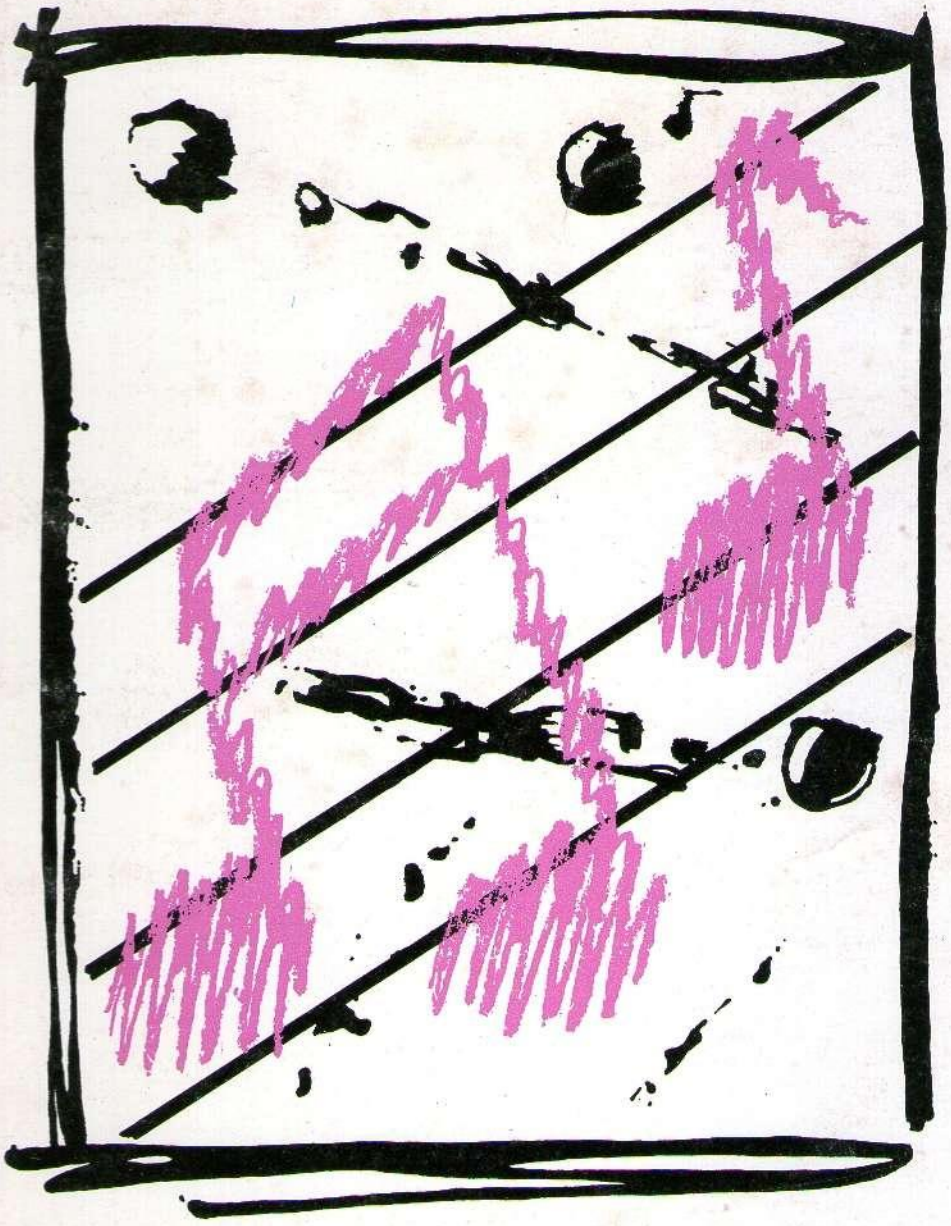


SONIX

User's Guide



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Second Edition

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Technical Support Information

If you have any problems when using Sonix, don't worry. Here is the best process for solving your problem:

1) Decide exactly what the problem is. Once you know this, check the most obvious possibilities.

2) Everything seems to be set right, but it's still not doing what it's supposed to do. Get your registration number which is on the part of the registration card you are supposed to keep. IF YOU DON'T HAVE THIS NUMBER, YOU WILL NOT BE ELIGIBLE FOR TECHNICAL SUPPORT!

3) Call us here at Oxxi for some help, at (213) 427-1227 and ask for Sonix technical support. Our technical support hours are from 10:00 a.m. to 4:00 p.m. Pacific Standard Time. You can also fax us, at (213) 427-0971.

If an answering machine answers, leave a message stating clearly your name, phone number, and that you need Sonix assistance. A technician will return your call promptly.

4) When the technician answers or returns your call, give him your registration number and a brief description of your problem.

5) Listen carefully to what you are told. If you don't understand, say so and the concept will be explained in more detail. If the problem is extremely unusual, you may be asked to send a copy of the files you are working with along with a written step-by-step list recreating the steps you took to get the problem.

6) When you send any kind of correspondence regarding Sonix to Oxxi, please address it as follows:

Oxxi, Inc.
Sonix Technical Support
P.O. Box 90309
Long Beach, CA 90809-0309

7) When an update or upgrade is available, you will be notified by mail provided you send in your registration card.

CHAPTER 1 Introduction to Music Theory

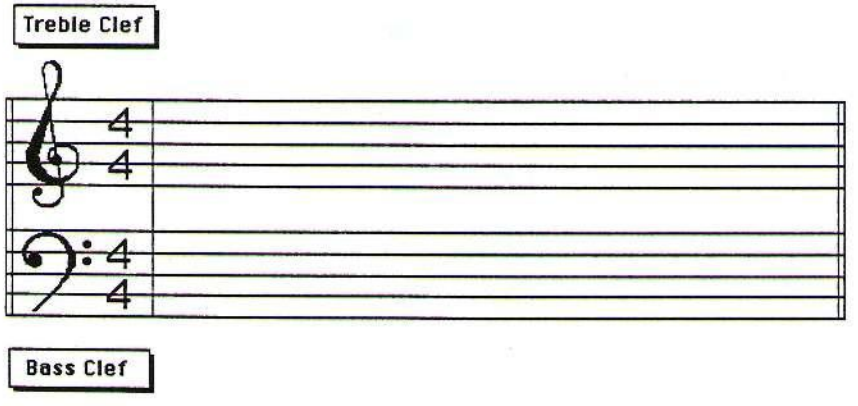
In order to take full advantage of the Sonix program, we recommend that you spend some time reviewing this section. It contains information about the staff, time signatures, bars, notation concepts and rests. It is a must for the beginning or inexperienced musician because this information is extremely important to harmony and composition.

This chapter begins with a discussion of what the staff is, then explains the Treble and Bass Clefs and then talks about time signatures, tempo, bars (or measures) and how to count beats in music.

These concepts at first may seem a bit confusing, but as you work with Sonix, your understanding will broaden and these concepts will seem quite easy.

The Staff

Music is notated with a common device called the staff. There are two parts to the staff: the upper part is called the Treble Clef and the lower part is called the Bass Clef.

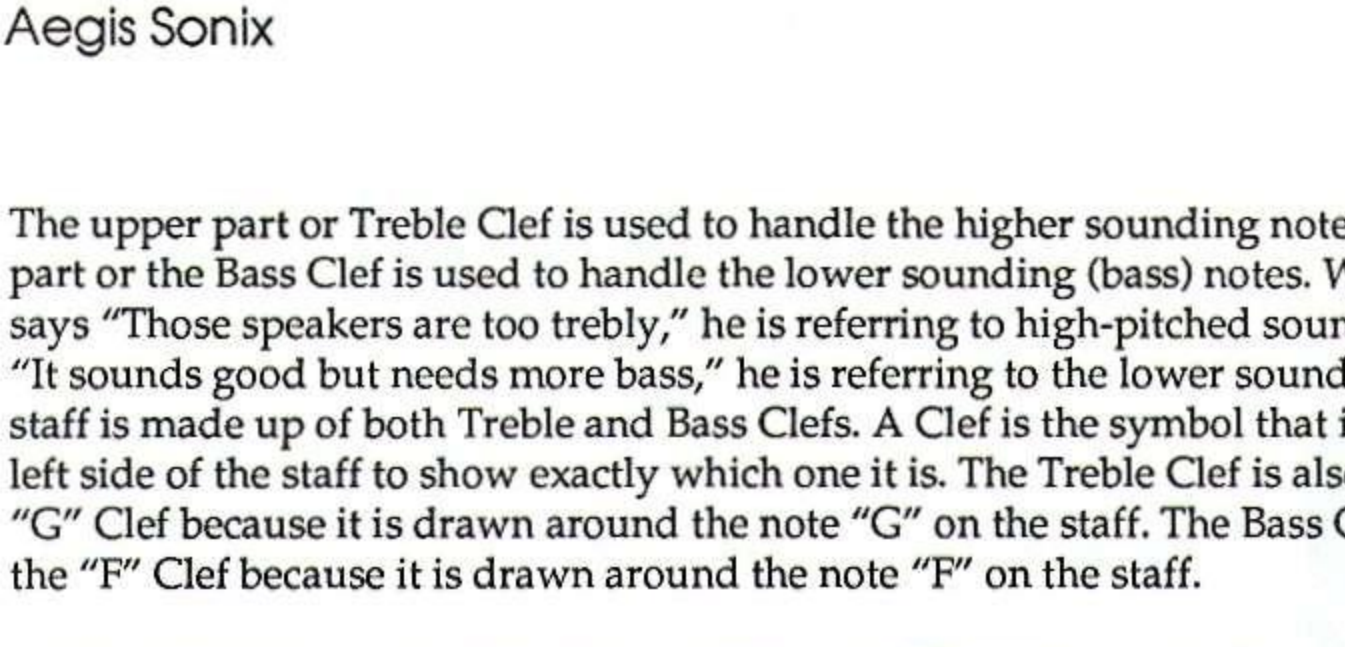


The upper part or Treble Clef is used to handle the higher sounding notes and the lower part or the Bass Clef is used to handle the lower sounding (bass) notes. When a musician says "Those speakers are too trebly," he is referring to high-pitched sound; when he says "It sounds good but needs more bass," he is referring to the lower sounding notes. The staff is made up of both Treble and Bass Clefs. A Clef is the symbol that is used on the far left side of the staff to show exactly which one it is. The Treble Clef is also often called the "G" Clef because it is drawn around the note "G" on the staff. The Bass Clef is also called the "F" Clef because it is drawn around the note "F" on the staff.

Most piano music is written with both Treble and Bass Clefs. Guitar music is written only using the Treble Clef. The two clefs together form what is called the "Grand Staff" and this is what the Sonix program has. A staff is the framework of lines and spaces in which music is written.

The Bass Clef

The Bass Clef (also called the "F" Clef) is made up of five lines and four spaces. The lines from bottom to top are the notes G, B, D, F and A, respectively and the spaces from bottom to top are the notes A, C, E, and G, respectively. Together both the lines and spaces form the notes in alphabetical order so from the bottom to the top of the Bass Clef all the notes are A, B, C, D, E, F, G, and A respectively.

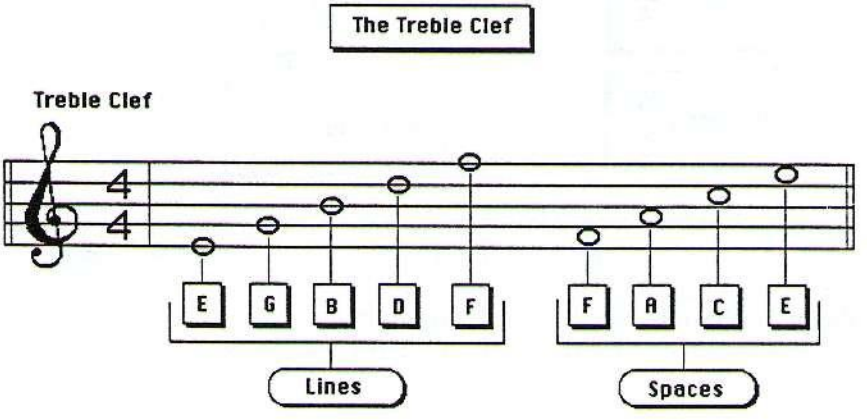


The order of the notes on the lines can be memorized by repeating the sentence "Good Boys Do Fine Always" and the notes occupying the spaces can be memorized by repeating the phrase "All Cows Eat Grass." Whenever you look at the Bass Clef on the screen you can use these sentences to keep track of exactly where you are.

Often in music theory and other arts, quite a bit of memorization is required. In order to memorize information we use what are called "Mnemonics" (noo-mah´-niks) or "Mnemonic devices." A Mnemonic device is a little idea or phrase that helps you remember the information. For example, the phrase "All Cows Eat Grass" helps us to remember the order of the notes A, C, E, G.

The Treble Clef

The Treble Clef (also called the "G" Clef) is also made up of five lines and four spaces. In the Treble Clef the lines from bottom to top are the notes E, G, B, D, and F respectively and the spaces from bottom to top are the notes F, A, C, and E respectively. Together the notes follow one another in alphabetical order so that in the Treble Clef the notes from bottom to top are E, F, G, A, B, C, D, E, and F respectively.



In the Treble Clef, the order of the notes appearing on the lines can be memorized by repeating the phrase "Every Good Boy Does Fine" and the spaces can be memorized by seeing the word "FACE" in the order of the spaces.

So, in a nutshell, the Treble Clef is EGBDF for lines and FACE for spaces, and the Bass Clef is GBDFA for lines and ACEG for spaces.

Time Signatures

In order for musicians (or computers) to be able to play a given piece of music, they need to know how the beat goes. We notate the beat of a composition using a device called a "Time Signature." A time signature explains to the musician how many beats the song

has and how it is timed. For example, a song that is written in 4/4 time has 4 beats per measure. What that means is you count 1-2-3-4, 1-2-3-4, 1-2-3-4 over and over again.

Commonly used Time Signatures:

Two-Four : $\frac{2}{4}$	Three-Eight : $\frac{3}{8}$
Three-Four : $\frac{3}{4}$	Five-Eight : $\frac{5}{8}$
Four-Four : $\frac{4}{4}$	Seven-Eight : $\frac{7}{8}$
Five-Four : $\frac{5}{4}$	Nine-Eight : $\frac{9}{8}$

Quite simply, you can look at the time signature and count the top number over and over again. If a song is in 3/4 time, you count 1-2-3, 1-2-3 over and over again like a waltz.

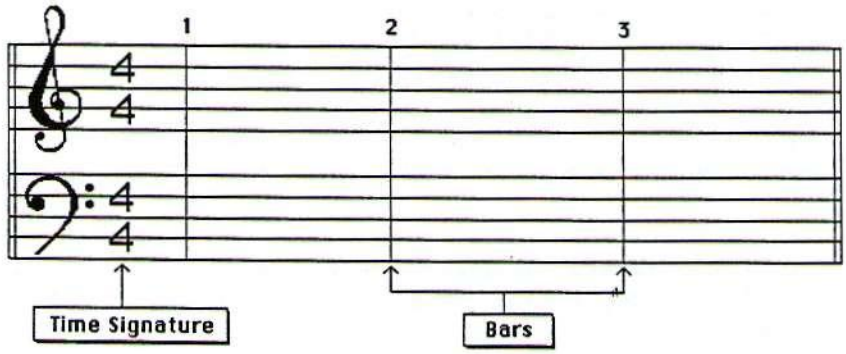
The bottom number indicates what kind of note gets one beat. If the bottom number is 4, then a quarter note gets one beat. If the bottom number is 8, then an eighth note gets one beat (more on this later).

Bars or Measures

Hand-in-hand with the concept of time signatures is the concept of bars or measures. Time signatures really cannot be explained without understanding what bars are.

A bar (also called a measure) is the division of beats into segments. A bar is notated by drawing a straight line vertically on the staff. This is what musicians use to notate phrases and timing. For example, if a song is written in 4/4 time, you would draw a bar every 4 beats.

In the **Score** screen of Sonix, bars are automatically created for you as you write notes on the screen and they are individually numbered on the top of the staff as they are created. Sonix does not have a limit on the amount of bars you can use in a composition.



Back to the idea of time signatures, if a song is written in 4/4 time then each bar gets 4 beats. If a song is written in 3/4 time then each bar gets 3 beats. The top number of any time signature indicates how many beats per bar.

The bottom number of any time signature indicates what kind of note gets one beat. If a composition is written in 4/4 then it has 4 beats per bar, and a quarter note gets one beat. If a composition is written in 3/4 time, then it has 3 beats per bar and a quarter gets one beat. If it is written in 3/8 time, the it has 3 beats per bar and an eighth note gets one beat. If it is in 5/8 time, then there are 5 beats per bar and an eighth note gets one beat.

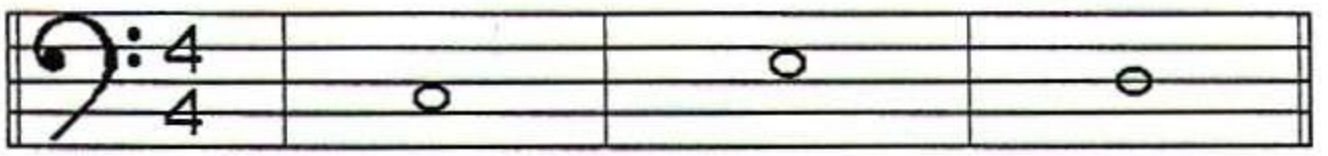
Notation Concepts

This section begins with a discussion of how actual music is written on the page. Since Sonix emulates pen and paper, we think that a discussion of notation techniques and note values cannot be overlooked.

Over the years, many composers and songwriters have evolved the practice of notating written music to a finely-honed art. Sonix supports most of the conventions used today and it also allows you to edit what you have done without using erasers and "white-out."

The Whole Note

The whole note almost always represents a sustained tone over a period of four beats. In 4/4 time you would tap 1-2-3-4 and sing a note over the entire duration of the four taps. The whole note looks like this:

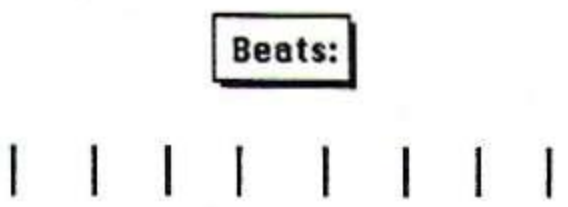


The bottom number indicates what kind of note gets one beat. If the bottom number is 4, then a quarter note gets one beat. If the bottom number is 8, then an eighth note gets one beat.

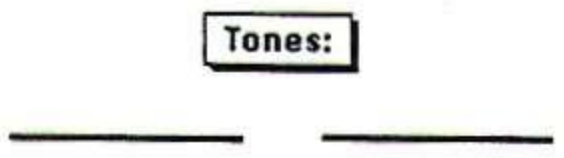
Whole notes are used often in the Bass Clef for cellos and string basses to bow a long tone while other instruments play a melody. The whole note is round and hollow in the center with no stems. It represents four beats.

The Half Note

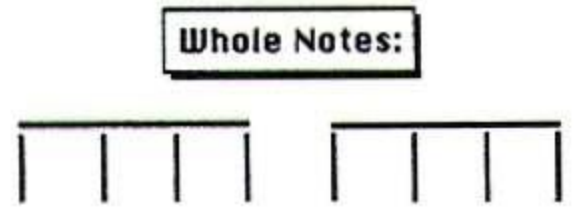
The half note represents two beats, or exactly half the duration of a whole note. In 4/4 time you would tap 1-2, 1-2 evenly and sing a tone over two beats and stop singing at the end of the second beat. In other words, if you were to write the beats like this:



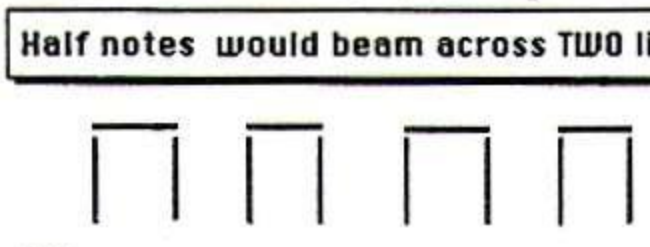
With each vertical line representing a beat, and a horizontal line representing a tone, like this:



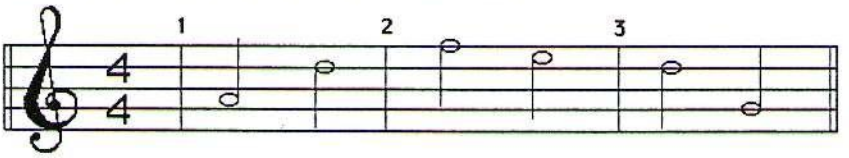
You would sing a tone for the duration of the length of the line and tap with a pencil on every vertical line, so that to sing a whole note would be represented like this:



And a half note would be represented like this:



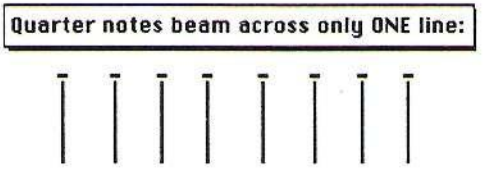
The half note is drawn on the staff like this:



The half note represents two beats and is drawn with a round, hollow circle with a "stem" on it. A "stem" indicates the difference between rhythmic values of the different kinds of notes. If you are writing music longhand with pen and paper, the direction of the stem (up or down) depends on exactly where the note is drawn on the staff. Anything drawn below the middle line usually has the stem pointing up and anything drawn above or on the middle line has the stem pointing down. Sonix, however has a highly sophisticated notation system and it automatically corrects the direction of the stem as you write it, without hassle.

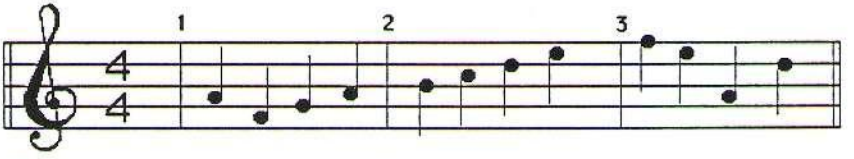
The Quarter Note

The quarter note is exactly one fourth of a whole note. A quarter note almost always represents one beat. It can be represented like this:



Each note is sung for exactly the time duration of one tap and then stopped.

The quarter note is drawn on the staff like this:

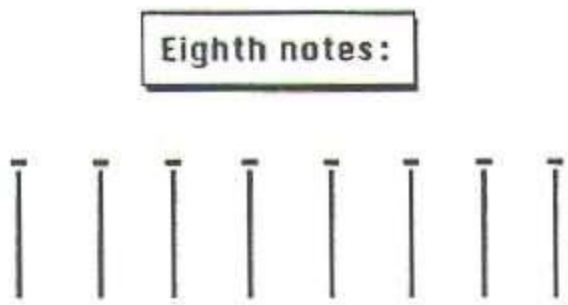


Each note is round and filled with a stem either going up or down. If the note has a stem going down then the stem is drawn on the left side of the note. If the stem is going up, then it is drawn on the right side of the note. Again, Sonix will automatically do this for you as you compose.

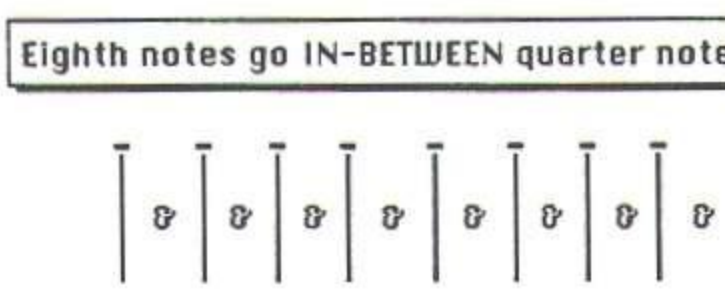
you as you compose.

The Eighth Note

The eighth note is exactly one eighth of a whole note. This means that in 4/4 time it occupies exactly half a beat. Eighth notes are traditionally counted as "One-and-Two-and-Three-and-Four-and." The "and" supplies the backbeat or "half beat" so if you have four quarter notes like this:



Eighth notes could be thought of like this:



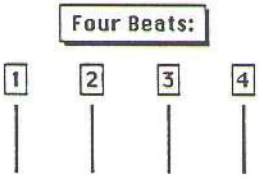
Eighth notes are notated on the staff like this:



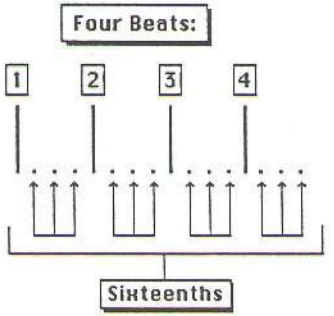
Eighth notes are written with a stem that has what is called a "flag" on it. The flag is usually connected to another eighth note if they are right next to each other.

