Let's look at a simple scenario where TAMPA's output is connected to an analog mixer. (This discussion also applies to recorders and sound cards that have input gain controls in either hardware or software.) If you want a "warm" sound, you'll want to drive TAMPA's internal signal level fairly high. That means that you're looking for hot signal levels approaching or even surpassing 0VU on the OUTPUT LEVEL METER. You can accomplish this by turning TAMPA's GAIN up and optionally engaging the +20dB switch on the input stage. (The CLIP indicator light comes on at +26dBu, approximately 4dB below the actual digital clipping level of 30.5dB. Basically, you can drive the OUTPUT LEVEL METER as hot as you want as long as you don't hear anything offensive.) If the signal level overloads your mixer input, engaging the 20dB PAD at TAMPA's output will likely bring it back down to a useable range. You'll find that there's an interactive process in setting TAMPA's GAIN and your mixer's input attenuation.

If, on the other hand, you want a more neutral or transparent sound from TAMPA, reduce the gain by about 10 to 20 dB. Be careful to maintain enough gain that you still have an acceptable signal level at the mixer. You'll probably want to keep the +20dB switch in the preamp stage off unless you're not getting much of a reading at all on the OUTPUT LEVEL METER. Similarly, you'll likely want to keep the 20dB PAD disengaged on the output stage so that your mixer receives a strong enough signal. Here, too, adjust TAMPA's GAIN control and your mixer's input gain to achieve the desired balance of tonality and signal level.

Compression adds another variable, as it has the effect of reducing gain. In general, the solution lies in continuing to interactively adjust TAMPA's GAIN and your mixer's input attenuation in order to achieve the right combination of signal level and tone. When using high compression settings, you may also need to disengage the 20dB PAD in order to get more gain. (The compressor is capable of a total gain reduction of about 20dB.)

Since the 20dB PAD only affects TAMPA's analog outs, it does not enter the equation if you are running the preamp's digital outputs directly into a digital recording device. Your digital recording device might have gain controls that you can use interactively with those of TAMPA. You can also add 6dB of gain to the digital signal by summing the identical left and right signals coming from TAMPA's digital outputs.

Conclusion

Treating TAMPA as the unique piece of gear that it is and familiarizing yourself with the characteristics of its gain structure will result in many rewarding sessions. For more information on setting TAMPA's signal levels, please read your entire TAMPA manual.

M-AUDIO®

M-AUDIO TAMPA - QUICKSTART GUIDE

Getting the Most from Your TAMPA

Thank you for purchasing TAMPA. TAMPA's design and sound are unlike any other preamp/compressor you've used. Please take a moment to read the following manual supplement in order to get the most from your new studio tool.

TAMPA Design Goals

One of the "Holy Grails" of audio electronics is the ability to simulate the harmonically rich "warm" or "natural" sound of tubes with more affordable solid-state electronics. Most attempts to emulate or model the tube sound fail to take into consideration all of the qualities that give tubes their characteristic sound. In designing TAMPA, we conducted extensive research into why people perceive tubes as being so pleasing to the ear. We also took into consideration that fact that the sonic coloration inherent in tubes is not always desirable. The result is a design that focuses on natural sound rather than strict tube emulation. TAMPA can deliver results that range from transparency to warm coloration similar to that associated with tubes—providing for more flexibility than you'll find in other preamps.

Working with TAMPA is a unique experience. At modest gain settings, TAMPA is extremely transparent. That means that you really hear the true nature and quality of what you connect to its input. (Many people have never really heard what their mics and instruments truly sound like because the devices are always colored by the preamp and other circuitry.) And, as you'll see, you can easily add more "warmth" to the sound using higher gain settings. Here, too, the natural-sounding coloration TAMPA adds to the signal has a unique sonic quality. So don't be surprised if your mics and other gear sound different through TAMPA.

About Temporal Harmonic Alignment

In nature, all sounds are comprised of a fundamental frequency along with a series of harmonics. The frequencies of those harmonics and how their amplitudes change over time give the sound source its unique sonic signature. In natural sound sources such as strings, drumheads and vocals chords, harmonics share a characteristic temporal relationship to the fundamental.

Virtually all electronic circuits generate additional harmonics not present in the source signal. In that way, every electronic device changes the sonic signature of the signal passing through it. That change can be quantified according to two different properties: the amplitude of the additional harmonics and their temporal relationship to the fundamental.

The amplitude of the induced harmonics is typically measured in THD or total harmonic distortion. In general, today's solid-state electronics exhibit very low THD. The sound of solid state is often described as "muddy" in lower frequencies and "harsh" in higher frequencies, however, because the harmonics generated rarely exhibit the temporal

alignment found in nature. (The industry has only even had the technology to measure this temporal distortion for the past decade or two.)

