### **CHAPTER 51**

## **UA 610-B Tube Preamp**

#### Historical to Modern Tube Amplification from Universal Audio

The Universal Audio 610 Modular Amplifier was designed by audio renaissance man and UA founder M.T. "Bill" Putnam, and was a major milestone in console design. An all tube and transformer class-A design with feedback style EQ, the 610 was the first preamp design to include echo sends and modularity that allowed channels to be swapped mid-recording session.

The Universal Audio 610 mic preamplifier has an illustrious history associated with numerous landmark recordings of the past, and is widely used today in its modern hardware incarnations (Universal Audio 2-610, 6176, LA-610mkII, SOLO/610, and M-610). The UA 610 is one of the best selling preamps in the boutique preamp market.

The sheer number of classic recordings made by the 610 – new or old – is staggering. From Coldplay to Cold War Kids, and Duke Ellington to The Doors, the 610 has been part of the fabric of modern recording since 1958.

With over a year in research and design, the UA 610-B Tube Preamp plugin represents the next major milestone in the evolution of Universal Audio's 610, and for preamplification as a whole. For the first time, the 610-B Tube Preamp offers the digital audio workstation environment the complete sound, behavior, and features of a dedicated tube preamp.

## UA 610-B Screenshot



Figure 159. The UA 610-B Tube Preamp plug-in window

#### **UA 610-B Overview**

The complete signal path is modeled in the UA 610-B plug-in, including tube amplifiers and transformer components, along with all the phase shift, slew rate, and distortion characteristics that are inherent in the hardware.

**Modern 610-B** The 610-B is the modern Universal Audio preamp design used in our popular hardware products such as the 2-610, LA-610mkII, and 6176.

The UA 610-B plug-in faithfully models this newer design, including all the expanded features optimized for modern use.

- In Use A primary use for the 610-B is for individual vocal or instrument tracks where colorful tube character and broad EQ strokes are desired. The 610-B is widely used as a vocal channel and bass channel, but it sounds great on any source signals.
- **Tonal Range** From clean to clipped, with a broad sweet spot between, extreme tonal flexibility is possible with the UA 610-B. The input and output circuits each have their own tube-driven gain stage, and because each stage imparts its own color, many variations can be obtained by tuning the I/O gain structures.

The 610-B equalizers can also add lots of flavor. Because the EQ has a feedback-style design, it effects the distortion characteristics of the output stage.

- **Presets** The UA 610-B includes presets in the internal factory bank which are accessed via the host application's preset menu. The presets are also copied to disk by the UAD installer so they can be used within Apollo's Console application. The presets can be loaded using the Settings menu in the UAD Toolbar (see "Using UAD Powered Plug-Ins" in Chapter 7 of the UAD System Manual).
- **UA 610-B** Latency The UA 610-B uses an internal upsampling technique to achieve sonic design goals. Upsampling results in a slightly larger latency (55 samples; 85 samples at 176.4/192 kHz) than non-upsampled UAD plug-ins. These additional samples are automatically compensated by modern host DAWs. See "Delay Compensation" in the UAD System Manual for more information.

# Unison™The UA 610-B plug-in features Unison mic preamp technology integrationIntegrationwith the mic preamp hardware in Universal Audio's Apollo audio interfaces.

When Unison is active, related controls in the plug-in and the Apollo hardware are mirrored. Modifying a control on Apollo's front panel will modify the plug-in setting, and vice versa.

**Note:** Unison is active only when the plug-in is inserted in a PREAMP insert slot within Apollo's Console application. For complete Unison details, see the Apollo Software Manual.

## **Input Level Controls**

Input levels for the UA 610-B plug-in is controlled by the overall combination of the input select, pad, and gain controls available within the plug-in.

These parameters control the first tube gain stage in the plug-in. Generally speaking, higher input gains will produce more color in the signal.

Input Select The 610 hardware has both mic and line level inputs. The Input Select control switches between the "virtual input jacks" in the emulated models.

In most mic preamplifiers (including the 610), the difference between the mic and line inputs is simply that the line input is attenuated before entering the preamp circuitry; the gain circuits are typically not different for the mic and line inputs.

#### Line

When set to Line, it's as if the DAW signal is plugged into the line level input of the emulated 610 hardware. Less tube gain is applied, and a cleaner sound is obtained.

#### Mic

When set to Mic (the 500 and 2.0K settings), it's as if the DAW signal is plugged into the microphone input of the emulated 610 hardware and approximately 30 dB of additional (unattenuated) tube gain is applied. Since the incoming signal in from the DAW is already at line level, this mode will more readily result in the tube color, saturation, and/or clipping associated with overdriving the input.

**Important:** Use caution when switching to Mic (500 or 2.0K settings) from Line, as signal output levels can increase significantly (as they would with a hardware preamp).

|                     | Impedance   |
|---------------------|---|
|                     | Impedance selections are available for the Mic input. The Mic inputs can be set to 500 ohms or 2 Kilohms; the different input impedances have subtle effects on the signal color and response.  |
| Unison<br>Impedance | When the plug-in is inserted in a PREAMP slot within the Apollo Console, the hardware input impedance of the Apollo mic preamp changes to match the value selected in the plug-in for unprecedented realism.  |
|                     | Matching the microphone to the closest impedance value is generally recom-<br>mended, but this parameter can be used creatively and will not harm equip-<br>ment connected to the Apollo mic preamp.  |
|                     | <b>Note:</b> For complete Unison details, see the Apollo Software Manual.   |
| Input Pad/Gain      | In addition to the Input Select switch, the plug-in has Pad and Gain parame-<br>ters that control the signal level at the tube input stage.   |
|                     | The Pad controls are used to attenuate incoming signals for less coloration, while the Gain controls increase the signal level for more tube color.   |
|                     | <b>Note:</b> Like the original hardware, values on the control labels may not match actual measured values.   |
| Input Gain          | The rotary Gain switch (at the top of the plug-in, beneath the Power switch) changes the level at the tube input stage. The control attenuates the input signal by $-10$ or $-5$ dB, or adds $+5$ or $+10$ dB of gain. In the center "0" position, neither gain nor attenuation is applied.   |
| Input Pad           | Additional attenuation for the Mic input is available via the two-position Pad switch (at the middle of the three up/down switches near the center of the plug-in). Setting the switch to the " $-15$ " (up) position attenuates the Mic signal at the tube input stage by $-15$ dB. In the down position, no attenuation is applied. |
|                     | Note: Like the hardware, Input Pad for UA 610-B effects only the Mic input.   |

