Murraypro Pico PPM Alignment V2.1

The following procedure defines the processes required to perform the alignment of the "Pico" correctly.

The procedure described below should only be performed on Pico units that have been PAT tested, and declared safe for subsequent use. This status is confirmed by affixing a printed PAT report, with wide transparent tape to the underside of the Pico.

The following pieces of equipment, and cables will be required.

- 1) Audio oscillator with dual, balanced OP, and associated PHASE reversal switch on one channel only.
- 2) Precision audio meter capable of measuring audio levels to 0.1dB, or better.
- 3) 4 off, XLR3 male to female cables.
- 4) A second Pico, with audio A1 & A2 input wiring phase confirmed as correct.

A) Using an "XLR3-F to XLR3-M" lead, connect the Audio Meter to output 1 of the Audio oscillator, and then to output 2. Both outputs of the oscillator should be producing an identical output level, which must be adjusted to generate 0dBU *precisely*, "ie an output of 0.775V RMS).

This 0dBU is the standard reference level from which ALL other measurements are made, as a positive or negative offset. *Correct setting, and maintenance, of this level is VITAL*.

B) Connect the two outputs of the audio oscillator to the two female XLR3s on the Pico rear panel. Ensure that the PHASE reversal switch on the generator is in the "normal" (non-inverted) condition.

C) Ensure that the Audio Oscillator is set to "SINE", and generating 1Khz, nominal.

All adjustments that require accurate meter setting MUST be performed with "normal" viewing, to remove any possible parallax error. A small mirror may be found useful to assist with obtaining a convenient viewing angle.

D) With no power applied to the Pico, check that the mechanical zero of the two meters are correct. Any pointer alignment error is corrected by adjustment of the nylon screw on the respective meter rear.

E) Apply mains power and, whilst the electronics are stabilising (allow 5 minutes before making any adjustment) check that the white LEDs are all illuminated, and that the scale illumination is reasonably consistent with no obvious hot spots. Correct any LED misalignment before proceeding. Do NOT be tempted to adjust the LED's positioning with power applied, it will be very easy to short circuit the LED leads to the case and to destroy them.

F) Check that the PHASE LED is extinguished when no signal is applied to either input, ie "stereo silence".

G) REMOVE test link "LK1" at the front of the main board and adjust the 2 individual meter sensitivity controls R47 and R48 to give a deflection of exactly "4" on each meter. Replace the link "LK1". Note the PICO generates an *internal* calibration signal for this particular parameter, and NO EXTERNAL INPUT SIGNALS ARE REQUIRED. Be aware that this is <u>NOT</u> the procedure for setting PICO gain.

Murraypro Pico PPM Alignment V2.1

SETTING the PICO's signal gain.

With the 0dBU reference tones applied to the PICO's XLR inputs, adjust input H) sensitivity presets R37 and R38 to give exactly "4" again on each meter. These are THE ONLY controls that should adjusted to normalise the PICO's signal gain.

I) Confirm that the PHASE LED is lit GREEN. Alter the PHASE switch on the Audio Generator, and confirm that the LED changes to RED, and that the displayed audio level does not alter significantly on either meter. Reset PHASE to the normal condition.

J) Adjust the audio OP level from the generator to give a reading of +8.15dB precisely on the audio level meter. Adjust the RED LED trigger threshold point control "P2" to ensure that the LEDs are *just* illuminated. Reduce the GENERATOR output to +8.1dB, and ensure that both the LEDs extinguish.

Note: VERY small balancing adjustments to the input sensitivity controls (R37 & R38) may be made to achieve this condition, but not so much as to affect the displayed deflection of "4", which is absolutely fundamental to correct operation of the PICO.

Check that the meters are indicating a value of approximately "6" on the scale. There is no adjustment for this requirement, which is entirely a factor of the meter's linearity. Any error that exceeds a couple of pointer widths (at "6") may indicate that the meter movement is out of tolerance, and will require changing.

Reduce the oscillator output to approximately -25dB, and confirm that the PHASE K) LED is extinguished within a second or so, when the meter has reached a steady state. The lamp should certainly be extinguished by -30dB.

When satisfied, return the oscillator output to the standard level, 0dBU precisely.

L) Check the phase integrity of the Pico's audio output loop wiring for A1 & A2, by using a pair of XLR3 male to female cables to feed the looped signal to a second Pico. Ensure that the PHASE LED on the second Pico is illuminated GREEN, and that the audio level indicated on ALL meters is "4".

It is particularly important that the audio levels do not alter significantly. Any variation that occurs when the signal is looped to a second Pico would suggest an output wiring error.

Note that is does not matter (at this stage) that the output wiring of the second Pico has yet to be confirmed as correct, since preliminary testing up to stage "I", will have confirmed correct input wiring.

M) When the output wiring has been confirmed as *correct* for the tested Unit, swap the Pico Units, and confirm that the output wiring is correct for the Unit originally used to check output PHASE. After this process BOTH Units will be confirmed as correct. Either of these tested Picos may then be used for subsequent output wiring testing, without further repeating this "M" step in this particular batch test.

> Issue V2.1 Tony Drummond-Murray 21/09/2009

