Keyboard patches

SA-05-1288

Synclavier timbre design

A Synclavier timbre is constructed by layering sounds.

Partial timbres

Each Synclavier timbre can have up to four **partial timbres,** each having its own distinctive sound.

You can create a **keyboard patch** partial timbre by assigning many soundfiles to different parts of the keyboard. Instructions for creating keyboard patches are in this section.

A partial timbre can also be modified in a variety of ways, including changing the volume envelope, adding vibrato or portamento, stereo or real-time effects. Instructions for modifying a partial timbre are in the section "Modifying partial timbres." Instructions for adding real-time effects are in the section "Real-time effects."

The whole timbre with its four layers can be further modified by adding chorus or repeat/arpeggiate effects. It can be stored, with a timbre name, in a timbre file. Instructions for modifying and storing timbres is in the section "Modifying and storing timbres."

Designing a timbre

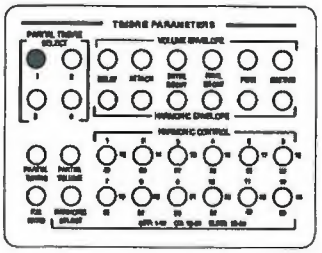
When you design a timbre, you create keyboard patches for as many as four partial timbres of the current timbre. A keyboard patch may be a series of different sounds assigned to one or more keys. For example, a series of Foley effects or a set of different percussion sounds for a drum kit might make up a keyboard patch for a single partial timbre.

Since a sound file most accurately represents the original sound when played at its recorded pitch, a patch might also be a series of sampled sounds from a single instrument. To recreate the sound of a grand piano, for example, a different sampled sound might be placed every two or three keys.

You can create very complex and dynamic whole timbres by choosing different sounds for two or more of the partial timbres. For example, to strengthen the attack of a brass instrument, you might put a percussive sound on one of the partial timbres.

You can also control the sound of the timbre using real-time effects. For example, you could patch a partial timbre's volume to the velocity input of the keyboard and thus control the weight of a footstep or car door slam by the strength of your keyboard attack.

Synclavier timbre design (con't)



PARTIAL TIMBRE SELECT 1 panel 1

Assigning a sound file to a partial timbre

When you record a sound file, or when you recall one into poly memory, it is automatically placed onto the first partial timbre of the current timbre.

You can, if you want, specify a different partial timbre when you recall a sound file from either the Winchester or the optical disk.

- Press and hold the desired PARTIAL TIMBRE SELECT button on the keyboard control panel while you click the sound file name in the Sound File Directory or Optical Disk Display.

  The selected sound file is placed on the specified partial timbre, and the PARTIAL TIMBRE SELECT button lights.

Selecting a partial timbre

You can select any partial timbre for programming using either the keyboard control panel or the terminal keyboard.

You can use the keyboard control panel to select and modify one partial timbre while listening to all the partials of the timbre.

- Press the desired PARTIAL TIMBRE SELECT button.

  The button lights. When you play a note, you hear all the partial timbres.

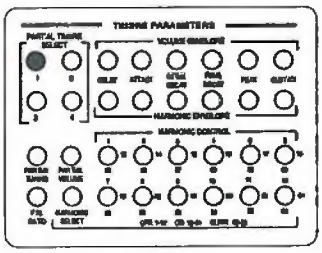
You can select and modify a partial timbre while listening to its sound alone.

- Press the desired PARTIAL TIMBRE SELECT button twice.

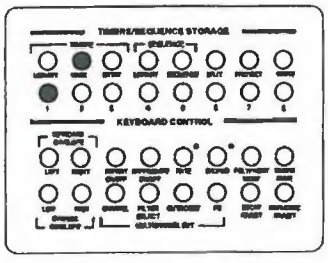
  The button blinks. When you play a note, you hear only that partial timbre.

When the Patch Display is on the screen, you can use the terminal keyboard to select a partial timbre. The currently selected partial timbre is displayed at the left of the screen just above the patch list.

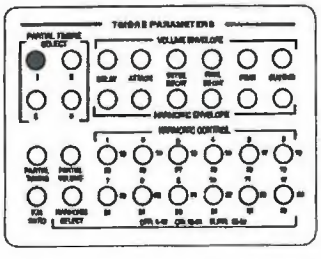
- Press the Spacebar repeatedly to step through the partial timbres in order.



PARTIAL TIMBRE SELECT 1 panel 1



TIMBRE/SEQUENCE STORAGE panel 4



PARTIAL TIMBRE SELECT 1 panel 1

Recalling a partial timbre to the keyboard

You can recall a single partial timbre from a stored timbre using the keyboard control panel.

The selected partial timbre can only be placed onto the corresponding partial timbre of the current timbre. For example, if you recall the second partial timbre of a timbre stored in the current timbre file, it is placed onto the second partial timbre of the current timbre.

1. Under TIMBRE/SEQUENCE STORAGE, press BANK and a numbered button corresponding to the bank in which the desired timbre is stored.

2. Press and hold the PARTIAL TIMBRE SELECT button that corresponds to the partial timbre you want to recall.

3. While you hold it down, press the TIMBRE/SEQUENCE STORAGE numbered button that corresponds to the partial timbre you want to recall.

   The recalled partial timbre replaces the corresponding partial timbre of the current timbre.

Recalling a partial timbre from a track in the memory recorder

You can recall a single partial timbre from a track of the current sequence using the keyboard control panel.

