Recording and overdubbing

MR-02-0188

Preparing to record

Before you record, you need to

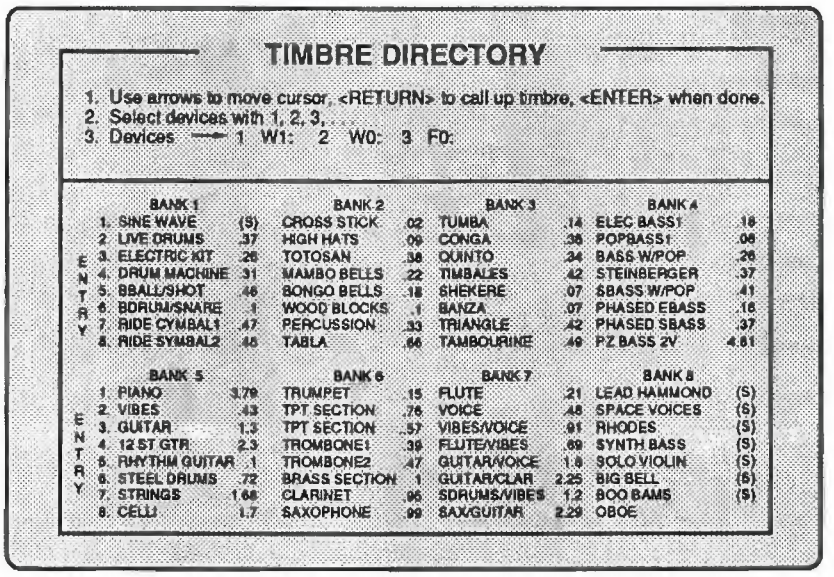
- recall a timbre to the keyboard;
- erase any previously recorded sequence;
- make sure sequence files of adequate size are available to store your sequence.

Recalling a timbre from the terminal

1. Select the Timbre Directory from the Welcome or Main Menu by typing the letter next to Timbre Directory.

2. If the timbre file containing the desired timbre is on another device, choose that device from those shown at the top of the screen by typing the appropriate number.

3. Select the timbre from those listed using the arrow keys and press **<return>.**



TIMBRE DIRECTORY

1. Use arrows to move cursor, <RETURN> to call up timbre, <ENTER> when done.
2. Select devices with 1, 2, 3, . . .
3. Devices ⟶ 1 W1: 2 W0: 3 F0:

ENTRY

	BANK 1		BANK 2		BANK 3		BANK 4	
1.	SINE WAVE	(S)	CROSS STICK	.02	TUMBA	.14	ELEC BASS1	.16
2.	LIVE DRUMS	.37	HIGH HATS	.09	CONGA	.36	POPBASS1	.06
3.	ELECTRIC KIT	.26	TOTOSAN	.38	QUINTO	.34	BASS W/POP	.26
4.	DRUM MACHINE	.31	MAMBO BELLS	.22	TIMBALES	.42	STEINBERGER	.37
5.	BBALL/SHOT	.46	BONGO BELLS	.18	SHEKERE	.07	SBASS W/POP	.41
6.	BDRUM/SNARE	.1	WOOD BLOCKS	.1	BANZA	.07	PHASED EBASS	.16
7.	RIDE CYMBAL1	.47	PERCUSSION	.33	TRIANGLE	.42	PHASED SBASS	.37
8.	RIDE SYMBAL2	.45	TABLA	.66	TAMBOURINE	.49	PZ BASS 2V	4.61

ENTRY

	BANK 5		BANK 6		BANK 7		BANK 8	
1.	PIANO	3.79	TRUMPET	.15	FLUTE	.21	LEAD HAMMOND	(S)
2.	VIBES	.43	TPT SECTION	.76	VOICE	.48	SPACE VOICES	(S)
3.	GUITAR	1.3	TPT SECTION	.57	VIBES/VOICE	.91	RHODES	(S)
4.	12 ST GTR	2.3	TROMBONE1	.39	FLUTE/VIBES	.69	SYNTH BASS	(S)
5.	RHYTHM GUITAR	.1	TROMBONE2	.47	GUITAR/VOICE	1.8	SOLO VIOLIN	(S)
6.	STEEL DRUMS	.72	BRASS SECTION	1	GUITAR/CLAR	2.25	BIG BELL	(S)
7.	STRINGS	1.66	CLARINET	.06	SDRUMS/VIBES	1.2	BOO BAMS	(S)
8.	CELLI	1.7	SAXOPHONE	.09	SAX/GUITAR	2.29	OBOE	

Timbre files

The Timbre Directory represents a special timbre storage space called a timbre file. Each timbre is ready for immediate recall at any time and always sounds exactly the same.

A timbre file consists of up to eight banks with up to eight timbre entries in each bank. Since some timbres take up more space than others, a bank may have fewer than eight timbres and a timbre file may have fewer than eight banks.

One timbre file is located on your Winchester in the top-level catalog; that is, the storage area of your Winchester that is immediately available when you start the system. Other timbre files can be located in subcatalogs and on floppy disks, one in each storage area.

Timbre identification

When you recall a timbre to the keyboard, the display window shows information about that timbre. The timbre number identifies the library, bank and entry numbers that define the location of the timbre in the timbre file.

Timbres that have been factory preset have been given identifying names. You can use the timbre name function on the Main Menu to rename the preset timbres and to name your own timbres.

