

Neuratron AudioScore

User Guide



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Remember, it is illegal to record copyrighted music without the owner's permission.

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HOW TO USE THIS USER GUIDE

Neuratron AudioScore is a sophisticated program with many advanced features. Please read this entire user guide, before embarking on any recording.

INSTALLATION

Requirements

To use AudioScore, you will need:

- An IBM compatible Pentium III (or equivalent AMD processor) or higher PC with at least 192Mb RAM - 256Mb if using Windows 2000/XP or 512Mb if using Windows Vista. If your computer has less than 192Mb RAM, contact your supplier for a memory upgrade.
- Windows 98SE/NT4SP6/Me/2000/XP/Vista. Neuratron AudioScore MIDI Input and Neuratron AudioScore VST plug-in require Windows XP/Vista.
- Version 8.1 or higher of DirectX must be installed for recording from your MIDI instrument/microphone/sound card.
- Adobe Reader® 6.0 or later should be installed to view AudioScore's on-line PDF help.
- Your computer should also have a reasonable amount of free hard disk space - at least 200Mb and preferably rather more.
- *(Optional)* A microphone connected to your computer's microphone socket.
- *(Optional)* A MIDI instrument (such as keyboard) connected to your computer's MIDI input or USB socket.

Setting up a microphone

You should ensure your microphone is plugged into the **Microphone In** socket of your computer. If you have any problems, try reinstalling the latest sound card drivers, or contact your dealer or computer/sound card manufacturer.

You may find that using cheap microphones with poor electrical insulation create a great deal of background noise caused by electrical interference. This may also happen if you are not using a dedicated sound card (ie. It is

part of your computer's motherboard). This can be typically observed as high levels of input showing in the input level window even when you are not performing. AudioScore will attempt to recognize the performance however it will be less accurate, particularly at lower or higher extremes of note pitch. Performing more loudly or closer to the microphone (taking care not to touch or blow on it) will improve matters. However it may be worth investing in a better quality microphone and dedicated sound card.

The System Tray Icon *(Windows XP/Vista only)*

During installation, AudioScore adds a **Neuratron AudioScore Input Assistant** icon to the system tray. This enables you to use AudioScore as a VST plug-in or sing or play directly into other MIDI programs. If you do not wish it to be there every time you start your computer, you should remove the item **Neuratron AudioScore Input Assistant** from **Program Files>Startup** accessible from the **Start** menu. After doing this it will be necessary to run **AudioScore Input Assistant** from **Program Files>Neuratron** each time you wish to sing or play directly into other MIDI programs.

How many computers can I install AudioScore on?

Unless you hold a multi-user site license, you are only permitted to use one copy of AudioScore on one computer at a time. (All copies are serial numbered; illegal copies can easily be traced back to their original owner.)

INTRODUCTION

Neuratron AudioScore is a highly intelligent and advanced program aimed primarily at allowing a user to enter music into a computer in the quickest and most accurate possible way. Notes can be entered using both MIDI input devices (such as keyboards) and microphones (AudioScore is able to work out accurately what notes you are performing). A metronome is available to use but is not required as AudioScore can determine your performed rhythm automatically. AudioScore also introduces the novel concept of serving you a set of notes already input which you can then quickly split, join, resize, and change pitch, purely on a performance level - no worrying about rests and technicalities such as accidentals, augmentation, beaming, key signature, ties etc.

Whichever way music is entered, it is immediately converted into score notation with the help of Neuratron's incredibly sophisticated rhythm recognition engine. This means that AudioScore knows (or makes a very good guess) at where barlines were intended in your performance and what notation you intend to be written. There is no fiddling around with adding accidentals, key signatures, augmentation dots, clefs, ties, beams and so on – this is all worked out for you automatically.

Furthermore, even after note entry, you can continue to adjust individual notes of your performance (both in pitch and time) and AudioScore will immediately recalculate the score notation, even down to repositioning barlines if necessary.

Once your score is entered you can send it directly to programs such as Sibelius, save MusicXML, NIFF, Wave, MIDI files for opening in virtually any music program. AudioScore itself is able to create a score suitable for printing and allows you to add title text, lyrics, dynamics and so on.

AudioScore also includes many other advanced music features, such as the concept of performances based around 'bendy' notes that do not need to keep a consistent pitch. It allows a microphone to be used as a MIDI input driver (so you can use it instead of a MIDI keyboard with most music programs) and as a wave-to-MIDI VST plug-in (which also utilizes intelligent rhythm recognition and timing correction). Other uses include MIDI sequencer, note-based wave editor, and powerful educational tool - AudioScore makes it very apparent to the user the relationship between performance and score.

Suitable microphone performances

AudioScore is designed to recognize microphone performances that satisfy the following criteria:

- are monophonic (i.e. no more than one note is played at a time – this is suitable for solo singing and most instruments)
- are natural (e.g. using voice, whistle, wind, string or brass instruments – *not* synthesized or processed sounds including many sounds from MIDI keyboards and sound cards).
- are performed clearly and cleanly (e.g. for violin, silent movement of fingers changing strings and avoidance of bow/fingers tapping on the instrument's body) and at a steady tempo
- little background noise (including electrical interference) exists

Copyright music

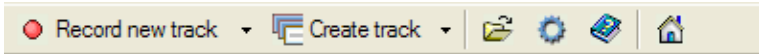
You should be aware that by recording music without permission you could infringe copyright. The following are rough guidelines to when copyright infringement might occur, but are not a full statement of the law:

- Music that was *composed* by someone who is alive, or who died less than 70 years ago, is in copyright. (Copyright lapses 50 years after death in the USA).
- An *arrangement* of a piece of out-of-copyright music is in copyright until 70 years after the arranger's death, though the original tune or piece on which the arrangement was based remains out of copyright.
- In most countries (but not the USA), music is automatically in copyright from when it is composed, arranged or edited; there is no registration procedure, and the music does not have to include a statement that it is copyright, or the © symbol.

GETTING STARTED

Run AudioScore using your preferred method (e.g. from the **Start menu**).

You should see the following toolbar below AudioScore's menu bar:



Clicking the first two buttons is equivalent to selecting the menu items **File>Record New Track** and **File>Create New Track** respectively. Their use will be described in the next chapter. The four buttons to the right correspond to the menu items **File>Open...** (for opening files), **File>Preferences...** (for changing AudioScore's preferences), **Help>Neuratron AudioScore Help...** (for online help), and **Help>Neuratron Web Site...** (for the Neuratron web site).

Screen resolution and colors

We recommend that you use AudioScore on a display with high screen resolution, such as 1024 x 768 or 1280 x 1024. A display with at least 16-bit color quality is highly recommended.

Setting up to record for the first time

Before using AudioScore for the first time you should click **File>Select Recording Source....** Computers often have more than one socket for inputting music and the dialog box that appears enables you to choose which one AudioScore should 'listen' to. All your *Wave* (e.g. microphone) and *MIDI* (e.g. MIDI keyboard) input devices are conveniently listed in one drop-down menu at the top.

Each Wave device often has more than one input (for example your computer's sound card is a Wave device and probably contains both microphone and line-in inputs). You can usually select the input e.g. **Microphone** from the drop-down menu below the one for choosing a device and then choose the input level from the slider. The input level is how loud the sound appears to AudioScore; too quiet and AudioScore cannot hear it properly; too loud and the sound can become distorted. Click **Set up to Record from Microphone** if you are singing into a microphone plugged into the standard microphone socket of your computer to set up recommended defaults. **Note that some Wave**

devices do not offer this method of choosing the input to AudioScore and you should consult the device's documentation for ways to select it.

It is also possible to select a Wave recording quality. Use the default **High – 44100Hz, 16-bit** unless you wish AudioScore to operate more quickly at the expense of a little accuracy.

The bottom option on the dialog box allows you to change where AudioScore temporarily stores your recordings. AudioScore extracts a great deal of information from your performance and needs to store it on your hard disk, so if you have more than one hard disk it is recommended you change this to the hard disk with the most available free space. The estimated amount of recording time available on the current drive is displayed to the left of the **Choose...** button.

