

DEEPMIND 12

True Analog 12-Voice Polyphonic Synthesizer with 4 FX Engines, 2 OSCs and LFOs per Voice, 3 ADSR Generators, 8-Channel Modulation Matrix, 32-Step Control Sequencer, Tablet Remote Control and Built-In Wifi



User Support Bulletin

Introduction

The unit is carefully calibrated at the factory. The performance may change over time or due to environmental changes, then the following recalibration procedures will help bring it back to its factory settings.

Calibration Procedure

The CALIBRATION menu in the SYSTEM SETTINGS menu allows you to perform CALIBRATION of the VOICES, MOD WHEEL, PITCH WHEEL, AFTERTOUCH and PEDAL INPUT.



Follow all steps in the order in which they are presented.

Calibration Menu

STEP
1

To navigate the options in the CALIBRATION menu, use the BANK/UP or BANK/DOWN switches.

STEP
2

Selected parameters are adjusted using the -/NO or +/YES switches, the rotary knob or the DATA ENTRY fader. The rotary knob has a click which allows very accurate control. The fader allows rapid adjustment across the full range.

STEP
3

In order to start a calibration routine, make sure that the '<' symbol on the appropriate CALIBRATE line is highlighted, and then press the +/YES switch.



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The DeepMind 12 has 12 voices. Each voice has its own LFO, OSC, VCF, ENV and VCA stages.

The CALIBRATION routine is used for Voice checking, OSC wave shapes, VCF self-oscillation, Pulse Width modulation and the VCA bias.

VCF - Unlike many other synthesizers, the DeepMind 12 is capable of accurate pitch tracking even when the filter resonance is pushed to (and past) the point where the filter starts to self-oscillate. When using this self-oscillating feature of the VCF as a sound source, the VCF calibration ensures the correct response when playing the entire scale of the keyboard.

The DeepMind 12 VCFs are calibrated at the factory during production. However, because its filters are voltage controlled and can be affected by extremes of temperature, you may need to use the built-in calibration function to fine tune them occasionally. Calibration may also be required after a firmware upgrade or when requested to do so by an authorized Behringer support technician.

OSC - The DeepMind 12 OSCs are calibrated at the factory during production. The oscillators are discrete analog circuits, but they are digitally controlled. Compared to a Voltage Controlled oscillator (VCO), the OSC has far superior stability, especially when they have very high frequency, low-jitter master clock sources, as used in the DeepMind 12. This stage calibrates the slope of the sawtooth waveform to ensure even volume and pulse-width across the full range of the synthesizer.

This means that the OSCs should never need re-calibrating except after a firmware upgrade, or when requested to do so by an authorized Behringer support technician.

Calibration Voices



Overview of the calibration routines:

ALL - This will initiate all of the routines.

VOICE CHECK - This performs a series of functionality tests on each voice.

VCF - This routine puts the voice into self oscillation and tunes to 1 kHz in order to calibrate the resonance of the VCF for that voice. The routine then puts the voice into self oscillation and checks the tuning at 50 Hz, 220 Hz, 880 Hz and 10 kHz to ensure the VCF is performing as expected. The test is repeated for all voices.

VCF FINE - This routine tests the scale and offset for all voices.

OSC - This routine adjusts the slope of the sawtooth at octave intervals. This ensures the precision of the slope so that it performs as designed. The test is repeated for all voices.

PW - This routine adjusts the pulse width (mark to space ratio) of the pulsewave. This ensures the precision of the ratio so that it performs as designed. The test is repeated for all voices.

VCA - The Voltage Controlled Amplifier (VCA) uses a bias voltage to set its operating level. This bias voltage is balanced so that the VCA responds as designed. The test is repeated for all voices.

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To start the calibration routine, please follow the procedure below:

STEP 1

In order to start the calibration routine, make sure that the '<' symbol is on the appropriate CALIBRATE line and highlighted, and press the +/YES switch.

NOTE: The calibration run time is shown on the bottom of the screen so that you can plan your work around any of the calibration phases.

