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S90 & PLG150-AN

Power User Plus Pack:

34 AN PLG_USR Voices & 25 Performances

The PLG150-AN is an extremely powerful plug-in board for use in any of the Modular Synthesis Plug-in System products. This set of sounds was developed specifically for the S90 and takes advantage of the fact that there are multiple technologies at play and multiple clocks. The data is provided so that you can look at (and hopefully learn from) the analog sounds in the AN EXPERT EDITOR. You can also see how the Custom Board Voices are molded into S90 PLUG-IN Voices (when you add Effects and Controllers to a BOARD Voice it becomes a PLUG-IN Voice). Then the PLUG-IN VOICE is placed into a PART of a S90 PERFORMANCE. The PLG150-AN has its own clock that can run either an arpeggio or an 'old school' Step Sequencer. This is used to create Patterns with the analog Voices and these are then synced to the S90 clock and combined with the arpeggio and synchronizable LFO and Effects of the S90. I originally wanted to do just 16 Voices and 16 Performances but, frankly I was having so much fun I couldn't stop myself. Hopefully these will give you some ideas and then you can go and build your own Voices/Performances.

PHATSLT1.w4a/w5a

PHATSLT2.w4a/w5a

PHATSLT3.w4a/w5a – Select the one file set that corresponds to your PLG150-AN SLOT.

PHATTY.w2b/w3b – Plug-in All Bulk file. Load through your "PluginAllBulk" type for your slot.

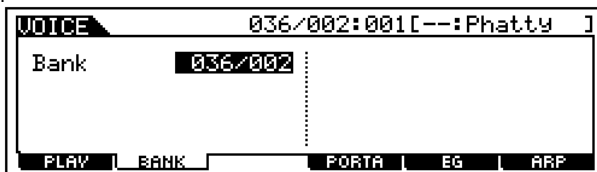
Phatset.ans – AN Expert Editor for those who want to see how they were programmed.

PLG150-AN Analog Physical Modeling Plug-in Board

This tutorial will take you through the whole process so that you can gain an understanding of how custom analog models can be built into PLG150-AN USER Board Voices. Those USER Board Voices become S90 PLUG-IN USER VOICES and then the PLUG-IN USER VOICE can be built into a S90 Performance mixed with internal Voices.

Custom Board Voice Element (036/002) + S90 Effects/Controllers = Plug-in User Voice (PLGUSR) -> S90 Performance

First, let's understand what a **BOARD VOICE** is: There are 2 types of BOARD Voices: PRESET and USER. There are two banks of PRESET BOARD Voices on the PLG150-AN – they are called 036/000 and 036/001. There is one volatile USER BOARD Voice bank (036/002) which can hold 128 User created/loaded AN sounds. All Board Voices are entirely contained on the PLG150-AN itself. They are the same no matter what product you place the PLG150-AN.



The **USER BOARD VOICES** are Voices that are constructed on the physical modeling PLG board and are stored in bank 036/002. You can either create your own Board Voices from scratch using the AN Expert Editor or you can (as with this tutorial) load them in from the Editor or from a SmartMedia card. This card file is a (.w2b) file – a special SmartMedia/SCSI drive Plug-in Bulk file format saved from the host product. Or they can be loaded in from the AN Expert Editor from a (.ans) type file. The AN Voice data provided with this article is saved in the .ans file format so that you can see how the Custom Board Voices were made. (If provided in the .w2b plugin bulk format you would only be able to load them directly to the Board bank 036/002 and you would never see them in the Editor.

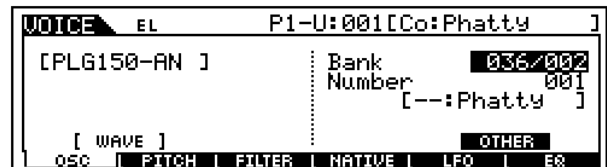


The **BOARD VOICE** can be positioned as a S90 Element – 'pointed' to as a waveform. And used to construct a PLUG-IN VOICE. Plug-in Voices include parameters of the S90.

Next is the **PLUG-IN VOICE**. It comes in two types, as well: PRESET and USER. The **PRESET** Board Voices (64 of them) are automatically loaded from the host ROM when you power up the unit and your PLG150-AN board is detected in a particular slot. It matters not which slot you have placed the PLG150-AN – the S90 queries the slots, locates it and loads the appropriate PLGPRE1 data to the 64 reserved locations. It also creates 64 *blank USER* locations per PLG150 board, PLG1USR, PLG2USR or PLG3USR, depending on the slot you have your PLG150-AN.



