

Chapter 4 Recording Operations

I. Preparing for a New Recording

A. Items Necessary for Recording

- VS-1680
- Internal IDE hard drive
- Audio equipment for the Master Out signal, or stereo headphones
- Recording source (electric guitar, synthesizer, CD player, etc.) or microphones

? IDE (Appendices p. 64)

B. Create a New Song

Recording cannot take place while a demo song is selected. **This is because the demo songs are protected from being changed or overwritten** (p. xx). Use the following procedure to create a new song. This process is analogous to exchanging reels of tape on a multi-track recorder.

1. Hold [SHIFT] and press [F1(SONG)]. The Song menu icon is displayed.
2. Press [F2(NEW)]. If "NEW" does not appear above [F2], press [PAGE] until "NEW" appears above [F2], and then press [F2(NEW)].
3. Press [F1(Name)]. The Song Name screen appears in the display.
4. Using [←], [→], [↑], and [↓], and the TIME / VALUE dial, enter the name of the song.

graphic here p 58 left column bottom

The function buttons work as shown below.

[F1(Hist)]: Pressing this button will take you through a list of the last 20 song names, one at a time.

[F2(Clr)]: Clears all the characters in the window.

[F3(Del)]: Deletes the character where the cursor is positioned.

[F4(Ins)]: Inserts a space where the cursor is positioned.

[F5(Write)]: Stores the song name and exits the Song Name screen.

[F6(EXIT)]: Exits the Song Name screen without storing the song name

5. When you are done entering the song name, press [F5(Write)].

Song Names

It is not necessary to name your song every time you create a new song. When you create a new song, it will automatically be given a name like "InitSong 001". However, this makes it difficult to remember what song it is. We suggest you assign a unique name to your song to help you keep track of it. You can change the name of the song later, if desired.

6. Use [←], [→], [↑], and [↓], and the TIME / VALUE dial to select the settings for the Sample Rate, Record Mode, Icon, Copy System PRM, and Copy Mixer/Scene PRM, as explained below.

Sample Rate

Choose 32 kHz, 44.1 kHz or 48 kHz for the sample rate. If you are planning to use a digital source and want to make a digital connection, you must match the sample rate to that of the digital source. **If you are planning to make a CD of your own original music, select 44.1 kHz.** You cannot change the sample rate after the song is recorded. In addition, you cannot mix different sample rates in the same song.

Record Mode

This selects how the song uses drive space. Once a song is created, the Record Mode cannot be changed.

MTP (Multi-Track Pro): Compatible with professional quality equipment (digital mixers, digital effects, processors, etc.). This provides the highest recording quality for recording and editing.

MAS (Mastering): Compatible with CD players and DAT recorders. Songs recorded with this Recording Mode can only playback eight tracks at a time. Tracks 9 - 16 cannot be used. This mode is appropriate for recording two channel stereo masters.

MT1 (Multi-Track 1): This recording mode provides approximately twice the recording time than MAS Mode.

MT2 (Multi-Track 2): This recording mode provides even longer record times than MT1.

LIV1 (Live 1): This mode is appropriate when your hard drive lacks much free space or when recording live performances, where the total recording time is unknown.

LIV2 (Live 2): This mode provides the longest record time. This mode is appropriate for live recordings of speeches, and recordings made for reference purposes. Use this mode if you have very little drive space left, and you aren't sure how long the recording will be.

Icon

Select from one of seven graphic icons to represent your song.

Copy System PRM (Copy System Parameters)

When set to "on", you can create a new song that has the current song's System Parameters copied to it. This means you don't have to go back to the System menu to recreate your favorite settings. This includes settings such as preview length (p. xx), metronome settings (p. xx) and so on. Note Global System Parameters under [F2(GLOBL)] are not copied.

Copy Mixer / Scene PRM (Copy Mixer / Scene Parameters)

When set to "On", you can create a new song that has the current song's mixer settings and stored Scenes.

7. Press [F4(EXEC)] to accept the settings. "Create New Song, Sure?" appears in the display.
8. Press [YES]. "STORE Current?" appears in the display.
9. If you wish to save any changes or edits made to the current song, press [YES]. **If the current song is a demo song, press [NO].** After the new song is created, the Song menu icon appears in the display.
10. Press [PLAY(DISPLAY)] to return to the Playlist display. The new song is now the current song selected for recording.

About Recording Times

The available recording time for a hard drive depends on the Recording Mode chosen, the Sample Rate, and the size of the hard drive. Both the Recording Mode and the Sample Rate can be selected on a song by song basis. Recording time in track minutes for 2.1 GB hard drive is shown below:

? Track Minutes (Appendices p. 65)

Recording Mode	Sample Rate		
	48 kHz	44.1 kHz	32 kHz
MTP	742 mins.	808 mins.	1114 mins.
MAS	370 mins.	404 mins.	556 mins.
MT1	742 mins.	808 mins.	1114 mins.

MT2	990 mins	1078 mins.	1484 mins
LIV1	1188 mins.	1292 mins.	1782 mins.
LIV2	1484 mins.	1616 mins.	2228 mins.

