



THETA PRO DSP

FLOOR CONTROLLED GUITAR SYSTEM



OWNERS MANUAL

INTRODUCTION

Congratulations on your purchase of the THETA PRO DSP™. The THETA PRO DSP™ was designed to provide the ultimate sonic performance possible in a Guitar DSP based processor; all controlled on the floor, with simplicity of use and programmability. The THETA PRO DSP™ is based on state of the art Digital and Analog circuit design and technology and features ISP Technologies proprietary algorithms for all THETA PRO DSP™ functions. The THETA PRO DSP™ also features the patented Decimator noise reduction system for the highest level of noise reduction and transparency available. Also included on board is a SONG mode allowing the guitarist to arrange presets into 124 songs with 4 preset patches per SONG. Please read this manual carefully for a through explanation of the THETA PRO DSP™ and its functions.

IMPORTANT SAFETY INSTRUCTIONS

Please read the following very carefully before operating this unit

- Read ALL instructions carefully before using this unit. Keep these instructions for future reference. Heed all warnings and follow all instructions.
- Do not use this unit near water, in the rain, or where there is moisture. If this warning is ignored a serious electrical shock or death may occur.
- Do not attempt to service this unit. No user serviceable parts inside. Refer servicing to qualified, ISP approved personnel. Servicing is required when the unit is damaged in any way, such as power adaptor is damaged, liquid has been spilled into the unit, the unit has been exposed to rain or moisture, does not operate normally, or has been dropped.
- Care should be taken to avoid spilling any foreign objects or liquid into this unit. Avoid exposure of this equipment to dripping or splashing and ensure that no objects filled with liquid, such as vases, are placed on the equipment.
- Only use accessories or attachments that are specified by the manufacturer.
- Failure to follow these instructions may void the warranty.



NO USER SERVICABLE PARTS INSIDE. REFER SERVICING TO
QUALIFIED ISP TECHNOLOGIES SERVICE PERSONNEL.

The lightning bolt triangle is used to alert the user to the risk of electric shock.
The exclamation point triangle is used to alert the user to important operating or
maintenance instructions.



POWER REQUIREMENTS

This unit requires the connection of the external AC Power Adaptor to a 120 volt AC outlet. Do not attempt to connect this unit to any power source other than the one supplied with the THETA PRO DSP. The THETA PRO DSP will typically draw on the order of 1.5 amps of current from the AC power adaptor when in use.

