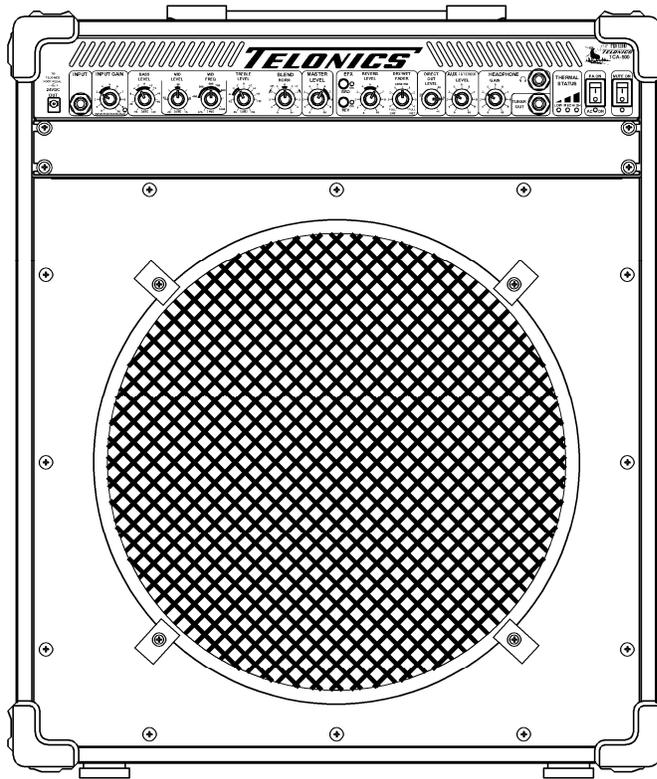


Telonics TCA-500 Combo Amp



932 E Impala Ave
Mesa, AZ 85204-6699 USA
(480) 892-4444 Fax (480) 892-9139

email: proaudioinfo@telonics.com



CAUTION Risks of electrical shock – **DO NOT OPEN**

CAUTION To reduce the risk of electric shock, do not remove from cabinet. No user serviceable parts inside. Refer Servicing to qualified service personnel.

WARNING To prevent electrical shock or fire hazard, do not expose this appliance to rain or moisture. Before using appliance, read the operating guide for further warnings.

EXPLANATION OF GRAPHICAL SYMBOLS:

EXPLICACION DE SIMBOLOS GRAFICOS:

EXPLICATION DES SYMBOLES GRAPHIQUES:



"DANGEROUS VOLTAGE"

"VOLTAJE PELIGROSO"

"DANGER HAUTE TENSION"



"IT IS NECESSARY FOR THE USER TO REFER TO THE INSTRUCTION MANUAL"

"ES NECESARIO QUE EL USUARIO SE REFIERA AL MANUAL DE INSTRUCCIONES"

"REFERREZ-VOUS AU MANUAL D'UTILISATION"



Correct disposal of this product: This symbol indicates that this product should not be disposed of with your household waste, according to the WEEE directive (2002/96/EC) and your national law. This product should be handed over to an authorized collection site for recycling waste electrical and electronic equipment (EEE). Improper handling of this type of waste could have a possible negative impact on the environment and human health due to potentially hazardous substances that are generally associated with EEE. At the same time, your cooperation in the correct disposal of this product will contribute to the effective usage of natural resources. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, waste authority, or your household waste disposal service.



FRONT PANEL (BLACK AND WHITE OPTION SHOWN)



REAR PANEL

Congratulations on purchasing one of the world's finest professional instrument combo amplifiers! The TCA-500 combo amplifier is a state of the art audiophile quality unit designed and built with the latest and best sounding technologies. It has been carefully engineered to provide every function and convenience possible within its cost/benefit ratio, for the professional musician. There is a reason for every function provided. The user is encouraged to read this manual in order to achieve the highest level of performance provided by these capabilities.

The TCA-500 combo amplifier gives you dramatically better control of your sound. The result is transparent smooth clean sound, tight bottom end and silky highs. It is designed to accommodate many different instruments and as such, its controls cover a wider range of options than previously offered to the professional musician. Accordingly, for any given instrument, the controls may 'feel' more sensitive when adjusted for a specific instrument. For this reason, the user is encouraged to make smaller adjustments while listening carefully. Final adjustments should always be made with the ear, without regard to where one "expects" the knob to be.

Telonics TCA-500 Combo Amp Features:

- Superb string separation at all volume levels. No muddiness!
- All pure analog, main signal chain. No digitization of your sound thru A/D or D/A converters.
- Pre EQ Insert for EQ or 3-wire Pot Pedal hook-up.
- Warm tube-like, even-order harmonic sound with crystal clear highs.
- Ultra low noise – studio quality.
- Exceptionally high headroom.
- High output level available on demand.
- 500 Watt Power Amp section.
- Studio Pre-EQ parallel effects loop with adjustable SEND and RETURN levels to accommodate any EFX unit(s) (rear panel mounted).
- Built in electronic reverb with front panel level control and remote control jack.

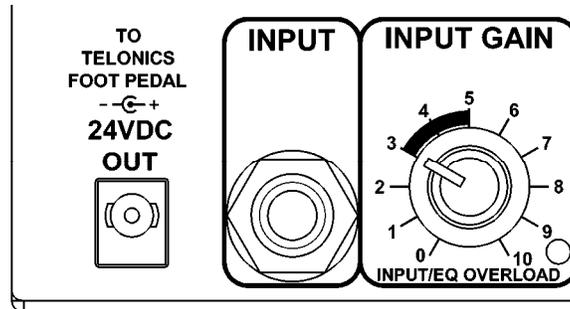
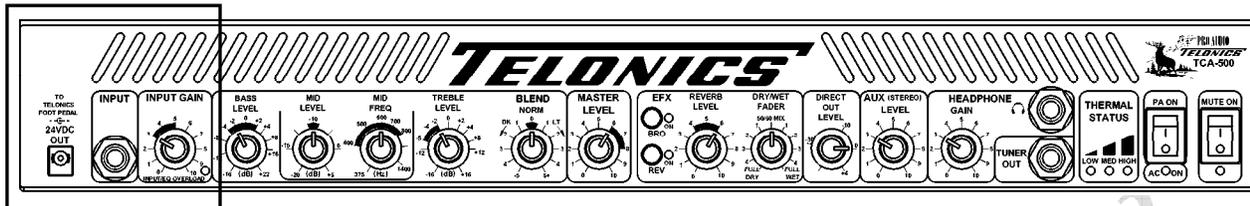
TELONICS TCA-500 COMBO AMP FEATURES:

(CONTINUED)

- Overload LED indicator.
- Master Wet/Dry fader control – controls internal effects and parallel EFX loop.
- Built-in “TBro” effect with remote control jack.
- Pedal Switch jack on rear panel allows switching “TBro” and Reverb remotely.
- Special “Blend” EQ control for personalizing your tone or adjusting for venue. (Once properly adjusted, Master volume and Blend are generally the only adjustments used).
- Auxiliary AC power outlet, switched with main power switch.
- Special Power On/Off circuit to minimize “pops” and speaker damage.
- Built in high output headphone amp with separate volume control.
- Super quiet Mute circuit with LED indicator.
- Digital Thermal Management System.
- 24 volt DC jack to power Telonics 24 VDC FP-100 foot pedal.
- Balanced XLR Direct stereo output for stage and studio use. Includes ground lift switch.
- Analog modeling for Direct Out for live venue or studio use, with preset modeling.
- Buffered tuner output (jacks on both front and rear panels) - active full-time, even when mute is ON.
- Auxiliary stereo input (on rear panel) for home practice or solo gigs with front panel level control. For CD/mp3 players or for use as a second effects RETURN. Also routed to DI for recording.
- Front Mounted Power Amplifier On/Off switch for preamp-only use in Studio.
- Highest Quality Telonics NEO Speaker (12 or 15 inch).
- 1U rack space provided which may be used for EFX Units, tuners, etc.
- Built-in cabinet-wide LED lighting for low light venues with back panel switch to control On/Off and brightness level.
- Highly abrasion-resistant outer surface, durable Baltic Birch plywood construction throughout. Made for years of trouble free use.
- International versions available for export.
- Proudly made in the U.S.A. by musicians and engineers.

TCA-500 COMBO AMP CONTROL FUNCTIONS, JACKS, & INDICATORS:

FRONT PANEL



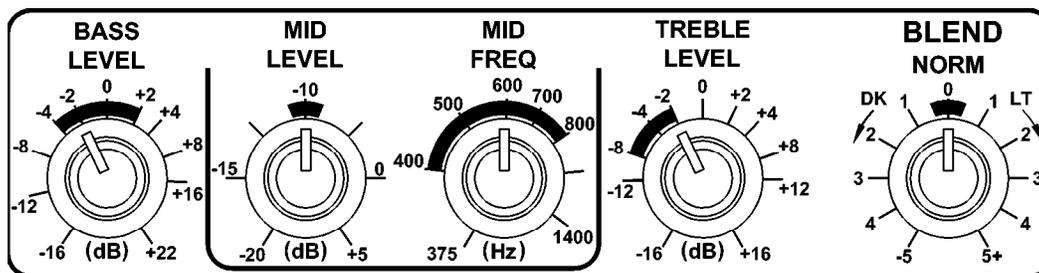
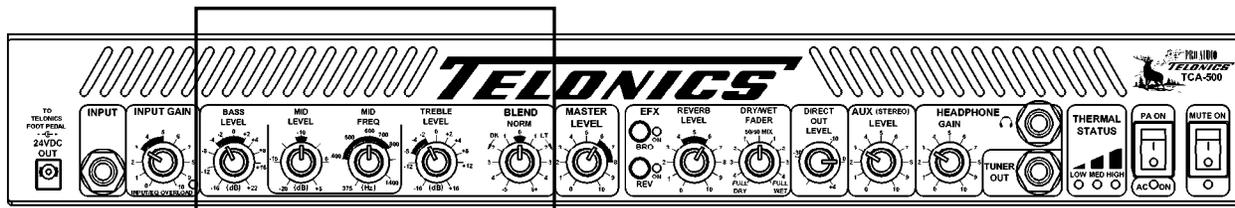
<p>24VDC Output</p>	<p>This socket provides an isolated 24 volts DC to power up the FP-100 foot pedal. It accepts a special twist lock plug for a secure connection of power to the pedal. A power lead with locking connectors is supplied with the TCA-500 Amplifier.</p>
<p>Input</p>	<p>High impedance (1Meg Ohm) instrument input - will not load down your guitar pickup or adversely affect your tone. It accepts a standard 1/4 inch type TS plug for guitar level signals.</p>
<p>Input Gain and Red Overload LED</p>	<p>This control sets the gain for the first amplification stage. And is used in conjunction with the MASTER LEVEL control, it also affects the level for the Pre EQ Pedal insert "To/Send" jack and the maximum level to the EFX Send jack (both of which are on the rear panel). Start at 3 or 4 and adjust as needed.</p> <p>It's important to understand the function of this control as its setting impacts other controls and the overall sound. When a guitar signal is fed into the amplifier, it is necessary to increase the signal level to minimise noise that might be added in the following stages. Typically, guitar pickups with a high output require a lower gain setting and pickups with a low output required a higher gain setting.</p> <p>In the lower right-hand corner of the Input Gain box is a red (Input/EQ Overload) LED that indicates an overload is occurring in the pre-amplifier stage. If this LED flashes on frequently, or stays on while the guitar is played, the Input Gain is setting is too high and should be reduced in order to avoid distortion of your sound.</p>