The selected partial timbre can only be placed onto the corresponding partial timbre of the current timbre. For example, if you recall the second partial timbre of a track timbre, it is placed onto the second partial timbre of the keyboard timbre.

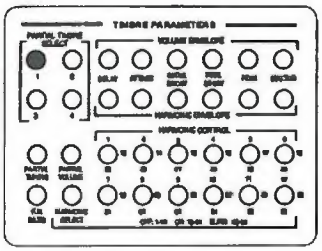
1. Press the PARTIAL TIMBRE SELECT button that corresponds to the partial timbre you want to recall.

2. Hold it down while you press SKT.

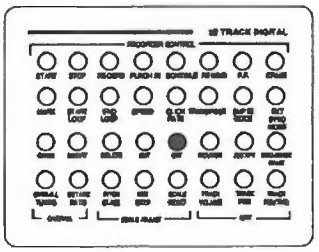
   The TRACK SELECT buttons blink.

3. Continue to hold it down while you press the appropriate numberedTRACK SELECT button.

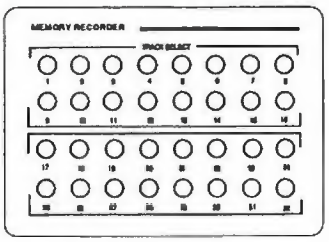
   The recalled partial timbre replaces the current partial timbre.



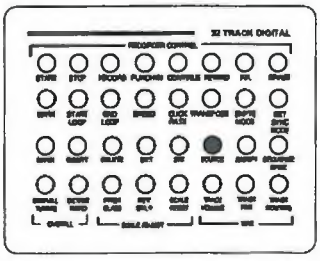
PARTIAL TIMBRE SELECT 1
panel 1



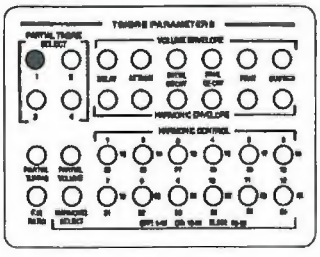
SKT
panel 2



TRACK SELECT
panel 3



BOUNCE panel 2



PARTIAL TIMBRE SELECT 1 panel 1

Copying from one partial timbre to another

You can copy or "bounce" partial timbres from one position to another using the BOUNCE button in the second panel of the keyboard button panel. You may want to do this to preserve the partial timbre of the keyboard timbre that corresponds to the partial timbre you want to recall. You may also want to move a copied partial timbre to another partial timbre location.

1. Press BOUNCE once.

   The button lights, and the TRACK SELECT buttons blink.

2. Press the source PARTIAL TIMBRE SELECT button.

3. Press the destination PARTIAL TIMBRE SELECT button.

   The source partial timbre is copied to the destination partial timbre.

Erasing partial timbres

You can erase all of the partial timbres of the current timbre using the keyboard control panel.

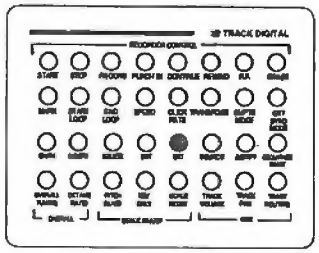
1. Press SKT.
2. Press a TRACK SELECT button for an empty track.

   All the partials of the current timbre are erased.

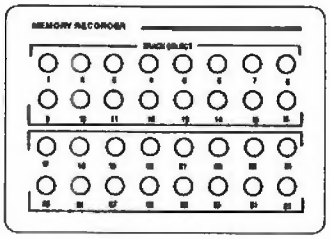
You also can erase an individual partial timbre.

1. Press SKT.
2. Press and hold the desired PARTIAL TIMBRE SELECT button.
3. Press a TRACK SELECT button for an empty track.

   The specified partial timbre is erased.



SKT
panel 2



TRACK SELECT buttons
panel 3

Creating a keyboard patch

A keyboard patch is a group of sound files on a single partial timbre. Each sound file is assigned to a region of the keyboard.

The Patch Display

You create a keyboard patch using the Patch Display, selected from the Main Menu.

The Patch Display is divided into three sections.

- At the top of the screen is a set of instructions for using the display.
- In the middle of the screen is information on the current keyboard timbre and catalog.
- At the bottom of the screen is the **patch list** area. A total of ten sound files can be displayed at a time.

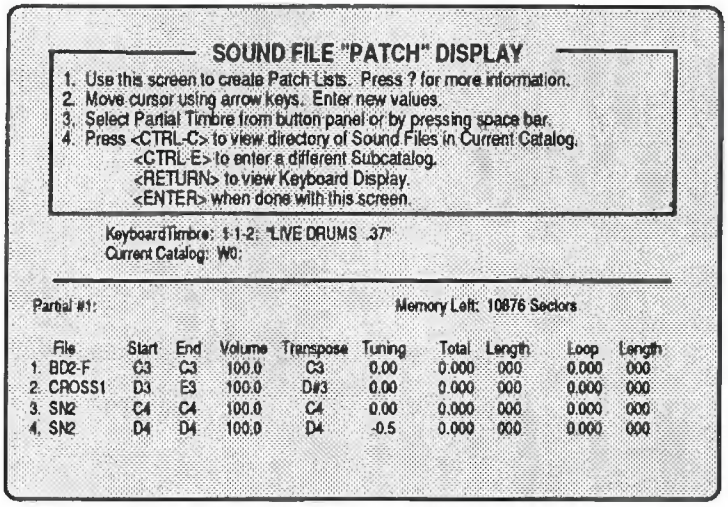
When you first bring up the Patch Display, the currently selected partial timbre is displayed at the top of the patch list area. If the partial timbre contains a synthesized timbre, the following message appears just below the partial timbre number.