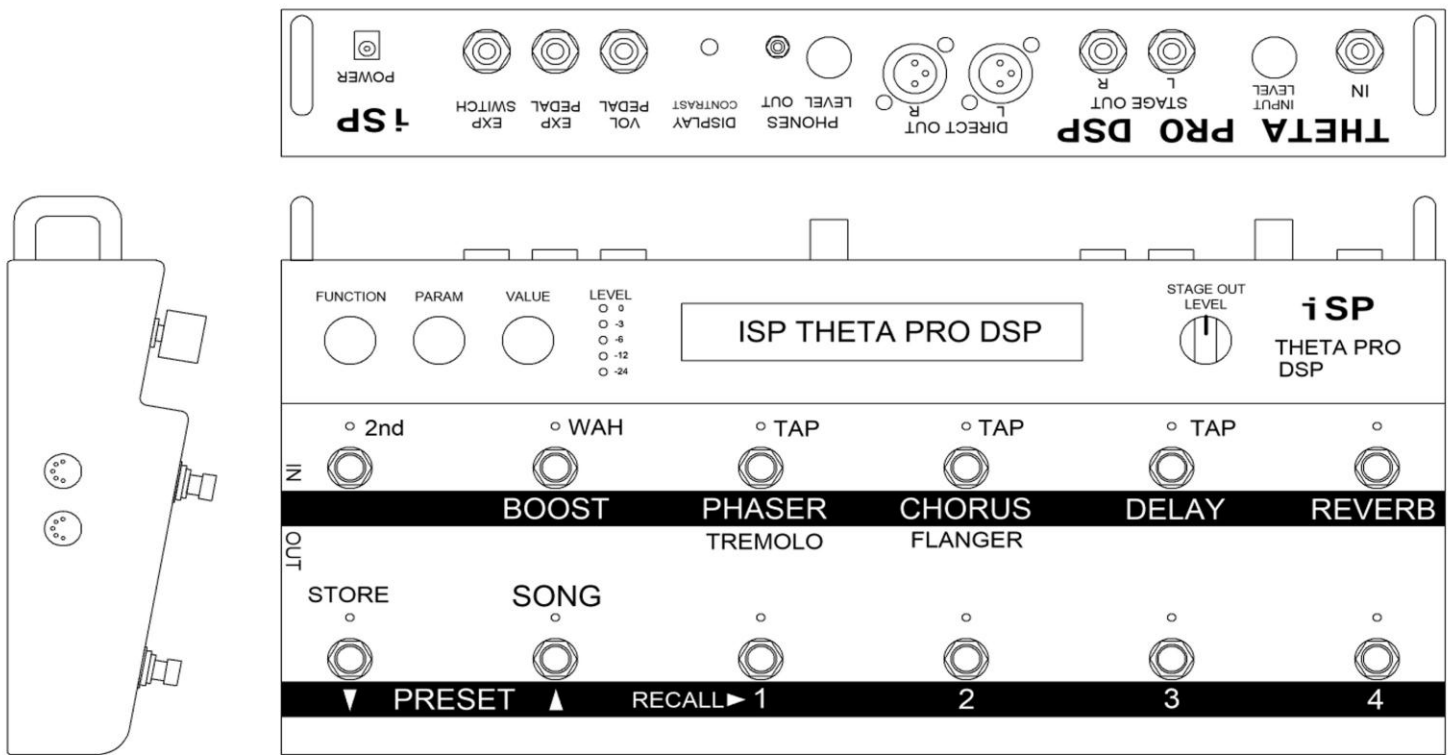


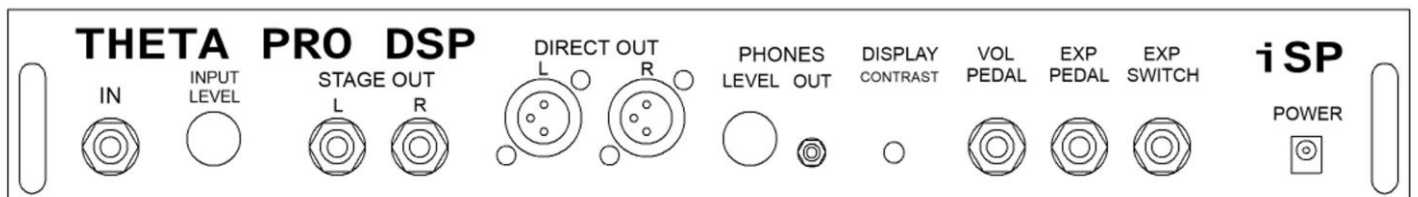
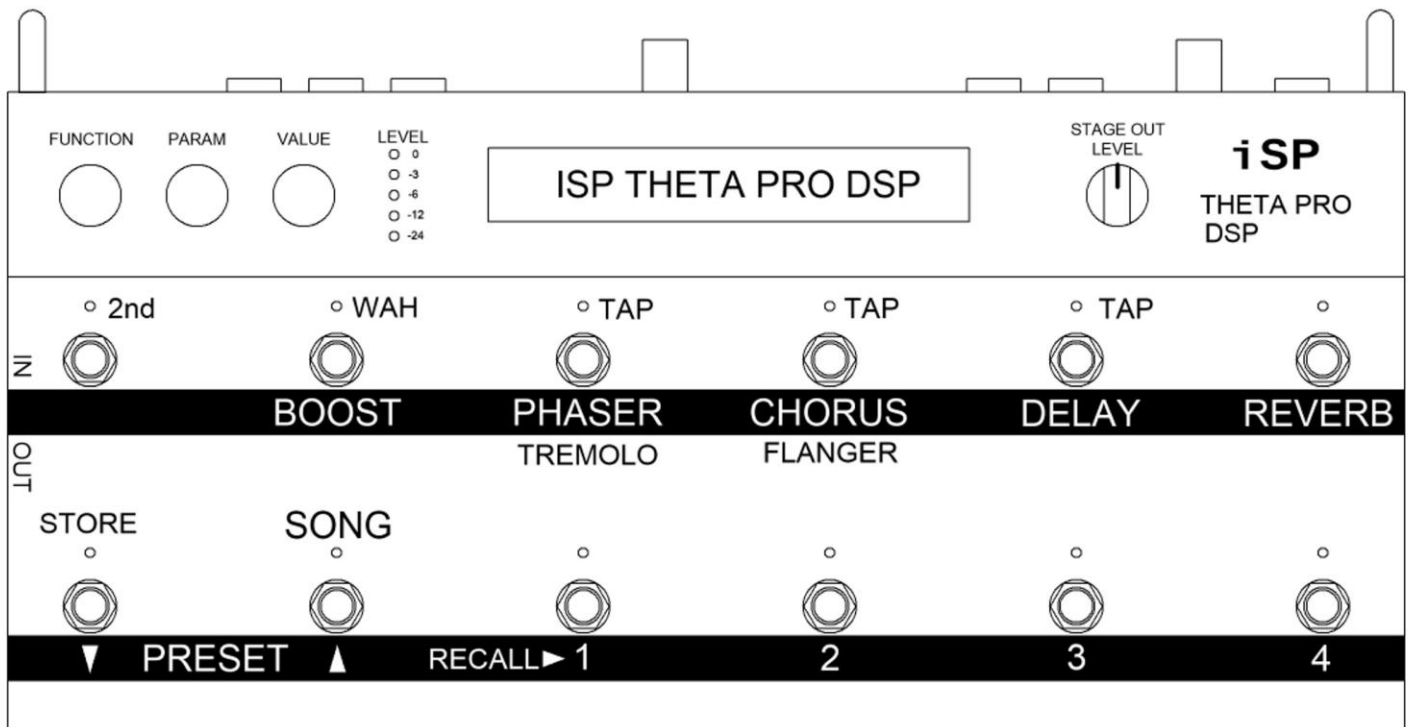
FIGURE 1

Quick Start

Refer to the Figures shown for the hardware drawings which show the locations of the switches, knobs, and jacks when reading the following, or even better, just look at your unit.

1. Connect the guitar to the IN jack, connect the STAGE OUT jack(s) to a power amp such as the ISP Stealth which is connected to a guitar speaker cabinet, OR connect the DIRECT OUT jacks to the input of a mixer, OR connect the PHONES jack to headphones or earbuds (or connect all three). With a mono system, the output(s) can be set to mono in the global parameters later. The STAGE OUT jacks can be connected to a conventional guitar amplifier, but this will not yield optimum results, since most guitar amps will further shape and distort the sound.
2. Connect the supplied 9V AC power adaptor to wall power, then to the POWER input on the Theta Pro. The unit will power up and recall Preset 1. Pressing the RECALL 1 switch will display the Preset 1 title.
3. With the Preset title displayed, adjust the INPUT LEVEL control on the back panel so that the LEVEL 0 LED (red) just flashes when playing hard, then back off the INPUT LEVEL control slightly so that the 0 LED does not light. Short, infrequent flashes of the red 0 LED are generally not audible. Adjust the STAGE OUT LEVEL or PHONES LEVEL controls to taste. The DIRECT OUT levels can be controlled by the global DIRECT TRIM parameter which affects all presets, and by the OUTPUT LEVEL parameter within each preset, which affects all outputs, but is the level specific to each preset. Note that the LEVEL LEDs only display the raw input level when the preset or song titles are displayed (FUNCTION turned fully counterclockwise). If any other parameters are displayed, the LEVEL LEDs will display the maximum of the 4 output DAC (Digital to Analog Converter) levels.

4. Play!
5. Presets can be selected by pressing the PRESET down or up switches, then the RECALL 1 switch. Holding the PRESET down or up switches will result in progressively faster scrolling through the preset titles. The RECALL 2 switch will immediately increment one preset, and the RECALL 3 switch will immediately decrement one preset. These can be used to step through the presets to try them out. The RECALL 4 switch will jump back to the **last** previously recalled preset, easy to remember since it is the **last switch** on the right. If the preset title is displayed (if FUNCTION is set fully counterclockwise), the VALUE knob can be turned to scroll through the preset titles. Pressing the RECALL 1 switch will then recall the selected preset.
6. BOOST, PHASER, TREMOLO, CHORUS, FLANGER, DELAY, and REVERB can be turned on or off by the top row of switches, depending on the settings within each preset.
7. Pressing the SECOND switch allows access to the WAH on/off, STORE, and SONG Mode, as well as TAP functions to set the modulation rates and DELAY time. The FUNCTION knob selects the function such as Preamp, EQ, etc. The PARAM knob selects the parameter within the function, and the VALUE knob adjusts the value.
8. Changing a value will light the red STORE LED. To store the new value for later recall, press the 2nd switch, followed by the STORE switch. Note that the THETA PRO DSP ships with the Preset 1-100 and Preset 101-200 LOCK set to ON, so storing to those presets will display a FAIL message. Storing to presets 201-224 is always allowed. See the section on the Global Parameters for more information on how turn off the Locks.
9. To copy a preset to a different location, first recall the preset. Then scroll to the desired new location by using the PRESET down or up switches, or the VALUE knob (if FUNCTION is set fully counterclockwise). Note that the preset titles will flash, meaning the preset is not fully recalled. Then press 2nd, STORE to store the last recalled preset into the new location. The original contents of this location will be overwritten, so be careful. The unit ships with 100 unique presets written in locations 1 to 100, then repeated again in locations 101 to 200, we recommend that one of the two banks be left locked to prevent inadvertently writing over the original presets, at least until the storage space is needed for new original presets.
10. Read the rest of the manual, it contains much valuable information to get the most from your Theta Pro DSP!



DETAILED OPERATION:

Refer to Figures above for the hardware drawings which show the locations of the switches, knobs, and jacks when reading the following. Refer to Figure 2 for the signal flow diagram which shows the flow of the signal through the unit from the input to the outputs. The following text explains the operation of the unit organized by the software functions and parameters, but it also incorporates explanations of the hardware functions where they are interrelated to the software. This fusion of both domains together helps to simplify the understanding of the unit, since everything about a single concept is contained together. Also, many important operational details are contained in the Quick Start section, so reading and understanding that section is essential.

PRESET MODE:

This is the default mode when the unit is first turned on. It allows direct recall of presets by name, adjustment and programming of presets, mapping of switches and the expression pedal, MIDI Dump and Load, and setting of Global parameters. The other mode of the unit is SONG MODE, which will be described later.

Functions and Parameters:

Note that the titles of the functions do not always appear on the display, but most of them are contained within the first parameter of that function. The following list of functions are accessed in order by turning the FUNCTION knob clockwise. The parameters are then accessed by turning the PARAM knob. The values displayed are changed by turning the VALUE knob.

A) Mixer Function

1. OUTPUT LEVEL (OFF to +10 dB): Controls the output level feeding all outputs from the unit. This is to allow the presets to be set to nominally equal levels given different gains, compression, EQ, and effects. It also allows adjustment to prevent clipping of the 4 channel output DAC. When the Function is turned to display this or any parameter other than the titles, the LEVEL leds will display the maximum output level of the 4 DAC channels. The OUTPUT LEVEL can then be adjusted to prevent clipping of the DAC by keeping the red 0 dB LED from lighting.
2. DIRECT PAN (0 to 100): Pans the direct signal (the signal before the stereo effects) from Left (0) to Right (100). The primary use for this is to have the direct sent to one channel and the delay sent to the other.
3. BOOST (OFF or ON): When ON, boosts the level of the signal after the Preamp.
4. BOOST LEVEL (0 to 10 dB): Adjusts the amount of BOOST. Note that if the preset already has a hot level, too much boost can clip the output DACs.

