

# Chapter 1 Before You Start (VS-1680 Terminology)

## I. Saving and Managing Data

### A. Data Organization

The grouping of data and audio recordings in the VS-1680 is referred to as the **song**. For example, on a cassette MTR, this would correspond to the actual cassette tape. In the VS-1680, up to 200 songs can be created per hard drive partition (see Drive Partitioning, page xx). The song currently being recorded, played back, or edited is referred to as the **current song**. The following data is included in a song:

- ó All data recorded on all V-Tracks
- ó MIDI clock information of the sync track
- ó Locators, Markers, Punch-In, Punch-Out points, Loop-In and Loop-Out points
- ó Mixer Scenes
- ó Vari Pitch settings
- ó System settings (system, MIDI, disk, etc.
- ó Effect settings
- ó AutoMix data

### B. Sources, Tracks, and Channels

When describing the recorder section and mixer section, this manual uses the terms “source”, “track”, and “channel”. It is important to understand the differences in the meanings of these terms:

- Source:** A signal which is put into the mixer section or recorded in the recorder. This term refers in particular to the signals of the analog input jacks (1 - 8) and the Digital In connector.
- Track:** A signal output from the recorder. It also refers to the location of a signal that is being recorded onto or played back from the hard drive.
- Channel:** A signal input to or output from the mixer section. This term refers in particular to the faders and buttons of the mixer section on the top panel.

### C. Takes, Phrases, and Playlists

On the VS-1680, audio data is managed in groups **called takes, phrases and playlists**. It is important to understand the differences in the meanings of these terms:

- Takes:** The data recorded to the drive is called a **take**. This recorded data includes audio wave data and time stamp information. Each new recording becomes one take. When you record material onto tracks that already have takes on them, the previous takes are not overwritten.
- Phrases:** The information that determines which take is played back, including the start and stop times is called a **phrase**. The length of the phrase may be the same as the length of the take, or a phrase may consist of part of a take. Additionally, you can use any number of phrases from the same take, or have a phrase playback repeatedly for looping. In the Playlist display, a phrase is indicated as one single block of information.

Graphic p 21 right column here

- Playlists:** A group of phrases assembled into a particular order is called a **playlist**. The playlist includes data that specifies which phrases are

played back and the order in which they are played. The VS-1680 features 256 Virtual tracks (V-tracks), and a maximum of sixteen tracks can be played back simultaneously. The playlist consists of a group tape-like graphics spread out across the sixteen playback tracks, where each graphic represents a phrase of audio.

#### D. About Events

The smallest unit of memory used by the VS-1680 to store recorded information on the drive is called an **event**. Each new song has approximately 18,000 events available. The number of events used per operation depends on the operation. For each track, one recording pass uses up two events. Operations such as punch-in and punch-out, or track copy also use up events. AutoMix data (p. xx) uses up six events per Marker. Even when your drive has ample free space, it is possible for one song to use up all the available events, in which case no more data can be recorded to the song. You can maximize the remaining number of events by using one of the following procedures. Use the one most appropriate for your situation.

- **Execute Song Store (p xx)**  
Use Song Store if the UNDO indicator is lit. Events reserved for REDO will be released. Note you cannot cancel the last UNDO after you perform Song Store.
- **Execute Song Optimize (p.xx)**  
Use Song Optimize if you have done many Punch In recordings. Events reserved by unused audio data will be released. Note, after performing Song Optimize, you will only be able to UNDO one level.
- **Erase AutoMix data (p. xx)** AutoMix uses six events per AutoMix marker. After you have bounced a group of tracks using AutoMix, erase the AutoMix data. This will free up the events being used by the AutoMix.

#### E. About Button Names

There are two groups of buttons referred to as SELECT buttons. The top row of SELECT buttons are the Input Select buttons. The right end of this top row also includes the Select buttons for the Stereo Input, Effect Returns 1/3, and Effect Returns 2/4.

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The middle row of buttons are the Track Select buttons.

## II. Mixer Section

The digital mixer specifies input or output of the recorder section. The VS-1680's mixers include the **input mixer**, which is situated before the recording section in the signal path; the **track mixer**, which is placed after the recording section; and the **Master Block**, which is used for determining which jacks and connectors output the signals from each of the busses.

During recording, the 10 channel Input Mixer and the 16 channel Track Mixer work independently. During a mixdown session, these two mixers can work side by side, for a total of 26 channels. The Input Mixer can be used to bring in additional sources into the master mix, such as tracks from a MIDI sound module or another multitrack recorder.

*\* For more detailed information about the mixer section, refer to the "Mixer Section Block Diagram" (Appendices p. 60)*

#### A. Signal Flow (Busses)

On the VS-1680, signals flow through busses. **Busses are shared paths through which multiple signals can be routed efficiently to multiple tracks or channels.** It may be easier to understand this if we use the analogy of water pipes. For example, the water supplied by the water company to your house is branched to a variety of locations within the house

(kitchen, bathroom, toilet, etc.) The water used at each of these locations is then collected into the sewer and carried away.