The expressions [number] V and [number] F show the number of voices and frames in a synthesized timbre. Voices are the number of FM synthesizer channels required to play a single note in that timbre. Frames are the number of spliced-in waveforms in a synthesized or resynthesized timbre. Voices and frames are explained in the manual *FM Synthesis*.

Recalling timbres on floppy disks

If the timbre you want to recall is not in the Timbre Directory, it may be located in a timbre file in a subcatalog on the Winchester or on one of the floppy disks of the New England Digital Timbre Library.

You can recall a timbre on a floppy disk by changing the Timbre Directory.

1. Place the appropriate disk into a floppy drive.

2. Select **F0:** (for floppy drive 0) or **F1:** (for floppy drive 1) from the list of storage devices across the top of the Timbre Directory by typing the number preceding it.

   The selected Timbre Directory appears on the screen.

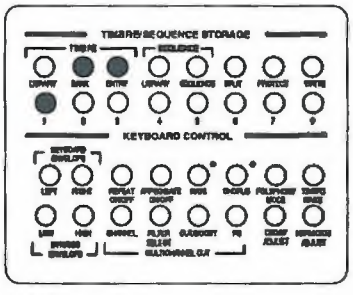
Recalling timbres from a subcatalog

You can recall a timbre stored in a subcatalog of the Winchester using the procedure below.

1. Return to the Welcome Menu by pressing **<enter>.**
2. Select the Subcatalog Directory.
3. Select the desired subcatalog.
4. Return to the Welcome Menu.
5. Select the Timbre Directory again.

   The directory from the selected subcatalog appears on the screen.

Note: Subcatalogs are described in the manual *Organizing and Storing Sounds.*



bank, entry, numbered button panel 4

Recalling a timbre using the keyboard control panel

When you use the keyboard button panel, you can only recall a timbre from a timbre file in the current catalog or from a disk placed in **floppy drive 0.**

To recall a timbre from the current catalog:

1. Press **bank** and then a numbered button to select a timbre bank.

2. Press **entry** and then a numbered button to select a timbre entry.

Recalling timbres on floppy disks from the keyboard control panel

To recall a timbre from a floppy disk:

1. Place the disk containing the desired timbre file into **floppy drive 0**.

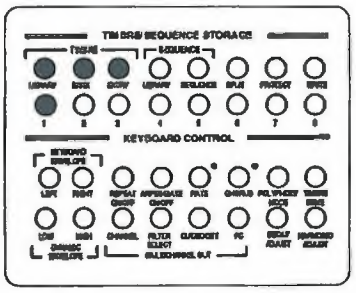
2. Press and hold **timbre library.**

3. Press **bank** and a numbered button for the bank you want to recall.

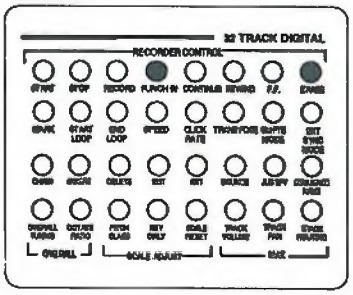
4. Continue to hold down **library** while you press **entry** and the numbered button for the timbre you want to recall.

   The timbre is placed on the keyboard and its data appears in the display window.

If the timbre you want is in a subcatalog on the floppy disk, use the Subcatalog Directory on the terminal screen to enter that subcatalog. Then use the buttons as usual.



timbre library, bank, entry, numbered button panel 4



punch in, erase panel 2

Erasing a sequence

Before you record it may be necessary to erase anything previously recorded on the track or tracks to be used.

The **erase** button is used to erase an entire sequence or an entire track.

To erase an entire sequence in the Memory Recorder:

- Press the **erase** button twice when none of the track select buttons are lit.

To erase one or more individual tracks:

1. Select the track or tracks you wish to erase by pressing the appropriate **track select** button(s). The buttons must be lit or blinking.

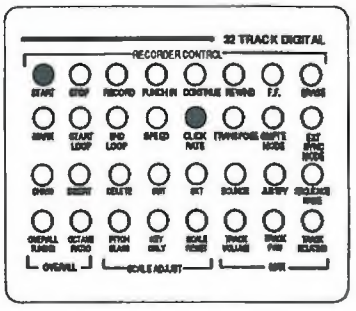
2. Press **erase** twice.

   All tracks with lit or blinking buttons are erased. Tracks with buttons neither lit nor blinking are not erased.

You can also erase a section of track as you record by pressing **punch in** instead of **record** (see "Changing a sequence from the keyboard" below).

Sequence files for storage

The eight numbered sequence files in the top-level catalog of the Winchester are of fixed size and are generally large enough for most purposes. Before recording longer projects, however, make sure you have sequence files available of adequate size to store your sequence. If you create a sequence and have no sequence file large enough in which to store it, you will not be able to save it. (See the section "Storing sequences.")



start, click rate panel 2

Recording the first track

Step 1. Recall a timbre to the keyboard.

Use the Timbre Directory or keyboard button panel to recall a timbre to the keyboard as described in "Recalling a timbre" above.

Step 2. Set the tempo.

Adjust the click rate to a comfortable tempo.

1. Press **start** to listen to the click.

   If you do not hear an audible click, check to see if your click output is properly connected to your sound system.

2. Press **click rate.**

   The display window shows the current tempo setting.