TCA-500 COMBO AMP CONTROL FUNCTIONS, JACKS, & INDICATORS:
FRONT PANEL (CONTINUED)

<p>Input Gain and Red Overload LED (continued)</p>	<p>The following text describes how the Input Gain should be set with a typical arrangement:</p> <ul style="list-style-type: none">i) We assume that in most cases, the output of your guitar connects to your volume pedal input and the output of your volume pedal connects to your amplifier (<i>Note; always use good quality leads for these connections and try to ensure they're no longer than they need to be to reach the jacks. Make sure they are not a trip hazard</i>).ii) With the Master Level control set to 1, your volume pedal set to maximum and Input Gain control set to 1, play some nice big chord groups slightly harder than you would normally play; slowly increase the Input Gain control until the Overload LED just starts to occasionally flash, then reduce the Input Gain control until it 'just' ceases to flash as you strike the chords.iii) You have now set the optimum level for the Input Gain control. You should not need to adjust the Input Gain control unless you change your guitar or volume pedal. We suggest you note this setting. <p>A common mistake is to see players using the Input Gain to control output volume. The problem with this is the Input Gain control affects the level sent to the effects unit.</p> <p>Always use the Master Level to control output volume after the Input Gain control has been adjusted as outlined above.</p>
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TCA-500 COMBO AMP CONTROL FUNCTIONS, JACKS, & INDICATORS:

FRONT PANEL (CONTINUED)



<p>Bass Level</p>	<p>Controls low frequency response. Turning clockwise will boost the bass up to +22dB. Turning counter clockwise will decrease the level down to -16dB. Start at 0 (flat) and adjust to taste.</p> <p>Note that it is a common error to boost the bass excessively, as this dulls the character of the strings. Remember that it is always best to use “Subtractive Equalization” as discussed later in this manual. i.e., instead of boosting the Bass, reduce the Mids and/or Treble. A simple check for excessive bass boost is to listen closely as you strike a lower string repeatedly. Start with the Bass Level control set at -4 or -5. While listening to the character of the string, advance the Bass Level control slowly clockwise. At some point (usually around +1 to +3, the character of the sound will change and will sound like more of a “thud” and have a muted quality. For most people, that is too much bass boost, so back off the control counterclockwise slightly until the sound is once again clear and clean.</p>
<p>Mid Level</p>	<p>It is necessary that the user understand that the Mid Level and Mid Frequency controls work ‘together’. These two controls are used together to set up the mid range frequency shaping; they are perhaps the most important tone shaping controls and they ‘must’ be set properly to achieve a balanced sound. These controls allow the player to compensate for the ear’s normal increase in sensitivity to mid range frequencies and the guitar’s resonance around those frequencies.</p> <p>The Mid Level control determines the amount of effect which the Mid Frequency control has on your sound.</p> <p>It sets a boost or cut in the mid-range frequencies, which are selected by the Mid Frequency control. Mid Level is adjustable from -20dB cut to +5dB boost.</p> <p>If you were to set the Mid Level control to Zero dB (3 o’clock knob position), the Mid Frequency control would ‘do nothing whatsoever’ to your sound, it would have NO effect on your tone.</p>

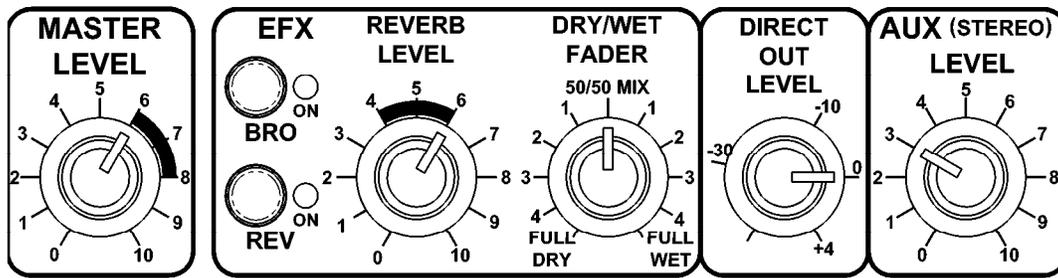
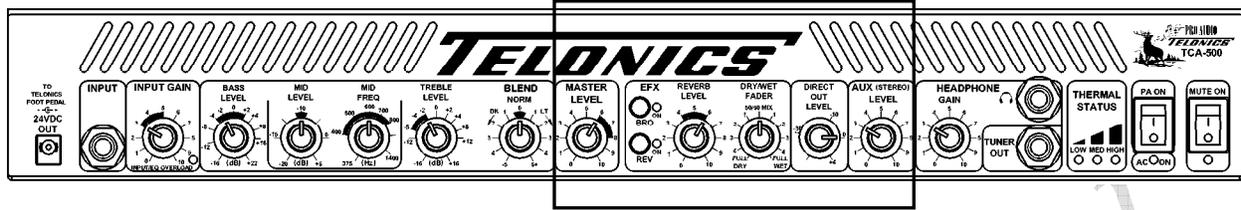
TCA-500 COMBO AMP CONTROL FUNCTIONS, JACKS, & INDICATORS:
FRONT PANEL (CONTINUED)

<p>Mid Level (continued)</p>	<p>Since the mid-range frequencies are tiring to the human ear, it is almost always necessary to CUT or reduce them. The Mid Frequency control allows the user to choose the center frequency at which the mid frequencies are reduced, to suit his or her ear.</p> <p>The following text describes how the Mid Level and Mid Freq controls should be set for steel guitar:</p> <ol style="list-style-type: none"> i) We assume the Input Gain control has already been set. Set the Bass Level control to 0, the Treble Level control to 0, the Blend control to 0 and the Master Level control to 2. All effects should be OFF. ii) Now set the Mid Level control fully clockwise (+5) and set the Mid Freq midway (600 Hz). Note when you pick a string the Overload LED may flash; don't adjust the Input Gain control. Note that the overload monitoring circuitry monitors both the output of the gain section and the EQ section; because we've set the Mid Level control to full boost it causes the overload. iii) Ensure the combo speaker is pointed towards your ear. Pick one or two strings in the center string grips and slide the bar over the normal range of the fret board you would use. As you are doing this, tweak the Mid Freq control up and down around the 400 to 800 region; it's handy to have a friend rotate the Mid Freq control as you play. At one point over the region you might possibly notice, no matter where you are on the fretboard, a 'honky' midrange sound is heard that's a little unpleasant on the ear. It does take practice and time to learn how to detect this point, so don't be concerned if it's not clear the first time you attempt this. Note the Overload LED may help detect this point, quite often it flashes more as you hit area's where's there's more resonance. <p>Once you have found the honky, excessive 'middle' sounding frequency, rotate the Mid Level control to around the 10 o'clock position (-12dB). As you play your guitar tweak the Mid Level control up and down around this point until it sounds balanced in the mid range. Generally, the most suitable setting is between -15 dB and -12 dB for most people. Don't worry about setting the bass and treble controls until you're happy that the mid range is the best it can be.</p> <p>Always, Always, make the above adjustments with the Bass and treble controls at zero.</p>
<p>Mid Frequency</p>	<p>Sets the frequency at which the Mid Level control has an effect. Several frequency intervals between 375 Hz and 1400 Hz are marked. Its effect is determined by the setting of the Mid Level control. Proper adjustment is achieved</p>

	as outlined above.
Treble Level	<p>Adjusts the high frequency level of the sound generated by your instrument. Start at 0 (flat) and adjust to taste. Turning clockwise boosts the level of highs up to +16dB, turning counterclockwise cuts the level of highs down to -16dB.</p> <p>Note: We always recommend using the minimum amount of bass and treble tone shaping to achieve the sound you desire. These controls are very powerful; they can greatly cut or boost the gain of the lower and higher frequencies. If an extreme setting of this control is required to achieve a balanced sound you may have an issue with your Mid Level and Mid Frequency control settings, or, with your guitar pickup, leads, volume pedal.</p> <p>After setting the Bass Level, Mid Level, Mid Freq and Treble Level controls we suggest you note the settings.</p>
Blend	<p>Only set this control after you have set all the other tone controls. This is to be used as a sonic “shading” control and, like any seasoning, a little goes a long way. Start at 12 o’clock. Clockwise yields a “Mooney” bright aggressive sound; counter clockwise gives you a mellow, darker tone.</p> <p>The Blend control is initially one of the most confusing settings to understand... until you start using it. After using the combo for a few gigs you may find it’s the only tone control you need! Once the bass, mid and treble controls have been set the amplifier might be considered as calibrated to your style and guitar sound.</p> <p>As you rotate the Blend control clockwise you’ll notice the treble increases and the bass decreases.</p> <p>As you rotate the Blend control anti-clockwise you’ll notice the treble decreases and the bass increases.</p> <p>This control is like ‘one stop shop’ compensating for the affect the room acoustics has on the overall sound. It’s quite remarkable how a small tweak of this control can sweeten up your sound in a gigging situation. And being a single control it’s easy to remember where you started before you started tweaking.</p> <p>Normally, players leave this control at zero and only adjust it slightly between +1 or -1 to compensate for the venue (room size, crowd size, bandstand configuration (even for relative humidity changes, as sound propagates differently with humidity changes).</p>

