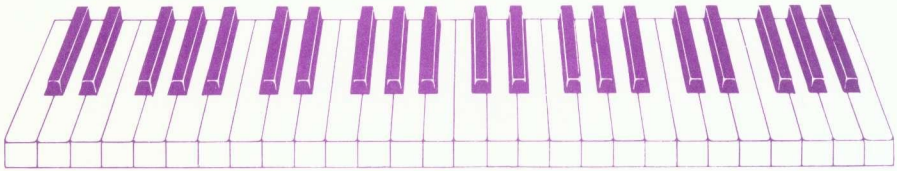
MIDISOFT
CORPORATION

MIDISOFT STUDIO

Multi-Track MIDI Recording Studio For The Atari ST



USER'S MANUAL

MIDISOFT STUDIO User's Manual

Edition 2

We hope you enjoy *MIDISOFT STUDIO.* It's the first in what we plan to be an emerging line of innovative quality products to complement your creative musical instincts. We want to see *MIDISOFT STUDIO* and our other musical tools fill your needs, so please offer feedback about what can make this a better product. A problem report template is provided on the last page.

One thing which has crippled many creative companies' ability to improve and introduce new good products is unauthorized copying of the software. We have priced *MIDISOFT STUDIO* so that it can be purchased for considerably less than its value, and hope this will encourage you to recommend that your friends buy *MIDISOFT STUDIO* instead of giving it to them. This will allow them to get the low-cost updates that you will be receiving, and the special prices for new products.

Have fun sequencing,

Midisoft Corporation

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1. What is MIDISOFT STUDIO?

MIDISOFT STUDIO is a creative music tool that will record what is played on a MIDI keyboard or other instrument, allow editing and rearrangement of the recorded musical information, and replay the music through the MIDI instrument. The recorded MIDI information may be saved and reloaded with a floppy or a hard disk.

MIDISOFT STUDIO can record approximately 70,000 notes on the 1040ST and 30,000 notes on the 520ST computers. All sixteen MIDI channels are supported and are reassignable during playback for each active track. *MIDISOFT STUDIO* is a complete implementation of MIDI and will record velocity, aftertouch, pitchbend, and program change information.

2. Getting Started

2.1. Getting Connected

The Atari ST computer has a built-in MIDI interface. There are two 5-pin circular (DIN) connectors on the rear of the computer that are labeled "Midi In" and "Midi Out." There should be two similar connectors on your MIDI instrument. Two standard MIDI cables are required and can be obtained at any keyboard-oriented music store. Connect one cable from the MIDI Out connector on the MIDI instrument to the "Midi In" connector on the ST computer. Connect the other cable from the "Midi Out" connector on the ST computer to the MIDI In connector on the MIDI instrument. It is not necessary that the computer be turned off when making the connections; check the owner's manual to see if your particular instrument should be turned off.

Double-check to make sure that the connections are correct.

2.2. Loading the Program

Before loading *MIDISOFT STUDIO*, the display monitor must be in the medium resolution mode (if it is color) or in high resolution mode (if it is monochrome). Refer to your Atari user's manual for details on changing monitor resolution. After the instrument(s) is properly connected to the MIDI interface, load the *MIDISOFT STUDIO* program by double-clicking the left mouse button on STUDIO.PRG. *Note: the resource file STUDIO.RSC must always be present on the same disk as STUDIO.PRG.* The main window will appear on the display.

2.3. How to Record

Load *MIDISOFT STUDIO* as described above. Set up the beat and metronome as desired by using the SETUP menu item as described in Section 5: "Setup" Functions (be sure the volume is up on your display if you use the metronome). Now, put one track in RECORD mode by single-clicking the left mouse button on the Track Mode selector for that track. That track should change from CLEAN to RECORD. Recording is begun by single-clicking on the Record button. If a track is in RECORD mode, the Record and Play buttons will both become highlighted, indicating that they are selected. If no track is in RECORD mode, *MIDISOFT STUDIO* will automatically change the next available CLEAN track to RECORD mode before enabling the Record function. The Play button always comes on together with Record even if no tracks are enabled for play.

When the Record button is selected, the metronome lead in starts (if enabled in the setup); then recording begins. Recording is ended by clicking on the Stop button. If anything was recorded on the track, *MIDISOFT STUDIO* will automatically switch that track to the Play mode, otherwise the track will remain in Record mode. The track length will display the length of the recorded track in measures.

RECORD will remember the notes played as well as other MIDI information. Program changes (sound selections), pitch bend, aftertouch, and a myriad of other MIDI signals can be sent from the synthesizer. Often it is useful to use the STEP RECORD feature (see Section 13: Step Record) to set your program change information precisely at the beginning of the music. It is often necessary to toggle the program changes so that the MIDI signal gets sent from the synthesizer. For example, on the CZ-101, you may want to designate channel 1 as TRUMPET (program 2). If your CZ-101 is already set to program 2, to record that sound in *MIDISOFT STUDIO* you should change to some other program (program 1: BRASS, for example) and change back to program 2: TRUMPET. If you keep all the program change information on a separate track, it is trivially easy to replace it when you want to rearrange your instruments settings.

2.4. How to Play

To play a track after recording, make sure the song is rewound to the beginning (1| 1| 1), the track mode is PLAY, and the track to be played is assigned to the correct MIDI channel for your instrument. Play is started by a single-click of the left mouse button on the Play button. The metronome lead-in will begin if enabled, and then the song will begin. During play, a

track may be turned on or off with the track mode selectors. While playing, access to most of the other *MIDISOFT STUDIO* functions is permitted. Playing may be temporarily paused with the Pause button. Playing is terminated by the Stop button. When playing is stopped, the song is automatically rewound to the beginning.

2.5. Using Fast Forward

The fast forward function allows cueing within a song by speeding up the tempo while the song is being played. Fast forward is enabled by placing the mouse cursor on the Fast Forward button and pressing the left mouse button. The Fast Forward button will highlight, indicating that fast forward is enabled. Fast forward is ended with another click on the Fast Forward button or with the Stop button. The Play button must be selected for fast forward to function.

2.6. Using Rewind

The rewind function may be used at any time (except during recording) by holding down the left mouse button on the Rewind button. This will rewind toward the beginning of the song. Clicking the right mouse button will rewind instantaneously.

2.7. Using Pause

The pause function is activated by single-clicking the left mouse button on the Pause button, thus highlighting the button. Pause is disabled with another

click on the Pause button. While paused, music may be played from that point with the Play button. Recording cannot occur when paused. If the song is paused while a note is being sustained, the note will not be terminated (you may continue to hear the note, depending on the particular voice or patch on your MIDI instrument). The All Notes Off command (see Section 4.6: The "MIDI" Menu) will terminate any notes that are left on while paused.

2.8. Using Stop

The Stop button is used to stop playing, recording, or fast forwarding. Unlike the Pause button, the Stop button will turn all sustained notes off.

3.1. Multitrack Recording Concepts

MIDISOFT STUDIO is designed to look and operate like a multitrack audio tape recorder. There are 32 total tracks that may be recorded, edited, or played. The control buttons record, play, fast forward, rewind, pause and stop exactly as they do in a standard tape recorder. Multitrack recording allows compositions to be built in independently recorded layers. For example: First a drum pattern is recorded on track one; then some rhythm passages are recorded on the second track while playing the drums from the first track; next, some melody is recorded on the third track while playing tracks one and two (rhythm and drum). Since each track is separately recorded, each may be edited or re-recorded without affecting the other tracks. Tracks may be combined together into a single track. Combined tracks should be tracks that are intended to be sent to the same MIDI channel (e.g. you wouldn't

want to combine your drum machine track on MIDI channel one with your synthesizer track on MIDI channel two; they could no longer be played as separate instruments).

3.2. Tracks and Channels

It is important to distinguish the difference between tracks and MIDI channels. A channel identifies the MIDI instrument involved, and a track is a single layer in the multi-layered representation of *MIDISOFT STUDIO* music. It is normal to be sending several tracks through a single channel (and thus a single instrument). The MIDI interface provides the capability for supporting up to sixteen channels of communication. Generally, a single MIDI instrument (drum machine, keyboard, etc.) uses one MIDI channel and this channel is selectable by the user through the instrument (see the owner's manual for your particular instrument to learn how to do this). Each MIDI command from the computer is sent with a channel identification which determines which instrument(s) will play that note. *MIDISOFT STUDIO* records the MIDI information coming from an instrument onto a track. This track is assigned (patched) to one of sixteen MIDI channels. It is this MIDI channel assignment that determines what channel identification code is transmitted with the MIDI commands. A track may only be assigned to a single channel, but multiple tracks may be assigned to the same channel.

4. MIDISOFT STUDIO's User Interface

MIDISOFT STUDIO was designed to make full use of the Atari ST series of computers and the GEM interface. Before using, you should be familiar with the basics of the GEM desktop, drop down menus, and dialogs. *MIDISOFT STUDIO* provides a main screen display with all of the controls necessary to operate the recorder. Special setup, editing and file operations are done by selecting drop down menus that appear across the top of the display.

4.1. Drop Down Menus

The drop down menus provide access to the special setup, file operations, and editing capabilities of *MIDISOFT STUDIO.* The menus automatically drop down when the mouse cursor is moved to the title of the menu in the menu bar. Selections are made within the menu by single-clicking the left mouse button over the desired item in the menu. Selections that appear in half-intensity are disabled and cannot be selected. The Menus include Desk, File, Setup, Edit and MIDI. Each is described in general below.

4.2. The "Desk" Menu

Access to all desk accessories is provided through the DESK menu. The accessories must have been installed by having disk files (with .acc name extensions) on the disk in drive A: when the system was turned on or reset. Also available through the Desk menu is an "About Studio" selection that displays copyright information and the release version of the program.

4.3. The "File" Menu

The File menu provides four selections: Save File, Load File, Abandon, and Quit. Selecting the "Quit" item will cause the program to remind the user that this function will erase all recorded tracks. The user may then choose to save that information, return to the program or quit the program and return to the desktop. The "Save File" and "Load File" operations will display a disk file selector dialog from which the user selects or enters a filename for the save or load operation. The "Abandon" operation will abandon current work, erasing all recorded tracks and track descriptions (this does not change what is on disk, however). See section 8: Saving and Loading *MIDISOFT STUDIO* Files.

