



VFX^{SD} Software Version 2.0 Update

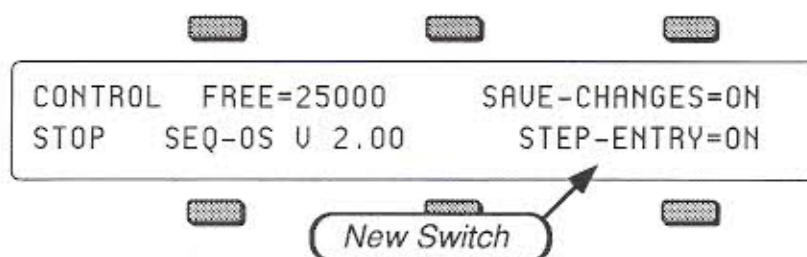
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Version 2.0 raises the VFX^{SD} to a new level of power and functionality with a number of significant new sequencer features as well as other enhancements. The information in this document supplements previous documents and supersedes them wherever apparent disagreements exist. Please retain all previous documentation, including the 1.3 Update.

1. Step Entry Recording

Step Entry Recording is a new way of recording tracks with the VFX^{SD}. A new switch has been added to the last Seq Control sub-page:

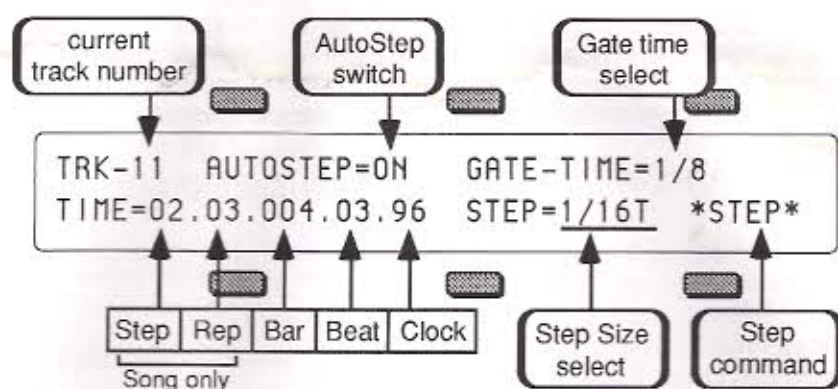


STEP-ENTRY

This switch determines whether Step Entry mode will be used when the sequencer is put into record.

- **ON** — Whenever you go into Record with this switch set to ON, the VFX^{SD} will automatically display the Step Entry page after the countoff has elapsed. If there is no countoff, then it will be immediately displayed.
- **OFF** — With this switch set to OFF, Step Entry Recording is disabled and the system will behave normally.

The Step Entry page looks something like this (depending on settings):



TRK-## — track number

The number of the currently selected track (on which you are recording) is shown in the upper left corner of the display. It is displayed only to remind you which track is being recorded and it cannot be selected or changed.

AUTOSTEP — Automatic Step advance switch

This switch determines whether key events will advance the current time setting.

- ON — each individual key *down* event will cause a note to be recorded on the track and will automatically advance the sequencer time by the amount set in the step size parameter. The duration of the note is controlled by the gate time select parameter.
- OFF — key events do *not* automatically advance the sequencer time, and multiple events can be recorded at the same track location (time).

If you use AutoStep for entering chords, the result will be an arpeggiated chord, similar to a guitar chord being strummed. This is true because each note of the chord will advance the time by the step size, causing older notes to have longer durations.

GATE — gate time select

The gate time (duration) value of a note is assigned when a key is released. This parameter allows you to determine the source of the duration value.

- HELD — the amount of time that you hold down the key(s) while advancing the track will determine the gate time. The time between key down and key release will be the duration.
- STEP — the duration of new notes will be the same as the current step size.
- 1/1 to 1/64T (and dotted note values 1/1D to 1/16D) — when you select any of these settings, the displayed note value will be used for the duration. If you need finer resolution, or wish to have longer gate times than a whole note (1/1), use the closest available value to enter the note and then, after you have finished with Step Recording, use the Event Editor to precisely adjust the duration.