## **Output Level Controls**

| Level  | Level (aka "the big knob") is used to control the gain of<br>the tube output stage of the preamp. Higher values add<br>more coloration and provides amplification to the feed-<br>back-style EQ circuitry.                                  |
|--------|---|
|        | The amount of available gain using this control is approximately 61 dB.   |
| Output | Output adjusts the signal level at the output of the plug-in without effecting the sonic character of the signal. The range is from $-\infty$ dB (off) to +12 dB.   |
|        | This control, which does not exist on the original hardware, facil-<br>itates the ability to increase the Level control for output stage tube<br>coloration while maintaining the ability to cleanly adjust the overall output vol-<br>ume. |
|        | <b>Tip:</b> Click the "0" label text above the control to return Output to 0 dB.  |
| EQ     |   |

The 610-B features high and low frequency boost/cut shelving filters with stepped gain controls. The equalizers utilize a feedback-style design which effects the distortion characteristics of the output stage.

Low EQ



The low frequency ("LO") shelf EQ has a selectable cutoff frequency which can be cut or boosted by various amounts.

Lo EQ Frequency

This switch determines the cutoff frequency (70, 100, or 200 Hz) of the low shelf EQ. This switch has no effect if the Lo EQ Gain value is zero.

**Note:** Like the hardware, low frequency values are not consecutively ordered.

#### Lo EQ Gain

This rotary switch determines the amount of boost or cut applied to the low frequency signal. Fixed values of plus or minus 9, 6, 4.5, 3, or 1.5 dB can be selected. When set to 0 dB, the filter is inactive.

**High EQ** 



The high frequency ("HI") shelf EQ has a selectable cutoff frequency which can be cut or boosted by various amounts.

#### **Hi EQ Frequency**

This switch determines the cutoff frequency (4.5 kHz, 7 kHz, or 10 kHz) of the high shelf EQ. This switch has no effect if the Hi EQ Gain value is zero.

**Note:** Like the hardware, high frequency values are not consecutively ordered.

#### Hi EQ Gain

This rotary switch determines the amount of boost or cut applied to the high frequency signal. Fixed values of plus or minus 9, 6, 4.5, 3, or 1.5 dB can be selected. When set to 0 dB, the filter is inactive.

**Polarity** This switch inverts the polarity (aka "phase") of the signal. The signal OUTØ polarity is inverted when the switch is in the up position. Polarity is normal when the switch is in the down position. Polarity inversion can help reduce phase cancellations when more than one microphone is used to record a single source.



Power Power is the plug-in bypass control. When set to OFF, emu-ON (I) (0) OFF lation processing is disabled and DSP usage is reduced (if DSP LoadLock is inactive). Power is useful for comparing the processed settings to the original signal.

## 610 History

Creating an original 610 desk meant buying the individual modules and building the console from scratch, as no complete consoles were ever sold commercially. However, Bill Putnam himself built a few full-fledged desks for his own studios, complete with fabricated frame, power supply, metering, and buss/effects routing options.

Although very few desks were built from 610 modules, their contribution to the history of recorded music is enormous. Ray Charles, Frank Sinatra and The Beach Boys were a few artists captured with the 610 at United/Western as part of landmark recordings such as "Sounds in Country and Western Music," "Strangers In The Night," and "Pet Sounds," respectively.

One of these 610 desks is the famous Wally Heider "Green Board." This extremely well-built example was originally fabricated by Frank DeMedio for Wally Heider's Remote Recording Service in the early '60s. Wally originally handled many of the live recording dates booked by Putnam. This console recorded and mixed some of the greatest performances of the era, from many live shows with the "Rat Pack," to recording the very last concert under the baton of Igor Stravinsky in Los Angeles.

With the Wally Heider Green Board alone, the list of records using the 610 is staggering. Here are but a few notable acts recorded with the Green Board: Duke Ellington, Elvis Presley, Johnny Cash at Folsom Prison, Fats Domino, Little Richard, Cream, The Beach Boys, The Doors, Janis Joplin with Big Brother & The Holding Company, The Who, The Grateful Dead, The Steve Miller Band, Moby Grape, The Byrds, Jefferson Airplane, Booker T. & the M.G.s, Otis Redding, Eric Burdon and The Animals, Simon and Garfunkel, and The Jimi Hendrix Experience (live at the Monterey Pop Festival, where he first set his guitar on fire!).

In the early '70s, long before this one-of-a-kind desk's historical significance could be anticipated, Neil Young bought the 12-channel board from Wally Heider. Young immediately moved it to his Broken Arrow Ranch. He installed the desk in his barn, which he used as a recording studio, and employed it to record his seminal record "Harvest" and may other classic albums. The Green Board remains at Broken Arrow Ranch, and is still in use today.



The original Wally Heider "Green Board" console containing 12 vintage UA 610-A preamplifier modules





The modern Universal Audio 2-610 Dual Channel Tube Preamplifier