4.4. The "Setup" Menu

The Setup menu is used to set up the basic operation of the program. The selections include Beat, Clock, Enables, Instruments, Fast Mouse, MIDI Thru, Aftertouch Filter, Expert Mode and Auto-rewind. The "Beat" item displays a dialog allowing the user to select the number of beats per measure and the number of lead-in measures. "Clock" allows the user to select from internal or external timing sources. Most often the clock will be internal; see Section 14: Using *MIDISOFT STUDIO* with External Clock. "Enables" lets the user choose characteristics of their MIDI setup. The "Instruments" item displays a dialog allowing the user to select some keyboard-specific information about how the instrument will be used.

The "Fast Mouse" and "Expert Mode" items allow the experienced user to select certain options that will

speed up the use of *MIDISOFT STUDIO.* "Auto-rewind," if enabled, will cause the program to rewind to the beginning of the song when playing or recording is stopped. "Aftertouch filter" instructs the program to ignore MIDI aftertouch information--information that frequently takes much memory.

4.5. The "Edit" Menu

The Edit menu provides access to all of the editing functions of *MIDISOFT STUDIO.* These functions each prompt with dialogs and include selections for Erase Track, Move Track, Copy Track, Combine Tracks, Insert, Delete, Paste, Erase, Transpose, Time Correction, and Step Record. These operations are further described under Sections 9, 10, and 11

4.6. The "MIDI" Menu

The MIDI menu contains special commands to be sent directly to the MIDI instruments. These commands are System Reset, All Notes Off, Tune Request, and Song Selection. The System Reset should be used with caution; it prompts with a dialog to verify the request before performing the reset. The All Notes Off command turns off any spurious notes left on. Tune Request will send a special MIDI command requesting that the instrument tune itself. This command is primarily for analog synthesizers. Song Selection will send a special MIDI command requesting that the receiving instrument (sequencer or drum machine) select a particular song. This MIDI command supports up to 128 songs numbered from 0 to 127. Check the owner's manual for your particular instrument to see if it will respond to the System Reset, Tune Request, or

Song Select commands. If not, the commands should be ignored with no adverse effect. If your instrument does respond to a system reset, become familiar with the results of the reset before using the Reset command.

5. "Setup" Functions

5.1. Setup "Beat"

This item lets you select the number of beats per measure and the number of lead-in measures. One to sixteen beats per measure are allowed. A quarter note always gets one beat. The number of beats per measure will affect the metronome (placement of strong and weak beats), the counter, and the track length display. Lead-in measures are counted off before playing or recording begins.

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1 – 2 – 3 – 4 – 1 . . .

^ Recording begins here

With one lead-in measure the metronome would begin on the first one count; the counter and recording (or playing) would begin on the second one count:

1 – 2 – 3 – 4 – 1 . . .

^ Recording begins here

5.2. Setup "MIDI Clock"

This item lets you select either an internal clock or an external MIDI clock. The clock is what provides the timing information and synchronization for the sequencer. For most cases, the internal clock will be used. The external clock may be used with another sequencer or drum machine that provides a MIDI clock. *MIDISOFT STUDIO* will synchronize to this external MIDI clock signal. For further information, see Section 14: Using *MIDISOFT STUDIO* with External Clock.

5.3. Setup "Enables"

This item provides a dialog for the selection of whether certain MIDI real-time commands will be sent and responded to by *MIDISOFT STUDIO.* Selections are provided to enable sending MIDI clock, MIDI start/stop and MIDI song pointer. Enables are also provided for responding to MIDI start/stop and MIDI song pointer commands. To change an enable selection, single-click the left mouse button on the ON/OFF button for the appropriate selection(s), and click on "OK".

5.4. Setup "Instruments"

This item provides a dialog for transmitting setup commands to instruments on each MIDI channel. This allows control of OMNI ON/OFF (OMNI ON means the instrument plays information on all MIDI channels), POLY ON/OFF (polyphonic or monophonic operation) and LOCAL ON/OFF (LOCAL OFF means that the synthesizer no longer plays music that is keyed on the

keyboard). Mode changes are made by single-clicking the left mouse button over the current mode. The modes toggle between OMNI ON/OMNI OFF, POLY/MONO, and LOCAL ON/LOCAL OFF. When the desired modes are selected for all channels, the "OK" button will end the dialog and transmit the information over the MIDI cable to the instruments. Channel setup information is saved on disk with each song and restored and re-transmitted when the song is loaded. Not all instruments implement all of the channel mode options; check with the owner's manual for your instrument's implementation of these channel modes.

5.4.1. Setting Mono Mode.

Because this mode can affect multiple channels, care must be taken to set it correctly. Some synthesizers have a POLY mode, when only one type of instrument is used polyphonically (chords), or MONO mode, where multiple instruments are used, but each is monophonic (no chords). When selecting MONO mode, you must set that option for all the channels that will be affected.

For example, when the CASIO CZ-101 is in MONO mode, it will accept monophonic music on each of four consecutive channels. If you wanted the CZ-101 to accept channels 3 through 6, you would select MONO for each of channels 3,4,5 and 6.

5.5. Setup "Thru"

The MIDI THRU function, when enabled, passes MIDI information from the MIDI input to the MIDI output of the Atari ST. In addition, all MIDI information sent from the Atari ST to MIDI Out (by PLAYing) is combined intelligently with this MIDI In information, in what would more appropriately be called Midi Merge.

MIDI Thru is enabled with the THRU dialog of the setup menu. MIDI is enabled/disabled by single-clicking the left mouse button on the YES/NO box that appears to the right of "MIDI THRU:". The MIDI channel number can be modified before the MIDI data is sent to the output. This feature is enabled/disabled by the ON/OFF button to the right of "CHANNEL MODIFY:". When "CHANNEL MODIFY:" is off, the original channel number of the MIDI IN information is retained when it is passed to the output.

When "CHANNEL MODIFY" is on, the MIDI channel number that is specified to the right of "THRU CHANNEL:" is included with all outgoing MIDI information. Even if you are recording on a keyboard that sends to multiple channels, this will be redirected to one channel if "CHANNEL MODIFY" is on. To change the THRU CHANNEL, single-click the right or left mouse button on the channel number in the box to the right of "THRU CHANNEL:". The left mouse will decrement the channel number; the right mouse button will increment the channel number.

Note: Changes to "MIDI THRU", "CHANNEL MODIFY", and "THRU CHANNEL" are sent to MIDI as they are changed, not when the OK button is pressed, as in most other dialogs.

5.6 Setup "Expert Mode"

This item lets you enable or disable the Expert Mode option. When enabled, the Expert Mode option will suppress the warning messages normally associated with saving and loading files, abandoning, and editing. The only warnings displayed while in Expert Mode are those associated with protected tracks and with quitting the program. This option allows for faster operation for experienced *MIDISOFT STUDIO* users. The Expert Mode option is enabled by single-clicking the left mouse button on the Expert Mode menu item. When enabled, a check mark will appear to the left of the Expert Mode menu item.

Caution: When Expert Mode option is enabled, no warning is given before abandoning or loading (and thereby erasing all recorded information in memory)! Also, no warning is given before overwriting an existing file with one of the same name during a save operation.

5.7. Setup "Fast Mouse"

This item lets you enable or disable the Fast Mouse option. When enabled, the Fast Mouse option will cause the cursor to move twice as far on the screen for a given mouse movement. This allows faster access with less hand movement for experienced users. It is also handy if you have a small space on which to move the mouse. The Fast Mouse option is enabled by single-clicking the left mouse button on the Fast Mouse menu item. When enabled, a check mark will appear to the left of the Fast Mouse menu item.

5.8. Setup "Aftertouch Filter"

Some MIDI keyboards transmit aftertouch information which may use up a great deal of memory, if recorded. Aftertouch sensing pays attention to how hard you are pressing a key and keeps sending this information as long as you hold the key down. If you don't need this aftertouch information, you may want to use the Aftertouch Filter.

When the aftertouch filter is on, no aftertouch information is recorded or passed through to MIDI out. The aftertouch filter is enabled by clicking the right mouse button on the A/T FILTER item on the setup menu. When enabled, a checkmark will appear to the left of this item.

5.9. Setup "Auto-rewind"

This item lets you enable or disable the Auto-rewind function. When enabled, Auto-rewind will rewind to the beginning of the current song whenever recording or playing is stopped or when step recording is completed. Auto-rewind is enabled by single-clicking the left mouse button on the Auto-rewind menu item. When enabled, a check mark will appear to the left of the Auto-rewind menu item.

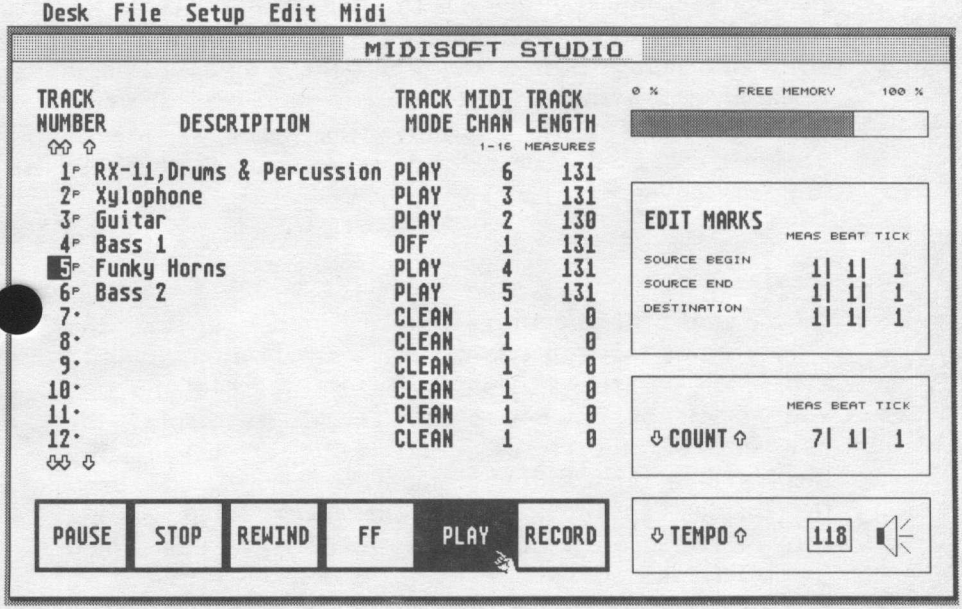
5.10. Default Setup Values

When *MIDISOFT STUDIO* is loaded, the setup defaults to internal clock, four beats per measure, no lead-in measures, metronome on, auto-rewind off, enables off, fast mouse off, aftertouch filter off, MIDI Thru off, and expert mode off.