Graphic p 23 center

If we think of the VS-1680 as the house, the water supplied from the water company corresponds to inputs such as mics or a guitar. Some of these inputs are sent to tracks and are recorded. Other inputs may be sent to the effects, and reverb or chorus applied before they are output.

The basic principle for operating the VS-1680 is by specifying **from where** and **to where** the common lines run, you can determine which input signal will be recorded on which track, or sent to which effect, and where it will be output.

Each bus in the VS-1680 is described below:

**1. RECORDING Bus:**

Signals assigned to the RECORDING bus are routed to the recorder section to be recorded. Up to eight channels can be assigned from the output of the Input Mixer, track mixer, or effects return section. Signals assigned to the RECORDING bus cannot be routed to the MIX bus.

**2. MIX Bus:**

Signals assigned to the MIX bus are sent to the MASTER jacks for monitoring. The MIX bus is two channels (left and right) and can take signals which are output from the input mixer, the track mixer, the effects return section, and the stereo input. Signals assigned to the MIX bus cannot be routed to the RECORDING bus.

**3. EFFECT Bus:**

Signals from either the input mixer, track mixer, or the Master Block assigned to the EFFECT bus are sent to the VS8F-2 Effects. The Effects Bus has eight channels (EFX 1 left, EFX 1 right, EFX 2 left, EFX 2 right, EFX 3 left, EFX 3 right, EFX 4 left, EFX 4 right). Signals assigned to the RECORDING bus as well as to the MIX bus can also be routed to the EFFECT bus.

**4. AUX Bus:**

Signals assigned to the AUX bus are routed to the AUX jacks for additional mix monitoring. This bus has six channels (AUX 1 left, AUX 1 right, AUX 2 left, AUX 2 right, AUX 3 left, AUX 3 right) and can take signals from the input mixer and the track mixer. Signals assigned to the RECORDING bus as well as the MIX bus can also be routed to the AUX bus. Use the AUX bus for connecting external effect processors, or for creating headphone mixes during recording sessions. The AUX bus can also be used to provide Direct Track outputs.

**About the EFFECT bus and AUX bus:**

The mixer architecture of a VS-1680 with two of the VS8F-2 boards installed is a bit different than a VS-1680 with only one VS8F-2 installed. If a VS-1680 has two VS8F-2 Effect boards installed, the AUX bus (AUX 1 left, AUX 1 right, AUX 2 left, AUX 2 right) is re-labeled as the EFFECT bus for EFX 3 and EFX 4.

**B. Input Mixer**

The 10 channel Input mixer is placed before the recorder section, and is used to make settings on the external input sources (INPUT 1 - 8, DIGITAL IN L/R).

graphic p 25

The signal coming from the Input mixer is typically assigned to tracks to be recorded. The fader levels of the input mixer will affect actual track recording levels. Any EQ settings made on the input mixer will be recorded. Channels not assigned to tracks are output directly from

the MASTER jacks. Tracks with signals assigned to them and in SOURCE status (status indicator orange) are also output from the MASTER jacks. The following signals are assigned to the channel faders:

<b>Channels 1 - 8:</b>	INPUT jacks 1 - 8
<b>DIGITAL:</b>	DIGITAL IN connector L/R
<b>ST IN:</b>	Sources assigned to the STEREO IN (p. xx)
<b>EFFECT 1:</b>	EFX 1 and EFX 3 return level
<b>EFFECT 2:</b>	EFX 2 and EFX 4 return level

### 3. Track Mixer

The 16 channel Track Mixer is located after the recorder section, and corresponds to recorded tracks (1 - 16).

Graphic p 26 top

All tracks are output from the MASTER jacks. Tracks can also be routed back to the Recording Bus for bouncing or re-recording. Channel faders 1 - 16 correspond directly to Tracks 1 - 16.

### C. Switching the Fader Functions

On the VS-1680, the channel faders can be assigned to adjust levels for either the input mixer or the track mixer. Press [FADER/MUTE]. This button switches the channel faders between controlling the input mixer and the track mixer. The button indicator indicates which mixer is currently selected.

graphic p 26 bottom

When "TR" is lit, the faders are assigned to and will mix the recorded Tracks. When "IN" is lit, the faders are assigned to the Inputs, Digital In, Stereo In, and Effect Returns, and cannot be used to change Track levels.

### D. Master Block

The Master Block determines which signal is routed to each of the output jacks and connectors.

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## III. Recorder Section

### A. Differences with a Tape-type MTR

Unlike DAT recorders which use tape, digital disk recorders record audio on a hard drive. Music recorded on a hard drive can be recalled and played back immediately, no matter where it is located on the drive. This is obvious from the difference in speed at which you can move from the beginning of a song to the end of a song, compared to a tape-based recorder. The ability to move quickly to a point in the song regardless of the time or sequence at which it was recorded is known as **random access**. In contrast, having to move to a point in the song based on the sequence at which it was recorded is known as **sequential access**. With random access, functions such as Return to Zero (Zero Rewind) are instantaneous.

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### B. Track Minutes and Recording Time

With tape recorders, the amount of audio you can record is determined by the length of the tape. Any unused portion of the tape is wasted.