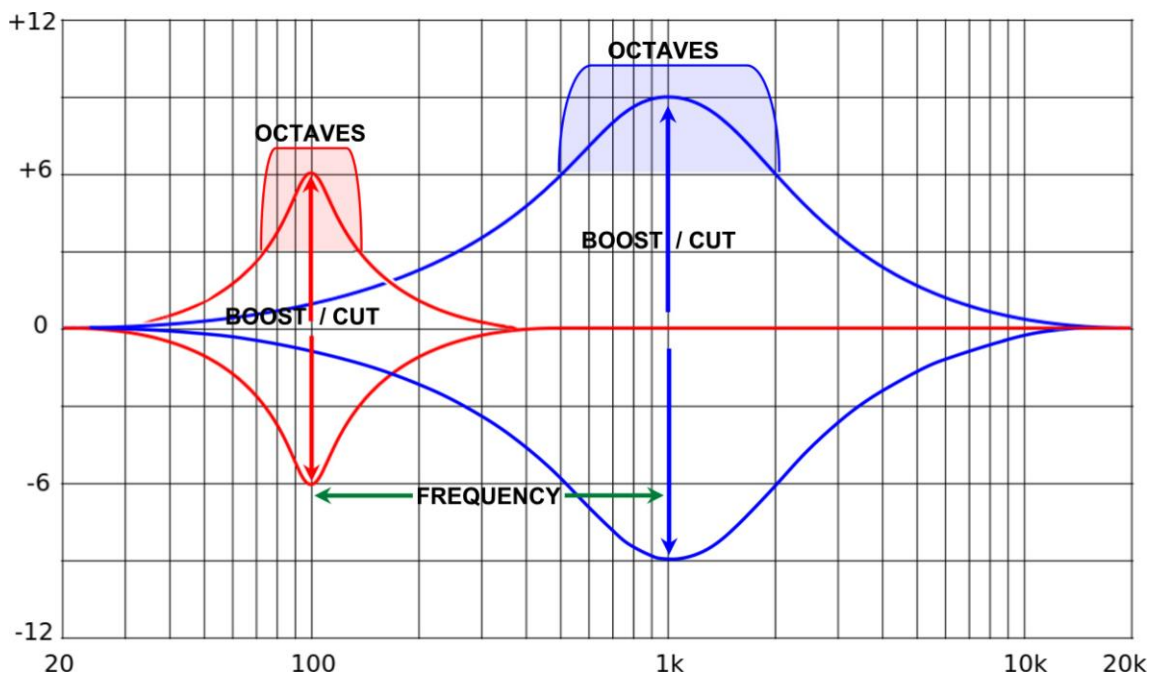
B) PREAMP Function

1. PREAMP (CLEAN or DISTORT): In CLEAN, the distortion part of the preamp is bypassed, so the DIST TYPE, GAIN, and SAG parameters have no effect, and it is not possible to get clipping within the preamp section, due to floating point processing. If you are still hearing distortion, it is probably due to the input ADC or output DACs being overdriven, or your guitar, amp, mixer, speakers, headphones, or ears. In DISTORT, the distortion part of the preamp is enabled, so all the parameters become active.
2. DIST TYPE (THETA or VINTAGE): THETA type applies an EQ curve before the clipper stage that matches that of the ISP THETA pedal. This is in addition to the settings of the PRE EQ controls. VINTAGE removes this curve, so that the only pre-distort EQ is what has been set on the PRE EQ controls. Real vintage amps do not have much pre-clip EQ, but sound less desirable at high gain settings.

3. GAIN (1 to 90 dB): Dials up the gain before the clipper stage. Additionally, there is gain available in the Pre EQ and THETA type distortion, so that the total amount of gain applied to the signal can exceed 120 dB! As a point of reference, a typical amp head has a gain of about 60 dB with the knobs set to maximum. If the GAIN is set above 60 dB, the compressor will be disabled, even if the PREAMP is set to CLEAN. To re-enable the compressor, the GAIN must be lowered to 60 or less, then the COMPRESSOR parameter can be turned from OFF to ON.
4. SAG (0 to 100): Emulates the sag of the supply voltage rails in an amp. Higher values result in more sag. As you play harder, the rails sag down resulting in more clipping of the signal. Play softer and the rails move higher, resulting in a cleaner sound. This is most effective with moderate levels of GAIN.
5. OUTPUT LEVEL (OFF to +10 dB): This is the same parameter as in the mixer function. It is just repeated here for convenience because as preamp parameters are changed, it is typical that the output level will need to be readjusted.
6. COMPRESSOR (OFF or ON): Turns on the compressor, which is positioned before the clipper stage. Compression is useful for making clean or low gain settings sound louder, as it reduces the level of loud passages and increases the level of soft passages. The downside is the more compression used via lowering the threshold, the more noise is added to the signal. See the GAIN parameter for an explanation of how it affects the compressor.
7. COMP THRESH (-30 to 0): The lower the setting, the more the compression.
8. PRE BASS (-15 dB to +15 dB): The level of the pre-clip bass EQ. Generally for distorted presets this is set to 0 or negative to get a bass cut. For higher gains, these pre-EQ sections do not so much affect the tone of the output, but rather affect the character of the distortion.
9. PRE BASS (40 Hz to 240 Hz): The 'turnover' or upper frequency at which the amount of pre bass boost or cut begins to lose effect. Frequencies above this point will still be boosted or cut, just not as much, and as frequency in the signal increases, the amount will diminish to 0. This is a 'shelf EQ' type section that remains nominally flat at low frequencies.
10. PRE MID (-15 dB to +15 dB): The level of pre-clip midrange EQ. Generally for distorted presets this is set to a positive value to get a boost in the mids.

See the graph on the next page for a better understanding of the operation of a parametric equalizer.

Note: there are three controls that adjust a parametric equalizer including **BOOST – CUT (LEVEL)**, **FREQUENCY** or **FREQUENCY SWEEP (FREQ)** and **BANDWIDTH** or **OCTAVES (BW)**. The graph below shows an EQ response curve with a center frequency of 100Hz and also at 1KHz. The MID “LEVEL” on the THETA PRO DSP will adjust the amount of Boost or Cut applied to the signal. The MID FREQUENCY, “FREQ” adjusts the center frequency as shown below allowing you to select the center point or peak frequency you are boosting or cutting. The MID BANDWIDTH “BW” is the bandwidth of the frequencies being boosted or cut and is selected as OCTAVES. An OCTAVE setting of .1 will be a narrow band of frequencies that are affected by the boost or cut approximately .1 octaves at 3db down from the peak frequency. An OCTAVE setting of 2.5 will be a much broader portion of the spectrum that is affected by the boost or cut approximately 2.5 octaves at 3db down from the peak frequency. This type of equalization allows much more precise adjustment of tone shaping than typical Bass, Mid, Treble controls.



11. PRE MID (88 Hz to 6000 Hz): The center frequency of the midrange boost or cut. It is typically set in the 300 to 2000 Hz range.
12. PRE MID (0.1 to 2.5 OCT): The approximate width in octaves of the midrange boost or cut. Beyond this width, the curve will slowly transition back to 0 if the bass and treble are set flat.
13. PRE TREBLE (-15 dB to +15 dB): The level of pre-clip treble EQ.
14. PRE TREBLE (2000 Hz to 12.0kHz): The lower frequency at which the amount of pre treble boost or cut begins to lose effect.

