# ProtoPlasm 21 Pro Synthesizer
## The Next Generation Pad & Texture Synthesizer by H.G. Fortune



The upgraded ProtoPlasm 21 has been reworked at a great extend and has become nearly a completely new synth. With it's new features like Super Modulation Morphing (SMM), key-control on Delay (LKO), LFO modulation matrix and a dedicated Attack Oscillator it enhances it's main purpose as synthesizer for vivid textures, soundscapes and pads. Even more with SMM and LKO there is a highly improved realtime control now.

The basic features are:
**New:** one dedicated Attack Oscillator with **50 waveforms** controllable by adjustable velocity amount
**New: Super Modulation Morhing** via Mod Wheel at selectable rows for the Mod Matrix
**New: Modulation Matrix** for LFOs with positive and negative inputs
**New: LKO system** for delay with four keydependant modes
three digital PCM-wave oscillators powered by **128 different waveforms (123 new ones!)**
each oscillator's level can be modulated by different sources via mod matrix
one LP filter (24db Lowpass) with ADSR EG, Filter FM and keytracking
one HP filter (12db Hipass) with ADSR EG, Filter FM and keytracking
two shapeable LFO with patternlike waveforms (bpm-synced)
one LFO with 21 complex waveforms and free speed adjustment
one shapeable Sample & Hold with pattern (bpm-synced)
adjustable level for direct, LP and HP output with separate pan each
stereo-delay (bpm-synced)
four Lazy buttons (Oscillator, Filters, LFO and All related params)
User-Waves for oscillators via Soundfontfiles (SF2) and wav-files loadable (see Apendix for details and howto)
**Changed**:Values within framed rectangles can be changed via mouse moving up/down (left mouse key pressed)

# The features in detail

## The sound-sources



There are three oscillators with octave range adjustable -2 to +2 **[Oct]**aves & **[Semi]**tones up to +11. The SF2 button is there to change oscillator mode (SF2 - Mute - Wave playing) The **[Level]** knobs determine the basic output level of each oscillator. By **[Mod]** you can modulate the output level of each oscillator fed by the output of the modmatrix.

## Attack Oscillator
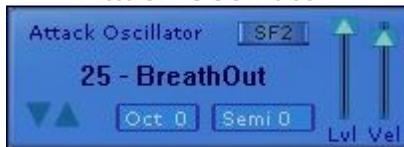


The Attack Oscillator adds another dimension to the ProtoPlasm now as You can add a dedicated attack wave (a oneshot sample) to a soundpatch giving You further pronounced sounds. Even more You can adjust a switching point via the [Vel] slider to determine when velocity by keyboard will play this Attack wave. Of course You might also 'abuse' this oscillator as normal oscillator by loading a different SF2 into the loading slot.
Loading Sf2 files is done by using the SF2 Load button as shown below



leading to pop up four loading slots on top of the mod matrix area. See also Appendix.

## The Filter section



There are two independant filters one 24dB lowpass filter with resonance [Q] and a 12dB hipass filter with resonance. Each filter can be modulated by an ADSR-EG and/or the output of the related sources within the mod matrix. The **[LFO]** knob determines the amount of modulation between ADSR EG and LFO-source. Filter FM (Frequency Modulation) is done

different to the prior versions as it uses output of Osc. 2 before its level adjustment so You can even set level of this oscillator to 0 while still using its source to modulate the filters. In order to use Filter FM **Q** must be up to a certain amount. Note: Due to the variety of oscillator waveforms the results will differ.

## The LFO section and Modulation Matrix



The LFO section offers two shapeable LFO's and one shapeable Sample and Hold with different source types, all bpm-synced (by divisors 1/16note to 8 bars) plus one LFO with complex waveforms and free Speed (=tempo) adjustment.
Each LFO and S&H resp. has a positive and negative output fed into the mod matrix (horizontal rows) while the vertical columns point to the five modulation destinations (Osc. 1 to 3, LP and HP filters). It should be considered that at normal conditions setting a positive and negative amount of the same source to a destination is not reasonble as +50 and -150 will lead to a sum of -100. On the other hand it is interesting to set a positive and a similar negative amount to different destinations so these change the opposite way.