PLUG-IN VOICE data resides in the host product but points to data on the Board. The PLUG-IN VOICE is made up of S90 parameters but the actual waveform resides on the PLG150-AN. Much like a "Normal" USER Voice is mainly S90 parameters but the data points to a sample on the waveform list, a PLUG-IN VOICE's data resides in the host but the data points to a Board Voice Element on the PLG bank list. And much like when a "normal" Voice points to a 'volatile' user *sample that reside on the SIMMS*, when the board Voice is in the volatile user board bank (036/002), you must ensure that the volatile data is in the proper location to be recalled properly.



When you start to create your own S90 Voices and Performances using the PLG150-AN board as the wave source, you will want to have a consistent layout for your PLG150 Boards. For example, when you create a PLUG-IN VOICE and use it in a S90 Performance – the Performance will remember what VOICE locations are used, not the VOICE data itself. If PRESET VOICES are used, nothing can go wrong the Presets are in a predictable location...but if you use USER VOICES (either internal or from the PLUG-IN bank) they have to be restored to the proper locations for the Performance to find them. This is why data for this tutorial is provided for the particular SLOT you have your PLG150-AN board placed. There are three different sets of data – one appropriate each of the three SLOTS.

Loading The Data

Back up your own data prior to loading this data, as it will overwrite your settings and data. Transfer **two** (sets) files to a SmartMedia card (or to a SCSI ZIP drive): "PHATSLTx.w4a/w5a" (**x** = 1, 2, or 3 depending on your slot) and the "PHATTY.w2b/w3b". For example, if your PLG150-AN is in Slot 1 you should use: PHATSLT1.w4a/w5a and PHATTY.w2b/w3b.

The .w2a file is an ALL data file and will load all the VOICES and PERFORMANCES and System settings necessary for this bank. An ALL data file was necessary because it includes Foot Switch settings, the User Arpeggios (drum grooves) in addition to all the PLG_USR Voices, internal Voices and, of course, the Performances. The .wb2 is necessary to load the custom PLG150-AN Board Voices to the PLG150-AN board (it includes all of the AN Step Sequences). Load the .w2a file from the "ALL" FILE type and the .w2b file via the "PluginAllBulk" FILE type numbered for the slot that contains you PLG150-AN. For example, if your PLG150-AN board is in slot 1, you would use the "PluginAllBulk1" Type to load the data. If your PLG150-AN is in slot 2, you would use the "PluginAllBulk2" Type, etc.

- You are also provided the data contained in the .w2b file as an "AN EXPERT EDITOR" type file (.ans). This is provided simply so that you can open the data in the "AN EXPERT EDITOR" to see and learn how these custom Voices were made.
- Place your S90 in VOICE mode. Make sure your USB connection to the computer is in place and working, then open the AN Expert Editor. Open the "Phatty.ans" file

To select the sounds from Voice mode:

- Press the PLG1, 2, or 3 button containing your PLG150-AN board.
- Press F2 BANK and use the DATA WHEEL to select **Bank 036/002** – the board's custom user bank.
- Press F1 PLAY
- The first USER BOARD Voice in this bank should be "Phatty". If not, please check you selected 036/002 and that the .w2b file is loaded (see troubleshooting at the end of the article).



The BOARD VOICE data:

