STS-21
The next generation Space Transition Synthesizer

This synthesizer is featuring the eXTended Wave-Transition method plus X-Torsion for absolute unique atmospheres, soundscapes, pads & textures. A very straight userinterface with 3 "Lazy"-Buttons for randomizing different sets of parameters so programming this synthesizer is incredibly easy. The Transition method adds a stunning new dimension and motion for an evolving sound changing completely it's characteristics.

The basic features are:
Four digital PCM-wave oscillators powered by 120 (Pro) / 78 (free) selectable waveforms
X-Torsion function for osciillators
two "Transit(ion)"-modes
two resonant filters (24db Lowpass and 12 db Highpass)
three ADSR-style envelope generators
two LFO (bpm-synced)
one LFO with shapeable and even patternlike waveforms (bpm-synced)
one Sample & Hold (bpm-synced)
one LFO (bpm-synced) for alternate Transition mode
Stereo delay
Stereo Reverb

The free version is supplied with 256 patches (1 internal and 1 external bank) only - a selection from the whole sets. If you check some patches(also in 2nd patchbank) made by talented Annabelle (ANN) you'll notice the STS is also capable for cutting leads and interesting gated stuff. The Pro version has differing internal and two external banks.

Although this is an amazingly "simple" structured synthesizer it gains its astounding sound from the Transition method between the oscillators.

The Pro version incorporates loading of User Soundfonts & wavefiles (up to 24 Bit), more voices instead of two with the free version. **In contrary to the Pro version the free version won't be updated.**
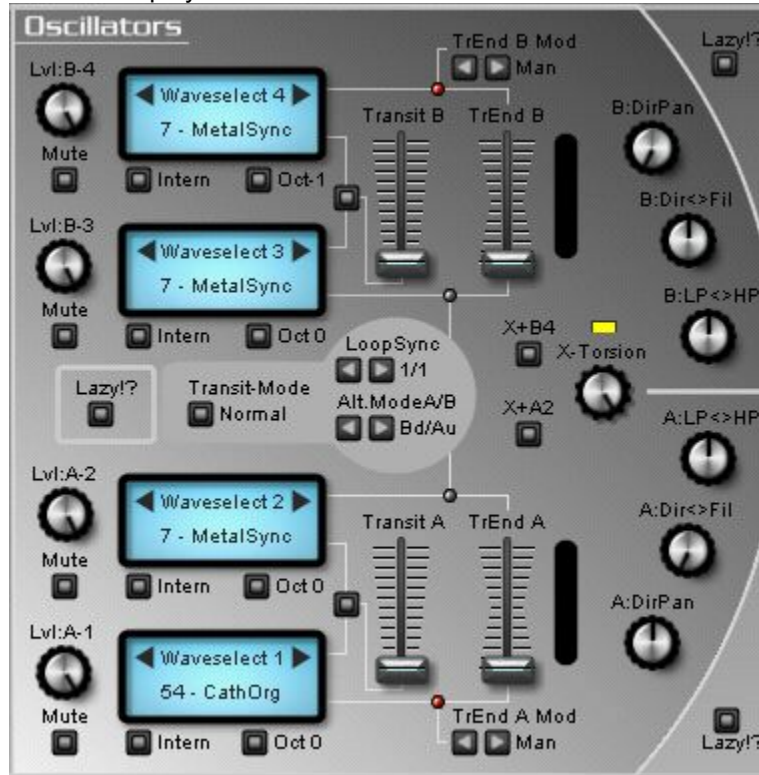
The features of the STS-21 Synthesizer in detail

The sound-sources

Four **digital oscillators** have a set of 120 selectable PCM-waves (78 in free) as soundsources. Each oscillator has a **[Level:]**-knob and can be set to -2/-1/0/+1/+2 **[Oct]**aves.

The outstanding feature of this synthesizer is the adjustable transition from one wave to the next via the **[Transit >]** sliders and with the advanced system with adjustable **[End]**point plus modulation on this separate for each section. Modulation is affected after the transition has reached it's end (or upper oscillator) and if **End** setting is lower fallen back to this point. The **End** point is determined by the resp. TrEnd slider setting so in middle position both oscillator will sound equally.

Note: since version 2.1 the order of oscillators resp. sections has been changed from top to bottom to reflect the moving of transition by the visual display bars.

Notes: Switching between Internal (sound source), User-SF2 (load User soundfonts) and Wave (file loading) is available in the Pro version only. See appendix for addidional notes! Selection of internal waves via dropdwon list simply click on wave name (not on 'Waveselect').