3. Turn the control knob to set the desired tempo.

   Turning the knob to the right increases the tempo; turning it to the left decreases the tempo.

Recording the first track (con't)

Step 3. Record the first track.

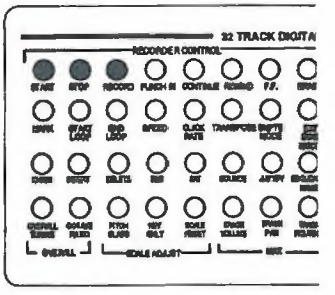
1. Press **record,** listen to the click for a couple of measures, then play on the keyboard.

   Your performance is automatically recorded on track 1.

2. Press **stop** when you are finished recording.

Step 4. Play back the recording

- Press **start** once to play back your sequence from the first beat..
- Press **start** twice to play back from the first note.



start, stop, record
panel 2

Multitrack recording (con't)

Overdubbing and adding tracks

In the Synclavier system, overdubbing means adding notes to a track without erasing any previously recorded notes.

Normally, when you press record, the first track using the same timbre is selected for recording. If there is no track with the same timbre, the first empty track is selected.

Thus, if you have recorded on track 1 and want to add notes using the same timbre, the notes are added to track 1. If you add notes using a different timbre, the new notes are recorded on track 2.

When you record on a previously recorded track, nothing is erased. Any notes played while recording are simply added to the track.

When adding notes to sequences, it is possible to record the same note more than once on the same beat. Both notes actually exist and sound; they are layered, one on top of the other. There is no limit to the number of layers, but each layer uses one of the Synclavier voices. In editing with the Music Notation or Recorder displays, each layer must be deleted or edited individually. It is important to keep these considerations in mind when using layering techniques.

When overdubbing, notes sounding simultaneously use at least one voice per note. If you exceed the maximum number of voices in your system while recording, bars appear in the display window and the notes are not recorded. (See the section "Notes, voices and the polyphony mode.")

Recording new notes using the same timbre

You can record additional notes on the same track if you use the same timbre.

1. Press **record.**

   You hear the previously recorded notes.

2. Play any additional notes you wish to add to the track.

   The notes are added to the original track.

Sometimes it is better to record new notes on a separate track to preserve the integrity of the original track, or if you are planning to use Music Printing to print separate parts (such as for first and second violin) that are recorded using the same timbre.

To record on a second track using the same timbre:

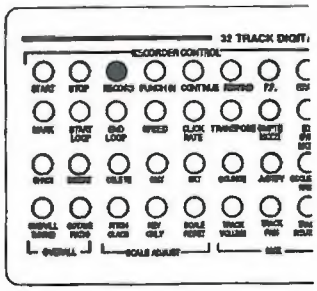
1. Solo the track on which you wish to record using the **track select** buttons.

   The **track select** button begins blinking.

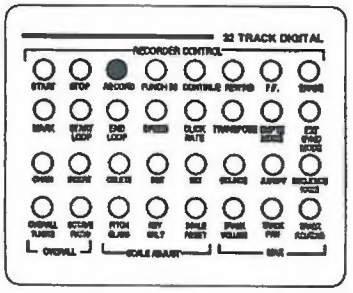
2. Press **record.**

   The new notes are recorded on the track with the blinking button. If no other **track select** buttons are lit, you hear all other recorded tracks.

After recording the same timbre on two or more different tracks, you can bounce, or merge, them to one track once you are satisfied with the recorded sequence. (See the section "Bouncing tracks.")



recor
panel



record panel 2

Selective track monitoring

If you are recording many tracks, you may not want to listen to all previously recorded tracks while recording new ones.

To record while monitoring selected tracks:

1. Solo the track(s) you want to monitor using the **track select** buttons.

   The buttons of the selected tracks light, and the last one pressed blinks.

2. Select the track on which to record using the **track select** buttons.

   The button of the selected track blinks, and the buttons of the previously soloed tracks remain lit.

3. Press **record.**

   As you record, you hear only the tracks with lit **track select** buttons. The notes you play are recorded on the track with the blinking button.

Recording without monitoring

There may be times when you wish to record without hearing any of the previously recorded tracks. You do this by monitoring an empty track.

1. Solo an empty track using the **track select** buttons.

   The button of the empty track begins blinking.

2. Solo the track on which you want to record.

   The empty track's button lights, and the selected track's button begins blinking.

3. Press **record.**

   You hear only digital metronome click and the keyboard timbre as you record.

Multitrack recording (con't)

Recording from the middle of a sequence

You can enter the record mode at any time while the sequence is playing.

- Press **record** while the sequence is playing.

  The **record** button lights, and any notes played are recorded on the selected track. The tracks you hear are determined by the selection procedures outlined above.

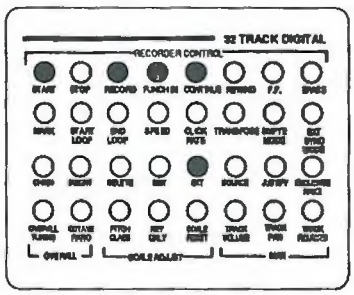
You can also use the **mark** button to set a starting point for recording anywhere in a sequence. (See the section "Setting a mark point.")