TIME — current track location

This parameter allows you to set the current location on the track. The track location or time is normally displayed as a three-part parameter when you are recording a *sequence* track, with two additional parts added when a *song* track is being recorded. In sequence mode, the three parts are Bars, Beats and Clocks. In song mode, Step Number and Repetition Count fields are added to the left of the Bars, Beats and Clocks fields.

The maximum values for these fields are determined by the length of the track. In song mode, the song structure is also important because the number of steps, the number of repetitions of each step, and the sequence length of each step are factored into the computation of the song track length.

You can advance the track by changing any of the fields, and if you have selected RECORD-MODE=LOOPED on the Seq Control page, advancing past the end of the track will wrap around to the beginning. Otherwise, if you advance past the end of the track you will enter Audition mode.

STEP — step size

This parameter allows you to set the current step size which will be added to the current track location (TIME) whenever you use the *STEP* command, or when the AutoStep switch is on. The range of step sizes is from whole notes (1/1) to 1/64th note triplets (1/64T). Dotted note values are also available (1/1D to 1/16D).

Note name	Setting	Beat.Clock	Note name	Setting	Beat.Clock	Note name	Setting	Beat.Clock
Whole note	1/1	4.00	Eighth note	1/8	0.48	64th note	1/8	0.06
Whole note triplet	1/1T	2.64	Eighth note triplet	1/8T	0.32	64th note triplet	1/8T	0.04
Half note	1/2	2.00	Sixteenth note	1/16	0.24	Dotted whole note	1/1D	6.00
Half note triplet	1/2T	1.32	Sixteenth note triplet	1/16T	0.16	Dotted half note	1/2D	3.00
Quarter note	1/4	1.00	32nd note	1/32	0.12	Dotted quarter note	1/4D	1.48
Quarter note triplet	1/4T	0.64	32nd note triplet	1/32T	0.08	Dotted eighth note	1/8D	0.72
						Dotted 16th note	1/16D	0.36

STEP — step command

Pressing this soft button will advance the track location (TIME) by the amount set in the step size parameter.

If you have selected RECORD-MODE=LOOPED on the Seq Control page, stepping past the end of the track will wrap around to the beginning, allowing you to continue stepping. Otherwise, if you step past the end of the track you will enter Audition mode.

If you are using the optional SW-5 dual footswitch, you can assign the left footswitch to advance the location by setting FS1=*STEP* on the Master page. Pressing the footswitch will act just like the *STEP* command on the Step Entry page. This is useful when you need both hands to control the keyboard.

Using the Step Entry Recorder

All notes played and all control changes made in Step Entry mode will *always* be recorded into the new track.

With GATE=HELD, if you enter a note and release the key without advancing the track location (time), then the note will be recorded with minimum (1/64th note) duration. This is also true when using AutoStep because the key down and key up appear to occur at the same time.

For controllers, it is necessary to advance the track location after entering the event so that they will be correctly recorded. Use *STEP* or advance one of the TIME fields.

It is possible to record trills played with monophonic sounds using AutoStep if you set the gate time to be less than the step size and remember to change GATE to HELD just before you finally release the held key. For example, if STEP=1/16, then GATE-TIME must be *less* than 1/16 (i.e. 1/16T, 1/32, etc.).

Temporary Record Bypass

If you press and hold the **Rec** button while in Step Entry Record mode, you will be able to play keys *without* having them recorded. Keys are not recorded while **Rec** is held down. This is useful when you are looking for the right key(s) to play next and you do not want to inadvertently enter wrong notes into the track.

Access to other pages while in Step Entry

Your access to other pages is restricted in Step Entry mode, in a way similar to Audition mode. You may get to any of the Performance parameter pages, the Click page, and the Master page. The Track Select pages (1-6 or 7-12) may be displayed, and you may use Replace Program to enter program changes onto the current track, but you may not change tracks. The Cart button may be used in Replace Program to change banks. Pressing any of the other restricted buttons will return you to the Step Entry page. This is a convenient way to get back after you have selected one of the accessible pages while in Step Entry mode.

Entering Audition mode from Step Entry

As with the normal mode of recording, when you have completed recording a track in Step Entry mode, either by pressing **Stop** or by reaching the end of the track, you will enter Audition mode, which behaves as it always has.

