imperfection is a feature

PRESENTS

Electric Grand EG70

The first Physical Modeling CP-70 Electroacoustic baby grand piano.

License

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System Requirements

Minimum System Requirements:

- Microsoft Windows 98se/ME/2000/XP/Vista
- Intel Pentium 4 @ 3000 MHz or AMD Athlon @ 3000 MHz
- 128 Mb of RAM
- 4 Mb of free disk space
- An ASIO compatible sound card

EG70 is a VST plug-in, and needs a VST host application to run. We recommend EnergyXT or Hermann Seib's VSThost / SAVIhost.

Manual Installation

Copy the file EG70.dll (or whatever it may have been renamed to, in case of future updates) to your VSTplugins folder, usually

C:\Program Files\Steinberg\VSTPlugins

According to the VST host application you're using, you have to recall this plugin inside your open project.

In case you have bought a license, install it before running EG70 to prevent it from running in Demo mode.
The DEMO version shows a reminder screen at start-up for a few seconds, then plays a white noise for 2 seconds every 10. No limitations are applied soundwise.

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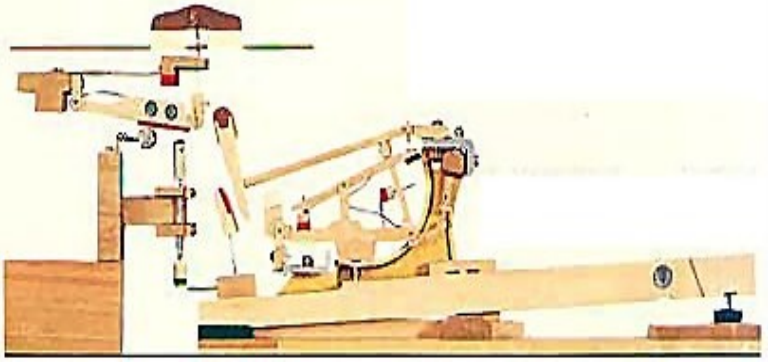
Premise: physical modeling vs. sampling

Although physical modeling synthesis is a well known concept nowadays, it's good to point out some of the differences that make a modeled instrument, like a piano, preferred over a sampled one. As we all know, physical modeling is a technique to recreate acoustic phenomena in the digital world by means of math formulas and other complex algorithms, but in practice it takes the musician to a compromise: while samples offer true realism, being an actual photography of a specific sound, just like a photography a sampled sound stays still, never changes over time and doesn't react to external variations. On the other hand, a modeled sound may lack of realism or may be somehow imprecise regarding little details, but it's *alive*, does react to musician's playing style, adds color and vitality, is never static and takes full advantage of the power of modern digital systems.
Speaking of a piano, which is one of the most expressive instruments ever invented by humans, using samples is a bit of a contradiction. Can you quantize the dynamics of a piano and establish a limit? You can't. Can you consider all of the variables and combinations that may happen with different numbers of notes played in as many different situations? You can't. Can you create resonances using samples? You can't. This is why, sometimes, physical modeling can be preferable over sampling, so that the virtual gets closer and closer to the real.

Now let's have a look at how EG70 benefits from physical modeling. First thing: the polyphony. In EG70 you have a full polyphony of 73 notes. One note available per each single key. This could seem obvious but it isn't. Many times you see digital pianos with 88 keys but offering 128 or even 256 notes of polyphony. So, what's the point of having more notes than keys? Because with sampling you need a note per each sample playback. If you press the sustain pedal and hit the same key twice or more times, you employ a new voice each time, so you can even use all the available voices for a single key, because samples start playing one on top of another, summing phases and amplitudes, resulting in an unnatural behaviour for a piano.
In EG70, when you hold the sustain pedal down and hit the same key more times, the virtual hammer always strikes the same (virtual) strings adding or subtracting vibrations according to the phase of the string in the very moment when it gets struck by the hammer. One key, one voice. This is exactly what happens in a real piano, and every time you hit the key you can hear subtle differences from other strikes of the same note. Also, this extends the *limit* of the 127 velocity values available in the MIDI protocol.



Another example: the resonances. A baby grand piano like the CP-70 has no soundboard, so the actual resonance is very limited, but still there are 131 strings that are free to vibrate when the dampers are released, 15 of which are large round-wound strings that produce a high number or overtones, and the last 8 keys (for a total of 16 strings) don't have dampers at all, and are free to resonate all the times. So, when the player keeps a key down when the note has reached a full decay, he's keeping the damper away from the string(s) setting them free to resonate if other keys are played. This is called “sympathetic resonance”. When the sustain pedal is down, all dampers get away from the strings, so a single note played may spread its resonances through the whole harp. This is what happens in a real piano and in the CP-70 electric piano, and is perfectly emulated by EG70.