(All times approximate)

** The above chart is a general yardstick for estimating record times. Actual times may be somewhat shorter depending on your hard disk's specifications or the number of songs created.*

If "Drive Busy!" is Displayed

If this message appears during recording or playback, it means the drive cannot catch up with the data read / write speed. In such instances, create a new song using a lower sample rate or recording mode, and record over.

Song Numbers

On the VS-1680, every song is assigned a number. Newly created songs are given the lowest available number. For example, if there are five songs on the hard drive, the next newly created song will be assigned song number 6. If song number three is deleted, the remaining songs will be numbered 1, 2, 4, 5, and 6. The next new song created will be assigned song number 3.

Graphic p60 left column here

II. The Recording and Mixing Process

The recording procedure with the VS-1680 is similar to the process of recording with traditional multi-track recorders. The general process of recording a song is outlined below.

1. Connect instruments and microphones to the VS-1680.
2. Record the basic rhythm tracks (i.e. drums, bass, etc.).
3. Record the other parts (electric guitars, synthesizers, vocals, etc.) while playing back the basic rhythm tracks.
4. If there are any mistakes in the process, record over the places where they occurred using punch-in and punch out.
5. Adjust the volume level, panning, equalization, and other settings for each track.
6. If you run out of empty tracks, you can merge the contents of two or more tracks onto a different track using track bouncing (p. xx).
7. Mix down the tracks to your stereo recorder to make a master tape. Or, bounce down the tracks to a stereo track within the VS-1680 to make your own original CD using the optional CD recorder.

III. Connecting Instruments

1. Pull the master fader all the way down.
2. Connect instruments and microphones to the INPUT jacks.

The INPUT 8 jack and the GUITAR (Hi-Z) jack cannot be used simultaneously. The GUITAR (Hi-Z) jack takes priority when connections are made to both jacks at the same time. If you wish to use the INPUT 8 jack, make sure nothing is plugged into the GUITAR (Hi-Z) jack.

? GUITAR (Hi-Z) (Appendices p. 63)

** The pin assignment for the XLR type connectors is as shown below. Before making any connections, make sure this pin assignment is compatible with all of your other devices.*

Graphic p 60 right column bottom

** To prevent feedback from occurring, pay attention to the position of "live" microphones connected near active speakers. If feedback occurs:*

1. Change the position of the microphones.
2. Move the microphones farther from the speakers.
3. Lower the volume levels

IV. Recording To The Tracks

1. Select a track to record on. While holding down [REC], press the STATUS button for that track. The STATUS button will begin blinking red to indicate "record ready".
2. To select the source to be recorded to the track, press and hold the STATUS button for the track to be recorded. Then press the input SELECT button for the input you want assigned to the track. The SELECT button will blink.

graphic p 61 middle

3. Adjust the input sensitivity with the INPUT knob for each input. Provide a strong input signal by having instrument volumes as high as possible. Raise the INPUT level as high as possible without having the PEAK indicator light up. The level meters should show signal peaking between -12 dB and 0 dB.
4. Press [REC]. The button indicator blinks red.
5. Press [PLAY]. The button indicator lights green, and recording starts.
6. When the performance is finished, press [STOP].
7. To listen to the recorded performance, press [ZERO] to return to the beginning of the song.
8. Press [PLAY] to begin playback of the song.
9. Use the channel faders and the master fader to adjust channel volumes to an appropriate volume.
10. If you are satisfied with the results of your recording, save the song to drive, using the procedure described in "Saving a Recorded Performance" (p. xx).

Sources Assigned to Tracks

In a newly created song, the inputs are assigned to tracks as shown below. This is the default mixer routing.

Graphic p 61 bottom

What to do About Low Level Input Signals

Occasionally, you may have a source which has a very low input level, for example when using a large diaphragm dynamic mic to record a soft-spoken vocalist. Use the steps below to provide extra gain to low level inputs:

1. Turn the INPUT sensitivity knob all the way clockwise.
2. Press the input SELECT button. There are two settings in the Input Mixer page which will provide additional recording signal gain:

ATT (Attenuation): Besides attenuation, this can also provide up to 6 dB of gain.

Fader: This is the fader for the input mixer. Since all input sources pass through the input fader before going to the recorder, the position of this fader will determine recording

levels. The position of this fader defaults to 100, which corresponds to unity gain. This fader setting can be increased up to 127.

When You Are Recording In Stereo

When recording to tracks 9/10 - 15/16 (stereo tracks), or when recording to tracks with Stereo Link (p. xx) on, you can set the pan for each input channel. After step 3, perform the procedure described below.

- 3.1 Press the SELECT button for the input you want assigned to the track.
- 3.2 Press [F1(Pan)]. If "Pan" does not appear in the display, first press [PAGE] until "Pan" is displayed, then press [F1(Pan)]. Or, you can use [←], [→], [↑] and [↓] to move the cursor to "Pan".
- 3.3 Use the TIME / VALUE dial to change the pan setting.

Graphic p 62 right column here

Master Send Switch

When this is set to "On", each input is sent to the MIX bus. Keep this setting to "On" when you want to simply mix the inputs without recording them.