New to the STS-21 is the mode selector for two transition types:

Normal is a combination of the known STS transition with the additional option to activate transition for osc section A and B seperately. Thus you can use e.g. Transition for section A and have section B as two normal oscillators playing without transition or vice versa. Switching off both transition the STS-21 is like 4 oscillator synthesizer.

Alternate is the new mode providing *alternating and bpm-synced* transitions between section A and B which is also synced to first keystroke or a new keystroke when no other keys are pressed - thus playing legato will simply follow tempo without retriggering the Startpoint. Both Transit > sliders are not used in this mode. The lit/unlit LED show what signal path is active in each mode.

You can also adjust levels of each osc-section (A & B) by knobs to go to direct out or filter by knobs **[A:Dir<>Fil]** & **[B:Dir<>Fil]** and also balance the output to filters between Hi-Pass and LowPass by the knobs **[A:LP<>HP]** and **[B:LP<>HP]**. Also you can determine a pan setting for each section's direct out by **[A:DirPan]**& **[B:DirPan].**
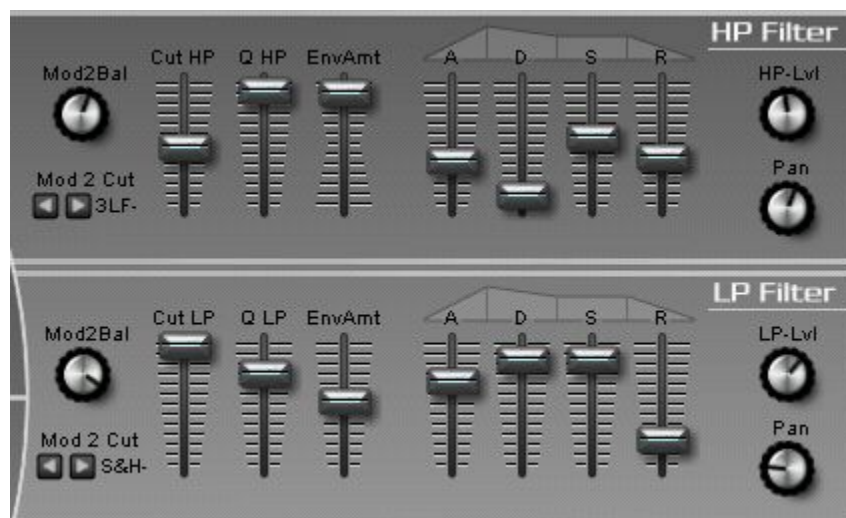
The X-Torsion is a variant of Ring- & Crossmodulation of the Oscillator-outputs. This signals goes directly to the outputsection and it's level is determined by the X-Torsion knob. Also You can add or remove Osc A2 and B4 to

be used within this function. Sometimes the effect of X-Torsion is more noticable if not all oscillators are used. Also it might occur at some wave-combinations that the effect is less prominent than with other combination. Finally it should be noted that in a few cases the output level of this function might lead to increase up to +4db - in such cases lower the the knobsetting of the X-Torsion knob. There is a Peak LED indicating overload in red.

The **[Lazy?!]** knob in this section changes at random waves, Transit-settings, Mix-amount of the signal to Filter and direct output as well as the Mod-Amount to this Mix-setting. Level and Octave setting are not touched.

Filter section

The signal of digital oscillators can be routed to a 24 dB LowPass and/or 12dB High-Pass Filter both with resonance (Q). Cutoff frequency **[Cut]** and Resonance **[Q]** are adjustable for each filter separately with the respective sliders.

Both **[A] [D] [S] [R]** envelope generators let you adjust the way the filter works on the incoming signal with **A**ttack, **D**ecay, **S**ustain and **R**elease providing the shape on filtering. With the **[EnvAmt]** – slider you can adjust the amount of this modulation on the filter. You won't need Release here much or this envelope at all, as the modulations by LFO and S&H provide a far more interesting motion in sound. The Release is quite CPU-hungry.

As further modulation-source serves a selectable LFO (one with patternlike waveforms too plus Shape knob!) and a Sample & Hold generator synced to host-clock (see LFO section below). The **[Mod2Cut]** buttons activates the modulation-source to the respective destinations with an adjustable amount from the **[ModBal]** knobs balacing to EG-amount. (+ is normal modulation while - is inverted modulation.) In contrary to the prior released prototype the the number of LFO-mod sources has been increased even to combinations of two or three LFO.

The Output level of each filter can be adjusted separately by **[HP-Lvl]** and **[HP-Lvl]** knobs as well as the panorama setting by the **[Pan]** knobs.

The **[Lazy?!]** knob changes at random values of all sliders and knobs in this section.