Instrument Background

The CP-70 was a portable electric piano invented during the seventies by the japanese company Yamaha, also makers of renowned fine classic grand pianos. It was made for the touring musician who wanted to take an acoustic piano on the stage. It's a rock solid instrument that splits into two parts for better transportability. The structure is based on the keyboard and mechanics of a classic grandpiano but with a smaller harp, less strings and shorter than a classic baby grand. There's no soundboard, and every note has its own piezoelectric pickup. The main preamplifier offers a basic 3-band equalizer and a tremolo effect. This piano had a significant role in the pop music of the seventies and the eighties, featuring in songs by well known musicians like Stevie Wonder, Genesis, George Duke, Simple Minds, etc. It is now back on the stage thanks to the british band "Keane", you can see it in the video of the song "Everybody's changing". Every modern digital keyboard offering a wide variety of timbres has a patch inspired to the sound of the CP piano, and sometimes it's still preferred in genres like rock and pop where the producers want a brighter and more prominent piano sound.

Plugin Description

EG70 is a physical modeling simulation of a CP-70 electroacoustic baby grand touring piano.

Main features:

- ✔ Full Polyphony (73 notes)
- ✔ Adjustable sympathetic resonances
- ✔ Realistic response to keyboard dynamics
- ✔ Adjustable global tuning
- ✔ Four dynamic curves available
- ✔ Realistic control panel with active EQ and Tremolo effect
- ✔ Stereo tremolo mode (auto-pan)
- ✔ Adjustable note decay and release lengths
- ✔ Built-in stereo digital reverb
- ✔ On-screen help tips and readout values
- ✔ Low memory and CPU power needed
- ✔ Easy MIDI-Learn feature

EG70 has a very natural response to keyboard dynamics and to player's style. You'll hear the benefits of physical modeling mostly when the sustain pedal is in use. The sound is warm and metallic at the same time, unpredictable, rich and natural like only a real piano can be.

Panel Controls

- **Volume, Bass, Middle, Treble**: These are the main controls of the piano section. Adjust the output volume and the 3-band active EQ like on the real instrument. Leaving all knobs at middle position leaves the sound unchanged;

- **Tremolo On/Off, Depth, Speed**: This is the tremolo effect. You can turn it off and on with the switch and adjust speed (from 0,8 to 10 Hz) and depth. Leaving depth at 0 has no effect on the sound. You can also switch to a stereo tremolo effect by setting the appropriate option in the Global Options menu (please refer to next chapter);

- **Piano Model: Decay, Release**: With these knobs you can adjust some of the most common parameters affecting the sound: the decay and release times. If you wish a longer sustained sound, adjust the decay time; use the Release knob to adjust the time needed to completely mute the note when a key is released (and the sustain pedal is released as well);

- **Piano Model: Reson.**: With this knob you can adjust the amount of global sympathetic resonaces. Keep in mind that you cannot exclude them completely, because they're part of the physical model and have a very important role in the generation of the sound;

- **Digital Reverb: Level**: Use this knob to turn the Digital Reverb effect on or off, and to adjust its volume. The dry sound will stay unchanged while the reverb will be added on top of it;

- **Digital Reverb: Size, Decay**: With these two knob you can model your virtual ambience. Size will establish the size of the environment into which the echo reflections will happen, and Decay establishes how long the echoes will last;

- **Digital Reverb: Spread**: You can use this knob to pass from a mono reverb to a wide stereo effect, resulting in a very natural and pleasant ambience effect. Please note that moving this knob may cause some glitches in the sound, so it is advisable to not move this knob while playing;

- **Digital Reverb: Tone**: A virtual environment can be made of different materials that affect the colour and the decay factors of the reverb sound. Use this knob to adjust this aspect according to your tastes.

Global Options Menu

Here you can set a few options stored globally:

- **Tuning**: set the global tuning ranging from A=437Hz to A=443Hz where A=440Hz is the default setting. You can choose between Equal Temperament and Stretched Tuning, which is the kind of tuning most used for pianos;

- **Velocity curve**: choose the one that matches your MIDI keyboard and your playing style;

- **Wood Noise Level**: adjust the level of the audible noise produced by the wooden hammers that accompany each note;

- **Pedal Noise Level**: adjust the level of the noise produced when the sustain pedal is pressed or released;

- **Tremolo Mode**: You can switch between a mono tremolo (default) or a stereo auto-panner.

Playing and usage tips

It is recommended to set a short ASIO latency and to use a sample-rate not higher than 48 Khz for best performance.

Using the GUI controls

When you move a knob on the User Interface, a small display appears on the screen showing the current value of the active control. Passing your mouse pointer over the controls, a pop-up text describes their function.

Tips on using the interface:
- to reset a control to its default value, hold down CTRL and click it;
- for "fine tuning" knob movements, hold down SHIFT while moving the knob;
- all knobs react to both vertical and horizontal movement;
- hold down the ALT key to activate the circular control of the knobs.

MIDI CC Mapping

You can assign your MIDI controllers to any of the available controls using the MIDI Learn function. It's very easy: just right-click on a knob or switch of your choice. A menu should pop-up. The first item shows the control's name, the second item shows the MIDI CC# currently associated to that control and the last item activates the MIDI Learn status. Click on "MIDI Learn", the tooltip text should say "Waiting for incoming MIDI data...". Now move a knob/slider/whatever on your physical controller. At this point you should see the virtual control following the movements of the physical control. To abort the "wait" state click on the first menu item, and to reset the assigned control (MIDI Forget) click the second menu item.