Px-B: --Phatty (where 'x' is the slot containing your PLG150-AN; "B" for Board. For example: if you have your PLG150-AN board in slot 1 the screen will read "P1-B --Phatty". If your board is in slot 2, the screen will read "P2-B --Phatty".) These are the 'raw' data – they have not yet been run through the S90's Effects or setup with S90 parameters. This Board Voice is a split. It has a STEP SEQUENCE pattern below B2 that will transpose with each note that you play on the lower half of the keyboard. Notice that it transposes immediately upon you touching another note (Step Sequence: Keyboard Mode = Mode 1). The tempo, as we will learn about, has been synced to "MIDI". When a PLG150-AN board Voice has an arpeggio or step sequence and its clock is set to MIDI – it will automatically follow the clock of the host product. The MIDI Tempo setting will allow it to slave to the host (S90) clock. It has a FREE EG (a user created control track). Let's take a closer look. Open the **AN EXPERT EDITOR** and find the PATTERN GENERATOR section in the upper right hand corner of the main screen and click on the DETAIL button. The PATTERN GENERATOR of the PLG150-AN can be configured as an ARPEGGIATOR or as an 'old school' STEP SEQUENCER¹. In this Voice it is a 16-step sequence. Notice that the parameters have a SPLIT-POINT which is set to C3. This is of significance because you can split the keyboard and have the lower portion playback the step sequence and the upper portion play normally or transpose the sequence. This is tied in with the KEYBOARD MODE parameter located in the STEP GRID area. It is set to "NOTE SHIFT & NORMAL" – all notes in the lower portion will note shift the step sequence up and down, all notes in the upper portion will play normally. With a split point set to C3, all notes B2 and below will NOTE SHIFT the step sequence, while notes C3 and above will play normally. You can make all notes NOTE SHIFT by setting the split point to G8 (the highest possible note). There are four parameters for each step of the sequence: NOTE, VELOCITY, GATE TIME (Duration) and CONTROL CHANGE. 'Note' and 'Velocity' need no explanation. GATE TIME will control how long the step is held – a low number can create a staccato step, a setting of 100 will create a legato step, and a setting of 200 will make the note overlap its neighbor. CONTROL CHANGE (not used in this particular sequence)

¹ Those old enough to remember the earliest sequencers remember that there was nothing real-time about data entry. You had a limited number of steps, typically 16, and each pitch was entered manually (usually with a knob or slider). A rest (or pause) cost you a step! Ah, those were the days!!!

can be assigned to any Control Change number 1-95 or to Aftertouch. This particular step sequence is playing FORWARD, is 16 steps in length and each step is a 1/16 note. HOLD MODE 1 means that it will change as soon as you play a note (Mode 2 will wait until the 16 steps complete before changing). And HOLD is ON meaning you do not have to keep a finger on the keyboard in order for the sequence to continue...once triggered it will continue on the last note played. As you will see when you start to customize, the PLG150-AN board will respond immediately to your changes (however, I will mention again that you are editing in an EDIT BUFFER.)²

FREE EG – From the main screen find the FREE EG section DETAIL button. FREE EG is so named because the user can freely ‘draw’ four control tracks for any of 59 parameters. It behaves like a user envelope generator – thus FREE EG. There are four tracks in the FREE EG – only two are used in the PHATTY Voice. Track 1 is assigned to control the “VCF (Voltage Control Filter) Cutoff” frequency (opening and closing the filter) and track 2 is assigned to control “PWM1/detune” or pulse width modulation detune of VCO 1. What is going on here is that the sound source VCO (Voltage Control Oscillators) in this sound are pulse waves. A pulse wave is either ON or OFF. A 10% pulse wave is on 10% of the time and off 90% of the time. A 25% pulse wave is on 25% of the time and off 75% of the time. A pulse wave that is on 50% and off 50% is a special case we call a square wave. The less time the wave is ON the more nasal it sounds (oboe/clavinet-like), and at 50% ON it sounds “hollow” – (clarinet/woody-like). A PWM sound is one where an LFO is assigned to change the % of the On/Off period of a pulse wave. If you examine the main screen closely you can see that LFO2 is assigned to control the “pulse width”. The detune will slightly change the pitch of the sound over time. The effect of this type control is sound that swells from nasal to hollow back to nasal, depending on the depth of the PWM and the sound will detune itself slightly. The filter and PWM detune movement are on a 4 measure cycle, based on the clock setting of the Step Sequencer. You will see that the step sequencer is set to MIDI clock – this will allow the PLG150-AN to follow the master clock of the host product, the S90. Hit and hold a note in the upper portion of this sound and hear how the filter and PWM move in the sound

² In order to save your data permanently is a multi-step process. First you store the change to the AN Expert Editor via the STORE button on the main screen. Then you must bulk it over to a “036/002” bank location. This will be covered later in the article.

referenced to the TEMPO. You can stop the STEP SEQUENCER by recalling the VOICE, stepping on the foot switch or by toggling the ARP ON/OFF button ON and OFF.