5.11. Using the Metronome and Counter

MIDISOFT STUDIO uses the count as a timing 'template' to provide a timing reference for editing and arranging recorded tracks. The metronome does not have to be used; instead a drum or rhythm 'sync' track may be recorded first and used as an audible cue for synchronizing additional recording. When the metronome is used, it provides a strong accented beat on the first beat of the measures. If the beat is compound, a second weaker accented beat is sounded also. For example, with six beats to the measure, there would be a strong accent on the one count, a weak accent on the four count, and normal beats on the remaining counts. The weakly accented beat is sounded as a slightly higher pitch than the normal beat, and the strongly accented beat is sounded as an even higher pitch. When starting from the beginning of a song, the metronome always starts on a pickup beat (i.e. the last beat of the preceding measure). The strongly accented beat (first beat in measure) will then be the second beat sounded. *MIDISOFT STUDIO* allows the user to freely change the number of beats per measure, even after recording. Changes in beat setup are not recorded.

Figure 1. The Main Window



6.1. The Main Window (see Figure 1)

The Main Window is opened automatically when the program is invoked and remains on the screen until the program is exited. This window provides all of the controls necessary for recording and playing. Most functions in the Main Window may be accessed by moving the mouse to make the cursor point to the particular item, and clicking the left mouse button. The different buttons, displays, and edit fields are described below. The Main Window may be moved by placing the mouse cursor on the 'mover bar' across the top of the window and holding the left mouse button while the mouse is moved. When the mouse button is released, the window will be redisplayed in its new position. The ability to move the main window is provided to give access to desk accessories that are 'topped' (covered up) by it.

6.2. Under the heading **Track Number** appear the numbers one through twelve, and a single up-arrow and a pair of up-arrows, along with a single down-arrow and a pair of down-arrows. The digits display the numbers of the tracks that are currently being displayed in the window. The single arrows will scroll the display up or down by one track. The double arrows will scroll the display up or down by one screen (twelve tracks).

Directly to the right of each track number is a **Track Protect** selector. When track protection is disabled, the selector appears as a small dot. Clicking the left mouse button on the selector will enable track protection and a 'P' will appear indicating that the track is protected. A protected track cannot be erased (except by the Abandon command), edited, or time corrected. A protected track can be moved to another track location.

If music is saved with the Save command, the track protect status is saved along with the file and restored when the work is reloaded from the file. It is recommended that track protect be used extensively to protect tracks from inadvertent modification or erasure.

6.3. Description provides a 24-character edit field for each track in which the user may optionally enter a description for the track. All characters, numbers and symbols that appear on the computer keyboard may be entered in these fields. To enter a track description, first open the field for editing by single-clicking the left mouse button over the track description area for the desired track. A cursor appearing as a thin vertical line will be displayed. The description field may be cleared with the Escape (Esc) key, and text may be entered from the ST keyboard. The cursor may be positioned within the entered text with the right-arrow and left-arrow cursor control keys on the ST. When the desired track description text has been entered, close the edit field by either single-clicking the left mouse button on the field or by striking the Return key. An open edit field may also be closed by opening another edit field.

6.4. Track Mode displays the current mode of each displayed track. The possible modes are CLEAN, RECORD, PLAY, OFF, and SOLO. A CLEAN track is one with no music recorded on it, although it may have a description entered in the track description field. The mode may be changed from CLEAN to RECORD by single-clicking the left mouse button on the track mode display for that particular track. Only CLEAN tracks may be put in RECORD mode and only one

track may be in RECORD mode at any one time. After a track has been recorded on, the mode is automatically changed to PLAY. Only tracks that have been recorded onto are allowed to be in PLAY mode. Single-clicking the left mouse button on the track mode display changes the mode alternately between PLAY and OFF. *MIDISOFT STUDIO* allows the track mode to be changed between PLAY and OFF while the tracks are being played. This can be useful for auditioning multitrack compositions. For instance, you could record different melody lines on two tracks and switch between the two as you played them with the rest of your composition. A track that is in PLAY or OFF mode may be put in SOLO mode by clicking the right mouse button on the track mode display for that track. A single click of the left mouse button on a track in SOLO mode will return that track to its previous mode (either PLAY or OFF). See Section 6.4.1: Using SOLO mode.

6.4.1. Using SOLO Mode. Quite often you will have recorded several tracks of a song and wish to play just one of those tracks. SOLO mode provides this capability without having to turn off all those tracks that you don't want to hear. When a track is put in SOLO mode, only that track will be played. Other tracks in PLAY mode will remain in PLAY mode, but will not be played as long as another track is in SOLO mode. When the track is taken out of SOLO mode, normal playing operation resumes.

6.5. MIDI Chan displays the MIDI channel that each track is assigned to. MIDI channels usually represent different MIDI instruments, although a single instrument may simultaneously use more than one

channel. Generally, an instrument is programmed to respond to a channel or a certain range of channels. Read the owner's manual for your particular instrument to determine its capabilities for different MIDI channels. One way to use the multi-channel capability of MIDI would be to assign each of two or more instruments to different MIDI channels. Then the recorded information for each instrument may be maintained on separate tracks. MIDI channel is applicable to playback operations only; during record operation, *MIDISOFT STUDIO* records from all MIDI channels. To change a MIDI channel, single-click the left mouse button on the MIDI channel display for the track to be changed. The display will become highlighted, indicating that the field is open for editing. The current entry may be cleared with the Escape (Esc) key and the new channel number is entered with the ST keyboard. Valid entries are the numbers one through sixteen only. When the correct channel number is entered, close the edit field with another single click on the same display field. When the field is closed, the highlight will disappear. If a valid MIDI channel number has been entered, that track will be assigned to the indicated MIDI channel. If an invalid entry has been made, no change will be made. Remember, the actual channel change does not occur until the edit field is closed. *MIDISOFT STUDIO* allows the MIDI channel to be changed during playback.

6.6. Track Length displays the length of each recorded track in measures. Changing the beats per measure set-up under the Setup menu will change the track length.

6.7. In the upper right corner of the main window is a horizontal bar graph displaying the amount of remaining **FREE MEMORY**. This quantity is displayed as a percentage of the total amount of free memory available when *MIDISOFT STUDIO* was loaded. Some desk accessories will use a part of the available free memory. The free memory display is updated during record, and provides an indication that MIDI note information is actually being recorded.

6.8. On the right side of the main window is a box containing **EDIT MARKS**. There is a display for Source Begin mark, Source End mark, and Destination mark. The marks are in units of measures, beats and ticks. The number of beats per measure is defined by the Beat setup; the number of ticks per beat is 96. Marks are set by single-clicking the left mouse button on one of the three fields (measure, beat, tick) displayed for the desired mark. Marks are set to different resolutions, depending on which field is used to set the mark. For example, clicking on the measure field will set a mark at the beginning of the nearest measure; clicking on the beat field will set a mark at the nearest beat. See Section 11: Region Editing for more information on the use of edit marks. Also within the edit mark box are displays for source and destination track numbers. These track numbers are display values only and do not respond to mouse clicks. To set the source and destination track numbers, single-click the mouse on the track number (displayed on the left side of the screen) for the desired track. The left button will set the source track and the right button will set the destination track. The selected track number will appear in the appropriate track number display in the edit mark box. When an edit function is selected, the source and destination tracks on that edit dialog will default to the pre-selected source and

destination track numbers that appeared in the edit mark box (the track numbers may still be changed while in the edit function if desired). For those edit functions involving only a single track (Erase Track, Erase Region, Delete Region, and Time Correct), the source track number is used.

6.9. COUNT is displayed in a box below the edit marks. The count indicates the current position within the song and is displayed in measures, beats, and ticks. The count may be changed when *MIDISOFT STUDIO* is stopped (not playing or recording). When the count is changed, playing or recording will begin from the new count. To change the count, single-click the left mouse button over either the measure, beat, or tick fields in the count display. The selected field will be highlighted, indicating that it is open for editing. The count may then be incremented or decremented with the up-arrow and down-arrow in the count display. The count may also be changed by typing in the desired value. The 'Esc' key will clear the highlighted count field. When the desired value has been entered either by incrementing/decrementing with the up/down arrows or by typing in the value, the count field must be closed by another single-click of the left mouse button on the highlighted field. The highlight will be turned off and the field will be closed for editing. If an invalid value was entered, an error message will be displayed when the field is closed.

6.10. TEMPO is displayed in a box below the count. The tempo is increased/decreased by placing the cursor on the up-arrow/down-arrow and pressing the left mouse button. A single button click will change the tempo by one beat per minute. Holding the mouse

button down will continue to change the tempo until the button is released. A new tempo value may be directly entered by opening the tempo field with a single-click of the left mouse button on the displayed tempo value. The tempo field will highlight and can be cleared with the 'Esc' key. The new tempo value is then entered with the ST keyboard. When the edit field is closed by another click of the left mouse button or the Return key, the tempo is set to the entered value. The tempo range is from 12 to 480 beats per minute. The tempo may be changed while playing.

6.11. Prg Chg shows a MIDI program change number for each track. Program change commands are sent for each track whenever a song is played from the beginning (Count 1|1|1). If the **Prg Chg** value is zero, no program change command is sent for that track. To change the value for **Prg Chg**, single-click the left or right mouse button on the **Prg Chg** display for that particular track. The left button will decrement the value, while the right button will increment it. Allowable values range from 0 to 128. Midisoft Studio allows the **Prg Chg** to be changed while playing. Note that different synthesizers and keyboard devices have different numbering schemes for MIDI program changes. Refer to your instrument's user manual for details.

