

PIANO SUSTAIN PEDAL FOR OAS/X INSTRUMENTS

In a piano, sustain is the term used to describe the gradual decay in sound after the strings have been struck. The length of the sustain is controlled by the sustain pedal which moves a set of felt pads known as *Dampers* onto or away from the strings. When the sustain pedal is depressed, the dampers are lifted away from the strings, the strings are then free to vibrate and the sound is sustained. When the sustain pedal is released, the dampers are moved back onto the strings, the strings are muted and the sound is no longer sustained.

OAS/X Piano Sustain

In OAS/X instruments there are two ways in which a sustain function can be achieved for the piano sounds. The first would be to utilise the *Release* parameter located on the Sound Controls menu. Adjusting this parameter will set the length of the sustain. The second would be to program an expression pedal footswitch or toe piston with the sustain function. Neither of these two options is entirely satisfactory. Using the Release function will apply a fixed length of sustain to every note, which is not what the sustain pedal on a piano does. We use this pedal to sustain selected notes or phrases with varying amounts of sustain according to what the music requires. Using the footswitches or toe pistons gets us nearer to the actions of the piano sustain pedal, but the footswitches provide lateral not vertical movement, and the toe pistons have only a small amount of travel. Additionally these devices are not designed for continuous operation as would be the case when playing a complete piano piece. Their function is to provide an occasional trigger for whatever OAS/X function they have been programmed with, for example a special effect or an accompaniment start/stop operation. As such their construction is not particularly robust or entirely reliable. The footswitch contacts comprise a thin length of tightly coiled spring pushed against a metal rod, and the toe pistons are just small microswitches. A better solution therefore would be to install a dedicated sustain pedal that can operate in the exactly the same way as the sustain pedal on an actual piano.

The Sustain Pedal

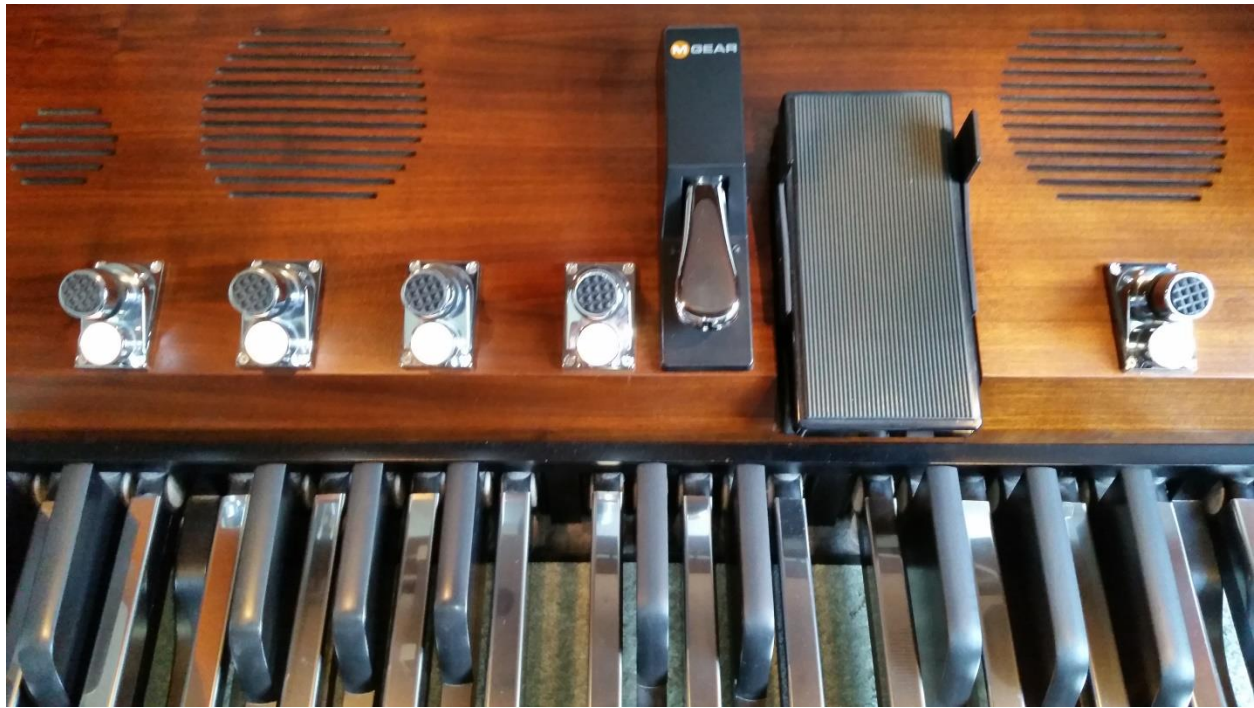
There are a large number of sustain pedals available on the market that all perform the same basic function. For the purpose of this installation the SP-2 Professional Style Piano Pedal from [M-Audio](#) has been chosen. Like the footswitches and toe pistons it comprises a simple switch which is activated when the pedal is depressed, and de-activated when the pedal is released. However because it is designed to replicate the sustain pedal on an actual piano, it gives us much greater control over the sustain function.