> Partial # [number] contains an FM or synthesized sound.
> Press **<return>** to erase this partial and create a patch list for
> Partial # [number]—

If the partial timbre is empty, the following message appears just below the partial timbre number.

> Partial # [number] is empty.
> Press **<return>** to create a patch list
> for Partial # [number]—

If the partial timbre contains sound files, a patch list is displayed in the lower third of the screen.



SOUND FILE "PATCH" DISPLAY

1. Use this screen to create Patch Lists. Press ? for more information.
2. Move cursor using arrow keys. Enter new values.
3. Select Partial Timbre from button panel or by pressing space bar.
4. Press <CTRL-C> to view directory of Sound Files in Current Catalog.
   <CTRL-E> to enter a different Subcatalog.
   <RETURN> to view Keyboard Display.
   <ENTER> when done with this screen.

KeyboardTimbre: 1-1-2: "LIVE DRUMS .37"
Current Catalog: W0:

Partial #1: Memory Left: 10876 Sectors

File	Start	End	Volume	Transpose	Tuning	Total Length	Loop Length
1. BD2-F	C3	C3	100.0	C3	0.00	0.000 000	0.000 000
2. CROSS1	D3	E3	100.0	D#3	0.00	0.000 000	0.000 000
3. SN2	C4	C4	100.0	C4	0.00	0.000 000	0.000 000
4. SN2	D4	D4	100.0	D4	-0.5	0.000 000	0.000 000

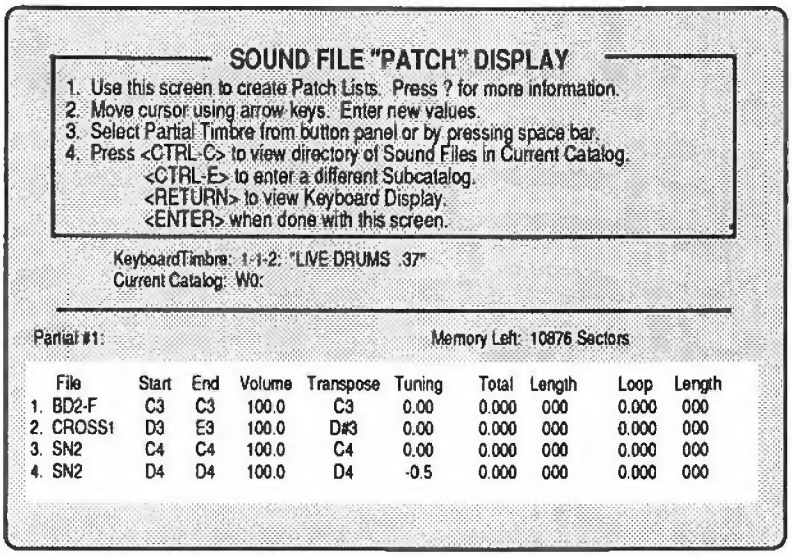
Creating a keyboard patch (con't)

The patch list

The **patch list** is an eight-column list that contains all of the sound files in a partial timbre and their keyboard assignments.

column	function
File	Sound file name.
Start	Lowest note to which the sound file is assigned.
End	Highest note to which the sound file is assigned.
Volume	Playback volume of the sound file.
Transpose	Key to which the original pitch is assigned. If no value is displayed, the original pitch sounds on A3.
Tuning	Tuning factor. Used to tune each sound file in the keyboard patch.
Total Length	The play length of a sound file.
Loop Length	The play length for a keyboard loop.

Patch Display patch list



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KeyboardTimbre: 1-1-2: "LIVE DRUMS .37"
Current Catalog: W0:

Partial #1: Memory Left: 10876 Sectors

	File	Start	End	Volume	Transpose	Tuning	Total	Length	Loop	Length
1.	BD2-F	C3	C3	100.0	C3	0.00	0.000	000	0.000	000
2.	CROSS1	D3	E3	100.0	D#3	0.00	0.000	000	0.000	000
3.	SN2	C4	C4	100.0	C4	0.00	0.000	000	0.000	000
4.	SN2	D4	D4	100.0	D4	-0.5	0.000	000	0.000	000

Creating a keyboard patch (con't)

Building a patch list

You build a patch list by recalling sound files to the Patch Display.

1. With the cursor at the last sound file in the patch list, press the down arrow key.

   The cursor moves to the next line.

2. Press Ctrl-C.

   The Patch Display is replaced by the Sound File Directory.