The PLUG-IN VOICE data:

While you are working in the AN Expert Editor the PLG150-AN will respond in real time – you are working in the edit buffer of the board. You cannot write data directly to the board. The board is only responding to the changes you are making in the editor. If you were to change the Voice on the S90 the sound would be changed – you would need to send it again from the Editor. You must bulk the data from the editor to the board for it to remain in a location on the board. Once this Custom Board Voice was created and stored in the AN Expert Editor, it was bulked to location 001 of bank 036/002 of the AN board.

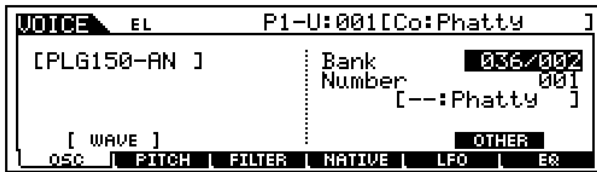
Let’s take a look at it inside a S90 PLUG-IN VOICE. To do this on the front panel of the S90 press the F2 Bank button and select the PLGxUSR bank. The “x” will have a number 1, 2 or 3 depending on the slot containing your PLG150-AN. If your board is in slot one select “PLG1USR” and then press F1 PLAY. Select sound 001 “Co: PHATTY” What is different about this version of the data? It is now a S90 PLUG-IN VOICE because it has been integrated with S90 parameters, including a two-letter prefix so that you can use the Category Search function and recall it like you do every other S90 Voice.³ It now has S90 effects - both the Insertion and System effect processors can be used, and S90 controllers have been assigned to the VOICE.



You can open the “Voice Editor for S90” and use it to edit the Plug-in Voice or you can now use the front panel of the S90 to make changes. The Voice Editor for S90 will let you select a PLUG-IN VOICE – just above the keyboard icon in the display you will see a box to select one of the possible PLG boards. Once selected you can set the MSB/LSB to 036/002, as appropriate for the PLG150-AN board. These changes (to the PLUG-IN VOICE) can be stored in the S90. Press EDIT on the S90, then touch Element 1 and navigate to the Oscillator Wave page by pressing F1 OSC/SF1

³ “Co” or combination was selected as the Category because combinations can be sub-divided into either splits or sequences. In this case it is a Sequence.

Wave to see how the S90 Voice data is pointing to this 036/002 bank Board Element: Phatty, as shown below.



If you see a wave element other than Phatty you need to load the .w2b file or send the data from the AN Expert Editor ("Metallic" is the default Voice that occupies location 001 of this bank).

The PERFORMANCE:



First, we created the Board Voice in the PLG150-AN's user bank 036/002. We then assigned that custom Board Voice to a S90 Plug-in Voice in the PLGxUSR bank. Now we can take that PLUG-IN USER Voice and place it in a PERFORMANCE combined with up to 3 Internal S90 Voices. Press the [PERFORM] button and recall Performance 001 "Co: Phatty". This Performance combines our PLG150-AN sound Phatty with a S90 Drum Kit (House Kit 1) assigned to a drum arpeggio, and a synthesizer lead sound (Ld: Sync).



To play this Performance any note below 'B2' will not only start the drum arpeggio but will start the PLG150-AN Step Sequencer. The step sequence will transpose with any note below the B2 split point. The "Ld: Sync" sound is available across the entire keyboard. With a little practice you can always start the two clocks together. Notice that any key will start the drum arpeggio but only notes below B2 will start the PLG150-AN Phatty sound. If you start the drums first you will be responsible for the timing of the "Phatty" sound when you bring it in. The CONTROL FUNCTION parameters can give you access to the tempo – controlling both the drum arpeggio and the step sequence will follow the tempo set for the Performance. The CS controls will allow you to adjust the Volume of the PARTS, press the Control Function button to select VOLUME: CS1 Drums; CS2 Ld: Sync; and CS3 Phatty.

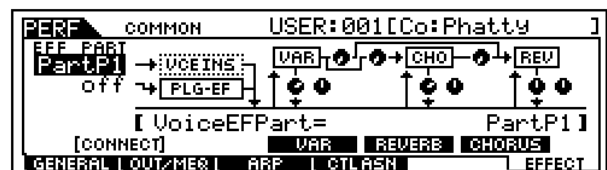
EXPLORE:

Many of the Voices contain PLG150-AN Step Sequences and each of these follows the same scenario as the PHATTY sound. The first 16 sounds were derived from the AN200 LoopFactory. They have been reprogrammed for use here in the S90. First, take a look at the Custom Board Voice data in the AN Expert Editor. Then go to the PLG_USR bank and see what has been added at the S90 level – in terms of effects, controllers, etc. Then go to the Performance and take a look/listen to how it all comes together in a Performance. Those listed below with an (*) asterisk have a Performance made from them.