The five stages

There are five main stages (not all of them necessary) when using AudioScore – *Creating Tracks*, *Editing Rhythm*, *Editing the Performance*, *Creating a Printable Score* and *Playing, Printing and Saving*.

1. **Creating Tracks** is where AudioScore records your performance, works out what notes and pitches are played (for Wave recordings) and then determines the rhythm of your performance so it can create accurate score notation. It is also possible to manually create tracks by editing automatically created tracks containing notes.
2. **Editing Rhythm** is where you edit AudioScore's interpretation of the performance's rhythm in the case of recording using a Wave or MIDI device.
3. **Editing the Performance** is where you edit your performance or created tracks.
4. **Creating a Printable Score** is where AudioScore can convert your performance into a formatted score suitable for printing and distribution.
5. **Playing, Printing and Saving** is where AudioScore plays, prints or saves your performance or score for use in other music notation programs.

1. CREATING TRACKS

Getting started and Recording options

Click **Record new track** from the toolbar (or simply press the **Space Bar**).

If you have chosen a Wave recording device (See **Setting up to record for the first time** above), then by default a dialog box will appear allowing you to select the pitch range of the voice or instrument you will be recording, in addition to a few other optimization options. A short list of instruments suitable for each pitch range option is shown.

Check **Boost speed** if you find that AudioScore cannot recognize your recording in real-time. This option has negligible effect on note recognition but will cause a slight loss in quality when using the pitch editing and time stretching functions in **Wave mode** (explained in **3. EDITING THE PERFORMANCE**).

Enhanced pitch accuracy makes AudioScore examine the pitch of your performance in more detail, which is useful if you want to see the exact pitch you are performing at. This option does slow recognition down significantly however, and AudioScore still makes a highly accurate interpretation of pitch with the option turned off.

Detect syllables is useful when singing. AudioScore attempts to recognize the syllables in your performance and splits notes in its interpretation accordingly. It can interfere however, if you are playing an instrument with high vibrato (such as violin), so should be turned off for this.

Display these options before recording is the setting that causes this dialog box to appear when you click **Record new track**. Un-check this option if you have already set up the options the way you like them and rarely need to change them.

All of these options are also available to change at any time from **File>Preferences...** and selecting the **Wave** tab.

Click **Record** to start recording your performance. If you are using the default settings, there will be no metronome and you are free to sing in your own time as AudioScore determines your rhythm automatically. If you require a metronome, see **Metronome/Accompaniment** below.

During recording

A window with a white background appears called the *composition window*. This window is split into two areas. The top half is called the *performance area* and the bottom, the *score preview area*. It is possible to change the size of both areas by clicking and dragging vertically the blue divider bar between them.

The performance area shows AudioScore's interpretation of your performance in terms of pitch and time. This area is also used for editing the pitch, position and duration of notes. It only ever shows one track, the *current track*.

The score preview area shows AudioScore's interpretation of your performance in terms of score notation. This area also displays all the tracks that make up your composition. Clicking on a track makes it the new current track and the original performance is shown in the performance area so that it becomes editable.

If all is well, black (and red if recording from a Wave device) rectangles should start scrolling left from the right of the performance area. These are the notes AudioScore has detected and the vertical position is the pitch. Don't worry if you see green bendy lines instead of blocks – some settings have been changed and these are explained in the chapter **3. EDITING THE PERFORMANCE**.

If recording using a Wave device, a smaller window, the *input level window*, also appears which shows the current input level (i.e. the volume of your performance that AudioScore can currently 'hear'). This smaller window can be resized by dragging the edges – you may find it useful to make it the size of your computer's screen if you need to read from a score whilst recording. It is possible to prevent this window appearing in AudioScore's preferences.

Wave Device Recording Tips

- You should perform at an appropriate distance from the microphone so that the vertical bars that scroll across the smaller input level window are mostly green. If you cannot see any bars (the contents of the window are black), or they are all yellow or red, adjust your distance from the microphone. Further advice is available in the chapter **Possible Problems**.
- During recording the current latency (the delay between what you are singing and what AudioScore draws as recognized in the output

window) and the processor usage (the percentage of your computer's power AudioScore is currently using to recognize your performance) are displayed in the black horizontal bar at the bottom of the composition window.

Finishing recording

When you have finished your performance click **Stop recording** from the toolbar, or press the **Space Bar**. Depending on the speed of your computer and the current settings, AudioScore may still need to finish analyzing your performance for notes (it stores your performance on your hard disk so that it does not forget any of it). If this happens, the black bar at the bottom of the screen will show how much of your performance has been processed, out of the total length. You may stop AudioScore recognizing your music immediately by clicking **Cancel processing** (the toolbar button would have changed from **Stop recording**) or by pressing the **Space Bar** once more. You can also press **Escape** during recording to immediately stop both recording and recognition. Pressing **Escape** also stops opening of .wav files.

Recording the next track

To record the next track in your composition, simply click Record new track once more. The track will be inserted immediately after the current track (the one displayed in the performance area and with a light background in the score preview area).

If you are using the default settings, a one bar metronome will lead you into the recording and AudioScore will accompany you by playing back either all your previously recorded tracks, or only those selected. Tracks can be selected by clicking, **Ctrl**-clicking and **Shift**-clicking over the instrument names of tracks in the score preview area so that the staves are filled with blue. The tempo of the metronome and accompaniment will have been calculated from the performance in the first track you recorded. If you do not wish to record to a metronome or accompaniment after laying down the first track, or wish to always record to a metronome, see **Metronome/Accompaniment** below.

Insert recording

If you wish to append, replace or insert music in the current track with a new performance, either click in the performance area at the position to insert so that a vertical line appears, or select the time you wish to replace as is appropriate (see the section **Selecting Notes and Time** in 2.

EDITING RHYTHM for information about selecting time). Then choose **File>Record To Current Track** or click the **Record** button at the top left of the performance area.

Depending on your settings you will either hear a bar's metronome (up to two bars if you selected to insert record at a position within a bar) to lead you in or you can start performing right away (see **Metronome/Accompaniment** below for more details). The area to the right of the position you are inserting a performance will be grayed out, but will return to normal once you finish recording, which can be done in the same way as usual (see **Finishing recording** above).

Deleting tracks

To delete the current track (displayed in the performance area and with a light background in the score preview area) select **Edit>Delete Current Track**.

To delete multiple tracks, select them by clicking, **Ctrl**-clicking and **Shift**-clicking over the instrument names of tracks in the score preview area so that the staves are filled with blue and then choose **Edit>Delete Selected Tracks**.

Please note that deleting a track cannot be undone.

Metronome/Accompaniment

AudioScore is able to automatically determine your performance's rhythm and so a metronome is not always required. The default settings allow you to perform the first track of your composition without a metronome so that you are unrestricted. When you lay the next track down, you will usually want to play along to your first (and other) track's performances. Therefore for tracks after the first, AudioScore will work out the tempo of your composition from the first track and then lead you into a recording with a bar's metronome before accompanying you.

If you wish to always recording without a metronome, or always with a metronome, open AudioScore's preferences and choose the **Rhythm** tab. There are three Metronome / accompaniment Play during recording options, described as follows.

Never – independent track tempos. If this is selected, AudioScore will never play a metronome nor accompany you. When editing any track in the performance area you will be able to drag the Score Start marker

and barlines as you wish and AudioScore will run ahead and recalculate rhythm for the remainder of the track.

After first track laid down – use first track’s tempo. This is the default option already explained. The behavior of barline editing is a combination of that described in the other two options.

Always – use tempo below. With this selected, AudioScore will always play a metronome and accompany you with the tracks selected (marked by blue staves) in the score preview area. The tempo is taken from the Default tempo option, also on the Rhythm tab of the preferences. Barlines can be moved left and right, but only to the previous or next bar and barlines after will not be recalculated. This is because it is assumed that your performance stayed roughly in time with the metronome.

Creating a track manually

AudioScore introduces the novel concept of serving you a set of notes already input which you can then quickly split, join, resize, and change pitch, purely on a performance level - no worrying about rests and technicalities such as accidentals, augmentation, beaming, key signature, ties etc. This is ideal for beginners to music notation and professionals alike.