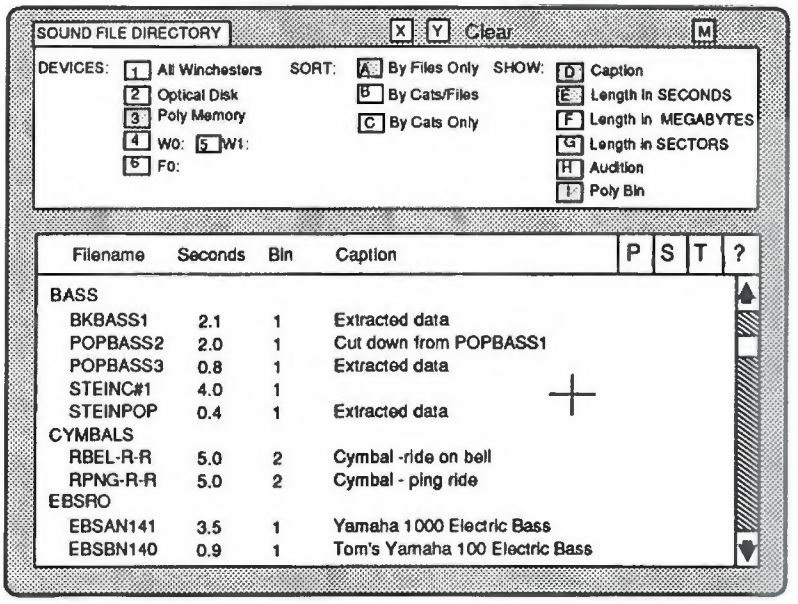
3. Select the desired sound file and press Return.

   The sound file is added to the patch list.

4. Move the cursor to the next line.

   The patch list is ready to accept a new entry. You may add as many entries as you like by pressing the down arrow key repeatedly.

Ten entries can be displayed at once. When you add an eleventh entry, the first five entries disappear and the second five move up, leaving room for additional entries.



Sound File Directory

Creating a keyboard patch (con't)

Adding sound files to the patch list

You can add sound files to the patch list by typing in the names of sound files.

1. Place the cursor at the bottom of the column labeled File.
2. Type the sound file name.
3. Press Return.

   The sound file is added to the patch list.

You can insert a sound file name between two existing sound file names.

1. Place the cursor at the current entry. Press – (the hyphen key).

   A new line is added before the current line.

2. Recall the desired sound file to the patch display, or type the sound file name.

   The new sound file is added to the patch list.

Deleting sound files from the patch list

You can delete a sound file from the patch list.

1. Move the cursor to the File column of the sound file to be deleted.

2. Press Delete.

   The designated sound file is deleted.

Creating a keyboard patch (con't)

Assigning sound files to the keyboard

You assign a sound file to an area of the keyboard by typing key names in the Start and End columns.

Key names are indicated by a pitch letter followed by an octave number. The lowest key on the keyboard, at the far left, is A0. The lowest C on the keyboard is C1. The highest key, at the far right, is C7.

Black keys are designated by placing a sharp sign (#) after the pitch name to designate the note to the right of the pitch letter. Flats are not used. For example, the black note between A and B is A# rather than B flat.

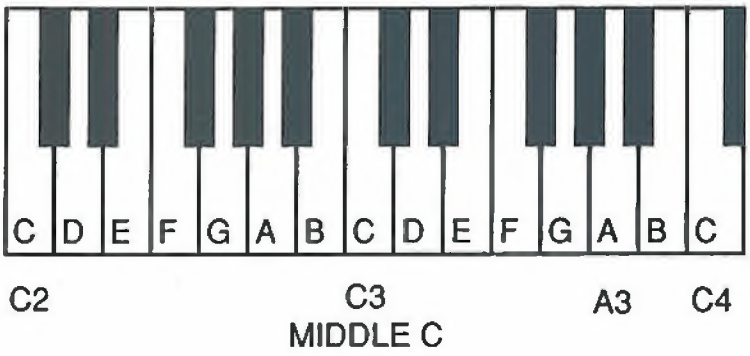
1. Move the cursor to the Start column.
2. Type a key name.

   The key name indicates the lowest key to which the sound file is assigned.
3. Move the cursor to the End column.
4. Type a key name.

   The key name indicates the highest key to which the sound file is assigned.

Only one sound file in a partial timbre may be assigned to a key. If you try to assign two different sound files to the same key, an error message is displayed.

> Error: Sound Files Overlap


C D E F G A B C D E F G A B C
C2
C3
MIDDLE C
A3
C4

Creating a keyboard patch (con't)

Adjusting the sound file volume

Each sound file in a patch list has an independent volume setting. You use these settings to adjust the relative volumes of the individual sound files in the patch list.

1. Move the cursor to the Volume column.

2. Type in any value between 0.0 and 100.0.

Transposing sound files on a patch list

Regardless of the pitch at which a sound file was recorded, its original pitch normally sounds only when you play A3 (A above middle C). The original sound is distorted as you play higher or lower on the keyboard.

You can place the original pitch on any key on the keyboard.

1. Move the cursor to the Transpose column.

2. Type the key name of the key on which you want the original pitch to sound.

Following are examples of different transpose settings.

recorded pitch	transpose setting	key pressed	sound
C3	—	A3	C3
C3	—	C3	E2
C3	C3	C3	C3
C3	C3	D3	D3
C3	F3	F3	C3
C3	F3	C3	G2
UNKNOWN	D3	D3	RECORDED PITCH

Creating a keyboard patch (con't)

Tuning sound files in a patch list

You can tune each sound file independently.

1. Move the cursor to the Tuning column.

2. Enter any value between -48.00 and +48.00 semitones, or adjust the tuning by ear by pressing a key while turning the knob.

   As you turn the control knob, the values in the Tuning column of the Patch Display change.

Looping sound files in a patch list

You can loop any individual sound file in the keyboard patch independently.