Tubes, on the other hand, induce harmonics that are temporally aligned with the fundamental—at least in the mid-range where most featured content lives. (In the lows and highs, tube harmonics are temporally misaligned just as with solid-state.) Further, harmonics produced by tubes exhibit fairly high amplitude. That combination produces the perception of "warm" tonality. Nonetheless, tube sound is colored as opposed to transparent.

Conventional attempts to simulate tubes consider the amount of harmonics generated, but not their timing. Unlike any other preamp—solid state or tube— TAMPA exhibits proper harmonic temporal relationships at all frequencies. And because we've intentionally designed TAMPA to have low THD, it does not necessarily have the same amplitude of harmonics as does tube equipment. Instead, the design allows harmonic energy to vary with signal level. The hotter the internal signal level, the greater the amplitude of the harmonics and the perception of "warmth". The result of this versatile design is sonic transparency across the entire audio range with the ability to add warmth as desired.

About TAMPA's Compressor

Most compressors, including many high-end models, exhibit very high distortion that gives them a particular sonic signature. TAMPA's compressor stage, on the other hand, has very low distortion that further contributes to the unit's transparent audio quality.

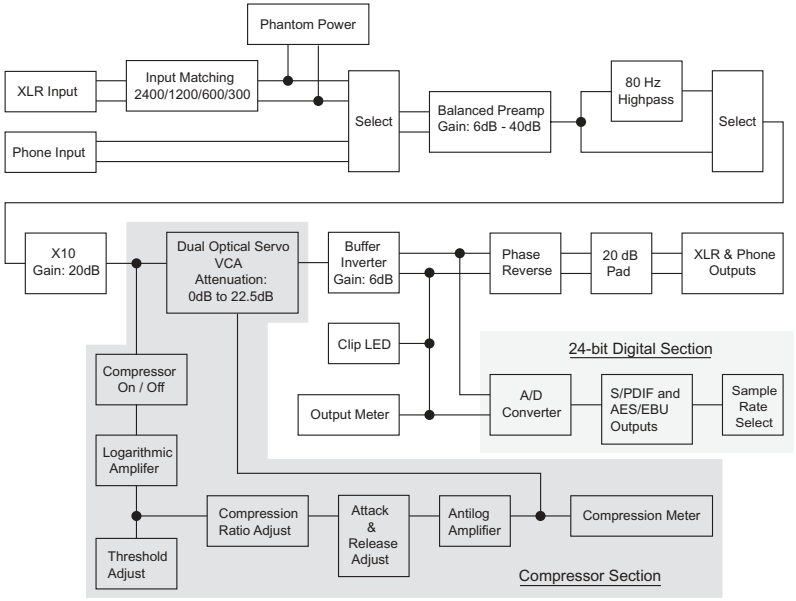
Inexpensive compressors utilize VCA technology exhibiting problematic distortion, noise and accuracy. Most professional-class compressors utilize servo-controlled optical resistor technology instead. While this design is quieter and more accurate, the servo system used to stabilize the optical resistor introduces considerable distortion into the optical device. TAMPA's design avoids this by using a matched pair of optical resistors. The servo system stabilizes one of the optical devices, yet audio is only passed through the other optical device. This dual-optical servo design completely eliminates the servo-induced distortion. As with the rest of TAMPA's gain stages, this means that you will experience a very transparent sound when using the compressor.

Setting TAMPA Properly

As we've established, TAMPA's Temporal Harmonic Alignment is designed to do something that no other preamp can do—deliver transparent sound. While that is its primary design criterion, a sophisticated series of gain stages also yield the ability to add tube-like "warmth" at higher signal levels. The real key to getting the results that you want from TAMPA, therefore, is understanding how to use those gain stages—both within TAMPA and in relation to your other gear. TAMPA's meters and pads play a significant role in this process.

TAMPA is capable of delivering up to 66dB of gain. As shown in the following block diagram, TAMPA's output gain is determined by the interaction of the GAIN control, +20dB switch, compressor settings and (in the case of analog output) the 20dB PAD.

TAMPA, simplified block-diagram:



The perception of warmth comes from a phenomenon called soft clipping, where desirable distortion increases with internal signal level. As shown in the following diagram, TAMPA's soft clipping exhibits a non-linear property: The majority of the increase in distortion only comes into play at the higher end of the gain range. TAMPA's OUTPUT LEVEL METER displays internal signal level and is therefore a good indicator of soft clipping.