Simply click **Create track** on the toolbar and a new track will be inserted after the current track displayed in the performance area and highlighted in the score preview area. It will come complete with quarter notes (in **Note** mode) or whole notes (in **Bends** mode). See **Note and Bends modes** in **3. EDITING THE PERFORMANCE** for information about these modes.

These notes can then be dragged up/down (to change pitch), deleted (to create rests), resized (to change note type) and repositioned. You can also join and split notes to create different note values and even tuplets. For more information regarding editing notes, please see the chapter **3. EDITING THE PERFORMANCE**.

It is also possible to create a track containing no notes by choosing **File>Create Empty Track**.

Inserting extra bars

To add a single empty bar to the current track, select **Create>Bar>In Current Track**.

To add a single empty bar to all tracks, select **Create>Bar>In All Tracks**.

By selecting **Create>Bar>Other...** it is possible to insert more than one bar in the current, selected, or all tracks. Additionally you can check **Fill with notes** to automatically fill them with notes.

The bars added will be inserted at the barline following the current cursor/selection position, or at the end of the track(s) if no cursor is positioned or selection has been made.

Opening MIDI and Wave files

It is also possible to open MIDI and Wave files by selecting **File>Open....**

MIDI files must be 'type 1'. This is the most common format, but if you have files which are type 0 or type 2 there are free converters available on the Internet. Also, please note that AudioScore will open, but is not designed to import MIDI files containing more than two parts per track (different duration notes occurring at the same time in one track) or MIDI files containing time signature or tempo changes during the song. In addition, percussion staves are not supported and will appear as piano. When opening MIDI files, a new composition is created (AudioScore will ask if you want to save any current composition) and each MIDI track is converted into an AudioScore track.

Wave files must be monophonic – one instrument only, with one note played at a time (no chords). When opening a Wave file a new track is created after the current track highlighted in your composition and the recognized notes are inserted into it.

2. EDITING RHYTHM

After your performance has been being recorded and recognized, AudioScore's interpretation of it is displayed in the composition window.

Note: If you simply wish to record and create a score, you can ignore most of the menu and toolbar options that are available from the composition window. Otherwise read the chapter **3. EDITING THE PERFORMANCE**.

Provided the default display settings are used, the performance area should show the original performance of the current track on an enlarged staff as black or red rectangles representing the notes that you have performed.

The black or red rectangles can be dragged up or down to adjust the pitch, or lengthened/shortened to adjust the duration. It is important to remember that rhythm and pitch editing can only be performed in this part of the composition window, but this should not take long to get used to.

Wave input only

The purple colored blobs in the background represent the frequencies that make your performance sound like it does to the human ear – the more frequencies shown the richer the sound.

The score preview area shows AudioScore's interpretation of each of the tracks you recorded as music notation. It is not possible to edit notes in this part of the window. Editing performed in the performance area will automatically update this music notation.

Note that formatting of notes, rests and beams is fairly rudimentary in the score preview area. Don't worry though – when saving MusicXML/NIFF files, sending to Sibelius or moving onto creating a score in **4. CREATING A PRINTABLE SCORE**, AudioScore will format everything nicely.

There is a specific order in which you should edit rhythm:

1. Select the Track

AudioScore will be displaying the last track you recording in the performance area, and the notation for this track will be highlighted in the score preview area. You can choose a different current track by clicking

on a track in the score preview are anywhere to the right of the instrument name. Clicking to the left of the track selects it (for playing recording purposes) but does not make it the current track displayed in the performance area.

2. Setting the Instrument

Double-click, or right-click on the current instrument name at the left of the performance area. Then choose an instrument from the dialog that appears and click **Rename**. AudioScore will also update the display with the clef and transposition that is standard for the instrument. If the clef or transposition is different from the current instrument, AudioScore will also offer to transpose the performance for the new instrument so that it falls within the instrument's pitch range.

3. Setting the Time Signature

This is important so that AudioScore is able to calculate bar size accurately. Choose **Create>Time Signature...** from the menu. Then choose the required time signature and click **OK**. AudioScore will recalculate the barline positions and notation for the entire performance. The time signature is displayed in the score preview area.

4. Adjusting the Score Start

Note: This is only possible if you recorded from a MIDI or Wave device and you did so without a metronome (see **Metronome/Accompaniment** in **1. CREATING TRACKS** for more information about metronomes). To create an anacrusis in the final score when a metronome is played, or if you used **Create Track** to compose music, you should leave the required initial part of the first bar empty of notes.

Near or at the beginning of the performance is drawn a dashed vertical line. This marks the point in time at which notes are to be notated from. Its initial value will be the start of the first note performed. However if you wish to have an anacrusis (also called pick-up bar) at the beginning, you should drag this score start marker to the left until the amount of rest that should be missing from the first bar is displayed in the bottom part of the composition window.

5. Adjusting the Barline Positions

AudioScore should have made a reasonable guess at the tempo of your performance and placed barlines accordingly. However this is a complicated process and AudioScore cannot always work out exactly

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what you require. If this is the case you should start at the first barline drawn and drag it left or right to the desired position. If you recorded the track without a metronome, AudioScore will go ahead recalculating barline positions to the end of the score (this should have the result that minimal adjustment is required after the first barline adjustment). Then go through the score adjusting further barlines if necessary. Remember, if you recorded the track without a metronome, you should always start at the beginning of the performance and work forwards, otherwise AudioScore will move barline positions that you have already set.

6. Adjusting the Note Durations and Pitches

Depending on the accuracy of your performance, AudioScore should have made an intelligent job of guessing how you would like your performance notated. However sometimes there may be mistakes and you should go through the score dragging the start or ends of notes. This causes AudioScore to automatically update the notation at the bottom of the window and with a little experimentation it should become second nature as to what editing is required to obtain the required notation. You can also drag notes up or down in case the pitch was guessed incorrectly.

You can create new notes where none exist by holding down **Ctrl** and dragging. Notes can be deleted by selecting them and pressing **Delete**.

Tip Use the vertical gray bar sub-division lines (they look like gray barlines but there are more of them) to help you position notes within a bar. This will make it easier for AudioScore to notate the rhythm correctly.

7. Transposing the Performance

If you sang or whistled into AudioScore, or you wish to score for an instrument with a different range from the one you normally perform with, you may wish to transpose the score to a different pitch. Choose **Transpose** from the toolbar. The current track you are editing should already be selected in the **Staff:** drop-down box, so set the interval by which you want to transpose by clicking **Up** or **Down**, and then choose the main interval from the right-hand box.

In the left-hand box, **Major/Perfect** leaves the main interval unaltered, **Augmented** adds a half-step (semitone), **Minor/Diminished** subtracts a half-step. Then click **OK**.

8. Setting the Key Signature

AudioScore will already have worked out a suitable key signature for your performance, displayed in the score preview area (and you may notice it recalculates it continually as you change note pitches). However if you wish to choose another, choose **Create>Key Signature** and choose a suitable submenu. After one has been chosen, the key signature will no longer be automatically recalculated by AudioScore.

9. Saving/Creating the Score

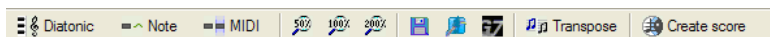
Once you are happy with the notation displayed in the score preview area you can send it directly to Sibelius/G7, or save a MusicXML, NIFF and MIDI files for opening in other music editing programs. For more information, see **5. PLAYING, PRINTING AND SAVING**.

You can also click **Create score** to make AudioScore create a fully formatted score which can be edited further (for example a title, lyrics and dynamics can be added), printed out and exported to other applications. For more information, see **4. CREATING A PRINTABLE SCORE**.

3. EDITING THE PERFORMANCE

In addition to being able to create musical scores, AudioScore offers a range of MIDI and wave audio editing functions from the composition window. This chapter goes through the options available in detail.