Master Send Pan

This adjusts the pan setting (L63 - R63) of the signal sent to the MIX bus and the RECORDING bus.

- 3.4 Repeat steps 3.1 through 3.3 for all inputs you want to make pan settings on. If you are recording a mono source to a mono track, it is not necessary to change the pan setting.
- 3.5 When you're done, press [PLAY(DISPLAY)] to return to the Playlist display.

V. Recording on Other Tracks (Overdubbing)

In multi-track recording, the normal process is to record new tracks while listening to previously recorded tracks. This is referred to as "overdubbing".

1. Select the tracks you want to playback. Hold [STOP] and press the STATUS button for the tracks you want to playback (i.e. that you want to hear while overdubbing). The STATUS buttons light green.
2. Select the tracks you want to record. Hold [REC] and press the STATUS button for the tracks you want to record. The STATUS buttons light red.
3. Select the inputs to record for each track. While holding the STATUS button for the track you will record, press the input SELECT buttons for the input you want assigned to the track. The SELECT button will blink, indicating it is now assigned to the track.
4. Now you are ready for overdubbing. Follow the steps 4 - 17 of "Recording to the Tracks" (p. xx) to record and then check the content.

VI. Recording using different Virtual Tracks

The VS-1680 features 16 recordable tracks per channel. These are called **Virtual Tracks**, or V-tracks. By using the V-tracks, you can record up to 256 tracks per song. You can use Virtual Tracks to record over and over on the same track without erasing or losing the previous recording.

1. Press the SELECT button for the track whose V-track you wish to change. The button indicator lights. The Track Mixer screen appears in the display.
2. Press [F5(V.Trk)]. If "V.Trk" does not appear above [F5], press [PAGE] until it appears, and then press [F5(V.Trk)]. Or, you may simply use [⇐], [⇒], [↑], and [↓] to move the cursor to "V. Trk" in the Track Mixer display.
3. Use the TIME / VALUE dial to choose the V-track you want to use. Note, you cannot change the V-track while the song is playing. If the song is playing, press [STOP], and then use the TIME / VALUE dial to choose the V-track.

Graphic p 69 left column top

4. Press [PLAY(DISPLAY)] to return to the Playlist display.

Begin recording as explained in "Recording To The Tracks" (p. xx).

VII. Saving A Recorded Performance (Song Store)

The contents of a recorded performance will be lost if you simply turn the power off, or if there is an accidental power failure or power outage. When you switch songs or change disks, a message will ask you to confirm whether the currently selected song should be saved ("STORE Current?" p. xx). Also, the contents of a recorded song can be lost due to unforeseen accidents, such as a power failure or power outage. **Once lost, the contents of a recorded song cannot be restored to the previous condition.** To prevent this from happening, use the following procedure to save your songs on the hard drive.

? Current Song (Appendices p. 63)

** When handling important song data, or when using the VS-1680 for extended periods, we strongly recommend you use the Song Store procedure frequently.*

1. Hold [SHIFT] and press [ZERO/(STORE)].
2. "STORE OK?" appears in the display. Press [YES]. If the song is saved properly, the initial display reappears. If you wish to cancel the STORE command, press [NO].

VIII. Track Status Buttons

The status for each track changes each time you press its STATUS button. You can determine the status by the color of the button:

Orange:	SOURCE. The input source assigned to the channel is heard.
Blinking Red:	RECORD READY. The track is ready to be recorded. When blinking red, previously recorded material on the track will be heard.
Blinking Red / Orange:	RECORD READY
Solid Red:	RECORDING. Signal is being recorded on that track.
Green:	PLAY. The track will playback.
Off (unlit):	MUTE. The track is muted.
Blinking Red / Green:	PLAY and RECORD. Indicates playback from and record to the same track simultaneously.

Using the Track Status Buttons

1. To put a track directly into RECORD READY status, press and hold [REC] and press the track's STATUS button once.

2. To put a track directly into PLAY mode, press and hold [STOP] and press the track's STATUS button once.
3. While in playback, the STATUS button will only change from green to unlit (mute) each time it is pressed.
4. To assign an input to a track for recording, press and hold the track's STATUS button, and then press a SELECT button for the input (or track) you want to record.

IX. Manual Punch In & Punch Out

Sometimes when listening to a recording, you may find sections containing mistakes or lyrics that were sung incorrectly. You may want to correct these sections without re-recording the entire track, or without starting the song over. In such instances, use the following procedure for re-recording only selected parts. The switching from playback to record while the song is playing is called **punch-in**, and the switch from recording back to playback is called **punch-out**.

A. Manual Punch-In using The RECORD Button

Use the transport control buttons to punch in and out.