Graphic p 28 top

With the VS-1680, the total recording time available on the hard drive depends on two things: the **sample rate** selected and the **recording mode** selected. Both the sample rate and the recording mode can be chosen on a song-by-song basis.

Recording times are normally described in terms of **track minutes**. To figure out available recording time if 16 tracks were recorded continuously from start to finish, divide the total number of available track minutes by 16. Keep in mind however you won't likely have all 16 tracks playing from start to finish. You can have several minutes of vocal takes on one track, whereas another track might use only 30 seconds of recording time because it was punched in on only a few times during the song. Unused drive space on one track is automatically available to be used on another. This method of using all available drive space is called **dynamic allocation**. The VS-1680 dynamically allocates its recording time as needed by each track.

Graphic p 28 bottom

For example, 10 track minutes can be used for 10 minutes of recording on just one track. Or, it can be used for recording 5 minutes on two tracks. Or, it can be used for recording 2 \_ minutes of recording on four tracks, and so on.

graphic p 29 top

The VS-1680 also makes use of **pointer-based editing**, so using the same material more than once, as in a drum loop or multiple copies of the same guitar part for different sections of the song, does not use any additional drive space.

### C. Virtual Tracks

You can record up to 256 tracks per song, and choose any 16 of these for playback. The 256 tracks are called **Virtual Tracks**, or **V-tracks**. Any combination of 16 of the 256 V-tracks can be assigned to any of the 16 track mixer channels using Track Editing (p. xx).

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*\* You'll find a blank track sheet in the Appendices p. 72, to help you keep track of your V-track recordings. Feel free to copy the track sheet to use for each recording session.*

## IV. Effects Section

### A. About The Effects Expansion Board

Up to two optional VS8F-2 effect expansion boards can be installed in the VS-1680. If your VS-1680 has two of the optional VS8F-2 Effect Boards installed, you can use four different stereo effects while recording or during mixdown. These effects can be used on both your recorded tracks, as well as on inputs while recording.

With just one VS8F-2 installed, you will only be able to use EFFECT A (EFX 1 / 2). With two VS8F-2s installed, you will be able to use both EFFECT A (EFX 1 / 2) and EFFECT B (EFX 3 / 4).

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*\* To install the VS8F-2, please refer to "Installing the Effect Expansion Board" (Quick Start p. 57)*

### B. Connecting Effects

There are two ways to use effects in the VS-1680.

**1. Insert:**

The effect is directly added either between each channel's EQ and fader, or before the master fader.

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Effects such as Compressors, EQs, Guitar Amp Simulators and Mic Simulators are normally used as Inserts. **Important Note:** If you set up an effect as an insert on either a Track or an Input, it cannot be used on any other Tracks or Inputs. For example, if you set up Effect 1 as preset P067 Limiter and insert it into Input 3, no other inputs or tracks can be routed to Effect 1.

**2. Send/Return:**

In addition to the RECORDING bus and the MIX bus, the output of each channel can also be sent to the EFFECT bus. Use this routing when you want to mix the dry sound (without effects) and the wet sound (after the effect has been applied). Effects such as Reverbs, Delays, Chorus, and others are typically used as a Send / Return Loop.

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All 26 channels of the VS-1680's mixer can be routed to a single effect as a Send / Return Loop. For example, you could have up to 26 different channels routed to the same Reverb, with different SEND levels on each channel.

If you're not sure whether an effect is supposed to be used as an Insert or a Send / Return Loop, check the VS-1680 APPENDICES manual, beginning on page 74 for the VS8F-2 Preset Patch List. The Type is indicated in the chart.

## V. Explanations used in this Manual

1. Actual front panel buttons are indicated in square brackets [ ]. For example, [STOP].
2. The VS-1680 has two different buttons labeled PLAY. In this manual, they are differentiated as follows:  
[PLAY] indicates the transport control button to begin song playback.  
[PLAY(DISPLAY)] indicates the button located to the left of the TIME / VALUE dial.
3. Some buttons have more than one label. The button label written in white with a white line box around it (for example STORE) indicates the function the button performs when [SHIFT] is pressed together with this button. In this manual, typically only the primary button function will be indicated. However, for a few cases, both button labels will be indicated, such as when indicating [PLAY(DISPLAY)].
4. The label for a FUNCTION button will appear directly above the button in the display, for example, [F1(ZOOM+)].
5. Commands or questions appearing in the display are indicated in quotes. For example, "STORE Current ?".
6. The mixer section of the VS-1680 has a row of STATUS buttons for each of the tracks. The command "Press Track 3 STATUS" means "press the STATUS button for Track 3".
7. The mixer section has a row of SELECT buttons for each of the ten inputs, and a row of SELECT buttons for each of the 16 tracks. Input SELECT buttons will be differentiated

from Track SELECT buttons as follows: "Press Track 4 SELECT" or "Press Input 7 SELECT". The top row of SELECT buttons are the Input Selects. The middle row of buttons are the Track Select. (The bottom row of buttons are not SELECT buttons - they are the TRACK STATUS buttons).