The Sixteenth Note

The Sixteenth note is exactly 1/16 of a Whole note and in 4/4 time it occupies exactly one fourth of a beat. This means that if you have four beats like this:



Sixteenth notes could be thought of like this:



The traditional mnemonic device used to remember sixteenth notes is to say them with the vowel "e" and the sound "uh" like this:

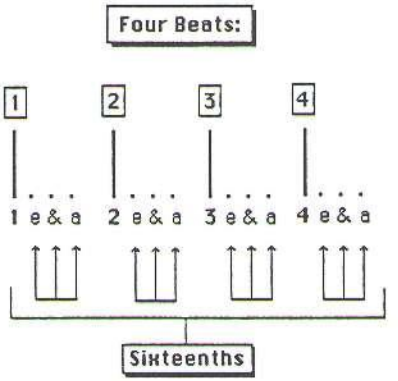
One-e-and-ah Two-e-and-ah Three-e-and-ah Four-e-and-ah

So you would actually say "One ee and uh, two ee and uh, three ee and uh, Four ee and uh." Many jazz players prefer to say it like this:

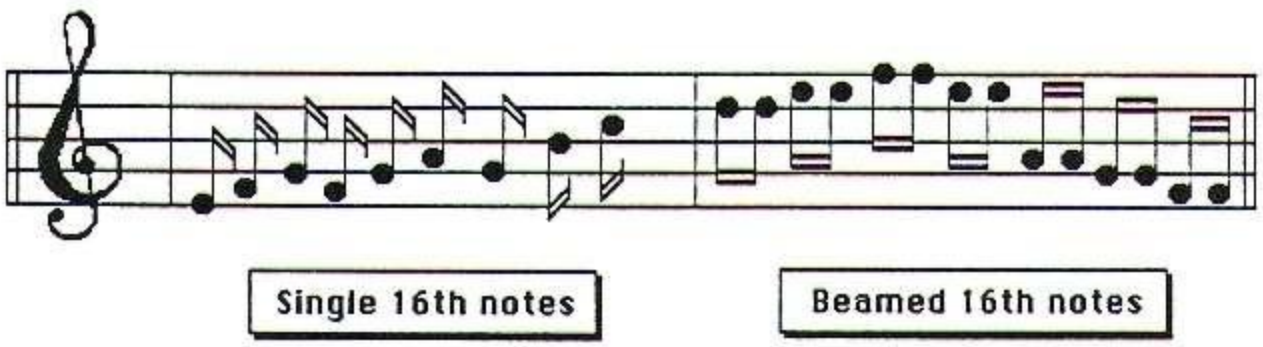
Doy-a-doo-ba Dah-ba-doo-ba

With rhythmic emphasis placed on the "Doy" and the "Dah" of each phrase.

So in 4/4 time, one bar of sixteenth notes can be thought of like this:



Sixteenth notes are written on the staff like this:



Each sixteenth note has a stem with two flags on it. If there are consecutive sixteenth notes they are connected together exactly like consecutive eighth notes.

The Dot (.)

The concept of the dot almost always baffles beginning music students. Please be patient and reread this material a few times. The dot is a rhythmic device that allows you to add time to a note.

The dot adds half as much of the original note to the note, as shown in the following examples:

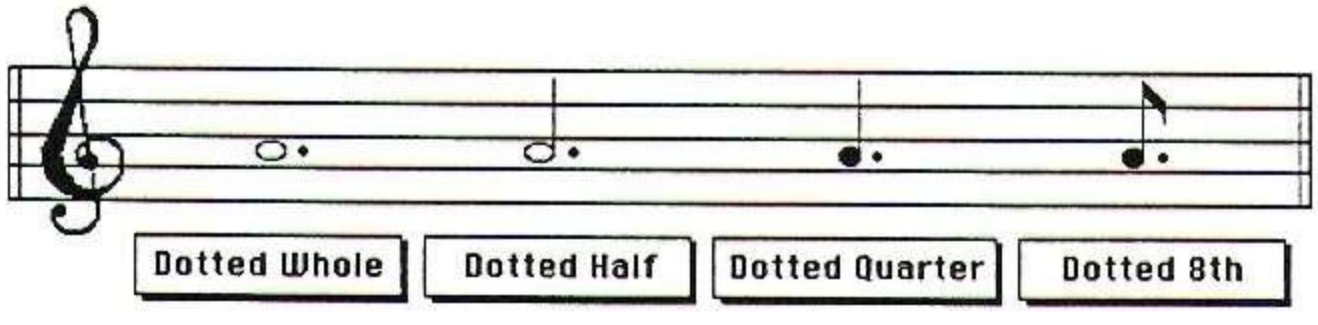
- If you have a whole note occupying four beats, a dotted whole note occupies 6 beats, since the dot added half again as much to the note (or two extra beats).

- A half note occupies two beats. A dotted half note occupies three.

- A quarter note occupies one beat. A dotted quarter note occupies one-and-a-half beats.

Summarized, adding a dot to a note lengthens the amount of time the note is played.

The dot is written on the staff like this:



Rests

Rests are a rhythmic concept that allow you to insert "space" between notes. Sonix has five different kinds of rests; they are:

- Whole Note Rest
- Half Note Rest
- Quarter Note Rest
- Eighth Note Rest
- Sixteenth Note Rest

Each rest corresponds to a different length of time or "Rhythmic Value." A rest is used when you would like to insert silence into a part, or add "syncopation" or rhythmic accents to a part.

Let's say that you have a drum sound and it is playing straight eighth notes like this:



To make it sound more exiting, you could add rests in between the notes to give it a more realistic sound and a better feel. What you would have by adding rests could be this:

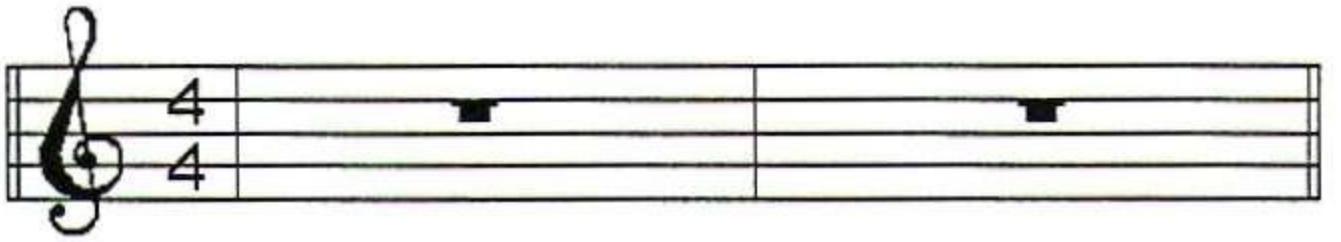


The rests eliminate the note from being played so as to add silence in between each note where the rest is.

The Whole Note Rest

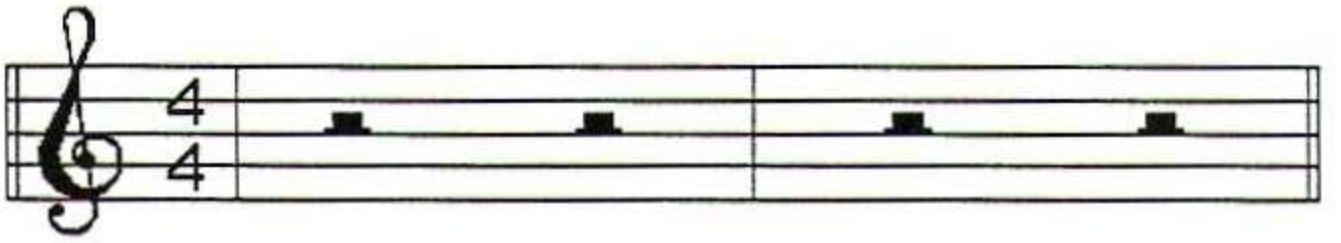
The whole note rest occupies exactly the same amount of time as a whole note. In 4/4 time, a whole note rest will give you silence for a time period of four beats. The whole note rest is written as a horizontal solid black bar with a thin black line over the top of it.

This signifies the "weight" of the whole note rest. Since the bar "hangs down" from the line, it is considered to be "heavier" than a half note rest, which sits above the line. This always helps you to remember how a whole note rest is notated. The whole note rest occupies four beats and looks like this:



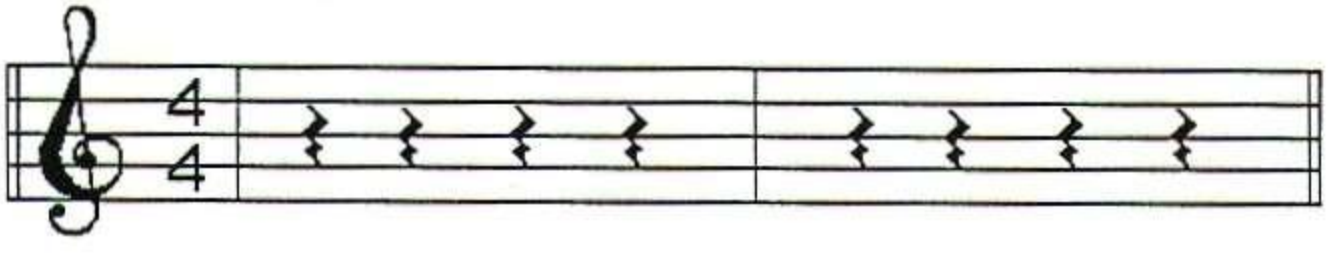
The Half Note Rest

The half note rest is exactly half of a whole note rest. In 4/4 time, the half note rest occupies two beats. The half note rest is notated with a horizontal solid black bar with a thin black line directly underneath it. This is easily distinguished from the whole note rest by thinking of the "weight" concept. The half note rest "sits above" the line and is "lighter" than the whole note rest which "hangs" below the line and is "heavier." This is an easy way to remember which rest you are looking at when sight-reading a piece of music. The half note rest looks like this:



The Quarter Note Rest

The quarter note rest is exactly half of a half note rest and is exactly one fourth of a whole note rest. It has the same rhythmic value as a quarter note. In 4/4 time a quarter note rest is exactly one beat. The quarter note rest is notated with a tricky little symbol that looks like a swirl. The quarter note rest looks like this:



The Eighth Note Rest

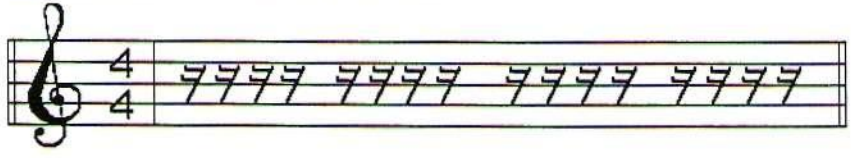
The eighth note rest is exactly one eighth of a whole note and is written as a slanted line

with a small stem on the top. In 4/4 time, the eighth note rest occupies exactly half a beat and is notated like this:



The Sixteenth Note Rest

The sixteenth note rest is exactly one sixteenth of a whole note. It occupies exactly half that of an eighth note rest. The sixteenth note rest is notated as a slanted line with two stems on the top of it. The sixteenth note rest takes up exactly the same amount of time as a sixteenth note, but with silence instead. When you become sufficiently advanced in your musical skill, the sixteenth note rest can be used frequently to add syncopation or "punch" to a composition. Listen to some of the demonstration songs on the Sonix diskette. These all implement the sixteenth note rest quite heavily with the drum sounds. The sixteenth note rest looks like this:



Aegis Sonix

CHAPTER 2 Starting Aegis Sonix

The Mouse

Almost every function in Sonix is initiated or performed with the mouse. The two buttons on the mouse always perform the same action with any function. Use the Selection (left) button to select and place objects (such as notes on the staff) and the Menu (right) button to work the menus.

Menus

At the top of each screen is the Title Bar, which displays the name of the current musical score or instrument. When you press the Menu button on the mouse, the Menu Bar replaces the Title Bar. The Menu Bar lists the names of the menus you can use in that screen. When you release the Menu button, the Title Bar replaces the Menu Bar.

Making a Working Copy

In order to prevent any possible damage to the Sonix master disk, you should immediately make backup copies of your disk before you start using the program. To learn how to make a copy of your disk, consult your Amiga Owner's manual for instructions.

Loading Sonix

After you have made a working copy, put the master disk away and use the backup in the following steps.

To load Sonix:

• Turn on the Amiga and insert the Sonix disk. In a moment, the start-up screen will appear and then Sonix's Score screen, with a requestor containing information about Sonix.

• Click the **OK** button. The requestor disappears and you are ready to use the program.

To reenter the program from the Workbench:

• Put the cursor over the Sonix icon and double-click the Selection button. The Sonix icon opens a window which contains a keyboard icon.

• Double-click on the keyboard icon. Sonix appears on the screen. You will see a box containing information about Sonix.

• Click on **OK**.

Using the Amiga Gadgets

Sliders

Sliders do what their name implies — they slide between minimum and maximum values. Sliders are represented on-screen by boxes with tick marks inside of which are sliding yellow columns . For example, the box marked **Volume** is a slider. To make the yellow column appear, put the cursor inside the box and click the Selection (left) button. There are two alternatives to adjusting the slider. You can either move the cursor to the desired level, click the Selection button and the column will jump to that level. Or, you can drag the column to the new level by putting the cursor on the column and holding down the Selection button as you move it. The second alternative is better when you want to hear how the sound is changing as you are adjusting the slider.

Buttons

The buttons are the little boxes that contain a number or a command. For example, the box marked **Play** is a button. You can activate a button by putting the cursor on it and clicking the Selection button.

CHAPTER 3 A Quick Tour

Using the Different Screens and Menus

There are three screens in Sonix:

The **Score** screen, the **Keyboard** screen and the **Instruments** screen.

Each screen has its own controls, features, and menus. When you open Sonix, the first thing you see is the Instruments screen.

To see the Instruments screen menus:

- Hold down the Menu button. The Menu Bar appears.
- Move the cursor across the Menu Bar. As the cursor touches each menu name, a menu appears under its name. When the cursor leaves the menu name, the menu disappears.
- Release the Menu button. The Title Bar reappears.

If you want to choose a menu item, open the menu and put the cursor on the item. When you release the Menu button, the item you pointed at will be selected or activated.

To choose an item from the Project menu:

- Hold down the Menu button. The Menu Bar appears.

- Move the cursor to **Project** on the Menu Bar. The **Project** menu appears.
- Move the cursor to **Load** on the **Project** menu. **Load** is highlighted.
- Release the Menu button. The menu disappears and the **Load** requestor appears.
- Click on the **Cancel** box in the **Load** requestor. The requestor disappears.

The Screens Menu

The **Screens** menu takes you from screen to screen in Sonix. There's a **Screens** menu in each screen. To go to another screen, open the **Screens** menu and choose the name of the screen you want. Try it now to make a quick tour of the three Sonix screens.

To go to different screens:

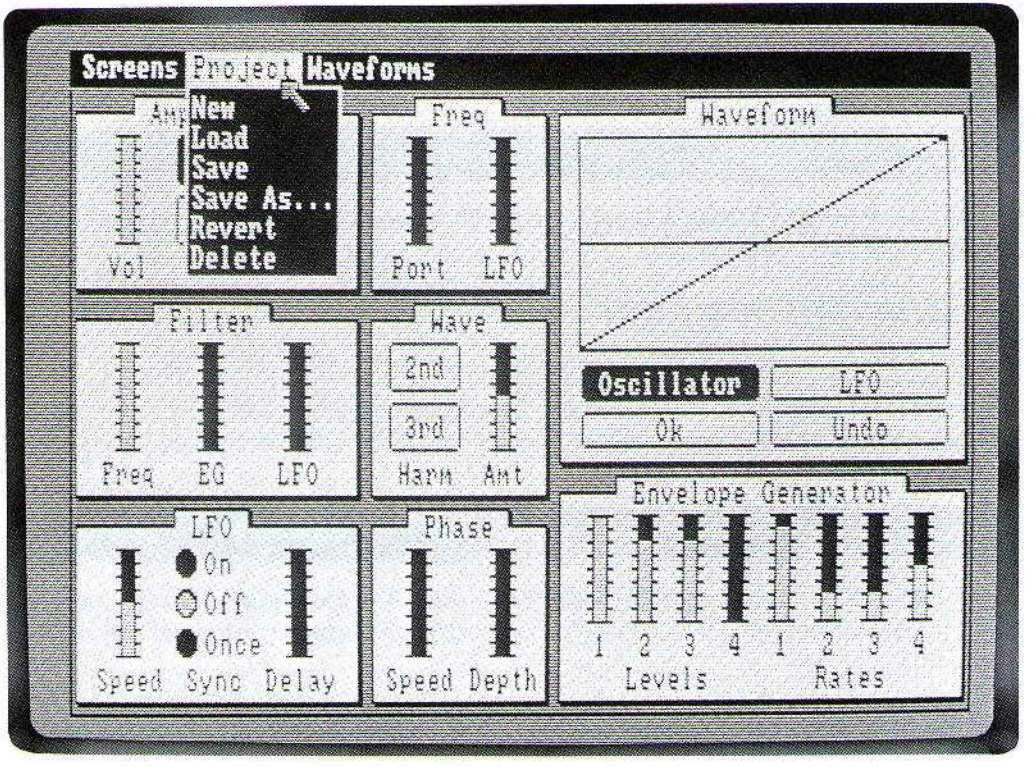
- Choose **Keyboard** from the **Screens** menu with the Menu (right) button. The **Keyboard** screen appears.
- Choose **Instruments** from the **Screens** menu with the Menu (right) button. The **Instruments** screen appears.
- Choose **Score** from the **Screens** menu with the Menu button. The **Score** screen appears. As you go from screen to screen, you can always find out which screen you're in by opening the menu with the Menu button; there's always a box before the name of the screen.

The Score Screen

You can use the screen to enter, edit, and play back musical scores. The staff in the top half of the screen displays a score in traditional music notation. The playback controls in the bottom half of the screen control the way a score plays back.

There are four menus in the screen:

- **Screens** contains items that take you to other Sonix screens.
- **Project** contains items that copy scores between the Amiga's memory, disks, and the screen. Also, the options to delete a score from disk, revert to a previous instrument setting, or exit the program are located here.



The Menu Bar and Instruments Screen

• **Edit** contains editing commands that revise a score.

• **Option** contains two items: **Signatures** which sets the key and time signatures of a score and **Mix Down** which adjusts the volumes of instruments in relation to each other.

Playing Back a Score

There are a number of musical scores stored on the Sonix disk. You can play any score by opening it and using the playback controls. Remember, you must be in the **Score** screen to hear a song play back.

To load a score onto the screen:

• Choose with the Menu button **Load** from the **Project** menu. The **Load** requestor appears with a list of score names.

• Put the cursor over the name of the score you want to hear and click the Selection button.

• Click on **Load** with the Selection button. The disk drive whirs and the score opens on the **Score** screen. You can see the name of the score in the Title Bar and the notes of the score on the staff.

To hear the score:

• Click on the **Play** button with the Selection button. The score plays from beginning to end. If you don't hear anything, check to make sure the volume control of your monitor is turned up.

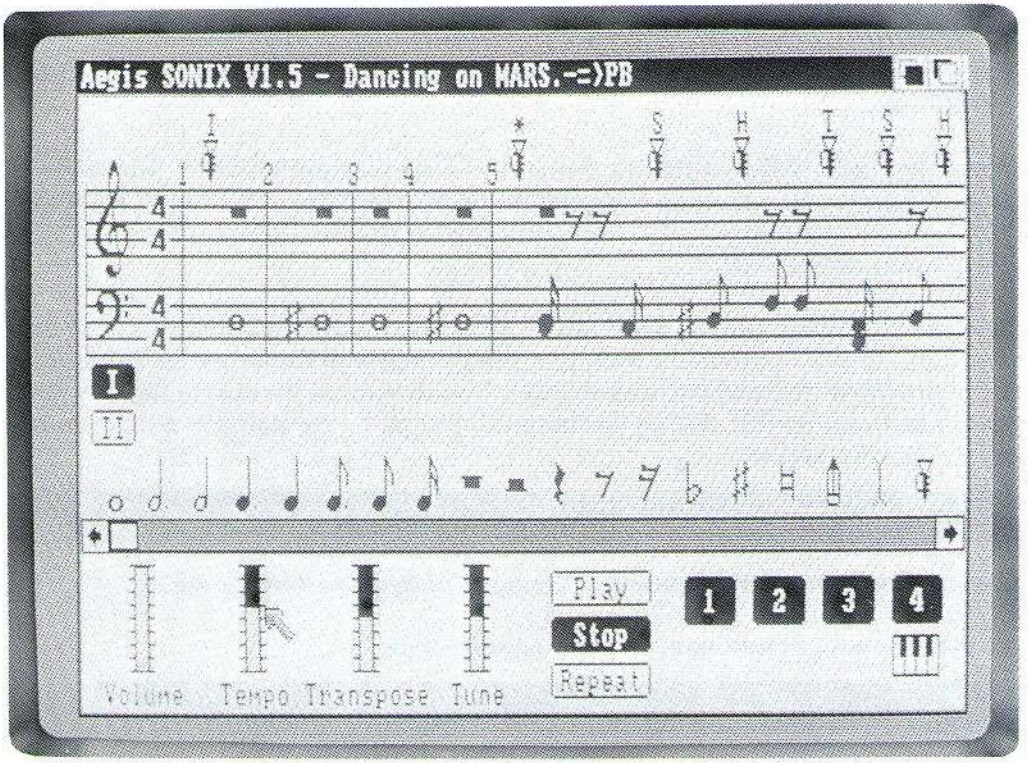
While the score plays back, you can change the way it sounds with the **Tempo** slider:

To speed up the score:

• Put the cursor just above the yellow column in the **Tempo** slider.

• Click the Selection button. The yellow column jumps up to the cursor and the score speeds up.

You can play back the score as many times as you want by selecting the **Play** button. If you want to stop the score before it's finished playing, select the **Stop** button.



Playing Back a Score

To open a score, choose **Load** from the **Project** menu; the **Load** requestor appears with a list of scores. Select a score and click the **Load** button. Now you can see the name of the score and its notes on the staff. Click on the **Play** button to hear the score. Put the cursor on the yellow **Tempo** slider, hold down the mouse Selection button and move the column to hear the score speed up or slow down.

Playing the Keyboard

You can perform on the Amiga keyboard.

To play the keyboard:

• Run your finger down the bottom row of keyboard (the ZXCVBNM row). You hear a series of notes.

Different keys play different pitches. Some keys don't play pitches at all. You can change this pattern of pitches by changing the pitch of the keys in the **Keyboard** screen.

Putting Notes on the Staff

When you create a score in the **Score** screen, you enter music by putting notes and rests on the staff. To put a note on the staff, you select a note with the mouse from the row of notes between the staff and the control panel. You then move the note to the staff and place it where you want it. Before you try putting notes on the staff you need to erase the score you opened earlier:

To erase a score from the screen:

• Choose **New** from the **Project** menu. The score disappears from the staff.

Now that you have a clean staff, try entering some notes:

To enter notes on the staff:

• Put the cursor on the quarter note symbol in the Symbol Bar and click the Selection button.

• Move the cursor up to the staff. The cursor turns into a quarter note.

• Put the cursor where you want to place the quarter note and click the Selection button. The cursor leaves a quarter note on the staff.

• Move the cursor to the right and click the Selection button again.

• Move the cursor to see the note underneath. The cursor leaves another quarter note on the staff.

- Click on the half note in the Symbol Bar.
- Move the cursor to the Staff. The cursor turns into a half note.
- Put the cursor where you want to place a half note and click.
- Move the cursor away. The cursor leaves a half note on the staff.

You can continue to enter a score by putting notes and rests on the staff until you finish your composition. You can play back your score to hear the music you wrote:

To hear your composition:

- Click on the **Play** button. Sonix plays back the notes you just entered.
- Now go to the **Keyboard** screen.
- Choose **Keyboard** from the **Screens** menu. The **Keyboard** screen appears.

The Keyboard Screen

You can play the keyboard in any of the three Sonix screens, just as you did in the Score screen. In the **Keyboard** screen, you can change the instrument and pitches played by the keyboard.