LFO section

The LFOs provide a visual display to watch motion.
All LFO and Sample & Hold are bpm synced to tempo.

LFO1 and LFO2 are basically meant for the Transition function but can be used as mod source for filters too.

LFO3 is featuring patternlike waveforms plus Shape knob

The **S**ample **& H**old generator provides a random modulation signal like pulses at varying levels instead of a continous / forseeable modulation from a selected wave of the **LFO**. With the **[Seed-Src]** button you can change the characteristics of the S&H pulses: Less (peaks), More (peaks) and Up & Dn types for ascending or descending motion preferably at lower rates.

The Output-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.

A Stereo delay is synced to host clock with several selectable division-settings for left and rigth seperately. Also Feedback amount is adjustable separately for left and right.
[F:DlyMix] serves to adjust of the amount of filtered signal while **[D:DlyMix]** serves to adjust the amount of direct signal to the delay section.
The reverb is rather selfexplanatory. Use **[R:Dry/Wet]** to adjust the amount of reverb to the overall signal.

The **[Lazy?!]** knob changes at random values of sliders and knobs in all sections.

Hint: Using long release settings will increase CPU-usage - remedy: lower release at filter ADSR, lower release at ADSR in master section and raise delay MixLvl instead. So in most cases a release just below half way up of the slider will be sufficient to get a fading on the sound.

!! Patches from other/prior STS versions can't be used within the STS-21 Pro but is (for now) compatible to STS-21 free !!

Credits and further info

The STS-21 Synthesizer has been created by H. G. Fortune with Synthedit by Jeff McClintock.

Thanks go to:
Vera Kinter (Brno, Czech Republic) for doing the GUI Graphics [www.artvera-music.com]

Patches were kindly done by
Vera Kinter (VK)
Annabelle (ANN)
Dimitri Schkoda (DS or no sign)
Aron Elvar (AE)
Phil Garrison (PG) [www.complexlogicrecordings.com]

This VSTi uses further modules by David Haupt and Lance Putnam

Another thanks go to Dr. Christian Gritzner for providing some synthesizers to be used as sample sources.

VSTI by H. G. Fortune:
STS-21 Transition Synthesizer (two voice free / enhanced 7 voice Pro version)
ProtoPlasm Synthesizer (two voice free / enhanced 8 voice Pro)
Swamp Timbre Modulation Synthesizer
X-Wheel of Fortune II Pro
X-Wheel of Fortune II (Freeware)
X-Wheel of Fortune Pro

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Thanks to all who have helped and do support my work!

List of internal PCM-Waveforms

001.MovinJaws	033.CharmLoop	065.CS+Orch
002.Fat-5th	034.AlienSpectr	066.4Score
003.AnLead	035.SpaceRide	067.BrassFake
004.3FatOsc	036.FarHorizon	068.RealBrass
005.AnFatSync	037.FroAndTo	069.ShiverBras
006.DistSync	038.Tundra	070.Trumping
007.MetalSync	039.InTheWoods	071.GongyFlute
008.6T-SloSub	040.Rain&Crackle	072.FNV-Syn
009.6T-Fatt	041.FX-OscStorm	073.CleanDigi-Z
010.6T-Horned	042.FX-Flash	074.FuzzDigi_Z
011.QQH-Waving	043.FX-Scrubber	075.FlowLoop
012.Digital_X	044.FX-Riser	076.TalkLoop
013.AuraWave	045.FX-U-F-O	077.MoltenBell
014.MinAtmo	046.FX-Stopper	078.BigGongL
015.XtraOrchst	047.FX-Tumble	
016.Symphonic	048.KS-Spectral	--- from here in Pro version only ---
017.OrcStrings	049.KS-Nebulous	079.LightningL
018.BreathVoc	050.KS-EthnoBlo	080.DXEP-Base
019.HallVox	051.JapFlute1	081.SwellStrs
020.TubeVox	052.HuanFlute	082.JustAFlute
021.VoxOouh	053.BottleVox	083.Octavian
022.LowVox	054.CathOrg	084.AtkSyn
023.Gregor-Oh (=split of 2 sounds)	055.NoiseChord	085.AsianMetal
024.FakeVox	056.NoiseOne	086.SynAthmoL
025.TubeBell	057.JetNse	087.Mythosfer
026.BellPad	058.TubeNse	088.ArcaNostra
027.BellWave	059.VoxyNse	089.OmziFMyth
028.MovinBell	060.MetalNse	090.OmziFSteps
029.DropDown	061.OrganaVox	091.reserved
030.BongBell	062.DrawbarOrg	092.reserved
031.PitchGong	063.FarFeesa	093.reserved
032.ArcaneBells	064.FullPipes	094.reserved
		095.reserved