Summary of recording procedures

- Have sequence files of sufficient size available.
- Use the **erase** button to erase previously recorded notes if necessary.
- Press **record** to record the first track.
- Overdub on the same track with the same timbre or on other tracks using the **track select** buttons or different timbres.
- Record while monitoring other tracks according to the setting of the **track select** buttons.
- Record from the middle of a sequence by pressing **record** while the sequence is playing or by setting a mark point with the **mark** button.

Punching in

When a studio places its tape recorder in the record mode while the tape is moving, it is called **punching in.** Any notes recorded on the tape at or after the point of the punch in are erased and new notes are recorded over them.



start, record, punch in, continue, skt panel 2

Editing with the punch in button

1. Recall to the keyboard the timbre matching the timbre of the track you want to punch in.

2. If the keyboard timbre is recorded on more than one track, solo the track on which you want to record.

3. Play back the sequence to the point where you want to edit in one of the following ways.

   - Press **start** to hear only the soloed track.
   - Press **record** if you want to hear all other tracks.

4. Press **punch in** and start recording after the last note preceding and before the first note of the passage you want to change.

   When you press **punch in,** both the **punch in** and **record** buttons light.

   The previously recorded notes are erased as you record new notes over them.

5. To stop erasing and recording, press **punch in** a second time or press **continue.**

   Erasing and recording stop, and the sequence continues to play.

Using a foot switch to punch in

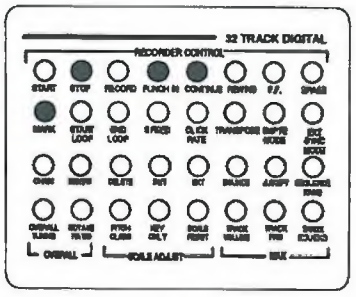
A foot switch can be used quite effectively to activate the punch in function, freeing your hands for the keyboard.

Connect the foot switch output to the **foot switch** jack on the back of the keyboard unit labeled **punch in/out.**

When you push the foot switch once, the recorder starts erasing and recording on the soloed track. You don't have to keep your foot on the foot switch. Just push it once and release.

To stop erasing and recording, push the foot switch again.

Punching in (con't)



stop, punch in, continue, mark panel 2

Notes on punching in

Recording starts as soon as you press **punch in** and stops as soon as you press it a second time. You can also exit the punch in mode by pressing **stop** or **continue.**

The Memory Recorder does not start or stop erasing in the middle of a note.

- If you press **punch in** between two notes (after one has ended and before the next one begins), the erasing begins immediately.
- If you press **punch in** in the middle of a note, the erasing begins right after the note ends.
- If you press **punch in** a second time to stop recording and this occurs during a held note, the recorder does not stop erasing until the note ends. The complete note is eliminated.

You can use the **mark** button to set a mark point for re-recording (see the section on "Setting a mark point"). Pressing **punch in** starts the sequence at that point.

Punch in can also be used to simply erase a note or notes without recording new ones. However, even if you only wish to erase notes and do not wish to record new ones, the keyboard timbre must be the same as the timbre on the blinking track.

The info button

You use the **info** button to get information about the sequence in the Memory Recorder.

1. Press **info.**

   The button lights, and the display window shows

   PRESS BUTTON FOR
   INFORMATION

   The **track select** buttons of all tracks containing notes light (or blink when the current position is beyond the last note on the track).

2. Press the **start** button.

   The display window shows the number of notes that can be recorded in the remaining recorder memory.

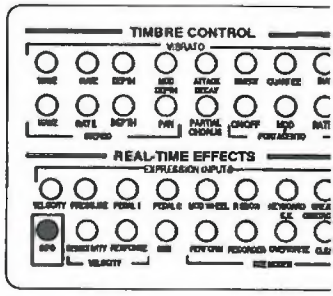
3. Press a **track select** button.

   The first note recorded on the track sounds. The display window shows the track number, the number of notes recorded and the name of the timbre.

4. Press a **partial timbre** button.

   The display window shows the number of voices and number of timbre frames in that partial timbre of the keyboard timbre.

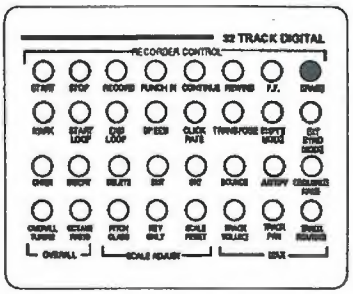
When you have finished using the **info** button, press it so that the light goes out.



info
panel 5

Notes, voices and the poly-phony mode

The Synclavier Memory Recorder is a multitrack recording device. You record on one track at a time, building a complex sequence. As you create larger sequences, you need to know some information about using your system to the maximum.



erase panel 2

Maximum number of notes

The maximum number of notes available is determined by the amount of external memory installed in your system. To find out this number:

- Press the **erase** button twice just after you load the system.

  The display window shows the maximum number of notes available in your system.

A timbre is recalled to the keyboard automatically when you first load your system. If that timbre (entry 1, bank 1, top-level W0:) contains a large number of patches or frames, it might use some of the available notespace. In this case you may see a smaller number than the actual maximum.

Maximum number of voices

The maximum number of notes that sound simultaneously on the keyboard depends on an interplay of two factors:

- the number of FM and/or polyphonic sampling voices required by the keyboard timbre; and
- the number of FM and/or polyphonic sampling voices installed in your system.

The number of notes sounding, multiplied by the number of voices used by the timbre, cannot exceed the number of FM or polyphonic sampling voices in your system. This is true not only of notes played on the keyboard, but of tracks recorded using the Memory Recorder as well.