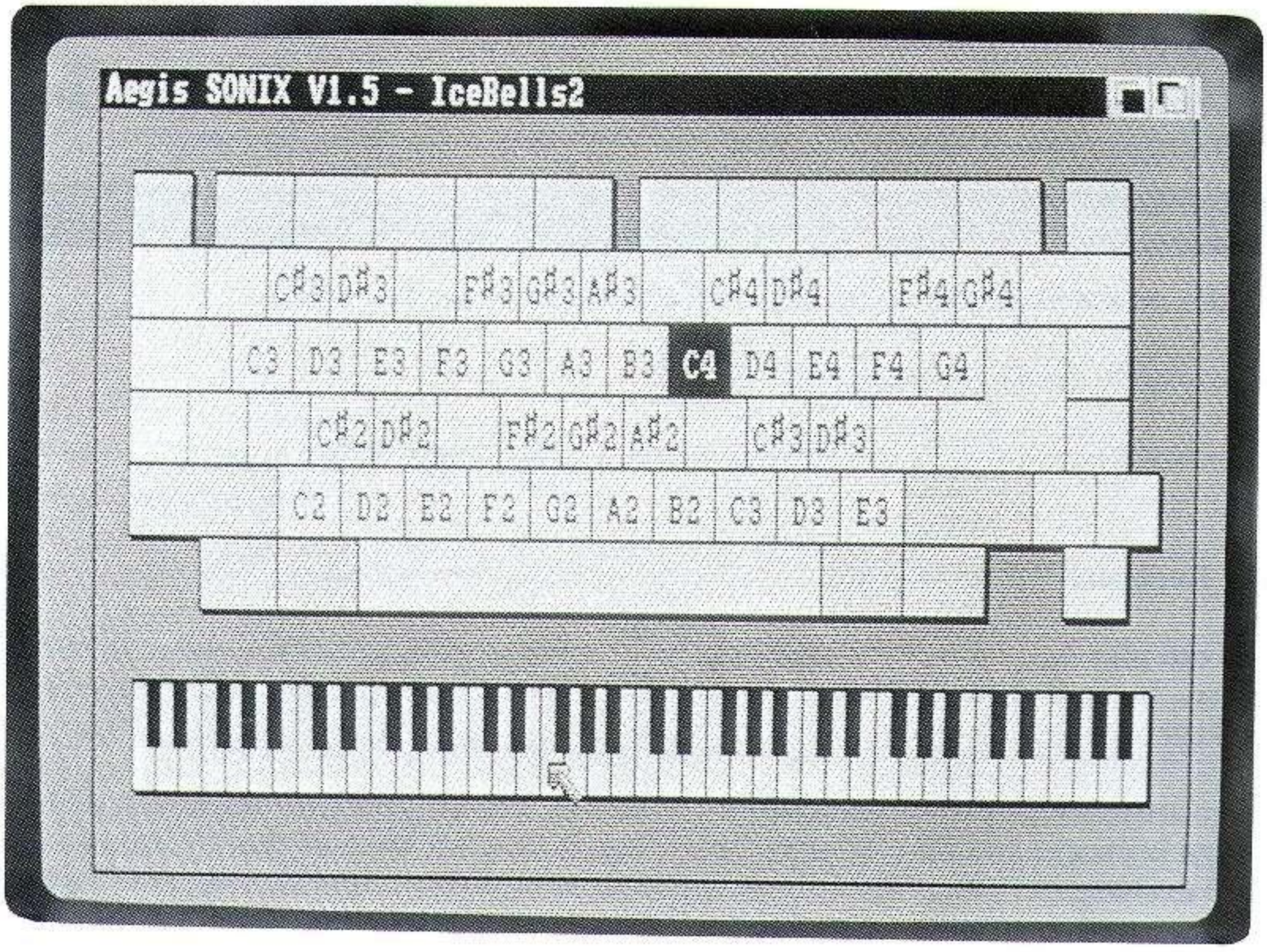
There are two keyboards on the **Keyboard** screen. The top keyboard is a layout of the Amiga keyboard and the pitches the keys play. You select a key on this layout when you want to change its pitch. The bottom keyboard is a layout of a piano keyboard. You use this keyboard to select the pitch you want to assign to a key on the Amiga keyboard. There are only two menus in the **Keyboard** screen:

Screens takes you to other Sonix screens.

Keyboard contains the Instrument command that opens different instruments for the keyboard to play.

Opening an Instrument

There are a number of instruments on the Sonix disk. Use them to give the keyboard a different sound.



The Keyboard Screen

You can play the keyboard as an instrument. You can use the piano keyboard to choose new pitches for the the pitch layout on the Amiga keyboard.

To open an instrument:

• Choose **Instrument** from the **Keyboard** menu. The Instrument requestor appears. There is a list of instrument names in the Instrument requestor.

• Put the cursor over the name of the instrument you want and click the Selection button. That instrument becomes highlighted.

• Click on **Load**. The disk drive whirs and the instrument opens on the **Keyboard** screen. You can see the name of the instrument in the Title Bar.

• Press several keys on the keyboard and you'll hear the sound of the instrument you just opened.

Open any instrument in the **Instrument** requestor and hear how it sounds when you play the keyboard. Each instrument has its own sound. When you go to another screen and play the keyboard, it uses the instrument you opened in the **Keyboard** screen.

Changing Keyboard Pitches

Some of the keys don't play pitches because no pitch is assigned to them. For example, the space bar at the bottom of the Amiga keyboard doesn't play a pitch. Try it:

Press the space bar and you will hear nothing.

To assign a pitch to the space bar:

• Click on the space bar in the Amiga keyboard layout. The space bar turns black.

• Click on a key on the piano keyboard layout. The name of the pitch on the piano keyboard layout appears in the space bar.

• Click on the space bar in the Amiga keyboard layout again. The space bar turns white again and now has a pitch name on it.

• Press the space bar and you can hear the pitch you assigned to the space bar.

You can change the pitches of keys that already have pitches in the same way:

Go to the **Instruments** screen and choose Instruments with the **Menu** button from the **Screens** menu. The **Instruments** screen appears. The Title Bar contains the name of the instrument you loaded in the **Keyboard** screen.

The Instruments Screen

Use the **Instruments** screen to create your own instruments or to change the instruments already on the Sonix disk. The Instruments screen is filled with controls that you set to change the sound of the instrument.

There are three menus in the **Instruments** screen:

Screens takes you to other Sonix screens.

Project contains items that copy instruments between memory and a disk.

Waveforms contains different waveforms that change the sound of an instrument on the synthesizer.

Creating an Instrument

To create an instrument on the synthesizer, you must first set the controls to a starting position using the **New** command.

To create a new instrument:

If you chose an instrument in the **Keyboard** screen that was a sampled sound, the Instruments screen will not show a waveform. If so, choose **Load** from the **Project** menu, click on **ElectricPiano2**, then on the **Load** button. Proceed with the following steps:

• Choose **New** from the **Project** menu. The synthesizer controls are set at their starting position and the Title Bar, which displays the name of the instrument you're working on, reads **Unnamed.**

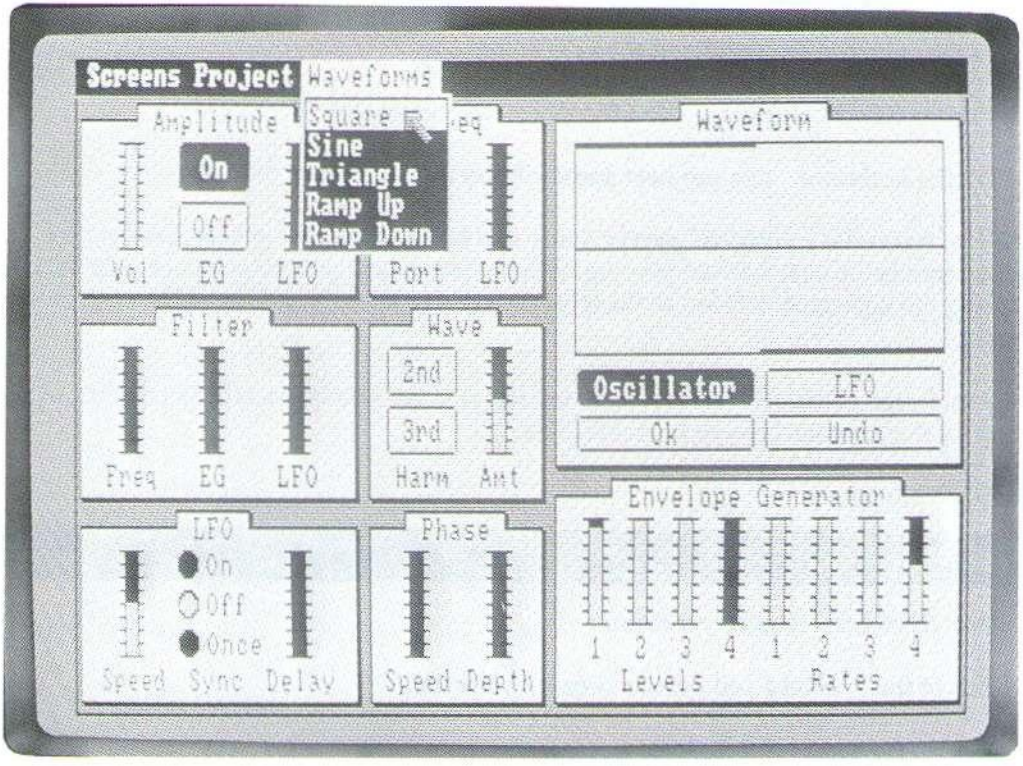
As you work on an instrument, you can hear how it sounds by playing the keyboard. It plays the current version of the instrument on the **Instruments** screen.

Try the keyboard now:

• Press several keys on the keyboard. You can hear the unnamed instrument as it sounds with the controls in their starting position.

To alter the sound of the instrument by changing the waveform:

• Choose **Square** from the **Waveforms** menu. The **Waveform** display in the upper right corner of the screen changes.



The Analog Instruments Screen

You can create new instruments by adjusting the controls in this screen. To make a new instrument, use the right mouse button to choose **New** from the **Project** menu.

• Click on the **Ok** button under the **Waveform** diagram to accept the new waveform.

• Play the keyboard to hear the new waveform. The instrument has a harder edge to its sound.

To add some vibrato (vibration) to the instrument:

• Put the cursor in the middle of the **LFO** slider.

• Click the Selection button. The **LFO** slider is set to the halfway mark.

• Play the keyboard. You can hear some vibrato in the notes as they play.

The synthesizer is a powerful part of Sonix that takes some time to learn and master. Experience is the best teacher; playing with the controls as you've just done and then playing the keyboard to listen to the effects gives you a practical idea of how each control works.

As you design instruments on the synthesizer, you can save them to disk so you can play them on the keyboard or use them in scores.

Saving Your Work

To save your work:

• Select **Save** from the **Project** menu.

• Click in the text field and type a name for your file.

• Click on the **Save** button. Your work is now saved.

• If the disk is full, or if you want to save to another disk or disk drive, click on the **Look** button. The program will find the next storage device to save to, or, put another disk in the drive and click **Look** again.

Closing Sonix

When you're done using Sonix, you can return to the Workbench or shut off the Amiga if you're done.

To exit the program:

- Choose **Score** from the **Screens** menu.

- Choose **Quit** from the **Project** menu. A requestor appears asking if you want to quit. This gives you another chance to save your work if you had forgotten to do so.

- Click on **Ok**. Sonix disappears and the Workbench appears.

- Eject the Sonix disk.

- Turn off the Amiga.

- Turn off the monitor.

And that completes the tour.

Aegis Sonix

CHAPTER 4 Working with Instruments on the Synthesizer

Instrument Categories

There are three kinds of instruments (sounds) in Sonix: digitally sampled sounds (discussed in **Chapter 10**), analog sounds, and IFF sounds. This difference is reflected in the two **Instruments** screens: the analog screen and the sampled-sound screen. The analog screen enables editing of a waveform and its overtones plus control of many other parameters of the sound. The sampled-sound screen only has a few parameters that you can edit because sampled sounds are not synthesized (made) by the computer. The third category of sounds, IFF sounds, are sampled sounds ported over in IFF files from another program and appear on the screen as a waveform which you can't edit.

The term analog recalls the older analog synthesizers which used physical electronic devices (e.g. filters) to shape a sound. The analog **Instruments** screen simulates the same devices which the analog synthesizers used; however, the **Instruments** screen's gadgets are not hardware, but are represented in the program electronically as digits. In effect, the sounds synthesized by the Amiga are digital but we call them analog sounds because of the physical devices they mimic.

In the analog **Instruments** screen, you can use the synthesizer to create your own Sonix instruments or modify existing Sonix instruments to get the sound you want. As you create new instruments, you can store them on a disk and make your own instruments library. You can use these instruments in your scores or keyboard performances.

As you work with the controls in the **Instruments** screens, you will find that they create different effects in different situations. The best way to understand them is to experiment with different combinations of settings.

This chapter discusses:

- The fundamentals of sound synthesis.
- How to use the synthesizer controls.
- How to save and load instruments.

Understanding Sound Synthesis

You can play with the synthesizer by setting different controls and listening to their effects. If you want to get serious about sound synthesis, take some time to understand how sound synthesis works. If you haven't worked with a synthesizer before, this section explains the basic concepts of sound synthesis. If you already understand sound synthesis or feel adventurous, skip this section and go to "The Elements of the Analog Instruments Screen" on page 44.

The Properties of Sound

Sounds are created by vibration: when an object vibrates, its vibrations travel through the air to your ears and you hear sound. The quality of these vibrations determines the quality of the sound.

To analyze a sound, you must break up its vibrational qualities into four basic properties: **Frequency, amplitude, timbre** and **duration.**

- **Frequency** is the speed of vibration that creates a sound. It determines the pitch of the sound. If an object vibrates at a high frequency (vibrates quickly), you hear a higher pitched sound than if it vibrates at a low frequency (vibrates slowly). For example, the long strings of a harp vibrate more slowly than the short strings. When you pluck a long string, it sounds lower than a short string because it vibrates at a lower frequency.

- **Amplitude** is the strength of vibration. It determines the loudness of a sound. An object that vibrates with more amplitude makes a louder sound than an object that vibrates with less amplitude. For example, when you tap a large gong lightly with a pencil, it sounds much softer than if you hit it solidly with a large mallet. The mallet gives the vibrating gong more amplitude than the pencil.

• **Timbre** is the tone color created by additional frequencies mixed in the sound. Most objects don't vibrate at just one frequency; in addition to the lowest frequency, called the fundamental frequency, objects simultaneously vibrate at higher frequencies called overtones. When you hear a sound, you hear the fundamental frequency as the pitch of the sound. You don't hear the overtones as separate pitches; they blend into the fundamental frequency to give the sound a distinct timbre.

A good example of timbre is the difference betweenthe way your voice sounds when you're healthy and when your head is stopped up with a cold. A stopped-up voice has a thin timbre because your sinuses, which add rich overtones to your voice, are clogged and don't vibrate as well as they do when they are empty.

• **Duration** describes the length of a sound or its frequency, amplitude, or pitch. For example, if the duration of a sound is two seconds, you hear the sound start then stop two seconds later. If the duration of the frequency of a long sound is two seconds, you hear the pitch of the sound change to a new pitch after two seconds while timbre and amplitude remain the same. Duration gives shape to a sound by changing frequency, amplitude, and timbre. When you create a sound by shaping these four properties, you are synthesizing a sound.

Oscillators and Waveforms

Electronic synthesizers use oscillators to create sounds. An oscillator is the electronic equivalent of a vibrating object—it oscillates in voltage (the voltage goes up and down). When the voltage is fed to a loudspeaker, its oscillation turns directly into vibration. If you can adjust the oscillator, you can directly control the sound coming from the speaker.

The easiest way to see the changing voltage of an oscillator is to draw it on a graph. Since these voltage changes repeat themselves, you only need to look at the first cycle of voltage change. A graph of the first cycle of voltage change is called a waveform.

A waveform shows how the voltage goes up and down around a steady voltage. The straight line through the center is the steady voltage. You read the waveform from left to right: it usually rises from the steady voltage at the beginning, drops back down in the middle, goes below the steady voltage on the right, and finally returns to the steady voltage again. With an experienced eye, you can get a good idea of how the oscillator will sound by looking at its waveform.

Sonix's synthesizer has a main oscillator that you use to create a sound. You set the timbre of the oscillator when you create its waveform. You can modify the output of the oscillator with other synthesizer controls; they change its amplitude and shape it by

changing the duration of its different properties. When you play the keyboard or play back a score, the notes you play change the frequency of the oscillator so you hear different pitches.

Instruments

You can use Sonix's controls to create your own unique sounds. Each different sound is called an instrument. You can name an instrument and then save it on a disk; and when you do, Sonix saves the synthesizer control settings under the instrument's name. When you use an instrument to play the keyboard or play back a score, Sonix uses the control settings of the instruments to make the synthesizer play the notes in your music using the sounds you created. A collection of instruments on a disk is called an instrument library; your Sonix disk contains one.

The Elements of the Analog Instruments Screen

The instrument you last opened determines which **Instruments** screen appears when you choose **Instruments** from the **Screens** menu. To see the analog Instruments screen, you will need to open an analog instrument.

To load the analog Instruments screen:

- Choose **Instruments** from the **Screens** menu.
- Choose **Load** from the **Project** menu. The **Instrument** requestor appears.
- Select **ElectricPiano2.** That instrument name is highlighted.
- Select **Load.** The analog **Instruments** screen appears.

The analog **Instruments** screen contains the following:

- The **Title Bar** is at the top of the **Instruments** screen. It gives the title of the instrument that is displayed on the screen. It reads **Unnamed** if you haven't named a new instrument.
- The **Back** and **Front** gadgets are on the right end of the Title Bar. You can use them to see the Workbench or other programs you may be running.
- The **Menu Bar** is in the same place as the Title Bar—holding down the Menu button

turns the Title Bar into the Menu Bar. The Menu Bar lists the Menus available in the Synthesizer screen. Choose an item from any of these menus. When you release the Menu button, the Menu Bar becomes the Title Bar again.

• The **Amplitude** controls affect the loudness of the instrument.

• The **Frequency** controls, labelled **Freq** control the main oscillator to vary the pitch of the instrument.

• The **Filter** controls filter out overtones to control the timbre of the instrument.

• The **Harmonic** controls, labeled **Wave**, add overtones to a waveform.

• The **LFO** button controls set the effects of the low frequency oscillator which doesn't make a sound itself but changes the sound of the main oscillator.

• The **Phase** controls affect the phase of the instrument, enriching its timbre.

• The **Waveform** display shows the shape of waveforms for the main oscillator and the **LFO**. You can alter the display by drawing a new waveform or choosing a new waveform from the Waveforms menu. Under the display are four buttons:

1. The **Oscillator** button puts the main oscillator's waveform on the display.
2. The **LFO** button, which puts the LFO's waveform on the display.
3. The **Ok** button, which applies the waveform on display to either the main oscillator or the LFO.
4. The **Undo** button, which changes the display back to the last entered waveform.

The **Envelope Generator** is in the lower right corner of the screen. It has eight sliders that set the shape of an envelope. An envelope shapes the amplitude, frequency, and timbre of a sound.

Creating a New Instrument

You can use the synthesizer controls in the analog Instruments screen to modify instruments that are already in the instrument library or to create new instruments from scratch. As you adjust the synthesizer controls, you can press a keyboard key to hear the changing sound of the instrument. The keyboard plays just as it does in the **Keyboard** screen, and uses the pitches you set there.

When you create a new instrument, form it in two parts: first create a steady-state sound and then add a time profile. A steady-state sound is an unchanging sound that is the foundation of an instrument. By itself, it's not very interesting. A good example of a steady-state sound is a 60-cycle hum, which is the sound you hear if you turn up your stereo system when nothing is playing.

When you add the time profile to the steady-state sound, you give the instrument character. A time profile might include a sharp attack like a plucked guitar string, or a warm vibrato like a singing cello note.

To start a new instrument:

- Select **New** from the **Instruments** menu.

This resets the synthesizer controls and waveforms, and puts **Unnamed** on the Title Bar.

Setting a Steady-State Sound

To create a steady-state sound in Sonix, you must:

- Choose an oscillator waveform.
- Add harmonics to the waveform if you want them.
- Add phasing to the sound if you want it.
- Set the filter frequency.
- Set the relative volume.

After you set a steady-state sound, you can add a time profile to give your instrument character.

The Waveform Display

To choose an oscillator waveform, look at the **Waveform** display to see the shape of the current waveform. The Waveform display shows waveforms for two different oscillators: the main oscillator and the **LFO** (Low Frequency Oscillator). The main oscillator creates a steady-state sound. The LFO doesn't create audible sound, but you

can use it to change the sound of the main oscillator when you create a time profile. You can choose between the two oscillators by selecting one of the two buttons just under the display. The **Oscillator** button shows the waveform of the main oscillator and the **LFO** button shows the waveform of the **LFO.**

You can change the waveform on display by choosing a different waveform from the **Waveforms** menu or by drawing your own waveform. When you change the waveform in the display, you are changing only the display; the sound won't change until you select the **Ok** button. When you select the **Ok** button, Sonix applies the waveform on display to the oscillator; you can hear it when you press a key. If you don't like the sound of it, select the **Undo** button and the oscillator goes back to its previous waveform.

As you look at the **Waveform** display for a new instrument, you can see the oscillator waveform. It's called a **Ramp Down** wave, and it is applied to the main oscillator.

As you try different waveforms from the **Waveforms** menu, you can hear differences in timbre. All the waveforms except the **Sine** waveform have overtones. Some are richer than others; the **Square** waveform has a very penetrating sound, while the **Triangle** waveform has a very smooth sound.

Drawing an Oscillator Waveform

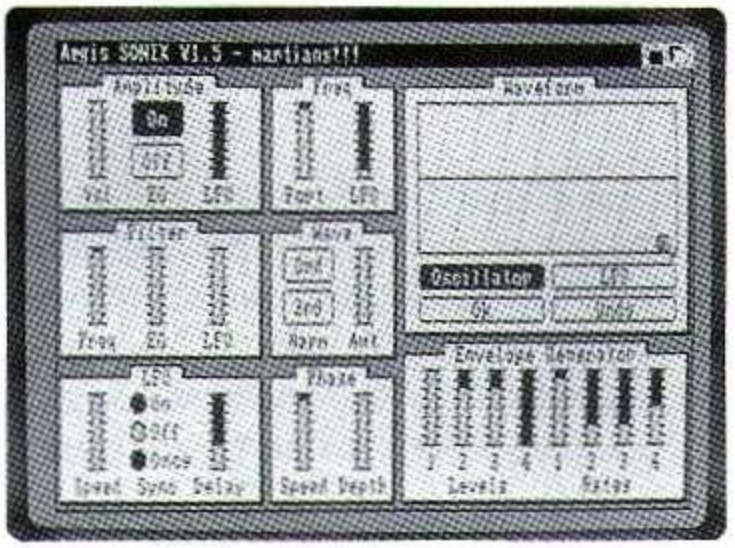
If you want a waveform that's not on the **Waveform** menu, you can draw your own waveform on the display. In the synthesizer world, this is called a "visual editing system." You can draw inside the **Waveform** window just like a paint program, the result producing a waveform that translates into a custom sound. There are some bizarre waveforms you can create with the waveform editor (e.g. **Martians**), so your own imagination is the guide to creating them.

You can't draw vertical lines in the **Waveform** window because you can only have one black dot in a vertical alignment. Anytime you see a break in the wave, picture a vertical line extending from the beginning of the break to the end of the break. This is why the **Square** waveform appears as a series of dashes.

To draw a waveform:

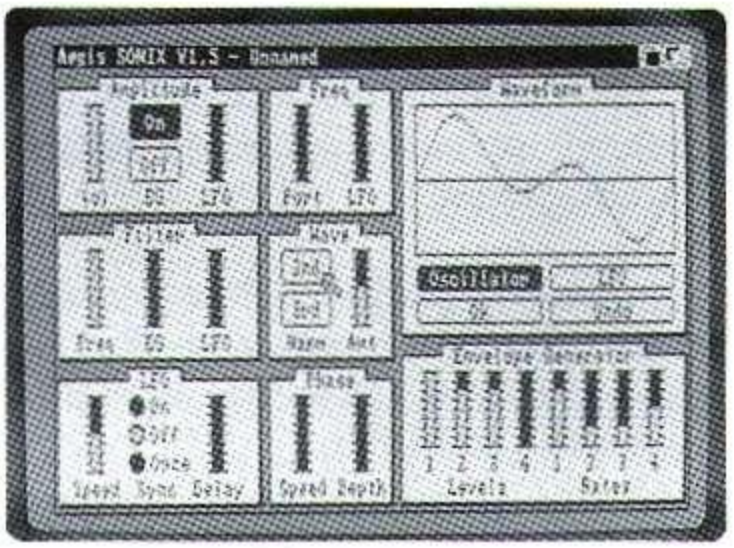
- Put the cursor on the left side in the **Waveform** display.

