Multi-Band
- Comb
- Spectral Subtraction
- X-Pass
- Graphic EQ
- Parametric EQ
- Gain
- Reference Canceller
- Filter Chain

### **System Requirements (minimum):**

- Windows 7/8/10 (32-bit or 64-bit)
- At least 2GB of RAM
- Intel Core 2 Duo or better
- Software application capable of hosting VST 2.4 plug-ins (Adobe Audition, Sound Forge Pro, and iZotope RX are popular choices)

**NOTE: We do not support Mac platforms at this time.**