*Hint*: resetting a slot within the mod matrix to 000 can be done by double clicking within the slot.

As there is **Super Modulation Morphing** settings of positive and negative values to one destination makes a new sense as You can morph via ModWheel between + and - at each row *selectable* by the button between + and -  so if you don't activate a button (red = active) there is no morphing. Image below shows three activated rows for morphing.



Anyway You will have to select the mod amounts for Super Mod Morphing quite carefully as the amount shown in the image is not an adequate example - an overdose amount of values.

What's so special and should to be known about using SMM = Super Modulation Morphing?

By Super-Modulation Morphing there is the ability to morph between selectable Mod settings at all four LFO with just moving the Mod Wheel at realtime. So You have the best control for a more or less sensitive control on this feature.

As You see at the Mod Matrix there are decidated rows for a positive and negative input values for modulation. Now using SMM by switching a button at one row enables this feature for this complete row.

Moving the Mod Wheel from lower position to upper will lead to shift or morph from the - setting to the + setting.

A simple example is to set -150 and +300 for e.g. the LP Filter At the lower point of Mod Wheel half the possible amount of Modulation is send to the target. Moving the wheel up will decrease this amount while the amount to positive maximum will increase. Thus it is a rather simple morph from positive to negative mod amount.

Setting - ammount to 000 and positive amount to 300 will simply fade up to positive amount. This might be useful if You want to fade in and out modulations at realtime manually so there is no need for a separate mod delay and/or fade in as manual interaction gives even more flexible control

Adding the HP to the game by setting it's - amount to 300 and it's + amount to 000 You can morph the LFO Modulation for LPF up while for HPF it goes down simply by moving the Mod Wheel up. This gets more interesting in selecting more sources and targets to achieve quite complex changes within modulations at more targets: This means manually controlled at realtime simply by moving the Mod Wheel to and fro.

## The Mix and VCA section



The output section provides an **[ A ]  [ D ]  [ S ]  [ R ]** envelope generator for shaping the overall signal with **A**ttack, **D**ecay, **S**ustain and **R**elease. Also You can mix the amount of level from outputs of direct (unfiltered signal), Lowpass and HiPass filter. In addition to this there is an independant pan-setting for each output. Also there is a knob to add some LoBoost and You can even use Velocity on the output level of the VCA.

# Delay and Main Out section



This stereo delay is synced to host clock at selectable division-settings by **[RSync]** and **[LSync].** Use the **[Dly-Lvl]** knob to adjust the amount of delayed signal to the normal signal while the two **[R / L Fdbck]** knobs determine the amount of repetitions of each delay. This is useful to get more delay repetitions at shorter delay times while the other delay has a longer delay time setting. So you can compensate the repetitions on the shorter delay vanishing too early. **[Mode]** switch serves to set the Delay into different modes or to switch it off. But what the heck are these LKO modes? When active it sets the delay to 0, 30%, 40% or 50% while playing until the last key is released leading to have the full amount of delay then. This avoids to much of delay while playing but still having a lot amount of delay after releasing all keys - thus LKO is Last Key Off.

**[Vol]** knob controls the overall output of the synthesizer.



There are four Lazy buttons to randomize certain sets of parameters for All, Oscillator, Filter and LFO sections. This is a really easy way to generate new ideas for new patches ;-)

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Hint according volume: 1st raise levels at Osc. and Vca as much as needed for each. Do not forget to raise VCA Sustain if sound is not of a decaying type. Finally adjust Main Vol for appropriate Out-level. Caution: please note this level might get higher the 0dB under certain conditions - so be careful with this one!