- Drag the mouse to draw a new waveform, sketching from left to right. The slower you drag the mouse, the cleaner the waveform. As you draw in the new waveform, the section of the old waveform above or below the cursor disappears.



Drawing a Waveform

Put the cursor in the **Waveform** window and draw a new waveform while holding down the Selection button. You can create some unusual sounds if you experiment.



Harmonic Overtones

The **Waveform** window shows the result of applying the second harmonic to the fundamental waveform (in this case, the **Sine** wave). The second harmonic is twice the frequency of the fundamental.

• Select the **Ok** box to apply the new waveform to the oscillator.

Some tips for drawing distinctive sounding waveforms:

• Always draw to the top and bottom of the display; the standard way to represent a waveform is to go to the top of the display on the left half of the display, and to go to the bottom of the display on the right half of the display.

• Put jagged edges on your waveform. This gives your waveform richer overtones.

• Make the contours of your waveform large. Small squiggles don't change the sound of the waveform very much.

The Wave Controls

Once you choose or draw a basic waveform, you can add tone color with the Wave controls. These controls add second and third harmonics to the waveform, changing the Waveform display. You can apply the harmonics to the oscillator using the **Ok** button.

Harmonics are a series of overtones. Each harmonic is exactly twice the frequency of the one preceding it. The first harmonic is the fundamental frequency, which determines the pitch of the waveform. The second harmonic is the frequency of the first (one octave higher in pitch), and the third harmonic is four times the frequency of the first (an octave and a fifth higher in pitch). The second and third harmonics add color to the first harmonic.

The **Amt** slider on the right side of the **Wave** controls sets the amount of harmonic you want to add to the waveform; the two buttons labeled 2nd and 3rd select the harmonic you're adding. Some of the instruments on the disk were created by selecting 2nd and 3rd harmonics and adjusting **LFO**, **Freq**, and **Phase** controls.

To add harmonic overtones to the fundamental waveform:

• Adjust the **Amt** slider. If you selected a high amount, you can hear the harmonic overtones clearly with the fundamental. If you selected a small amount, you can barely hear the harmonic overtones. Adjusting the **Amt** slider after you select a harmonic overtone has no effect.

• Select the **2nd** or **3rd** buttons. The waveform in the display changes to show the added harmonic. The **2nd** harmonic doubles the amount of loops (peaks) in the display and the

3rd quadruples the amount. The waveform in the window will break itself up symmetrically according to the level that the **Amt** slider is set to.

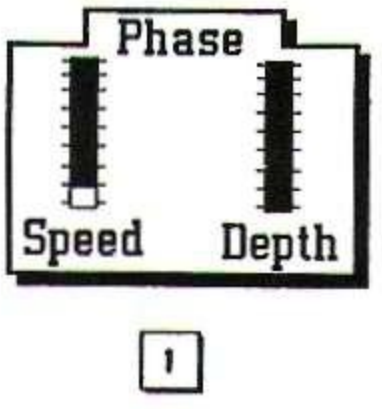
- Select the **Ok** button to apply the new waveform to the oscillator.

You can add harmonics to harmonics by repeating these steps. Each time you select the **Ok** button, it applies the harmonics to the oscillator. Using the harmonics buttons again creates harmonics for the applied waveform, so you get the harmonics of previously applied harmonics. This can create very colorful sounds.

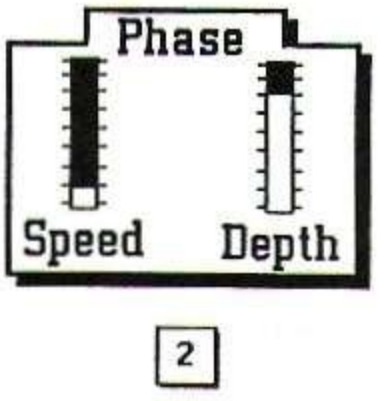
Adding harmonics to the waveform is the last step in setting the waveform. The remaining steps in setting a steady-state sound change the output of the oscillator, but don't directly change the waveform. You can't see their results on the **Waveform** display, but you can hear their results when you press keys to play notes.

The Phase Controls

Phasing is an effect that sounds similar to several of the same instruments playing a tone in unison. For example, two violins playing exactly the same pitch sound richer than one violin playing that pitch. The **Phase** controls alter the sound of an instrument to fatten its timbre and give the illusion of several instruments playing at once. In the music world, the phase effect is sometimes called the "Leslie" effect after a type of loudspeaker which simulated phasing by physically spinning two speaker horns.



1



2

The phasing effect is caused when the main oscillator's waveform is altered to simulate two sound waves, both identical but one slower than the other. If you looked at this condition on an oscilloscope you could see two similar waves whose loops didn't meet at the same points. When the **Depth** slider is set to **0**, the **Speed** slider determines how out-of-phase (staggered) the waves are — the higher the level, the more out-of-phase. How out-of-phase the waves are remains constant only when the **Depth** slider is set to **0**.

The **Speed** slider has a completely different function when the **Depth** slider is above **0**. In this case, the **Depth** slider determines how out-of-phase the two waves are. The term for the distance between the two waves' peaks is "depth." This distance cycles at a constant rate from **0** degrees to the value that the **Depth** slider is set to. In this case, the **Speed** slider determines the rate at which the depth changes. In other words, the **Speed** slider adjusts the amount of beats per second, and the **Depth** slider adjusts how much phase shift is put into the sound. Also, the amplitude changes as the depth changes, causing the sound to get louder and softer. You cannot affect the phasing depth without having the phasing turned on (**Speed** slider set above **0**). It is helpful to hold down a key so that you can hear how the sound is affected as you adjust the **Phase** controls.

The Filter Controls

The **Filter** controls adjust the cutoff frequency of a low-pass filter that is applied to the sound of the instrument. A low-pass filter stands between the oscillator and the speaker output. It passes low frequencies through without changing them, but attenuates (cuts down on) high frequencies. The cutoff frequency of a low-pass filter is the frequency above which the high frequencies are attenuated. When you set the cutoff frequency as high as it goes, all sounds come through unaltered. As you lower the cutoff frequency, more and more high frequencies are blocked out.

The **Freq** slider sets the cutoff frequency of the synthesizer's low-pass filter. When you slide it all the way up, the cutoff frequency is as high as it can go and has no effect on the instrument's sound. As you lower the slider, the cutoff frequency comes down, filtering overtones out of the instrument's sound. Lowering the **Freq** slider makes the instrument sound thinner; raising the slider makes the instrument sound fuller. The **EG** slider adjusts the frequency of the Envelope Generator (see "Applying the Envelope to the Filter"), and the **LFO** slider can add "wah" to each note (see "Applying the LFO to the Filter"). It is helpful to hold down a key so that you can hear how the sound is affected as you adjust **Freq**.

The Amplitude Controls

The amplitude of a sound is defined as the peak value attained by a wave or an alternating current during one cycle. The **Amplitude** control panel contains three separate controls: volume, envelope generator on/off, and low frequency oscillation. The volume slider, labeled **Vol**, sets the volume of the instrument relative to the other instruments. You can use it to balance the instrument with other instruments in a score. For example, you may have a trumpet and flute playing a duet. If the trumpet volume is

louder than the flute volume, the trumpet drowns out the flute. To balance them, you can change their volumes in either the **Amplitude** control panel or the **Mix Down** requestor found in the **Score** screen. The **EG On/Off** buttons turn on the envelope generator effect (see "Applying the Envelope to Amplitude" on page 55) and the **LFO** slider adjusts tremolo amount (see "Applying the LFO to Amplitude" on page 52).

When you're creating a new instrument, you don't have other instruments to compare volumes with. It's a good idea to set the **Vol** slider a little higher than the halfway mark so the volume of the instrument is loud enough to hear, but leaves some margin for later adjustment. It is helpful to hold down a key so that you can hear how the sound is affected as you adjust **Vol**.

Adding a Time Profile

To add a time profile to a steady state sound you can:

- Create an envelope and apply it to the volume or timbre of an instrument.
- Set the waveform and frequency of the LFO (low frequency oscillator) and apply it to the volume, pitch, or timbre of an instrument.
- Add portamento to an instrument.

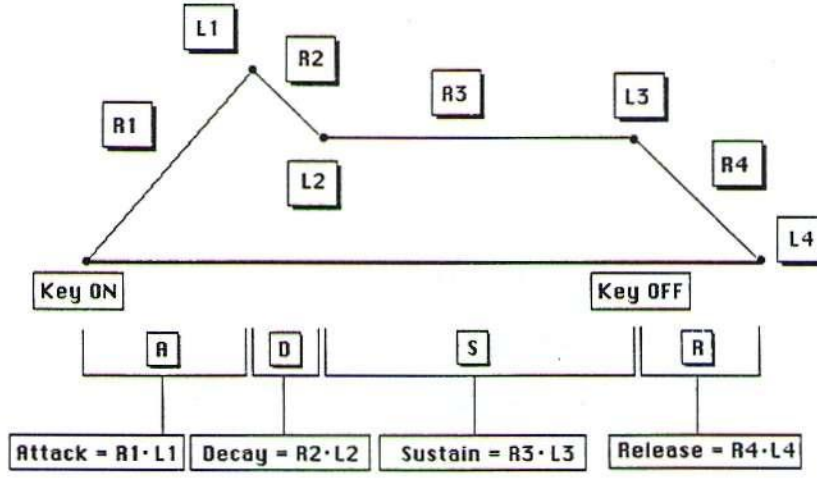
All of these activities shape each note an instrument plays and give it a distinct character.

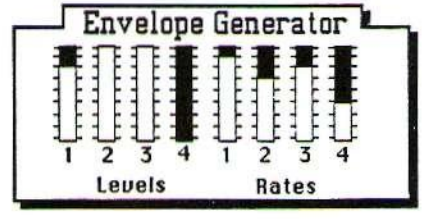
The Envelope

Most non-electronic instruments have a pattern of change for each note they play. When the note starts, the timbre, volume, and pitch are usually unsteady for a brief moment until they settle down to a steady state. When the note ends, the instrument usually takes a moment or two to stop vibrating, so there's a brief sound of the note dying away. This pattern of change is called an envelope, and it has four main sections:

- The attack, when the note first starts and the sound is unsteady.
- The decay, when the sound falls off from the initial attack.
- The sustain, when the sound has settled into a steady state.
- The release, when the note ends and the sound dies away.

The sound of an organ pipe when it plays a note is a good example of an envelope. When the air first blows through the pipe to start the note, you hear a distinct puff (called





- R1 = Rate 1
- R2 = Rate 2
- R3 = Rate 3
- R4 = Rate 4
- L1 = Level 1
- L2 = Level 2
- L3 = Level 3
- L4 = Level 4

The Envelope Generator

The diagram is a plot of the sound level of a note against the time taken to sound. This plot is analagous to the volume "shape" of the note. You can create many different shapes by adjusting the **Rates** and **Levels** sliders in the **Envelope Generator.**

a "chiff" by organists). This is the attack. Then the note sounds true and steady while the air blows through the pipe. This is the sustain. At the end of the note, the air stops, the pipe stops vibrating, and the note quickly dies out. This is the release.

ADSR (Attack-Decay-Sustain-Release) has been used as a method to create electronic sounds for over twenty years. The **Envelope Generator** functions as a completely adjustable ADSR patch board. It has two parts, **Levels** and **Rates**. The following diagram should help explain the correlation between ADSR and its components:

AttackRate 1 — Level 1
Decay Rate 2 — Level 2
Sustain Rate 3 — Level 3
Release Rate 4 — Level 4

Sonix creates envelopes using the **Envelope Generator**. There are two adjustable components each for the attack, decay, sustain, and release of a sound. These components are the **Levels** and **Rates**. The **Levels** control the volume at which the attack, decay, sustain, and release sound; for example, **Level 1** controls how loud the attack is. The **Rates** control the time it takes to go from one level to the next; for example, **Rate 2** determines how soon the volume will change from **Level 1** to **Level 2**.

The envelope is important. It gives a distinct feeling of beginning and end to each note. The attack starts the moment a key is pressed or a note in a score starts, the release starts the moment the key is released or the note ends.

Attack

The **Rate 1** and **Level 1** sliders adjust the attack of a sound. **Level 1** determines how loud the attack is, and **Rate 1** determines how soon the attack is after the key is pressed. If the **Rate 1** slider is set at a low level, the attack will take a long time to sound, making it "fade" in. For example, a low rate can emulate a woodwind instrument by causing a slow attack.

Decay

After the initial attack of the note frequency, there is a fall-off where the note reaches its peak volume, and then subsides to a constant tone level. This "in-between" period of time from the peak of the attack to the sustained tone level is called the decay rate and is controlled by **Rate 2**. **Level 2** is the volume at which the decay sounds; adjusting it can cause stutter effects.

Sustain

After the note is plucked or hit, the initial volume decreases slightly and then levels off to a constant volume called the sustain. For example, on a guitar the sustain is how long the string will vibrate after the note is plucked before it stops vibrating. **Level 3** controls the sustain volume, and **Rate 3** controls the length of time to reach the sustain volume.

Release

The release factors, **Level 4** and Rate 4 control what happens when the key is released. Setting the **Level 4** slider at the bottom causes the note to end in silence after the key is released. **Rate 4** controls the time taken to reach **Level 4**. For example, if the **Rate 3** slider is set at the top, the sound will end as soon as the key is released; if the slider is set at the bottom, the sound will linger after the key is released. Increasing **Level 4** causes a constant sound because the note is never commanded to go to a zero volume level.

Applying the Envelope to Amplitude

Creating an envelope in the **Envelope Generator** has no effect on the sound of an instrument unless you apply it to the **Amplitude** or **Filter** controls. When you apply the envelope to the amplitude of an instrument, the loudness changes with the envelope. The shape of the envelope ranges from silence (the **Levels** are set at the bottom) to full volume (the **Levels** sliders are set at the top). You can hear the **Envelope Generator** effects when you select the **On** button in the **EG** column of the **Amplitude** controls.

Applying the Envelope to the Filter

When you apply the envelope to the filter, you control the filter's cutoff frequency. When envelope levels are high, the cutoff frequency is high so you hear a full timbre with more overtones. When envelope levels are low, the cutoff frequency is low, which filters out the overtones, so you hear a thin timbre with few overtones.

The envelope control, **EG**, in the **Filter** controls is a slider which changes the amount the envelope affects the filter. A high level gives a fuller sound and a low level gives a muffled sound.

Before you apply the envelope to the filter, you should set the cutoff frequency, **Freq**, to the halfway mark to give the filter envelope some room to operate in. When the envelope controls the ups and downs of the cutoff frequency, it operates around the cutoff frequency set by the **Freq** slider. If you set the **Freq** slider at the top, the cutoff frequency can't go any higher for the envelope's high levels. If the **Freq** slider is set at the bottom, the cutoff frequency can't go lower for the envelope's low levels.

Controlling the LFO

The low frequency oscillator (LFO) is an oscillator that is similar to Sonix's main oscillator. The main difference is that the **LFO** has a much lower frequency; the main oscillator cycles fast enough to create audible tones, while the **LFO** cycles too slowly to hear.

You must apply the **LFO** to the output of an audible oscillator to hear its effects. Once you do so, you can hear the **LFO** changing the sound of the main oscillator. The **LFO** is often slow enough so you can hear the shape of the waveform in each individual cycle.

To use the LFO in a Sonix instrument, you can:

- Set the **LFO**'s waveform on the **Waveform** display.
- Set the frequency of the **LFO** with the **LFO** slider in the **Freq** controls.
- Set the speed of the **LFO** with the **Speed** slider in the **Freq** controls.
- Decide whether or not to synchronize the **LFO** with the start of each note using the **Sync** and **Delay** sliders in the **LFO** controls.
- **Apply the LFO to the amplitude, or timbre of an instrument using the LFO sliders.**

If you don't apply the **LFO** to the amplitude, frequency, or filter of the instrument, you can't hear its effects. You can apply the **LFO** to these three qualities with the sliders labeled **LFO** in each control section. When the slider is set at the bottom, the **LFO** has no effect. As the slider is moved to the top, the **LFO** has more and more effect on the quality you apply it to.

Setting the LFO Waveform

You can set the waveform of the **LFO** on the **Waveform** display just like you set the waveform for the main oscillator. You can choose waveforms from the Waveforms menu, or you can draw your own waveform. Once you have a waveform, you can add harmonics using the **Wave** controls.

The controls that change the **LFO** waveform work in the same way as the controls that change the main oscillator waveform. The only difference is that you select the **LFO** button instead of the **Oscillator** button before you start working on the waveform. This sets the **Waveform** display to show the **LFO** waveform.

Applying the LFO to Amplitude

The **LFO** slider in the **Amplitude** controls determines the amount of tremolo in a sound. Tremolo is an effect characterized by the rapid repetition of a sound. The **LFO** induces tremolo when its amplitude (volume) is increased, causing the main oscillator to quickly cycle from quiet to loud. Whether the tremolo increases or decreases as the **LFO** slider goes up depends on what other controls are turned on.

Applying the LFO to Frequency

Vibrato is another type of change in the sound of an instrument. Vibrato is an Italian musical term that means vibration. It adds warmth to a steady-state sound by moving its pitch, volume, or timbre up and down regularly. A good example of vibrato is the warm vibration of a cellist holding a long tone.

The synthesizer adds vibrato to an instrument using the **LFO**. When you apply the **LFO** to the **Freq** controls, its slow modulation moves the pitch up and down to create vibrato. The frequency (pitch) deviates an equal amount above and below the note; although you hear a pitch change, the true pitch of the note is still at the center of the range. When you raise the **Freq LFO** level, you increase the amount of pitch deviation from the note. To experiment with vibrato, try different combinations of the **Speed**, **Delay**, and **Freq LFO** sliders.

Applying the LFO to the Filter

The **LFO** slider in the **Filter** controls simulates the "wah-wah" pedal used with electric guitars. You may have to also adjust the **Freq** and/or the **EG** sliders in order to get the "wah" sound. Also, the "wah" sound is less obvious with some waveforms.

Setting the Speed of the LFO

You can change the wave speed of the **LFO** by setting the **Speed** slider in the **LFO** controls. Sliding the **Speed** slider up speeds up the **LFO**, sliding it down slows down the **LFO**. The **Speed** slider adjusts the vibrato, tremolo and "wah" rates; the higher the **Speed** level, the faster those sounds cycle.

Synchronizing the LFO with Notes

When you apply an envelope to an instrument, the envelope starts and stops at the

beginning and end of each note the instrument plays. When you use an **LFO**, you have a choice when it starts during a note. With the **Sync** buttons located in the **LFO** controls, you can:

• Synchronize the **LFO** with each note so it starts at the beginning of the note and stops at the end.

• Synchronize the **LFO** so it affects the sound for the duration of one cycle (one wave) during a note; in other words, so that it sounds once.

• Adjust at what time during the note the **LFO** will oscillate.

Let the **LFO** run by itself so it runs constantly, and is not affected by the beginning and ending of the notes on the keyboard or in a score.

The Delay Slider

The **Delay** slider determines at what point in time the **LFO** is synchronized with a note. If the slider is set at the bottom, the **LFO** is activated as soon as a key is pressed. If you turn off **LFO** synchronization, the **Delay** slider has no effect.

The Sync On button

The **On** button turns on the synchronization so the **LFO** starts the beginning of its waveform at a chosen time during the note, and doesn't stop until you release the key.

The Sync Off button

The **Off** button turns off the synchronization so the **LFO** runs by itself.

The Sync Once button

The **Once** button, like **On**, starts the **LFO** at the beginning of the note. **Once** runs the **LFO** through just one cycle of the waveform and stops. The **Delay** slider determines at what point during the note the **LFO** runs its cycle.

You can use the **LFO** as a second envelope if you set the **LFO Sync** to **Once** and set a slow **LFO** speed. Draw a waveform in the **Waveform** display shaped like the graph of an

envelope. (Use the envelope graph earlier in the chapter as an example.) Use the bottom of the **Waveform** display for the bottom of the graph, and use the top of the **Waveform** display for the top of the graph.

Once you've drawn the envelope-shaped waveform, apply it to the **LFO** with the **OK** box. Then apply the **LFO** to the instrument. The **LFO** waveform becomes a second envelope. Unlike the envelope set by the **Envelope Generator**, this second envelope set by the **LFO** is tied only to part of the note's duration. It has no sustain—it runs through it waveform once and stops, no matter how long the note lasts. When you set the **Delay** slider at the bottom, the **LFO** immediately begins at the beginning of the note. As you move the slider up, **LFO** waits until after the note begins before it starts. The higher you move the slider, the longer the **LFO** delays.

You can use the **Delay** slider to keep the **LFO** from entering a note until after the attack of the **Envelope Generator** is finished. You can also use it to make vibrato more expressive; if you set the delay so the **LFO** starts vibrating after a wait, it increase the note's intensity at the point the **LFO** enters.

Adding Portamento to an Instrument

Envelopes and the **LFO** are not the only elements in a Sonix instrument's time profile. You can also add portamento. Portamento is a music term that describes a slide in pitch between two different pitches. A trombonist playing one pitch and then pulling in the trombone's slide as he plays to slide up to a new pitch is an example of portamento. You might also have heard this effect called glissando or gliss. Technically, the two are not the same. A glissando is a run of notes in a scale. Portamento is an unbroken slide through all pitches between the starting and ending pitches.

The **Port** slider in the **Freq** controls adjusts the amount of portamento. The higher you set the slider, the slower the slide between pitches. When the **Port** slider is set at the bottom, the portamento is turned off.

Portamento works best between notes of a single track. When you play the keyboard, you can play several notes at once—voices blur together, and it'a hard to keep them separate. As a result, you don't always hear a clean portamento when you play the keyboard. Portamento is best used in an instrument in a score, where the voices are written as separate tracks.

Portamento only works on notes without pause. Any time there is a rest between notes, you can't hear portamento. When notes follow one another without rests, you can hear portamento between the notes.

Saving and Loading Instruments

The items in the **Project** menu in the **Instruments** screen are for saving and opening instruments. They operate exactly the same as the **Project** items in the **Score** screen. The following is a brief description of each item. For details on using the **Storage** requestor, see **Chapter 9,** "Score Storage."

Load opens another instrument from the disk and erases the synthesizer settings for the current instrument. If you load a sampled-sound instrument you will get the sampled-sound **Instruments** screen; if you load a synthesized instrument you will get the analog **Instruments** screen.

Save saves an instrument under its current name, or if it's unnamed, lets you choose a name.

Save As saves a previously named instrument under a new name that you choose so you won't disturb the original instrument. You can also use this function to save the instrument to a data disk.

Revert loads the last saved version of the instrument you're working on and erases any changes you've made since you last saved the instrument.

New sets all the synthesizer controls to neutral settings if you are in the analog **Instruments** screen, and erases any instrument settings currently in the computer's memory. **New** has no effect in the sampled-sound or IFF Instruments screens.

CHAPTER 5 Entering Music on the Grand Staff

Once you've played the scores in the Sonix score library, you might want to enter some of your own scores. This chapter explains how to create scores on the **Score** screen. To use the **Score** screen effectively, you should know how to read and write music with traditional music notation. If you can't read music, you can still play with the **Score** screen to see how it works; you can learn some traditional music notation as you play.

The Elements of the Score Screen

The **Score** screen contains the following:

Title Bar

The Title Bar is at the top of the **Score** screen. It displays the title of the score that's on the screen. It reads **Unnamed** if you haven't named a score.

Back and Front Gadgets

The Back and Front Gadgets are on the right end of the Title Bar. You can use them to see the Workbench or other programs you may be running while you run Sonix.

Menu Bar

The Menu Bar is in the same location as the Title Bar. Holding down the menu button changes the Title Bar into the Menu Bar. The Menu Bar lists the menus available in the Score screen. You can use any of these menus to choose a menu item. When you release the Menu button, the Menu Bar becomes the Title Bar again.