Graphic p 63 left column bottom

1. Hold down [REC] and press the STATUS button for the track you wish to re-record.
2. Press [ZERO] to return to the beginning of the song.
3. Press [PLAY] to begin song playback. At this point, you will hear the performance which was already recorded on the track.
4. Press the STATUS button. The indicator alternately blinks red and orange. Confirm that you can hear the source you want to record in the monitors or headphones.
5. During playback of the song, each time the STATUS button is pressed, you will alternately hear the previously recorded track, and then the source (input). If necessary, use the input sensitivity knob to adjust the input level of the source so it matches the level of the recorded track.
6. Once you have adjusted the input sensitivity, press [STOP].
7. Move to the section of the song where you wish to re-record.
8. Press [PLAY] to begin playback of the song.
9. When you reach the exact point in the song you wish to re-record, press [REC]. The VS-1680 goes into record mode, and begins recording the new performance.
10. When you have finished recording, press [REC] once more to punch-out.
11. Each time the [REC] button is pressed, the recorder alternately punches in and out. Repeat steps 9 and 10 for any other tracks you wish to re-record.
12. Press [STOP] to stop the song.
13. To listen to the results of the punch-in and punch-out, press [ZERO] to return to the beginning of the song and press [PLAY].

B. Manual Punch-In using the Foot switch

Performing a manual punch-in punch-out when both playing an instrument and recording is difficult. In such cases, it is convenient to use a foot switch (such as the DP-2 or BOSS FS-5U) to do your switches.

Graphic p 64 top left column

Connect the optional foot switch to the VS-1680's FOOT SWITCH jack.

Graphic p 64 left column, middle

1. Hold [SHIFT] and press [F5(SYSTEM)]. The System menu icon appears in the display. If the System menu does not appear, press [F6(EXIT)].
2. Press [F1(SYSPM)]. If "SYSPM" does not appear above [F1], press [PAGE] until "SYSPM" appears, then press [F1(SYSPM)].
3. Using [⇐], [⇒], [↑], and [↓], select "Foot Sw.". If "Foot Sw" does not appear in the display, press [F2(Prm 2)].

Graphic p 65 bottom left column

FootSw (Foot Switch)

Set the function of the foot switch connected to the FOOT SWITCH jack.

Play/Stop:	Repeats playback and stop each time the foot switch is pressed.
Record:	Performs the same function as [REC]. Use this setting for performing punch-in and punch-out using a foot switch.
TapMarker:	Performs the same function as [TAP]. Pressing the foot switch places a Marker at the current position of the time line.
Next:	Performs the same function as [NEXT]. Moves the time line to the beginning or end of the next phrase each time the foot switch is pressed.
Previous:	Performs the same function as [PREVIOUS]. Moves the time line to the beginning or end of the previous phrase each time the foot switch is pressed.
GPI:	Controls playback and recording of the song depending on the GPI trigger signal received from the FOOT SWITCH jack.

? GPI (Appendices p. 63)

4. Select "Record" with the TIME / VALUE dial.
5. Press [PLAY(DISPLAY)] to return to the Playlist display.

Now, you can punch-in and punch-out of record using the foot switch. Follow the same steps as if you were going to perform a Manual Punch In (p. xx), but use the foot switch instead of the [REC] button to perform the operation.

X. Auto Punch In & Punch Out

You can automatically punch in and punch out at pre-programmed locations. This is called **Auto Punch In**. This is convenient when you need to punch in or out at a precise time. Before you begin recording, set the times for punch in and punch out. There are three ways to set these times as described below. Use the method appropriate for your situation.

A. Using Locators

1. Find the position in the song where you want to punch in. Place a locator at that point. Find the position in the song where you want to punch out. Place another locator there.
2. While holding down [AUTO PUNCH], press the locator corresponding to the punch in point.
3. While continuing to hold [AUTO PUNCH], press the locator corresponding to the punch out point.

Graphic p 65 left column top

B. Using Markers

1. Place two markers, one at the desired punch in point, and one at the desired punch out point.
2. Move to the marker which corresponds with the punch in point.
3. Hold [AUTO PUNCH], and press [NEXT].
4. Without releasing [AUTO PUNCH], press [PREVIOUS].

Graphic page 65 left column bottom

C. Programming Points during Song Playback

1. Press [PLAY] to begin song playback.
2. Press and hold [AUTO PUNCH] as the song is playing. When you reach the desired punch in location, press [TAP].
3. Continue to hold [AUTO PUNCH]. When you reach the desired punch out point, press [TAP] again.
4. Press [STOP].

Graphic p 65 right column top

D. Editing Punch In and Punch Out Points

1. Hold [SHIFT] and press [AUTO PUNCH].

Graphic p 65 right column bottom here

2. The punch in and punch out values appear in the display. Use [←] and [→] to move the cursor to the value you want to adjust. If no value is stored, “—h—m—s—f ----” appears in the display. The function buttons work as shown:

[F1(In)]:	Moves the cursor to the punch in location.
[F2(NOW)]:	Enters the current time as the punch in or punch out point.
[F3(JUMP)]:	Moves the timeline to the currently stored punch in or punch out point.
[F4(Out)]:	Moves the cursor to the punch out location.
[F6(EXIT)]:	Exits the screen. Returns to the Utility menu screen.

4. Enter the new value using the TIME / VALUE dial.
5. When you are done making changes, press [PLAY(DISPLAY)] to return to the Playlist display.