Frequencies below this point will still be boosted or cut, just not as much, and as the frequency in the signal decreases, the amount will diminish to 0. This is a 'shelf EQ' type section that remains nominally flat at high frequencies.

C) POST EQ Function

1. POST EQ (OFF or ON): Turns off or on the 4-band parametric EQ section that follows the clipper. **See the graph on the previous page for an explanation of how a parametric equalizer works.** For distorted presets, these parameters have the largest influence on the tone. The fully parametric nature of these sections with adjustable frequencies and bandwidths give you the power to create nearly any tone you want.
2. BASS (0 to +15 dB): The level of boost of the bass EQ.
3. BASS (40 Hz to 240 Hz): The 'turnover' or upper frequency at which the amount of bass boost begins to lose effect. Frequencies above this point will still be boosted, just not as much, and as frequency in the signal increases, the amount will diminish to 0. This is a shelf type section.
4. MID1 LEVEL (-15 dB to +15 dB): The level of cut or boost at the center frequency in the first midrange section.
5. MID1 FREQ (88 Hz to 6000 Hz): The center frequency of the first midrange section.
6. MID1 BW (0.1 OCT to 2.5 OCT): The approximate width in octaves of the midrange boost or cut. Beyond this width, the curve will slowly transition back to 0 if the bass and treble are set flat.
7. MID2 LEVEL (-15 to +15): The level of cut or boost at the center frequency of the second midrange section.
8. MID2 FREQ (88 Hz to 6000 Hz): The center frequency of the second midrange section.
9. MID2 BW (0.1 OCT to 2.5 OCT): The approximate width in octaves of the midrange boost or cut.
10. TREBLE (-15 to +15 dB): The level of the treble EQ.
11. TREBLE FREQ (2000 Hz to 12.0kHz): The lower frequency at which the amount of treble boost or cut begins to lose effect. Frequencies below this point will still be boosted or cut, just not as much, and as the frequency in the signal decreases the amount will diminish to 0. This is a 'shelf EQ' type section that remains nominally flat at high frequencies.

DECIMATOR Function

12. DECIMATOR (OFF or ON): Turning the VALUE knob turns off or on the DECIMATOR noise reduction.

13. THRESHOLD (-90 dB to -20 dB): The approximate signal level at which the DECIMATOR will begin downward expansion of the input signal, effectively turning off the noise. Higher threshold values are needed to deal with higher levels of noise. Since the detector for the DECIMATOR is at the very input of the digital signal processing chain, this threshold does not usually have to be re-adjusted because of changes in the preamp settings, but using very high values of gain may make the residual noise more apparent, so you will want to set this to a higher value on those presets.

D) INTELLIGENT SPEAKER™ (INTELLIGENT SPKR™) Function

1. INTELLIGENT SPKR™ (OFF or ON): This turns on the speaker filter function. It achieves virtually identical sound to a microphone on a speaker cabinet, since it convolves the signal with actual samples of a microphone on a speaker cabinet. This function always affects the signal output on the Direct and Headphone outputs, but will also affect the Stage Outputs if the Global parameter 'STAGE SPKR SIM' is set to ON. This parameter is useful if using the Stage Outputs to drive a full-range speaker such as a vocal wedge or even in-ear monitors, and use the STAGE OUT LEVEL control to vary the level independently from the DIRECT OUT signal, which typically feeds the front of house system in a live situation, or mixer/DAW inputs in a recording situation.
2. Type (4x12 Greenback, 1x12 Creamback, 1x12 Deluxe, 4x10 59 B-man, 2x12 Twin, or Lowpass Filter): Of these, only the Lowpass Filter is not based on measurement of an actual speaker, but is simply a fourth order lowpass filter approximation to a guitar speaker. Some may like its sound for certain uses, but it serves as a comparison to the sound of less advanced speaker simulations.
3. REACTANCE (-6 to +6): Bass boost or cut level. This simulates the bump in the bass that can occur with a tube amp interacting with the LF impedance bump (the reactance) in a speaker. It allows you to adjust the bass further to your liking.
4. MIC POSITION (-6 to +6): This simulates moving the microphone from the edge of the cone to the center of the cone by applying a high frequency shelf EQ.

E) WAH Function

1. WAH (OFF or ON): Turns the WAH on or off. There are four ways the WAH can be turned on or off. One is by accessing this parameter and turning the VALUE knob. The second is by pressing the 2nd switch (if it is not already on), then pressing the BOOST/WAH switch. The third is to connect an expression pedal with a switch to the EXP. SWITCH jack on the rear panel with a

mono (2 conductor) ¼" cable and press down on the expression pedal, just like on a separate wah-wah pedal. For this to work, the EXP SWITCH parameter within the EXP PDL function must be set to WAH. The fourth way in which the WAH function is turned on is by recalling a Preset with this WAH parameter set to ON.

2. WAH FREQ (500 Hz to 3084 Hz): The wah center frequency. A wah-wah pedal is a peaking filter with user variable center frequency inserted in the signal path. A classic Cry-Baby wah pedal will have a typical frequency range from about 1000 Hz to 2800 Hz, so the range available here is greater. This frequency can be adjusted by turning the VALUE knob, but the usual method is to connect an expression pedal which has a linear potentiometer (pot) to the EXP. PEDAL jack on the rear panel with a ¼" stereo cable (3 conductor with ring-tip-sleeve or RTS plugs). The EXP PDL1 or EXP PDL2 parameters must be set to WAH FREQ, and the corresponding EXP MIN and EXP MAX parameters can be set the minimum and maximum frequency values you want to sweep over. This allows you to limit the range to equal that of a classic wah pedal if you wish. But the MIN and MAX values you set will only be reached if the pot in your expression pedal sweeps from 0 ohms to the full maximum resistance of the pot within the pedal, which often is not the case. So the actual MIN and MAX values you reach may cover a slightly reduced range. See also the EXPRESSION PEDAL Function.
3. WAH LEVEL (0 to +10): Controls the level near the center frequency of the wah. Since the wah filters off frequencies away from the center frequency, the audible level will typically go down when the wah is switched in. This allows you to boost the level back. Clean presets will require more boost, while higher gain presets will require less because the increased harmonic content of the distorted signal will tend to fall within the passband of the wah filter.

F) TREMOLO Function

A tremolo works by simple amplitude (volume) modulation of the signal. It has a MONO output.

1. TREMOLO (OFF or ON): Turns it off or on. The tremolo can also be turned on or off by pressing the switch marked PHASER/TREMOLO, if the P/T SWITCH parameter within the Switch function is set to TREMOLO or PHA+TREM.
2. TREM DEPTH (0 to 100): Controls the depth, which is the amount of amplitude modulation.
3. TREM RATE (1 to 127): Higher numbers give faster rates. The rate can also be controlled by pressing 2nd, then pressing twice

(tapping) on the PHASER/TREMOLO switch, if the P/T switch is set to TREMOLO, or if it is set to PHA+TREM and the tremolo is ON.

G) PHASER Function

A phaser works by running the signal through an all-pass filter to shift its phase as a function of frequency, then mixing this signal back into the original signal, creating a series of notches in the frequency response, also known as a comb filter. The amount of phase shift is modulated up and down, resulting in the notches shifting up and down in frequency depending on the rate setting. It has a mono output.

1. PHASER (OFF or ON): The phaser can also be turned on or off by pressing the switch marked PHASER/TREMOLO, if the P/T SWITCH parameter within the Switch function is set to PHASER or PHA+TREM.
2. RESONANCE (OFF to -2): Controls the amount of feedback within the phaser. This affects the shape of the notches or 'teeth' of the comb filter, and also the time-domain decay of the response.
3. PHASER DEPTH (0 to 100): Controls the mix between the original signal and the phase shifted signal, which varies the depth of the notches in the comb filter, and hence the amount of the effect.
4. PHASER RATE (1 to 127): Higher numbers give faster rates. The rate can also be controlled by pressing 2nd, then pressing twice (tapping) on the PHASER/TREMOLO switch, if the P/T SWITCH is set to PHASER, or if it is set to PHA+TREM and the phaser is ON.
5. PHASER STAGES (4, 6, 8 or 10): The number of stages in the all-pass filter, which gives more phase shift, which then results in more notches in the comb filter. A certain widely used 'classic' phaser pedal has 4 stages.