Pitch Indicator

The pitch indicator is on the left of the **Score** screen, just below the Title Bar. As you enter notes, the pitch indicator shows their pitch and octave.

Grand Staff
The Grand Staff stretches across the screen below the pitch indicator. This is where you enter music into the score.

Signatures
The score signature is the entire left section of the staff. You can change the meter and key signature in **Signatures** under the **Options** menu. The score signature includes:

- The Treble Clef for the top staff.
- The Bass Clef for the bottom staff.
- The key signature, which is set to C major unless you change it. When it is set to keys other than C major, you'll see flats or sharps here.
- The time signature, which shows the meter of your score. The time signature is 4/4 unless you change it.

Bar Lines
The first bar line which is to the right of the score signature. Bar lines divide the score into numbered measures.

Measure Numbers
The measure numbers are at the top of each bar line. There are bar lines and measure numbers across the rest of the staff. As you scroll through a score, the bar lines and measure numbers scroll with the notes. The measure numbers help you keep your place.

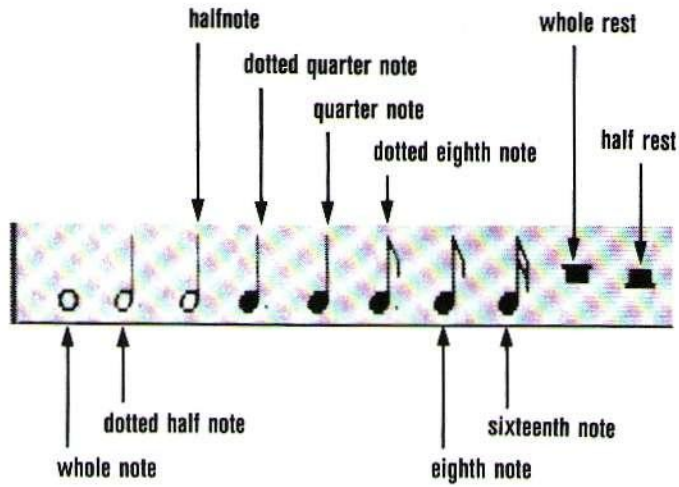
Scroll Bar
The Scroll Bar is below the staff, under the row of music symbols. This bar is a standard Amiga Horizontal Scroll Bar, and scrolls the score right and left.

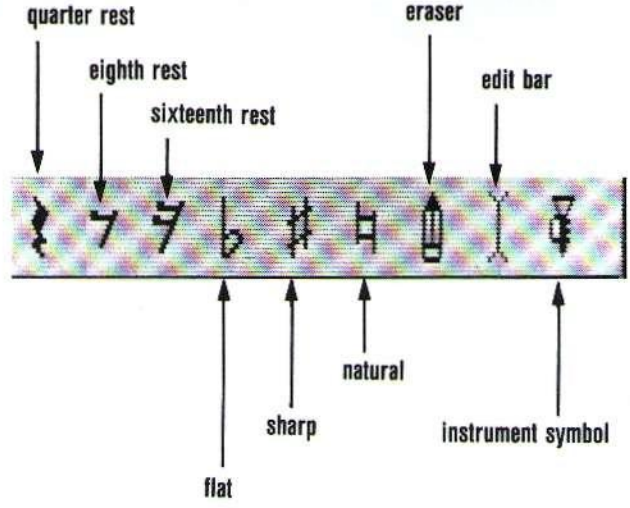
The Symbol Bar

The Symbol Bar is the row of music symbols located just under the Grand Staff and just above the Scroll Bar. You can select any symbol with the cursor and then place it on the staff.

The Symbol Bar has five types of symbols:

- The notes, located on the left half of the Symbol Bar. There are eight different notes. From left to right, they are: the whole note, the dotted half note, the half note, the dotted quarter note, the quarter note, the dotted eighth note, the eighth note, and the sixteenth note.





The Symbol Bar

You can select any of the music symbols and place them in the Grand Staff. The eraser lets you click on a note or rest on the staff to erase them. You can section off part of the score with the edit bar to make changes to it. Click twice with the Selection button on the instrument symbol to chose an instrument.

• The rests, which follow the notes. They are, from left to right: the whole rest, the half rest, the quarter rest, the eighth rest, and the sixteenth rest.

• The accidentals, which follow the notes. From left to right, they are the sharp, the flat, and the natural.

• The editing symbols: the eraser and editing indicator (breaks the score into segments to edit).

• The instrument symbol, at the right end of the Symbol Bar. It changes the instruments that play the score.

Selecting a Key and Meter

The first step in entering a score is to set the key and time signatures. The key and meter that appear automatically in Sonix are C major and 4/4 time. If you want to write music in another key or meter, just change the key and time signatures using the Signatures requestor:

To change the key and meter:

• Choose **Signatures** from the **Options** menu. The **Signatures** requestor opens over the staff.

• In the top row of numbers (beats per measure) following **Meter**, move the cursor to a number and click the Selection button. That number becomes highlighted.

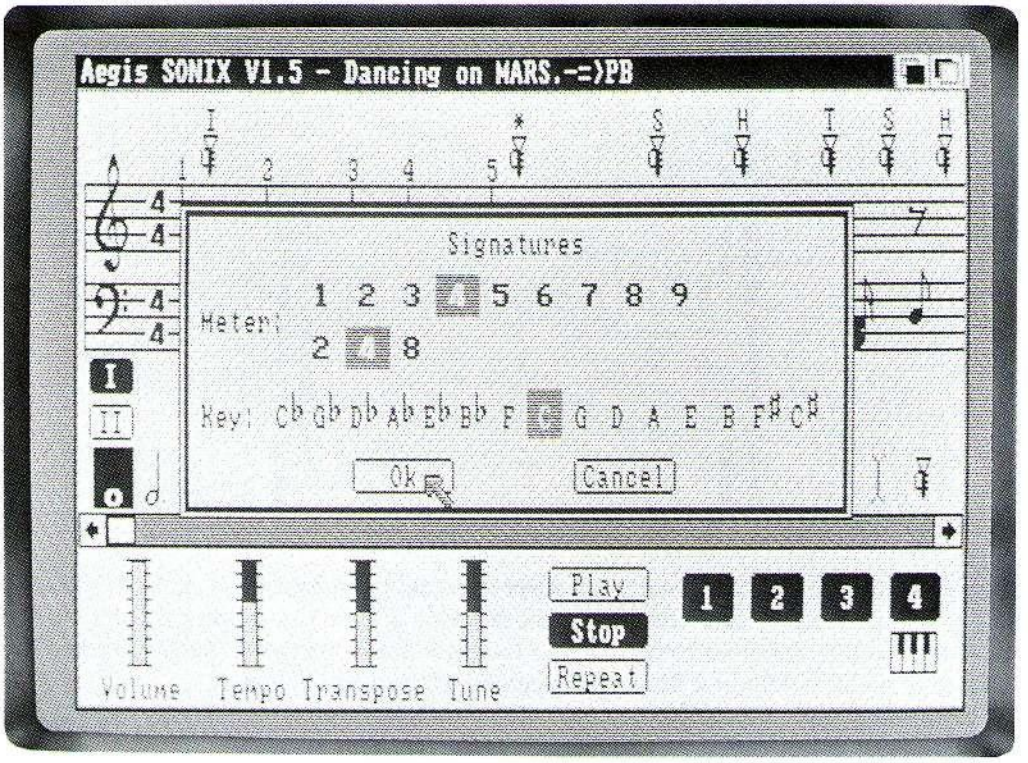
• Next, move the cursor to a number in the bottom row of numbers (beat value) and click the Selection button. That number becomes highlighted.

• In the row of keys following **Key**, move the cursor to a key and click the Selection button. That key becomes highlighted.

• Select **Ok**. The **Signatures** requestor closes and you see the staff again. The score signature now the meter and key that you selected.

The **Cancel** button in the requestor will close the requestor without applying the changes you just made to the score signature.

The **Key** letters list the 12 major keys. You can choose any of them to set the key signature. If you want to write music in a minor key, pick the major key signature that



The Signatures Requestor

Choose **Signatures** from the **Options** menu to open the requestor. Select the beats per measure from the top row of numbers and the beat value from the next row. Select a key and then **Ok** to close the requestor.

corresponds to that minor key. For example, the key of B major and the key of G minor both use a key signature of two flats. In music terms, G minor is the relative minor of B major, and B major is the relative major of G minor. The following table shows the 12 major keys, their relative minor keys, and their key signature. To compose in a minor key, find the minor key you want, then enter its relative major using the **Signatures** requestor.

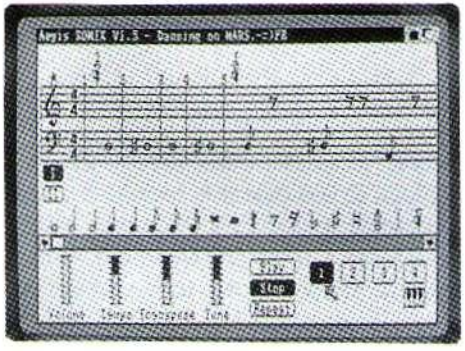
Major	**Relative Minor**
C	A
F	D
B♭	G
E♭	C
A♭	F
D♭	B♭
G♭	E♭
B	A♭
E	D♭
A	G♭
D	B
G	E
F♯	D♯
C♯	A♯

Selecting a Track

When you enter music on the staff, you enter it in voices. Although you might think of a voice as a human voice, in traditional music notation a voice is a single part or a musical line. For example, a four-voice chorale has four simultaneous parts. Each voice has its own line of music, which it follows independent of the other voices.

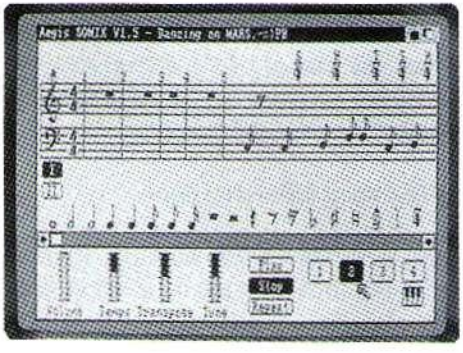
Sonix has eight voices called "tracks" (four of which can sound on the Amiga): Tracks 1 through 8. Tracks 5 through 8 are in mode II of the Score screen and will only sound on an external MIDI instrument. See **Chapter 11,** "MIDI Parameters," for more information on Tracks 5 through 8. Each track has an instrumental sound that you can change with the instrument symbol. A track can switch from instrument to instrument as it plays. For example, Track 1 might play for 8 measures as a saxophone , and then switch to a trumpet for 16 more measures. It might change to a violin for 5 measures and then change back to a saxophone.

Each track is monophonic, that is, it plays only one note at a time, and doesn't play chords. You must combine several different tracks to create chords. Monophonic tracks divide the score into separate parts for easy music entry and editing.



The Track Buttons

Only one track can be turned on when you want to enter or edit a score. To turn on a track, click on its track button until it turns black. A white button means it's turned off and a blue button sets the sound to half volume.



Delaying the Start of a Track

Enter rests for a track if you want it to hold off playing until after the other tracks have started.

To avoid confusion, you can only enter notes and rests one track at a time. When you enter one track, the other tracks must either be turned blue (more on this later) or turned off completely.

The Track Buttons

When you first enter a score, Sonix automatically selects Track **1** and turns off Tracks **2**, **3**, and **4**. Track button **1** is black to indicate it is turned on, and the other track buttons are white. After you finish entering music for a track, you can enter music for another track. While you enter music, it's helpful to set the other tracks to half so their notes appear in blue on the staff. You can use the blue notes to see where you are in relation to the other voices.

To turn on another track for entering a score:

• Move the cursor to any black Track button and click the Selection button twice. The track button turns blue and then white because you turned it off. Repeat until all buttons are turned off (white).

• Move the cursor to the desired track button and click the Selection button once. That track button turns black.

• Click on the track buttons until all are black to see how the track scores look together on the staff.

Note: If you do not want a track to sound until later in that score, you must enter rests for that track until the measure it begins. For example, let's say you composed a duet for flute (Track 1) and piano (Track 2), and you wanted the piano to play three measures before the flute began. You would have to enter rests for three measures of Track 1.

Each track button color represents a different state:

Black means the track button is on; its track is selected so you can enter music in that track. Music in the selected track shows on the staff in black symbols.

White means the track button is off; its track is not selected so you can't enter music in that track. Music in a turned-off track doesn't show on the staff.

Blue means the track button is set to half; its track is not selected so you can't enter music in that track. Any music already entered in a track set to half appears in blue on the staff. With the half setting, you can see that track's music on the staff while entering another track.

Stereo Output

You can take advantage of the Amiga's stereo capability by directing which instruments go out of which speakers. Tracks **1** and **4** play through the left speaker and Tracks **2** and **3** play through the right one.

Entering Notes and Rests

Sonix makes it just as easy to enter music on the Grand Staff as it is to write music on staff paper. You pick the symbol you want from the Symbol Bar and place it where you want it on the staff.

To enter notes:

- Move the cursor to a note on the Symbol Bar and click the Selection button.

- Move the cursor to the staff. The cursor changes to the note.

- Move the cursor up and down the staff area. As you move the note cursor up and down, its pitch and octave location show in the pitch indicator. Octaves are numbered from 1 at the bottom of Sonix's range to 7 at the top of its range. The pitch indicator is useful for finding pitches above or below the staff.

- Move the note to the pitch you want in the measure.

- Click the Selection button. This enters the note at the pitch you selected.

- Move the note cursor a little to the right and click again to enter another note. You can enter notes until you reach the screen edge, after which you will have to scroll to the next measures.

To enter rests:

- Move the cursor to a rest on the Symbol Bar and click.

- Move the cursor to the staff and click. The rest is entered on the staff.

- Continue entering any notes and rests you want until you reach the right edge of the staff, then scroll the staff to make more room.

Notice the way Sonix handles your notes as you enter them on the staff. When you enter a note or rest, Sonix automatically positions it in the measure. If the measure is full, the note appears in the next measure.

If you choose a note or rest value that is too long for the remaining time in a measure, Sonix automatically splits it, moves the overflow to the next measure, and ties the notes together across the bar line.

When you add an accidental to a note in Sonix, it applies only to that note. In traditional music notation, an accidental remains in effect until the end of the measure. To make sure the notes that follow remain at the original pitch, Sonix automatically adds an accidental if necessary.

You can enter notes and rests until you run out of computer memory, but Sonix will warn you with a requestor before this happens. You can always check on the amount of free memory you have by choosing the **About SONIX** requestor from the **Project** menu.

Entering Accidentals (Sharps, Flats, and Naturals)

Rarely does selecting an accidental cause Sonix to act in a "what you see is what you get" manner. For example, let's say you are in the key of C and you want to flat a B quarter note. So you select the flat symbol and click on the note with it. Instead of a flat appearing in front of the note, a sharp does. In addition, the note moves down a half step on the staff. Sonix is simply following music theory—a score in the key of C never has flat symbols on the staff just as a piece written in the key of F major would never have sharps.

The accidental functions do the following:

The **flat** symbol moves a note down a half step. If you are in a key with flats, it can add a natural or a flat symbol before a note.

The **sharp** symbol moves a note up a half step. If you are in a key with sharps, it can add a natural or a sharp symbol before a note.

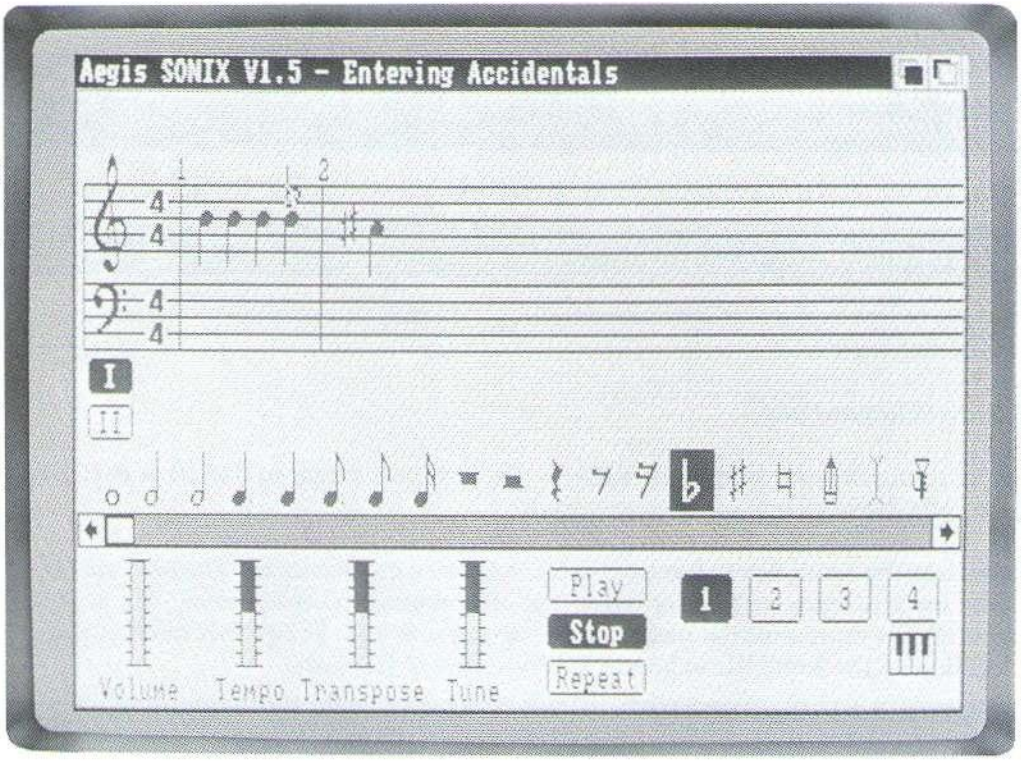
The **natural** symbol erases either a flat or a sharp symbol from in front of a note.

To use accidentals:

- Select the accidental from the Symbol Bar. The cursor turns into the accidental.
- Put it on the note. The note will either move a half step or acquire a symbol before it.

Scrolling the Score

When your score grows larger than a few measures, you can't see it all on screen. You



Entering Accidentals

Select the accidental from the Symbol Bar and click on the note with it. The note will either move a half step or acquire the approproate symbol.

must scroll through it to see all of it. You can use the Scroll Bar under the Symbol Bar to move your score by single measures, by full screens, or by large sections at a time.

To scroll a little at a time:

- Put the cursor over the Scroll Arrow on either the right or left arrow of the Scroll Bar.
- Click the Selection button once. One click scrolls past several notes or rests at a time.

To scroll continuously:

- Put the cursor on the left or right Scroll Arrow and hold the Selection button down.

To scroll one measure:

- Move the cursor to the blue area to the right of the Scroll Box (the white box in the middle of the Scroll Bar).
- Click the Selection button.

The score scrolls one measure to the right. If you move the cursor to the left of the Scroll Box, it scrolls the score one measure to the left.

You can drag the Scroll Box to jump from place to place in your score. The blue area of the Scroll Bar that stretches from arrow to arrow represents the entire score. The location of the Scroll Box represents the measures you see on the staff. Drag the Scroll Box to a new location on the Scroll Bar to go to a different part of the score.

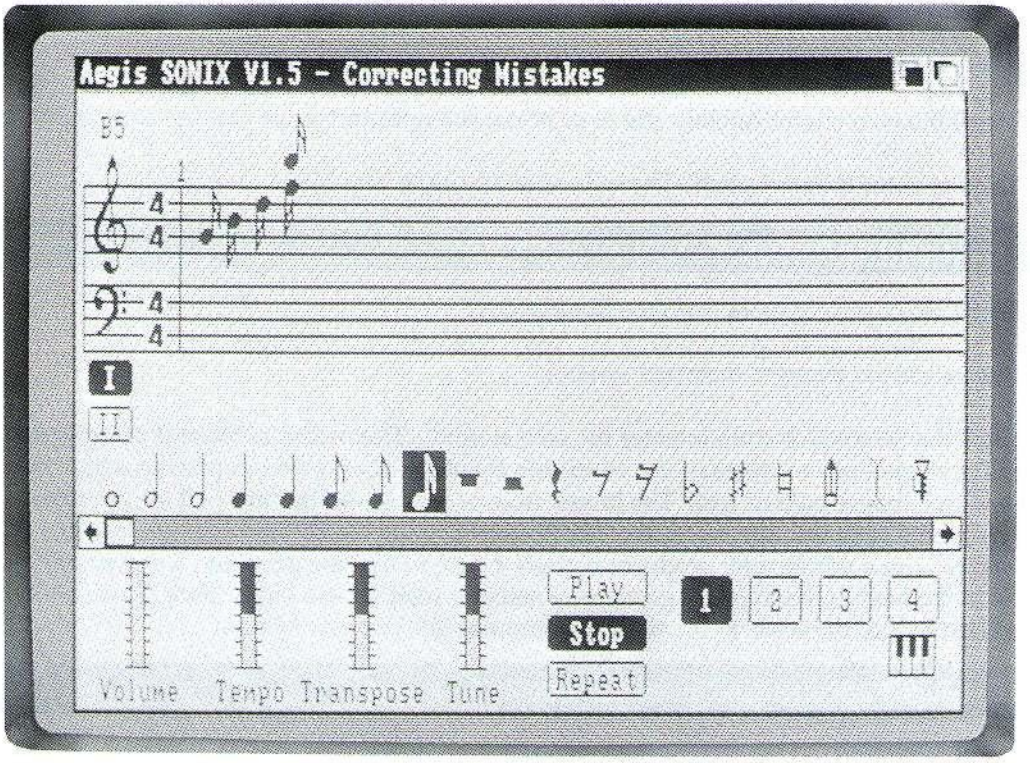
To scroll a large section at a time:

- Move the cursor to the Scroll Box and hold down the Selection button.
- Drag the Scroll Box to a different location and release the button. A different part of the score appears on the staff.

To scroll to a fresh screen when entering a score:

- Drag the Scroll Box all the way to the right. The last measure that you had entered notes or rests in remains at the far left of the screen so you can find your place.

As you scroll through your score, the measure numbers always tell you where you are.



Correcting Mistakes

To change the pitch of a note, select the same note from the Symbol Bar, place the cursor at the correct pitch directly above or below the note and click the Selection button. To change a note symbol, select the new symbol and click on the note with it.

Making Changes

You can easily correct mistakes you make while entering a score. For example, if you enter a note at the wrong pitch you can change the pitch.

To change the pitch of a note:

Note: You cannot correct a mistake if more than one voice is turned on.

- Move the note cursor directly above or below the note and place it at the correct pitch.
- Click to enter the new pitch. The note appears at the new pitch.

To change a symbol (notes, rests, or accidentals):

- Select the correct symbol from the Symbol Bar.
- Put the cursor over the incorrect symbol.
- Click the Selection button to enter the new symbol. The incorrect symbol disappears and the correct one replaces it. An exception would be if you were replacing a note or rest with a longer note or rest. The longer note or rest would be chopped into smaller components to fit into the measure. For example, replacing the last quarter note in a measure with a whole note produces a quarter note in that measure and a dotted half note in the next. Also, replacing a note or rest in a score with a larger note or rest shifts the right half of the score to the right to accommodate the new symbol.

To change both pitch and note in one step:

- Position the new note value at the new pitch and click.

If you forget to enter a symbol, you can insert one between symbols.

To insert a new symbol between two symbols:

- Select the symbol you want from the Symbol Bar.
- Move the cursor to the staff and put it where you want to insert the new symbol.
- Click the Selection button. The new symbol appears between the surrounding symbols; the symbols to the right move right to make room for the new symbol.

To erase a symbol:

- Select the eraser from the Symbol Bar.

- Put the eraser on the symbol you want to erase.

- Click the Selection button. The symbol under the eraser disappears, and the symbols to the right move left to fill the space.

To erase several symbols in a row, put the eraser on the first symbol and click as many times as necessary without moving the eraser. Each click erases a symbol.

To get rid of an accidental you must replace it with another accidental. For example, to get rid of a flat before a note, add a natural to the note and the flat disappears.

You can use editing commands to correct large portions of the score (see **Chapter 8**, "Editing a Score").

Assigning Instruments

Sonix has a library of different instruments on disk that you can use to give each track and your music a wide variety of tone colors and sounds. You can assign an instrument to a track with the instrument symbol.

To choose an instrument:

- Double-click on the instrument symbol in the Symbol Bar. The **Instrument** requestor appears.

- Click on either the up or down arrow in the requestor to scroll through the instruments.

- Either select an instrument and then select **Load** or double-click on an instrument. The cursor turns into the instrument symbol.