You can record 200 timbres on 200 tracks, but the number of sounds you hear simultaneously on playback is still limited by the number of FM or polyphonic sampling voices in your system.

Notes, voices and the poly–phony mode (con't)

Independence of voices

The polyphonic sampling voices are independent of the FM voices. Polyphonic sampling voices do not use FM voices, and vice versa. Therefore, you can reach the limitations of either system—polyphonic sampling or FM—without affecting the other.

If you have recorded more voices than your system has available, some of the recorded notes do not sound when you play back the sequence. They are still in the Memory Recorder. You can hear them by soloing different tracks. You can also assign them to MIDI output channels and use them to control other synthesizers.

Keyboard polyphony control

Keyboard polyphony defines the number of notes that can be played simultaneously on a track or the keyboard. This allows for more efficient use of voices.

When the number of notes being played at the keyboard or on a track exceeds the polyphony setting, the earliest notes played are cut off to free up voices for the new notes. Any final decays sounding are also cut off.

Passages played using timbres with long final decays tie up voices for a longer period of time than those using timbres with short decays. When using FM or looped sound file timbres, all of the voices required by a note and its timbre are in use and unavailable as long as the final decay lasts. With unlooped sound file timbres, a voice is available when the end of the sound file is reached.

Notes, voices and the poly–phony mode (con't)

Keyboard polyphony control (con't)

Most timbres are programmed to be fully polyphonic, a setting of 128. With these timbres, you can play as many notes as you wish at the same time until all the voices in your system are used. When the timbre uses a long final decay, a note can be repeated as many times as you wish without cutting off the final decay. This can use a large number of voices in a very short time.

In real time, the system plays any new note by assigning it to unused voices. If there are not enough unused voices to play the note, the system tries to free up voices by cutting off any notes that are in their final decay. If there are still not enough voices, the new note does not play and bars appear in the display window.

In the Memory Recorder, the system also cuts off the final decays of any notes recorded on the same track. It does not, however, cut off final decays of notes recorded on different tracks in order to free up voices. In essence, each track is like a separate polyphonic synthesizer or sampler.

Setting the keyboard polyphony

You can limit the maximum number of voices used by the keyboard timbre by setting the keyboard polyphony.

1. Press the **polyphony mode** button.

   The display window shows

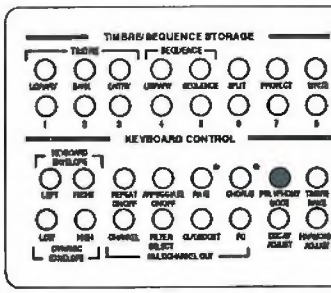
   [number] POLYPHONY

2. Use the control knob to change the number of notes which can be played simultaneously by the keyboard timbre.

A keyboard polyphony setting of 1 makes the timbre monophonic on the keyboard. This means that each new note cuts off the previous note regardless of whether the note is in the attack, sustain or final decay.

A setting of 2 or 3 means that two or three notes may be played simultaneously before notes begin to be cut off.

You may find the polyphony control useful when doing multitrack recording using timbres with long final decays.



polyphony mode panel 4

Changing the time display format

Time can be displayed in three formats:

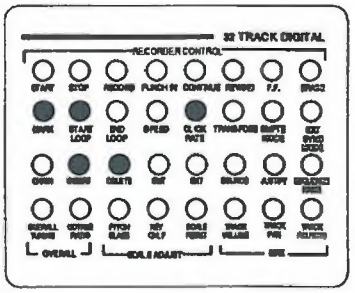
- measures and beats
- seconds
- SMPTE time code

You step through the three time display formats in the following manner.

1. Press and hold one of the following buttons:
   - **mark** button
   - **start loop** button
   - **insert** button
   - **delete** button
   - any **track select** button
2. Press the **click rate** button repeatedly.

   With each press of the **click rate** button, the time display changes to a different format.

Changing the display of the time format using any of the buttons listed above changes the parameters on the other buttons to the same format.



mark, start loop, click rate, insert, delete panel 2

Changing the tempo

You can change the playback or recording speed of a sequence without changing its pitch.

1. Press **start** to listen to the sequence while you adjust the speed.

2. Press the **speed** button.

   The display window shows

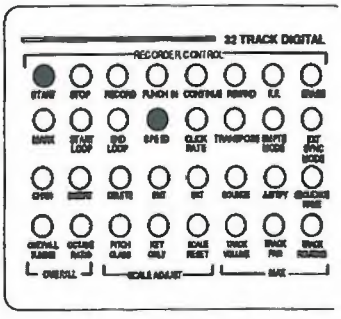
   [number] SPEED

3. Dial in any number from 0.000 to 10.00 with the control knob.

Dialing zero brings the recorded sequence to a standstill; dialing ten makes its speed ten times the original recorded speed. Pressing the **speed** button again restores the sequence to a speed setting of 1.000. When you store a sequence on disk, the current speed setting is stored along with it.

With any speed changes made between recording and playback, the click is adjusted automatically to keep the digital metronome in time with the sequence. The click rate that appears in the window when you press the **click rate** button, however, always indicates the rate of the click when the speed setting is 1.000.

