S2, S3 Turbokit

NEW FUNCTIONS

GENERALMUSIC

Contents

▓ Introduction

Using the Turbokit Manual

This manual explains the new functions of S2/S3 that are implemented by Turbokit and do not appear in the "User Manual". Turbokit adds these functions:

- Maximum of 32-note polyphony
- Over 500 ROM-Sounds
- 100 ready-programmed Performances
- SampleTranslator 2 incorporated
- Optional RAM-disk (by fitting a Static-RAM chip)*
- Improved Sound Edit functions
- Improved disk management
- Improved sequencer

* In some countries the Static-RAM is supplied as a standard feature.

This Manual follows the layout of the "User Manual", with the same numbering system for chapters and the same order of sub-sections. Some information substitutes or modifies parts of the "User Manual", and other information is completely new.

The information given in the "Basic" manual, describing the general functions of the instrument, remains substantially unaltered.

What's new

This section summarizes the new features implemented with Turbokit, which therefore cannot be found in the "User Manual".

1. Select and Edit controls

- If the **TRACK SELECT KEYS** are held pressed, the tracks will scroll continuously to bring tracks out of view into the display area.

2. Source

- The display can show Performance tracks or the Performance name in large type. A Sound can be assigned to tracks only if these are displayed.

3. Performance

- Pitchbend has a maximum excursion of ± 12 semitones.
- "Create Track" and "Copy Track" can have "All" as destination.
- Pedal, Wheel and User Sliders can control the "'Progr." and "Prop. Volume" parameters.
- Performance can memorize "slow" or "fast" Rotary status.
- The Track Transposer page also includes the "Oct Up" and "Oct Down" options.

4. Sound Edit

- Sounds can be of three types: "Single Oscillator" (32 note polyphony), "Dual XFade" or "Dual Oscillator".
- A Sound in edit can be listened to together with the other Sounds of the Performance; a Song can be played while a Sound is being Edited.
- The LFO can be synchronized to the MIDI Clock.
- SampleTranslator enables Sounds to be created starting from samples received via MIDI, or loaded from Atari, Ms-Dos or Akai S1000™ disks.
- An entire SoundPatch level can be copied to the other level.

5. Sequencer

- The Erase, Dynamic, Quantize On and Copy functions show "Note Range from... to...".
- In Erase Events, "double" notes can be cancelled.

- A track can be copied to another Bank/Song.
- The Song Position Pointer is transmitted and received (in Play mode).

6. General

- Footswitch polarity can be programmed ("Normally Open" or "Normally Closed").
- Footswitches can "Start" or "Stop" the sequencer, and can recall the next or previous Performance.
- The "GeneralMidi" command ensures the compatibility of MIDI-files and MIDI communications with General MIDI/GS (automatic conversion of Program Changes on MIDI channel 10).

7. Disk&Ram

- There are two disk units, the **floppy disk** and the **Ram-disk** (if Static-Ram is installed).
- The disk can contain up to **10 Groups** of **10 Bank/Songs** each (10 x 10 Bank/Songs).
- Samples are compressed during the saving operation (the entire Ram contents can be memorized on a floppy disk).
- Floppy disks can be formatted in Atari (720k) or Ms-Dos (1420k) formats.

8. Sound Library

- Over 500 Sounds
- The "Mask" function offers these display options: (a) all Sounds, (b) only Ram-Sounds, (c) only Ram-Sounds with imported Waveform.
- The "Import" function displays only the Ram-Sounds contained in the floppy disk.

9. Effects Libraries

(no changes)

10. MIDI

- Internal sound generation can be modified with "(08) Balance" (oscillator balance), "(66) Sostenuto" and "(67) Soft Pedal" Controllers.
- System Exclusive can be transmitted and recognized.

Other new features

- There are now 100 ready-programmed Performances in ROM (→ Appendix).
- The "Demo Song" is located in ROM, as Bank/Song 1.

Installing Turbokit

The installation of the Turbokit requires a certain level of technical skill.