E. Recording Procedure when using Auto Punch

1. Hold [REC] and press the STATUS button for the track you wish to re-record. It begins blinking red.
2. Press [ZERO] to return to the beginning of the song.
3. Press [PLAY] to begin song playback. At this point, you will hear the **performance which has already been recorded** on the track.
4. Press the STATUS button. The indicator alternately blinks red and orange. Confirm that you can hear the **source you want to record** in the monitors or headphones.
5. During playback of the song, each time the STATUS button is pressed, you will alternately hear the previously recorded track, and then the source (input). If necessary, use the input sensitivity knob to adjust the input level of the source so it matches the recorded level of the track.
6. Once you have adjusted the input sensitivity, press [STOP].
7. Press [AUTO PUNCH]. The button indicator will be lit.

8. Locate to a point several seconds or measures before the auto punch in point.
9. Press [REC]. The button indicator will blink red.
10. Press [PLAY] to begin playback of the song.
11. The VS-1680 will automatically go into record mode where the punch in point was set.
12. The VS-1680 will automatically go out of record where the punch out point was set. Once you've passed the punch out point, press [STOP].
13. To listen to the results of the punch-in and punch-out, press [ZERO] to return to the beginning of the song and press [PLAY].
14. Press [AUTO PUNCH] to disable auto punch when you are finished. The button indicator will be unlit.

XI. Loop Recording

You can playback a specific section of the song over and over again, and use Auto Punch In recording to record many quick takes. This is called **Loop Recording**. This is convenient when you want to rehearse a section of the song, or record a number of takes of a solo, and compare the different takes.

Graphic page 66 right column center

Before you begin recording, specify the begin and end times for the loop. There are three ways to specify the loop times. Use the method appropriate to your situation.

** To specify the punch in and punch out points, refer to the previous section "Auto Punch In"*

** Make settings so the loop completely includes the area to be recorded (i.e. from the punch in point to the punch out point). If the area to be recorded is not completely inside the loop, recording may not start at the correct location, or may be interrupted in the middle of the area for recording.*

A. Using Locators

1. Find the position in the song where you want to start the loop. Place a locator at that point. Find the position in the song where you want to end the loop. Place another locator there.
2. While holding down [LOOP], press the locator corresponding to the start point.
3. While continuing to hold [LOOP], press the locator corresponding to the end point.

Graphic p 67 left column top

B. Using Markers

1. Place two markers, one at the desired start point, and one at the desired end point.
2. Move to the marker which corresponds with the loop start point.
3. Hold [LOOP], and press [NEXT].
4. Without releasing [LOOP], press [PREVIOUS].

Graphic page 67 left column bottom

C. Programming Points during Song Playback

1. Press [PLAY] to begin song playback.
2. Press and hold [LOOP] as the song is playing. When you reach the desired location for the start of the loop, press [TAP].

3. Continue to hold [LOOP]. When you reach the desired ending point, press [TAP] again.
4. Press [STOP].

Graphic p 67 top right column

D. Editing Punch In and Punch Out Points

1. Hold [SHIFT] and press [LOOP].

Graphic p 67 right column bottom here

2. The loop start and loop end values appear in the display. Use [←] and [→] to move the cursor to the value you want to adjust. If no value is stored, “—h—m—s—f ----” appears in the display.

The function buttons work as shown:

- [F1(Start)]:** Moves the cursor to the start location.
- [F2(NOW)]:** Enters the current time as the loop start or loop end point.
- [F3(JUMP)]:** Moves the timeline to the currently stored loop start or loop end point.
- [F4(End)]:** Moves the cursor to the loop end location.
- [F6(EXIT)]:** Exits the screen. Returns to the Utility menu screen.

3. Enter the new value using the TIME / VALUE dial.
4. When you are done making changes, press [PLAY(DISPLAY)] to return to the Playlist display.

E. Recording Procedure Using Loop Play

1. Hold [REC] and press the STATUS button for the track you wish to re-record. It begins blinking red.
2. Press [ZERO] to return to the beginning of the song.
3. Press [PLAY] to begin song playback. At this point, you will hear the **performance which has already been recorded** on the track.
4. Press the STATUS button. The indicator alternately blinks red and orange. Confirm that you can hear the **source you want to record** in the monitors or headphones.
5. During playback of the song, each time the STATUS button is pressed, you will alternately hear the previously recorded track, and then the source (input). If necessary, use the input sensitivity knob to adjust the input level of the source so it matches the recorded level of the track.
6. Once you have adjusted the input sensitivity, press [STOP].
7. Press [LOOP]. The button indicator lights, and Loop Play is enabled.
8. Press [AUTO PUNCH]. The button indicator lights. You are now able to use Auto Punch for recording.
9. Press [PLAY] to begin playback of the song. The song will play until it reaches the end of the loop. It will then located to the loop start, and play from that point. It will continue to loop between the two specified points until you press [STOP].
10. Press [REC] when you are ready to try recording. The VS-1680 will automatically go into record mode where the punch in point was set.
11. The VS-1680 will automatically go out of record where the punch out point was set. Playback continues until the end of the loop is reached, and the loop will begin from the start point again.
12. During the playback of the loop, listen to what you just recorded to check the result. If recording didn't turn out as you intended, repeat steps 10 and 11.
13. When you are finished recording, press [STOP].
14. Press [LOOP] to disable loop play. The button indicator goes out.
15. Press [AUTO PUNCH] to disable auto punch. The button indicator goes out.