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General hints: 1. When moving a knob or slider you can also press <Crtl> on the PC-keyboard for fine adjustments. 2. Long release settings at the ADSR EGs use more CPU.

Known bugs: loading a single patch program (*.fxp) to first program number (and only there) may change the waveform of the oscillators. This does not apply when loading a patchbank file (*.fxb)! This has to be fixed in the development-environment.

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The eight voice version of ProtoPlasm 21 is available via Paypal or ShareIt for 39 Euro - please visit www.hgf-synthesizer.de for further details.

There is a also **Free Edition of ProtoPlasm 21** - featuring 4 voices instead of 8 and without options to change SF2 files or loading .wav files. Also the SF2 file within the free edition is internal while with the Pro version it is as external file so it can be modified and be used in another VSTi like STS-26 Pro.

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Other VSTI by H. G. Fortune are:
STS-26 Space Transition Synthesizer
X-Wheel of Fortune III Pro
LaserBlade Synthesizer

Homepage: www.hgf-synthesizer.de
email: fortune@flomo-art.de

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**Credits, thanks and further info**

The ProtoPlasm 21 Synthesizer has been created with Synthedit by Jeff McClintock with further modules by David Haupt, Peter Schoffhauzer and Kelly D. Lynch.

Preset patches were kindly contributed by:
Marko "Gravehill" Hautamäki (G), Antonio (AP), Timothy Moffett (TM), Jack Solium (JS), Roy Bourcier (RBJ), Darren Wilson aka Dazza66 (DW), Andrew (Xol), Lutz Oettershagen (EYB), Adam aka Rellik (AR), Derek Kay (DK), Tooobsox (T), Dimitri Schkoda

H. G. Fortune
major upgrade to ProtoPlasm 21: April, 25th 2007
updated to TSM: February, 25th 2006
updated to TS: January, 8th 2006

# Appendices

## List of 128 waves in HGF-ROM2.SF2 (123 new ones!)

| | | | |
|---|---|---|---|
| 001 DeepSpaceX | 033 Aspiration | 065 XPulsed | 097 SitArc |
| 002 MultiSyn | 034 VoxPlus | 066 Twinky 4 | 098 DXitar |
| 003 Ayesha | 035 AaaOhhhs | 067 Soloid | 099 Claviculi |
| 004 Unexpected | 036 VoxOfNoise | 068 Narrowsyn | 100 Layer-Z |
| 005 SimpleSoft | 037 HyperVox | 069 Nasalic | 101 Layer-X |
| 006 BellSpaceX | 038 VoxObscura | 070 PolySimple | 102 DelaySpaceX |
| 007 PaddyBell | 039 Voxodont | 071 Syndenfall | 103 UnNatural |
| 008 FlyingPad | 040 Aaahtificial | 072 UnOrganic | 104 OuterPad |
| 009 LigaPad | 041 NoVocal | 073 Purity | 105 ShipLiftOff |
| 010 OuterChoirA | 042 LowSyn | 074 Simplify | 106 Tunnellizer |
| 011 OuterChoirB | 043 Growly | 075 RhodesIsle | 107 SubStorm |
| 012 FogQuyer | 044 GoodLow | 076 MarimInkosi | 108 Surreal1 |
| 013 Y-Guayer | 045 FullBass | 077 Tubularity | 109 Surreal4 |
| 014 Superstr | 046 Punched | 078 Bellatrix | 110 Surreal5 |
| 015 Stringsys | 047 Sharpening | 079 Belltronic | 111 ManyClocks |
| 016 StringTanga | 048 DuoSound | 080 Digitalis | 112 SamUnhold |
| 017 Unstringed | 049 Blasomatrix | 081 GlassyZone | 113 FineRandom |
| 018 Hermaphrod | 050 BroadBras | 082 LiteSync | 114 FX-Rattler |
| 019 2ndHndStr | 051 SawsOff | 083 BariSync | 115 Bitdisorder |
| 020 Shena-org | 052 WideSaws | 084 BlueSync | 116 Stuttering |
| 021 StringOrg | 053 BriteSaw | 085 ShredSync | 117 KvRTalk |
| 022 OrgueStr | 054 Saktrix II | 086 InHrmSync | 118 ChipTalk |
| 023 Organox | 055 Lysipox35 | 087 Inharm-V | 119 MachinaX |
| 024 Tanofir | 056 LysiPox17 | 088 Inharm-VI | 120 NoiseBug |
| 025 Gorgue | 057 BriteFive | 089 Inharm-IX | 121 InsideTube * |
| 026 HeavyOrgI | 058 PSynHit | 090 Inharm-XI | 122 Tundra  * |
| 027 HeavyOrgIIb | 059 LiteBrite | 091 InHrmDrill 1 | 123 Bassical   * |
| 028 HeavyOrgIII | 060 HvyBrite | 092 InHrmDrill 2 | 124 KS-FatBras  * |
| 029 DuoSynOrg | 061 BassBrite | 093 InHrmDrill 3 | 125 MovinJaws   * |
| 030 SpaceOrgan | 062 DuoWave | 094 InHrmDrill 4 | 126 Arcanasque |
| 031 COrgnus | 063 GrowlSpit | 095 InharmOrg | 127 Vocalesque |
| 032 LiteOrg | 064 EyyYa | 096 Exotica | 128 Narronics |