Generalmusic declines all responsibility for any damage resulting from defective installation carried out by the user.

The S2/S3 guarantee is automatically invalidated if the instrument is opened by unauthorized persons.

We recommend that installation be carried out only by authorized Generalmusic service centres.

RAM disk back-up battery

Turbokit incorporates a rechargeable Nickel-Cadmium (Ni-Cd) battery that safeguards all data stored in the RAM-disk.

This battery is recharged when the instrument is connected to a power supply, and it therefore has a virtually unlimited duration.

However, if it ever needs changing, the operation should be carried out by an authorized Generalmusic service centre.

Demo Song

When the instrument is switched on, Song 1 will already be present in memory, and can be listened to by pressing the PLAY button.

To interrupt the Demo Song, press the STOP button.

The Demo Song can be edited with all the functions that can be used for other Songs.

Before recording a Song on the Bank/Song 1 location, the Demo Song must be cancelled.

1. Access **Edit Song**:

	EDIT SONG DEMO_1	EDIT MENU	
4♪ie	❶ Erase events	❷ Move events	rec/play...
❶♫ie	❸ Ins/del bar	❹ Dynamic	
5-ie	❺ Transpose	❻ Quantize	
7-ie	❼ Copy	❽ Microscope	
8-ie	❾ Utility	❿ Master track	erase song
9-ie			
10♪ie			
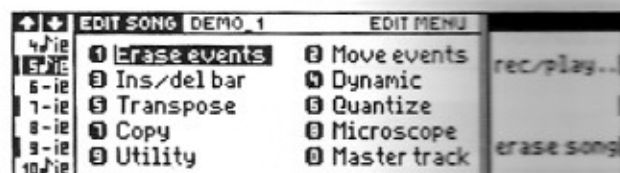
2. Select the **Erase Song** command and confirm with ENTER.

◼ Selection and Edit controls

Track select keys

It is not necessary to repeatedly press the **TRACK SELECT KEYS** to bring hidden tracks onto the display. Scrolling occurs continuously if one of these buttons is held pressed.

Source

"Performance" and "Sounds" display modes

The "Normal" (or "Source") display shows the **PERF** or **SOUNDS** options, selectable with **Function Key a**. "Perf" and "Sounds" are two display modes:

PERF   The display shows the name of the active Performance in large type. The upper part of the display also shows the Bank/Song name.
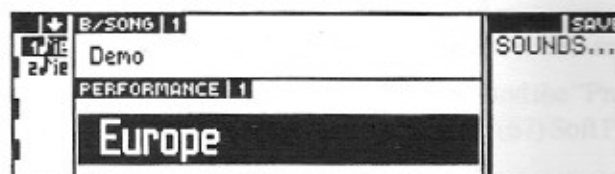
The Performance can be changed by rotating the DIAL (or by specifying a number from 1 - 0).

The track status column (left-hand part of display) can still be used to select, "mute" or reactivate tracks.

SOUNDS   The display shows the Sounds assigned to the Performance tracks. The Bank/Song name appears on the top line of the display, followed by the name of the active Performance.
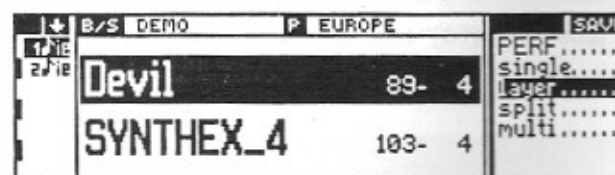
It is possible to select the tracks and to change the Sound assigned to them.

100 Rom Performances

There are 100 ready-programmed Performances in Rom (that means all the Performances of all the Bank/Songs).

The list of Rom Performances is given at the end of this manual. →*Appendix C/a.*

Performance-Controls

* Balance (08) balances the volume of the two oscillators in Dual Oscillator Sounds (→ Sound Edit). Sostenuto (66) sustains the notes played after the pedal is pressed, as on the sustain pedal of a normal piano.