TCA-500 COMBO AMP CONTROL FUNCTIONS, JACKS, & INDICATORS:

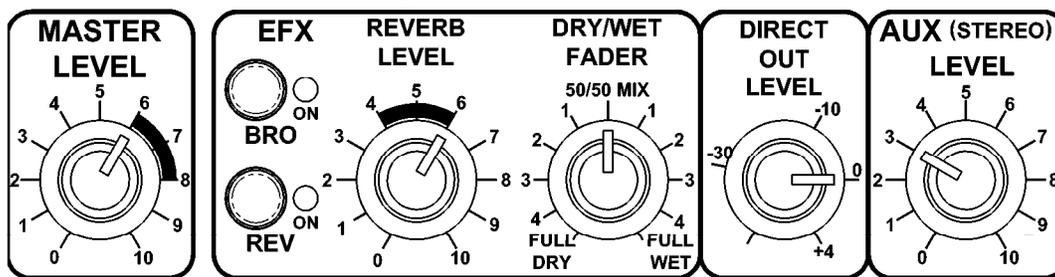
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Master Level	<p>Sets the overall output level of the Combo Amp. Adjust this after you have set the Input Gain and EQ. This is your main volume control knob – to be adjusted as necessary as you play a gig. For normal size venues, the customary range is between 6 and 8 or less.</p> <p>The Master Level control sets the overall signal level sent to the power amplifier (PA). Adjustment of this control will not affect the Direct Out level. This allows players to adjust their own stage level without affecting the signal level sent to the mixing desk – a handy feature!</p>
BRO	<p>This switch will activate a “TBro” type effect. The green “TBro” “ON” LED will light when TBro is active. The Foot Switch connector on the rear panel can be used to turn the TBro function Off and On if the TBRO pushbutton switch on the front panel is pushed On (in). If either this switch or an external switch is in the Off position, the effect will remain Off. (When an external/remote switch is not used, the default is On. (See back panel Foot Switch)</p> <p>An optional remote switch box for steel guitar (and a remote foot switch for other instruments) is available for rapid remote control of the TBro and Reverb functions. The usage of these optional accessories is outlined later in this manual.</p>
Reverb Level – Rev ON button	<p>The Reverb Level control determines how much of the internal reverb signal is applied to the Wet/Dry Fader control. The input level to the reverb circuit is affected by the Input Gain control level (as mentioned earlier). The reverb input is a combination of the dry input after the EQ controls and the Post EQ EFX Return signal (rear panel).</p>

TCA-500 COMBO AMP CONTROL FUNCTIONS, JACKS, & INDICATORS:

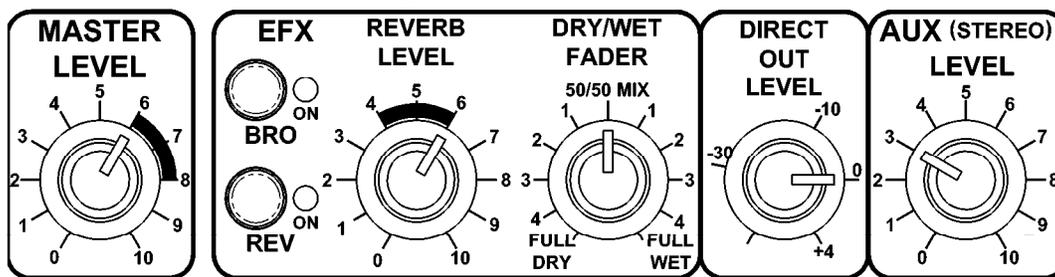
FRONT PANEL (CONTINUED)



<p>Reverb Level – Rev ON button (continued)</p>	<p>The Rev switch will activate the internal reverb circuit. The green LED will light when the reverb is active. The Foot Switch connector on the rear panel can be used to turn the internal reverb Off and On if the Rev pushbutton switch on the front panel is pushed On (in). If either this switch, or an external switch, is in the Off position, the reverb will remain Off. When an external remote switch is not used, the default is On. (See back panel Foot Switch)</p> <p>The built-in reverb is useful if you don't have an effect processor installed. It can be switched On/Off from the front panel using the Rev ON button or by remote control using the Footswitch jack on the rear panel. The reverb sound has been preset to a general ambience algorithm; the Reverb Level control adjusts the amount of reverb introduced.</p> <p>The built-in reverb signal is added to the signal returning from the EFX Return jack that feeds the Wet side of the DRY/WET Fader. This means, the DRY/WET Fader must have a proportion of Wet signal set or the built-in reverb will not be heard. i.e. if the DRY/WET Fader is set fully Dry no reverb will be heard.</p> <p>If the TCA-500 is used with a 19" rack effects processor, (such as a Lexicon MX-200, a T.C. Electronics G-Major/II, or other 1U space multi-effects unit), we would recommend the built-in reverb be turned off and patches set up on the effects processor; the reverb algorithms of a good quality effects processor should be superior to the built-in reverb.</p> <p>1U 19" Rack Space – The TCA-500 has a built in rack space below the main amplifier chassis. If no effects processor is fitted in this space a blanking plate should be fitted. On the rear panel an IEC switched outlet is provided to power up the effects processor; 50W max. Although the general thought behind providing this space is to enhance the reverb and delay effects, almost any 1U unit no more than 8 inches or 200mm deep could be installed in this space.</p>
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TCA-500 COMBO AMP CONTROL FUNCTIONS, JACKS, & INDICATORS:

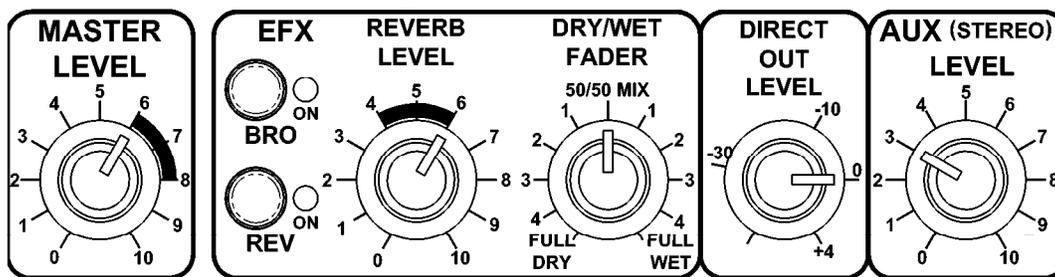
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<p>Reverb Level – Rev ON button (continued)</p>	<p>An optional remote switch box for steel guitar (and a remote foot switch for other instruments) is available for rapid remote control of the TBro and Reverb functions. The usage of these optional accessories is outlined later in this manual. A TRS three-conductor coaxial cable is necessary to connect most multi-effect units to an external control box or foot pedal.</p>
<p>DRY/WET Fader</p>	<p>This fader controls the ratio of “dry” (without effects) and “wet” (with effects) signals sent to the Master Level control. Counter clockwise is dry, clockwise is wet.</p> <p>DRY/WET FADER – EFX SEND + LEVEL (rear panel) - EFX RETURN + LEVEL (rear panel) – The Dry/Wet Fader and rear panel effects loop is a very powerful feature that allows effects to be added to the analog signal chain in a number of ways.</p> <p>The level sent out to the effects unit can be adjusted using the EFX Send Level on the rear panel. This is adjustable to drive effect inputs from, -30dB to +4dB ; the +4dB setting generates the highest output. It’s very important to ensure the TCA-500 Overload LED just starts to blink BEFORE the effects processor input level reaches its maximum input level or clipping point. The average user can easily ensure the correct and proper EFX send level by looking up the preferred level in the manual for the appropriate multi-effects units and setting the EFX RETURN and EFX SEND controls on the TCA-500 to specified levels. Normally these levels will be -10 dBu, -8 dBu, -4 dBu, 0 dBu or +4 dBu. The TCA-500 provides the ability to match virtually any high quality EFX units.</p> <p>The level returned from the effects unit can be reduced or boosted using the EFX Return Level on the rear panel. This is adjustable over the range from, -30dB to +4dB ; the +4dB setting applies the highest gain to the returned signal. This level should be adjusted so the effects processor output doesn’t cut or boost the signal; we call this ‘unity’ gain. A good way to check this is to set the effects processor to ‘bypass’: Then set the DRY/WET Fader fully Wet and then fully Dry, you should notice virtually no change in volume; adjust the EFX Return Level to achieve this.</p>

TCA-500 COMBO AMP CONTROL FUNCTIONS, JACKS, & INDICATORS:

FRONT PANEL (CONTINUED)



DRY/WET Fader (continued)

Your effects send and return levels should now be optimised. We suggest you note the settings.

Series Effects Loop Mode

By setting the Dry/Wet Fader fully Wet, mono effects can be introduced in a series chain. i.e. all of the signal passes through the effects loop and no thru signal is added to the effected signal. This mode is useful where compression or modulation effects need to be added.