Installing the Sustain Pedal

The sustain pedal can be installed on any OAS/X instrument that is equipped with toe pistons.

It can be located next to any one of the toe pistons, but a good option would be adjacent to the fourth piston as shown below. This puts the pedal in the centre of the instrument. Owners of instruments with pedalboards less than 25 notes will also have the option of placing the pedal on the floor.



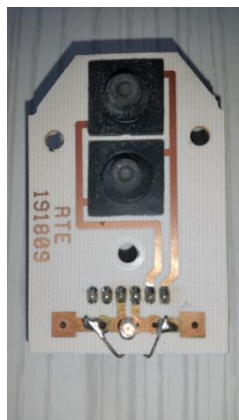
Wiring up the pedal is simple and straightforward. All that's needed is to connect the pedal to the chosen toe piston. This means that whatever function is programmed into the toe piston will also be replicated by the pedal. This gives us the option of being able to select either of these devices when playing, depending on which is better suited to the programmed function.

Wiring up the Sustain Pedal

The toe pistons are connected to the instrument's electronics via a ribbon cable that protrudes from a round hole in the instrument's woodwork immediately behind the piston.

The cable connects to a socket on the back of a small Printed Circuit Board (PCB) screwed inside the piston.

The picture opposite shows the back view of this assembly.

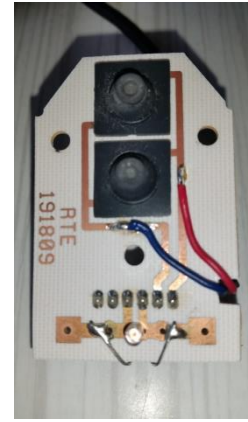


On the other side of the PCB are located two microswitches at the top of the board, and a white Light Emitting Diode (LED) at the bottom.

The microswitches are wired in parallel, presumably for increased reliability, and are simultaneously activated when the piston is depressed. They simply short together the two contacts that are used to trigger the programmed function.

The LED is used to light up the piston number in the circular display window located immediately below the piston.

The SP-2 piano pedal, like all pedals of this type, is supplied with a two core cable terminated by a 1/4" jack plug that is designed to fit into a jack socket of a standard midi keyboard. For installation on the Wersi we need to remove this jack plug, cut the cable to a suitable length, and connect the two wires of the cable to the PCB of the toe piston.



The easiest way to do this is to solder the wires to the printed circuit tracks that connect to the switch contacts, as shown opposite. Note that it doesn't matter which wire goes to which track, the switch will be closed in either direction when the pedal is activated.

Completing the Installation

The wiring between the pedal and the toe piston can be hidden from view by running the connecting cable through the base of the instrument.

First drill a hole in the base woodwork underneath the pedal in line with the hole behind the toe piston through which the ribbon cable protrudes. Now drill a hole in the base plate of the pedal to line up with this hole in the base woodwork.

Re-route the pedal cable from the top of the pedal enclosure internally down to the hole in the base plate. Feed the cable through this hole, through the hole in the base woodwork and into the base of the instrument.

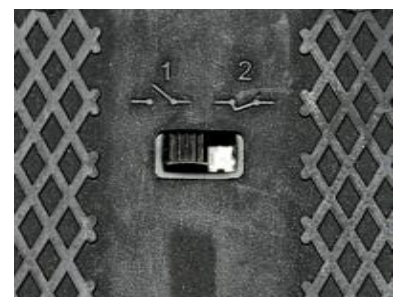
This section of the base woodwork underneath both the pedal and the piston is unenclosed to accommodate the pedalboard, so simply run the cable through this section, up through the ribbon cable hole and onto the piston PCB.

The pedal is quite a heavy unit with a thick rubber base that minimises movement, but for additional rigidity you may wish to also secure the pedal to the base woodwork. This can be done by inserting a couple of wood screws through holes drilled in the front section of the pedal casing and in the base plate directly below.



Operating the Sustain Pedal

Note that many sustain pedals of this type include a polarity setting to accommodate different types of midi keyboard. Wersi instruments require the pedal switch to be normally open when the pedal is released and closed when depressed. So ensure that your chosen pedal can operate this way. On the SP2 pedal this is achieved by setting the polarity switch located on the base of the unit to position '1' as shown opposite.



To obtain the sustain function on the pedal, simply program this into the toe piston to which it is connected.

Since it's situated in the centre of the instrument, the pedal can be operated by either foot. Operating with the right foot leaves the left foot free to play the pedalboard. Operating with the left foot enables the right foot to use the expression pedal.