Entering Step Entry Record after Locating or from Play

You can use the Locate page to get to the place in the track where you wish to begin Step Entry recording, and then hold **Rec** and press **Cont** to enter record at that point. You may also be in PLAY and press the **Rec** button at the point where you want to start Step Entry recording.

AutoPunch does *not* affect Step Entry recording.

2. Multi-Track Record

Multi-Track Recording is a new way of recording MIDI tracks with the VFX^{SD}. A new setting has been added to the Record Source parameter on the middle Seq Control sub-page to enable this feature:



REC-SOURCE — record source select

- **MULTI** — this setting allows you to record data onto multiple VFX^{SD} tracks simultaneously, but only from MIDI. This is most useful for recording tracks sent from external sequencers or played from guitar controllers.

Note: The VFX^{SD} must be set to receive data from MIDI in Multi mode (MODE=MULTI on the MIDI control page) in order for this feature to work correctly.

It is possible to record multi-track sequences from the keyboard, but only if you set track status to MIDI for each of the active (primary and layered) tracks and then set up a MIDI loop (by connecting MIDI Out to MIDI In). This procedure is a bit tricky, and should only be attempted if you have a good understanding of the system.

Using Multi-Track Record

Tracks do not have to be selected in order to have data recorded on them, but they must be defined. Each channel of incoming MIDI data will be recorded on the *lowest-numbered* VFX^{SD} track which has the corresponding MIDI channel number. For example, if both track 1 and track 2 are set to MIDI channel 1, only track 1 will receive and record any data because it is the lowest-numbered track set to MIDI channel 1. It is suggested that you set each track to a different MIDI channel to avoid confusion.

A newly created sequence (or song) will have MIDI channels 1 to 12 automatically assigned to the 12 tracks in ascending order, but all of the tracks except track 1 are initially UNDEFINED. Selecting undefined tracks while on the Track Select page (TRAX) will cause all the settings from the previously selected track to be copied to the new track, including the MIDI channel number. You will have to make sure that the channel assignments and other settings are correct *after* you have defined the appropriate number of tracks to record on.

Suggestion:

If you wish to define a new track but leave its settings alone, you can use Replace Program after underlining one of the new track's performance parameters (i.e. MIDI Channel). Underlining this parameter sets up the new track to have its program replaced without actually "selecting" the track. This method allows you to define the track without changing most of the settings (except for MIDI Program number, Timbre, Release, and Pressure mode).

Note:

MIDI Program Changes will define the tracks on which they are received. If your external sequencer sends program changes on each track before any other event data, then the tracks will be automatically defined, and the MIDI channel settings will not be altered. You can see if this happens by creating a new sequence on the VFX^{SD}, playing your external sequence, and checking which tracks became defined.

Suggestion:

If you will be doing much Multi-Track recording, you may find it useful to create a template sequence which has no track data recorded on it to use as a starting point for each recording. Give it an easily recognizable name like "MULTI-TRACK", and simply copy this template sequence to an unused location before starting each new recording. You can then edit the copy to suit the particular needs of the current multi-track recording.

There is no Audition when using Multi-Track Record. All new tracks that received data are kept automatically after recording ends. The "EDITING DATA..." message is displayed while the sequencer is processing the data you have recorded. The time required for processing depends on how much data and how many tracks were recorded, and it can take several minutes. After the processing is complete, the Locate page is displayed. You can either re-record or erase the tracks (or the entire sequence or song) if you do not wish to keep the results after recording. Multi-Track Record always operates in Replace mode, regardless of the setting of the REC-MODE switch on the Seq Control page.

Data is not recorded on tracks whose status is set to *EXT*, but *all defined tracks* will have "dots" next to the program name after recording, even if they do not have any actual track events on them.

If external sync is being used (CLOCK=MIDI), recording begins with the first clock received after the MIDI Start command. If internal sync is selected (CLOCK=INT), then recording begins when the first note is received.

Basic Recording from an External Sequencer

The following procedure is the basic method for recording a multi-track sequence from an external sequencer into the VFX^{SD}.