Soft Pedal (67) dampens the sound, as on the soft pedal of a normal piano. Prop. Volume is a specific S2/S3 function that modifies the volume of tracks according to their initial settings.

While the "Main Volume (07)" Controller, applied to all tracks, would bring them to the same level:

"Prop. Volume" maintains the proportional differences between track volumes:
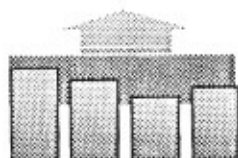
Page 2. Controllers

The page has been reorganized to include a new item ("4-Rotary"). Some other items are slightly different.


```
  |↑|↓| EDIT PERFORMANCE      CONTROLLERS    |PAGE:2|↑|↓|
 |1♪ie|❶ Pitch bend sens.     =      2
 |2♪ie|❽ Pedal 1             = Main vol   7
 |3♪ie|❾ Footswitch 2 = Damper ped.64
 |4♪ie|❿ Rotary             = Slow
 |5xie|❾ Wheel 1            = Pitch bend
 |6xie|❿ Wheel 2            = Modulat.    1
 |7xie|
```

(1) PitchBend Sensitivity... Maximum Ptch Bend excursion is ±12 semitones.

(2)&(3) Pedal/Footswitch 1&2... Controller "(08) Balance" and the "Prop. Volume" function can be assigned to the pedals. Controllers "(66) Sostenuto" and "(67) Soft Pedal" can be assigned to the FootSwitches.*

(4) Rotary... The "Rotary" effect has two *extremes* of modulation speed ("slow" or "fast"). When "Rotary" is applied to a track, the effect is activated as "slow" or "fast", depending on the parameter selected. MIDI Controller 90 (assigned to Wheels, Footswitches or Function Controllers) gradually shifts the modulation speed to the opposite extreme.

(5)&(6) Wheel 1&2... Controller "(08) Balance" and the "Prop. Volume" function can be assigned to Wheels.*

Page 3. User Keys

MIDI Controllers "(08) Balance", "(66) Sostenuto" and "(67) Soft Pedal" act on internal sound generation.

Page 4. User Sliders

Pitchbend now has a range of ±12 semitones. MIDI Controller "(08) Balance" acts on internal sound generation.*

The "Prop. Volume" function can be assigned to User Sliders.*

Performance-Tracks

Create, Copy, Delete and Revert commands

Create Track and Copy Track can have an "All" destination.

- **Create Track** creates a new track with default values. If "All" is selected instead of a single track, all tracks will be replaced by tracks with default values.
- **Copy Track** copies the selected track to another track. If "All" is selected instead of a single track, all tracks will be replaced by tracks with the same settings as the original track being copied.

Page 3. Local

The page has been modified:

```
 |↓| EDIT TRACK  1                    LOCAL │PAGE:3│↑│↓│
 1♪ie │①After touch =  Poly
 2♪ie │②Wheel    1=On     2=On          create.....│
 3♪ie │③Pedal    1=On     2=On          copy........│
 4♪ie │                                 delete.....│
 5xie │Valid in multi mode (local & common)
 6xie │④Key range    from    A0 to   C8
 7xie │⑤Dynamic range  from    0 to  127│revert.....│
```

The message "Valid in multi mode (local & common)" reminds you that Key Range and Dynamic Range are limits of extension and dynamic intensity that are valid for multi mode both in Local (i.e. from the keyboard) and via MIDI Common.

Track Transposer

The two new options which appear in the display, called of Octave Up ("1 octave up") and Octave Down, can be activated with **FUNCTION KEYS A** and **B**.

```
 |↓|TRANSPOSE    MASTER TRANSPOSE =    0
1♪i2 |····|····|····|·■·|····|····|····|   -7   oct.up.....
2♪i2 |····|····|····|····|····|····|····|    0   oct.down..
3♪i2 |····|····|····|■·|····|····|····|    8
4♪i2 |····|····|····|····|····|····|····|    0   master ....
5Xi2 |····|··■■■■·|····|····|····|  -32
6Xi2 |····|····|····|····|····|····|····|    0
TXi2 |····|····|····|··■■■·|····|····|   23   reset......
```

Octave transpositions can be carried out quickly with these commands.