H) CHORUS/PSHIFT Function

In V2 software, the CHORUS function has been modified by addition of PITCH SHIFT mode. When the pitch shift is active, the chorus is disabled. A new parameter has been added to the chorus to switch between the two modes. The pitch parameters are accessed by turning the FUNCTION knob one click clockwise, then using the PARAM knob to select the parameter to adjust.

A chorus works by running the signal through a short delay of about 20 ms, and mixing the delayed signal with the original. The delay time is modulated according to the rate and depth, creating a small amount of pitch bend in the delayed signal. The Theta Pro DSP has 4 voices, each separately delayed, modulated, and panned left or right, providing a lush stereo output.

1. CHORUS (OFF or ON): Controlled via VALUE knob or the CHORUS/FLANGER switch. For footswitch control, the C/F

SWITCH parameter within the Switch function must be set to CHORUS or CRS+FLA.

2. CRS MODE (CRS or PSHIFT): switches between the modes.
3. CHORUS MIX (0 to 100): Controls the relative mix between the original signal and all 4 delayed voices.
4. CRS DEPTH 1 (0 to 100): Varies the amount of change in the delay time, which varies the amount of pitch bend in Voice 1.
5. CRS RATE 1 (1 to 127): Varies the rate at which the pitch is being modulated. The rate can also be controlled by pressing 2nd, then pressing twice (tapping) on the CHORUS/FLANGER switch, if the C/F SWITCH is set to CHORUS, or if it is set to CRS+FLA and the chorus is ON.
6. CRS LEVEL 1 (OFF to 0 dB): Controls the level of voice 1 that is mixed in the stereo output.
7. CRS PAN 1 (0 to 100): Pans voice 1. 0 is fully Left, 100 is fully Right, and 50 is centered.
8. CRS DEPTH 2 (0 to 100): Same as for voice 1.
9. CRS RATE 2/1 (0.1 to 1.5): Sets the ratio between the rate of voice 2 and the rate of voice 1. It is done this way so that if the rate of voice 1 is varied by either the VALUE knob, the TAP function, or the EXP. PEDAL function, the rate of all 4 voices will track each other. Typically these ratios are set to a value other than 1.0, so that each voice will modulate at a different rate resulting in a more random and 'lush' sounding effect.
10. CRS LEVEL 2 (OFF to 0 dB): Same as for voice 1.
11. CRS PAN 2 (0 to 100): Same as for voice 1.
12. The explanation for voices 3 and 4 the same as for voice 2.

A pitch shifter works by storing the signal in a short delay, then reading it out at a faster (shift up) or slower rate (shift down). For a shift up, this means that portions of the signal must be repeated. For a shift down, portions of the signal are thrown away. For either case, the output signal will be spliced together from portions of the input. The Theta Pro has an intelligent algorithm to find 'best match' splice points to minimize their audibility. Presets 210 to 220 have been re-written to utilize the pitch shifter.

1. PITCH (-1200 to +1200 CENTS): Varies the amount of pitch shift in 20 cent increments. -1200 cents is one octave down, +1200 cents is one octave up, and each 100 cents is one semitone. This parameter can be mapped to the expression pedal for real-time foot controlled pitch bending, as in the "WHAM ME" preset.
2. DETUNE (-25 to +25 CENTS): Varies the amount of pitch shift in 1 cent increments to achieve a slight detune effect. The total pitch shift will be the addition of the PITCH and DETUNE values, but typically PITCH will be set to 0 if DETUNE is being used. An exception to this is in the "12 STRING" preset, where a slight detune is used off a full

octave shift.

3. PSHIFT MIX (0 to 100): Controls the relative mix between the original signal and the pitch shifted voice.
4. PSHIFT PAN (0 to 100): Pans the pitch shifted voice. 0 is fully Left, 100 is fully Right, and 50 is centered.
5. DIRECT PAN (0 to 100): Pans the direct voice. This is a repeat of the same parameter from the Mixer Function. It is repeated here for convenience.

I) FLANGE Function

The flanger works in a very similar fashion to the chorus, except the variable delay time is much shorter, resulting in the predominate effect being a modulated comb filter, not a pitch bend. It is therefore similar sounding to the phaser, but since it uses time delay the resulting phase shift is linear with frequency, whereas the all-pass filters used in the phaser are not. The result is that the notch frequencies in the flanger have a different spacing, and there are many more of them. There are also two voices in the flanger. These are panned hard left for voice 1 and hard right for voice 2, removing the need for Level and Pan parameters. Using Phase and Flange at the same time may be interesting results.

1. FLANGE (OFF or ON): Controlled via VALUE knob or the CHORUS/FLANGER switch. For footswitch control, the C/F SWITCH parameter within the Switch function must be set to FLANGER or CRS+FLA.
2. FLA REGEN (OFF to -2 dB): Controls the amount of feedback within the flanger. This affects the shape of the notches or 'teeth' of the comb filter, and also the time-domain decay of the response, resulting in a more dramatic effect. But as in real life, you can get tired of too much 'drama'.
3. FLA DEPTH 1 (0 to 100): Varies the amount of change in the delay time, which varies the amount of change in frequency of the notches in Voice 1.
4. FLA RATE 1 (1 to 127): Varies the rate at which the notch frequencies are being modulated. The rate can also be controlled by pressing 2nd, then pressing twice (tapping) on the CHORUS/FLANGER switch, if the C/F SWITCH is set to FLANGER, or if it is set to CRS+FLA and the flanger is ON.
5. FLA DEPTH 2 (0 to 100): As described for voice 1.
6. FLA RATE 2/1 (0.1 to 1.5): Sets the ratio between the rate of voice 2 and the rate of voice 1. It is done this way so that if the rate of voice 1 is varied by either the VALUE knob, the TAP function, or the EXP. PEDAL function, both rates will track each other.

J) DELAY Function

- a. DELAY (OFF or ON): Turns the delay OFF or ON. Controlled by the VALUE knob or the DELAY switch. Turning the Delay OFF mutes both the input and output of the delay, so the delayed output stops immediately.
- b. DELAY LEVEL (OFF to 0 dB): Controls the level of the delayed signal.
- c. REGEN LEVEL (OFF to 0 dB): Controls the level of successive repeats of the delay, and therefore the number of repeats that can be heard. If set to -10 dB, each echo will be 10 dB lower than the one before it.
- d. DELAY TIME (10 ms to 1300 ms): 1300 ms = 1.3 seconds. The delay time can also be set by pressing the 2nd switch, then pressing twice (tapping) on the DELAY switch. The time interval between taps will set the delay time. You can tap twice again to change the setting. If the interval between taps exceeds 1300 ms, the delay time will be set to 1300ms. If you only tap once, after a few seconds the time will be set to 1300 ms. Press 2nd again to exit the tap function.
- e. DELAY PAN (0 to 100): Pans the delay output. 0 is fully Left, 100 is fully Right, and 50 is centered.

K) REVERB Function

- a. REVERB (OFF or ON): Turns the reverb OFF or ON. Controlled by the VALUE knob or the REVERB switch. Turning the Reverb OFF mutes only the input to the reverb, so the reverberated output 'spills over', even if set to OFF in the next preset.
- b. REVERB DECAY (0 to 99): Sets the relative decay time of the reverb.
- c. REVERB HFDAMP (0 to 99): Set at 0, the highs will decay at the same rate as the lower frequencies. At larger settings, the highs will decay more rapidly than the lows, so the room will sound 'darker'. A setting of around 20 will sound more natural, since real rooms always absorb high frequencies faster than lows.
- d. ROOM SIZE (SMALL, MEDIUM, or LARGE): With other settings being equal, a larger room will have a longer decay time, since it will take more time for the sound to travel from one surface to another.