1. Move the cursor to the Total Length column.
2. Type the time in seconds from the start of the file to the end point of the loop.
3. Move the cursor to the Loop Length column.
4. Type the time in seconds of the length of the loop.

You may find it easier to set these values from the keyboard as described in the section "Keyboard looping."

Creating a keyboard patch (con't)

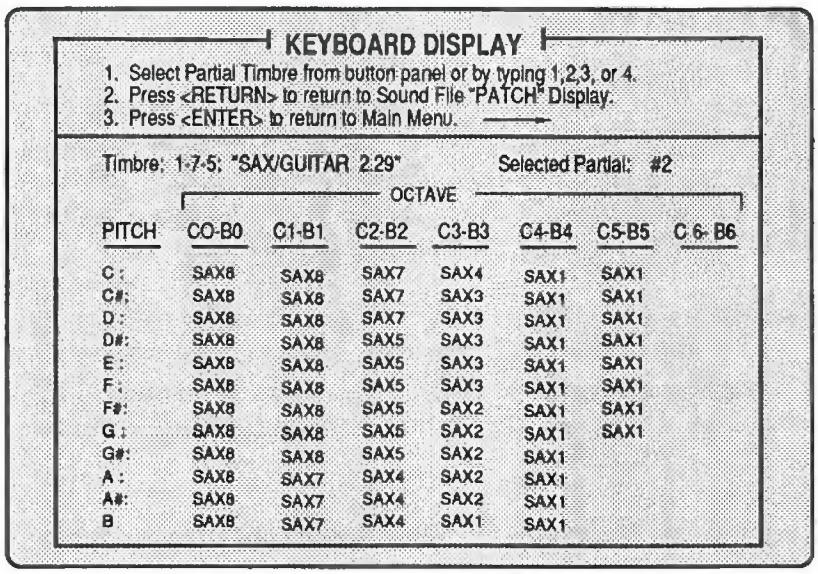
Using the Keyboard Display

The Keyboard Display, accessed from the Patch Display, lists every note on the keyboard with its corresponding sound file assignment. You can use this display to see an overview of the patch.

- From the Patch Display, press Return.

  The Keyboard Display appears.

Press Return again to go back to the Patch Display. Press Enter to go to the Main Menu.



KEYBOARD DISPLAY

1. Select Partial Timbre from button panel or by typing 1,2,3, or 4.
2. Press <RETURN> to return to Sound File "PATCH" Display.
3. Press <ENTER> to return to Main Menu.

Timbre: 1-7-5: "SAX/GUITAR 2.29" Selected Partial: #2

OCTAVE

PITCH	C0-B0	C1-B1	C2-B2	C3-B3	C4-B4	C5-B5	C 6- B6
C :	SAX8	SAX8	SAX7	SAX4	SAX1	SAX1	
C#;	SAX8	SAX8	SAX7	SAX3	SAX1	SAX1	
D :	SAX8	SAX8	SAX7	SAX3	SAX1	SAX1	
D#:	SAX8	SAX8	SAX5	SAX3	SAX1	SAX1	
E :	SAX8	SAX8	SAX5	SAX3	SAX1	SAX1	
F :	SAX8	SAX8	SAX5	SAX3	SAX1	SAX1	
F#:	SAX8	SAX8	SAX5	SAX2	SAX1	SAX1	
G :	SAX8	SAX8	SAX5	SAX2	SAX1	SAX1	
G#:	SAX8	SAX8	SAX5	SAX2	SAX1		
A :	SAX8	SAX7	SAX4	SAX2	SAX1		
A#:	SAX8	SAX7	SAX4	SAX2	SAX1		
B	SAX8	SAX7	SAX4	SAX1	SAX1		

Keyboard looping

Normally, if you hold down a key for longer than the original length of a sound file, the sound stops. When you place a loop on a sound file, the looped section is repeated (and thus the sound is sustained) for as long as a key is held.

The keyboard loop

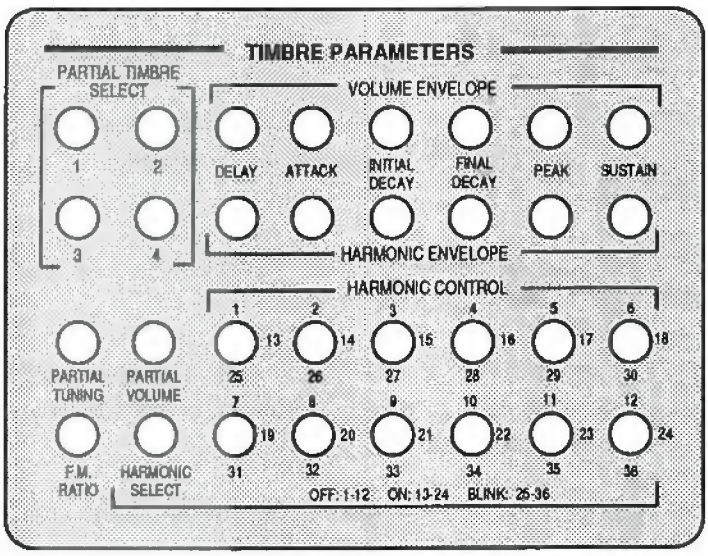
You can sustain the sound of a sound file indefinitely by looping the sound file itself or by looping the sound file as the partial timbre on which it is placed. To loop the sound file itself, use a **crossfade loop.** To loop the sound file as a partial timbre, use a **keyboard loop.**

A crossfade loop is best for complex sounds, such as strings or piano. A crossfade loop is part of the sound file itself and is stored with the sound file when it is saved to disk. Instructions for crossfade looping are in "Modifying sound files."