■ Sound Edit

Sound editing possibilities have been expanded with new functions, and two new Sound types are now available. As well as the original S2/S3 Sounds (now called "Dual Crossfade" Sounds), there are also "Single Oscillator" and "Dual Oscillator" Sounds.

In addition, the "SampleTranslator" program has been incorporated into the Edit Sound environment.

Single Oscillator, Dual Oscillator, Dual Crossfade

The S2/S3 sound generator can use its oscillators in different ways to reproduce a sampled sound.

• In "Dual Crossfade" (DC) mode, S2/S3 uses the sophisticated technique of "Multiloop Crossfade Looping", in which two oscillators produce a single note, alternately reading different portions (loops) of the same Waveform. The two oscillators operate in continuous crossfading, making the sound softer and more natural.

An example is given in this diagram, showing how the two oscillators combine to create GrandPiano 1-1:
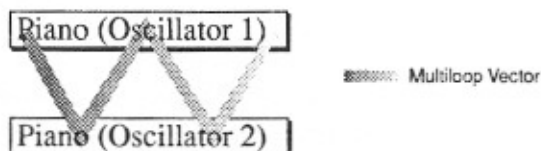
Obviously, this technique has the drawback that when all 32 oscillators are used, only 16 notes will be produced.

• "Single Oscillator" Sounds (SO) use a single oscillator to read a Waveform, and can produce a total polyphony of 32 notes. However, in this mode only one "loop" is used for a Sound, which therefore sounds more artificial. (This is the most widely used technique in instruments of the S2/S3 category).

• "Dual Oscillator" Sounds (DO) link oscillators in pairs to produce a single note, but using two waveforms (which can be different). A maximum polyphony of 16 notes can be obtained.

The three Sound types are shown in the ROM-Sound chart at the end of this manual.

The choice of creating DC, SO or DO Sound types can be made from the Waveform display, and existing Sounds can also be changed into other types.

Polyphony

When the tracks are in "Single" mode, DC and DO Sounds can produce a maximum polyphony of 16 notes. In "Layer" mode the maximum limit is 8 + 8 notes. In "Multi" mode the maximum limit drops even lower, depending on the overall complexity of the track combinations.

When the tracks are in "Single" mode, the SO Sounds have a maximum polyphony of 32 notes. In "Layer" mode, polyphony is halved to 16 + 16. In "Multi" mode the maximum limit drops even lower, depending on the overall complexity of the track combinations.

SoundPatches always use two oscillators per note, and even if they are made up of SO Sounds, the maximum limit is still 16 notes.

GrandPiano on the Demo 2 disk gives an example of how the 32 note polyphony of SO Sounds can be exploited to great advantage. With this SO Sound, the Sustain (or Damper) can be used extensively without causing the problem of "chopped notes".

Generalities

Different displays will appear, depending on the type of Sound with which you enter editing.

• With DC and DO Sounds the Edit-Sound display shows all items:

Hint: When you are using a Multi-track mode, you can obtain a good compromise between polyphony and sound quality by assigning SO Sounds to the less important parts (Bass, Guitar, cymbals of the drumkit isolated from other percussion instruments...).
In complex arrangements, a lower quality "second level" sound is less evident than using the same sound alone.