7. The Control Buttons

There are six control buttons across the bottom of the *MIDISOFT STUDIO* main window. These six buttons are used to control playing and recording. They are activated by a single-click of the left mouse button, and are highlighted when turned on.

7.1. Use the **PAUSE** button to halt playing until released in the same manner.

7.2. The **STOP** button stops playing, recording and fast forwarding. If Auto-rewind is enabled, the STOP button will automatically rewind to the beginning of the current song (see Section 5.9: Auto-rewind).

7.3. The **REWIND** button rewinds the recording toward the beginning and ends with the count at 1| 1| 1 (measure one, beat one, tick one). Instant rewind (right mouse button) may be engaged while playing, causing *MIDISOFT STUDIO* to immediately begin playing from the beginning of the song (including lead-in if enabled).

7.4. The **FF** button (fast forward) allows cueing within a song by speeding up the tempo while the song is being played. Fast forward is ended with another left button click on the FF button or with the Stop button. The fast forward speed is two times the current tempo. The Play button must be selected for fast forward to function this way. Fast Forward without Play will move the COUNT slowly toward the end. To position within a song when not playing, the Count may be changed to the desired location. See Section 6.9: COUNT in the Main Window for details on changing the count.

7.5. The **PLAY** button begins playing to the MIDI instruments those tracks that are designated to "PLAY."

7.6. The **RECORD** button begins recording MIDI music into the "RECORD" track and playing any tracks that are in "PLAY" mode. Selecting the Record button when no tracks are in RECORD mode will automatically put the first available CLEAN track in RECORD mode. When recording, the RECORD and PLAY buttons are highlighted.

7.7. Using Function Keys as Control Buttons *MIDISOFT STUDIO* provides an alternate method of using the Pause, Stop, Rewind, Fast Forward, Play, Record, and Tempo change functions. This method uses the function keys across the top of the ST computer as 'hard' buttons. The function keys are labeled F1 through F10. The function key assignment is:

F1 -- Pause

F2 -- Stop

F3 -- Rewind

F4 -- Fast Forward

F5 -- Play

F6 -- Record

F9 -- Decrement Tempo

F10 -- Increment Tempo

These 'hard' buttons function exactly as their 'soft' counterparts previously described. When using the function keys, they should not be held down as this results in repeated commands being sent to *MIDISOFT STUDIO*. You may want to adjust the response of your ST keyboard with the key repeat adjustment provided through the Control Panel Desktop Accessory.

7.8. Slow Rewind and Instant Rewind. The Rewind function provides several different styles of rewinding. When not PLAYing or RECORDing, by using the rewind box on the main screen, you can hold down the LEFT mouse button like you would hold down a tape recorder rewind button. In doing so, the tape counter will move backwards toward 1| 1| 1. Fast Forward works similarly, except it moves the tape counter forward.

Rewinding instantly to the beginning of the music is also offered. For an Instant Rewind, press the RIGHT mouse button on the REWIND box of the main screen. The COUNT moves instantly to 1| 1| 1.

If STUDIO is playing a song, the left mouse button will reset the COUNT to the previous starting point and the song will continue to play. It will act similarly during RECORD, except it will prompt the user with a dialog asking if the just recorded track is to be saved or abandoned (if expert mode is set, STUDIO assumes that the track is to be abandoned). If the recorded track is abandoned, STUDIO will reset the COUNT to the previous starting point and continue recording, otherwise the recorded track will be saved and recording will stop. This allows a quick way to re-record a track if a mistake was made during recording. It provides advantages equivalent to a traditional PUNCH-IN/PUNCH-OUT feature, without risking losing previously recorded music.

7.8.1. Rewind & Fast Forward Keys [F3,F4]. If STUDIO is playing or recording, the REWIND and FAST FORWARD keys operate exactly like the left mouse button on the corresponding control. If STUDIO is not playing or recording, the function keys will decrement or increment the COUNT by one measure. The count value will be rounded to the nearest whole measure. Holding the key down will move the COUNT measure-by-measure.

7.9. Step Play. This feature eases the process of setting region boundaries. Instead of the normal real-time play, individual MIDI events can be single-stepped to be able to set precise region boundaries. Step Play is performed by pressing the right mouse button over the PLAY box on the main screen. Similarly, the F8 key also lets you single-step past an individual event.

Here is a typical use of Step Play: You record a track of music. In playing back the track, you notice that there is a spurious note that you want removed. You play the music until you hear this bad note, and you back the counter one measure (click the mouse button on the down-arrow in the COUNT window). Now Step Play, note by note (clicking the right mouse button while the cursor is on Play), until you first hear the bad note. At that point, you click on the TICK number of SOURCE BEGIN in the EDIT MARKS window. You also click on the TICK number of the SOURCE END in the EDIT MARKS window, because you want to only remove that one note. You now can click on STOP if you no longer want to hear that note. If necessary, you can set the EDIT MARK Source Track number by clicking the left mouse button on the appropriate track number (left side of screen). (You can also simply remember that track number and enter it when you pull down the edit menu.)

Pull down the EDIT menu and select the ERASE . . . item. Make sure you are erasing from the correct track; then click on the ERASE box. The bad note will now be gone forever.

This same example can be extended to include multiple notes, or even a large region of music. The key to remember is that you can set SOURCE BEGIN, SOURCE END, and DESTINATION any time you want—it will always take the current COUNT whenever you click in the EDIT MARKS window. Similarly any of the region editing features (ERASE, DELETE, INSERT (and looping), PASTE, TRANSPOSE) can be used in conjunction with Step Play.

8. Saving and Loading MIDISOFT STUDIO Files

To save or load recorded musical information on a disk, select the Save or Load item in the File drop-down menu. A file selector dialog will appear (see Section 8.1). Enter the desired file name, and single-click the left mouse button on OK. The selected function (save or load) will be executed. When *MIDISOFT STUDIO* saves a file, the track description, track protect status, tempo, MIDI channel, track mode, beat, and MIDI clock information are saved along with the recorded musical information. Likewise, all of this information is restored when a file is loaded. When a file is loaded, all previously recorded information that has not been saved will be erased. So that data is not inadvertently lost, *MIDISOFT STUDIO* verifies the load request with the user before proceeding. There is no default file type for *MIDISOFT STUDIO* files. The directory path defaults to the current drive, giving a directory of all files on that drive: current drive:*.* It is suggested that the program disk not be used for storing songs, but that they be stored on separate disks. This will allow the maximum disk capacity for song storage and eliminate the possibility of the user accidentally writing over the program or resource files.

8.1. The File Selector (see Figure 2)

The file selector is a GEM dialog that appears when saving or loading a file. It is used to select the filename or to enter a new filename for the file to be saved or loaded. When reading the following description, it will be helpful to refer to Figure 2: The File Selector Dialog. Under the label "Directory:" is an edit field that indicates the current directory pathname

Figure 2. File Selector Dialog

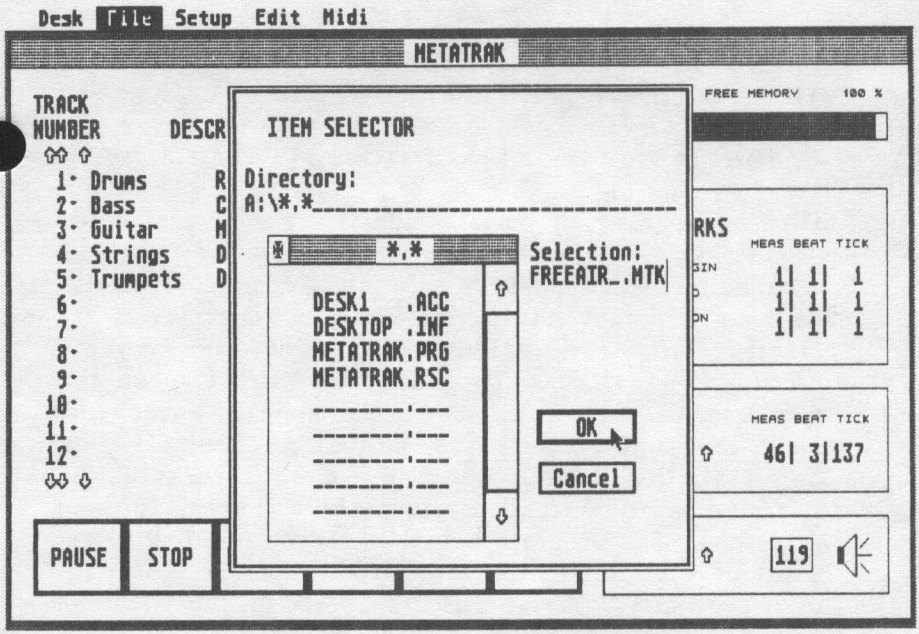
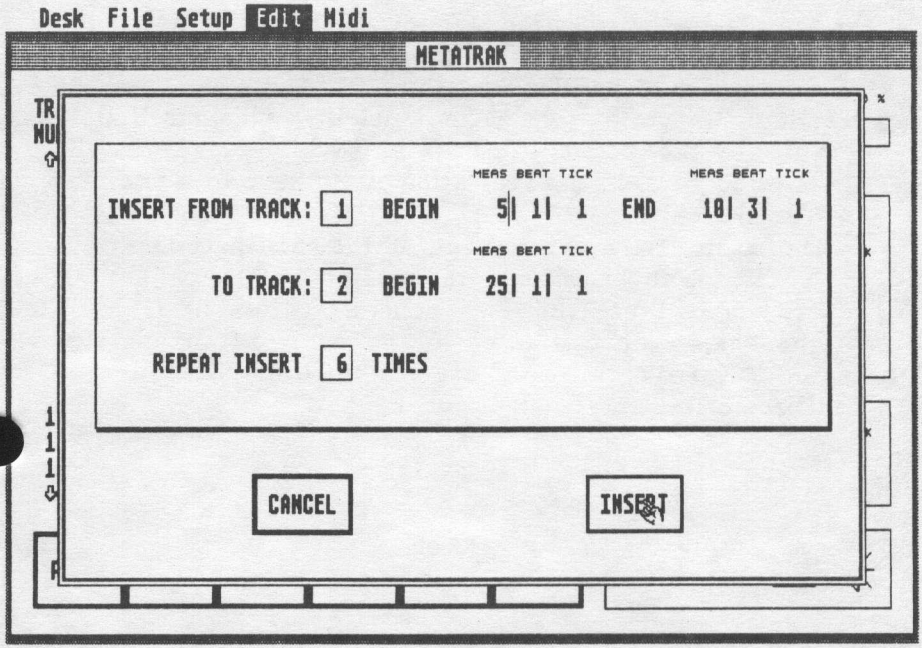