STEP 2

The calibration routine will then start. Throughout the tests you will see various waveforms being played. It is safe to turn down the volume while the calibration routine is running.

NOTE: While the calibration is running, you can mute the signal using the BANK/DOWN switch and un-mute using the BANK/UP switch.

STEP 3

When the calibration routine is complete, you will see a summary of the test results as shown below. The 1st column is Voice 1, 2nd is Voice 2, and so on:

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Inactive: Finished
Results:
Skip(-)Pass(1)Fail(0)
Chk: 11111111111111
Res: 11111111111111
UCF: 11111111111111
Fin: 11111111111111
DCV: 11111111111111
DPW: 11111111111111
UCA: 11111111111111

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NOTE: During the calibration, the GLOBAL and -/NO switches will be flashing. If at any time you want to cancel the calibration routine, you can press the -/NO switch. No previous calibration data will be changed if you cancel the routine.

CAL MOD WHEEL

To calibrate the MOD WHEEL, please use the following procedure:

NOTE: During the calibration the GLOBAL, -/NO and +/YES switches will be flashing. If at any time you want to cancel the calibration routine, you can press the -/NO switch. No previous calibration data will be changed if you do cancel the routine. To confirm the calibration at each stage press +/YES as described below.

STEP 1

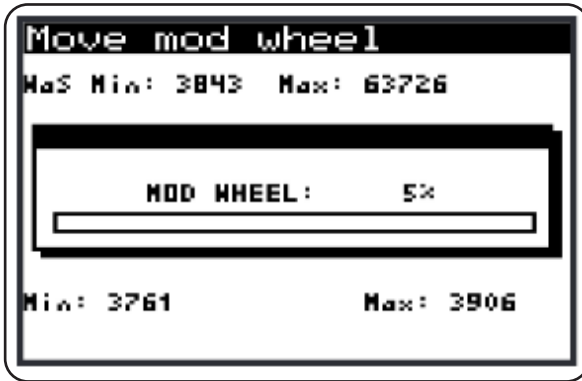
First move the MOD WHEEL to its minimum position (shown on the panel).

STEP 2

In order to start the calibration routine make sure that the '<' symbol on the CAL MOD WHEEL line is highlighted and press +/YES.

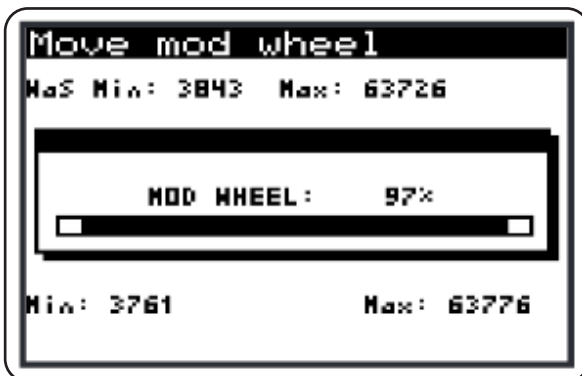
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STEP 3 You will see the following display showing a bar representing the MOD WHEEL value. Also on this screen you can see the stored calibration data above the bar and the current value below the bar.



STEP 4 Then move the MOD WHEEL to its maximum position (shown on the panel).

STEP 5 Repeat steps 3 and 4 until both frequencies are correct A1 - 55 Hz and A4 - 440 Hz.



NOTE: To cancel the routine you can press the -/NO switch.

STEP 6 To confirm the CALIBRATION of the MOD WHEEL, press the +/YES switch: The calibration data will then be stored for the MOD-WHEEL and you will be returned to the CALIBRATE menu. From here you can perform another calibration from the menu, or press the GLOBAL switch again to return to the SYSTEM SETTINGS menu.