You should see the following toolbar at the top of the composition window:



Clicking the first three buttons is equivalent to selecting the menu items **View>Layout>Chromatic/Diatonic**, **Play>Mode>Note/Bends** and **Play>Mode>MIDI/Wave** respectively. The three buttons to the right of these allow the current view to be zoomed in or out of (see **View>Zoom**). Further right still are buttons allowing the current song to be saved to disc (**File>Save**), send to Sibelius or G7 (**File>Send to Sibelius/G7**) (only if Sibelius or G7 installed on your computer), transposed (**Notes>Transpose...**), and made into a score (**Notes>Create Score**).

General features of the composition window

At the left of the composition window, the current instrument name that is used when playing or saving MIDI files is shown. This can be changed by double-clicking over the name and selecting a new instrument from the list.

The top half of the composition window, the *performance area*, shows AudioScore's interpretation of your performance. The purple color that exists in places on the white background depicts some of the different frequencies and amplitudes that exist in your recording. In front of this are the recognized notes, either represented as black/red horizontal rectangles, or as curved green lines (depending on the mode you are in – see below). The notes will also have purple highlighting from the bottom to the top of the window if you are in **MIDI mode** (see below).

At the bottom of the window is a black horizontal bar containing information about what the mouse pointer is currently over. This includes time and pitch (both note and frequency) information – try holding the mouse pointer over a note. The ten dark red rectangles to the right collectively form a digital tuning meter. If the note the mouse pointer is over is slightly below pitch (but not enough to be a semitone) red

rectangles to the right of the centre red line light up. The more rectangles that light up, the more off pitch the note is.

AudioScore's 'modes'

To enable AudioScore to be as versatile as possible, it uses the concept of modes. These enable the user to work with the same interface for performing a variety of different functions. The modes are in three groups and can be toggled from the first three buttons on the composition window's toolbar. Alternatively, they can be 'switched in' temporarily by holding down **F5**, **F6** or **F7** respectively. Here are the modes explained in full:

Chromatic and Diatonic modes

Chromatic

In this mode, notes are displayed on a linear scale of semitones. To the left of the display is a keyboard and moving the mouse pointer over a note highlights the key on the keyboard that plays that note's pitch. The pitches of the keys are written to the right of the keyboard. Each faint horizontal blue line represents a semitone boundary.

Diatonic

In this mode, notes are displayed on a scale representing standard music notation. Treble and/or bass clef staves are drawn so the user can see the pitch of the notes. In addition, leger lines are drawn where a note goes off a staff. If in **Note mode** (see below) flat and sharp symbols are drawn at the left of notes where the note is flat or sharp (in a key of C major).

Note and Bends modes

Note

In this mode, notes are displayed, edited and played with continuous pitches and amplitudes. If a note is perfectly on pitch (relative to MIDI tuning where middle A is 440 Hz) then it is colored black. If it is off pitch it is colored red; the more red a note, the more off pitch it is and a white arrow drawn within the note shows whether you would need to perform higher or lower to hit that pitch. If a note is selected a small black triangle is drawn to the right of the note and shows the exact pitch of the note on a continuous vertical scale.

Bends

In this mode, the exact pitch of notes is displayed, edited and played. The notes are always drawn as green curved lines with black vertical lines at each end. The timing of notes cannot be editing in this mode.

Wave and MIDI modes

Wave

Unless you record from a Wave input device or open a Wave file, this mode will be disabled. In this mode, notes are editing and played as in the original performance. Purple transparent rectangles are drawn over the notes from the bottom to the top of the performance area to indicate that the wave (and not just the **MIDI note**) is being edited. In this mode it is possible to edit the pitch of your original recording as well as the timing (it is necessary to be in **Note mode** for the latter – see above).

Note that in **Wave mode**, time is selected when clicking on them. If you delete a note, the entire period of time that the note occupies is removed. If you resize a note, extra time is added or removed from your performance. Also see **Selecting Notes and Time** below.

It is important that, before recording, you choose a suitable recording quality (Recording tab) and pitch range (Accuracy/Speed tab) from the AudioScore preferences to achieve the best sound quality when adjusting pitch, timing and volume in Wave mode.

MIDI

In this mode, notes are edited and played as the MIDI notes that have been recognized by AudioScore. The instrument used for playback can be changed by double-clicking over the current instrument name at the left of the composition window and selecting a new one from the list that appears.

It is possible to select either time or notes. Resizing when only a note is selected does not insert or remove time from your performance. Also see **Selecting Notes and Time** below.

Basic editing

- **To select a note** click on it so that it turns a darker color.
- **To select multiple notes/time** click over an area of the composition window that does not contain a note and drag over the notes or time you

want to select. You can select further individual notes by holding down **Ctrl**, or a series of notes by holding down **Shift**, and clicking.

- **Notes can be dragged up and down** with the mouse or up/down cursor keys (**Note mode** only). When using the mouse, hold down **Alt** to adjust the pitch finely (**Note mode** only).
- **Pitch can be adjusted** with the mouse by clicking on a note in **Bends mode** and dragging (or 'drawing') the new pitch on screen.
- **To copy and paste** you can use **Ctrl+C** and **Ctrl+V** respectively (clicking where you want to paste). If you recorded using a Wave device or opened a Wave file, you can also copy and paste selected time (as Wave data) into other applications supporting the Windows clipboard. Also read the section below called **Cutting, pasting and deleting notes** for important information.
- **To delete objects** type **Delete**.
- **To reposition notes:** When in both **MIDI mode** and **Note mode** it is possible to move notes left and right by clicking and dragging them.
- **To resize notes:** It is possible to change the duration of a note by holding the pointer over the right side of it so that the cursor changes (into two horizontal arrows pointing in opposite directions), and then clicking and dragging.
- **To create notes:** It is possible to create a new note by holding down **Ctrl**, clicking on a region with no notes and dragging horizontally. If you wish to add another note to make a chord, hold down **Ctrl**, click at the pitch of the new note and drag horizontally.
- **To adjust where one note ends and the next begins:** It is possible to adjust, for two touching notes, where one ends and the other begins: Hold the pointer over where the notes touch (so that the cursor changes) and then click and drag.

The Notes menu

The Notes menu can also be obtained by right-clicking on the performance area and is useful for a variety of editing actions.

Right-click over a note for it to become selected at the same time as the menu opens.

Here are the various items and submenus explained:

Joining and Splitting notes

Join Notes Into One allows you to join a number of consecutive notes into one. This is useful if you wish to create a longer note.

Split Note Into Two allows you to split a note in two. This is useful if you wish to create notes of shorter duration.

Split Note Into Three allows you to split a note in three. This is useful if you wish to create triplets.

Pitch submenu

Quantize moves the note (**Note mode**) or frequencies within the note (**Bends mode**) to the nearest semitone.

Flatten (**Bends mode** only) makes all the frequencies in the note the same (the actual frequency is the quantized frequency of the note in **Note mode**).

Slide up (**Bends mode** only) causes the note to slide up in pitch by two semitones.

Slide down (**Bends mode** only) causes the note to slide down in pitch by two semitones.

Add vibrato (**Bends mode** only) adds vibrato to the note (rapid slight fluctuations in frequency, making it sound fuller).

Timing submenu (MIDI mode only)

Speed up makes the note 10% faster

Slow down makes the note 10% slower

Double speed makes the note twice the speed

Halve speed makes the note half the speed

Original speed sets the speed of the note to what it was originally recorded at

Accelerando makes the note's speed slide up to double its original

Decelerando makes the note's speed slide down to half its original

Ritenuito makes the note sound like it is 'held-back'.

Volume submenu

Increase increases the note's volume by 3dB (a slight, but noticeable increase)

Decrease decreases the note's volume by 3dB (a slight, but noticeable decrease)

Double increases the note's volume by 10dB, effectively doubling it

Halve decreases the note's volume by 10dB, effectively halving it

Set to 25%/50%/75%/100% (**MIDI mode** only) sets the notes volume to the required MIDI volume.

Transpose

If you sang or whistled into AudioScore, or you wish to score for an instrument with a different range from the one you normally perform with, you may wish to transpose the score to a different pitch.