- Move the cursor to the staff.

- Use the mouthpiece at the bottom of the instrument symbol to point to the place in the score at which you want to change instruments.

- Click the Selection button. The instrument symbol is pasted at that point with the first letter of the instrument name as an identifier.

You can only insert instrument symbols for one track at a time. The symbol becomes part of the score for that track and appears throughout the score wherever you change instruments. An instrument assigned by a symbol remains in effect until the next symbol appears in the score.

If you want to get rid of an instrument change, use the eraser to erase the instrument symbol.

If you want to change an instrument in the score, put a new instrument symbol over the old instrument symbol or insert it later in the score.

Sonix automatically assigns an instrument to each track at the beginning of a score even though there is no instrument symbol. To override this, insert the instrument of your choice at the beginning of the score.

If you assign several instruments for several tracks at the same point in a score, the instrument symbol will have an asterisk above it instead of an instrument initial. To see which track gets which instrument just turn on one track at a time.

CHAPTER 6 Playing the Keyboard

When you play back a Sonix score, you're listening to music that was recorded earlier. If you want to play live music, you can perform on your Amiga keyboard like a piano keyboard.

Sonix's **Keyboard** screen helps you prepare your Amiga for performance. You can:

• Choose the instrument you want to play on the keyboard from Sonix's instrument library.

• Set up a pattern of pitches on the keyboard to play the notes and scales you need for your music.

In the **Score** screen, you can play the keyboard while a score accompanies you. This chapter tells you how to set up and play your Amiga keyboard. First, you must go to the **Keyboard** screen to set it up.

The Elements of the Keyboard Screen

The **Keyboard** screen contains the following:

The **Title Bar** which is at the top of the **Keyboard** screen. It displays the title of the instrument the Amiga keyboard plays.

The **Back** and **Front** gadgets which are on the right side of the Title Bar. You can use them to see the Workbench or other Tools you may be running while you run Sonix.

The **Menu Bar** is in the same location as the Title Bar. Holding down the Menu button turns the Title Bar into the Menu Bar. The Menu Bar lists the menus available in the Keyboard screen. When you release the Menu button, the Menu Bar becomes the Title Bar again.

The **keyboard layout** is below the title bar. It shows the keys of your Amiga keyboard and the pitch that each key plays. It also shows keys that are currently unassigned.

The **piano keyboard** is below the keyboard layout. You can use it to select pitches for the keyboard layout.

Playing the Solo Keyboard

You can play the Amiga keyboard as a solo instrument if you don't want a score to accompany you. You can do this in any Sonix screen; just press the keys. You can always hear the sound of the instrument that's opened in the **Keyboard** screen. Its name is in the **Keyboard** screen's Title Bar.

Some keys in the preset keyboard don't play notes. They are blank keys on the keyboard layout and have not been assigned pitch names; but you can change that. All notes you play use the same instrument. You can play up to four notes at the same time. If you press more than four keys, the extra keys don't sound until you release the first keys you pressed.

Opening an Instrument

You can open a different instrument just as you would open a new score in the Score screen.

To open a new instrument:

- Select **Instrument** from the **Keyboard** menu. The **Instrument** requestor appears.

- Click on either the up or down arrow in the requestor to scroll through the instruments.

- Select an instrument and then select Load, or double-click on an instrument. The instrument name appears in the Title bar.

Designing Your Own Keyboard

The keyboard layout determines the pitch that each key on the keyboard plays. This

arrangement of pitches on the keyboard layout is called the pitch pattern. You can change the pitch pattern on the keyboard layout by assigning a new pitch to any key, or turning that key off completely.

Each key that plays a note in the keyboard layout has a pitch name on it. The pitch name includes a letter followed by an optional flat or sharp symbol, which determines the specific pitch of the key. At the end of the pitch name, a numeral indicates the octave in which the pitch lies. For example, E4 is an E flat in the fourth octave. (Octaves divide a wide range of pitches into sections of twelve pitches each. They are numbered from one to seven; one is the lowest octave, seven is the highest octave.) Keys without pitch names don't play a note when you press them.

There are six keys marked in yellow in the keyboard layout which don't play notes: two Shift keys, two Alt keys, and two Amiga keys. You can use them for menu shortcuts, selection shortcuts, and other keyboard functions. The numeric keypad on the right of the keyboard doesn't play any notes either and doesn't appear on the keyboard layout.

If you want a different pitch pattern on the keyboard layout, you can easily select a new pitch for any white key.

To select a new pitch for a key:

- Select the key on the keyboard layout you want to change. The key turns black.

- Move the cursor to the piano keyboard.

- Hold down the Selection button. The pitch you point to on the piano keyboard appears in the key you selected on the keyboard layout.

- While pressing the Selection button move the cursor back and forth across the piano keyboard. The pitch name in the selected key changes with the position of the cursor.

- Release the button when you find the pitch you want. The pitch you just selected is now assigned to the selected key. The pitch name appears in that key.

- Now click on that key to turn it white again. You can change the selected key back to white by selecting a different key or selecting the same key a second time.

- Press the key you selected on the Amiga keyboard. You can hear the pitch you assigned to that key.

Removing the pitch assignment will make a key silent.

To erase a pitch assignment:

- Click on a key in the keyboard layout.

- Move the cursor to any part of the blue background of the **Keyboard** screen.

- Click the Selection button. The pitch name disappears from the key you selected.

- Set the key back to white by selecting it again. When you press the key on your Amiga keyboard, it no longer sounds.

Keyboard Suggestions

You can set the pitch pattern on the keyboard layout so it's easier for you to make music. Some simple suggestions:

- In a row of keys, you can arrange the pitches in the same order as the pitches of a major or minor scale. Then when you play, you don't play notes out of the scale.

- In columns of keys, you can arrange the pitches as chords, each column of keys being a chord. For example, keys Q, A, and Z are set to pitches C, E, and G (a C major chord). You can play the chords by strumming across the columns of keys.

- Across a row of keys, you can arrange the pitches of a favorite melody or riff. You can play the row from one end to the other to sound the melody. The function keys at the top of the keyboard are a very useful place to set a riff.

Playing the Keyboard Accompanied by a Score

When you play the keyboard in the Keyboard screen, you are always a solo performer. If you want one of the scores on the disk to accompany you, go to the Score screen. Once you're in the Score screen, you can play the keyboard with the same instrument as you did in the Keyboard screen, as long as you don't play back a score at the same time. The keyboard uses the instrument you opened and the pitch pattern you set in the Keyboard screen.

You can play only four notes at once on the keyboard, because Sonix uses four internal sound channels. These four sound channels are the same channels it uses to play the four tracks in a score. If you play back a score with all four voices turned on, you can't play the keyboard because all four sound channels are playing back the score. To play the keyboard while a score plays, you must:

• Turn off one or more voices so the keyboard can use their sound channels.

• Move the keyboard icon below a track button so the keyboard will use the same instrument that track uses.

To play along with a score:

• Choose **Score** from the Screens menu.

• Open a score you like. (Choose **Load** from the **Project** menu.)

• Click twice with the Selection button on a score.

• Turn off a **Track** button by clicking on it with the Selection button until it turns white. This opens a sound channel for the keyboard.

The keyboard will play the instrument of the track which has the keyboard symbol beneath it. For example, if Track 1 is assigned the saxophone in the score and the keyboard symbol is underneath it, the keyboard will play the saxophone.

To select an instrument for the keyboard while accompanying a score:

• Put the cursor under the desired track, and click the Selection button. The keyboard symbol, which looks like a short section of piano keys, moves under that track.

You can move the keyboard icon under any track button, whether on or off. The keyboard will play the instrument assigned to that track, even if the track isn't turned on.

You can only play one note at a time on the keyboard if only one track is turned off. If the track with the keyboard symbol changes instruments during the score, the keyboard also changes instruments at the same point because it follows the same instrumentation.

To play more than one note at a time on the keyboard while accompanying a score:

• Turn off another track button by clicking on it with the Selection button until it turns white.

You can turn off as many tracks in the playback controls as you want to give the keyboard more sound channels, but if you turn off all four, there aren't any left to play back the score.

Adjusting the Balance Between the Score and Keyboard

As you play the keyboard accompanied by a score, you might have trouble hearing the keyboard notes. To balance the sound between score and keyboard, you can use the **Mix Down** control panel:

To adjust the relative volumes of the score and keyboard:

- Click on the **Repeat** button so you can hear the adjustments as you make them.

- Choose **Mix Down** from the **Option** menu. The **Mix Down** requestor appears.

- Click in the desired track, and, while pressing the Selection button, drag the yellow column to the desired level. Play the keyboard so you can hear how it sounds compared to the other tracks.

- Click on the **Ok** button.

Saving the Keyboard Pitch Layout With a Score

As you play the keyboard with a score, the keyboard uses the pitches you assigned in the **Keyboard** screen. You can make the keyboard particularly effective if you design a keyboard pitch layout that uses the same key as the score and some melodies that fit it.

If you design a pitch layout you like, you can save it with a score using the Save or Save **As** commands in the **Project** menu. Whenever you open a score, the pitch layout you saved with it is opened too. **Chapter 9**, "Score Storage," gives complete information about saving and opening scores and keyboard pitch layouts.

CHAPTER 7 Playing Back Scores

The Playback Control Panel

The Playback control panel is located under the Scroll Bar. Its controls start, stop, and modify playback of the score in the staff. There are four kinds of playback controls:

The sliders, located on the left half of the Playback control panel, change the way the score plays back. The four sliders are **Volume, Tempo, Transpose,** and **Tune**. You can slide each one up and down with the cursor to change its setting.

The three Playback buttons located in the center of the Playback control panel start and stop the score playback. They are the **Play** button, the **Stop** button, and the **Repeat** button. You can select each one with the Selection button.

The track buttons are the four numbered buttons at the bottom right of the Playback control panel. Each one, numbered **1** through **4**, turns a track (instrument) on or off. If you are in Mode II, you will see Track Buttons **5** through **8** (see **Chapter 11**, "MIDI Parameters"). You can select a track with the Selection button.

The keyboard icon is the button located just below one of the track buttons. It selects a track to be played using your Amiga keyboard. You can position this icon to sit below any of the four track buttons. (For more on accompanying a score with the keyboard, see **Chapter 6**, "Playing the Keyboard.")

For centuries, musicians have recorded their musical thoughts on paper using staffs, notes, and rests. These written records, called scores, preserve the composer's music and allow other musicians to recreate it. Sonix also uses scores to store music. You can create your own scores, or play back scores from Sonix's score library which is a collection of songs and compositions on the Sonix disk.

Playing back a score is one of the easiest things to do with Sonix. The Playback controls start and stop a score in almost the same way you start and stop a song on a cassette deck. You can also use the Playback controls to change the way the score sounds as it plays:

The sliders change the speed, volume, key, and tuning while the score plays.

The track buttons turn tracks on and off so you can choose which tracks sound as you play back a score.

You will need a score to use with the Playback controls. Open one from the disk.

To open a score:

- Choose **Load** from the **Project** menu.

- When the **Load** Requestor opens, move the cursor to a title that interests you and double-click to open it.

Selecting the Playback Buttons

The Playback buttons are like the on and off buttons of a cassette recorder; they turn the music on and off.

To select a Playback Button:

- Put the cursor over the button.

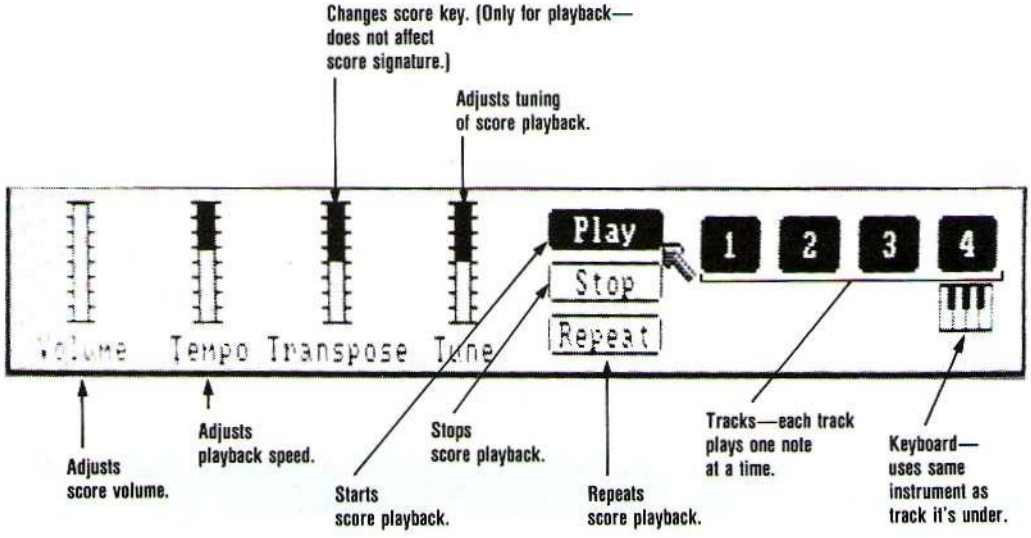
- Click the Selection button.

The Play Button

The **Play** button starts playback. Select it, and your score plays from beginning to end and then stops.

The Stop Button

The **Stop** button bails you out. If you select **Stop** while the score is playing, the score will stop. This is handy if your friends complain about your taste in music. If you select **Play** again, the score will start over from the beginning.



The Playback Control Panel

These controls start, stop and modify playback of the current score in the Grand Staff.

The Repeat Button

The **Repeat** button lets you hear your score over and over. Select it, and your score plays from beginning to end and repeats until you select the **Stop** button.

Setting the Track Buttons

Sonix scores separate music into tracks (lines of music, each playing one note at a time). You can use the track buttons to select the tracks you want to hear as you play back a score.

Each track button has three settings:

On (black)

Off (white)

Half (blue)

When a track button is on, its track sounds at full volume when you select the **Play** or **Repeat** buttons. If the track button is off, its track doesn't play. If the track button is set to half, it sounds at half its usual volume.

To adjust a track button:

- Put the cursor over the track button.
- Click until the track button changes to the desired color.

If you turn on a track button but can't hear it, the track has no notes in that part of the score. Some scores have less than four tracks. If you play back a score that contains only Tracks **1**, **2**, and **3**, Track **4** won't play back no matter how you set it.

The track buttons are handy when you edit a score—you can isolate one or two tracks. Listening to a single track helps you find mistakes. Listening to two tracks at a time, such as a bass line and an upper track catches mistakes in harmony. If you set one track to on and set the other tracks to half, you can concentrate on the loud track while listening to the harmonies of the other tracks.

The Mix Down Controls

The **Mix Down** controls, found under the **Option** menu, control the relative volumes of the tracks when they play back. Sliders **1** through **4** refer to track buttons **1** through 4. For example, you can make Track **1** play louder than the other tracks. Sliders **5** through **8** refer to the external tracks you hear when you connect a MIDI instrument to the Amiga (see **Chapter 11**, "MIDI Parameters").

It is helpful to select **Play** before you choose the **Mix Down** controls so that you can hear the changes in the instruments' volumes as you adjust the sliders.

To use the Mix Down controls

- Choose **Mix Down** from the **Options** menu. The **Mix Down** requestor appears.

You can adjust as many tracks as you want—up is louder, down is softer.

- Select **Ok**. The **Mix Down** requestor disappears.

The Playback Sliders

The four sliders, located to the left of the Playback buttons, look a little like thermometers. Sliders control the way your score plays back. They can:

- Raise and lower the volume.
- Change the tempo.
- Play the score back in different keys.
- Change the intonation.

The Volume Slider

Raising and lowering the **Volume** slider raises and lowers the volume of playback. Remember Sonix's **Volume** slider works within the limit set by the volume control on your monitor. If the monitor (or amplifier) volume is set very low, then the **Volume** slider can't set the volume any louder. Be sure to set the monitor volume level high enough to give the **Volume** slider a wide range of volume.

The Tempo Slider

Tempo (Italian for time) describes the playback speed of music. Sonix's **Tempo** slider controls the playback speed of your score. When you set it low, the tempo is very slow. Dragging the **Tempo** slider up increases the tempo.

The Transpose Slider

The **Transpose** slider (for transposition) adjusts the range of a score. If you're singing along with a Sonix score and the high notes are just too high, you can set the **Transpose** slider to play the score back in a lower range. Likewise, if you're playing along on contrabass bagpipes and can't make it down to the low F# in the score, you can use the **Transpose** slider to play the score a little higher.

When you transpose a score in playback, every note plays up or down by the same number of half steps. For example, a French horn player might have a melody in the key of C major. If she has to transpose the melody down by three half steps (a major third), she plays every note of the melody three half steps below what she reads on the sheet music before her. The melody comes out in the key of A major, which is three half steps below C major.

- If you drag the **Transpose** slider up, the music goes a half step up in pitch.

- If you drag the **Transpose** slider down, the music goes down in pitch by two half steps (one whole step).

- If you drag the **Transpose** slider, the music returns to its original pitch.

You can move the slider up or down four notches, which could be a range of a major third or a minor sixth in either direction, depending on the instrument used.

The **Transpose** slider doesn't change the notation of the score; it just changes the way it plays back. If you want to change the notes in your score to a different key, you can use the four transposing Edit commands described in **Chapter 8**, "Editing a Score."

The Tune Slider

The **Tune** slider, which sets intonation, tunes Sonix's playback by moving the pitch up or down in very small increments. You can use the **Tune** slider to tune Sonix to an accompanying instrument. Move the slider up to tune sharper, and move it done to tune flatter.

When you set the **Tune** slider to the middle, Sonix is set to a pitch centered around an A 440 (the international standard for intonation). You can move the pitch up and down by a quarter step each way, with 16 increments in each direction.

If you need to tune up higher than a quarter step, move the **Transpose** slider up a half step and use the **Tune** slider to tune down to the pitch you want. Likewise, if you need to tune down lower than a quarter step, move the **Transpose** slider down by a half step and use the **Tune** slider to tune up to the pitch you want.

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CHAPTER 8 Editing A Score

The time will come when you make a major mistake as you enter music on the staff. For example, a tune repeats too many times or a part is too low. Don't start all over. You can save a lot of time and trouble by using the editing commands in the **Edit** menu to change your score.

Editing commands work on large or small sections of music. Once you select a section of music, you can:

- Raise or lower its pitch.
- Duplicate it.
- Move it to another part of the score.
- Play back or repeat that section, without playing back the rest of the score.

Selecting the Edit Block

The first step in editing a score is to select a section of music. You can select the entire score, just one note, or any length in between. Once you select this section of music, it's called the edit block. Any editing commands you choose change the music in the edit block; the rest of the score remains the same. In the **Score** screen, the edit symbol is in the Symbol Bar. It's the second symbol from the right, and looks like an I-beam.

To select an edit block:

- Click with the Selection button on the edit symbol in the Symbol Bar.
- Move the edit cursor to where you want the beginning of the edit block to be.

• Click the Selection button. The cursor puts a tall vertical bar on the score. This bar is the edit bar, and marks one end of the edit block.

• Move the edit cursor to where you want the end of the edit block to be.

• Click the Selection button. The block of music is highlighted. You've just selected an edit block. The edit block includes all the music between the two edit bars.

Deactivating the Edit Block

When you're ready to deactivate the edit block, just select another symbol from the Symbol Bar. That score section will revert to a normal appearance.

Selecting a Long Edit Block

To select a section of music that is longer than what you see on the screen, you can scroll the score as you set the edit block.

To select a long edit block:

• Click on the edit symbol in the Symbol Bar.

• Move the edit cursor to where you want the beginning of edit block to be and click. An edit bar appears.

• Use any of the Scroll Bar tools to scroll to where you want the end of the edit block to be.

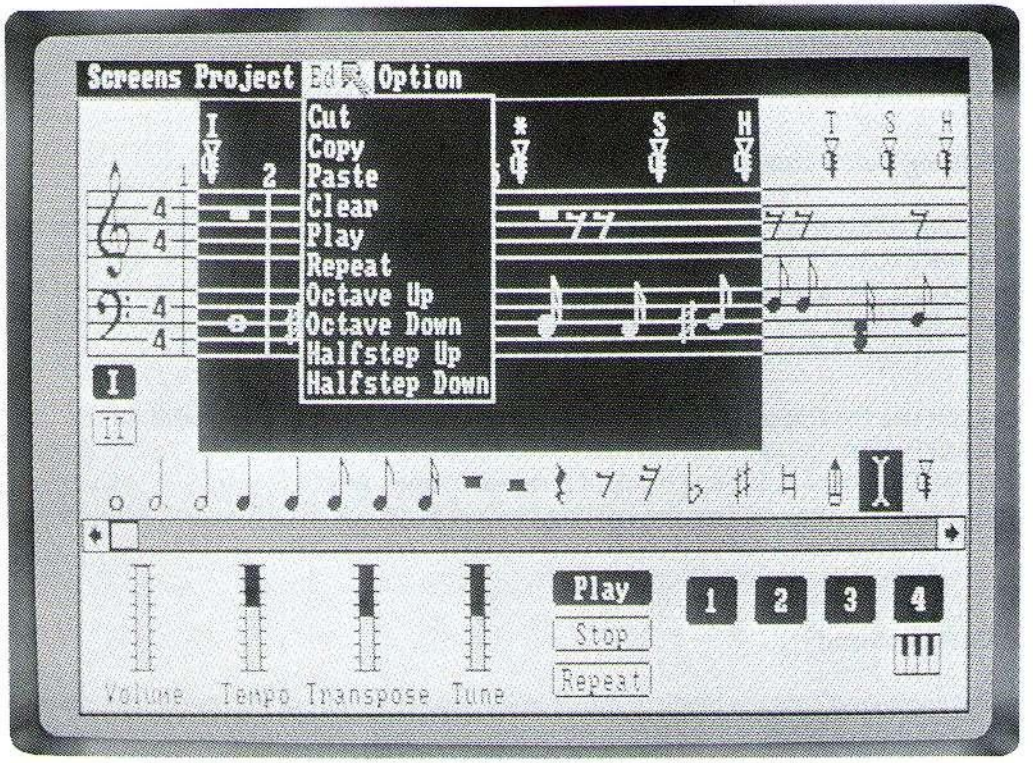
• Put the edit cursor where you want the end of the edit block to be and click. The section of the edit block on screen is highlighted.

Let's say that you included a few too many measures when you selected your long edit block. You can do the following steps to make the edit block shorter.

To change the size of an edit block:

• Place the edit cursor where you want the new end of the edit block to be.

• While holding down the SHIFT key, click the Selection button. The right end of the edit block appears where you put your cursor.



Selecting an Edit Block

You need to define a section of music before you can use the commands in the **Edit** menu. To select an edit block, select the edit bar from the Symbol Bar, place the cursor bar at the beginning of the section and click the Selection button. Next, move the cursor to the end of the section and click again. The sectionbecomes highlighted in reverse.

Selecting Tracks for Editing

When you select an edit block, you define a section of music that you want to edit. Within that edit block, you may want to edit all four tracks, one single track, or a combination of tracks. You can use the track buttons to select the tracks you want to edit. Any track button you turn on is edited. Any track button you turn off (white) or set to half (blue) isn't edited.

The Editing Commands

The editing commands do the work in the editing block. They're listed in the **Edit** menu in the **Score** screen's **Menu** Bar. You can choose any of the commands with the mouse Menu button, just as you choose any other menu item. Once you choose one, it goes to work on the tracks you selected in the edit block. The editing commands only affect the score if you define an edit block and turn on one or more tracks.

When you use the **Cut** or **Copy** commands on a section of music, it is placed on the Clipboard (which you can't see) so that you can **Paste** it onto a different place in the score. The Clipboard holds one block of music at a time. Anytime you use the **Cut** or **Copy** commands, they replace the existing block of music on the Clipboard with a new one.

The Cut Command

The **Cut** command cuts the block of music in the edit block out of the score. The music to the right of the cut block moves left to fill in the cut music. Any music you cut out of the score with the **Cut** command is put on the Clipboard, where it is kept separate from the score.

To cut a section of music:

- Select an edit block.

- Choose **Cut** from the **Edit** menu. The score highlighted in the edit block disappears from the screen; however, it is now on the Clipboard.

The Copy Command

The **Copy** command copies the block of music in the edit block onto the Clipboard

without erasing the music in the edit block. Later you can use the **Paste** command to insert the copied music block elsewhere in the score.

To copy a section of music:

- Select the edit block.

- Choose **Copy** from the **Edit** menu. The black edit block remains and the score remains untouched. A copy of the edit block is now on the Clipboard.