• With SO Sounds, the display does not show "Filter Envelope":

```
┌──┬─────────────────────────────────┬──────────────┐
│▐▌│ EDIT SND  NYL.GTR32    MENU     │              │
│▐▌│                                 │ save ......  │
│  │ ❶ Waveset      ❼ Volume        │              │
│  │ ❷ Amp. envelope ❽ Lfo          │              │
│  │ ❺ Filter 1/2    ❻ ------        │ abort......  │
│  │ ❼ Pitch envelope ❾ Pan         │ sample trs.  │
└──┴─────────────────────────────────┴──────────────┘
```
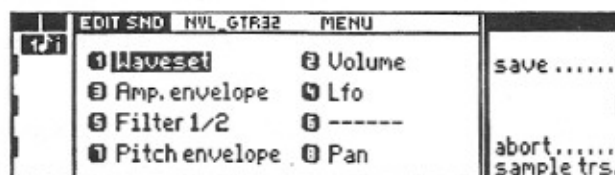
In Edit Sound, S2/S3 is in "solo" mode (**solo** button flashes). By deactivating "solo" (by pressing the **solo** button) the results of the changes made to the Sound can be listened to in the overall Performance context (programmed track settings, Wheels, Pedals, Aftertouch...).

A Song can be listened to whilst a Sound is in edit. To listen to a Song correctly, "solo" must be deactivated. Performance changes are ignored.

If you exit from **Edit Sound** without having made any changes, it is not necessary to use the ABORT procedure to free the buffer dedicated to Sound editing.

Waveset

Converting a Sound to a different type

Waveset presents the options necessary to transform the Sound in edit into the "Single Oscillator " (SO), "Dual Crossfade" (DC) or "Dual Oscillator" (DO) types:

```
┌──────────┐
│ Single.. │
│ Dual xf. │
│ Dual osc.│
└──────────┘
```
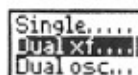
There is a different Waveset page for each of the three Sound types.

Conversion limits

Filter Envelope DC and DO Sound types that are converted into SO keep their Filter Envelope data, even though this is not used. If they are returned to DC or DO, the data is recovered in its original form.

Waveforms made up of two different samples When a DC Sound is converted to SO or DO, Waveforms made up of two different samples (such as Vocal_Gtr, Strings_Glkn or Fantasy) lose the second sample. Returning to DC mode, this second sample can be heard again.

Gain... SO Sounds have an output level that is -6dB lower than DC and DO Sounds. When you convert a Sound to SO, you may need to adjust the Gain parameter on the Filter 1/2 page to balance your levels. Remember that an opposite change might be necessary when returning from SO to DC or DO.

SampleTranslator... SampleTranslator creates DC Sounds that can then be converted. Not all Sounds created with the SampleTranslator can be converted to SO or DO. This happens when there is a big difference between the Loop Start point amplitude and that of the Sample Start. If you want to be sure of converting the Sounds created with SampleTranslator in SO, choose a Loop Start point with an amplitude similar to that of Sample Start.

Dual Crossfade Sound ("Dual xf", DC)

Edit corresponds exactly to the description provided in the "User Manual".

```
  ┌─┬─ EDIT SND  12_ST_GTR    WAVESET
  │↑↓│①Waveform = 12st_Gtr      41    menu.......
  │  │                                 Single.....
  │  │② Transpose    =    0            Dual xf....
  │  │③ Detune       =    3            Dual osc...
  │  │④ Pitch touch sens.=   0         compare...
  └──┴──────────────────────────────────────────
```

Single Oscillator Sound ("Single", SO)

With respect to the previous display, Detune has been replaced by Fine Pitch.

```
  ┌─┬─ EDIT SND  12_ST_GTR    WAVESET
  │↑↓│①Waveform = 12st_Gtr      41    menu.......
  │  │                                 Single.....
  │  │② Transpose    =    0            Dual xf....
  │  │③ Fine pitch   =    3            Dual osc...
  │  │④ Pitch touch sens.=   0         compare...
  └──┴──────────────────────────────────────────
```

(3) Fine Pitch [-64 ~ +64]... The pitch can be modified with great accuracy, in steps of 1/64 of a semitone. "0" is the standard pitch.

```
  ┌─────────────────────────────────┐
  │ ③ Fine pitch      =    ▓▓ 0     │
  └─────────────────────────────────┘
```

Returning to DC, this parameter changes to Detune, whose value will most probably require modification.

Dual Oscillator Sound ("Dual osc", DO)

Edit appears on two pages.