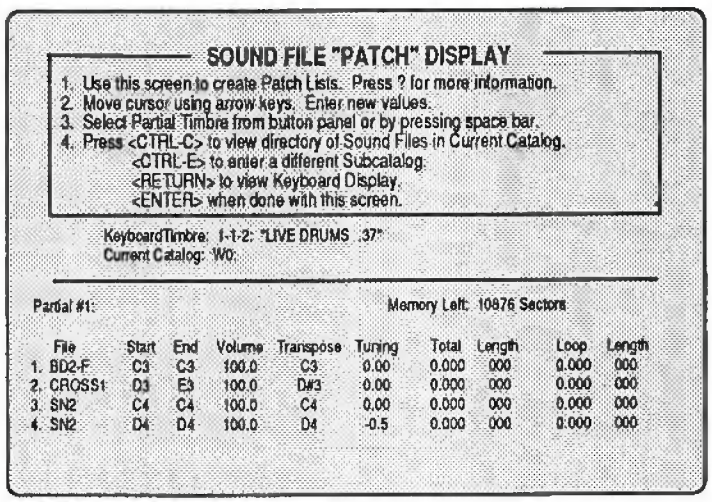
A keyboard loop is best for sounds with a fairly even harmonic structure on the decay, such as a single brass instrument. The keyboard loop defines start and end points of the loop with no crossfade. You can perform automatic searches for good loop points.

A keyboard loop is part of the timbre definition and does not affect the sound file apart from the timbre.

Keyboard loops can be placed by using either the keyboard control panel or the Patch Display.



Panel 1



Patch Display

Keyboard looping (con't)

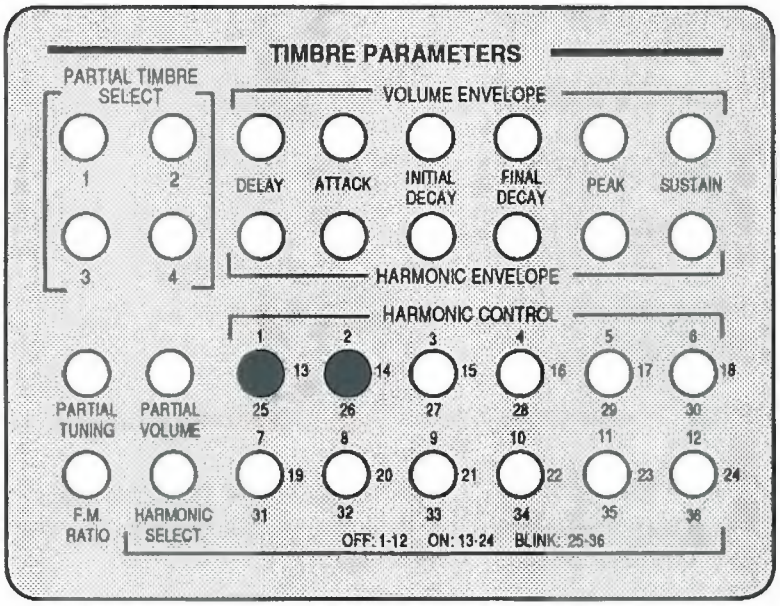
Defining a keyboard loop

To define a keyboard loop, you set two parameters.

- The total length, expressed in seconds, is measured from the start of the file to the start of the "loopback."
- The loop length, expressed in seconds, of the section of the sound file to be repeated.

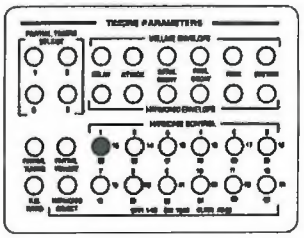
You use the HARMONIC CONTROL buttons, located in the first panel, along with the control knob to set the keyboard loop parameters.

HARMONIC CONTROL 1 sets the total length; HARMONIC CONTROL 2 sets the loop length.

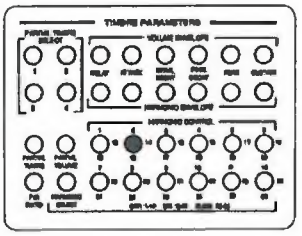


Harmonic control 1 & 2

Keyboard looping (con't)



HARMONIC CONTROL 1 panel 1



HARMONIC CONTROL 2 panel 1

Basic keyboard looping

1. Recall a sound file to the keyboard.
2. Press HARMONIC CONTROL 1.

   The display window shows

   0.000 000 SECONDS
   TOTAL LENGTH

3. Turn the control knob to set the total play length.

   The display window reflects the new total length. When you press a key, the sound file only plays for the amount of time specified.