Figure 3. Insert Edit Dialog



(a directory pathname describes the location of a certain file in terms of what folder contains the file). The pathname is specified as:

```
[label]:\[folder1]\[folder2]\file.type
```

Directories (also known as folders) are very useful for organizing your music files. Directories may be created to group melodies, rhythms, completed works, or even different setup configurations. Directories are created from the GEM desktop before invoking *MIDISOFT STUDIO*. To change the directory on the file selector dialog, left-click the mouse on the edit field, and enter the desired pathname. Then left-click on the button in the upper left-hand corner of the selection window that displays the filenames of the directory. The program will then search the disk to get a list of the files in the specified directory. The wild card character * may be used in place of the filename or the file type. For example, B:/*.MTK would display all filenames on drive B: that have a file type of MTK. If the operation is a Save to a new filename, the name is entered in the edit field under the heading Selection:. Otherwise, the filename may be chosen from the list in the selection window by left-clicking on the highlighted title. A single-click will display the selected filename under Selection: and wait for a click to the OK or Cancel buttons. A double-click will immediately initiate the desired operation (save or load) to the selected file. If the user attempts to Save to a file that already exists, *MIDISOFT STUDIO* will respond with dialog to verify overwriting of the existing file. Once a file is overwritten, the original file cannot be recovered. Since this is a general feature of GEM in the Atari, you can refer to the Atari ST manual for more information on using the File Selector and Directories.

9. Editing Recorded Music

MIDISOFT STUDIO provides straightforward editing functions that in combination provide a powerful mechanism for manipulating your music. Two levels of editing are provided: track editing and region editing. Track editing works on whole tracks with functions like ERASE TRACK, MOVE TRACK, COPY TRACK, COMBINE TRACKS, and TIME CORRECT. Region editing operates on user-defined regions within tracks with INSERT, DELETE, PASTE, ERASE, and TRANSPOSE. The regions are defined by setting 'edit marks' that indicate the beginning and ending points of a region.

10. Track Editing Functions

Track editing functions operate on entire tracks of recorded MIDI information.

10.1. ERASE TRACK removes all of the recorded MIDI music from a given track. The track data is not recoverable (unless previously copied to another track). The track description information and the MIDI channel assignment are not affected by this operation.

10.2. MOVE TRACK moves all of the information associated with a specified track to a different track. This includes the track description and the MIDI channel assignment as well as the MIDI music. The source track is erased after this operation. This command is valuable in rearranging a number of tracks, and in transferring active and inactive tracks.

10.3. COPY TRACK copies all of the information associated with a given track to another track. COPY TRACK differs from MOVE TRACK in that the source track is not erased. This command is useful for making backup copies of tracks before editing, combining or time correcting.

10.4. COMBINE TRACKS combines the MIDI music from one track with the music from another track. The resulting combination is put in the second track. The source track is erased by this operation. The original information and music in the destination track is not recoverable (unless previously copied to another track). This function is analogous to 'sound on sound' recording with an audio tape recorder. Two tracks that are combined together will sound no different than they did when played separately. COMBINE TRACKS is a valuable tool in building compositions or sequences from layers that are assigned to the same MIDI channel or instrument and in increasing the number of available active tracks.

11. Region Editing Functions

Region editing functions operate on defined regions within a recorded track. Regions are defined with two time marks: A beginning mark and an ending mark. A mark specifies a specific COUNT time within a track in terms of measures, beats, and ticks.

11.1. Edit Marks

All of the region edit operations operate on a region specified by beginning and ending marks. Each mark represents a specific time within the track, specified in terms of measures, beats, and ticks. The number of beats per measure is set through the SETUP menu. Ticks are sub-divisions of a beat. There are 96 ticks per beat. For example, the following marks specify a time interval of two and a half measures (assuming four beats to the measure):

```
BEGIN  3| 1|  1        END  5| 3|  1
```

The counts for measure, beat, and tick begin at one, so that tracks begin at a time of 1| 1| 1. A count of 5| 1| 96 marks the last tick of the first beat of the fifth measure.

11.2. Setting Edit Marks

Marks may be set when playing tracks by placing the cursor on either the measure, beat, or tick field of the the desired mark display on the main screen and single-clicking the left mouse button. If the cursor is in the measure field, the mark is set to the nearest measure; if in the beat field, or tick field, the mark is

set to the nearest beat or tick. The marks will automatically appear in the begin and end fields on the region edit screens. There are three marks that may be set. The first two marks are used to define the beginning and ending points of an edit region and the third one marks a single insert or paste point. Editing marks are not associated with any particular track; they only specify a particular time within the song. Editing marks may also be changed via any of the region edit dialog screens (INSERT, PASTE, DELETE, ERASE, TRANSPOSE). This is accomplished by single-clicking the left mouse button on either the measure, beat, or tick portion of the mark display for the particular edit mark to be changed. This will open that field for editing, which is indicated by a cursor appearing as a thin vertical line. The field may be cleared with the Escape (Esc) key and the desired values entered. There are three fields that make up one edit mark. These are labeled meas, beat, and tick. Any or all of these fields may be changed as described above. When all of the marks are set as desired, the edit is initiated with the appropriate menu item (INSERT, PASTE, DELETE, ERASE, TRANSPOSE) and the program verifies that the edit marks are valid. If there is an invalid entry in an edit mark, an appropriate error message appears and the edit does not occur.

11.3. Region Edit Functions:

11.3.1. INSERT (see Figure 3) takes a specified region from a source track and inserts it at a designated location within a destination track. Any music in the destination track occurring after the insert location is moved to occur after the inserted music. The

destination track will be changed, while the source track will remain unchanged.

11.3.2. PASTE takes a given region from a source track and pastes it to a specified location within a destination track. Any music on the destination track that is overlayed by the pasted region will be erased. The destination track will be changed, while the source track will remain unchanged.

11.3.3. DELETE removes a specified region from a track. The music following the delete region is shifted so that it follows the music preceding the deleted region.

11.3.4. ERASE removes a specified region from a track. The timing of the erased region, however, is unchanged. This is analogous to replacing notes with rests.

11.3.5. TRANSPOSE will transpose a specified region within a track up or down by the indicated number of semitones (half-steps). The transpose direction is selected by single-clicking on the UP/DOWN button. The number of semitones to transpose is expressed in octaves and semitones (one octave equals twelve semitones). The transposition range is five octaves up or down. If an attempt is made to transpose a note out of the range of MIDI (C five octaves below middle C to G five octaves above middle C), a message will be

displayed and the the transposition will not be performed.

12. Time Correction (see Figure 4)

Time correction is an edit function that is used to 'snap' the recorded notes into 'perfect' timing relationships. Time correction is also known as quantization. One way to view this is to imagine a grid. Time correction forces all notes to begin and end exactly on the grid marks. Notes that are in between the grid marks are moved to the nearest grid mark. The distance between the grid marks would be the resolution of time correction. For example, if a track was time corrected to a resolution of eighth notes, all notes smaller than an eighth note would be changed to eighth notes and any note larger than an eighth note would would be changed to a note duration is the nearest multiple of eighth notes. Time correction also applies to the note location (the time that a note begins). The note locations are time corrected to the nearest multiple of the specified resolution. Time correction makes edits to the track data that are not recoverable. It is recommended that a track be copied (see Section 10.3: COPY TRACK) onto an unused track before experimenting with time correction.

12.1. Time Correction Resolution

The resolution of time correction is specified in terms of note values. The resolution value ranges from a sixty-fourth note triplet to a whole note. Resolution is selected by clicking a mouse button on the note icon for the desired value. The selected note icon will