16. To listen to the results of the recordings, press [ZERO] to return to the beginning of the song and press [PLAY].

XII. Using UNDO during Recording

If following a recording, you decide the recording is unusable, you can use **Undo** to instantly delete the recording. When using Undo, you need to specify the number of levels to be undone. For example, suppose you use punch in recording to create five consecutive recordings at the same location. Each of these recordings is given its own Undo level. If you decide you want to revert to the second of the five recordings, you would set the Undo level to three.

Graphic p 157 right column center.

If after executing the Undo function, you decide you want the last (fifth) recording back, you can use **Redo** to get it back.

Graphic p 157 right column bottom

If you use Undo to revert back to the second of five recordings, and then make a new recording, you will not be able to get the old recordings 3 - 5 back. If after making the new recording, you use Undo, you will be able to get back to the original second recording.

Graphic p 158 top left column

To use the Undo Function:

1. Press [UNDO].
2. "Level=1" appears in the display. Use the TIME / VALUE dial to select the level of Undo. As you choose different levels of Undo, the date and time stamp for each recording or edit is displayed.

graphic p 158 right column center.

3. Press [YES] to execute the Undo. Immediately after performing the Undo function, the Undo button will stay lit. This is a visual reminder that you can Redo your last Undo.

To cancel an Undo:

1. Hold [SHIFT] and press [UNDO].
2. "Cancel the last UNDO?" appears in the display.
3. Press [YES].

For more detailed information about using the Undo and Redo functions, see "Using Undo" (p. xx).

XIII. Track Bouncing

You can merge the performance of two or more tracks and re-record them onto a different empty track. This operation is known as **track bouncing**. Track bouncing comes in handy when you have run out of free playback tracks. For this example, we'll mix the audio recorded on tracks 5 - 8, and bounce them onto the stereo track 9/10.

Graphic p77 left column center.

For this example, tracks 5 - 8 are called the **source** tracks. Tracks 9/10 are called the **destination** tracks.

** Make all panning, level, EQ and effect settings on the source tracks before doing the bounce. Once source tracks have been bounced to the destination tracks, you cannot make individual mixer settings of each source track.*

** It is not possible to do track bouncing on songs saved with Song Protect On. If you want to do track bouncing, you must turn Song Protect Off first.*

A. Selecting the Source Tracks and the Destination Tracks

1. Hold [STOP], and press the STATUS buttons for source tracks 5 - 8. The STATUS buttons light green.
2. Press the STATUS button for the destination Track 9/10 so it is lit orange.
3. Hold the STATUS button for Track 9/10 and press the SELECT buttons for the source tracks 5 - 8. The SELECT buttons will blink.
4. Normally, inputs 1 and 2 are assigned to Track 9/10. If this is the case the SELECT buttons for Input 1 and Input 2 will be blinking. While continuing to hold the STATUS button for Track 9/10, press the SELECT button for Input 1 and Input 2. The SELECT buttons will stop blinking.
5. The source Tracks 5 - 8 can now be monitored on channel 9/10.

B. Adjust the Pan for Each Track and Check the Volume Levels for Each Track

1. Press [PLAY(DISPLAY)] to return to the Playlist display.
2. Press [PLAY] to begin song playback.
3. Adjust the volume and mix balance using faders 5 - 8. The presently monitored sound (track volumes and panning) will be recorded to Track 9/10 just as you hear it.

C. Set Meters to Pre Fader Track

While bouncing Tracks, it's a good idea to set your meters to Pre Fader Track Levels. This will allow you to create a track bounce that is as loud as possible, without distortion.

1. Press [PAGE].
2. Press [F1(LMTrack)].
3. Look for "Pre" in the lower left area of the Levels display. If it shows "Post", press [F4(Pre)] once.
4. While mixing, pay attention to the levels for the destination tracks 9/10.

D. Record the Track Bounce

1. Press [ZERO] to return to the beginning of the song.
2. While holding [REC], press the STATUS button for Track 9/10. The STATUS button blinks red to indicate record ready.
3. Press [REC]. The button blinks red.
4. Press [PLAY]. The button lights green, and recording begins.
5. As the recording occurs, you can make adjustments to the fader levels of the source tracks 5 - 8. Any change in the sound will affect the sound of the bounce.
6. Press [STOP] at the end of the song.
7. Press [ZERO] to return to the beginning of the song.
8. Mute Tracks 5 - 8. Press the STATUS button for each of these tracks once. The button will be unlit, indicating the track is muted.
9. Press [PLAY] to hear the song. Use the track fader 9/10 and the master fader to adjust the volume to a comfortable listening level.