[  * 'surviving' waves of prior ProtoPlasm version ]

## 51 oneshot waves for AttackOscillator SF2

| | | | |
|---|---|---|---|
| 001 TinCanPitch | 014 VA-BrassAtk | 027 HouseIt | 040 HousePi |
| 002 NoisyTone | 015 MovinBell | 028 Doublesque | 041 BrightAtk |
| 003 VA-Bell | 016 Narrowness | 029 StrangeSeq | 042 BreathBlow |
| 004 BarChiming | 017 BaliSeq | 030 Blow Up | 043 PercWhistler |
| 005 Distorted | 018 HarpStrum1 | 031 BlowFlute | 044 Hoooi |
| 006 BubbleBras | 019 WoodyAtk | 032 WPhoneAtk | 045 Strike! |
| 007 Metal-Hit | 020 NoisyAtk | 033 BaliPercuss | 046 Drippler |
| 008 SurreaBell | 021 Asianess | 034 SitarAtk | 047 ExoBell |
| 009 TinyTines | 022 12Stringer | 035 Pizzi Cat | 048 Baliness |
| 010 Distorted2 | 023 Tubularity | 036 Bali-Bell | 049 DownBell |
| 011 SmallBells | 024 FunnySeq | 037 Harp-Strum2 | 050 Hunchback |
| 012 VAPianesque | 025 BreathOut | 038 Exotique | 051 PitGong |
| 013 SpaceyAtk | 026 Sitar-short | 039 PitchedAtk | |

