

USB MIDI Driver Problem with PLG150-AN Plug-in Card in Motif ES8

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Abstract

The author has experienced problems with PLG150-AN plug-in card when using Yamaha USB to MIDI driver. This results in incorrect operation of AN Expert Editor. The error causes wrong operation of the plug-in card voice. The error is not present when using a proprietary MIDI interface card instead of USB connection.

Introduction

The PLG150-AN comes supplied with the *AN Expert Editor*, which enables custom voice to be created using a computer. The computer must be connected to the host instrument, which has the card installed. Using this set-up, user can program sounds into the card and use them later. The real-time controls of the Editor enables intuitive creation of sounds using virtual knob controllers, as in a real analog synthesizer.

In our set-up, problems were encountered with two different computer systems when using the Expert Editor with Yamaha USB to MIDI driver. This resulted in wrong voice operation of the PLG150-AN. When switched to a MIDI connection with an E-MU 1820 soundcard, the problem was solved. This report introduces the problem and the symptoms associated with it.

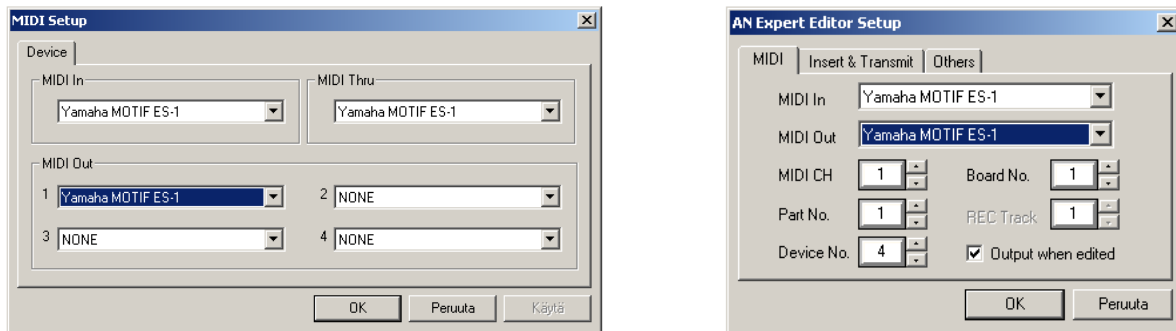
System set-up

The system consists of Yamaha MOTIF ES8 with PLG150-AN in the plug-in bay no. 1 and two computers with Windows XP SP3. The first computer, a laptop, uses USB to connect to the MOTIF. The other is a desktop with USB and E-MU 1820 AudioDock MIDI connection to the instrument. The MIDI channel is set to 1 in all cases. The PLG150-AN device number is 4 and port is 2. The set-up is first made in the MOTIF. The PLG150-AN bank is set to 036/002 which reflect the RAM voices edited with AN Expert Editor. The MOTIF setup screens are shown in Fig. 1((a)-(d)).



Fig. 1. The MIDI and voice bank set-up is made on the host instrument.

Next the USB connection is set in the AN Expert Editor. The MIDI channel and device number is set in the AN Expert Editor as shown in Fig. 2(a) and (b).



a) b)
Fig. 2. The MIDI channel of the USB driver is set to 1 and the device number to 4.

Next we select the voice 1 from bank 036/002 and initialize it in the Editor as shown in Fig. 3. We now have a basic sawtooth voice in the PLG150-AN, with settings of the Editor as shown in Fig. 4.

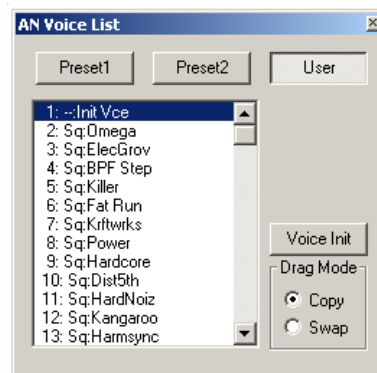


Fig. 3. The voice no. 1 is initialized.



Fig. 4. The initialization results in a simple polyphonic voice with one sawtooth VCO.

A. Timbre error in POLY mode

The voice which can now be heard when playing the MOTIF is, however, not quite as reflected by the settings in Fig. 4. There is an attachment file *poly_usb_init.mp3* to indicate this. As there should be only one VCO playing, it can be heard that the voice is not correct. A screenshot of the waveform in Fig. 5 also reflects this.