Set the interval by which you want to transpose by clicking **Up** or **Down**, and then choose the main interval from the right-hand box.

In the left-hand box, **Major/Perfect** leaves the main interval unaltered, **Augmented** adds a half-step (semitone), **Minor/Diminished** subtracts a half-step. Then click **OK**.

Strip ends of song

Deletes the ends of the songs that contain no performance (up to where the first note is, and from the end of the last note as shown in the composition window).

Create score

AudioScore creates a fully formatted score which can be edited further, printed out and exported to other applications. For more information, see **4. CREATING A PRINTABLE SCORE**.

Undo and Redo

If you make a mistake (e.g. by deleting the wrong note) you can 'undo' this action by pressing **Ctrl+Z**. You can reverse an undo (called 'redo') by pressing **Ctrl+Y**. AudioScore remembers, and thus you can undo, up to the last sixteen editing actions which you perform.

Selecting Notes and Time

It is important to remember that it is possible to make two different types of selection in the performance area:

A *note selection* is when only the notes themselves are selected and is only possible in **MIDI mode**. This means that if you delete a note

selection then the equivalent of a rest will be left behind. When notes are selected, only the notes themselves are highlighted, unlike for a time selection where purple transparent rectangles are drawn over notes from the bottom of the performance area to the top.

A *time selection* is when both notes and time are selected. This means that if you delete a time selection, then the time it occupies is deleted from the song, effectively shortening it. When time is selected purple transparent rectangles are drawn over the notes from the bottom of the performance area to the top.

In **MIDI mode**, if you click with the mouse over the performance area and drag, you will notice that if you are dragging over notes, only the notes are selected (a red or green rectangle from where you started dragging to your current mouse position is drawn which does not snap to note start/ends), otherwise time is selected (a purple rectangle stretching from top to bottom is drawn which snaps to note starts/ends).

Cutting, pasting and deleting notes

It is possible to cut and paste music from one part of the song to another. However the results are slightly different depending on whether you have time or notes selected:

If notes only are selected (not possible in **Wave mode**), only the MIDI notes themselves can be cut/deleted from the song, and not the time they occupy. For example if you delete a note, the equivalent of a rest will be left (but nothing will be displayed). When you paste a note or notes they are not inserted into the song, but 'overwrite' the song. However, if there are notes already existing where notes are to be pasted, they are not overwritten, with the result that only some of the notes are actually pasted.

If time is selected notes and the time they occupy are cut/deleted from the song, effectively shortening it. Pasting inserts the notes into the song, effectively lengthening it. This is similar to how a word processor usually works.

Playing from the performance area

You can have your edited performance played back to you. Your computer will need a MIDI and/or Wave device attached (incorporated into most computer's sound cards) to make use of this feature (if you have more than one attached, the default will be used).

Choose **Play/Pause Original** from the **Play** menu. Alternatively you can press **O**, or click the **Play** button at the top left of the performance area.

To play from a particular point on the page, position the cursor where you would like playback from.

While the music is playing, the currently played notes will be highlighted.

In **MIDI mode**, midi notes will be played back. If **Note mode** is selected these will be continuous pitch and volume notes. In **Bends mode** these will fluctuate in pitch and volume to your original performance. To hear a different instrument sound, double-click on the current instrument name at the left-hand side of the composition window and then select a new instrument from the list.

In **Wave mode**, your original performance (with edits) will be played back.

Saving

You can save your performance to disk by clicking the **Save** button at the top of the composition window to open a standard save dialog box. You will be asked what name to store the score as, and where to store it. You can choose to save 6 types of files AudioScore, MIDI, Wave audio (if the current track was recorded from a Wave device or created from a Wave file), MusicXML, NIFF, and PhotoScore.

AudioScore (.nas) files contain all information about your recorded and edited tracks. If you need to take a break from editing, you can save a file in this format, open it up and resume editing at a later time.

MIDI files (.mid) contain the MIDI data associated with your performance (in other words the notes AudioScore recognized). Checking **Pitch bends** in the save dialog stores pitch bend information in the MIDI file so that it sounds more like your original performance. MIDI files can be opened in most music programs.

Wave audio files (.wav) contain your original recorded performance. Wave files can be opened in most music sequencing programs and can also be played back using programs such as **Windows Media Player**. They are only given as an option to save if the current track was recorded from a Wave device or created from a Wave file.

Save MusicXML, NIFF and PhotoScore files if you want to open your score in a notation product, for example Sibelius or Finale. Finale 2006 can open MusicXML files from the File menu. In Finale 2003 to 2005 use

the 'Dolet Light' plug-in to open MusicXML files. Sibelius opens PhotoScore files.

Please check www.neuratron.com/fileformats.htm for the latest information including which programs open these file formats.

Backup files

In the preferences General tab it is possible to specify the time interval at which AudioScore saves your current score to a special 'backup' file. In the unlikely event that your computer crashes, AudioScore will offer you the possibility of opening this file the next time it is opened, so as to limit any loss of work.

4. CREATING A PRINTABLE SCORE

Once you are happy that the rhythm is correct in the score preview area of the composition window, and have clicked **Create score**, the first page of your new score will pop up in a window called the *score window*. Rests and beams will have been formatted correctly and you can perform any further editing required, such as adding title text, articulation, lyrics, slurs and so on.

Quick Editing Guide

- **To select an object** click on it so that it turns a different color. To change the selected note within a chord hold down **Alt** whilst using the up/down cursor keys. To select a whole chord double-click in the centre of one of its notes.
- **Notes can be dragged up and down** with the mouse or up/down cursor keys.
- **To add a note** click a note-value on the 'keypad' at the bottom right of the window, then click on a staff to input the note at the pitch where you click. The keypad button stays pressed down so you can click more notes onto the staff. Input several notes, one above the other, to make a chord. To stop creating notes, press **Esc** to deselect all the keypad buttons. A note can quickly be added to an existing chord by selecting the chord and double-clicking in the desired position.
- **To edit notes:** You can select a note and edit its articulations, accidental, etc. just by choosing the relevant keypad button. To edit a note's length, choose a note-value on the keypad. Type the left/right arrows to move between notes.
- **To add/edit rests:** To add rests, do the same as for adding a note, but also click on the bottom left rest button in the keypad to convert the note to a rest. Rests can be edited in the same way as notes
- **To see more exotic sets of symbols** click the five buttons at the top of the keypad.
- **To change the voice of a note or rest**, click one of the buttons marked **1 2 3 4** at the bottom of the keypad (*only voices 1 and 2 in Lite version*). Individual notes within a chord may be split into different voices, and chords in different voices may be joined into single chords in this way.

- **The keypad on the screen** corresponds to the numeric keypad at the right of your computer keyboard. Type these keys in preference to using the mouse, as it's much quicker. You can choose several keys together (but type the note-value first), e.g. type **4 . - /** to get a dotted quarter-note (crotchet) with a tenuto and accent.

- **To copy and paste** you can use **⌘C** or **Ctrl+C** and **⌘V** or **Ctrl+V** respectively (clicking where you want to paste), but it's quicker to duplicate an object in a single action by selecting it, pointing somewhere else and clicking with the **⌘** or **Alt** key held down. Try this with a note or some text.

- **To delete objects** type **Delete**.

- **To edit other objects:** Most objects such as clefs, time signatures and barlines can be changed by double- or right-clicking over them to bring up an appropriate dialog box or menu

- **To create other objects:** You can create other objects (e.g. clefs, time signatures) from the **Create** menu, which you can also get by **Ctrl-** (Mac) or right- (Windows) clicking. Choose an object from the menu, then click on the score to create it.

- **To reposition/resize objects:** Most objects can be moved around the page by clicking and dragging. Some objects such as slurs and hairpins can be resized in a similar manner by clicking and dragging their left or right edges.

At the top left of the window it says, for example, **Page 1 of 7**, and by clicking on the arrows you can move through all of the pages that have been created (the *output score*). The magnifying glass icon zooms the page to fit the window; **100** scales to 100%; **200** scales to 200%.