L) SWITCH Function

- a. P/T SWITCH: (PHASER, TREMOLO, or PHA+TREM): Determines the action of the PHASER/TREMOLO switch and LED. Set to PHASER, the switch will turn off or on the phaser, or if 2nd is activated, the switch will allow tap setting of the phaser rate. The LED will show the phaser is on by blinking at the set rate. If this

parameter is set to TREMOLO, the switch will turn off or on the tremolo, or if 2nd is activated, the switch will allow tap setting of the tremolo rate. The LED will show the tremolo is on by blinking at the set rate. If this parameter is set to PHA+TREM, the switch will turn on both functions if they are both off, or turn them both off if they are both on. If only one is on, the switch will turn that function off and the other one on. If both phaser and tremolo are on, the LED will display the rate of the phaser, since that is considered the most typical use of the switch.

- b. C/F SWITCH: (CHORUS, FLANGER, or CRS+FLA): Determines the action of the CHORUS/FLANGER switch and LED. Set to CHORUS, the switch will turn off or on the chorus, or if 2nd is activated, the switch will allow tap setting of the chorus rate. The LED will show the chorus is on by blinking at the set rate. If this parameter is set to FLANGER, the switch will turn off or on the flanger, or if 2nd is activated, the switch will allow tap setting of the flanger rate. The LED will show the flanger is on by blinking at the set rate. If this parameter is set to CRS+FLA, the switch will turn on both functions if they are both off, or turn them both off if they are both on. If only one is on, the switch will turn that function off and the other one on. If both chorus and flanger are on, the LED will display the rate of the chorus, since that is considered the most typical use of the switch.

M) EXPRESSION PEDAL Function

- a. EXP PDL1 (OFF, WAH FREQ, GAIN, DIRECT PAN, TREBLE, TREBLE FREQ, PHASER RATE, PHASER DEPTH, CRS RATE 1, CHORUS MIX, FLA RATE 1): Allows you to map the EXP PEDAL input to the selected parameter. Select OFF if you don't want the expression pedal to be able to change any parameters.
- b. EXP MIN1 (various): Allows you to set the minimum range of the expression pedal sweep. The units that appear with this parameter will change to match the units of the parameter selected above in 1.
- c. EXP MAX1 (various): Allows you to set the maximum range of the expression pedal sweep. The units that appear with this parameter will change to match the units of the parameter selected above in 1.
- d. EXP PDL2 (OFF, WAH FREQ, GAIN, DIRECT PAN, TREBLE, TREBLE FREQ, PHASER RATE, PHASER DEPTH, CRS RATE 1, CHORUS MIX, FLA RATE 1): Allows you to map the EXP PEDAL input to the selected parameter. This parameter exists to allow you to map the expression pedal to two parameters from the list, for even greater creative control. Select OFF if you do not want to use.
- e. EXP MIN 2 (various): Allows you to set the maximum range of the expression pedal sweep. The units that appear with this parameter will change to match the units of the parameter selected above in 4.

- f. EXP MAX2 (various): Allows you to set the maximum range of the expression pedal sweep. The units that appear with this parameter will change to match the units of the parameter selected above in 4.
- g. EXP SWITCH (OFF, WAH): Selects the ON/OFF function which is controlled by the EXP SWITCH jack.

It is recommended to use a pedal with a linear taper pot, the resistance of which is not critical, since the circuit is just reading the ratio of two voltages. **The ideal pedal for this is the Mission Engineering model EP1-KP.** It has two jacks, one is TRS (3 conductors) labeled OUT 1 for the potentiometer (pot). Connect this jack via ¼" TRS cable to the EXP PEDAL jack on the back of the Theta Pro. The second jack on the EP1-KP is labeled OUT 2. Connect this jack via ¼" TS (2 conductor, standard jumper cable) to the EXP SWITCH jack on the back of the Theta Pro, and the switch in the toe of the pedal can be used to turn on the WAH. Other pedals can be used, but for a standard volume pedal you will need a 'Y' cord which has a single ¼" TRS (tip-ring-sleeve) jack at 1 end and two ¼" mono jacks at the other end, assuming your volume pedal has separate IN and OUT jacks (sometimes labeled INST and AMP). The ring of the EXP PEDAL jack supplies 3.3 volts DC to the IN jack on the pedal, and the tip of the EXP PEDAL jack reads the wiper voltage on the OUT or AMP jack of the pedal. If you connect them backwards you won't damage anything, but the parameter change will be very abrupt in the bottom part of the pedal travel. Connecting them the other way will result in most of the parameter change occurring at the top of the pedal travel, if an audio taper pot is used. For most parameters, especially the WAH frequency, a pedal with a linear taper pot is recommended for correct functionality.

N) Title Edit Function

This displays the preset title. The PARAM knob selects the character position to be edited, which moves the cursor under the character selected. There are 16 character positions. The VALUE knob then selects the particular letter, number, or symbol. When you are finished editing the title, don't forget to press 2nd, then STORE to save it.

O) Dump/Load Function

- a. DUMP PRESET (ALL, 1 to 224): Selects the preset to be dumped as a midi sysex message to the MIDI OUT jack. A single preset can be dumped, or all presets. If ALL is selected, the GLOBAL data, followed by all 224 presets, followed by all 124 songs will be dumped. To initiate the dump, press 2nd, followed by STORE. A "DUMPING ..." message will be displayed, followed by "DUMP

COMPLETE” when finished. For single presets, this will occur so fast that only the “DUMP COMPLETE” message will be visible.

- b. READY TO LOAD (ALL, 1 to 224): Selects the preset destination. For example, preset 101 from a unit can be loaded into preset 21 of another unit. If ALL is selected, the GLOBAL data, followed by all 224 presets, followed by all 124 songs will be loaded. No further switch presses are needed on the receiving unit, rather it will just wait for the data stream to start, and will then display “RECEIVING MIDI” once data is detected, followed by “LOAD COMPLETE” when finished. If there are errors detected in the data stream, the message “DATA ERROR – NO LOAD” will be displayed instead. If this occurs, exit the Dump/Load function on each unit, check the cable connection, then re-enter this function and try again. Note that the only functions supported by the MIDI jacks are sysex dump and load. Preset changes, parameter mods, etc. are not supported.

There are two scenarios for use of the Dump/Load Function. The first is the direct transfer of preset data from one Theta Pro DSP to a second Theta Pro DSP. The second scenario is Dump/Load to a MIDI recording device, which is usually a PC or MAC. For this you will need a MIDI interface box, such as an iConnectivity iConnect MIDI2, which interfaces MIDI to a PC via USB port. You will also need software to record the sysex data and save it to disc, or load a disc file and send to MIDI. One recommendation ISP has is to use the MIDI-OX program, which can be readily found via a web search and download. The files so obtained can be attached to emails.

P) Global Function

This function is the last one reached via the FUNCTION knob when in Preset Mode. Even though it appears within every preset, there is only one set of these parameters, and they affect all presets equally. To store changes to these parameters, you must press 2nd, then STORE within this function, before changing back to any other function. You should get in the habit of checking the DECIM OFFSET and output EQ's to reset them every time you play in a different room or with different speakers. For the touring musician, the FOH speakers may change in every different venue. If time permits, you may want to take the THETA PRO DSP out into the house, connect it, and adjust the DIRECT OUT EQ settings to your own preference (or have your tech adjust them from the stage) at the start of sound check. Just remember changes must be stored, or they will be lost upon power down.