Note: Pressing the **speed** button repeatedly toggles the speed of the sequence between 1.000 and 0.960. When the speed is set to 0.960, the click rate is expressed in frames-per-beat instead of the normal beats-per-minute or milliseconds. Pressing speed again restores the default 1.000 speed.



start, speed panel 2

Increasing the speed by factors greater than ten

It is possible to speed up a recorded sequence by a factor even greater than 10. You must anticipate this possibility before making your original recording.

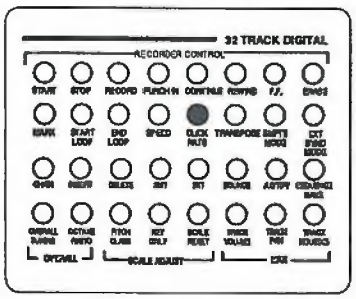
1. Before recording, set the speed to less than 1.000.
2. Make the recording.
3. After recording, set the speed setting to greater than 1.000.

For example, recording a sequence at a speed of .010 and playing it back at a speed of 10.00 results in a playback speed 100 times faster than the original recording.

The digital metronome

The digital metronome provides an audible click signal used to synchronize recording on one track with that of another. If your system has been properly set up, the internal click is audible when you first load the Real-Time Performance system and press **start.** If it is not, see that the **click output** on the computer audio connector panel is connected to a line input on your console or mixer and that the volume level at the console is turned up.

The click can also be heard through headphones connected to the headphone jack on the back of the keyboard unit. The volume knob next to the headphone jack controls the headphone volume.



click rate panel 2

Controlling the click

To turn the click off:

- Press the **click rate** button three times.

  The button begins to blink, and the click becomes inaudible.

To turn the click back on:

- Press the **click rate** button once.

  The button lights, and the click becomes audible.

The audible or inaudible state of the **click rate** button is retained in memory, even when you turn the button light out by pressing a different button to change another parameter. Pressing the **click rate** button when it is not lit does not change the status, but lights the button in its current state, displaying the click rate in the display window.

To change the click rate:

1. Press the **click rate** button.

   The display window shows

   120.0 BEATS/MIN

2. Press **start** if you want to hear the click while you change the rate.

3. Use the control knob to change the click rate.

Click rate and click period

The click can be expressed as either a click rate (beats-per-minute or frames-per-beat) or a click period (milliseconds). These values are reciprocals; that is, the click rate increases as the period between clicks decreases, and vice versa.

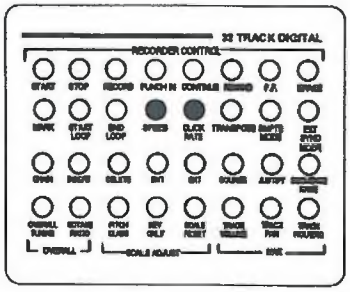
When you first load the system, the click is expressed in beats-per-minute. When you press the **click rate** button, the button lights up and the display window shows:

120 BEATS/MIN

To see the click expressed as a click period, press **click rate** a second time. The button remains lit and the display window shows

500 MILLISEC

If you press **click rate** a third time, the button begins blinking and the click becomes inaudible during playback or recording.



speed, click rate panel 2

The frames-per-beat mode

When recording music for film synchronization, you may want to use a click rate expressed in frames-per-beat instead of beats-per-minute. Based on the standard film speed of 24 frames-per-second, this click rate allows you to specify the tempo of the music in film synchronization terms.

1. Press the **speed** button twice.

   The number 0.960 appears in the display window. This timing adjustment is necessary so that each Synclavier click exactly equals an eighth of a frame.

2. Press **click rate.** The display window shows

   12.4 FRAMES/BT

   This default click rate makes each click last exactly 12 and 4/8ths frames at the frame rate of 24 frames-per-second. (The number to the right of the decimal is in base 8.)

3. To change the click rate, dial in a new frames-per-beat rate.

To return to a click rate in beats-per-minute (or a click period in milliseconds), press **speed** twice more. The setting returns to 1.000.

Any time the speed is set to 0.960, the click rate is displayed in frames-per-beat. This is true whether you press the **speed** button twice or use the control knob to dial the speed to 0.960.

Resetting the click rate to its default value

The default click rate is 120 beats-per-minute. The default value of its reciprocal, the click period, is 500 milliseconds.

When you store a sequence, the current click rate is stored along with it. When you erase a sequence, the current click rate is not reset to its default value.

You can only reset the click rate to its default value by

- using the control knob to set the click rate to 120.0 beats-per-minute or 500 milliseconds;
- leaving the Real-Time Performance system.

If you change the click rate after a sequence has been recorded, the tempo of the sequence remains the same. This allows you to set the click to different metronomic settings without changing the tempo.

Creating a click track

The clicks generated by the digital metronome occur at a steady rate. Although you can change the click rate at any time during recording, the click rate remains the same from one bar to the next. This does not lend itself to certain types of musical expression, such as a cadenza, accelerando or ritard.

Any track can be used to control the output of the digital metronome. The click sounds each time a note starts. Tracks used this way are called **click tracks.***

You can record a click track by tapping the beat on a key on the keyboard. Percussion timbres are easiest to work with, but any timbre may be used.

You may want to record different parts of the click track on different tracks at different tempos and then slide and bounce the tracks together to create the final click track. The justified mode should be used in this procedure.

You can record the parts of your sequence with steady tempo first, then record sections of click track to use in recording the places where tempo changes. A click track cannot be used to impose tempo changes upon already recorded tracks.