Page 1. WAVESET

```
    | EDIT SND  12 ST GTR     WAVESET   | PAGE:1 |↓|
 1♪i|(1)Wavef.osc.1= 12st_Gtr      41| menu.......
    |(2)Wavef.osc.2= 12st_Gtr      41|
    |                                 | Single.....
    |(3)Transp.osc.1 =   0 osc.2=   0| Dual xf....
    |(4)Fine p.osc.1 =   3 osc.2=   3| Dual osc...
    |                                 |
    |(5)Pitch t.osc.1 =  0 osc.2=   0| compare...
```

(1) **Waveform oscillator 1...** Assigns a Waveform to oscillator #1. The list of Waveforms can be found in the appendix.

(2) **Waveform oscillator 2...** Assigns a Waveform to oscillator #2.

(3) **Transpose oscillator 1 ... oscillator 2 ...** [±24 semitones] Applies a transposition to each of the two oscillators that produce the Sound.

(4) **Fine pitch oscillator 1 ... oscillator 2 ...** [±64/64ths of a semitone] Fine adjustments of pitch for each of the two oscillators that produce the Sound.

(5) **Pitch Touch oscillator 1 ... oscillator 2 ...** [-7~+7] Causes a variation of pitch according to the pressure applied to the keyboard (Aftertouch). The value that can be assigned to this parameter corresponds to a maximum of -2 and +2 semitones.

Page 2. OSCILLATOR BALANCE

```
    | EDIT SND  12 ST GTR   OSCIL.BALANCE | PAGE:2 |↑|
 1♪i|(1)Balance           =    0   | menu.......
    |                                 |
    |(2)Balance env. sens.  =    0   |
    |(3)Balance env. contr. =---     |
    |                                 |
    |(4)Balance dyn. sens.  =    0   |
    |(5)Balance touch. sens. =   0   | compare...
```

Note:
"Balance" can be controlled by a Pedal, Wheel or User Slider. It can also be controlled via MIDI with Controller 08.

```
        OSC#1
+127   ▓▓▓▓
   0   ────
-127   ▓▓▓▓
        OSC#2
```
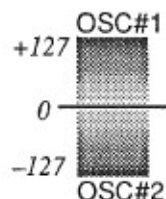
(1) **Balance** [-127 ~ +127]... Adjusts the mix of the two Waveforms. Positive values make the first Waveform dominate, and negative values make the second Waveform dominate.

(2) **Balance envelope sensitivity** [-7 ~ +7]... Affects the degree of action of the envelope on Balance. The envelope is activated with the next item.

**(3) Balance envelope control...** Links the Balance of the two oscillators to the graphic form of the Pitch or Pan envelopes. If dashes are shown (—), the Balance is fixed, and is not linked to the graphic form of an envelope.

```
[❸] Balance env. contr.  =Pitch
```

```
[❸] Balance env. contr.  =Pan
```

Note: It is not necessary for the Pan or Pitch envelopes to be active. Balance requires only the graphic form of the envelope.

(4) Balance dynamic sensitivity [-7 ~ +7]... Affects the response of Balance to dynamics. Positive values make the first Waveform dominate with greater dynamic intensity, and negative values make the second Waveform dominate with greater dynamic intensity.

(5) Balance touch sensitivity [-7 ~ +7]... Affects the response of Balance to Aftertouch. Positive values make the first Waveform dominate with greater keyboard pressure, and negative values make the second Waveform dominate with greater keyboard pressure.