- a. G:DECIM OFFSET (-20 to +20 dB): This number is added to the Decimator THRESHOLD parameter in each preset, thus affecting

the threshold in all presets equally. It is useful for situations where you are playing with a different guitar or in a different environment, where you need a temporary change in the decimator threshold, without having to change decimator settings within individual presets.

- b. G: STAGE OUT (STEREO or MONO): When set to MONO, the left and right STAGE OUTs will be summed and divided by 2. This is useful when you only have a single speaker cabinet on stage.
- c. G: STAGE SPKR SIM (OFF or ON): Typically this would be set to OFF for using a traditional 1x12, 2x12, or 4x12 guitar cabinet on stage. But if you want to use a full range cabinet such as a vocal wedge, or even in-ear monitors, yet still control their volume via the STAGE OUT LEVEL on the front of the unit, setting this to ON will route the INTELLIGENT SPEAKER™ processed output to the STAGE OUT jacks.
- d. G: DIRECT OUT (STEREO or MONO): When set to MONO, the left and right DIRECT OUTs will be summed and divided by 2. This is useful when you only want a mono feed to the front of house. Note that this will also affect the phones output, since they share the same pair of DAC channels.
- e. G: DIRECT TRIM (-12 to 0 dB): This attenuates the DIRECT OUTs to prevent input clipping on some mixers.
- f. G: DIRECT EQ (OFF or ON): This turns on a stereo 3-band EQ section on the DIRECT OUTs. Remember, this EQ curve will then be present on all presets, and is useful for making basic corrections to speakers and rooms.
- g. G: DIR BASS (-15 to +15 dB): Consult the POST EQ function for a detailed explanation of these 7 EQ parameters.
- h. G: DIR BASS (40 to 240 Hz):
- i. G: DIR MID (-15 to +15 dB):
- j. G: DIR MID (88 to 6000 Hz):
- k. G: DIR MID (0.1 to 2.5 OCT):
- l. G: DIR TREBLE (-15 to +15 dB):
- m. G: DIR TREBLE (2000 to 12.0k Hz):
- n. G: STAGE EQ (OFF or ON): This turns on a stereo 3-band EQ section on the STAGE OUTs. Remember, this EQ curve will then be present on all presets, and is useful for making basic corrections to speakers and rooms.
- o. G: STAGE BASS (-15 to +15 dB): Consult the POST EQ function for a detailed explanation of these 7 EQ parameters.
- p. G: STAGE BASS (40 to 240 Hz):
- q. G: STAGE MID (-15 to +15 dB):
- r. G: STAGE MID (88 to 6000 Hz):
- s. G: STAGE MID (0.1 to 2.5 OCT):
- t. G: STAGE TREB (-15 to +15 dB):
- u. G: STAGE TREB (2000 to 12.0k Hz):

- v. **G: VOLUME PEDAL (OFF or ON):** This would normally be set to ON, so that when you plug in an expression pedal to the VOL PEDAL jack, the pedal will become active. However, if the circuitry involved in reading the expression pedal were to fail, the volume could be stuck to maximum attenuation, and since Volume is a hidden parameter that can't be adjusted, this parameter allows you allowing the unit to still be usable. It is recommended to use a volume pedal with an audio taper pot, the resistance of which is not critical, since the circuit is just reading the ratio of two voltages. You will need a 'Y' cord which has a single ¼" TRS (tip-ring-sleeve) jack at 1 end and two ¼" mono jacks at the other end, assuming your volume pedal has separate IN and OUT jacks (sometimes labeled INST and AMP). The ring of the VOL PEDAL jack supplies 3.3 volts DC to the IN jack on the pedal, and the tip of the VOL PEDAL jack reads the wiper voltage on the OUT or AMP jack of the pedal. If you connect them backwards you won't damage anything, but the volume change will be very abrupt from full off to full on in the bottom part of the pedal travel. You should mark the ends of the Y cord so that you know in the future which end connects to the IN or INST jack on the pedal.
- w. **G: P 1-100 LOCK (OFF or ON):** Allows you to 'lock' the first block of 100 presets so that they cannot be stored to. You can still edit them, but any changes will be lost if another preset is recalled or if you power down. This helps prevent the presets from becoming altered during tryouts in stores. This parameter cannot be changed until the correct LOCK COMBO is entered on parameter 24. To change the setting of the LOCK turn the **FUNCTION** Knob clockwise to the last Function, which will display "**G: DECIM OFFSETT**", then turn the **PARAMATER** Knob clockwise to the last Parameter, which will display "**G: LOCK COMBO**". Enter the unlock code 234, then turn the Parameter knob back to "**G: P 1-100 LOCK**". Now you can change the lock ON / OFF setting. Press Second / Store to save the new status. If you do not press Second / Save the changes will only be in effect while the unit is powered ON and the new settings will be lost on the next power ON. You must hit Second / Save to make any new saved presets permanent.
- x. **G: P 101-200 LOCK (OFF or ON):** Allows you to 'lock' the second block of 100 presets so that they cannot be stored to. You can still edit them, but any changes will be lost if another preset is recalled or if you power down. Since this second hundred presets are identical to the first hundred when shipped, you may want to keep the lock set to ON in this block until you are certain you need to write over these presets. Note that presets 201 to 224 cannot be locked. To change the setting of the LOCK turn the **FUNCTION** Knob clockwise to the last Function, which will display "**G: DECIM OFFSETT**", then turn the **PARAMATER** Knob clockwise to the last

Parameter, which will display “**G: LOCK COMBO**”. Enter the unlock code 234, then turn the Parameter knob back to “**G: P 101-200 LOCK**”. Now you can change the lock ON / OFF setting. Press Second / Store to save the new status. If you do not press Second / Save the changes will only be in effect while the unit is powered ON and the new settings will be lost on the next power ON. You must hit Second / Save to make any new saved presets permanent.

y.

- z. **G: LOCK COMBO (0 to 255)**: You cannot change the state of the previous two locks until the correct combo number is entered here. That number is 234, which should be easy to remember, but still provide some hurdle to keep uninformed players in a store from trashing the presets, or keep you from accidentally modifying your own presets, for example from an inadvertent preset copy. Note that if you navigate away from this function, the value is reset to 0.

SONG MODE:

To enter SONG MODE, press 2nd, then SONG (the second switch from the lower left). The blue SONG LED will light, the 2nd function will turn off, and the first song title will be displayed. You can then use the RECALL 1, 2, 3, or 4 switches to recall a preset programmed to be grouped within that song. As soon as one of the 4 RECALL switches is pressed, that preset will be recalled and the preset's title will be displayed. Pressing the down or up switches (the first two from the lower left) will queue up the next song and display the title of that song. The title will flash, letting you know it has not been recalled yet. Hitting one of the 4 recall switches will then recall a preset within that song. It would be logical to assign the RECALL 1 switch to correspond to the first preset you would like to use within that song, assign RECALL 2 to correspond to the next preset you would like to use within that song, etc. It is not necessary to assign a preset to all 4 switches, but the default programming assigns presets 1 to 4 to switches 1 to 4 in all 124 songs, so if you accidentally press RECALL 4 and you haven't programmed it, you will jump to Preset 4. Turn the FUNCTION knob clockwise to access the following two functions:

Song Title Edit Function

This displays the song title. Song titles are distinguished by the > character which follows the song number and precedes the title, whereas preset titles do not have this character. The PARAM knob selects the character position to be edited, which moves the cursor under the character selected. There are 16 character positions. The VALUE knob then selects the particular letter, number, or symbol. When you are finished editing the title, don't forget to press 2nd, then

STORE to save it, but you can wait until after you have edited the preset mapping to do this save. The STORE LED lights if any changes have been made to remind you to save it.