- Set MODE=MULTI on MIDI Control page.
- Set CLOCK=MIDI and REC-SOURCE=MULTI on the Seq Control page(s).
- Disable count-off on *both* systems to avoid problems.
- Create a new sequence with the correct time signature.
- Make sure that the external sequencer will send its track data on MIDI channels that the VFX^{SD} is set up to receive (track MIDI channels 1..12 by default).
- Make sure that the external sequencer will send program changes at the start of each track to automatically define the necessary tracks on the VFX^{SD}, or define them yourself on the VFX^{SD} manually.
- Press **Rec** to enter MIDI Record mode (MREC will be flashing indicating that the VFX^{SD} is waiting for MIDI Start and Clock messages).
- Start your external sequencer playing its sequence. When the external sequence stops, or when you press **Stop** on the VFX^{SD}, the VFX^{SD} will show "EDITING DATA..." for a time and then display the Locate page.
- Set CLOCK=INT on the Seq Control page and press **Play** to hear what you have recorded. You may then decide that the results are satisfactory, or if not, you can try again or erase the sequence.

3. Changes to the Master page



FOOTSWITCH FS1

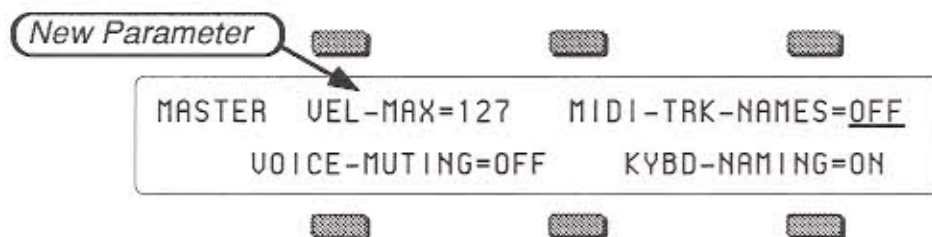
A new setting has been added to the list of options for the left footswitch of the optional SW-5 dual footswitch:

- ***STEP*** — this setting allows the pedal to be used in Step Entry record mode to advance the track location by the amount set in the step size parameter on the Step Entry page. This is the same as using the ***STEP*** command on that page.

BENDRNG — system pitch bend range

A new range of values, 00H to 12H, has been added to the system pitch bend range parameter. The "H" suffix on the semitone value indicates that the system **Pitch Bend Held** mode is active. In this mode, only keys that are actually being held down will be affected by the pitch bend wheel. The original parameter values, 00 to 12 with no suffix, will continue to act as they always have (refer to section 6-2 of the VFX^{SD} Musician's Manual for more information).

In addition, a new keyboard control parameter has been added to the second sub-page of the Master page:



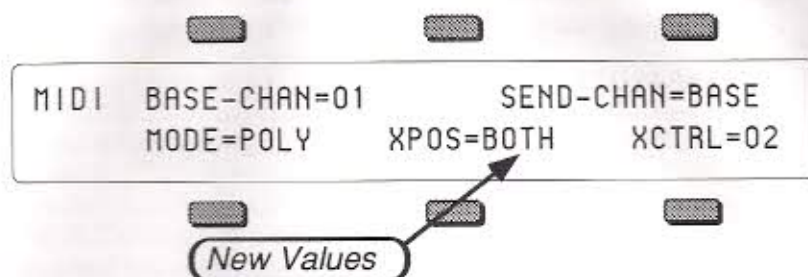
VEL-MAX — maximum keyboard velocity

This parameter determines the maximum keyboard velocity value that will be recognized and transmitted by the VFX^{SD}. The default setting is 127, which allows for the normal full range of velocity values. Lower settings limit the maximum value that will be used internally and sent out via MIDI. This can be useful when controlling devices which do not respond to the full range of velocity values, or can be used in conjunction with the TOUCH parameter to control just the top part of the velocity response curve.