List of MIDI-Controllers (CC) used within the ProtoPlasm 21

| >CC | Destination | >CC | Destination |
|-----|-------------|-----|-------------|
| > 07 | Main Volume | >81 | Hipass Filter Cutoff |
| >12 | Delay switch on/LKO/off | >82 | Hipass Filter Q |
| >13 | Left Delay Feedback | >83 | Hipass Filter Attack |
| >14 | Right Delay Feedback | >84 | Hipass Filter Decay |
| >15 | Delay Level | >85 | Hipass Filter Sustain |
| | | >86 | Hipass Filter Release |
| >17 | LFO 1 Sync | >87 | Hipass Filter Envelope Amount |
| >18 | LFO 1 Waveform | >88 | Hipass Filter ModBal (Env - LFOs) |
| >19 | LFO 1 Shape | >89 | Hipass Filter KeyTracking |
| >20 | LFO 2 Sync | >90 | Hipass Filter Osc2 Filter FM |
| >21 | LFO 2 Waveform | | |
| >22 | LFO 2 Shape | >91 | VCA EG Attack |
| >23 | Sample & Hold Sync | >92 | VCA EG Decay |
| >24 | Sample & Hold Wave/Mode | >93 | VCA EG Sustain |
| >25 | Sample & Hold Shape | >94 | VCA EG Release |
| >26 | LFO 3 Waveform | >95 | LoBoost |
| >27 | LFO 3 Speed | | |
| | | >102 | Dir Level |
| | | >103 | Dir Pan |
| >71 | Lopass Filter Cutoff | >107 | LoPass Level |
| >72 | Lopass Filter Q | >105 | LoPass Pan |
| >73 | Lopass Filter Attack | >106 | HiPass Level |
| >74 | Lopass Filter Decay | >107 | Hipass Pan |
| >75 | Lopass Filter Sustain | | |
| >76 | Lopass Filter Release | >110 | Osc 1 Wave Select |
| >77 | Lopass Filter Envelope Amount | >111 | Osc 2 Wave Select |
| >78 | Lopass Filter ModBal (Env - LFOs) | >112 | Osc 3 Wave Select |
| >79 | Lopass Filter KeyTracking | >113 | Atk Osc Wave Select |
| >80 | Lopass Filter Osc2 Filter FM | >114 | Osc 1 Mod Amount |
| | | >115 | Osc 2 Mod Amount |
| | | >116 | Osc 3 Mod Amount |

## Appendix on Soundfonts (SF2)

**General note:** place all SF2 you want to use into the subdir which has been created by the ProtoPlasm (e.g. C:\somewhere\VSTplugins\HGF\ProtoPlasm21\ ) you can also have subdirs there. The VSTi will automatically point to this subdir so it is more convenient to load files from there.

If You load a Soundfont file e.g. into slot for osc. 1 this is valid for the whole patchbank i.e. this soundfont will be used in all patches osc.1 settings switched to SF2 - while set to internal the internal waves remain valid. For each osc. you can use a different soundfont being valid for all patches of course. Saving the bankfile will keep the resp. settings. Thus using different bankfiles you can manage more than three soundfonts in usage at all.

### Note on SF2-files:
Although you can use basically any SF2 around there are two limitations: the internal SF-Player does support only one layer from an SF2-preset or instrument (the bottom one as seen in Vienna) and the synthfunctions of the SB-hardware are not supported as a specific SB soundcard is not needed.
In order to make SF2-files from Your wavefiles You can use the freeware tool *Viena* by Kenneth Rundt - http://www.saunalahti.fi/kru99/index.htm
Viena  does not require a Creative Soundblaster Live or Audigy Card to assemble SF2-files and please note there is only one 'n' in Viena (unlike *Vienna* from Creative Labs) And please note to start with an already existing SF2 within Viena as a new generated SF2 file within Viena does not really meet the SF2 specs thus it might not load into some apllications..
As a freeware Wave-Editor with capability to set looppoints you can use Yamaha's TWE Ver. 2.3.1 which is running on Windows XP systems.

**Loading wav-files**



Using the SF2 button the filebox will appear. Click on [File:] to get the file / directory selectorbox to choose a wave file. Up to 24Bit and loops are supported. Note: This is not made to play drumloops etc. at a synchronized tempo or so - this is a synth not a drumthing!

The four slots to load SF2 files to the oscillators and to select a bank within an Sf2 file if present:



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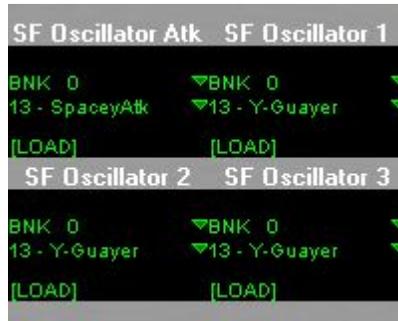
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