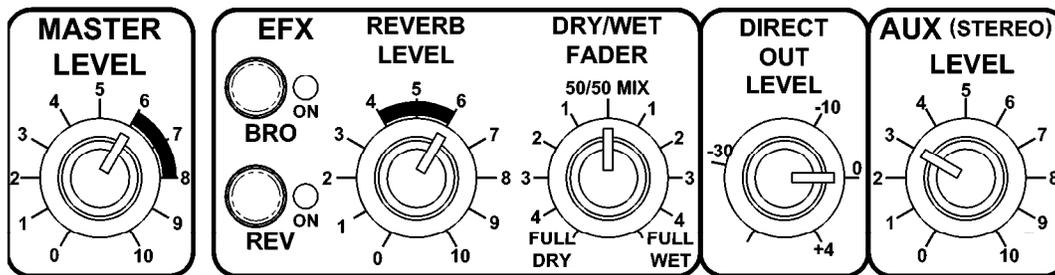
Most effects processor manufacturers recommend series mode, there is however a down side when using effects processors as part of a series chain. To generate high quality effects requires complex mathematics and powerful processors, and time to perform the calculations. This introduces a small delay as the signal passes through the effects processor; this delay is called 'latency'. A high performance processor like the T.C. Electronics G-Major/2 introduces a delay of about 1.6 milliseconds into the signal chain.

If you consider reverb or delay effects this latency has negligible effect, as the effect you are using is in fact delay based itself. But in a series chain effect arrangement the straight through signal will also be delayed by 1.6 milliseconds. There is considerable debate whether or not this delay can be detected by the player. In tests we've carried out, comparing series and parallel effects patches, it is our opinion that it is, in fact, detectable by some players.

For this reason we would therefore not recommend using effects processors in a series mode that introduce latency.

TCA-500 COMBO AMP CONTROL FUNCTIONS, JACKS, & INDICATORS:

FRONT PANEL (CONTINUED)



DRY/WET Fader (continued)

Parallel Effects Loop Mode

By setting the Dry/Wet Fader at a mid-way point, the dry or thru signal will be mixed with the effected signal. Typically a 12 o'clock position is a good starting point.

The EFX Return Level should be adjusted so the effects processor adds a typical effect level when the Dry/Wet Fader is in the 12 o'clock position. Note the effects processor patch settings will also affect this level; good noise / headroom practice must be considered when developing patches.

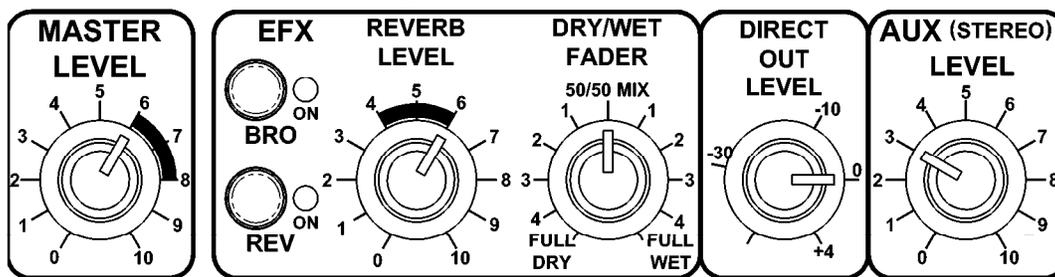
In parallel mode the dry or thru signal is passed within the TCA-500 and only the effected signal is returned by the effects processor. When developing patches for parallel mode use, it is essential that the effects processor is not allowed to pass an unaffected or straight through signal. If this occurs, the true thru signal will mix with the latency delayed thru signal and generate a modulated dry signal. This might in some situations sound nice while setting up the patch, but in a gigging or recording situation this often corrupts the general EQ, messing up the natural sound of the instrument.

A well configured parallel effects loop, with a suitably configured delay and reverb effect only being returned, enhances the natural sound of the steel guitar and most other instruments. The T C Electronics G-Major/2 effects processor has some suitable routings with good control of both the effect mix and effect level, for both delay and reverb. A number of patches have been developed for this unit to be used with the TCA-500.

The ability to adjust the Dry/Wet Fader to control the effects level in a live gigging situation is another advantageous feature of parallel mode.

TCA-500 COMBO AMP CONTROL FUNCTIONS, JACKS, & INDICATORS:

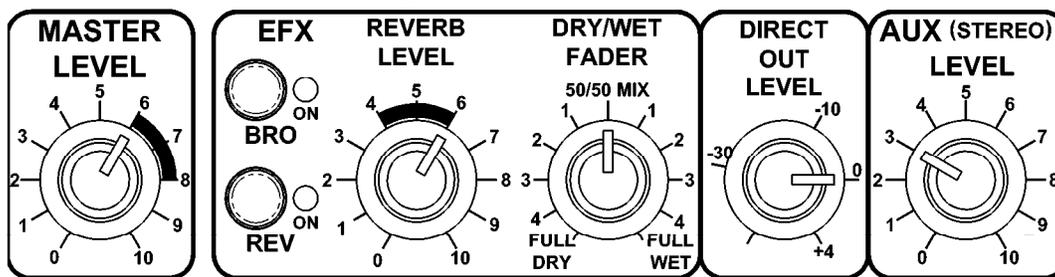
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<p>Direct Out Level – Gnd Lift</p>	<p>This level adjustment will allow you to match the DO signal you are sending, to the proper level required by the mixer board or recording device. Most line level devices are either +4dB or -10dB. You can adjust for either, however, you can also adjust your Direct Output signal low enough for microphone inputs with below -30dB adjustment- this is an unusual capability. This allows you to use your high quality balanced XLR Direct Output with low end mixer boards which only provide mic level inputs. (A very handy capability when you walk into a new venue cold and have no idea what the sound person might have to work with.)</p> <p>The DO in the TCA-500 is analog modeled to deliver to a flat response system, a very closely EQ'd approximation to what is output from the combo speaker in its cabinet.</p> <p>The signal sent from the XLR connection is balanced line and male gendered (standard XLR out). The GND Lift pushbutton allows the combo earth to be separated from the DI earth to assist with hum ground loop issues. The front panel Direct Level control allows the signal sent to the desk/house board to be easily adjusted over a wide range.</p> <p>Note; when the PA ON (Power Amp On/Off) button is Off (i.e. no sound is output from the combo speaker, but the headphones output is still active), the DO output remains ON because the preamplifier section is ON.</p>
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TCA-500 COMBO AMP CONTROL FUNCTIONS, JACKS, & INDICATORS:

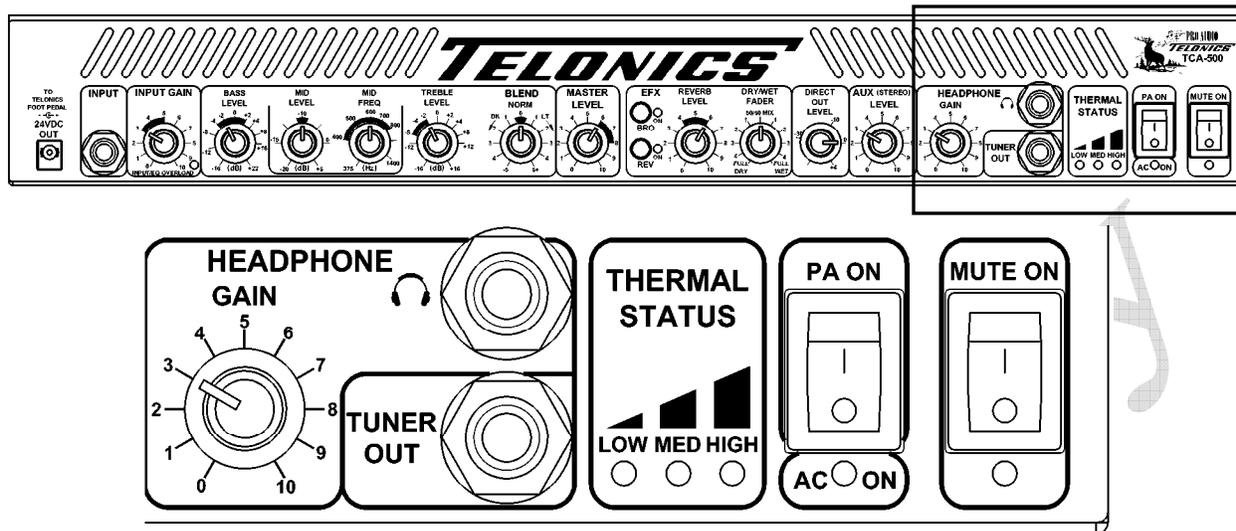
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<p>Aux Level (Stereo)</p>	<p>The Auxiliary level control is used to set the level of background/track music from .MP3 players, CD players or other audio sources. It can also be used as a second effects RETURN. If used as second effects return, the Tuner Out on the rear panel can be used as effects SEND. See FAQ sheet.</p> <p>This input accepts a standard ¼ inch TS or TRS plug. Most .MP3 players require a 1/8 inch TRS plug. Accordingly, a 1/8 inch-to-1/4 inch TRS cable is supplied with the TCA-500. Some CD players still utilize separate RCA jacks and therefore require a dual RCA plug (male) to ¼ inch TRS plug cable. These are readily available to most home entertainment electronics stores and are generally stocked at Telonics as well.</p> <p>As such, the Auxiliary Input is not designed for low-level instrument signals. HOWEVER, it may also be used as a second channel input from an external source such as a preamp and/or effects chain. For example, a musician who doubles on a second instrument might connect the output of a preamp, compressor and/or other EFX units following his instrument to the Aux input on the rear panel of the TCA-500, thus providing for quick switching to a Tele, MandoCaster, mandolin, or other instrument.</p>
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TCA-500 COMBO AMP CONTROL FUNCTIONS, JACKS, & INDICATORS:

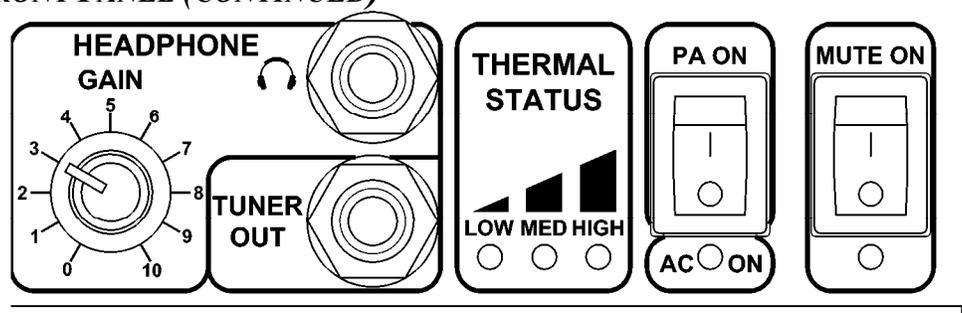
FRONT PANEL (CONTINUED)