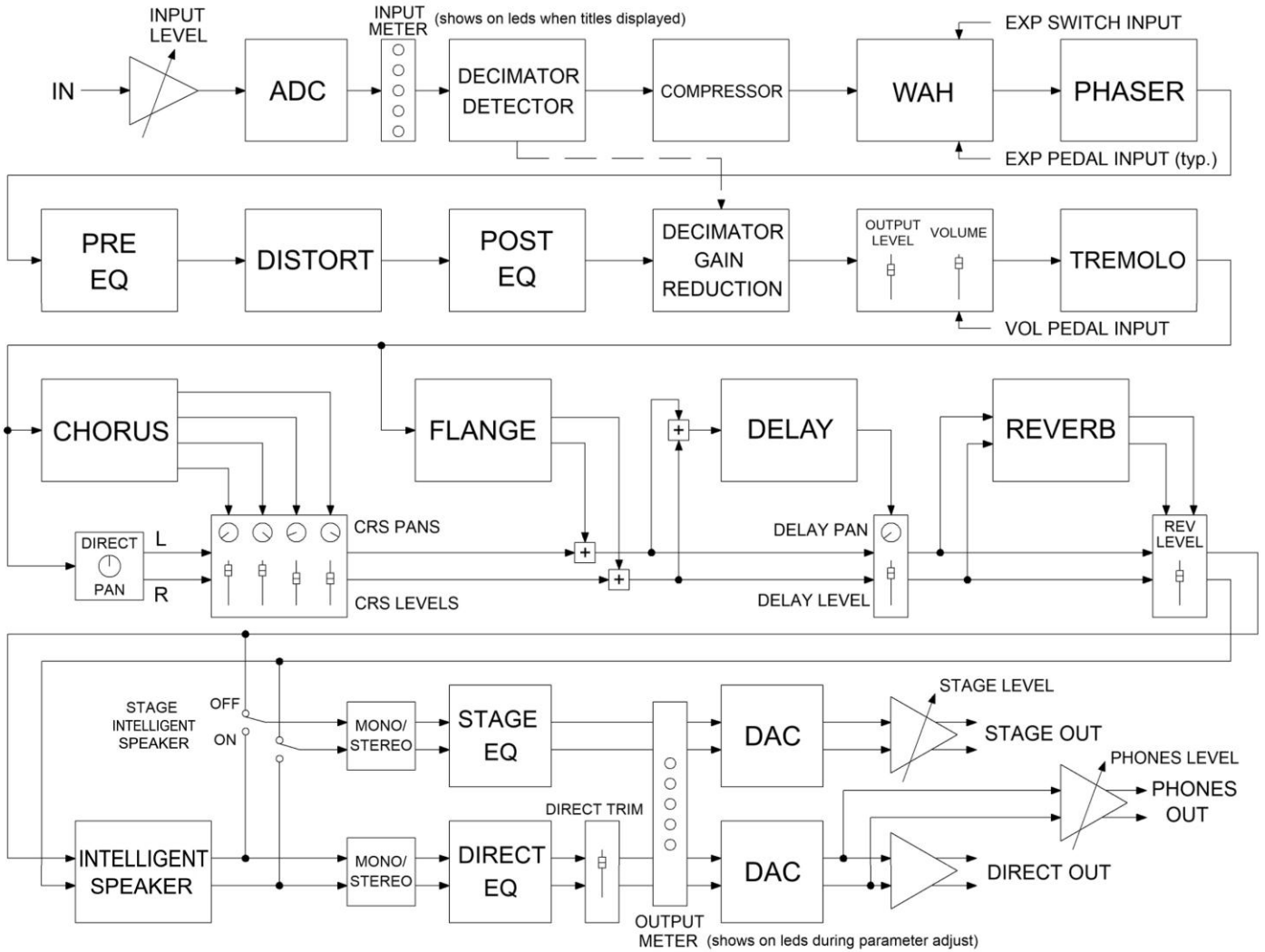
Preset Mapping Function

Turning the FUNCTION knob one more detent clockwise accesses this function. The LED above the RECALL 1 switch will light, and the preset that is mapped to that switch will be displayed. Turning the VALUE knob will allow you to select which preset you would like mapped to RECALL 1. Note the presets will be immediately recalled so you can audition them to aid in your selection. Turn the PARAM knob clockwise one detent will then light the LED above the RECALL 2 switch, and the preset that is mapped to that switch will be displayed. You can then turn the VALUE knob to select that preset to map to RECALL 2. You can then repeat this process for the RECALL 3 and RECALL 4 switches. When complete, press 2nd, then STORE to save the changes to the current song. Turning the FUNCTION knob fully counterclockwise will then display the song title, and pressing one of the RECALL switches will recall the mapped preset and display its title.

Song Copy

To copy a Song to a different location, first 'fully' recall the song by pressing one of the RECALL 1 to 4 switches. Then scroll to the desired new location by using the PRESET down or up switches or the VALUE knob (if FUNCTION is set fully counterclockwise). Note that the Song titles will flash, meaning the Song is not fully recalled. Then press 2nd, STORE to store the last recalled Song into the new location. The original contents of this location will be overwritten, so be careful. To exit SONG MODE, press 2nd, then SONG. The blue SONG LED and red 2nd LED will turn off, and you will be back in preset mode, where you can edit presets if you wish. **NOTE YOU CANNOT EDIT VALUES WITHIN PRESETS WHEN YOU ARE IN THE SONG MODE.**

Figure 2: ISP THETA PRO DSP SIGNAL FLOW DIAGRAM



THETA PRO DSP™ SPECIFICATIONS

INPUT IMPEDANCE	470K OHM
INPUT LEVEL TRIM	21.5db / input level -8dbu to +13.5dbu
MAXIMUM INPUT SIGNAL	+13.5dbu
NOISE FLOOR	- 110dbu A WTD
DYNAMIC RANGE	123db A WTD
MAX PREAMP GAIN / DIGITAL	125db
THD / CLEAN MODE	.002%
DECIMATOR / MAX NOISE RED	80db
COMPRESSION / MAXIMUM	22db
FREQUENCY RESPONSE	20Hz – 20KHz = +0 / -.5db
HEADPHONE OUTPUT LEVEL	MIN -95dbu / MAX 0dbu / +6dbu BOOST ON
STAGE OUTPUTS / MAX LEVEL	+12dbu / +15dbu with BOOST ON
DIRECT XLR OUTPUT S	Max Level +20dbu / Global Trim -12db
DIMENSIONS	17" W x 3.4" H x 9" D
WEIGHT	6.12 lbs
DIRECT OUTPUT CONNECTION	Balanced XLR
POWER	9VAC RMS / 1.5 AMPS

NOTE:0dbu = .775 VRMS

THETA PRO DSP™ is covered under US Patents 6,944,305 and 7,532,730

THETA PRO DSP™ and INTELLIGENT SPEAKER™ are trademarks of ISP Technologies

PRESET LIST

ISP Technologies would like to thank Ethan Brosh and Adam Mclean for their support in writing presets for the THETA PRO DSP.

WARRANTY AND SERVICE

The Internal Circuitry is fully guaranteed to be free of defects under normal use and service for a period of three years from the date of purchase.

Any damage resulting from the misuse or the failure to follow the precautions and instructions will void the warranty.

In the event that the unit needs to be repaired, please return the unit to ISP Technologies directly. Simply repack the unit, send a copy of the original receipt, a note stating the problem, your contact information and send it to:

ISP Technologies, LLC
5479 Perry Drive Unit B
Waterford, MI 48329
Attn: Repair Dept.

All shipping charges must be fully prepaid.

ISP will not be responsible for any damages incurred in shipping of any unit. Any claim will need to be settled with the shipping company.

The warranty will be voided if the serial number has been tampered with in any way. The warranty card must also be filled out and returned in order to activate the warranty.

Should you have any questions for the repair department prior to returning the product please call 248-673-7790



ISP TECHNOLOGIES, LLC
5479 PERRY DRIVE UNIT B
WATERFORD, MI. 48329
Phone: 248-673-7790
www.isptechnologies.com