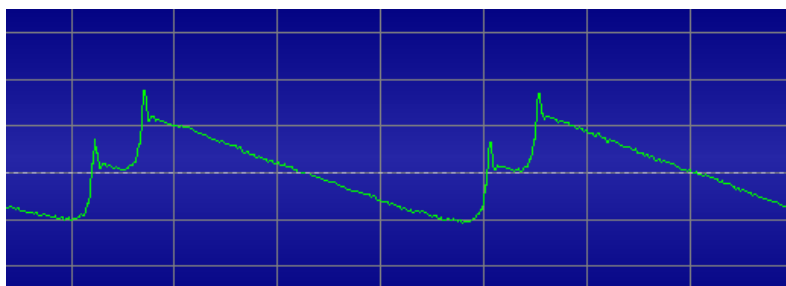


Fig. 5. The waveform is not a single-tone sawtooth, but has a character more close to a double sawtooth or a sawtooth with synchronization from another VCO. This is not what is reflected by the settings in the Expert Editor.

When the key mode is switched to MONO, the incorrect voice character disappears as indicated by the attached file *mono_usb_init.mp3*. It is also not present in the LEGATO mode, *legato_usb_init.mp3*. But in the MONO mode, an incorrect operation of the voltage controlled amplifier envelope was found.

B. VCA envelope error

The envelope error is present when the key mode is MONO and the VCA envelope is set e.g. as in Fig. 6.



Fig. 6. The VCA envelope generator attack and release times are increased to get a voice with slow amplitude rise and fall in note-on and note-off.

The result in the MONO key mode is as can be heard in *mono_usb_env.mp3*. It clearly has an abrupt step-like drop in the release phase, causing a noticeable transient in the sound amplitude. Comparing to the correct sound in LEGATO mode, *legato_usb_env.mp3*, the MONO mode is not working correctly. The difference between the voice amplitude envelopes is illustrated in Fig. 7(a) and (b).

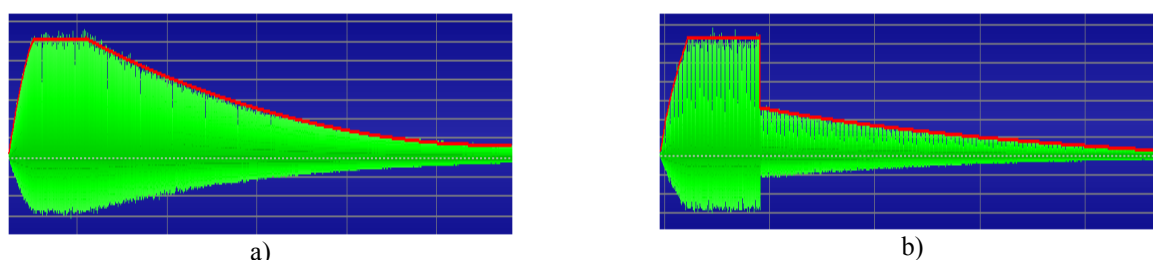


Fig. 7. Comparing the amplitude envelopes of the LEGATO mode (a) and MONO mode (b). The step-like behaviour in (b) should not be present according to the VCA envelope settings.

In the POLY mode, *poly_usb_env.mp3*, the timbre error is once again heard, but the envelope is working correctly.

MIDI interface

With E-MU 1820 MIDI connection, these experiments were repeated. The result is a correct operation of the PLG150-AN and the Editor in all three key modes and with different VCA envelope settings. The MIDI channel and device number settings were the same as with the USB interface, only the MIDI connection device was changed from USB to MIDI.

The final test considers the using of the USB interface to configure a voice, and then closing the AN Expert Editor with voice settings still in the card. In all faulty modes explained above, this resulted in a correct operation of the synthesizer card once the Editor was closed. With E-MU MIDI interface, there clearly was no difference whether the Editor was open or closed, the voice was always correct.

Conclusions

In our Yamaha MOTIF ES8 test setup with two computers using USB to MIDI interface, there was incorrect operation of PLG150-AN and AN Expert Editor. This resulted in incorrect voice to be heard from the instrument. Using a sound card with MIDI interface instead of the USB interface, the operation of the card/editor combination was found to be correct. In a case the user has no MIDI interface but is bound to a USB connection, the PLG150-AN and Expert Editor is subject to incorrect operation as in the author's case. Future work might be the solution to the USB connection problem.

APPENDIX A.

List of attached media files:

poly_usb_init.mp3
mono_usb_init.mp3
legato_usb_init.mp3
poly_usb_env.mp3
poly_usb_env.mp3
poly_usb_env.mp3