Headphone Gain	Adjusts headphone output level. <u>Turn down when not in use.</u>
Headphone Jack	<p>The headphones output is a high level stereo ¼” TRS Jack output, capable of driving headphones impedances of 8 Ohms or above.</p> <p>WARNING – High headphone levels may damage your hearing</p> <p>The Headphones Gain control allows the headphone output level to be adjusted.</p> <p>The Mute ON and PA ON switches do not affect the headphones output.</p> <p>This unit puts out up to half a watt per channel into 8 ohms – more than enough for any player at home. We recommend using quality headphones such as Sony model MDR 7505.</p>
Tuner Out	Buffered output so it will not load down the pickup or the rest of the signal chain, nor will it allow noise from the tuner to get back into the system. May be used simultaneously with the Tuner Out jack on the rear panel. Output impedance is approximately 500 ohms. These outputs are buffered for feeding to a guitar tuner. The Mute ON switch does not affect these outputs; they are always ON .
Thermal Management Status	<p>The Thermal Management Status indicates the temperature status of the power amplifier. The LEDs indicate a low (green), medium (yellow), or high (red) temperature range. (For more details see the Thermal Management System section)</p> <p>The LEDs will also indicate a fan speed out of specification condition as described later, in the Thermal Management System; Fan Speed out of Spec Indication paragraph.</p>

TCA-500 COMBO AMP CONTROL FUNCTIONS, JACKS, & INDICATORS:

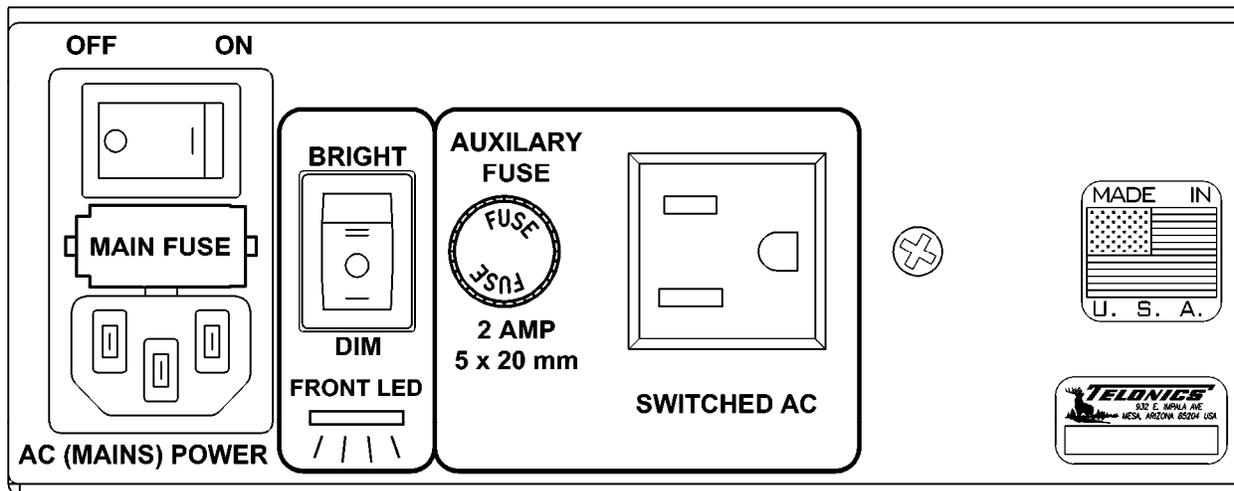
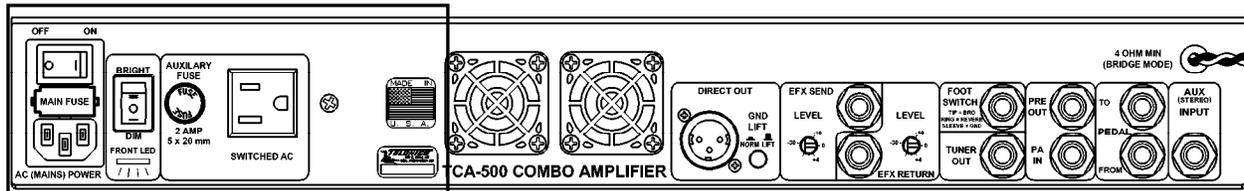
FRONT PANEL (CONTINUED)



Green LED	The green LED will blink; On for a short time then Off, once a second while the temperature is below the Low setting. This “wink” (short blink, once per second) lets you know that the Thermal Management System is working. As the temperature increases the green LED will come On solid while the temperature is at or above the low setting.
Yellow LED	The yellow LED will come On solid if the temperature is at or above the medium set point.
Red LED	The red LED will come On solid if the temperature is at or above the high set point.
PA On	Turns the power amplifier On and Off. A time delay is built into the audio circuits to minimize “pop” when turning On or Off. Note: The preamp is still operational when the PA is off. The PA ON switches the combo Power Amp On/Off. It does not affect the XLR Direct Out or the Headphones. When the PA ON switch is Off the cooling fans are disabled to minimise noise for use in a studio. Hint: If you ever find yourself at a live gig, trying to get sound from your combo, but nothing is coming out, check this switch – someone may have turned your power amplifier off!
AC On LED / AC Switch	Main Power ON / OFF switch (rear) / AC ON LED (blue) – The AC power switch is a small black “rocker” switch located above the AC power cord IEC connection point/socket on the rear panel. The blue AC On LED on the front panel indicates AC mains power is applied and the AC Mains Power switch is On .
Mute	MUTE ON switch / LED (yellow) – The Mute ON switch mutes the output to the Power Amplifier, to the XLR Direct Out and to the PRE OUT; it <u>does not</u> affect the Headphone output, Effects Send and Pedal TO outputs. The Mute circuitry is designed to be super quiet when switched On and Off. When the Mute is On the Yellow Mute LED is lit. The Mute system in the TCA-500 is very handy for string replacement, practice licks, tuning, and effects adjustment during live venue situations.

TCA-500 COMBO AMP CONTROL FUNCTIONS, JACKS, & INDICATORS:

REAR PANEL



AC (MAINS) Power Input

110-120VAC input*. Standard C13 plug on a 18 AWG cord is recommended. The power input is fused with an 8 amp 250VAC 5x20mm ceramic Slow Blow fuse.

Main Fuse (rear) – The AC mains protection fuse is located on the rear panel. It is in a fuse drawer directly above the AC mains power cord socket and below the Off/On switch. Use a small screwdriver to release the spring latch on each side of the drawer to release the fuse drawer.

WARNING - Before checking this fuse **ALWAYS** ensure the combo is disconnected from the mains supply.

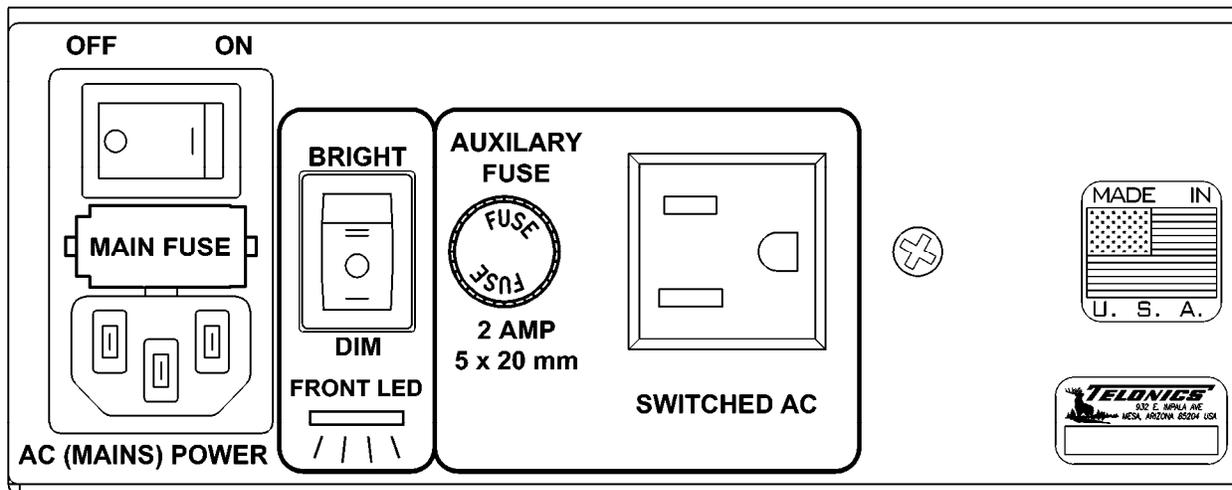
If tests / a visual inspection of this fuse indicate it is open circuit, take caution, your combo may have developed a fault.

ONLY replace the fuse with the EXACT type – Ceramic 8 Amp : 5 x 20mm : 250 Volt.

Note: If the fuse should blow immediately after being replaced **DO NOT** try it again, this could cause more damage; return the combo to Telonics for testing and repair.