To the bottom right of the window is the keypad. This can be repositioned using the title bar. The keypad can be removed by unchecking the appropriate options in the **View** menu.

There is a **Create** menu in the menu bar, which is similar to Sibelius/G7's **Create** menu. Editing features not appropriate for AudioScore have been omitted.

Mouse and keys

Broadly speaking, you can:

- select and move markings using the (left) mouse button

- copy markings using **⌘**-click, **Alt**-click or clicking with the middle mouse button
- create markings using the **Create** menu
- delete markings with **Delete**
- edit notes and rests using the keypad

Selecting

To select a marking:

- Point at the marking so that it is highlighted with a purple box
- Click with the (left) mouse button - the marking goes blue if in voice 1, green if voice 2, orange if voice 3 or purple if voice 4

It is also possible to move left and right selecting different markings by using the left and right arrow keys. Hold down **Ctrl** at the same time to jump to the start of the current or next bar.

Multiple selections

Note that you can select several markings at once by holding down **⌘** or **Shift**, holding down the (left) mouse button and dragging a box around the markings to be selected. You can then edit or delete all the markings at once. This can save a lot of time. Alternatively you can select further individual notes by holding down **⌘** or **Ctrl**, or a series of notes by holding down **Shift**, and clicking.

It is also possible to select additional markings to the left and right by holding down **Shift** whilst using the left and right arrow keys. Similarly use **⇧⌘** or **Ctrl+Shift** to select up to the start or end of a bar.

Copying markings

To copy a marking, simply select it, point elsewhere and click with **⌘** or **Alt** held down. You can copy almost any type of marking.

Deleting markings

To delete any marking, simply select it and press **Delete**. Hold down **⌘** or **Ctrl** when deleting key signatures to remove multiple ones from a system.

Deleting a page

Selecting **Edit>Delete page** from the menu removes the current page from the output score.

Altering note-values

To alter a note-value, simply select the note or rest in question, and then use the keypad.

If several notes have the wrong note-value, bear in mind that you can drag a selection box around them to select them all, and then correct them all with a single key-stroke.

Inserting notes/rests

To insert a note somewhere, simply select another note and copy it where you want it to go with **⌘**-click *or* **Alt**-click. Alternatively, you can create a note or rest from the keypad.

If you wish to quickly add a note to an existing chord, select the chord and then double-click where you would like the new note to be added.

Deleting notes/rests

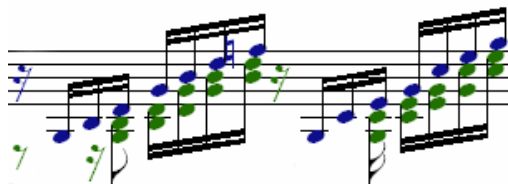
To remove a note/rest, simply select it and press **Delete**. You can select several notes/rests for deletion by dragging a selection box around them first.

Because AudioScore does not attempt to pad out bars with rests, deleting a note simply removes it rather than turning it into a rest. You can explicitly turn a note into a rest by using the keypad if you like.

AudioScore has no concept of an 'invisible' rest (unlike Sibelius/G7), so you needn't worry about leaving invisible rests lying about when you delete rests.

Two or more voices

When music is in two or more voices, AudioScore marks each note/chord/rest with an appropriate color (blue, green, orange or purple for voices 1 through 4). In this example the top notes are colored blue (voice 1) and the bottom ones are green (voice 2):



To change the voicing of a selected note/chord/rest, press **⌘1** *or* **Alt+1** to put it into the first voice, **⌘2** *or* **Alt+2** to put it into the second

voice, **⌘3** or **Alt+3** for third voice or **⌘4** or **Alt+4** for fourth voice. Alternatively you can use the keypad.

AudioScore shows any rhythmic mistakes for each voice independently in an appropriate color for the voice at the end of the bar. Take care when correcting any rhythmic mistakes that *all* voices end up with the correct number of beats in a bar.

Accidentals and articulation marks

These can be applied to the selected note using the keypad.

Barlines

You can alter the style of a barline by double- or right-clicking over it and selecting one from the menu that appears. You can also create special barlines from the **Create** menu.

Beams

You can alter the beaming of notes using the keypad.

Clefs

You can alter a clef by double- or right-clicking over it and selecting one from the dialog box (Mac) or menu (Windows) that appears. You can create a clef from the **Create** menu.

To insert a clef change in the middle of a staff, you can select and copy the desired clef and paste it where you want the clef change. AudioScore will automatically draw it at the smaller size.

Fingering *(not Lite version)*

You can create note fingering from the **Create>Text** submenu.

A dialog appears allowing you to enter up to five fingering values from dropdown boxes.

Click **OK** to place the marking in the score. If a note is not already selected, you must click on a note to place it. This marking can be repositioned by clicking it and dragging with the mouse, and can be editing by double- or right-clicking over it.

Guitar Chord Diagrams & Symbols *(not Lite version)*

You can create guitar chord diagrams and symbols from the **Create** menu and the **Create>Text** submenu.

A dialog appears allowing you to add/edit the chord symbol text in the top half and the diagram in the bottom half. Please note that AudioScore

does not synchronize the symbol and the diagram, so it is possible to create a diagram and symbol combination that does not make sense.

If **Show chord symbol** is checked, then you can choose the chord, type and bass components of the symbol from the drop-down menus.

If **Show chord diagram** is checked, it is possible to click on the appropriate strings and frets in the diagram to add finger position markings. Click at the top of a string to alternate between open string and silent. Click the arrows to the right of the diagram to adjust the starting fret.

Click **OK** to place the marking in the score. If a note or rest is not already selected, you must now click on a note or rest to place it. This marking can be repositioned by clicking it and dragging with the mouse, and can be editing by double- or right-clicking over it.

Instrument names

You edit the instruments used in the score:

- Locate the area to the left of any staff, where the instrument name should be written, and double-click to open a dialog box.
- Go through each instrument in the list, selecting it, clicking **Rename...** and choosing the new name from the list of standard instruments, or entering a name manually.

Multirests

You can create multirests from the **Create>Bar Rest** submenu. Choose the number of bars you want the multirest to last for and click **OK** to place the marking. Drag it horizontally to adjust its size.

Pitch

You can correct pitches by dragging notes up and down, or by typing the up/down arrow keys. We recommend using the arrow keys where possible, as the mouse can be more difficult to accurately position notes with.

If a chord has a notehead missed off, select the chord and double-click where you want to add it. Alternatively select another notehead in the same chord and copy it with **⌘**-click *or* **Alt**-click to where you want to add it.

Note that you can't alter the vertical position of rests, but this is a fairly rare requirement anyway. You can always adjust their position later on in another music program if necessary.

Slurs / hairpins (not Lite version) / ties

Make hairpins using the **Line** submenu found in the **Create** menu. After selecting the direction of the hairpin, if a note is not already selected, you must click on a note to place it. The start and end position of a hairpin can be adjusted by clicking near the ends of the hairpin and dragging with the mouse.

When a hairpin is selected (and **Attachment** is ticked in the **View** menu), a dotted line is drawn between the hairpin and the note it is attached to. AudioScore automatically reattaches hairpins to the closest notes when they are added, dragged or deleted.

Make slurs using the **Line** submenu found in the **Create** menu. After selecting the position of the slur, if a note is not already selected, you must click on a note to place it. Selecting multiple notes in a passage before creating a slur causes a slur to be created for the length of the selection. The start and end position of a slur can be adjusted by clicking near the ends of the slur and dragging with the mouse. The curvature can be adjusted by clicking and dragging near the centre of the slur.

Add/remove ties by selecting the appropriate note and using the keypad. The curvature can be adjusted by clicking and dragging near the centre of the tie.

Text (not Lite version)

You can create text from the **Create** menu. The top half of the **Text** submenu contains text types that can be attached to notes or rests (*staff text*). The bottom half contains types that can be attached to the back of the page (*system text*). Select the text type to be placed. If a note or rest is not already selected, you must now click on a note or rest to place it. A dialog box then appears, and you should type the text and click **OK**.

