REAL WORLD INTERFACES

TR-808 Kenton MIDI interface interactions with the Sound Mods, 4 Level Accent system and the 32 Bank Memory system

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TR-808-Kenton-MIDI-interactions-2018-06-17

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Further to the description of MIDI interfaces at http://www.firstpr.com.au/rwi/tr-808/#midi, here is a description of how the Kenton MIDI Interface interacts with other modifications. The manual for the Kenton interface can be found via the Manuals tab of: http://www.kentonuk.com/products/items/sockets/roland/tr808.shtml On 2018-06-17 it is named TR882000.pdf and has a PDF file date of 2006-08-10 .

There are actually three versions of the Kenton interface, the first being based on a Z-80 CPU, rather than a modern microcontroller. As far as I know, their interactions are the same. However, in some earlier installations I may have had the interface sense the Accent state directly from the TR-808's microcontroller, rather than from the OR of this and the Accent switch and Accent input, which is how I now do it, as mentioned below.

The standard (unmodified) TR-808 mode of operation is that the Internal Sequencer (implemented by a 4 bit microcontroller and associated circuitry) triggers each drum channel by sending it a trigger pulse. The voltage at this point is normally 0 volts (ground) but rises to a particular positive voltage for 1 millisecond, and then goes back to 0 volts. Each Tom/Conga circuit is a single drum channel. So is the Rimshot/Claves. The Hand Clap and Maracas are actually independent drum channels, which can produce sound at the same time, and which share a common volume control. However, the TR-808's Internal Sequencer has a single trigger signal for this, and the switch selects which of the two channels the pulse is sent to.

For non-accented notes, the voltage of these trigger pulses is +5 volts. For accented notes, depending on the setting of the Accent knob, the voltage is between +5 and +14 volts. With the exception of the HCP sound, all the sound channels vary the volume and usually other aspects of their sound in response to the height of this trigger pulse. For instance, in the Tom/Conga circuits, two back-to-back diodes increase the pitch for high level oscillations. Generally, the sounds begin at a higher volume and last longer.

With the Kenton interface, the path from the Internal Sequencer's trigger pulses to the sound channels is intercepted by the interface, which recreates similar pulses to those produced by the Internal Sequencer.

Here are some interactions between the various sub-systems:

- When the MIDI interface receives a Note On message to trigger a drum circuit, the voltage of the trigger pulse it sends to that circuit depends on the velocity of the note event. It can be lower than the normal 5 volts for low velocity Note On messages. It can be high, such as 14 volts or so, for the Note On events with the highest velocity: 127.

For these trigger pulses, generated by the interface in response to MIDI In Note On messages, no other parts of the machine affects the voltage of the pulse sent to the drum circuits, so the Accent button and Accent CV/Audio input detector have no effect on these voltages, or the sounds which result. Nor does the 4 Level Accent system have any effect.

- The **Accent button** and the **Accent input** (a CV or Audio input which activates Accent, just like pressing the Accent button) affects the voltage of trigger pulses generated by the Internal Sequencer by selecting the Accent pot voltage (+5 to +14V), rather than the ordinary +5V, for the voltage of however many trigger pulses are generated on a given beat.

  The MIDI Interface's MIDI note out system is driven by the individual drum select lines coming from the TR-808's microcontroller, and the Accent select line, which is normally generated by the microcontroller alone. However, with the Sound Mods, this line, which is sensed by the interface, is the logical OR of, three signals:

  1 -   Accent from the Internal Sequencer.

  2 -   The signal from the Accent button.

  3 -   The signal from the detector circuit of the Accent CV/Audio input.

  So any one, two or all three of them being active will cause the interface to send a Note On event with a higher velocity

- The state of Accent used by the **4 Level Accent system** is the same as above, the logical OR of all these three signals. So any one, two or all three of them being active results in the Accent bit to this system being true. The other bit which selects between the four knobs for the four levels of trigger pulse being sent to the drum circuits by the Internal Sequencer is the Cowbell bit, which is driven by the Internal Sequencer. The 4 Level Accent system only operates in response to the Internal Sequencer – not in response to MIDI In received notes. Of course, if the interface is receiving MIDI Sync, then the Internal Sequencer is running in time with the MIDI master device, and may be playing notes in response to MIDI In notes as well, but it is only the Internal Sequencer's notes which can have their trigger pulses affected by the 4 Level Accent system.

- The rear panel **Accent trigger output** will be active on any step (typically 16 per bar) from the internal sequencer in which any of the above three signals are active. This is true even if no drum beats are programmed on that step.

- When the MIDI system receives a Note On message for the HCP/MA drum channel, a pulse will appear on the rear panel socket for **HC trigger output**, irrespective of whether the front panel switch selects HC or MA for this channel. (While the RWI MIDI In system receives on different note numbers for the HC and MA sound channels, the Kenton interface only receives on one note number and sends a trigger pulse in the same way as the Internal Sequencer does, to the switch, which directs it to one or the other of these two sound channels.)

- The **CB trigger output** is not driven when a MIDI In Note On message is received for the CB drum channel.

- The Internal Sequencer can be playing notes from what it sees as a particular pattern. In the middle of such a pattern, with the 32 Bank Memory system, you can switch to another bank. Since the Internal Sequencer reads from memory before playing each beat, it will then play beats from the same numbered pattern in the new memory bank, so leading to rhythms which are more complex and dynamically changed than is possible by playing one pattern fully, and then another.

  With Dynamic Bank Switching, the selection of memory bank is not just a function of switch positions, but also of two or four input CV/Audio input signals.

  All the Internal Sequencer's drum beats which result from manipulating the memory bank selection in these ways are seen by the Kenton Interface and will be sent out as MIDI Note On events to MIDI Out.