TCA-500 COMBO AMP CONTROL FUNCTIONS, JACKS, & INDICATORS:

REAR PANEL (CONTINUED)



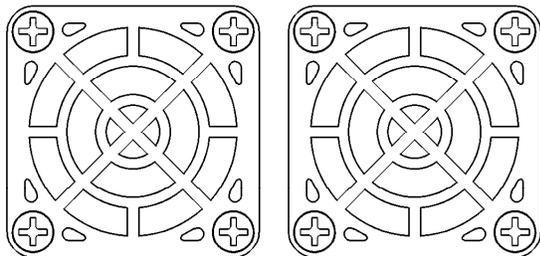
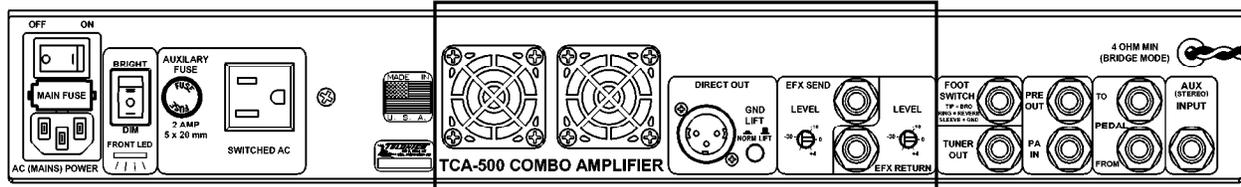
Front LED Light	<p>The Front LED Light switch is a three-position toggle switch which turns the Front panel LED illumination system to one of the following conditions: “Bright” “Off” or “Dim”.</p>
Switched AC Outlet Socket (rear panel)	<p>Switched 110-120VAC outlet, fused with a 2 amp 250VAC 5x20mm glass Slow Blow fuse. Note: This outlet is a C14connector in the export version.</p> <p>To allow the combo to be powered from a single AC cord, a switched AC power socket is provided to power up the effects unit.</p> <p>WARNING – Mains voltage is present on this connection – DO NOT insert any device into this socket other than the IEC lead provided – If any liquid is spilled on the combo in this area UNDER NO CIRCUMSTANCES should the combo be used, and the AC mains cord plug should be IMMEDIATELY disconnected from the AC mains supply socket.</p> <p>The output voltage from the Switched AC socket will be the same as applied to the combo AC mains cord plug. Always check to be certain that your effects processor voltage suits the supply voltage applied to the TCA-500 Combo Amplifier.</p> <p>Note; the power taken by the effects processor should not exceed 50 Watts.</p>

*NOTE: Standard versions are wired for domestic use only. Export units are available on special order. Export AC Power Input range is 170-240 VAC, 50-60 Hz with an 8A 250VAC fuse.

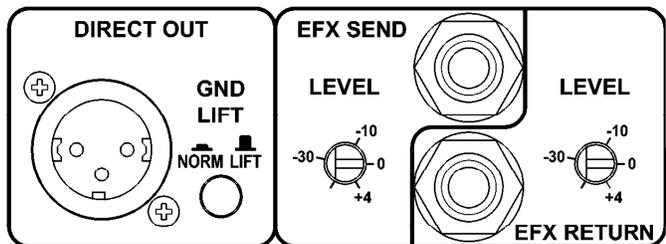
CAUTION: Voltages outside this range could damage the unit and cause a shock hazard.

TCA-500 COMBO AMP CONTROL FUNCTIONS, JACKS, & INDICATORS:

REAR PANEL (CONTINUED)



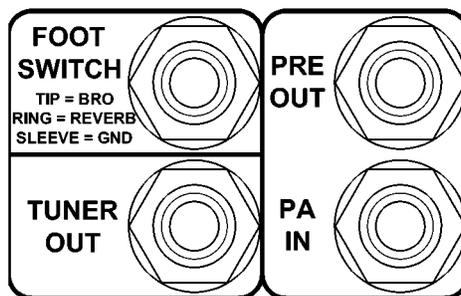
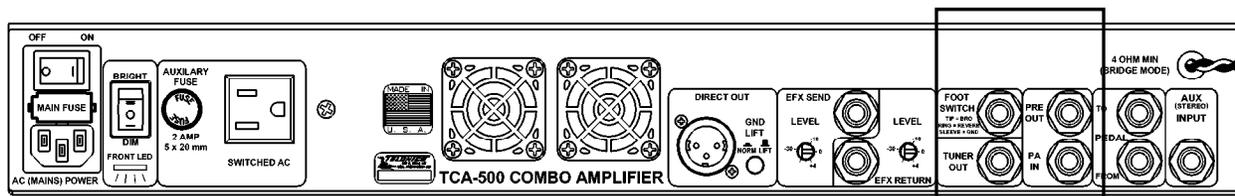
TCA-500 COMBO AMPLIFIER



Direct Out XLR	Buffered post effects, post EQ signal for studio or stage use. Output impedance = 600 ohms. The XLR connector is wired to the standards for audio. Pin 1 is shield, Pin 2 is signal plus, and Pin 3 is signal minus.
Direct Out GND Lift	This switch allows you to disconnect Pin 1 of the XLR connector from the chassis ground. It is seldom necessary in properly built equipment, but might be needed sometime. Leave in the Norm (In) position unless needed.
EFX Send Level	This adjusts the level to your effects unit. This will allow you to have enough of a signal to make the effects work well and yet not overdrive it.
EFX Send Jack	Mono send to parallel mode effects unit input. Use a ¼ inch TS (tip, sleeve) phone plug.
EFX Return	This is a mono (TS) input from your effects unit mono output.
EFX Return Level	This potentiometer allows you to select the nominal signal level coming from your effects unit, it is adjustable from +4dB to less than -30dB. Most “Pro” equipment is usually +4dB while consumer equipment is usually -10dB.

TCA-500 COMBO AMP CONTROL FUNCTIONS, JACKS, & INDICATORS:

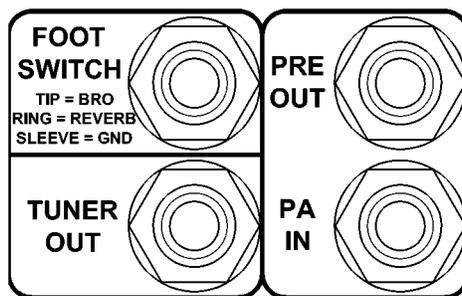
REAR PANEL (CONTINUED)



Foot Switch	<p>The Foot Switch jack on the rear panel may be used to switch the TBro and/or the internal Reverb effects circuit on and off. A ¼ inch TRS (tip, ring, and sleeve) plug is needed. The sleeve is common, tip is TBro and ring is reverb. The switch will enable the effects in the closed position.</p> <p>Note that the type of switch to be used must ‘not’ be a momentary contact type, but rather a continuously on or off type, such as a toggle switch.</p>
Tuner Out	<p>The Tuner Out jack on the rear panel performs the same function as the Tuner Out jack on front panel. It is designed for internal feed to a rack mounted tuner. Both Tuner Outs, front and rear, may be used simultaneously. The output impedance is approximately 500 ohms.</p>
Preamp Out	<p>The Preamp Out jack is a line level output from the preamplifier section of the TCA-500 that can be used to send the fully processed signal to another power amplifier, powered speaker, etc.</p> <p>Using a standard guitar cable with 1/4 inch TS plugs on both ends, this jack can be used to treat this TCA-500 as a “Master” unit, which can control a second TCA-500 as a “Slave – thus providing a total of 1000 watts of total amplifier power (500 per unit).</p> <p>(Note that when this is done, a ground lifting device such as a HUM-X must be used on the “Slave” unit in order to prevent a loud and unpleasant ground loop hum.)</p>

TCA-500 COMBO AMP CONTROL FUNCTIONS, JACKS, & INDICATORS:

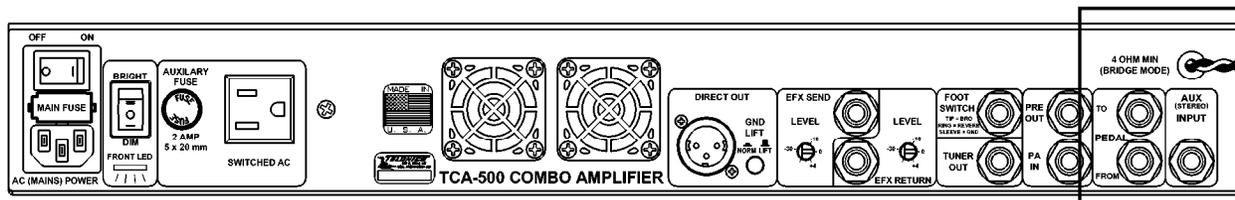
REAR PANEL (CONTINUED)



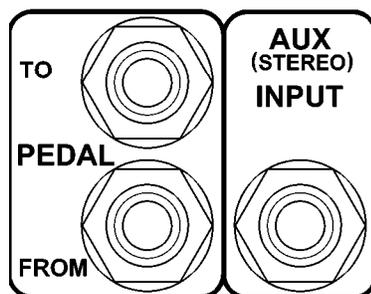
Power Amp Input	<p>The Power Amplifier Input accepts line level signals from another source to the power amplifier and local speaker in the TCA-500 Combo Amplifier. When used, this jack will disconnect the internal preamplifier signal from going to the Power Amp. Only the external signal coming in on the TS plug will be amplified through the speaker.</p> <p>PRE OUT / PA IN (jacks, rear) – These jacks allow two TCA-500 combo's to be slaved together. Connect a lead from the Pre Out of the Master combo (<i>The combo that the guitar is plugged into</i>) to the PA In of the Slave combo. The output from the speaker of the master and slave combo's will now be the same. When adjustments are made to the master combo controls both combos' outputs will be affected.</p> <p>(Note that when this is done, a ground lifting device such as a HUM-X must be used on the "Slave" unit in order to prevent a loud and unpleasant ground loop hum.)</p>
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TCA-500 COMBO AMP CONTROL FUNCTIONS, JACKS, & INDICATORS:

REAR PANEL (CONTINUED)



**4 OHM MIN
(BRIDGE MODE)**

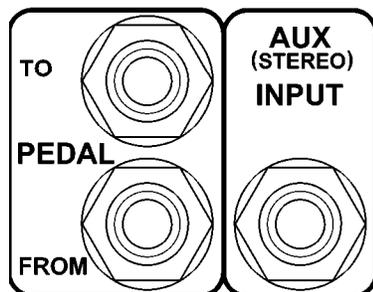



Pedal To	<p>Output to a volume pedal or an effects unit or chain. This signal is affected by the input gain control, and is prior to the equalization.</p> <p>PEDAL TO / FROM (jacks, rear) – The Pre Out and Pre In jacks allow an effects unit to be inserted before the tone control and effects section. If a ¼ inch plug is inserted into the Pre Out or Pre In jack, the normal link between the jacks is broken.</p> <p>With the Input Gain control optimized, and with a typical output from a steel guitar applied, with no volume pedal reduction applied, the output from the Pre Out jack averages around -6dB This level should be suitable for most pedal based effects and professional 19” rack equipment that operates around 0db.</p>
Pedal From	<p>Return from volume pedal or an effects unit or chain and is also prior to the equalization.</p>