LFO

This display is slightly different, as it now includes the Midi Sync function.

```
  | EDIT SND  12 ST GTR    LFO
[🎹]|❶ Wave      = Sinus          | menu.......
  |❷ Rate      =   11            |
  |❸ Delay     =   10            |
  |❹ Pitch     =  0  Touch sens.= 2 | midi sync..
  |❺ Amplitude =  1  Touch sens.= 3 |
  |❻ Filter 1  =  0  Touch sens.= 0 |
  |❼ Filter 2  =  0  Touch sens.= 0 | compare...
```

Midi Sync synchronizes the LFO with the S2/S3 MIDI Clock, so that the LFO is synchronized with the Song tempo or external clock messages. (The MIDI Clock can be accessed by pressing the **clock** button.) When Midi Sync is selected, Rate allows the note value corresponding to the oscillation to be set:

```
  | EDIT SND  12 ST GTR    LFO
[🎹]|❶ Wave      = Sinus          | menu.......
  |❷ Rate      =   1 / ♪         |
  |❸ Delay     =   10            |
  |❹ Pitch     =  0  Touch sens.= 2 | midi sync..
  |❺ Amplitude =  1  Touch sens.= 3 |
  |❻ Filter 1  =  0  Touch sens.= 0 |
  |❼ Filter 2  =  0  Touch sens.= 0 | compare...
```

The range of note values is from 1/1 to 1/128 of a full note (o). "Irrational" values are also possible (1/15, 1/27...). "1/0" deactivates the LFO.

SO Sounds do not have an LFO control over Filters, so items (6) and (7) are absent:

```
 ┌────────────────────────────────────────────────┐
 │ EDIT SND  12 ST GTR    LFO                       │
┌┴┐ ① Wave     = Sinus              menu.......    │
│1i│ ② Rate     =   11                              │
│  │ ③ Delay    =   10                              │
│  │ ④ Pitch    =  0  Touch sens.= 2  midi sync..  │
│  │ ⑤ Amplitude=  1  Touch sens.= 3               │
│  │                                 compare...    │
 └────────────────────────────────────────────────┘
```

Filter 1/2

SO Sounds have non-dynamic filters, as they have no Filter Envelope.

Filter Envelope

SO Sounds do not have this envelope. The Filters, therefore, are fixed, and have no time values that can be modified.

```
 ┌────────────────────────────────────────────────┐
 │ EDIT SND  NYL_GTR32    MENU                      │
┌┴┐                                                 │
│1i│  ① Waveset        ② Volume       save ......   │
│  │  ③ Amp. envelope  ④ Lfo                        │
│  │  ⑤ Filter 1/2     ⑥ ------       abort.......  │
│  │  ⑦ Pitch envelope ⑧ Pan          sample trs.  │
 └────────────────────────────────────────────────┘
```

Pitch Envelope

SO Sounds do not have a Pitch envelope on oscillator #2. Pitch depth appears on the page, and can be modified in the case of conversions to DC or DO Sound types.

Pan

The Pan of SO Sounds is handled in a different way. The Pan envelope is absent, so the relevant programming pages are missing, as is the Tracking programming page.

The only page present is called Pan Controls (instead of Pan Envelope Controls):

```
┌──┬─────────────────────────────────────────┬─────────┐
│  │ EDIT SND   NVL_GTR32        PAN CTRLS    │         │
│t↑i│ ❶ Pan                = LL_L._JR         │ menu....... │
│  │                                          │         │
│  │ ❷ Pan dynamic sens.      =    0          │         │
│  │                                          │         │
│  │ ❸ Pan touch sens.        =    0          │         │
│  │                                          │ compare... │
└──┴─────────────────────────────────────────┴─────────┘
```

(1) Pan [-31 (All Left) ~ +31 (All Right)]...   "Pan" modifies the position of the Sound between the Left and Right channels (Pan), using a graphic parameter. Modify the parameter with the DIAL or by inserting the corresponding number from the number keypad.

```
┌────────────────────────────────────┐
│ ❶ Pan                  = LL_L._JR   │
└────────────────────────────────────┘
```

"0" corresponds to the central position.

(2) Pan dynamic sensitivity [-7 ~ +7]...   Links Pan to dynamics. Positive values move the Sound right with greater dynamic intensity, and negative values move it left.

(3) Pan touch sensitivity [-7 ~ +7]...   Links Pan to Aftertouch. Positive values move the Sound right with greater pressure, and negative values move it left.