Figure 4. Time Correct Dialog

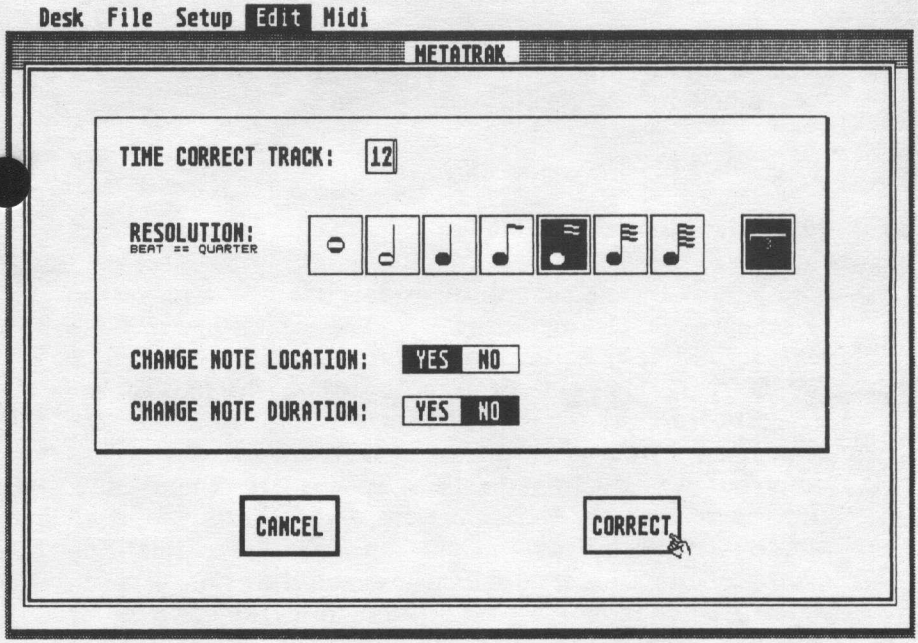
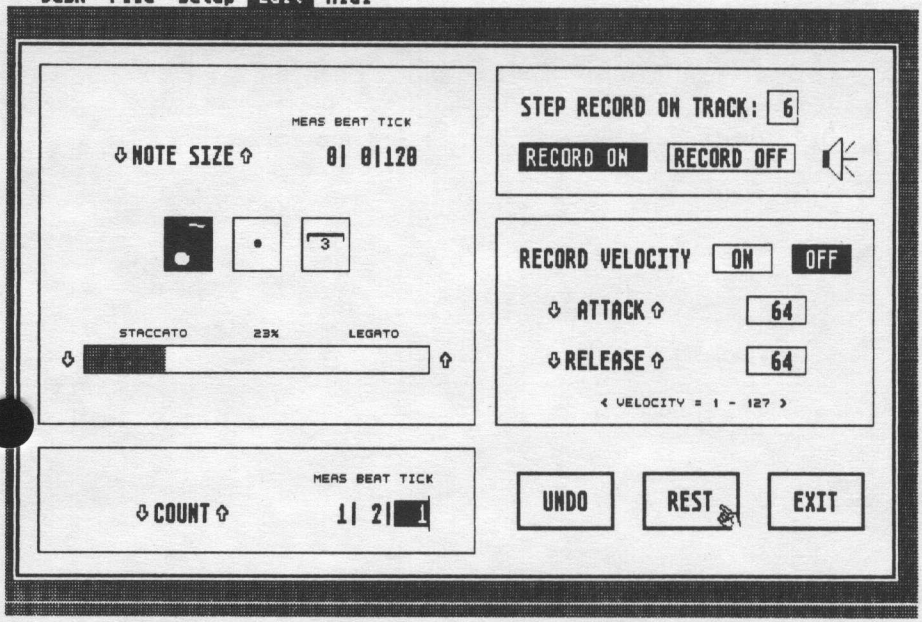


Figure 5. Step Record Dialog



become highlighted. To select a triplet value, click the left mouse button on the triplet icon.

12.2. Time Correction Mode

The mode of time correction is specified by two yes/no selections for Change Note Location and Change Note Duration. Enabling Change Note Location will allow the starting time of each note to be shifted to the nearest time that is an integral multiple of the resolution value. For instance, if there was an eighth note that was trailing the beat by a thirty-second note, time correcting the location with eighth note resolution would move the note right on the beat. Enabling Change Note Duration will allow the duration of each note to be changed so that it is an integral multiple of the resolution value. For example, time correcting the duration of a note that was slightly longer than an eighth note to eighth note resolution would change the duration of the note to be exactly equal to one eighth note. Time correcting the duration of a note to a resolution that is larger than the note duration (e.g. time correcting an eighth note to a quarter note) will lengthen the duration of the note to the value of time correct resolution. Change Note Location and Change Note Duration may be independently enabled to provide three different modes of time correction.

13. Step Recording (see Figure 5)

Step recording provides a means for recording difficult passages of music that the user prefers not to play directly on the keyboard in real-time. Step recorded tracks may be played, edited, and combined with other tracks that were recorded in real-time. The *MIDISOFT STUDIO* step recorder uses both the ST computer keyboard and a MIDI keyboard to enter notes and rests.

13.1. Note Size

Before a note is entered, its duration (i.e., quarter note vs. half note) can be selected by using the Note Size selectors. The size of note is changed by single-clicking the right or left mouse button on the note icon. By clicking the left mouse button, the note value is halved (a quarter note is changed to an eighth note and so on). Likewise clicking the right mouse button will double the note value (a quarter note is changed to a half note). The note icon on the screen will change to represent the active note length. If the note is to be dotted or is a triplet, those boxes may also be highlighted by clicking with the left mouse button (and deactivated by clicking a second time). More flexible control of the note's length is offered by highlighting a number in the "MEAS BEAT TICK" selector, and increasing or decreasing that number with the up-arrow and down-arrow accordingly. Values may also be entered directly by clearing the field with the 'Esc' key and entering the number from the computer keyboard. For example, to change the current note to be 3 1/2 measures long (assuming 4-beat measures): Highlight the number under MEAS; click on the up-arrow until the number becomes 3; highlight the number under BEAT; click on the up-arrow until the number becomes 2; highlight the number under TICK;

click on the down-arrow until the number becomes 0. Finally, it is often useful to change the duration of the actual sound relative to the duration of the note. Specifically, a note can become staccato (short sound duration compared to the note length) or legato (long sound duration) by clicking on the bar graph where you want the duration. By default, the sound will hold for 67% of the time of the note size. This can be changed to anywhere from no or very short sound duration, to 100% duration (no space between notes). The arrow keys on either side of the graph may also be clicked to change the duration by single percentage points. Whenever the sound duration is changed, the exact percentage is displayed above the graph. With a sound duration of zero (zero percent on the bar graph), a short note will still be transmitted to the MIDI instrument. Depending on your particular instrument, the resulting sound may not be audible, or a short tone or click sound may be heard.

13.2. Entering Notes and Rests

To enter notes or rests, the step recorder must be enabled with a single-click of the left mouse button on the RECORD ON button. The step recorder may be turned off at any time with the RECORD OFF button. First the proper note size is selected as described above. Then, notes are entered from the MIDI keyboard and are assigned a duration equal to the note size. Note that the COUNT display will increment by the selected duration value when the note is entered. An optional short beep will also be emitted from the ST (see 13.3) to signify that the note was recorded. The note is not entered until all of the keys on the MIDI keyboard are released. If more than one key is played before the previous ones have been released, the notes will be entered as a chord. To enter a rest, first select the

proper duration, then single-click the left mouse button on the button labeled REST. A rest may also be entered by striking the space bar on the ST keyboard. Note that when a rest is entered, the COUNT will be incremented by the selected duration value.

13.3. Audible Step Indication

In the upper right corner of the step record screen is a loudspeaker icon. Single-clicking on this icon will enable or disable an audible step indicator. When enabled (indicated by several lines radiating from the speaker), an audible click will be produced from the ST computer's speaker each time a note or chord is entered from the MIDI instrument and each time a rest or undo command is entered from the ST computer. The audible click is produced when the step or rest is entered and the count is updated. Therefore the click will be heard when notes on the MIDI instrument are released, not when they are depressed.

13.4. The UNDO Function

The UNDO function will erase the last note, chord, or rest that was step-recorded and back the counter up to the appropriate position. To undo, click the left mouse button on the button labeled UNDO. Only one "Undo" is allowed at a particular instance.

13.5. Changing the COUNT

In the lower left of the step record dialog is a box containing a counter displaying the current record

location in terms of measures, beats, and ticks. This counter is updated with each note or rest entry. The counter may be changed during step record allowing note entry at any location within the song. The COUNT is edited in same manner as the step record Note Size using MEAS/BEAT/TICK, and the COUNT on the main window (see Section 13.1: Note Size).

13.6. Recording Velocity

Each note that is played on a MIDI instrument has an associated attack (note-on) and release (note-off) velocity. The attack velocity determines the loudness of the note that is played (the higher the velocity number, the louder the note is). The release velocity determines how quickly the note is turned off after the key is released. *MIDISOFT STUDIO* allows the user to choose whether to record the velocity information as transmitted by the MIDI instrument, or to ignore the transmitted velocity and record the velocity as indicated on the step record screen. If Record Velocity is on, the velocity transmitted by the MIDI instrument is recorded. Each time a note is played or released, the velocity displays on the screen are updated with the transmitted velocity information. If Record Velocity is off, the attack and release velocities specified on the step record screen are substituted for the transmitted values and recorded. Velocity values range from 1 to 127. Many instruments do not transmit or respond to velocity information. These instruments will generally transmit a velocity value of 64. Some instruments do not transmit velocity information, but will respond to velocity information. An example of such instruments are the Yamaha RX11 and RX21 drum machines. Step recording with Velocity Record off will allow 127 different volume levels for each note on these instruments.

13.7. Step Recording Program Changes

The *MIDISOFT STUDIO* step record function provides a method for accurately locating program (patch) changes within a sequence. Set the step counter to the desired location for the program change, turn step record on, and perform the program change on the MIDI instrument. An audible click will be heard (if the audible step indication is enabled). The step counter will not increment. It is suggested that program changes be sequenced on a separate track from the actual music. This allows easy enabling, disabling and changing of this information.

13.8. Information That is Not Step Recorded:

The *MIDISOFT STUDIO* step record function only records note information and program change information. All other information (including aftertouch, pitch bend and system exclusive information) is ignored during step recording.

13.9. Saving the Step Recorded Music

The step recorded music is saved when the step record dialog is exited. To exit, single-click the left mouse button on the EXIT button.

14. Using STUDIO With External Clock

MIDISOFT STUDIO may be operated with an external MIDI clock. This will allow another sequencer, or a drum machine to provide the timing synchronization and the sequencer stop and start control. To operate with external clock, select the MIDI Clock item in the Setup menu. Select MIDI on the Clock selection dialog and press 'OK'. When the sequencer clock is changed to MIDI, the tempo display box is replaced with a box displaying: 'Sequencer Clock: MIDI'. This box serves as a reminder that the sequencer is under external control and expecting stop, start, and clock commands over MIDI. The enables for receiving MIDI clock and MIDI start/stop commands are automatically turned on. When the sequencer clock is set to MIDI, the PLAY, RECORD, FF, and PAUSE controls are not used and will not respond.

14.1. Recording with External Clock

Select the external clock source as described above. Place a track in the record mode. *MIDISOFT STUDIO* will wait for a MIDI sequence start command to begin recording. Upon reception of the start command (initiated by starting the external controlling MIDI device), the COUNT will be reset, the RECORD and PLAY buttons will highlight and recording will begin. The *MIDISOFT STUDIO* counter will increase at the tempo of the controlling device. Recording is terminated upon the reception of a MIDI stop command (sent when the external controlling device is stopped), or with the STOP button.