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CAL PITCH WHEEL

To calibrate the PITCH WHEEL, please use the following procedure:

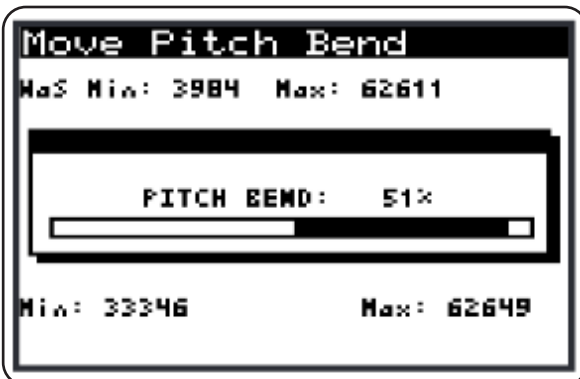
STEP 1 In order to start the calibration routine make sure that the '<' symbol on the CAL PITCH WHEEL line is highlighted and press +/YES.

STEP 2 You will see the following display showing a bar representing the PITCH WHEEL value. Also on this screen you can see the stored calibration data above the bar and the current value below the bar:



STEP 3 Then move the PITCH WHEEL to its maximum position (shown on the panel).

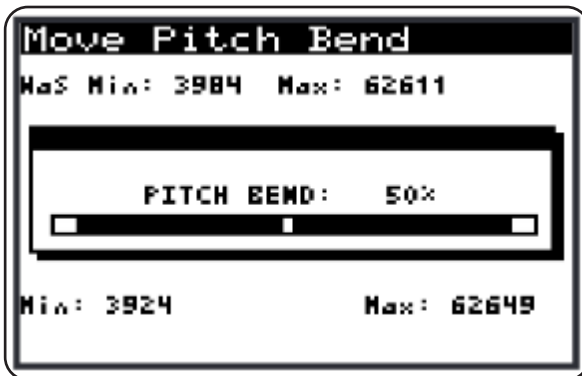
STEP 4 You will see the following display showing the maximum position of the PITCH WHEEL and the associated values:



STEP 5 Then move the PITCH WHEEL to its minimum position (shown on the panel).

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STEP 6 You will see the following display showing the maximum position of the PITCH WHEEL and the associated values:



STEP 7 To confirm the CALIBRATION of the PITCH WHEEL press the +/YES switch and you will be moved on to the PITCH CENTRE page:



STEP 8 At this point move the PITCH WHEEL within the dead zone where you don't feel the tension of the spring. This is ensure that no pitch information is sent while the pitch wheel is not being touched. You will see the following display showing a guide to assist you:



NOTE: To cancel the routine you can press the -/NO switch.

STEP 9 To confirm the CALIBRATION of the PITCH CENTRE press the +/YES switch: The calibration data will then be stored for the PITCH CENTRE and you will be returned to the CALIBRATE menu. From here you can perform another calibration from the menu, or press the GLOBAL switch again to return to the SYSTEM SETTINGS menu.

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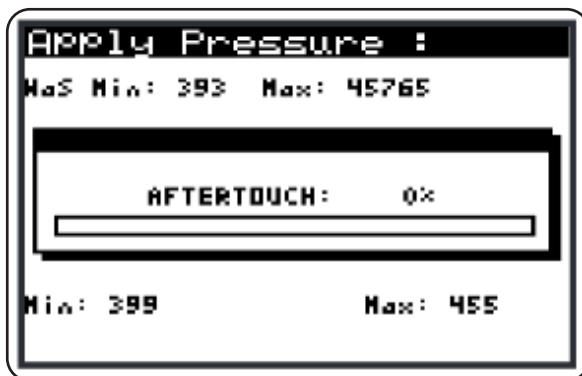
CAL AFTERTOUCH

To calibrate the KEYBOARD AFTERTOUCH, please use the following procedure:

NOTE: During the calibration the GLOBAL, -/NO and +/YES switches will be flashing. If at any time you want to cancel the calibration routine, you can press the -/NO switch. No previous calibration data will be changed if you do cancel the routine. To confirm the calibration at each stage press +/YES as described below.