The 34 PLUG-IN VOICES:

Co: Phatty – AN Step Sequence, Free EG*
 Co: Fat 5th – AN Step Sequence, Free EG*
 Co: Acid EG – AN Step Sequence, Free EG*
 Co: Noize on – AN Step Sequence, Free EG*
 Co: Joshin – AN Step Sequence, Free EG*
 Co: Flabber – AN Step Sequence, Free EG*
 Co: Bad Sign – AN Step Sequence, Free EG*
 Co: 3rd Love 5 – AN Step Sequence, Free EG*
 Co: 5th Morph – AN Step Sequence, Free EG*
 Co: Short Saw – AN Step Sequence, Free EG*
 Co: Noizz – AN Step Sequence, Free EG*
 Co: Nu Basic – AN Step Sequence, Free EG*
 Co: The Racer – AN Step Sequence, Free EG*
 Co: Dark Temple – AN Step Sequence, Free EG*
 Co: Maneki – AN Step Sequence, Free EG*
 Co: Gabbler – AN Step Sequence, Free EG*
 Co: Seismic – AN Step Sequence, Free EG*
 Ba: Init Bass – basic synth bass sound emulation
 Br: Init Brass – basic brass sound emulation
 St: Init String – basic string sound emulation
 Kb: Init EP – basic electric piano emulation
 Or: Init Organ – basic electric organ emulation
 Ld: Init Sync – classic synced oscillator
 Pd: Init PWM – classic pulse width modulation
 Ld: Tom Sawyer – lead voice emulation
 Ba: Uni-Bass – AN Step Sequence, Free EG*
 Co: Terraforma – AN Step Sequence Patterns*
 Co: FreeEGRt – AN Arpeggio, Free EG*
 Ba: Hardstep – bass sound*
 Ld: Earth Lead – lead sound
 Ld: Chick – lead emulation
 Pd: Da Padd – analog pad*
 Se: We All... – AN Step Sequence, Free EG
 Se: ...Die – AN Step Sequence, Free EG

The NEW Performances:



In general the Performances with the "Co" (combination) category prefix use the AN Step

Sequence or Arpeggio synchronized with an internal arpeggio (most often Drum arpeggio). If you have an FC4 or FC5, plug it into the Assignable Foot Switch jack – the FT SW is assigned to cc96, which will stop both the drums and the AN Step Sequencer while in Performance mode. Some of the AN and Drum arpeggios are programmed to play even without you holding down any notes.

Troubleshooting: There are no rules, but try everything, knobs. You must hit the note cleanly to start the two clocks together (S90's and PLG150-AN's). Use the Foot Switch to stop both arpeggios. Often the AN Step Sequenced sound is in the LEFT hand split below a certain note. While *any* key will start the drums, only keys below a certain note will start the AN sequence. If you "miss", hit the FT SW twice and retrigger. Once locked they remain locked.

| PERF | | DIR | Performance | | | | | | | |
|------|----------|-------|-------------|----|-----------|----|----------|---|---|---|
| BANK | USER | GROUP | A | B | C | D | E | F | G | H |
| 1 | Phatty | 5 | Joshin | 9 | 5th Morph | 13 | The Race | | | |
| 2 | Fat 5th | 6 | Flabber | 10 | Short Sa | 14 | DarkTemp | | | |
| 3 | Acid EG | 7 | Bad Sign | 11 | Noizz | 15 | Maneki | | | |
| 4 | Noize on | 8 | 3rd Love | 12 | Nu Basic | 16 | Gabbler | | | |

The 25 PERFORMANCES: The first 16 step sequences were derived from the AN200

A1: Co: Phatty – 3 PARTS; Drum Arpeggio (Dr: House Kit1) sync'd with AN Step Sequence. Right-hand pad sync sound with fulltime portamento. The AN step sequence is triggered Bb2 and below.

A2: Co: Fat 5th - 3 PARTS; Drum Arpeggio (Dr: Tekno Kit) sync'd with AN Step Sequence. Right-hand 5th Lead sound.