TCA-500 COMBO AMP CONTROL FUNCTIONS, JACKS, & INDICATORS:

REAR PANEL (CONTINUED)

4 OHM MIN
(BRIDGE MODE) 



<p>Aux Input (Stereo)</p>	<p>The Auxiliary Input on the rear panel accepts a 1/4" stereo or monaural plug and may be used to inject audio from a CD, MP3 player or other line level source, for home practice or live gigs. Use the Aux (stereo) Level control on the front panel to set the desired music level.</p> <p>The Aux Input provides a secondary input to the amplifier that sums into the system such that it can be heard via the headphones, main speaker and XLR Direct Out. The Aux Input is a stereo 1/4" TRS Jack input; signals fed via this input in stereo will remain in stereo when fed out to the stereo Headphones jack. Signals fed via this input are summed to a mono signal before being fed to the speaker and XLR Direct Out.</p> <p>This input can be used in one of three ways:</p> <ul style="list-style-type: none"> i) A CD / MP3 Player connected to the Aux Input will allow tracks to be played for practice and small gigs. ii) An additional effects processor output can be returned via this input. iii) A guitar effects unit output can be connected into this input, enabling the amplifier to be used for both steel and guitar. <p>Note; this input is optimised for a 0dB line level signal.</p> <p>Note; Signals applied to the Aux Input will be analog modelled when output from the Direct Out.</p> <p>It can also be used as a second effects return. If used as second effects return, the rear tuner out can be used as effects send. See FAQ sheet.</p>
<p>Speaker Wire (Red and Black)</p>	<p>This is the bridged output to the speaker. The speaker impedance must be greater than 3 ohms. The red wire is (+) or positive phase, the black wire is (-) or negative phase.</p> <p>CAUTION Both wires have an AC voltage on them. DO NOT allow them to short to ground when you should hear sound, as this could cause a failure. NEVER use grounded equipment to measure the speaker output.</p>

TCA-500 THERMAL MANAGEMENT SYSTEM

INTRODUCTION

The cooling system for the TCA-500 Audio Amplifier consists of two variable-speed fans and an intelligent digital controller circuit. The speed of the fans is determined by the temperature at multiple key points within the amplifier. The controller is designed to run the fans at the slowest possible speed sufficient to maintain the amplifier at a safe operating temperature, and thus yield the quietest possible operation. As the temperature of the amplifier increases, the fan speed is increased as necessary.

NORMAL COOLING MODE:

TEMPERATURE INDICATION

The amplifier's temperature is indicated on the front panel via the status LED's:

- Blue = Thermal Management System/ AC power ON LED is On
- Green = Temperature is above the Low temperature threshold
- Yellow = Temperature is above the Medium temperature threshold
- Red = Temperature is above the High temperature threshold

The following table shows the state of the Green, Yellow and Red LED's, and the fan speed for the specified temperature ranges:

Temperature		LED Status			Fans	
>=	<	Green	Yellow	Red	No.	Speed
	Low	Wink	off	off	1	Minimum
Low	Medium	ON	off	off	2	Increasing
Medium	High	ON	ON	off	2	Increasing
High		ON	ON	ON	2	Maximum

Notes:
'Wink' = short blink, once per sec.
'ON' = on solid.

FAN SPEED OUT OF SPEC INDICATION

The speed of the fans is measured continuously in order to make sure that the fans are operating properly and to assure adequate cooling for the amplifier. If the speed of any of the fans is out of allowed tolerance for five or more consecutive seconds, then the LEDs defined by the above table (i.e., Green and Yellow for temperature between Medium and High) will blink long flashes twice per second; they will be On for ¼ second, and Off for ¼ second. This is a flash that is easily discernible from the 'Wink' condition described above. If the speed of all of the fans returns back to within tolerance, the blinking will stop, and the LEDs will return to the state described in the table above. Should this 'Flashing' persist, this could be indicative of a fan failure, and could lead to the amplifier overheating. In this case, the amplifier should be returned to the factory for repairs.

FAN-WEAR BALANCING

In order to further minimize the noise produced by the fans, and to prolong the life of the fans, the fans are controlled individually. Whenever the temperature of the amplifier is below the Low temperature threshold, one of the fans is turned off, and one fan continues to run at the minimum speed. In most environments, when the amplifier is idle or played at lower levels, a single fan is adequate to maintain a desirable temperature within the amplifier. Whenever the amplifier temperature rises above the Low threshold, the second fan is turned on in addition to the first one; therefore, both fans will be running, initially at the minimum speed. Should the temperature of the amplifier continue to rise, the speed of both fans will be increased accordingly; if the temperature of the amplifier drops, the speed of both fans is reduced accordingly. If the temperature of the amplifier again drops below the Low threshold, then the second fan is turned back off. The fan which will 'always be On' is alternated every time that the AC mains power is cycled. Thus, in the long run, the wear on the fans will be balanced.

***STUDIO (NO FANS) MODE:
TEMPERATURE INDICATION***

In the Studio mode, the power amplifier is switched off and the fans are not turned on. In this mode, the LEDs blink a special pattern to alert the user to the fact that the unit is in this mode and the power amplifier is off, and to indicate the temperature of the amplifier. The blink pattern is three short blinks (winks) followed by a short pause, and then repeat.

The amplifier's temperature is indicated on the front panel via the status LEDs:

Blue	Fan controller power is On
Green winking	Temperature is below the Medium temperature threshold
Green and Yellow winking	Temperature is above the Medium temperature threshold
Green, Yellow, and Red winking	Temperature is above the High temperature threshold

FREQUENTLY ASKED QUESTIONS

What's a good setting to start with on the Gain control?

An initial setting of “3” is a good starting point. The Input Gain control delivers plenty of level so be cautious to avoid the red overload (“clipping”) LED from coming on.

What are the frequencies covered by the Mid Freq control? Mid Level?

The “Mid Freq” control has a range from 375 Hz to about 1400 Hz. The range is scaled to values of, 375, 400, 500, 600, 700, 800 and 1400 Hz. The “Mid Level” control adjusts from -20 dB cut at full CCW position to a +5 dB boost at full CW position.

What does the Blend control do?

This control is used as an overall “fine” tone control to be used **only** after setting the other tone controls to your satisfaction. Rotating the knob clockwise yields a brighter more aggressive tone and counterclockwise results in a mellower, warmer tone. Straight up (zero) yields no change.

What's a good setting to start with on the Master Level control?

A setting of “5” is a good place to start. This level will be determined by the size of the room you are playing in. The Master Level control delivers plenty of level so be cautious in its use.

What kind of headphones should I use?

Use low impedance (35-60 ohms) stereo closed or open style depending on personal preference. Sony MDR 7505 headphones are recommended for best fidelity.

Can I drive speakers with the headphone jack?

No, only use it for headphones. It was designed for headphones. The preamp will deliver up to half a watt per channel into eight ohms from its internal stereo headphone amp.

What does the red LED overload indicator show?

The **Overload LED** shows when the preamp enters (or is about to enter) soft clipping. Although you might see it light up on rare occasions, you'll probably never hear the difference. This LED indicates an overload on the input or equalizer circuits. Reduce gain or adjust EQ of input to eliminate blinking.

Tell me about the Tuner Out function.

The Tuner Out jacks have a buffer stage and circuitry which isolates both outputs of the tuner from the rest of the circuitry eliminating a common source of external noise sometimes emanating from some tuners. This circuit will not load down other circuitry in the TCA-500. The front and rear panel jacks can be used at the same time. The Tuner Out can also be used as an effects Send.

What does the Mute button do?

When engaged, the mute function allows the tuner, headphone amp, and effects send and return to remain On while the power amp send and XLR direct out feed are disabled. This way you can practice at home or in between songs on stage without your power amp On and still get a stereo feed to your headphones complete with stereo effects. Use it to mute your output while changing a string, tuning up, running through upcoming licks or adjusting the effects unit.

FREQUENTLY ASKED QUESTIONS

(CONTINUED)

Will pushing the Mute button send a loud “pop” into my speakers, headphones or the XLR Direct Out (the house feed) when I activate it?

No, the preamp employs silent muting circuitry.

How do I use the Aux In feature?

The Aux In may be used to input stereo rhythm tracks or background music from CD or MP3 players. The Aux In feature can also function like a second stereo effects return. It can be used as a way to inject practice music into the main channels and/or headphones or to add a second effects return. The amount of music or effects level is determined by the output level of the music or effects player and the Aux In Level control.

Can I safely run phantom power into my Direct Out circuit?

While it is not necessary (nor a good idea) to run phantom voltage into the Direct Out connector, it is designed to withstand the IEC specified maximum of 10 milliamps without damage.

What output level can I expect to see from the Direct Output connector?

Normally, the output is approximately the same as the main outputs, up to 5 volts maximum, however it can be controlled by the user in real-time by using the Direct Output control on the front panel. This control allows the DO output to be set from mic level (-30 dBu), to high line level (+4 dBu).

This is very handy when a sound man pre-sets your level on the board too low and leaves for a while. Normally, you would be stuck. By using this control, you can simply reach over, set your house volume through the PA board, and hopefully, not start a “sound war” when he returns to the booth.....

(OPTIONAL) EXTERNAL CONTROL UNIT

TCA-500 FOOT SWITCH



An external control unit which clips on the leg of a pedal steel is available to control the Reverb and TBro effects within the TCA-500 Combo Amplifier. It provides two toggle switches, one for Reverb On and Off, and a second for TBro effect On and Off.

Note that the TBro and Reverb **pushbutton switches** on the front panel of the TCA-500 **must be ON** (pushed in) in order for the remote unit to function.