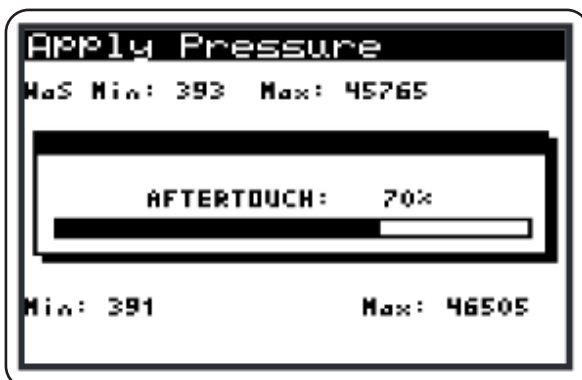
STEP 1 In order to start the calibration routine, make sure that the '<' symbol on the CAL AFTERTOUCH line is highlighted and press +/YES.

STEP 2 You will see the following display showing a bar representing the current AFTERTOUCH value (0% for no pressure). Also on this screen you can see the stored calibration data above the bar and the current value below the bar:



STEP 3 Now apply pressure to any one of the keys (or multiple keys) until the value stops increasing.

STEP 4 You will see the following display showing the maximum position of the AFTERTOUCH and the associated value:



NOTE: To cancel the routine you can press the -/NO switch.

STEP 5 To confirm the CALIBRATION of the AFTERTOUCH press the +/YES switch: The calibration data will then be stored for the AFTERTOUCH and you will be returned to the CALIBRATE menu. From here you can perform another calibration from the menu, or press the GLOBAL switch again to return to the SYSTEM SETTINGS menu.

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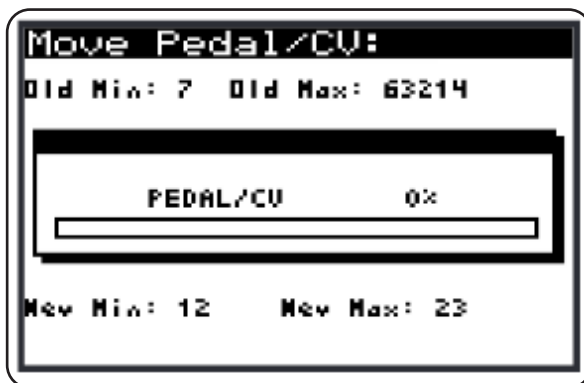
CALIBRATE PEDAL

To calibrate the PEDAL please use the following process:

NOTE: During the calibration the GLOBAL, -/NO and +/YES switches will be flashing. If at any time you want to cancel the calibration routine, you can press the -/NO switch. No previous calibration data will be changed if you do cancel the routine. To confirm the calibration at each stage press +/YES as described below.

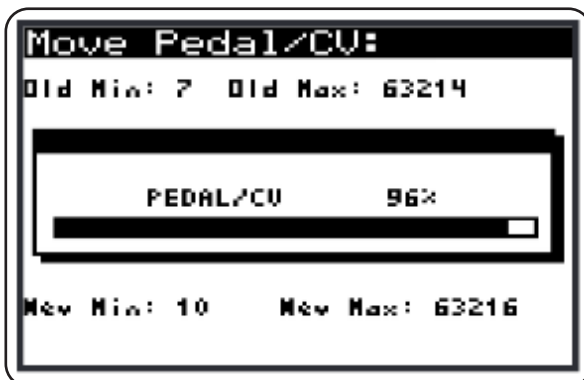
STEP 1 In order to start the calibration routine, make sure that the '<' symbol on the CALIBRATE PEDAL line is highlighted and press +/YES.

STEP 2 You will see the following display showing a bar representing the current PEDAL value (0% for no pressure). Also on this screen you can see the stored calibration data above the bar and the current value below the bar:



STEP 3 Then press the pedal until the value stops increasing.

STEP 4 You will see the following display showing the maximum position of the PEDAL input and the associated value:



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NOTE: To cancel the routine, press the -/NO switch, and you will see the following message:



STEP
5

To confirm the CALIBRATION of the PEDAL input, press the +/YES switch: The calibration data will then be stored for the PEDAL and you will be returned to the CALIBRATE menu. From here you can perform another calibration from the menu, or press the GLOBAL switch again to return to the SYSTEM SETTINGS menu.

End of Procedure