STS-17 Bonus waves in User SF2	STS-17 Bonus waves in User SF2	STS-17 Bonus waves in User SF2
001._Al_Saria	011._RhytmoLp	021.#Watery
002._di_Motou	012._KotoicLp	022.#Seaside
003._SwirlyHole	013.#MetalHit	023.#Thunder-nl
004._Spaceballs	014.#MetalHit-nl	024.#Falcon
005._Bubbles	015.#ALoop	025.#Jungle
006._Sparkling	016.#ALooph	026.#Tropica
007._Mystery	017.#ALoop-nl	027.#BigRoar
008._Mystery-nl	018.#BLoop	028.#Baby_Kong
009._Cymbalic	019.#BLoop-nl	029.#Juno'sBird
010._Cymbalic-nl	020.#Flowater	030.#Werewolf

In total there are **120 waves** selectable in the STS-21 Pro, only 78 waves in the free version
Note: The bonus waves from the STS-17 are preloaded into the User-SF2 slots - anyway You can change the soundfonts.

NOTE: User SF2 and Wave load is only available in the registered copy: STS-21 Pro!

Appendix on Soundfonts SF2 and wave files

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

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.

Notes on Loading wave files
it is possible since Ver 1.4 to load wavefiles (loops supported) directly into the STS serving as oscillators/soundsource. from V2.1 wavefiles up to 24 Bit are supported.

To load a wave file click on '**File:**' (see marked area in pic below)

You can also set an own rootnote for the wave files now in steps to 11 halftones up using left/right arrows.

Anyway this feature is useful for testing wavefiles within the STS so you can do a quite easy selection of waves to be gathered into an SF2 file later as it is more convenient to switch between different waves rather than loading a wave from somwhere on your harddisk. Also this setting is stored und restored when loading that SF2 on next sartup again.

HINT: When storing a patch the location of the wavefiles loaded is stored as well in order to reload these when switching to that preset. So You should keep in mind that deleting wavefiles used within presets will lead to an error-message! **Due to this it is more advisable to use single patches stored as .fxp rather than complete banks stored as .fxb.** Worst case might be when loading a complete bankfile (.fxb) with stored information of files now deleted will lead to a whole bunch of errormessages. Now You know about it so it is up to You to take care in advance. So SF2 files are a better solution in handling a whole bunch of samples.

The STS wave file capability **is obviously not made to play drumloops, basslines or melodic loops** used typically by programs like Magix Music Maker (tm) although there might be a few (better: very few) exceptions as always are.

Best results will be when using looped instrumentsamples, FX-sounds or samples alike those used within the STS. Ideally waves to be played should be tuned to C (best is C4 or C5) in order to correspond to the MIDI-keys on a keyboard. It is best to use monosamples, stereosamples can used but will be processed as mono-signals. Stereosound is done at the outputsection.

MIDI-Implementation of Continuous Controllers (CC) for sliders & knobs
=CC# (recognized data valid from 0-127)

A:		LP:		Amp	
Dir:Fil	= 11	Cut	= 70	A	= 90
LP:HP	= 12	Q	= 71	D	= 91
ModSrc	= 13	A	= 72		
DPan	= 14	D	= 73	Fdbck L	=92
		S	= 74	Fdbck R	=93
B:				FDlyMix	=94
Dir:Fil	= 15	EnvAmt	= 75	DdylMix	=95
LP:HP	= 16	Mod2Src	= 76		
ModSrc	= 17	Mod2Bal	= 77	Reverb:	
DPan	= 18	Lvl	= 78	Size	=102
		Pan	= 79	Width	=103
Transit A	= 19			Damp	=104
Transit B	= 21	HP:		Decay	=105
End A	= 22	Cut	= 80		
End B	= 23	Q	= 81	LFOs	
Mod A	= 24			1 Sync	=106
Mod B	= 25	A	= 82	1 Wav	=107
		D	= 83	2 Sync	=108
Wav 1	= 26	S	= 84	2 Wav	=109
Wav 2	= 27	EnvAmt	= 85	3 Sync	=110
Wav 3	= 28	Mod2Src	= 86	3 Wav	=111
Wav 4	= 29	Mod2Bal	= 87	3 Shape	=112
		Lvl	= 88	SH Sync	=113
Wave-Lvl1	= 116	Pan	= 89	SH Wav	=114
Wave-Lvl2	= 117				
Wave-Lvl3	= 118				
Wave-Lvl4	= 119				

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