The Paste Command

The **Paste** command copies the entire block of music from the Clipboard into the score. Put a single edit bar where you want to put the block, and **Paste** will insert the music to the right of it. All music to the right of the insert point moves right to make room for the pasted music. If you have an edit block in the score, **Paste** replaces the music in the edit block.

The contents of the Clipboard remain when you paste music from it. When you paste several times in a row, you create several duplicate sections of music.

To paste a section of music into a score:

- Cut or copy the music to be pasted to the Clipboard.

- Select the edit cursor.

- Place the edit cursor where you want the section to be pasted.

- Click the Selection button. An edit bar appears.

(An alternative to the previous two steps is to select an edit block.)

- Choose **Paste** from the **Project** menu. The contents of the Clipboard are inserted to the right of the edit bar, pushing the existing score to the right. If you selected an edit block, the contents of that block are replaced with the Clipboard contents.

The Clear Command

The **Clear** command cuts music just like the **Cut** command, except it doesn't store the cut edit block onthe Clipboard. Once you **Clear** a block of music, it's gone forever.

To clear a section of music:

- Select an edit block.

- Choose **Clear** from the **Edit** menu. The score blacked out in the edit block disappears from the screen.

The Play Command

As you enter or edit music, you may want to hear a particular section of the score to check on your progress. If you don't want to play a whole score to hear a passage in the middle, select an edit block first and then either choose the **Play** command from the **Edit** menu or select the **Play** button. Then Sonix plays the score defined by the edit block; the tracks turned on sound at full volume, the tracks set to half sound at half volume, and the tracks turned off don't sound at all.

To play a score segment:

- Select an edit block.

- Choose **Play** from the **Edit** menu, or select the **Play** button.

- To stop the music, select the **Stop** button.

The Repeat Command

If you choose **Repeat** from the **Edit** menu, it plays the music in the edit block just as the Play command does. The difference is that **Repeat** repeats the music in the edit block over and over again.

To repeat a score segment:

- Select an edit block.

- Choose **Repeat** from the **Edit** menu, or select the **Repeat** button.

- To stop the music, select the **Stop** button.

The Transpose Commands

The four editing commands that follow are transposing commands. They transpose the music in a block; that is, they move all the notes the same distance up or down in pitch. With the transpose commands, you can:

- Change the range of music by moving the pitch of the block up or down by octaves.

- Change the key of music by moving the pitch of the block up or down by half steps.

When you use the transpose commands, Sonix occasionally adds accidentals to the music in the edit block to show that all pitches are transposed by the same amount. For example, let's say your score is in the key of E and you move a D a half step up (up to a D). The note does not move up the staff, instead Sonix puts a sharp symbol in front of it. The key signature doesn't change at all when you use the transpose commands. (If you want to transpose the entire score to a different key with a corresponding new key signature display, see "Changing the Key Signature" later in this chapter.)

The Octave Up Command

The **Octave Up** command moves all the notes in an edit block up one octave at a time. The Amiga will sound the pitches in the range of C2 to C7. Octaves which don't sound on the Amiga can sound on an attached sound system.

To move an edit block up an octave:

- Select an edit block.

- Choose **Octave Up** from the **Edit** menu. The notes in the edit block are shifted up one octave. All accidentals remain.

- Repeat the last step until the notes are in the desired octave.

The Octave Down Command

The **Octave Down** command moves all the notes in an edit block down one octave at a time. The Amiga will sound the pitches in the range of C2 to C7. Octaves which don't sound on the Amiga can sound on an attached sound system.

To move an edit block down an octave:

- Select an edit block.

- Choose **Octave Down** from the **Edit** menu. The notes in the edit block are shifted down one octave. All accidentals remain.

- Repeat the last step until the notes are in the desired octave.

The Half Step Up Command

The **Half Step Up** command moves all the notes in an edit block up by one half step (up to the next highest pitch).

To move an edit block a half step up:

- Select an edit block.

- Choose the **Half Step Up** command from the **Edit** menu. All the notes in the edit block are raised a half step with accidentals added where necessary.

The Half Step Down Command

The **Half Step Down** command moves all the notes in an edit block down by one half step (down to the next lowest pitch).

To move an edit block a half step down:

- Select an edit block.

- Choose the **Half Step Down** command from the **Edit** menu. All the notes in the edit block are lowered a half step with accidentals added where necessary.

Changing the Score Signature

Editing commands aren't the only way you can change the music in a score. You can also change the score signature. When you do so, you change the way the score looks on the screen, but you don't change the way the score sounds when you play it back. To change the way a score sounds you would have to use the transpose commands.

Changing the Key Signature

Once you have notes in your score, changing the key signature won't change the key of the notes on screen, but it will change the way the notes look on the **Score** screen; Sonix adds accidentals before some notes to keep them at their original pitch.

If you want to transpose the entire score to a new key, you can use the transpose commands in the **Edit** menu to move all the notes in the score to the new key, then change the key signature to match the new key.

To transpose a score to a new key

- Select the entire score as an edit block.
- Turn on all the tracks.
- Choose **Half Step Up** or **Half Step Down** from the **Edit** menu until the score has moved into the desired key.
- Choose **Signatures** from the **Option** menu.
- Select the key that matches the key that the score was transposed to.
- Select **Ok**. The score signature changes to match the new key.

Changing the Time Signature

When you change the time signature, you change only the lengths of the measures and the size of the beats, not the lengths of the notes and the rests. On the staff, the notes and rests remain the same unless one is broken up by a relocated bar line, in which case it's split in two and tied over the bar line.

To change the time signature:

- Choose Signatures from the **Option** menu.
- Select the new meter.
- Select **Ok**. The score on the Staff is rebarred, changing the number of measures.

If you play back the score, you won't hear any difference in the way it sounds. You can change the meter of the score to any value you can set in the **Signatures** Requestor.

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CHAPTER 9 Score Storage

When you work on a Sonix score, it resides in the Amiga's memory. If you turn off the computer or the power fails, the score is erased. If you store a score on disk, the contents of the disk remain intact when you turn off the computer. By using the **Load** command, you can copy a score saved on disk back to memory whenever you want to play it back or edit it.

The commands in the Score screen's **Project** menu help you manage your scores. They can:

- Copy scores from memory to a disk.
- Copy scores from disk to memory.
- Erase a score from memory.
- Delete a score from disk.

This chapter explains how to use the **Score** screen's **Project** commands.

The Storage Requestor

When you choose the **Load**, **Save**, **Save As...**, or **Delete** commands, the Storage requestor appears. The Storage requestor looks the same for every command except its title and buttons match the command chosen. You can use the Storage requestor to view directories and files on the disk; however, you can only see score files when you choose a command from the **Project** menu. When you save, load, or delete a file, the Storage requestor allows you to enter new names and specify to which drives, directories or disks to apply them. You will see the following in every Storage requestor:

The Left Arrow

To see the directories on the current disk:

- Select the left arrow. The window displays the directories.

If you click more than once, you will get backslashes to remind you that you're in the root directory.

To erase the back slashes:

- Click in the edit box with the Selection button. The cursor appears.
- Backspace until the slashes are gone.
- Type anything and select the left arrow. The directories reappear.

The Directory Edit Box

To type a new directory:

- Click in the edit box. A cursor appears.
- Type a directory name and press Return. Its files appear in the list below.

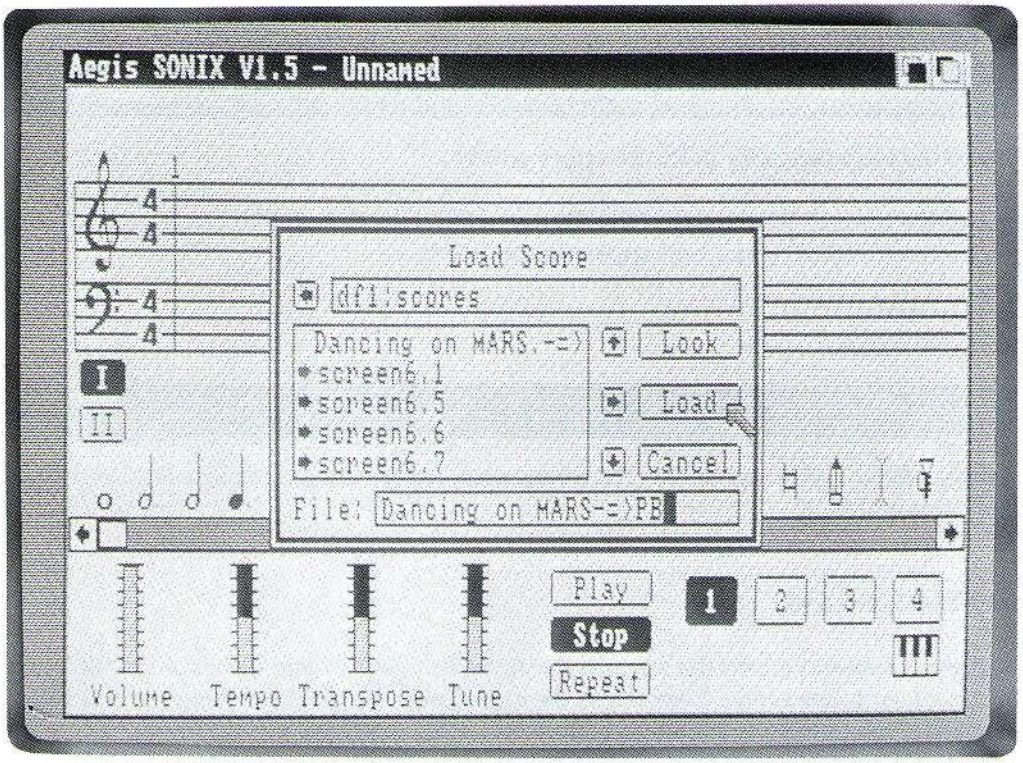
If a drive is not listed in the edit box, it is understood that the directories shown are in the current drive. If you want to access a different drive, click in the box and type its name; for example, type **DH0:** if you want to access your hard disk.

The Right Arrow

To enter a directory in the directory edit box:

- Click on a directory name. That name becomes highlighted.
- Select the right arrow. That directory appears in the top edit box and its files appear in the list below.

You can double-click on the directory name instead of using the right arrow.



The Storage Requestor

Select the left arrow to see the directories. Click on the directory and select the right arrow to see its files. You can also type a path directly in the top edit box. To access a file, click on a filename and select the the middle button (**Load, Save** or **Delete**). You can also type a filename directly in the file edit box.

The Up and Down Arrows

The Up and Down arrows scroll through the directories or files.

The File Edit Box

To choose a file:

- Enter the file's directory in the directory edit box.

Click in the file edit box and type the file name and hit Return. You can double-click on the file name instead and it will appear in the edit box.

The Look Button

To swap disks:

- Change disks and select **Look**. The Storage requestor changes to show the new disk's directories and files.

The New Command

The **New** command erases the score in the Amiga's memory and leaves a clear screen so you can enter a new score. New resets the signatures, the playback controls, and the keyboard pitch pattern to the settings they had when you first opened Sonix.

To clear the screen in order to enter a new score:

- Choose **New** from the **Project** menu. If there is a score on screen, it is erased from memory. The Title Bar now reads **Unnamed** and there are no notes or rests on the staff.

The Load Command

The **Load** command copies a score from disk into the Amiga's memory. It erases any score that may already be in memory (there can be only one score in memory at any time.)

To load a score from disk:

• Choose **Load** from the **Project** menu. The **Load** requestor appears on the screen. The scores that are available on the disk are listed in the window. The Scores directory appears in the directory edit box.

• Select the score you want or type its name in the file edit box.

• Select the **Load** button. That score appears on the staff.

The Save Command

The **Save** command copies the score in memory to a disk. If the score is unnamed, you must enter the name in the Storage requestor. Sonix saves the score only after you type in a name. If there is a score with the same name already on the disk, **Save** replaces that score with the current version of the score.

To save an on-screen score to disk:

• Choose **Save** from the **Project** menu. If the score is not new, Sonix saves the score to disk, replacing the old version.

• If the score is new, type the name of the score when the requestor appears and select **Save**.

When you save a score, Sonix also saves the current playback control settings and the keyboard pitch pattern set in the **Keyboard** screen. When you use **Load**, these settings automatically open with the score.

It's a good idea to save your score periodically as you work on it. Once every 15 minutes is a good rule of thumb. That way, if the power fails, you can open the last version of the score you saved, and you'll have lost no more than 15 minutes worth of work.

The Save As... Command

The **Save As...** command saves the score in the Amiga's memory to the disk using a different score name. When you choose **Save As...**, a requestor appears for you to enter a new name. After you enter a new name, **Save As...** saves the score to disk under that name. If there is already a score on the disk with the name you entered , another requestor appears to ask you if you want to replace that score with the new score. If you decide to go ahead, Sonix replaces the old score on disk with the new score.

To use the Save As... command:

• Choose **Save As...** from the **Project** menu. The Storage requestor appears.

• Type the score title in the file edit box. If there is a name already present in the requestor just start typing and it will disappear.

• Select the **Save** button.

The Storage requestor also gives you a chance to save the score to a disk in the external drive (select **DF1:** and then **Save**). Sonix saves your score to disk under the new name.

Save As... is useful for saving a new version of a song already on disk without disturbing the original version. For example, let's say there was a song called "Elizabeth's Song" on disk, and you wanted another version of the song with different instruments. You could load "Elizabeth's Song" onto the screen, change the instruments, and then **Save As...** "Elizabeth's Song 2." As a result, you would have two songs on disk: the original "Elizabeth's song" and the new "Elizabeth's Song 2."

Like **Save**, **Save As...** also saves the playback control panel settings and the keyboard pitch pattern with the score.

The Revert Command

The **Revert** command reverts the score in memory to the last version you saved. When you choose **Revert**, Sonix erases the score in memory and opens the last version you saved of the score. If the score wasn't saved previously, **Revert** has no effect.

Use **Revert** as a type of Undo command. Save your scores regularly. If you change the score in ways that you don't like, use **Revert**. It undoes everything you did since the last time you saved the score.

To revert a score to the last saved version:

• Choose **Revert** from the **Project** menu. Sonix opens the last saved version of your score, and the changes you made to the score disappear.

The Delete Command

The **Delete** command erases a score from the disk. Once you delete a score, it is gone forever.

To delete a score from disk:

• Choose **Delete** from the **Project** menu. The Storage requestor appears, listing the scores on the disk.

• Select the score you want to delete, or type the name in the file edit field.

• Select **Delete**. The requestor disappears and the score is erased from the disk.

The Print Command

Sonix can print your scores vertically on any printer that is included in the Amiga Preferences menu. Three Grand Staffs will fit per page, and if it looks like there's going to be a break in a measure, Sonix will move the measure down to the next staff. There's also a title bar at the top of each page with the name of the score and the page number.

To print a score:

• If you have not already done so, choose the appropriate printer from the Preferences program on the Workbench disk. You'll have to exit Sonix to do this at this point.

• Load the score you want to print.

• Choose **Print** from the **Project** menu. A requestor appears which says **Printing Score....**

• The requestor includes a **Page Breaks** option with two radio buttons. Select the **On** button if you want the printer to pause after each page so you can load separate sheets of paper.

• Select **Cancel** to stop printing at any time.

Using a Data Disk

If you find that you are starting to run out of room on the Sonix disk, you can save scores to a data disk. Your data disk must be initialized (see Introduction to the Amiga for instructions). You can use the data disk with one drive although two drives are more convenient.

When you move a score over to another disk, you also need to move the instruments that appear in the score (see "Saving and LoadingInstruments"on page 60). If you try to load

a score from a data disk that is missing an instrument, a requestor appears telling you which instrument is missing.

To see which instruments are in a score:

• Load the score onto the screen.

Bring up the Instrument requestor by double-clicking on the Instrument icon. The Storage requestor appears. All instruments above the black line are used in the score.

To save a score to a data disk:

Note: Do not eject a disk if its drive light is on.

• Choose **Save As...** from the **Project** menu. The Storage requestor appears.

• If you have two disk drives, enter **DF1:** in the directory edit field and put the data disk in the external drive.

• If you have one disk drive, swap disks and click on **Look.**

• Type the score name in the edit field or select it in the list.

• Select **Save.** The requestor disappears and the score is saved to the data disk.

To load a score from a data disk:

• Choose **Load** from the **Project** menu. The Storage requestor appears.

• If you have two disk drives, enter **DF1:** in the directory edit field and put the data disk in the external drive.

• If you have one disk drive, swap disks and select **Look.**

• Select **Load.** The score appears on the screen.

If the data disk is missing an instrument it will say "Can't find this instrument: Name." Select **Ignore** if you want to find out what other instruments are missing. Select **Rename** if you want to assign an instrument on disk to the missing instrument's part.

CHAPTER 10 Working With Sampled Sounds

Understanding Sampled Sounds

In the last chapter you learned about synthesized sounds — sounds the synthesizer creates by shaping timbre, amplitude, volume, and duration. Your computer directly generates synthesized sounds using mathematical formulas. Sampled sounds are created differently; they are digitally recorded from a live source and stored in the computer's memory. The computer reproduces them when you need them. Since they are recordings of live sounds, sampled sounds can sound richer, with more complex timbres and envelopes than synthesized sounds.

Sampled sounds are created with a standard microphone, an analog-to-digital converter (ADC for short), and a computer. The ADC converts sounds captured by the microphone into a series of numbers. A typical sound sampling system does this by reading the sound level 50,000 times a second. Each reading is called a sample.

The computer stores the record of samples in its memory as a waveform table. A waveform table contains all the necessary information to reproduce the original sound. To do this, the computer feeds the waveform table to a digital-to-analog converter (DAC for short). The DAC, which performs the opposite function of the ADC, converts the waveform table into a sound signal that is amplified and fed to a speaker, from which you hear the sampled sound.

The most common example of sampled-sound reproduction is a compact disk player When a record company produces a compact disk, it records a musical performance as a series of numbers (one long sampled sound) on a compact disk. When you play a compact disk, the player (actually a small computer) reads the numbers on the disk and converts them back to the sound of the original performance.

Sampled sounds have more flexibility than normally recorded sounds. Since they are stored as a series of numbers in memory, the computer can modify the numbers to change the sampled sound as it plays back. For example, if you record the sound of a drop of water as a sampled sound, you can play it back at different pitches and lengths. You can then use the sound of the water drop as an instrument in a composition.

Adding Vibrato

The **Vibrato** sliders in the **Characteristics** controls add vibrato to a sampled-sound instrument.

The Depth Slider

The **Depth** slider turns the vibrato on and off and determines the intensity of the vibrato. The higher the level, the greater pitch deviation you can hear in the vibrato.

The Speed Slider

The **Speed** slider controls the speed of the vibrato. The higher the level, the faster you can hear the vibrato cycle.

The Delay Slider

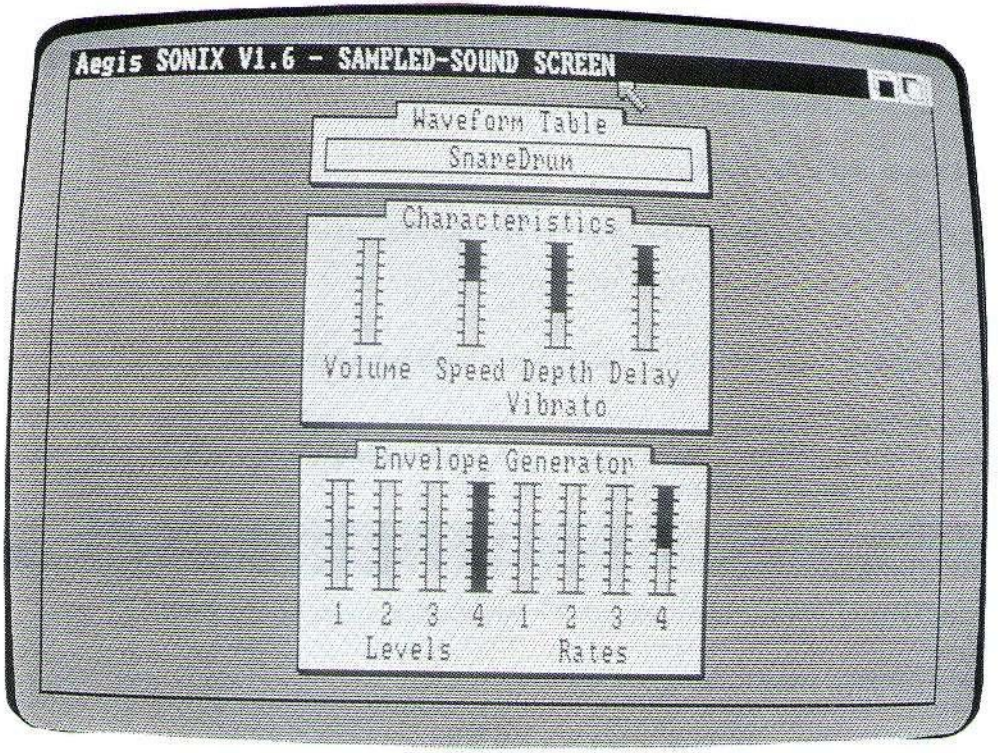
The **Delay** slider determines at what point during the note the vibrato sounds. If you set the slider at the bottom, the vibrato sounds as soon as the note starts. The higher the level, the later the vibrato sounds.

Setting the Relative Volume

Like the **Volume** slider in the analog **Instruments** screen, the **Vol** slider in the sampled-sound **Instruments** screen adjusts the volume of the instrument relative to other instruments. Use it to balance the sound of the instrument you're working on with the sound of other instruments.

Saving and Loading Sampled Sound Instruments

The commands in the **Instruments** menu are the same commands you used to save and



The Sampled Sound Screen

This screen appears whenever you **Load** a sampled sound instrument. The **Depth, Speed** and **Delay** sliders add vibrato to the instrument. The **Volume** slider sets the volume. The **Envelope Generator** works the same way as the one on the analog synthesizer screen.

load synthesized instruments. These commands perform the same tasks for sampled-sound instruments. However, if you want move a sampled sound to a directory other than the default Instruments directory, you must also move its waveform file. This is because sampled sounds have two files: the waveform data and the patch data (the controls you see on the screen and save in the **Instruments** menu).

To save the waveform:

- Choose **Save As...** from the **Waveform** menu.
- Enter a name and select **Save**.

Now that the waveform file also has a name, you can move both files to another directory.

Transforming IFF Instruments into Sonix Sampled-Sound Instruments

When you load an IFF instrument you get a screen with a waveform that you can't edit. If you save the instrument, Sonix will transform it into a sampled-sound instrument and give it a sampled-sound screen which you can edit.

To transform an IFF instrument:

- Load an IFF instrument. The instrument's waveform appears on the screen.
- Choose **Save As...** from the **Project** menu.
- Type a name for the instrument in the file edit field and press **Return**.
- Load the new instrument. The sampled-sound screen will appear for that instrument.

Transforming IFF Instruments into Sonix Sampled-Sound Instruments

When you load an IFF instrument you get a screen with a waveform that you can't edit.

The Elements of the Sampled-Sound Instruments Screen

The instrument you last opened determines which screen appears when you choose Instruments from the **Screens** menu. To see the sampled-sound **Instruments** screen, you will need to load a sampled-sound instrument.

To load the sampled-sound Instruments screen:

- Choose **Instruments** from the **Screens** menu.
- Choose **Load** from the **Project** menu. The Storage requestor appears.
- Click on **Saxophone**. That instrument name is highlighted.
- Click on **Load**. The sampled-sound Instruments screen appears.

The sampled-sound screen has many different parts:

The **Title Bar, Back** and **Front** gadgets, and **Menu Bar** are the same as those you used in the analog Instruments screen. Menu items that don't apply to sampled sounds (such as the **Waveform** menu) aren't available when the sampled-sound Instruments screen appears.

The **Characteristics** controls have three sliders that add vibrato to the instrument and a **Volume** slider that sets the relative volume of the instrument.

The **Envelope Generator** shapes the envelope of the instrument.

Modifying a Sampled Sound Instrument

All the controls are sliders and work just as the sliders in other screens work. The **Volume** slider and the **Envelope Generator** are the same controls you'll find in the analog Instruments screen. They work the same here as they did in the analog **Instruments** screen. When you modify an instrument, you can hear the modifications by playing the keyboard as you did with the analog **Instruments** screen.