4. Press HARMONIC CONTROL 2.

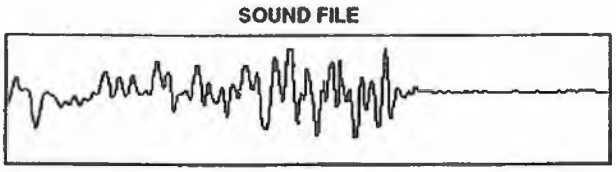
   The display window shows

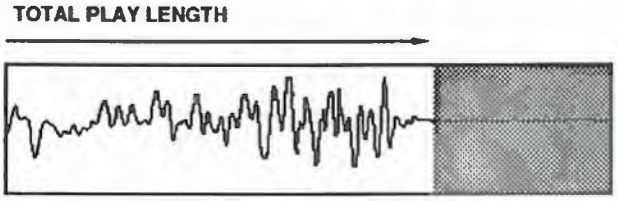
   0.000 000 SECONDS
   LOOP LENGTH

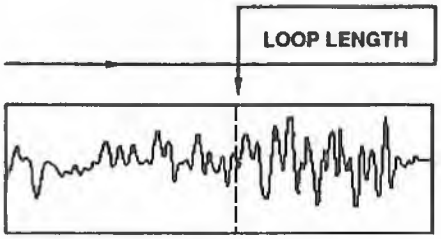
5. Turn the control knob to set the loop length.

   The display window reflects the new loop length. When you press a key, the sound file plays for the specified total length time, then loops back as specified by the loop length.

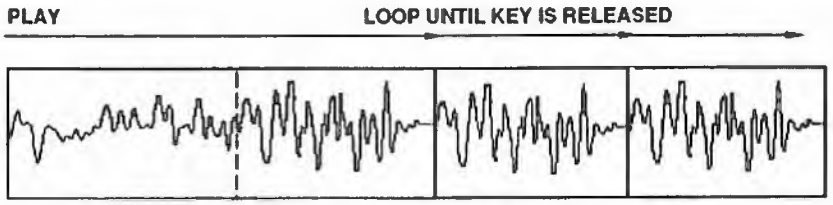
You can adjust both the total length and the loop length while playing a key.





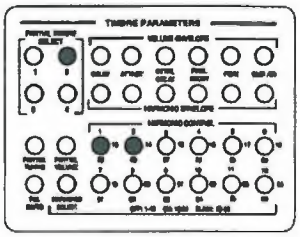


Result:



Setting the total length and loop length

Keyboard looping (con't)



PARTIAL TIMBRE SELECT, HARMONIC CONTROL 1 & 2 panel 1

Selecting a sound file in a keyboard patch for looping

Each sound file in a keyboard patch can have its own keyboard loop.

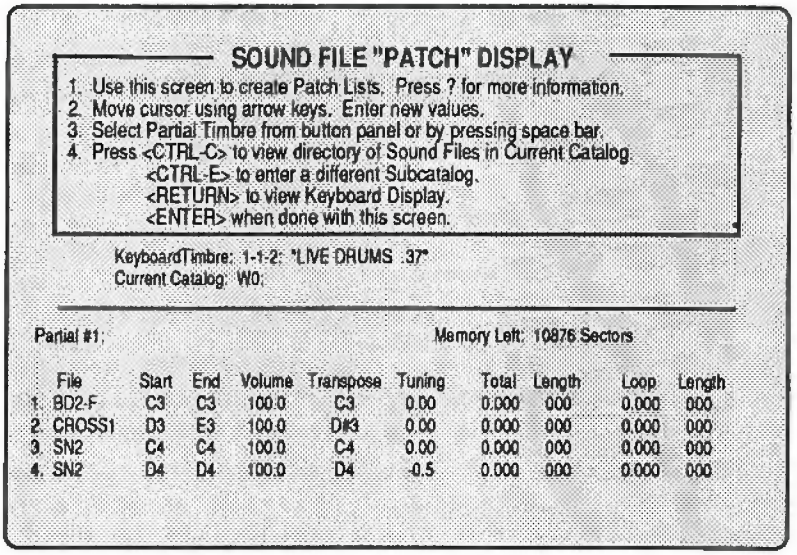
Use the Patch Display to select a sound file for looping.

1. Select the desired partial timbre by pressing the Spacebar on the terminal keyboard or the appropriate PARTIAL TIMBRE SELECT button on the keyboard control panel.

2. Select the sound file to be looped by placing the cursor on the line that corresponds to the desired sound file.

3. Use the control knob, HARMONIC CONTROL 1 and HARMONIC CONTROL 2 to adjust the total length and loop length for the selected sound file.

   The new total length and loop length values appear in the last two columns of the Patch Display.



SOUND FILE "PATCH" DISPLAY

1. Use this screen to create Patch Lists. Press ? for more information.
2. Move cursor using arrow keys. Enter new values.
3. Select Partial Timbre from button panel or by pressing space bar.
4. Press <CTRL-C> to view directory of Sound Files in Current Catalog.
   <CTRL-E> to enter a different Subcatalog.
   <RETURN> to view Keyboard Display.
   <ENTER> when done with this screen.

KeyboardTimbre: 1-1-2: "LIVE DRUMS .37"
Current Catalog: W0:

Partial #1: Memory Left: 10876 Sectors

	File	Start	End	Volume	Transpose	Tuning	Total Length	Loop Length
1.	BD2-F	C3	C3	100.0	C3	0.00	0.000 000	0.000 000
2.	CROSS1	D3	E3	100.0	D#3	0.00	0.000 000	0.000 000
3.	SN2	C4	C4	100.0	C4	0.00	0.000 000	0.000 000
4.	SN2	D4	D4	100.0	D4	-0.5	0.000 000	0.000 000

Keyboard looping (con't)

Automatic searches

You can search for a loop point automatically using either of two types of searches.