To edit existing text, double- or right-click over it so that a dialog box appears. The top part of it allows you to change the style of the text (between say, *Lyrics* and *Expression* for text attached to notes, or *Title* and *Composer* for text not attached). The middle part allows you to edit the text itself, and the bottom part shows you what effect this text will have on saved MIDI files and playback.

When text attached to notes or rests is selected (and **Attachment** is ticked in the **View** menu), a dotted line is drawn between the text and the note it is attached to. AudioScore automatically reattaches text to the nearest note when it is added, dragged or deleted.

Tuplets and triplets (*not Lite version*)

It is possible to create triplets and also click and drag existing ones to alter their vertical position. Before creating a triplet, the duration of the first note to be included needs setting to the *beat length* (this, multiplied by the triplet number to be displayed over the notes must equal the written, *not played*, duration that the triplet is to cover).

Then, either 1) Click on the first note to be in the triplet and type $\text{♯} n$ or **Ctrl**+ n where n is the number displayed over the notes, or

2) Choose **Triplet** from the **Create** menu. You can then either enter a single number, or a ratio in the form $n:p$, where n notes are played in the time of p . You can also choose whether a bracket should be displayed, plus adjust the brackets on all triplets in a score and in future scores. In the score window, if the triplet ratio is not 'standard', the ratio will be written instead of a solitary number.

If it was necessary to alter the duration of the first note to set it to the *beat length*, it should now be edited back to its original value for the triplet to fit in place. If the triplet is drawn in red, this is a warning and means that it does not fit the underlying note duration exactly.

Editing hints

If you make a mistake (e.g. by deleting the wrong marking) you can 'undo' this action by pressing $\text{♯}Z$ or **Ctrl**+**Z**. You can reverse an undo (called 'redo') by pressing $\text{♯}Y$ or **Ctrl**+**Y**. AudioScore remembers, and thus you can undo, up to the last hundred editing actions which you perform.

5. PLAYING, PRINTING AND SAVING

Once you have finished composing, you can transpose, print, playback and/or save the music for use in other music programs. In addition you can send the music directly to Sibelius or G7 and even create files suitable for burning to an audio CD.

Transposing

To transpose an instrument, for example to bring it within an easier-to-play/sing range, choose **Notes>Transpose...**

First select the instrument you want to transpose from the top box. Then set the interval by which you want to transpose by clicking **Up** or **Down**, and then choose the main interval from the right-hand box.

In the left-hand box, **Major/Perfect** leaves the main interval unaltered, **Augmented** adds a half-step (semitone), **Minor/Diminished** subtracts a half-step.

Printing *(not Lite version)*

This feature is available from the score window only (i.e. after pressing **Create score** from the composition window). You can print one or more pages of the score by choosing **File>Print...** You will be presented with a standard Windows print dialog which you should use in the normal way.

Playing

You can have your composition played back to you. Your computer will need a MIDI device (a component of most modern sound cards) and relevant drivers installed to make use of this feature.

When playing from the composition window:

Click where you would like the playback to begin so that a vertical line appears, and press either the **Play** button (marked with a green arrow) at the top left of the performance area to hear playback with your original performance timing, or click the **Play** button at the top left of the score preview area to hear it with the notated timing.

If playing from the score preview area it is possible to select which tracks are played by clicking over the instrument names with **Ctrl** or **Shift** held down so that the required staves become highlighted light blue. Press **Escape** to clear the selection.

Please also see **Playing from the performance area** in the chapter **3. EDITING THE PERFORMANCE**.

When playing from the score window:

Display the page where you would like playback to commence. To play from the beginning of the page, ensure that nothing is selected by clicking on an area of the page with no notation, or by pressing **Escape**. Then choose **Play/Stop** from the **Play** menu. Alternatively you can click **Play** on the toolbar. Do the same to stop the music.

To play from a particular position on the page, select notation in each of the staves you want playback from. AudioScore will commence from the start of the bar with the earliest selection.

While the music is playing, the currently played bars will be highlighted in dark gray. AudioScore will display consecutive pages as it plays.

Depending on the **Reverb** settings under the **Play** menu, the playback will vary slightly (*not Lite version*). Refer to their descriptions in **Saving MIDI files** later in this chapter.

To alter the tempo or dynamics add **Tempo** or **Expression** text from the **Create** menu to the note on the score where you would like the effect to begin.

To give a staff a different instrument sound, change its name by double-clicking to the left of it and choosing **Rename...** from the dialog box.

Note: If you have more than one MIDI device the default will be used, but this can be changed from the System Preferences (Mac) *or* Control Panel (Windows). AudioScore for Windows offers a shortcut **Computer audio properties...** button in the **General** pane of the preferences dialog.

Saving



You can save your composition to disk by clicking the **Save** button at the top of the composition/score window to open a standard save dialog box. You will be asked what name to store the composition as, and where to store it.

You can also choose what file type/format to save the composition in, by selecting a choice from the pop-up menu/combo box at the bottom of the dialog box. Note that some formats store less information about the scanned score than others (e.g. MIDI does not store specific slur,

articulation mark, note stem or beam direction information). Also note that not all music programs are able to open all the file formats listed.

Once saved, you can run your favorite music program, load the audioscored music and use it like any other.

Sibelius/G7 users

To send your score to Sibelius/G7, simply click the little  or  button next to **Save** at the top of the score window to launch Sibelius/G7. Within Sibelius/G7, a dialog will open asking you to choose instruments (*Sibelius/G7 v2 and higher only*) and the page size. After a second or two, the music will pop up in another window as a Sibelius/G7 document.

Once the music is in Sibelius/G7 you can do anything you like to it, just as if you had inputted it yourself.

Note: Versions of Sibelius/G7 earlier than v4.0 cannot import all of the musical information from AudioScore. Here is a table to summarize (details listed in successive versions are not repeated):

- v1.0 to v1.2 will not read triplets/tuplets.
- v1.3 to v1.x will not read guitar chords, fingerings or text formatting and cannot handle transposing instruments. It is also not able to import files as accurately as later versions.
- v2.0 to v2.10 will not read partial bars correctly.
- v2.11 to v2.x will not read guitar tablature staves, guitar chord diagrams, cross-noteheads, appoggiaturas (grace notes), cue notes.
- v3.0 to v3.x will not read percussion staves or scores containing more than 2 voices. Later versions also import files more accurately.

Saving PhotoScore (.opt) files

AudioScore is able to save compositions in the PhotoScore file format (as developed for the PhotoScore music scanning programs).

AudioScore, PhotoScore, Sibelius and G7 are able to read this format.

You can open a PhotoScore file in AudioScore by using the **Open** dialog box.

Sibelius/G7 users

PhotoScore files can be imported into Sibelius/G7 by opening them from the standard **Open** dialog box.

Saving MusicXML & NIFF files (*not Lite version*)

Save MusicXML and NIFF files if you want to open your score in a notation product other than Sibelius, for example Finale. Finale 2006 can open MusicXML files from the File menu. In Finale 2003 to 2005 use the 'Dolet Light' plug-in to open MusicXML files.

Please check www.neuratron.com/fileformats.htm for the latest information including which programs open these file formats.

Saving MIDI files

MIDI files were developed to store musical playback information, as opposed to printed notation, and as a result have a few limitations when it comes to storing scanned music. However, they are still very useful since virtually every music-editing product can read this type of file.

Please observe the following when saving MIDI files:

- If saving from the score window, there is an **Optimize for playback** option in the save dialog box. If the MIDI file is to be imported into a music notation program, then this should be turned off to improve accuracy. Otherwise it should be left on, as it improves the realism of playback.
- Note stem and beam direction, end of staff & page positioning, staff size, and multiple-voice-per-staff separation cannot be stored. If a file is to end up in a separate music program, then the final results are dependent on how that program interprets the music.
- Musical features such as slurs, clef changes, rests, articulation marks, dotted notes, tuplets, dynamics, expression markings and ties also cannot be stored as objects in a MIDI file. However, if they are present AudioScore will emulate them for playback. To clarify: If the MIDI file is played back from a *MIDI editing/playback* program, the features should be heard, but the features will not necessarily be present if opened and displayed in a *music notation* program.
- Although features such as time signatures, key signatures, and text (like lyrics and title, but not dynamics as these are used to emulate changes in playback volume) are saved in a MIDI file, not all music programs will necessarily use or display them. You may find there is

an option in your music program to ignore or make use of such information.