Modifying the Envelope

Each sampled-sound instrument has its own envelope which is the natural envelope of the original sound that was sampled. You can modify this natural envelope with the **Envelope Generator** which works the same as the one in the **Instruments** screen. It has the same sliders, controls the same levels and rates, and uses the same attack, decay, sustain, and release points. The same rules that apply to the **Envelope Generator** in the analog **Instruments** screen apply to the **Envelope Generator** in the sampled sound **Instruments** screen. You can learn about the **Envelope Generator** in the sections beginning with "The Envelope" on page 52.

CHAPTER 11 MIDI Parameters

It is possible to connect a variety of musical instruments to one another and have them "talk" to each other and send instructions back and forth. This phenomena is called MIDI. It stands for Musical Instrument Digital Interface.

MIDI allows you to connect keyboards and guitar synthesizers to drum machines and have them be synchronized together so that as you play the keyboard, it controls the other instruments as well.

MIDI also allows you to play simultaneous keyboards with one keyboard. For example, you can play one keyboard that has an Electric Piano sound, and by "MIDI-ing" it to another keyboard (i.e. connecting them together with a MIDI cable) you can play the other keyboard's sound in addition to the electric piano sound. This means you can play one keyboard and have it "play" two or more sounds, like a combination of electric piano and strings.

MIDI was invented by a large group of scientists, instrument manufacturers, and musicians. It was developed in the late 1970's out of a growing need to have a standard by which instruments could interface together. They developed what is called the "MIDI code." This code transmits digitally stored information (data) through the MIDI cable at a speed of 31,250 bytes per second. This is generally referred to as "31.2 Kilobaud" (baud stands for "bits-audio"). The data is sent via a 5-pin serial port on the back of the MIDI instrument.

Computers are capable of controlling the digital information that is produced by synthesizers, hence the introduction of MIDI software into the musical arena. MIDI software generally allows you to do two things:

• "Sequence" notes and store the information on a diskette.

• Control MIDI instruments by automatically selecting patches (sounds) in a pre-programmed order.

Sonix and the Amiga allow you to do both. The Amiga has a built-in RS-232 serial port capable of handling data up to 31.2 Kilobaud. To use MIDI instruments with the Amiga, you need to either purchase or make what is called a "MIDI Interface." The MIDI interface is connected to the serial port of the Amiga and the standard 5-pin DIN MIDI cables are connected to the MIDI interface. There are numerous MIDI interfaces available for the Amiga in the $50-$80 price range. You can make your own MIDI interface if you are more technically inclined and possess a soldering gun. You can order the schematic diagram for the Amiga MIDI interface from Commodore.

Sonix and MIDI

Musicians use MIDI to do the things that were previously possible only at large recording studios. With Sonix and MIDI, you can:

• Sequence notes in up to 8 independent MIDI tracks.
• Compose scores on the Amiga and have them played by MIDI instruments such as synthesizers & drum machines.
• Create an Instrument on a MIDI keyboard and use it in a score.
• Switch between different MIDI patches within a score.
• Use up to 16 MIDI Channels (different MIDI instruments) at once.
• For each MIDI instrument, use up to 32 separate patches.
• Play a MIDI instrument from the Amiga keyboard.
• Change the velocity sensitivity of the MIDI keyboard with the mouse.
• Change which octave the MIDI keyboard plays with the mouse.
• Adjust the Volume and Pitch bend information with the mouse.

MIDI Patch Mode

Sonix accesses MIDI instruments in the same way that it accesses instruments on disk. To access the MIDI module of Sonix, you must load instruments 1, 2, or MIDIPatch, which causes the MIDI Patch screen to appear. If you play the Amiga keyboard, you will hear the current patch setting of the MIDI instrument.

MIDI Patch mode has eight attributes:

- Channel
- Patch
- Octave
- Factor
- Offset
- Volume
- Bender
- Wheel

Channel and Patch

To quote Mark Riley, Sonix' author, "A channel can be thought of as a P.O. Box, with patches being the letters." There are 16 Boxes, and each box can hold 32 letters.

A Channel is analogous to a TV channel and Patch is analogous to the different TV Shows. Channel is the pathway to the instrument and Patch is the instrument setting.

Channel allows you to choose up to 16 different MIDI instruments. Patch allows you to change from 1 to 32 sounds. For example, you can set the channel on a keyboard to 1 and the channel on a drum machine to 2 and Sonix will send information to the correct machine. This means you can play a Yamaha DX-7 keyboard from the Amiga keyboard if both the DX-7 and the current channel are set to the number 1.

You can also enter notes on the staff and have them played by the DX-7 if you select a MIDI Patch instrument that is set to the same channel as the DX-7. A MIDI instrument can only play one patch at a time but it can play more than one track in a score. For example, you can't play a flute patch and a saxophone patch at the same time on the DX-7, but you can have several flutes sounding at once on the DX-7; or you can have the flute patch play a few measures then switch to the saxophone patch. On the other hand, you can have a flute track and a saxophone track playing at the same time on the Amiga.

To play a Sonix score with a MIDI instrument:

- First, assign patches on the instrument to corresponding channels. If you can't assign channels on the instrument, keep in mind that patches on the first instrument hooked up to the Amiga are transmitted to the Amiga on Channel 1 unless otherwise specified.

- Load the **MIDI Patch** mode into Sonix.

- Select the channel desired by clicking inside the numeric box next to **Channel.**

- Click inside the **Patch** box until you get the desired patch number.

• Select **Save As...** from the **Project** menu. The Storage requestor appears.

• Assign a name to the MIDI Patch. We suggest naming any MIDI Patch instrument as a Number to avoid confusing it with a non-MIDI instrument, and to easily find it while scrolling through the list of instruments.

To use MIDI instruments in a score, select them just like you would a non-MIDI instrument while creating the score. For example, if you select the instrument 2 and save it into the score, every time that instrument is used in the score it will be played by an external MIDI instrument to Channel 2 (or any channel you choose) if everything is hooked up correctly.

This means you can use up to 16 different MIDI keyboards and drum machines and hear your compositions entered on the staff being played by all of the MIDI instruments instead of the Amiga, or right along with the Amiga if you wish.

Each track (voice) of Sonix supports up to 16 MIDI channels, and each MIDI channel is capable of supporting up to 32 different patches, so you have a total of 8 x 16 x 32 or 4,096 MIDI possibilities. This can be easily increased by using memory cartridges for your MIDI keyboards.

There is also a Patch setting represented by the minus (-) sign. This allows you to change any of the **Bender, Wheel, Octave** or **Velocity** settings without changing the patch.

Octave

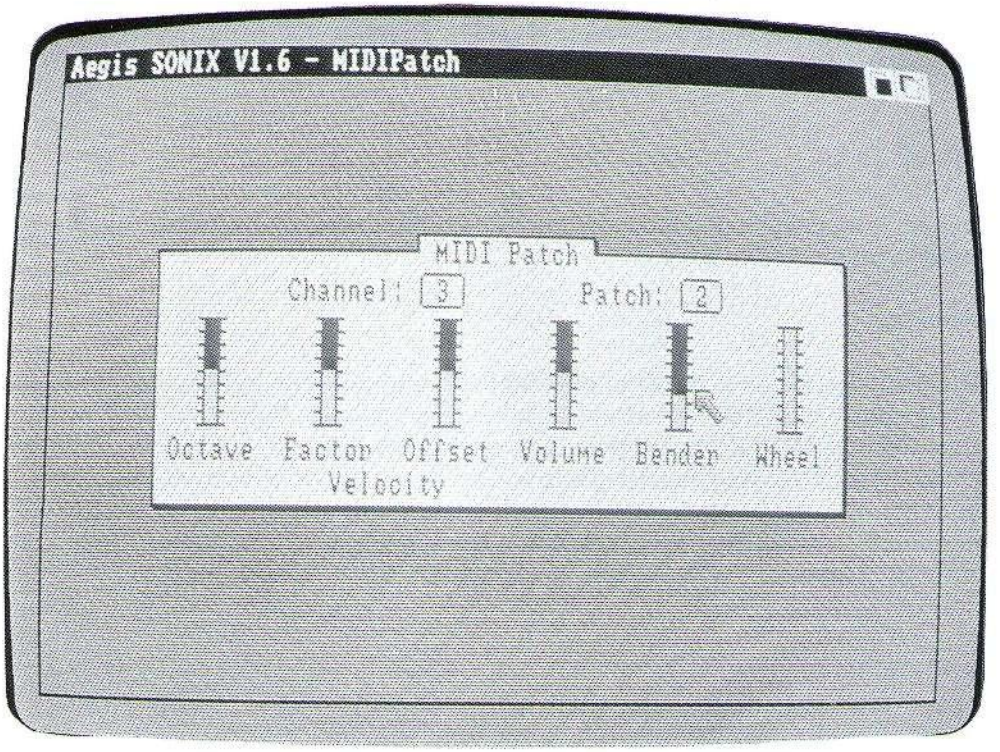
The **Octave** slider allows you to change the octave of the MIDI sound up or down by dragging the slider. For example, if you are playing a passage, you can make it 1 or 2 octaves higher by sliding it up, and lower it by sliding it down.

Factor and Offset

These control the velocity sensitivity of the MIDI keyboard. This will not work on MIDI keyboards made before 1984, such as the Yamaha DX-9. **Offset** adjusts the actual value to set the keyboard velocity, and **Factor** is a micro-adjustment of the **Offset**.

Volume

Volume sets the Master Volume of the MIDI keyboard (post 1984). It allows you to adjust how loud or soft the MIDI instrument is with the mouse.



The MIDI Patch Screen

This screen appears when you **Load** the **MIDIPatch** instrumnet. The **Patch** is the instrument setting on the MIDI keyboard and the **Channel** is the path to the MIDI instrument. To use a MIDI patch in a score, select the **Channel** and **Patch** you want and choose **Save As.** You can use the sliders to change ths ounds and the velocity sensitivity of ther MIDI instrument.

Bender

This is identical to the Pitch Bender found on MIDI keyboards. It allows you to change the pitch of the note up or down with the mouse.

Wheel

The **Wheel** is identical to the Modulator wheel found on the DX-7. It allows you to add "Vibrato" to any note or chord.

Sequencing

MIDI Sequencing is one of the most popular aspects of all MIDI software. It allows you to enter any information into the computer (notes, chords, drum rhythms etc.) and play them back on the MIDI keyboard over and over again to create a repetitive pattern or "sequence." Sonix allows you to sequence up to 8 separate MIDI tracks simultaneously. To sequence with Sonix, first enter the notes onto the staff using a MIDI patch as an instrument, then select the **Repeat** command from the **Staff** screen. This will play the sequence of notes on the external MIDI instrument over and over again.

Modes I and II

The first four tracks (Mode I- Tracks 1, 2, 3 & 4) of Staff mode are directly accessible by either the Amiga or MIDI instruments. The second four tracks (Mode II- Tracks 5, 6, 7 & 8) are only accessible from MIDI instruments. If you enter music into Mode I, it can be played by either the Amiga or an external MIDI instrument. If you enter music into Mode II, it can only be played by an external MIDI instrument.

Sonix allows you to enter music into both modes (I and II), and in all eight tracks (Tracks 1, 2, 3, 4, 5, 6, 7 and 8) so that you can sequence them with external MIDI instruments. To load a score into Mode II, you must first change all the instruments in the score to MIDI patches. Then you can load a score into Modes I and II, select **Play** and all eight tracks will sound.

Contrary to popular belief, MIDI sequencing does not allow you to play the keyboard and have it play back to you. This is called "MIDI Recording," which Sonix does not currently support.

APPENDIX A Advanced Techniques

Creating a Rhythm Track

Many of you would like to use Sonix to help you in writing or improvising. For improvisers, Sonix can take the place of a metronome by creating a rhythm section for you. Instead of the click, click of the metronome you can create a rock feel, latin feel or anything that you like. Some organs have built-in rhythm boxes to accompany you. Sonix can do that, but much better since the drum sounds are digitally sampled.

Entering the Rhythm Track

To begin creating a rhythm track, first make sure you are in the **Score** screen.

To enter the rhythm track:

- Select the 8th-note icon and place it anywhere in the lower part of the bass clef. This is going to function as a bass drum.

- After the first 8th note is positioned, select the 8th-note rest icon and place it directly after the first 8th note.

- Select the 8th-note icon again and position another 8th note in the upper part of the bass clef.

- Select the 8th-note rest again and place it after the second 8th note.

- Select the 8th-note icon again and this time place two 8th notes in the same register as the first 8th note of the bar.

• Place another 8th note in the same register as the second 8th note of the bar directly after the two 8th notes.

• Select the 8th note rest icon and place it directly after the last 8th note.

Selecting Rhythm Instruments

Now it's time to select drum sounds:

To enter instruments for the rhythm track:

• Load the **BassDrum.**

• Insert the **BassDrum** in front of the first 8th note. The instrument icon will appear with the letter **B** above it. If you select **Play**, the entire bar will be played by the **BassDrum.**

Let's make this drum track sound real. Now that you have the bass drum installed for the first note, the second note should be a snare drum.

• Load the **SnareDrum.**

• Insert the **SnareDrum** in front of the second 8th note (not the rest).

The instrument icon will appear above the staff again, but this time will have the letter S above it. This means the snare drum has been installed for the second note.

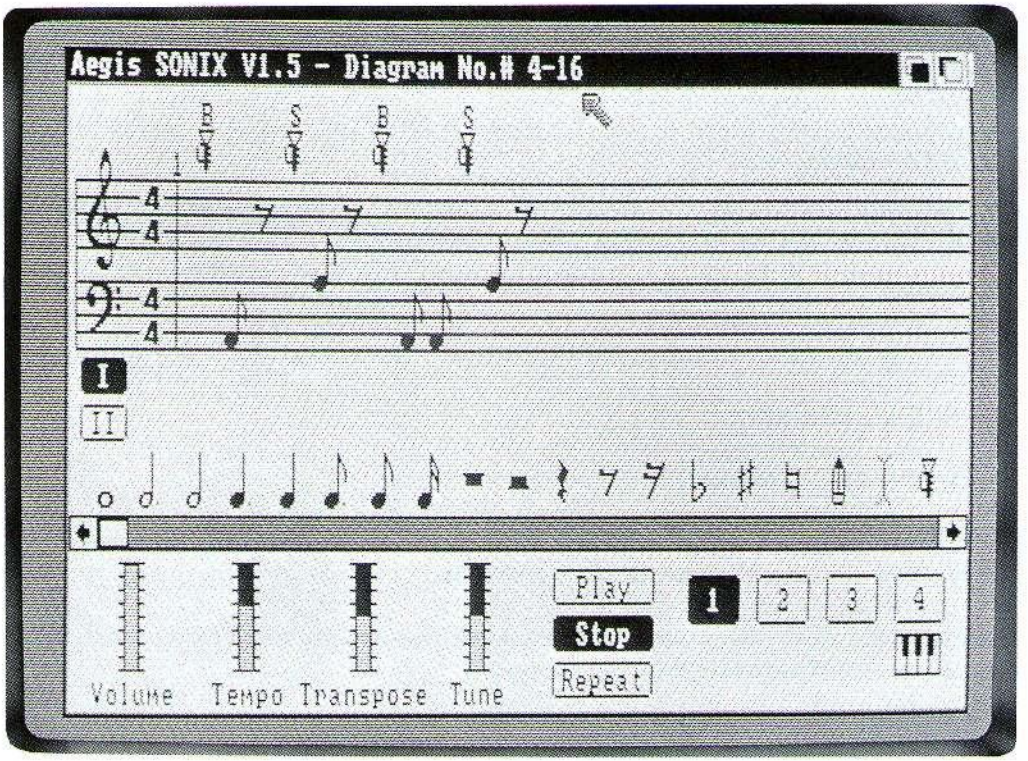
• Load the **BassDrum** instrument again and install it for the third and fourth 8th notes.

• Load the **SnareDrum** again and install it for the last 8th note.

After you have created the first bar, you'll want to add more bars so you can make a song. You don't have to do this all over again. There is a much easier way, copying measures and parts between tracks.

Copying Measures

The easy way to create a rhythm track is to use the editing features built into Sonix. This allows you to create a rhythm track very quickly so you can add other instruments and melodies right away. Just **Copy** and **Paste** the rhythm bar over and over again. The rhythm track can be as long as you have memory for—keep in mind that the measure



Creating A Rhythm Track

Sonix can take the place of a metronome by playing rhythm tracks for you. Place the notesand rests as shown and then alternate the **Bass Drum** with the **Snare Drum**.. You can copy the measure over and over so you'll only have to ernter the basic pattern once.

numbers go up to 999 and then start over again. After you create a large rhythm track with a basic beat, you can go in and add other little nuances later.

Copying Parts Between Tracks

Sonix allows you to take one part of any composition entered in Mode I of the Score screen and copy it to any of the four tracks (voices) contained within Mode I. If the part is created within MIDI mode (Mode II), Sonix allows you to copy it to any of the four tracks contained within Mode II, and also allows you to copy the part to any of the tracks contained within Mode I.

To copy a passage to another track:

- The passage you want to copy must have its corresponding track button turned on (colored black) and all other track buttons must be either set to half (blue) or turned off (white). After you have done that, put the passage in an edit block.

- Choose **Copy** from **Edit**.

- Select either Mode I or Mode II.

The track receiving the passage must be turned on (black track button), and all others must be either turned off (white) or set to half (blue).

- Paste the Clipboard contents onto the new track. If the track was already filled, it's contents are moved to the right to make room.

Modulating Parts

Many times you may want a certain section of a composition to be played a fifth higher or a third higher to create an effect. This can be done without re-entering the notes onto the staff.

To modulate a part:

- **Copy** and **Paste** the part into the desired location in the score.

- Put the part in an edit block.

To modulate the part up a fifth, select the **Half Step Up** command from the **Edit** menu 7 times. This will move the music up 7 halfsteps, which equals a fifth. You can also move the part up in halfsteps by holding down the right Amiga key and the left Shift key and pressing the Plus (+) key 7 times. To modulate down, hold down the right Amiga key and press the minus (-) key.

To modulate up or down any interval, count in halfsteps how far you want to modulate the part and select **Half Step Up** or **Half Step Down** that number of times; or press the corresponding keys the same amount of times.

To modulate up or down an octave, select the **Octave Up** or **Octave Down** commands from the **Edit** menu, or hold down the right Amiga key and press the left bracket key ([) to modulate an octave down, or the right bracket key (]) to modulate up an octave.

Creating Triplets

A triplet contains three notes per beat, evenly spaced. Sonix will not play triplets, but triplets can be simulated with a few tricks.

The dotted eighth note contains three sixteenth notes, and the dotted quarter note contains three eighth notes. If you use two dotted eighth notes and one regular eighth note per quarter note, this will create the illusion of triplets, although the last eighth note ends just a hair too short to be called a real triplet. The effect is the same as a triplet.

You can also fake triplets by using dotted quarter notes against half notes, and the most accurate way is to use sixteenth notes against dotted quarter notes. This can be done by entering a 16th note, a 16th note rest, 16th note, 16th rest etc. in Track 1 while entering dotted quarter notes in Track 2. This creates a triplet feel in actual sound.

Polychord Voicing

This section is intended for more advanced musicians and composers.
The basic concept of a polychord is that of stacking triads to create a larger chord voicing. For example:

The chord $\frac{D}{A}$ means to play a D major triad on top of an A major triad.

This generally requires that you have a minimum of six voices to play the chord. Sonix will output 8 MIDI tracks simultaneously, so there is no difficulty in obtaining the correct

voicings, however the Amiga only supports four internal voices, so again you need to cheat a little to make it work.

A polychord usually is a chord that contains the 9th, 11th and 13th chord tones as well as 1, 3, 5 and 7. The available chord tones from a diatonic scale are 1, 3, 5, 7, 9, 11 and 13. If you are using the Amiga's internal voices, the trick is to know exactly which chord tones to use and which ones to delete.

This table should be used as a guide:

Chord Tone:	1	2	3	4	5	6	7	8	9	10	11	12	13
Letter Name:	C	D	E	F	G	A	B	C	D	E	F	G	A

To write polychord using the Amiga's four internal voices, enter each chord tone into a different track (1, 2, 3 or 4). If you are using external MIDI keyboards, all 8 tracks in both modes I and II output each voice independently to external MIDI channels. This allows you to write a full 7-note polychord and have one track left over to use with an additional instrument or voice.

For example, you could organize it as follows:

Track	Instrument
[1]	Yamaha DX-7
[2]	Roland JUNO-106
[3]	Ensoniq Mirage
[4]	Casio CZ-101
[5]	Yamaha RX-11
[6]	Roland JX-3P
[7]	Roland TR-727
[8]	Open

The above combination of five keyboards and two drum machines sounds extremely rich and full (although expensive), and Sonix allows you to use any of 32 different patches on each MIDI instrument.

You can write a composition using both modes I and II for all of the above MIDI instruments and record it onto a cassette or preferably a 4-Track tape deck. If you record all of the MIDI instruments onto 2 tracks of the tape machine it will be in stereo and also leave you two extra tracks to overdub vocals, or electric guitar solos, or whatever you like.

Table of Polychord Voicing

Track	7th Chord	9th Chord	11th Chord	13th Chord
[1]	1	1	1	1
[2]	3	3	3	3
[3]	5	5	5	5
[4]	7	9	11	13
[1]	1	1	1	1
[2]	3	3	3	3
[3]	7	7	7	7
[4]	5	9	11	13
[1]	1	1	1	1
[2]	5	5	5	5
[3]	3	7	7	7
[4]	7	9	11	13
[1]		1	1	1
[2]		3	5	5
[3]		5	9	9
[4]		9	11	13
[1]			1	1
[2]			7	7
[3]			9	9
[4]			11	13
[1]				1
[2]				7
[3]				11
[4]				13
[1]				1
[2]				9
[3]				11
[4]				13

Audio Hookups on the Amiga

The Amiga comes standard with stereo phono outputs, and is capable of up to four independently programmable sounds. Each audio channel includes an 8-bit Analog-to-Digital converter driven by a direct memory access (DMA) channel.

Four-channel sound is what Sonix was designed for and you can create musical compositions with up to four different instruments playing simultaneously on the Amiga (with additional MIDI voices).

Many Amiga users connect a "Y" phono cable from the back of the Amiga and then connect it to the Amiga monitor for sound reproduction. This is acceptable but the resulting sound doesn't do the Amiga any justice. To get some real sound out of the Amiga, you need to connect two separate phono cables from the back of the Amiga into a stereo receiver with speakers attached. This will give you full stereo reproduction that sounds much better than using only the monitor.

APPENDIX B Keyboard Commands

Synthesizer:
Left A - N = Workbench
Left A - M = Synth Screen
Left A - S = Oscillator
Left A - L = LFO
Left A - K = Ok
Left A - U = Undo

Right A - 1 = Square Wave
Right A - 2 = Sine Wave
Right A - 3 = Triangle Wave
Right A - 4 = Ramp Up
Right A - 5 = Ramp Down

Staff Mode:
Left A - N = Workbench Screen
Left A - M = Staff Screen
Left A - 1 = Whole Note
Left A - 2 = Dotted Half Note
Left A - 3 = Half Note
Left A - 4 = Dotted Quarter Note
Left A - 5 = Quarter Note
Left A - 6 = Dotted Eighth Note
Left A - 7 = Eighth Note
Left A - 8 = Sixteenth Note

Left A - F1 = Whole Note Rest
Left A - F2 = Half Note Rest
Left A - F3 = Quarter Note Rest
Left A - F4 = Eighth Note Rest
Left A - F5 = Sixteenth Note Rest

Mode I:
Left A - F6 = Track 1 - Black/White/Blue
Left A - F7 = Track 2 - Black/White/Blue
Left A - F8 = Track 3 - Black/White/Blue
Left A - F9 = Track 4 - Black/White/Blue

Mode II:
Left A - F6 = Track 5 - Black/White/Blue
Left A - F7 = Track 6 - Black/White/Blue
Left A - F8 = Track 7 - Black/White/Blue
Left A - F9 = Track 8 - Black/White/Blue

Left A - S = Sharp
Left A - F = Flat
Left A - D = Natural
Left A - Y = Play
Left A - R = Repeat
Left A - T = Stop
Left A - E = Eraser
Left A - B = Edit Cursor
Left A - I = Instrument Cursor

Edit Menu of Staff Mode:
Right A - X = Cut
Right A - C = Copy
Right A - P = Paste
Right A - Y = Play
Right A - R = Repeat
Right A -] = Octave Up
Right A - [= Octave Down
Right A - + = Halfstep Up
Right A - - = Halfstep Down

Aegis Sonix

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