- overall search
- local search

When you perform an overall automatic search, the computer checks the pitch, volume and harmonic components of a portion of the sound file directly preceding the end loop point. It looks through the entire sound file for an area that most closely matches this portion and automatically sets the loop length so that the loop starts at that point.

When you perform a local automatic search, the computer checks the portions of the sound file near the start and end points already specified and resets both the total length and loop length for the best possible loop point.

Performing an overall search

1. Recall a sound file or select one from the Patch Display.

2. Set a total length using the control knob and HARMONIC CONTROL 1 as described above.

   The point at which the sound file stops playing is the point from which the loop length is automatically determined.

3. Press and hold HARMONIC CONTROL 1 and press the START button.

   The display window shows

   SEARCHING...

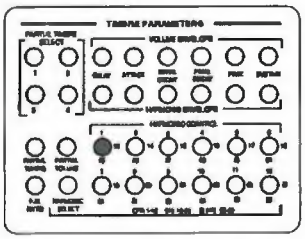
   When the search is complete, the display window shows

   DONE WITH SEARCH
   MATCH: [percentage]

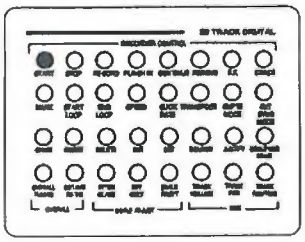
   A keyboard loop is placed on the sound file. You can hear the loop by pressing any of the keys to which the sound file is assigned. The time required for the search varies depending on the length of the file and the total length setting. The "MATCH" percentage indicates the accuracy of the match of the end-loop point with the start-loop point.

4. Press HARMONIC CONTROL 2.

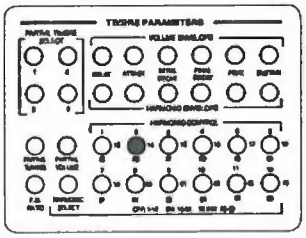
   The loop length determined by the automatic search is displayed.



HARMONIC CONTROL 1
panel 1

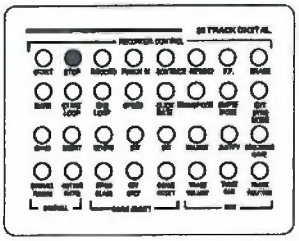


START
panel 2



HARMONIC CONTOL 2
panel 1

Keyboard looping (con't)



STOP panel 2

Overall search results

An overall automatic search produces good loop results about 50% of the time. Unpredicted results are frequently encountered, some of which may be useful. If the loop length selected is too short, the loop length itself may become an audible frequency.

If you select a slightly different total length and try another overall search, a completely different loop length may be found.

You can abort an overall search at any time during the search.

- Press the STOP button.

  The program selects the best match of samples surveyed up to the point at which you pressed the STOP button.

Performing a local automatic search

If the results of manual or overall automatic searches are not adequate, a local automatic search can be performed.

1. Recall a sound file or select one from the Patch Display.

2. Set a total length using the control knob and HARMONIC CONTROL 1 as described above.

3. Set a rough loop length using the control knob and HARMONIC CONTROL 2 as described above.

4. Press and hold HARMONIC CONTROL 1 and press the CONTINUE button.

   The local automatic search generally takes less than a second. Both the start loop and end loop points are shifted slightly to improve the match.

You may want to make repeated local automatic searches to find the best loop length.

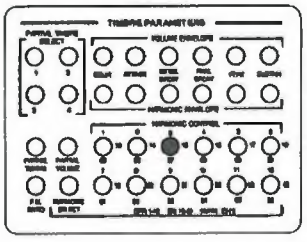
Setting the window length for automatic searches

A **window length** is the number of actual samples that are compared during the search.

With a window length setting of ten, for example, an overall search tries to match the ten samples immediately preceding the loop end point with a section of ten adjacent samples.

A local search with a window length setting of ten tries to match the ten samples adjacent to both the start and end loop points with a section of ten adjacent samples. Both points are then shifted to the best match found.

You can change the window length.



HARMONIC CONTROL 3 panel 1

1. Press HARMONIC CONTROL 3.

   The display window shows

   5 SAMPLES
   WINDOW LENGTH

2. Turn the control knob to set the window length to any value up to 250. A window length of 3 to 10 samples works well with most sound files.

The larger the window setting, the more time a search takes. In addition, samples may match harmonically, but vary in volume, which results in an audible loop point.

If a window setting is too small, the volume may match, but there are not enough samples to create an accurate harmonic match. The loop may be so short that the loop frequency itself is audible.

1. Recall a sound file using the Sound File Directory, select a partial timbre of the keyboard timbre, or use the Patch Display to select a sound file contained in a keyboard patch.

2. Set the total length by pressing HARMONIC CONTROL 1 and turning the control knob.

3. Set the loop length by pressing HARMONIC CONTROL 2 and turning the control knob.

4. Set the loop length automatically using an overall search by holding HARMONIC CONTROL 1 and pressing START.

5. Adjust the loop points automatically using a local automatic search by holding HARMONIC CONTROL 1 and pressing CONTINUE.

6. Set the window length — the length of the area compared in an automatic search — by pressing HARMONIC CONTROL 3 and turning the control knob.

7. Store the current timbre to a Timbre Directory to save the looping information as part of the timbre definition. The sound file stored on disk is unaffected by a keyboard loop.