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* A system limitation allows no more than 60 seconds between clicks.

Using a click track

Once a click track is recorded, you use it to control the digital metronome.

1. Record a track containing notes which sound at exactly the times you want the clicks to sound.
2. Press **click rate** and hold it down.
3. Press the appropriate **track select** button.

   The display window shows

   CLICK: TRACK [number]

4. Press **track volume** and turn the control knob to set the track volume at zero.
5. Press **start** or **record.**

   When you play the sequence, a click sounds for every note recorded on the click track.

To return to the digital metronome:

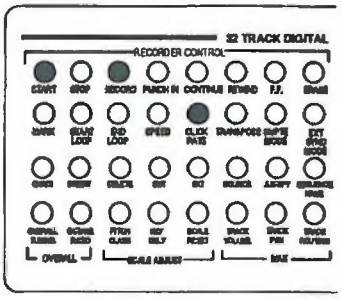
1. Press **click rate** and hold it down.

   The display window shows

   CLICK: TRACK [number]

2. Press the **track select** button having the number of the track displayed in the display window.

   The display window then shows the current click rate.



start, record, click rate panel 2

Using an external click track

You can use a trigger pulse or DC sync signal from an external source such as a drum machine to control the click while recording on the Synclavier. Using a timing interface module such as the Doctor Click* or the CIM-1**, you can control a click with a sync signal or percussive audio track recorded on tape.

External click tracks that can be used include

- a live click or percussive sound that has been recorded on tape and conditioned using a timing interface module;
- a SMPTE-driven metronome that generates a trigger pulse from SMPTE time code recorded on tape;
- a drum machine or sync box that generates a trigger pulse based on a sync code (such as FSK) recorded on tape.
- any TTL standard trigger pulse (2 volts or more).

Each of these external trigger pulses can be fed into the **external clock in** jack. When you press **start** or **record**, the Memory Recorder waits until it receives the appropriate signal before starting to play or record. (See the manual *Studio Operations* for complete instructions.)

When recording is controlled by an external click, justification occurs relative to the external click. (See the section "Rhythmic justification" in this manual.)

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* Doctor Click is a registered trademark of Garfield Electronics, P. O. Box 1941, Burbank, CA 91507

** The CIM-1 is a clock interface module available from New England Digital.

Setting measure length (beats-per-measure)

You can define the meter of a sequence by setting the measure length in beats-per-measure. Measure length settings are especially useful when defining loop lengths or when using the chain, insert or delete functions.

Regardless of the actual meter of the sequence you record, the default measure length is four beats. As the sequence plays, the display window shows the current measure, the current beat and the actual click number. For example,

M 1:4 8

indicates that the sequence is at the 4th beat of the first measure and the eighth click of the sequence. Note that the measure numbers begin with zero. This means you get a one-measure count.

To set the measure length to a value other than four beats per measure:

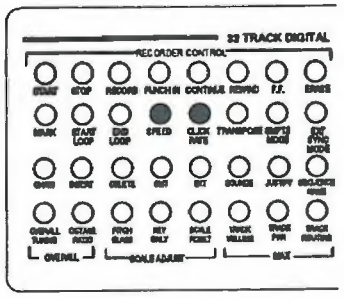
1. Press and hold the **click rate** button while you press the **speed** button.

   The display window shows

   4 BTS/MEASR

2. Use the control knob to select a measure length in beats.

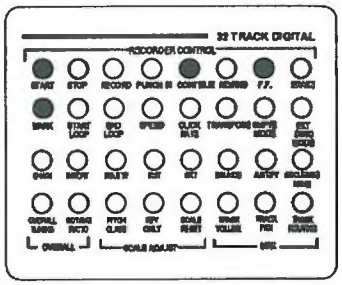
To display only the actual click numbers, set the measure length to 1. The maximum measure length is 128 beats. The measure length setting is saved with the sequence.



speed, click rate panel 2

Marking a sequence

You can specify any beat of a sequence as a mark point either while the sequence is playing or while it is stopped. Once a mark point is set, pressing start automatically starts the sequence from that point.



start, continue, f.f., mark panel 2

Setting a mark point

To set a mark point while the sequence is stopped:

1. Press and release the **mark** button.

   The display window shows

   M [measure]:[beat]
   MARK POINT: ON

2. Use the control knob to set a starting beat number.

3. Press the **start** button.

   The sequence plays from the specified beat.

To set a mark point while the sequence is playing:

1. Press the **start** button to play the sequence.

2. Press and hold the **mark** button.

   The display window shows

   M [measure]:[beat]
   MARK POINT: ON

3. Press **continue** at the desired point. Release both buttons.

   The display window shows a new starting measure and beat.

4. Press **start.**

   The sequence plays at the specified mark point.

Marking the first recorded beat

If you are working on a particular track that starts after the beginning of the sequence, you can set the mark point to the first recorded beat of the track.