XIV. Track Bouncing With Effects

The process for bouncing tracks with effects is exactly as explained above in “Track Bouncing”, except follow the steps outlined below for “Select the Source Tracks and the Destination Tracks”. Set up effects on each of the source tracks as desired. For specific information on how to apply effects to playback tracks, see the chapter “Using Effects” (p. xx).

Bouncing With Effects: Selecting the Source Tracks and the Destination Tracks

1. Hold [STOP], and press the STATUS buttons for source tracks 5 - 8. The STATUS buttons light green.
2. Press the STATUS button for the destination Track 9/10 so it is lit orange.
3. Hold the STATUS button for Track 9/10 and press the SELECT buttons for the source tracks 5 - 8. The SELECT buttons will blink.
4. Normally, inputs 1 and 2 are assigned to Track 9/10. If this is the case, the SELECT buttons for Input 1 and Input 2 will be blinking. While continuing to hold the STATUS button for Track 9/10, press the SELECT button for Input 1 and Input 2. The SELECT buttons will stop blinking.
5. While continuing to hold the STATUS button for Track 9/10, press the SELECT button for EFFECT 1 and EFFECT 2. This action will include Effect 1 and Effect 2 Returns in the track bounce.
5. While continuing to hold the STATUS button for Track 9/10, hold [SHIFT] and press the SELECT button for EFFECT 1 and EFFECT 2. This action will include Effect 3 and Effect 4 Returns in the track bounce.
6. The source Tracks 5 - 8 can now be monitored on channel 9/10.

Continue with Steps for bouncing Tracks as explained above in “Track Bouncing”.

XV. Recording a Digital Source

With the VS-1680, you can record the digital signals output from CD players, the Roland VS-880, DAT machines and other digital sources.

** The VS-1680's digital interface conforms to S/P DIF. When recording digital signals, be sure to use digital audio devices which conform to S/P DIF standards.*

? S/P DIF (Appendices p. 64)

A. Preparations for Recording a Digital Source

1. Items Necessary for a Digital Recording
 - VS-1680
 - CD player, DAT, VS-880, or other digital audio device
 - Digital connector cable (coaxial or optical)
2. Making Connections

Connect the digital output connector of your audio device to the VS-1680's DIGITAL IN connector. DIGITAL IN 1 is a coaxial connector, DIGITAL IN 2 is an optical connector. Use the appropriate connector for your audio device. DIGITAL IN 1 and DIGITAL IN 2 cannot be used simultaneously. Select one of the connectors for use.
3. Match Sample Rates

The VS-1680 can record digital signals only when the sample rate of the song is set to the same sample rate of the digital source. When a drive is initialized, the default sample rate of a song is 44.1 kHz. If the sample rate of the source is other than 44.1 kHz, create a new song with that sample rate (page xx). If you wish to create original audio CDs, you must select a sample rate of 44.1 kHz.

4. Set the Master Clock
In order to bring any digital signal into the VS-1680, you must synchronize the VS-1680's internal clock with the digital signal from the your digital source.
 - a. Hold [SHIFT] and press [F5(System)]. The System icon appears in the display. If the System menu icon does not appear, press [F6(EXIT)].
 - b. Press [F1(SYSPM)]. If "SYSPM" does not appear in the display above [F1], press [PAGE] until it appears, then press [F1].
 - c. Use [⇒], [⇐], [↑] and [↓] to move the cursor to "MasterClk". If "MasterClk" is not displayed, press [F1(Prm 1)].
 - d. Use the TIME / VALUE dial to select either DIGIN1 or DIGIN2, depending on whether you are using a coaxial connector or an optical connector.

Graphic page 75 left column bottom here.

MasterClk (Master Clock)

This sets the VS-1680's reference clock.

DIGIN1: Receives digital timing information from the DIGITAL IN 1 connector (coaxial).

INT: Uses the VS-1680's own internal clock.

DIGIN2: Receives digital timing information from the DIGITAL IN 2 connector (optical).

- e. Press [PLAY(DISPLAY)] to return to the Playlist display.

Record your tracks as usual, following the steps for "Recording To The Tracks" (p xx.). Press the SELECT button for the Digital Input.

If "Digital In Lock" is Displayed

This indicates the reference clock for the sample rate is set by the digital signal from the DIGITAL IN connector. You can record using the digital connection.

If "Digital In Unlock" is Displayed

This indicates that no digital signal is being received from the DIGITAL IN connector. It may also indicate the sample rate for the selected song does not match the sample rate of the digital source connected to the DIGITAL IN connector. In this state, you cannot record using the digital source.

B. Recording from A CD

The default setting of the VS-1680 does not permit recording the output of CD players using the DIGITAL IN connector. If you want to record from a CD using the DIGITAL IN connection, perform the following procedure. You will only need to perform this procedure one time to enable the VS-1680 to record digital signals from CD players.