A3: Co: Acid EG – 3 PARTS; Drum Arpeggio (House kit); Big Drone lead sound in right-hand; AN Step Sequence below C2.

A4: Co: Noize on – 3 PARTS; Drum Arpeggio (Electric kit); Mr. Cool in the right-hand; AN Step Sequence with FreeEG opening the filter over many measures below C2.

A5: Co: Joshin – 3 PARTS; Drum Arpeggio (HipHop3 Kit); High-pass on MW on right-hand Voice; AN Step Sequence below F#2

A6: Co: Flabber – 3 PARTS; Drum Arpeggio (House Kit2) Filter sync sound in the right-hand; AN Step Sequence below F#2. Techno.

A7: Co: Bad Sign – 3 PARTS; Drum Arpeggio (Analog kit); illbient sound in the right-hand; AN Step Sequence below C2

A8: Co: 3rd Love 5 – 3 PARTS; Drum Arpeggio; Wild AN step sequence against a lead sound; musical 5th comes in on the MW

A9: Co: 5th Morph - Rippin

A10: Co: Short Saw - House

A11: Co: Noizz - Techno

A12: Co: Nu Basic – Filter movement

A13: Co: The Racer - moving

A14: Co: Dark Temple – energy

A15: Co: Maneki - freaky

A16: Co: Gabbler – mad techno

| PERF | | DIR | Performance | | | | | | | |
|------|----------|-------|-------------|----|-----------|----|----------|---|---|---|
| BANK | USER | GROUP | A | B | C | D | E | F | G | H |
| 1 | Funky Ba | 5 | SeismicG | 9 | Bass+drum | 13 | A Visit | | | |
| 2 | Terrafor | 6 | FreeGroo | 10 | Fat Stac | 14 | Race | | | |
| 3 | FreeEGrt | 7 | SonOfNoi | 11 | Funk Jam | 15 | SongWrit | | | |
| 4 | RichPad | 8 | Big Fun | 12 | ChinaEns | 16 | Multiple | | | |

B1: Co: Funky Bass – Groovin' R&B funk line and lead

B2: Co: Terraforma – Each note below B2 has a different Step Sequence against a serious funk groove. Step Sequence completes its run before next one begins.

B3: Co: FreeEGrthm - A favorite of mine FREE EG Bubbles.

B4: Pd: Rich Pad AT – You can never have enough piano + pad sounds. AN sound on AT

B5: Co: SeismicGrv – Lots of stuff going on: 8 measure User drum Arpeggio sync'd to a User LFO sync'd to a PLG150-AN Step Sequence – STOP action when you release the keys - hope you have a sub-woofer.

B6: Co: FreeGroove – Floating – more in the previous vein.

B7: Me: SonOfNoizz – son of noizz

B8: Co: Big Fun – Hip-hop groove, Sample & Hold, pad, where's Miles?

B9: Co: Bass+drum2 – Jungle stuff

The VOICE Morph Function – Go to UTILITY/ F6 PLUG and select the NATIVE X parameters, where X = the slot number of your PLG150-AN board. Here you will find specific parameters concerning the PLG150-AN. Notice you can set up a MORPH function. This can be a VOICE to which you can morph any current AN VOICE. For example, let's use the modulation wheel to morph the "We All..." Voice (PLG_USR #033) into the "...Die" Voice (PLG_USR #034). Go to VOICE mode. Originally, this voice was in the AN1x sound set. The AN1x had two AN engines so each Voice had two "Scenes" – you could morph or fade between the scenes with any assigned controller.

| UTILITY | | [PLG150-AN] | |
|--------------|------|--------------|-------------------------------|
| | | PAGE | |
| Vel Curve | norm | Morph Pgm No | 034 |
| Morph CtrlNo | 001 | MorphBankLSB | 002 |
| STATUS | | MIDI | [NATIVE1] [NATIVE2] [NATIVE3] |
| GENERAL | | I/O | CLASH MIDI PLUG |

By setting the "Morph Control No." to 001 (Mod Wheel) the Modulation Wheel will morph the current Voice, as best it can, to the Voice designated by the "Morph Program No" and "Morph Bank LSB" number, i.e., Bank 036/002 program #34. In this case it is the "...Die" Voice. Enjoy...

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Technology Products
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