4 The Legends

Getting ready to bring the legends back to life

Legends vol. 2

analogvibes

Here s the deal:
Before we talk more about legendary vintage gear and what it does I want to narrow it down and focus on some selected pieces, from a certain era. To do that, we ll only look at vacuum tube gear for now. From this selection I ll choose the LA2A leveling amplifer, the Pultec EQP 1A program equalizer & MEQ 5 as its midband companion, and finally the Universal Audio 176 vari mu tube limiter.

The Teletronix LA2A

The LA2A is without a doubt one of the most iconic compressors of all times. With it s extremely silky sound and unrivaled simplicity of controls it s **the go to weapon for most engineers when it comes to vocals or bass.**

Invented by James F. Lawrence II, founder of the Teletronix Engineering Company, as the successor of the LA 1 and LA 2, its popularity remains even more than 50 years after its original design!
The LA2A is actually a very simple circuit a single tube gain stage sporting a 12AX7 and a 12BH7 tube, offering 40db of gain. And a tube gain reduction control circuit using another 12AX7 and 6AQ5 tube. **As a result the LA2A is controlled by only two knobs.**

Even though the tube preamp by itself sounds absolutely wonderful, the special character is owed mostly to the T4 cell.

Check out this great clip by Doctor Mix on using the Teletronix LA2A on various sources...

The LA2A is an opto compressor, meaning the compression is controlled by a light being emitted by an electroluminscent panel and absorbed by a photoconductive cell. Simply put, the more light is absorbed by the cell, the more compression. This circuit is housed in a small enclosure plugged to the back of the unit and resembles the T4 unit.
I ll explain more about how the LA2A works and what it does to the sound in the upcoming paper, but for now let s go on.

OPTO COMPRESSOR

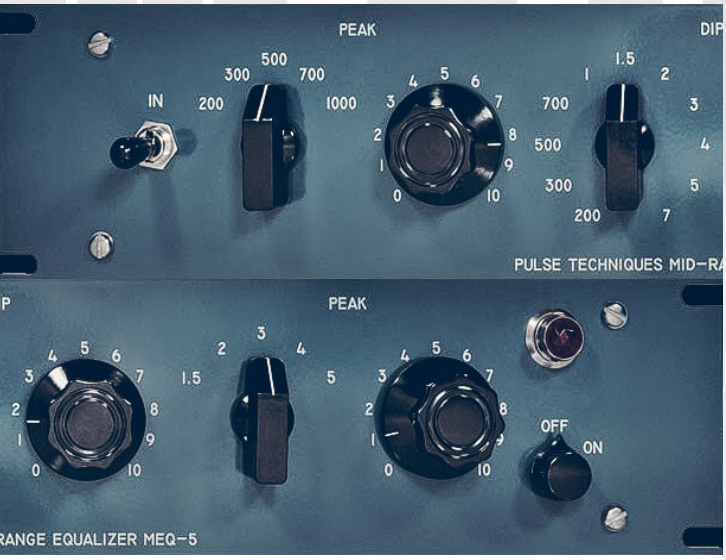
THE PULTEC EQP-1A

If there is a holy grail of vintage tube equalizers the Pultec EQP 1A is certainly it. A true legend of which the magic can be heard on countless records from the golden era of anolog recording to the present day. Introduced in 1951 by Pulse Techniques founders Ollie Summerland and Gene Shank, the passive design of amazingly smooth filters paired with a tube amplifier **make this EQ shine on pretty much everything you throw at it.**

The circuit though is equally as simple as the LA2A.
The signal is fed into a **passive filter circuit** made up of a variety of capacitors and a filter coil called inductor. **Depending on which frequency is selected through the switch on the front, a certain capacitor is connected to a certain tap of the filter coil**. And the according boost or attenuation pot determines how much of the signal is going through the selected coil & capacitor. Again this simplified a little bit, but that s ok for now.

Anyway this passive filter circuit causes a loss in gain, which the following tube amplifier is designed to make up, so when you insert the EQP 1A into the signal chain, no level drop will happen wether the filter is in bypass or not.

Probably the most famous version of the EQP 1 series the EQP 1A. Other models were the earlier EQP 1 which was lacking the high frequency attenuation selector, the EQP 1a3 (2RU high) **and the EQP 1S3** (solid state).



The perfect companion of the EQP 1A: the Pultec MEQ5 mid range equalizer

THE PULTEC MEQ-5

In this respect the MEQ 5 works exactly the same way. Only the filter itself is set up a little differently.

While the EQP 1A basically consists of a low shelf (boost & cut) from **20Hz to 100Hz**, a high freq. paramatric eq (boost only) from **3Khz to 16Kz**, and a high shelf eq (cut only) from **5Khz to 20Khz**, **the MEQ 5 is a parametric eq** with 3 bands ranging from **200Hz up to 5Khz boost** and from **200Hz up to 7Khz cut resembling the perfect midrange companion of the EQP 1A.**

What is so special about the EQP compared to the MEQ is that in the Lo Freq. section there s only one frequency selection switch for both boost and cut as per the original manual being recommended to use either boost or attenuation.
But actually both affect slightly different frequencies which allows for a great trick to shape the low end and low mids of instruments like e.g a kick drum by turning up boost & attenuation at the same time.
I thoroughly studied the original Pultec circuits, so there s a lot more to talk about. That s why I ll also cover these EQs in further detail in the future.

THE UNIVERSAL AUDIO 176 LIMITING AMPLIFIER

Now I want to take a glance at yet one more legend which is probably not as widely known as its above mentioned fellows, but **besides sounding absolutely amazing its importance reaches far beyond its own existence.**

Designed by Bill Putnam, the original 175 was one of the first commercially available products by Universal Audio introduced in 1961. Shortly followed by the 175b and the 176 - being concurrently available and which differ in that the 176 has selectable compression ratios of 2:1, 4:1, 8:1, 12:1, while the 175b has a fixed ratio of 12:1.

As the name implies, the 176 is the predecessor of the later introduced and much more famous 1176. But even though they have much in common - in both designs the threshold is kind of fixed (depending on ratio settings) and the input control is used drive the signal against the threshold to trigger compression - **the 176 is a completely different animal.**

If we only take the compression circuits into account, whereas the 1176 uses a FET (field-effect-transistor) **circuit for compression control, the 176 is a variable-mu design**, meaning compression is controlled by a dual-triode tube (6BC8) which provides a variable gain stage.

In other words, the compression behavior adapts to the program material. As an audible result the signal going through **sounds less compressed than it actually is**, and the sonic imprint of the vari-mu design in combination with the wonderful tube preamp (based on Bill Putnam's 108 preamp) **in my humble opinion, makes the 176 the epitome of ultimate tube compressor mojo. And it looks absolutely beautiful!**

Legendary producer & engineer Richard Kaplan (Neil Young, The Temptations, Leonard Cohen, just to name a few) even went as far as to say it's **„The best sounding limiter ever made by anybody."**

Ok - now you might think you've heard that before, but yes - I'll cover more on this wonderful piece of gear in a dedicated episode later down the road.
And who knows, maybe there's classics to find their way into the analogvibes project range - for now have fun exploring the site and welcome to the community!

From top to bottom: my personal recreation of an original 176, another 176 @ Sears Studio - NY, and a UA 175B