Range: 001..127

4. Changes to the MIDI Control page

A new parameter has been added to the sub-page, and an existing parameter on the MIDI Control page has been modified:



XPOS — MIDI transpose enable

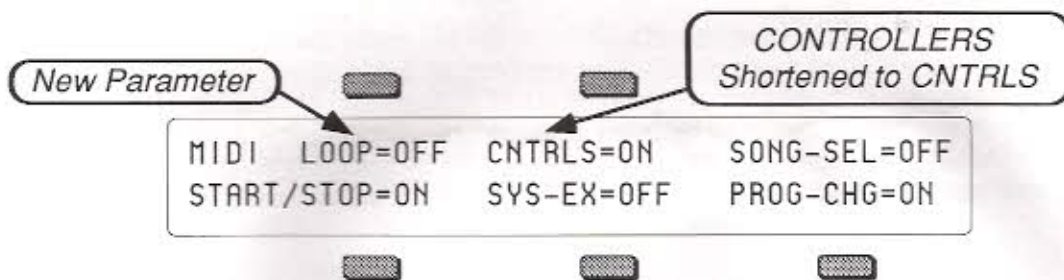
The MIDI Transpose Enable parameter on the MIDI Control page has been modified to give you more control over how the Performance Transpose function will affect notes played on a track.

- SEND—the VFX^{SD} will transmit the transposed key numbers of a track, but notes received from MIDI and the local keyboard will not be transposed. This setting is useful for sending transposed key numbers to an external MIDI device, without affecting the pitch of the internal sounds.
- RECV—the key number transmitted by the VFX^{SD} will always be the same key that was actually played on the VFX^{SD} keyboard. In this mode, the VFX^{SD} will respond properly when transposed data sent to an external sequencer is played back.
- BOTH—the VFX^{SD} will transmit and receive the transposed key numbers of a track. Useful for sending transposed key numbers to an external MIDI device, while also affecting the pitch of the internal sounds.

Working with MIDI Loops

It is now easier to use the VFX^{SD} with advanced MIDI setups, such as a computer sequencer in a *MIDI loop* with the VFX^{SD}. With a MIDI loop setup, the MIDI Out of the VFX^{SD} is either directly or indirectly (through an external device such as a computer) connected to the MIDI In of the VFX^{SD}. This type of "short circuit" can sometimes cause apparently strange problems, and the VFX^{SD} has been modified to make the MIDI loop configuration easier to manage.

The MIDI Loop switch enhances the functionality of the track MIDI STATUS performance parameter when the status is set to MIDI. Either the "*EXT*" or "MIDI" track status settings can be used to control external sound modules from VFX^{SD} tracks. The preferred setting for simply controlling external MIDI devices is "*EXT*" because nothing will be received by the sending track. To connect a VFX^{SD} track to a computer sequencer, the MIDI setting should be used. In this type of setup, a computer in MIDI Thru mode forms a loop which echoes the MIDI information back into the VFX^{SD}. To control this configuration, there is a new parameter on the the MIDI Control sub-page which has been added to control how certain MIDI functions are handled when a MIDI "loop" is active.



LOOP - MIDI Loop switch

The MIDI Loop switch parameter controls how volume information is handled *when the track status is set to MIDI*. It controls whether the track VOLUME parameter, as adjusted in the Performance section, will affect *outbound* MIDI. It only affects tracks with status set to MIDI. It is normally OFF, but in a MIDI loop setup it should be ON.

- OFF—this is the default setting; the VFX^{SD} will behave as it did in previous releases. When changes are made to the Performance Volume parameter (on tracks with status = MIDI) *or* the volume pedal, the VFX^{SD} will transmit MIDI volume (controller 7) messages which combine the track volume setting with the current setting of the volume pedal.
- ON—with this setting the VFX^{SD} will *not* transmit changes made to the Performance Volume parameter on tracks with status = MIDI. Volume pedal changes will be transmitted directly and are unaffected by the Performance Volume setting.

When LOOP=OFF, then the track VOLUME parameter, (or "mix") is combined (multiplied) with the volume pedal setting to create a composite volume, which is then transmitted to external sound modules as MIDI controller 7. In a MIDI loop situation with a computer, this is undesirable, because lowering the VOLUME will send controller messages which are indistinguishable from volume pedal messages. When this information is echoed by the computer, the VFX^{SD} receives it as volume pedal, lowering the volume on that track even further. Eventually this causes the volume pedal to spiral down to zero, which in turn causes the track to be silenced, even though the displayed volume setting is greater than zero. Turning on the switch will prevent this problem from occurring.

Note that the volume pedal is only active if CV-PEDAL=VOL on the Master page and that volume pedal changes will always be transmitted as MIDI volume (controller 7).