14.2. Playing with External Clock

Select the external clock source as described above. Place the tracks to be played in the play mode and engage the PLAY button. *MIDISOFT STUDIO* will wait for a MIDI sequence start command from the controlling device to begin playing. The *MIDISOFT STUDIO* counter will increase at the tempo of the controlling device. Playing is terminated upon the reception of a MIDI stop command, or with the STOP button.

15. Tips and Suggestions for Using MIDISOFT STUDIO

15.1. Downloading Sequences From Other Sequencers or Drum Machines

If you have already have programmed sequences into your drum machine (or another sequencer), you may wish to download them to *MIDISOFT STUDIO*, allowing editing and saving with additional sequencing. To allow this, your drum machine must transmit MIDI note information; check the manual for your particular instrument to see if it will do this. To download, set up *MIDISOFT STUDIO* for external MIDI clock operation and enable it for record as described in Section 14: Using *MIDISOFT STUDIO* with External Clock. Then start the drum machine (or other sequencer); *MIDISOFT STUDIO* will record the sequence. Now setup *MIDISOFT STUDIO* for internal clock operation and set up the drum machine so that it can be played from an external controlling device. The drum sequence can now be played and edited just as any other recorded track. Alternately, if your other sequencer or drum machine will respond to external MIDI clock and MIDI start and stop commands, downloads can be performed by setting up the other sequencer or drum machine to work with external MIDI clock. Then with *MIDISOFT STUDIO* using internal MIDI clock, record normally. The other sequencer or drum machine should begin playing when recording is begun on *MIDISOFT STUDIO.* If downloading from another multitrack sequencer, perform a separate download operation for each track with only that track enabled to play. This will result in a duplicate multitrack version in *MIDISOFT STUDIO* of your original sequence.

15.2. Building Loops

MIDISOFT STUDIO does not provide a looping function, but the edit functions provided make it very easy to build repetitive sequences from just a basic musical phrase. If you are entering a sequence (either in step recording or real-time) that is repetitive, enter the the basic passage only once. Then use the insert or paste region edit functions repetitively to build the desired number of repetitions.

Appendix A. Glossary

1040ST. An Atari ST computer with 1024K of RAM memory.

520ST. An Atari ST computer with 512K of RAM memory.

Abandon. In *MIDISOFT STUDIO*, an option in the FILE menu that lets allows you to clear out the computer's collection of music information that is stored in the computer's RAM memory (does not change the disk files).

Aftertouch. The pressure applied to the MIDI keyboard's keys after they are down. Some MIDI keyboards send this special aftertouch information (they usually send velocity information too).

Auto-rewind. A feature of *MIDISOFT STUDIO* causing the song's COUNT to automatically return to the beginning of the song (count 1|1|1) after playing or recording is stopped.

Beat. A unit of time in music. In *MIDISOFT STUDIO*, a beat represents a single metronome click, and is equivalent to a quarter note.

Cancel. A button that appears in all dialog boxes. If the dialog is exited with the Cancel button, the information in that particular dialog is restored to its original state (as it was before any changes were made).

Channel. The MIDI standard allows 16 MIDI channels. Each channel can potentially be assigned to a different MIDI instrument--the MIDI instruments each know which channel(s) they

are to recognize and they ignore signals from other MIDI channels. *MIDISOFT STUDIO* allows flexible use of all 16 MIDI channels. Note that a channel and a track mean totally different things!

Click. To touch a button on the mouse.

Control Button. In *MIDISOFT STUDIO*, it is one of the tape-recorder buttons on the lower portion of the screen (function keys F1, F2, F3, F4, F5, F6, F9 and F10 are also control buttons).

Count. The internal numbers (broken into measure, beat, and tick components) that represent a particular time in the music. When music is being played or recorded, the count is changing with time.

Cueing. Listening to music and setting marks or stopping at desired points.

Cursor. The symbol(s) on the computer screen that signify the location of the mouse or a point within an edit field. Usually, the mouse cursor is a pointing finger that that follows movement of the mouse. When the computer is busy, as in loading or saving a disk file, the mouse cursor will become a busy bee. In an edit field, the cursor is a thin vertical line. The edit field cursor is positioned within the edit field with the cursor control keys. Both the mouse cursor and the edit field cursor may appear simultaneously.

Cursor Control Keys. The four keys (up-arrow, down-arrow, left-arrow, right-arrow) positioned in the group of keys between the main typewriter style

keyboard and the numeric keypad on the ST computer.

Default. A number or word that a computer assumes without the user giving an answer. Many parts of *MIDISOFT STUDIO* make assumptions to make the product easier to use. For example, when using the "RECORD" button, *MIDISOFT STUDIO* defaults to the first unused (clean) track.

Delete. A computer term that means to remove. In *MIDISOFT STUDIO*, deleting a region of music causes the music following it to be moved forward in time to fill the space left vacant. Compare to Erase.

Desktop. A special program built in the Atari ST. This is the program that automatically runs when the ST is turned on or reset and displays the familiar trash can and file cabinet icons.

Desk Accessories. Special programs on the Atari ST provided by Atari and other companies to enhance the usefulness of the computer. These programs can be used while using *MIDISOFT STUDIO* by pulling down the top-left "DESK" menu item.

Dialog. An Atari ST feature, allowing the user to enter information necessary to the operation of a program. When in a dialog, a rectangular box appears on the screen and the computer is expecting a response from the user. A dialog is completed when one of the two buttons near the bottom of the dialog box is 'clicked'. A dialog may have a default entry that can be erased and replaced by typing the "Esc" key (an Edit Field).

Display Monitor. The computer's screen--where you see this program when you're running it.

Double-click. To hit the desired mouse button twice in quick succession. This is most frequently used to select a program to run.

Download. To transfer a song from one sequencer to another via MIDI by playing one device while recording with the other.

Drop-Down Menu. A feature of the Atari ST, one of the choices appearing on the bar across the top of the screen that will open up a menu (list of choices to select) when the mouse cursor is moved over the desired choice.

Edit Field. An item on the screen whose text can be changed or re-entered. To change text in an edit field, the arrow keys are used to reposition the cursor. To reenter text, 'Esc' should be typed first to clear what was already there.

Edit Mark. In *MIDISOFT STUDIO*, an edit mark lets you remember a specific time (or location) in the music so that editing can be done. For example, an edit mark can be made right before a note gets played, and pasting at that mark will cause the note to be overwritten with something else.

Erase. In *MIDISOFT STUDIO*, to erase a region of music fills that time with no music, but does not move any of the music following the erased music on that track. Compare to Delete.

External Clock. Some MIDI instruments (especially drum machines) have a clock external to *MIDISOFT STUDIO* that can be used to set the

beat. This "External Clock" must be specially selected to be used by *MIDISOFT STUDIO.*

Field. A particular item on the screen that can be selected, moved to, or entered in some way.

File Selector Dialog. A special window used by GEM to let the user specify (by using the mouse and computer keyboard) what disk file name is desired.

Function Key. One of the ten keys across the top of the ST computer labeled F1 to F10.

GEM. The operating system software in the Atari ST computer (written by Digital Research Inc.) that gives it a graphical user-interaction capability.

Highlight. A selected item on the screen, usually shown by reversing the colors of the letters or icon. Often items that are selected by moving and clicking the mouse will become highlighted.

Icon. A graphical representation (or picture). The trash can on the ST desktop is an icon. In *MIDISOFT STUDIO*, there is a loudspeaker icon used to enable/disable the audible metronome.

Insert. In *MIDISOFT STUDIO*, to insert a region of music causes the music at the insert point to get shifted forward in time (instead of being overwritten). Compare to PASTE.

Item. A part of a drop-down menu. Each menu has a number of items that can be selected. Items are highlighted by placing the mouse cursor over the item and selected with a single click of the left button.

Lead-In Measures. The measures that are counted off by the metronome before recording or playing begins. It is often desirable to set a few lead-in measures to get used to the metronome's timing.

Local Control. Allows an instrument to separate its keyboard from its tone generation sources. An instrument in the LOCAL OFF mode could only be played from MIDI.

Location. The point in the music that gets noted with an Edit Mark.

Menu. See Drop-down Menu.

Metronome. A sound generated upon every beat. In *MIDISOFT STUDIO*, the metronome has a higher pitch on the measure's first beat so that the user can keep in synchronization with each measure.

MIDI. Musical Instrument Digital Interface. This is the electronic language that musical instruments (and computers) use to communicate performance information. *MIDISOFT STUDIO* also sends and receives signals using the MIDI language so that it can talk to any instrument that also uses MIDI. The MIDI language is characteristically sent using a five-pin round (DIN) connector.

Monophonic. An instrument in MONO mode will assign voice messages from each MIDI channel to a different voice on the instrument. Used to get more than one sound simultaneously from an instrument. Usually, only one note may be played at a time on a monophonic channel!

Mouse Button. One of the two buttons on the Atari's mouse.

Omni On. An instrument in the OMNI ON mode will receive voice messages from all MIDI channels.

Omni Off. An instrument in the OMNI OFF mode will receive voice messages from only one assigned MIDI channel.

Paste. In *MIDISOFT STUDIO* to paste a region of music causes music starting from the given count to be overwritten on that track by the new region of music. Compare to Insert.

Patch. Two meanings: (1) Information that a sequencer uses to define a specific sound waveform (timbre). (2) A "connection" between a *MIDISOFT STUDIO* track and a specific MIDI channel number. For example, if Track 1 is patched to Channel 2, then all Track 1 information will be played on the MIDI instruments that are receiving on MIDI Channel 2.

Pickup Note. The note right before the first note of a measure. In *MIDISOFT STUDIO*, a pickup beat is used with the metronome so that you know when to start playing.

Pitchbend. A feature of many synthesizers, pitchbend is the control that gives a continuous change of pitch. This often deserves special mention because the MIDI language sends special signals to communicate the pitchbend information.

Polyphonic. An instrument in POLY mode will assign voice messages to a single voice. This mode allows for more than one note to be played simultaneously on a particular voice (i.e. a chord).

Program Change. Also called Program Select, it is a message sent to and from instruments that change the patch or sound information for that instrument resulting in a different timbre.