These switches are located on the right side of the box as viewed from the player's position. The TBro On/Off switch is positioned on the upper right corner of the front panel. The Reverb On/Off switch is positioned on the lower right corner of the front panel.

A ¼ inch TRS cable is required to connect the TCA-500 side of the Control Unit to the "Foot Switch" jack on the rear panel of the TCA-500. This cable is identified by a white ring around the cable directly behind the TRS plugs on both ends. Always be sure the cable with the white ring markings is fully inserted into the right side of the Control Unit, with the TRS plug on the other end plugged into the Foot Switch jack on the rear panel of the TCA-500.

One way to remember this is to recall the rhyme used by cardiac technicians in hospitals for their EKG leads:

"White on the Right".

(NOTE: A two-button foot pedal switch is also available from Telonics which accomplishes the same remote switching functions for the TCA-500. A single ¼ inch TRS cable is used to connect the foot pedal switch unit to the Foot Switch jack on the rear panel of the TCA-500.)

(OPTIONAL) EXTERNAL CONTROL UNIT

LEXICON MX 200 FOOT SWITCH

The initial External EFX Control Units also provide for controlling the two “EFX engines” in the Lexicon MX-200 multi-effects unit. The MX-200 requires Momentary Contact, Normally Open (MCNO) switches for its remote control function. Accordingly, two momentary push button switches are provided on the left side of the External EFX Control Unit.

The button at the upper left of the front panel controls Effect Engine #1 (normally programmed for Delay effects in Telonics patches), and the button at the lower left of the front panel controls Effect Engine #2 (normally programmed for Reverb effects in Telonics patches). The buttons are labeled accordingly.

A second ¼ inch TRS cable is required to connect the Lexicon MX-200 side of the Control Unit to the “Foot Switch” jack on the rear panel of a Lexicon MX-200. Always be sure this cable is plugged into the left side of the Control Unit, with the TRS plug on the other end fully inserted into the Foot Switch jack on the rear panel of the Lexicon MX-200.

You can determine whether an effects “engine” in the Lexicon MX-200 is On or Off by looking at the BYPASS buttons on its front panel. If the engine is On, the LED for that engine will be NOT be illuminated – the light will be Off, indicating that the effect generated by that unit is NOT bypassed.

This can be confusing, so be sure to remember that BYPASSED means OFF and that effect is bypassed or off, when the LED in the BYPASS button is On.

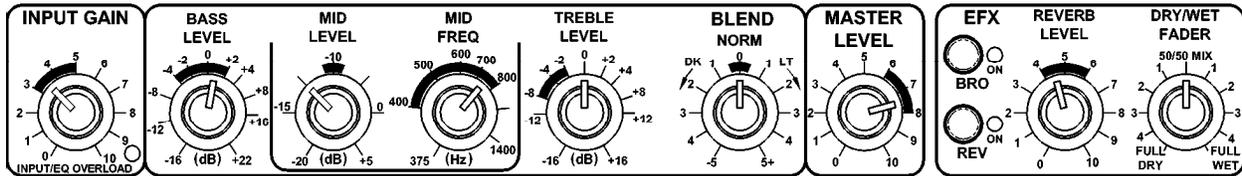
If you have an MX-200 in your Combo, be sure to try the pushbuttons a few times to be sure you have this concept firmly in mind.

At the time of this writing, we have indications that the T.C. Electronics G-Major/2 may provide improved capabilities with the TCA-500. They generally cost twice as much as the MX-200 and we want to make sure they deliver that level of service. We are currently working with them to develop our understanding of their usage and to develop custom patches.

If and when we recommend them, we will also look into remotely controlling them as well.

TCA-500 COMBO AMP SETUP:

GENERAL USE SETTINGS



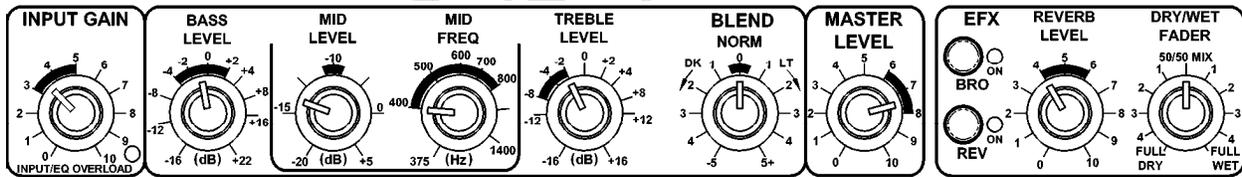
The EQ settings shown above are suitable as a starting point for users who desire a more general setting for all styles with a middle-to- slightly darker tonal coloration.

As stated earlier, the MID frequencies are the key. Turning the MID Frequency control slightly clockwise will reduce highs further.

You may also want to pull the Middle frequencies down a bit further toward -14 or -15 dB if they are still too “in your face”.

Remember that these controls are sensitive, so a little adjustment can change a lot

MAXIMUM CLARITY SETTINGS



The EQ settings shown above are suitable as a starting point for users who desire a very crisp and sharp, setting with very high definition of both lows and highs. This type of setting is bright and clear (with good pickups in your guitar), and optimizes both the “growl” on the lower strings and the “bells” on the high strings.

As stated earlier, the MID frequencies are the key. Turning the MID Frequency control slightly clockwise will reduce highs further.

Once set to your satisfaction, the BLEND control can be rocked slowly while striking a wide grip of strings repeatedly to accurately “fine tune” all the EQ settings at one time.

Remember that these controls are sensitive, so a little adjustment can change a lot.

HOW TO BE A TONE MASTER – SUBTRACTIVE EQUALIZATION

The following information from the great audio engineer John LeMay is an important and insightful key to achieving well-balanced sound with ideal tone.

How to Be a Tone Master

by John LeMay

This is a collection of thoughts on how to get the best tone you can through what might seem to be an unconventional way of doing it. This information comes from my years of mixing and mastering experience in Hollywood.

Subtractive equalization: The Art of attenuating, rather than boosting, frequencies to achieve equalization.

When first trying to get "that sound", your tendency may be to push something up. Where you might feel like you need to add some high end, you may actually just need to cut at 200Hz to clear the sound up. Then you can add a dB or two at the top end, and it will sound as open as adding 6dB or 8dB of high-frequency EQ.

Excessive EQ can mask perception of audio nuance and detail. When frequency buildup becomes extreme — particularly in the upper midrange, where the ear is most sensitive — subtle space-enhancing details are the first to fall victim to frequency masking and hearing fatigue. As more additive EQ (boosts as opposed to cuts) gets piled on, the final result is often grating, tinny, or downright unlistenable at moderate volume. Such an excessive buildup — in addition to hastening listening fatigue — may smear or obscure subtler aspects you're playing. The interaction of compression or reverb in this range further compounds the problem.

EQ should almost always be used as a subtractive device. That means, use it primarily for lowering certain frequencies in a pre-amp. Every mix or amp sound usually has too much of something to begin with." Too much bottom end, too many high's, mids are honkin'. Use EQ to lower those trouble spots. Result . . .Cleaner sound, better sound. Simple, isn't it? EQ should be subtle - not drastic. Boosting the EQ also has a tendency to raise the noise floor.

In subtractive EQing you are pulling down the level of a given frequency. In additive EQing you are raising the level of the chosen frequency. For example, say you're in the studio and you have an acoustic guitar track that sounds too "muddy". Your first instinct may be to raise the frequencies around 4kHz to brighten up the sound a bit. But you are better off pulling down the low-mid frequencies around 325Hz instead!

Here's a simplistic example of how to do it. Say you want more high-end. First bring down the low end a bit, and then raise the overall (master) gain to compensate for the gain loss. This has the effect of raising the high end but without increasing noise. Go back and forth between lowering the bottom end and replacing gain with the master level control till you achieve the tone you are looking for. Practice this till it becomes second nature. Raising the bottom end is done in much the same way. First bring down the high end a bit, and then raise the overall (master) gain to compensate for the gain loss. This effectively raises the bottom end EQ. This requires

HOW TO BE A TONE MASTER – SUBTRACTIVE EQUALIZATION

CONTINUED

careful listening to know how much to cut and how much master gain to compensate with.

For midrange, I cheat a bit and boost it slightly in the frequency I wish to affect. I then lower the high and low EQ till I achieve the midrange sound I am looking for. A little goes a long way. Practice, practice, practice.

Watch out for the low end. Too much energy in the bottom octaves (below 300 Hz) will mask the higher frequencies and cause you to want to add more highs. You'll end up chasing your tail running after the perfect tone.

When it comes to using EQ, "Less is more".

MECHANICAL DATA

Feature	Specification
Electronics Chassis Material	Hard Anodized Aluminum
Front & Rear Panel Markings	Lexan Surface
Cabinet	The cabinet is made from multi-ply Baltic Birch, 12mm & 15mm thick continuous panels that are dove tailed together for maximum strength. Then sprayed with urethane to make a hard durable finish.
Dimensions	See Drawing page
Total weight	35 lb. (15.875 kg) Without effects unit

ELECTRICAL DATA

Parameter	Condition	Value
Mains input voltage	115Vac setting (factory set)	85Vac to 132Vac
Mains input voltage	230Vac setting (factory set)	170Vac to 250Vac
Mains fuse	115 V ac and 230Vac settings	8 amp 250Vac 5x20mm Ceramic Slow Blow fuse.
Auxiliary switched AC power outlet	115Vac and 230Vac setting	2 amp 250VAC 5x20mm glass Slow Blow fuse
Preamp Gain	1kHz sine	58dB typical
Power Amp Gain	1kHz sine	30dB typical
Output power @ 1%THD+N	$R_L = 4 \text{ Ohm}$ 20Hz < f > 20kHz, both channels driven 115Vac	300 W rms typical
Output power @ 10%THD+N (Max power 500 W)	$R_L = 4 \text{ Ohm}$ 20Hz < f > 20kHz, both channels driven 115Vac	400 W rms typical

MECHANICAL OUTLINE DRAWINGS

ALL DIMENSIONS ARE IN INCHES [CM] AND ARE NOMINAL