Hint for using Presets with MIDI Loops

For best results, set SEND=BASE and MODE=POLY on the MIDI Control page. Be aware that program changes (with the preset's number) are sent when you select a new preset, and are not sent for the individual track programs in the preset. Receiving from MIDI while on a preset page will minimize problems.

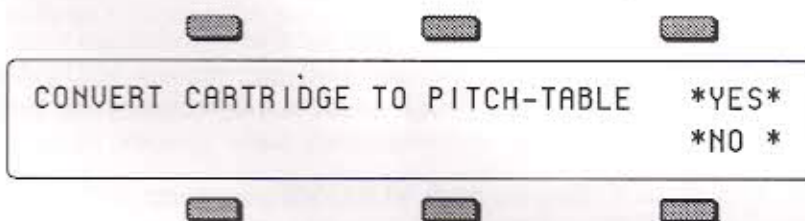
5. Pitch Table Cartridges

A new way of using pitch-tables has been added to allow you to easily switch between different system pitch tables in performance situations. With a special *Pitch-Table Cartridge* installed, you can instantly install new system pitch tables without affecting the sound you are playing by selecting programs containing pitch tables from the special cartridge. This allows you to change the tuning while playing, and without having to actually select a different sound.

In order for this new feature to work correctly, you must set the system pitch table switch to `SYSTEM PITCH-TABLE=CUSTOM` on the Master sub-page *before* "selecting" a new pitch-table program. If the program you indicate contains a valid pitch table, it will be installed into the system pitch table, and you will immediately hear the new tuning. If it does not, nothing will happen. In either case there will be no visible indication of your action. The program name will not be underlined when you "select" it, which is a good indication that you are using a Pitch-Table Cartridge.

If `SYSTEM PITCH-TABLE=NORMAL`, the indicated program will be selected from the cartridge normally, and you will hear it when you play the next note.

You can convert normal Program Cartridges (STC-32) into Pitch-Table Cartridges and back again by holding *Preset* and then pressing *Pitch*. You will see the message:



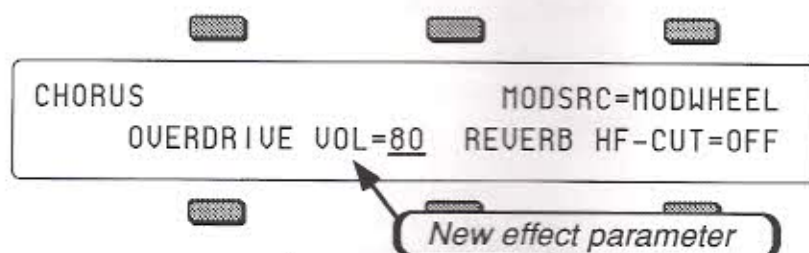
If you answer YES, then the cartridge will be converted into a Pitch-Table Cartridge. If you answer NO, then the cartridge will be converted back into a normal Program Cartridge. In either case you will be returned to the Preset page. If the conversion was unsuccessful, you will see the WRITE FAILED message. It is not possible to convert ROM cartridges (VPC-xxx and others).

You may save programs (with or without pitch tables) onto Pitch-Table Cartridges in the normal way. It is suggested that you name programs which are to be used to install pitch-tables with names which describe the pitch-table they contain. For example `*JUST-INTON` or `*EQUI-TEMP` OR `*BALINESE` are names that describe specific tunings. Naming with a leading "*" or some other indication of their special properties will be useful in making them easily recognizable.

In MIDI receiver modes OMNI, POLY, and MONO A, MIDI program changes 61 to 120 are able to select pitch tables from Pitch-Table Cartridges if `SYSTEM PITCH-TABLE=CUSTOM`.