1. Press and hold the **mark** button.

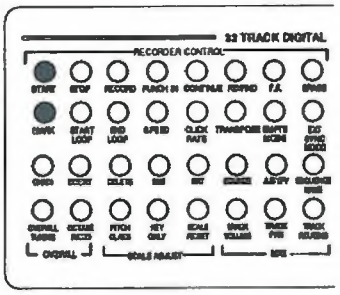
   The display window shows

   M [measure]:[beat]
   MARK POINT: ON

2. Press the desired track button.

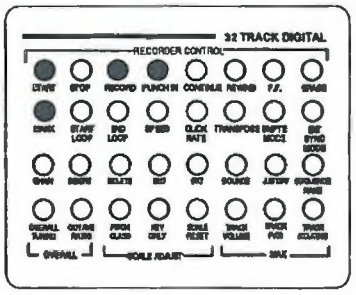
3. Press **start.**

   The sequence begins playing at the first recorded beat of the selected track.



start, mark panel 2

Marking a sequence (con't)



start, record, punch in, mark panel 2

Clearing a mark point

You can clear a mark point using either of the following methods.

Method 1.

1. Press **mark.**
2. Use the control knob to set the mark point to zero.

Method 2.

1. Press and hold **mark.**
2. Press a **track select** button containing an empty track. The display window shows

   M 0:0.000
   MARK POINT: ON

When a mark point has been set, pressing **start** once or twice starts the sequence from the designated mark point. **Record** and **punch in** also start the sequence from the mark point.

Turning the mark start feature on and off

You can turn off the mark start feature while retaining the mark point in memory.

1. Press and hold the **mark** button.
2. Press the **stop** button. The display window shows

   M [measure]:[beat]
   MARK POINT: OFF

   When you press **start**, the sequence starts at the beginning.

Even when the mark point is disabled, it can be set or changed using any of the methods described previously.

To turn the mark start feature back on:

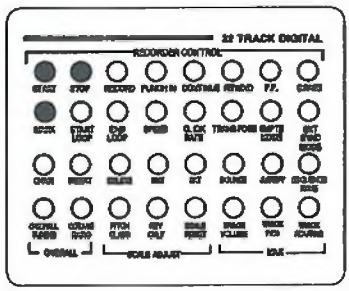
1. Press and hold the **mark** button.
2. Press the **start** button. The display window shows

   M [measure]:[beat]
   MARK POINT: ON

   When you press **start**, the sequence starts at the previous mark point.

The on/off status of the mark start feature is displayed whenever the mark button is pressed. The status does not change when you set or change the mark point. The default status is "Off."

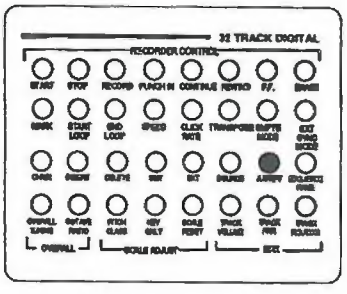
Mark points are saved with a sequence; the on/off status of the mark start feature is not.



start, stop, mark panel 2

Rhythmic justification

When the justified mode is selected, the computer automatically positions the notes you play exactly on the nearest beat or selected subdivision of the beat.



justify panel 2

Setting a click rate multiplier

A justification unit is established by the click rate and click-rate multiplier settings.

The click-rate multiplier subdivides the click period so that additional inaudible "clicks" are produced internally. You still hear the click only on the beat, but recorded notes are justified to the nearest internal click (or subdivided beat). When the click-rate multiplier is set to one, recorded notes are justified to the nearest click.

Different click-rate multiplier settings can be used to achieve different justification results. The default setting for the click rate multiplier is 4.

To set the click-rate multiplier:

1. Press the **justify** button so that it is lit.

   The display window shows

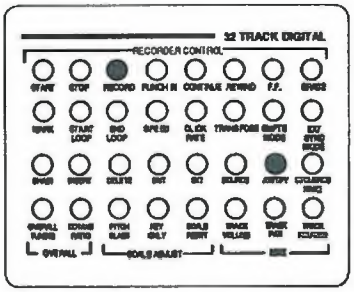
   [number] CLICK MUL

2. Use the control knob to dial any number from 1 to 16.

Click-rate multiplier settings

time signature	click note	click-rate multiplier	note value justified
4/4	quarter	1	quarter
4/4	quarter	2	eighth
4/4	quarter	4	sixteenth
6/8	dotted quarter	1	dotted quarter
6/8	dotted quarter	2	eighth
6/8	dotted quarter	4	sixteenth

Rhythmic justification (con't)



justify, record panel 2

Entering the justified mode

The **justify** button must be lit before you press record to produce a justified recording. Any notes you record are justified to the nearest click or click subdivision.

1. Press the **justify** button.

   The button lights and the display window shows

   [number] CLICK MUL

   The justify mode is now active.

2. Press **record.**

Uses of justification

Justification moves notes played slightly early or late to the correct position. You must play accurately enough, however, so that notes are not moved to the wrong position.

You can also use the justified mode to overdub precise polyrhythms onto the same or different tracks. To do this, change the click rate for each overdubbing, maintaining a ratio that represents the ratio of the two rhythms to be merged. For example, to record a two against three rhythmic pattern, record one track at two-thirds the rate of the second track. The second click rate does not affect the beat of the previously recorded justified notes.

Other uses of justification include

- entering the justified mode before pressing punch in to assure perfect synchrony when adding new notes to a justified sequence;
- entering the justified mode before placing a loop while a sequence is playing so that the entire loop contains an integral number of beats;
- recording a steady justified tempo in the background of a composition with an expressive unjustified musical line on top.

Note: Once a sequence has been recorded in the unjustified mode, it can only be justified one note at a time from the Music Notation or Recorder displays.

You can use the **speed** setting to slow the recording for precise justification of extremely short note values.