1. Hold [SHIFT] and press [F5(System)]. The System icon appears in the display. If the System menu icon does not appear, press [F6(EXIT)].
2. Press [F2(GLOBL)]. If "GLOBL" does not appear in the display above [F2], press [PAGE] until it appears, then press [F2(GLOBL)].
3. Use [⇒], [⇐], [↑] and [↓] to move the cursor to "CD Digital Record".
4. Use the TIME / VALUE dial to select "On".
5. A message concerning copyright appears in the display. After reading this message, press [ENTER]. The same message appears in the back cover of this Manual.
6. A message concerning Licensing Conditions is displayed. After reading this message, press [ENTER]. This message appears in the back cover of this

Manual. From now on, you can make digital connections and recordings from CD players. If you do not agree to the conditions, then press [NO]. If you press [NO], you will not be able to make any digital connections from CD players.

7. Press [PLAY(DISPLAY)] to return to the Playlist display.

XVI. Using the Metronome

The VS-1680 features a built-in metronome which will provide a click track at any tempo you specify. By listening to the click track as you record your instrument, you'll be able to record your performance with more accuracy. Plus, recording using a click track allows song editing to be done by measure and beat. The metronome tempo can be controlled by the Tempo Map or Sync Track MIDI Clock. When using this feature, set up the Tempo Map (p. xx) or Sync Track (p.xx) beforehand. When you create a new song, the Tempo Map defaults to a 4/4 rhythm and a tempo of 120.

A. Program the Tempo Map

1. Hold [SHIFT] and press [TAP]. The Tempo Map appears in the display.

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2. Use [↓] to move the cursor to "120.0" and use the TIME / VALUE dial to change the tempo as desired.
3. Use [↓] to move the cursor to "1" and use the TIME / VALUE dial to set the number of measures.
4. Use [↓] to move the cursor to "4/4" and use the TIME / VALUE dial to change the time signature, if desired.
5. When you are finished setting the Tempo Map, press [F6(EXIT)]. The Sync/Tempo screen appears in the display.
6. Press [PLAY(DISPLAY)] to return to the Playlist display.

Using the Metronome during Recording

The metronome will begin when recording or playback begins. However, you may want to hear a count-in on the metronome to help you establish the song tempo before recording begins. In such cases, set aside the first couple of measures as a count in, and don't record any audio during those measures.

B. Turn On the Sync Generator

1. Hold [SHIFT] and press [EXT SYNC]. The Sync / Tempo screen appears in the display.
2. Press [←], [→], [↑], and [↓] to move the cursor to "Sync Gen" and use the TIME / VALUE dial to change the setting.

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Sync Gen. (Generator)

This setting determines what type of MIDI signal is generated at the MIDI OUT connector on the VS-1680. Select "MIDIclk" if you wish to use the Tempo Map, and "SyncTr" if you are going to use a Sync Track.

Off:	No MIDI signals are transmitted.
MTC:	MIDI Time Code is transmitted.
MIDIclk:	The Tempo Map MIDI Clock is transmitted.
SyncTr:	The Sync Track MIDI Clock is transmitted.

3. Press [EXIT]. The System menu icon appears.

C. Turn On the Metronome

1. The Metronome is output from both the MONITOR jacks and the PHONES jack. Connect your playback audio equipment to the MONITOR jacks.
2. Hold [SHIFT] and press [F5(SYSTEM)]. The System menu icon appears.
3. Press [F5(METRO)]. If "METRO" does not appear in the display above [F5], press [PAGE] until you see "METRO" above [F5], then press [F5(METRO)]. The Metronome Parameter screen appears.

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4. Press [↵], [⇨], [⇧], and [⇩] to move the cursor to and use the TIME / VALUE dial to change the settings.

Metronome Out

This selects where the metronome is output. For now, select "INT". **Selecting "Off" prevents you from making any settings related to the Metronome.**

- Off:** The metronome sound is not output.
INT: The metronome sound is output from the MONITOR and HEADPHONE jacks.
MIDI: The metronome signal is only transmitted via the MIDI OUT connector.

Metro Level (Metronome Level)

This adjusts the volume level (0-127) of the metronome output.

Metronome Mode

This determines when the metronome is played.

- Rec Only:** The metronome sounds only during recording.
Rec&Play: The metronome sounds during playback and recording.

5. Press [PLAY(DISPLAY)] to return to the Playlist display.

XVII. Saving Your Recordings

Song data that you recorded or edited will be lost if you simply turn the power off. Also, the contents of a recorded song can be lost due to unforeseen accidents, such as a power failure or power outage. **Once lost, the contents of a recorded song cannot be restored to the previous condition.** To prevent this from happening, use the following procedure to save your songs on the drive.

** When handling important song data, or when using the VS-1680 for extended periods, we strongly recommend you use the Song Store procedure frequently.*

1. Hold [SHIFT] and press [ZERO/(STORE)].
2. "STORE OK?" appears in the display. Press [YES]. If the song is saved properly, the initial display reappears. If you wish to cancel the STORE command, press [NO].

** The contents of the demo songs are protected from being changed or edited (Song Protect, p. xx) You cannot save changes or edits made to the demo songs. This means if you press [YES] at Step 2 when a demo song is selected, the message "Song Protected" will appear, and the procedure will not continue.*

? Current Song (Appendices p. 63)