6. New Effect - Chorus and Reverb with Distortion

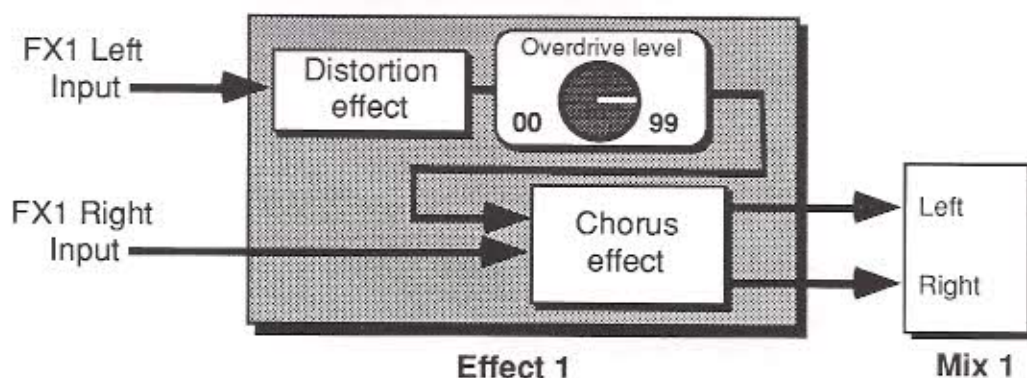
A new effect called DIST+CHORUS+REVB which combines the familiar Chorus and Reverb effect with Distortion has been added. On the third parameter page of this effect, the WAVESHAPE parameter has been replaced by the OVERDRIVE parameter. The chorus modulation waveshape for this effect is permanently set to SIN.



OVERDRIVE VOL — distortion output level

Range: 0 to 99 (16 values)

The new Overdrive parameter controls the *output level* from the distortion effect into the Chorus. *Input level* to the distortion effect is controlled by the Left input level to FX1. Panning full Left (value 00) on the Output page will result in maximum distortion, and panning full Right (99) will minimize distortion input drive. Modulation of Pan on the Output page can affect the amount of distortion.



7. Sequence Bank Utilities

A new way to select sequences has been added to certain sequencer edit pages. When a sequence name parameter is selected on the Song Edit, Append Sequence, Copy Track or Merge Track pages, an LED in one of the bank buttons will flash to show where the indicated sequence is located. Pressing a bank button will temporarily show the corresponding sequence bank page, and sequences may be selected using soft buttons. If the selection is valid, the page will then revert to the previous edit page with the new sequence name installed. In addition, you may select the destination Location for Copy Song or Copy Sequence by indicating a -BLANK- location on one of the bank pages. This will automatically install the corresponding location number and return to the copy command page.

8. Playing Tracks in Audition Mode

It is now possible to alternate between playing Old and New tracks in Audition mode *without* having the track restart from the beginning, making comparisons more convenient. If the sequencer is playing, each time Play New or Play Old is selected, the context will instantly switch. Pressing **Play** will play the selected track from the beginning.

9. Shortcut To Find The Current Sound

Double-clicking the **Sounds** button will display the program bank page which contains the current primary sound. This feature was added to make it easy to find the current program.

10. Sustain Pedal Changes

In previous versions, Sustain Pedal events were always transmitted via MIDI (except if track status was LOCAL) even if the Sustain Pedal Enable switch on the track was set to OFF. This has been changed, and now MIDI transmission of Sustain Pedal events is controlled by the switch.

11. Updating System Setup Files

System Setup files created with previous versions will need to be updated to work correctly with the new system. Load your old System Setup file and then set the following parameters to the values you wish them to have when you load the file:

- Master page: VEL-MAX=127 (default setting)
- MIDI Control page: LOOP=OFF (default setting)
- MIDI Control page: START/STOP=OFF (default setting)

After you have set the values, save the System Setup file under the same name.

12. Using older sequencer data created on previous O.S. versions

Be aware that older sequencer data *may* have been created or saved with invisible problems which can still confuse the sequencer, even if the conditions that originally caused the problem have been corrected. We recommend using the new software to re-create old sequences if you are having problems with old data.

13. Corrections to the VFX^{SD} MIDI Implementation Specification

Numerous changes and corrections were made to the VFX^{SD} SysEx documentation (Appendix A of the VFX^{SD} Musician's Manual). A complete revised version of Appendix A is now available upon request. If you need a copy, please write to:

ENSONIQ Corp.
MIDI Specification Desk
155 Great Valley Parkway
Malvern, PA 19355

Include your name and mailing address, and indicate that you need a copy of the current version of the "VFX^{SD} MIDI Implementation Specification".

The Virtual Button command has been modified to separate button up and down commands, allowing more complete simulation of front panel actions. This change is documented in the revised Appendix A.

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THE TECHNOLOGY THAT PERFORMS