Prompt. In Atari ST terms, to ask. The computer will often "prompt" the user, at which time it will wait until an answer has been typed (and a return or mouse click to signify completion).

Quit. To leave the program. Does not automatically save new information to disk.

Real-Time Recording, as opposed to step recording, lets you play a song and keeps track not only of what notes were played, but how long and when each note was played so that the exact music can be reproduced. Audio tape-recorders are always real-time recorders.

Region. A piece of music specified by a beginning and ending edit mark. For example, three measures in the middle of a song can be marked and become a region for region editing.

Region Editing. Editing operations involving a region or portion of a track. Region editing functions include Insert, Delete, Paste, Erase, and Transpose.

Scroll. To move part of a computer image off the top or bottom of the screen so that you can see another part. In *MIDISOFT STUDIO*, only twelve tracks are displayed at a time. The remaining tracks must be viewed by scrolling.

Selector. Text, numbers, or icons on the screen that can be selected to indicate that particular option is desired.

Sequencer. A MIDI multi-track tape recorder.

Single-click. To press the desired mouse button once.

ST. The Atari computer that you use to run *MIDISOFT STUDIO.*

Step Record. To record one note at a time, giving all the information for individual notes. This is sometimes used instead of real-time recording, because in step recording you need not be able to play well to get perfect music.

System Exclusive Message. Allows information unique to one instrument manufacturer to be transmitted to or received from instruments made by the same manufacturer.

Tick. Music in *MIDISOFT STUDIO* is segmented by Measure, Beat, and Tick. Tick is a small, precise unit. There are 96 ticks in each beat.

Time Correct. A feature of *MIDISOFT STUDIO* that lengthens or shortens notes (and changes where notes begin) to be even multiples of a specified note length. Time correct can make somewhat sloppy playing sound 'tighter'.

Track. A *MIDISOFT STUDIO* sequencer term, each track is displayed on the screen and has its own set of music and performance features. A track can be polyphonic (have many simultaneous notes), but cannot be patched to more than one MIDI channel. A track can be considered a song or a part of a song that is treated independently of the other tracks. Many tracks can be combined into one track, but a track cannot be split into more than one track.

User-Interface. The interaction the computer has with you. It usually refers to how you select what options you want to use or change.

Velocity. A synthesizer and MIDI term that means how hard the musical key is pressed (or released). For keyboards that have velocity control, this enables that synthesizer to play at different volumes, and have unique attack and release characteristics.

Wild card. A computer term usually referring to a way of listing disk files. When listing with wild cards, the disk files that follow a certain pattern are displayed. For example, the wild card *.* displays all disk files, but the wild card *.stu displays only the files that end in ".stu". Window. A rectangle that separates a block of screen information from other screen information. Sometimes windows (like *MIDISOFT STUDIO*'s main window) can be moved around by using the mouse.

Appendix B. Sample Session.

This appendix will try to step you through an example of how you would use *MIDISOFT STUDIO.* It assumes some familiarity with your synthesizer, your Atari ST, and *MIDISOFT STUDIO* as described in this manual.

- Load *MIDISOFT STUDIO* by double-clicking on Disk A, and then STUDIO.PRG.

- Move the mouse so that the cursor is on "Setup" and brings down the drop-down menu. From there single-click on "Beat."

- We want 4/4 time, so leave the number of beats per measure at 4. We want a two measure lead-in, however, so click on the "2", and "OK" to set that value.

- Make sure the metronome will be sounding by clicking on the speaker (bottom-right of screen) until lines demonstrate that sound will be emitted.

- Change the TEMPO on the main window to something slow (like 60 beats/minute). This can be done by holding the mouse button down when the cursor is on the down-arrow to the left of the word "TEMPO". It can also be done by clicking on the TEMPO number and typing: 'Esc' 60 'Return'.

- Move the cursor over the RECORD button and press the left mouse button. The metronome should begin on the up beat. If you don't hear anything, adjust the volume control on your computer monitor.

- Once you've heard two measures of metronome, begin by playing a simple melody on the synthesizer.

- When done playing the melody, single-click on STOP.

- Rewind the song by clicking on the "Rewind" button. To play back, select the "Play" button.

    - While listening, try FF and REWIND to see how these features act.

    - Watch the COUNT, and after stopping playing with the "STOP" button, manually set the count (by opening the meas|beat|tick edit fields with the mouse button and editing the values) to see how to move around within the music. Remember, edit fields are cleared with the 'Esc' key.

    - Also, when playing back, change the tempo to something much faster.

- We now want to add a harmony track to Track 2.

    - Rewind to get to the beginning of the music

    - Type in DESCRIPTIONS for Track 1 and 2 so we remember which is melody and which is harmony.

    - Change the TEMPO so it is back to 60 beats/minute.

    - Select the RECORD button. Track 1 will automatically play and it will be expecting you to play along (and will put that information into Track 2).

- Play some harmony to fit with what you hear in Track 1. When done, single-click on STOP.

- Play back both tracks together by selecting the PLAY button.

- If both tracks together sound awful, select the "FILE" command, and "ABANDON." This will let you start fresh now that you know what you're doing.

- If you don't like your harmonization and would like to try again, single-click on the "PLAY" mode designator for Track 2 so that it becomes "OFF." You now can record a second harmony onto Track 3.

- Now you should have a beautiful harmony on Track 3 and a beautiful melody on Track 1. Just to clean things up, let's move Track 3 to Track 2 (Track 2 is no good anyway).

    - Select the EDIT pull-down menu, and MOVE TRACK within that.

    - Where it asks for "From Track" (source) number, enter 3. Put 2 as the "To Track" (destination). Click on "MOVE" when done.

- Now we want to add an unobtrusive bass line to what is now a CLEAN Track 3.

    - Rewind (if necessary), and hit the record option. This time you will only be recording a two-measure bass line.

- When done playing the first two measures, stop playing.

- We want to use REGION EDITING to repeat these same two lines throughout the whole song. Select EDIT, then "INSERT ...". Tell the dialog boxes that you want to insert music from Track 3, Region 1|1|1 to 3|1|1 to Track 4 at 1|1|1, and set repeat to 20 times.

- When you've completed the editing, try playing your new music. Turn Track 3 OFF (it just has the two measures that are repeated in Track 4). Sounds great, doesn't it?

- As a final exercise, let's use *MIDISOFT STUDIO* to correct a bad phrase you have in your music. Let's say that somewhere in your melody you've made some mistakes, and you don't want to have to replay the whole melody track.

  - RECORD onto a new track while you are playing back the melody track. In the phrase that has mistakes, be playing that same phrase again (correct this time) on the new track.

  - After you've completed that phrase, click on STOP.

  - Play back the music, this time being prepared to click on the BEAT numbers of the EDIT MARK boxes as that music is playing. In particular, click the BEAT number of the SOURCE BEGIN right before the bad phrase begins, and click the BEAT number of the SOURCE END

when the bad phrase ends. It may help to slow the tempo as you set the edit marks.

- Now select EDIT, then "ERASE ...". Since you've correctly selected the edit marks, set the track number to the track that you are editing and click on the ERASE button.

- Now play the music again (with both the edited melody track and the patch track), listening to see if the bad phrase has been corrected properly.

- If it sounds good, you will probably want to combine the two tracks into the melody track. To do so, select the EDIT menu, then the COMBINE TRACK item. Put the correct track numbers in to combine the new overdub track onto the old melody track. Note that this edit operation could have been completed with just one operation, a region PASTE edit.

- Now that it all sounds beautiful and you want to send a copy to Stevie Wonder to record, you will want to save it on disk.

  - Select the FILE menu then click on SAVE FILE item.

  - It will ask for a file name. Just type a meaningful eight (or less) character name, followed by a 'Return." The disk drive will turn on and the file will be saved for future retrieval.

Appendix C. MIDI Implementation Chart

Channel Voice Messages

Function	Transmitted	Recognized	Notes
NOTE ON	YES	YES	
NOTE OFF	YES	YES	
VELOCITY (NOTE ON)	YES	YES	
VELOCITY (NOTE OFF)	YES	YES	
AFTERTOUCH (KEY)	YES	YES	5
AFTERTOUCH (CHANNEL)	YES	YES	
CONTROL CHANGE	YES	YES	
PROGRAM CHANGE	YES	YES	
PITCH BEND	YES	YES	

System Real Time Commands

Function	Transmitted	Recognized	Notes
MIDI TIMING CLOCK	YES	YES	1,2
START COMMAND	YES	YES	1,2
STOP COMMAND	YES	YES	1,2
CONTINUE COMMAND	YES	YES	1,2
SYSTEM RESET	YES	NO	
ACTIVE SENSE	NO	NO	

Channel Mode Messages

Function	Transmitted	Recognized	Notes
MODE MESSAGE	YES		4
ALL NOTES OFF	YES	NO	
LOCAL CONTROL CHANGE	YES	NO	
OMNI MODE CHANGE	YES	NO	
MONO MODE CHANGE	YES	NO	
POLY MODE CHANGE	YES	NO	

System Common Messages

Function	Transmitted	Recognized	Notes
SONG POSITION POINTER	YES	YES	1
SONG SELECT	YES	YES	
TUNE REQUEST	YES	NO	

System Exclusive Messages

Function	Transmitted	Recognized	Notes
System Exclusive	NO	NO	3

Notes:

1. Transmitted only when internal clock used.
2. Recognized only when external clock used.
3. System Exclusive information is ignored during recording.
4. All Mode messages are recorded.
5. Aftertouch may be optionally filtered.

SOFTWARE AND MANUAL PROBLEM REPORT.

Please provide the following information when submitting bug reports or documentation error reports. We appreciate all the help you can give us to make this a better product!

Product release version:
Product serial number (on release disk):
Your name:
Address:
Phone number:

Report type:

_____ Problem/possible error
_____ Suggested enhancement
_____ Document suggestion
_____ Other

Rate problem impact:

_____ Shuts down system
_____ Impairs systems performance
_____ Causes inconvenience
_____ Not affected by problem (yet)

System configuration:
List what hardware (computer and music) you have, and diagram your MIDI setup.

Problem description:
Describe the problem, specifically all the details necessary to reproduce it, and any recommendations you might have for a solution.