- Instruments allocated to each staff are stored according to the General MIDI standard. To give a staff a different instrument sound, change its name by double-clicking to the left of it and choosing **Rename...** from the dialog box. AudioScore intelligently chooses the correct MIDI instrument.
- Due to MIDI file constraints, only the first 15 pitched non-percussion instruments in the score can be saved, however all non-pitched percussion instruments are saved (the MIDI standard limits the number of available tracks to 16 with track 10 reserved as the percussion track).
- The default tempo is 100 Quarters/Minute, but can be altered by adding Tempo style text to a note where you would like the change to begin.
- *(not Lite version)* If selected from the **Play** menu, reverb (similar effect to the echo you hear in a room) is added to playback. This can be set to various presets between **Dead** and **Cathedral**, or a percentage can be entered. Note that this feature will only work on devices that respond to and recognize standard general MIDI reverb messages.
- *(not Lite version)* AudioScore also plays back appoggiaturas, or grace notes. As these do not fit the regular timing of a bar, they are played for around half the duration indicated, and the timing is taken from the following note. If you hear strange effects or notes hanging on, try shortening the notes to a quaver or less. If they are played back with a normal note's duration they are probably cue notes; you can easily change them to appoggiaturas using the keypad – see chapter 4. **CREATING A PRINTABLE SCORE.**

Saving Wave files *(not Lite version)*

When saving from the composition window:

AudioScore is only able to save a Wave file containing your original performance in the current track. This file format is not available if the track was recorded using a MIDI instrument or made with **Create track** or **Create Empty Track**.

When saving from the score window:

Windows users

This feature requires Windows 98 or later and a full-duplex soundcard – most modern soundcards are adequate. DirectX 8.1 or later must also be installed – the latest version should be available from Microsoft's web site.

Save Wave files if you want to burn your music to audio CD or convert it to MP3 format (e.g. for playback on a portable digital music player). Wave files (with the file extension .wav) store music in a similar way to CDs and as such retain no information regarding musical structure. The advantage gained is that these files sound the same (allowing for speaker differences etc) no matter what software or hardware they are played back from. The quality of the output depends on the quality of your MIDI device - AudioScore effectively plays back your scanned music as MIDI and records it at the same time (although you cannot hear the music). Saving a Wave file typically takes about the same amount of time as playing back the entire score from AudioScore.

Burning to audio CD (*not Lite version*)

It is possible to burn audio CDs from Wave files using **Windows Media Player**, available from Microsoft. The following instructions should work if using version 10:

- Click **File>CDs and Devices>Burn Audio CD....** (The menu bar may not be displayed, in which case click the down pointing arrow icon at the right of the title bar to display the menu).
- Click and drag your saved Wave files from Explorer onto the **Burn List** on the left-hand side of the window.
- Insert a blank CD-R or CD-RW in your recordable CD drive.
- Click **Start Burn** and wait while your CD is created.

Converting to MP3 (*not Lite version*)

Unless you already own third party software for encoding MP3 files, we recommend the use of LAME, a free open source MP3 encoder from www.mp3-tech.org. Please note that Neuratron Ltd accepts no responsibility for the use of this software or for any consequences that may arise from the use of it.

Saving files containing rhythmic mistakes

When saving from score window only: If you save a file containing bars that don't 'add up', bars that are too short will be lengthened, and those that are too long will be shortened.

To do this, the lengths of the bars are compared with the prevailing time signature. If a bar is too short, rests are simply inserted at the end. If a bar is too long, it is shortened by omitting one or more notes/rests at the end of the bar.

Although the lengths of the bars are adjusted like this, you are strongly advised to correct faulty rhythms in AudioScore in the first place rather than trying to fix them in another music program afterwards, as it will save you extra work.

Saving page and system format

Sibelius/G7 users

Sibelius/G7 uses **Make Into System** and **Make Into Page** (**Layout>Format** submenu) to ensure that the format of the music is the same as the original. However, if the notes seem uncomfortably close together or far apart in the end result, try changing the staff size in the **Layout>Document Setup...** dialog box. Alternatively, if you don't need the format of the music to match the original, select the whole score (**⌘A** or **Ctrl+A**) and unlock the format (**⇧⌘U** or **Ctrl+Shift+U**).

Performance mode

Performance mode can be selected from the output window's toolbar, the **View>Performance Mode** menu item, or by typing **⌘M** or **Ctrl+M**.

In performance mode the output score is displayed full screen and formatted so that it is easily read from a small distance. Pages are split in sensible positions where necessary and using the cursor keys allows you to turn to different pages or sections of pages. You can alternatively use foot controlled page turning devices like the Bili Footime Page Turner. This allows you to perform from your computer's monitor and quickly and easily change page using your foot whilst you are playing.

Performance mode can be switched off by clicking with the mouse or keying **Escape** or **⌘M** or **Ctrl+M**.

AUDIOSCORE VST PLUG-IN

(Windows XP/VISTA only)

Installation

- 1) After installing AudioScore Professional, select **AudioScore VST Plug-in** from **Start Menu>All Programs>Neuratron**.
- 2) From the displayed folder, copy the file **Neuratron AudioScore VST** to your shared VST Plug-in folder. For Cubase, this folder can be found in the Cubase application folder. Alternatively, you may copy this to your own preferred folder and set up accordingly in the VST host, e.g. Cubase.

Using the VST plug-in with Cubase

For applications other than Cubase, you should follow the preferred VST plug-in usage directions consulting your application's documentation if necessary.

- 1) Load Cubase SX/SL and create a **New Project** selecting the **Empty template**.
- 2) From the **Project** menu, select **Add Track>Audio** and **Add Track>Midi** to create an Audio (Wave) track and a MIDI track.
- 3) Select the Audio track and expand the **Inserts** tab. Click in an available slot and select **Neuratron AudioScore VST** from the resulting menu. You will now be presented with the Neuratron AudioScore VST plug-in interface.
- 4) Select the MIDI track and click on the **in** : menu to select the midi input for this track. From the resulting menu, select **Neuratron AudioScore VST**.
- 5) Set up the required preferences for using the VST plug-in by right-clicking on the **Neuratron AudioScore Input Assistant** in the system tray and choosing **Preferences....**

For more immediate note recognition feedback, ensure **Display input meter level** is checked on the **Recording** tab.

On the **Processing** tab, if **Rhythm recognition and timing correction** is checked, the MIDI output will be analysed and

aligned musically in real time and be returned to you one bar at a time, otherwise it will be returned using the original timing of the audio performance.

Check **Detect Syllables** in the **Processing** tab if the audio is of a person singing.

- 6) Neuratron AudioScore VST plug-in is now configured and ready to use with Cubase.
- 7) Within Cubase, setup your Audio track for this session. This may mean configuring the track to record from your microphone or importing a wave file.
- 8) Once this is complete, click the large **Record** button in the Neuratron AudioScore VST plug-in interface to start the session. The button should glow red.
- 9) Next, arm the MIDI track for recording, this track will receive the produced midi.
- 10) Click **Record** in Cubase and begin the session.
- 11) Click the **Record** button in the Neuratron AudioScore VST plug-in interface to end the session. There may be a second or two processing time whilst AudioScore finishes calculating the final notes. **Ensure you leave Cubase recording to receive these final notes.**
- 12) You will then be presented with the option of saving the recognized midi as a file. This is indicated by the highlighted picture of a disk with the label MIDI on the Neuratron AudioScore VST plug-in. Click this button to save the generated midi. You are also given the option of saving with or without pitch bend information.

Note, if you begin a new session by clicking record inside the Neuratron AudioScore VST plug-in this midi information will be lost.

- 13) Neuratron AudioScore VST plug-in is now ready for another session.

AUDIOSCORE MIDI INPUT DEVICE

(Windows XP/VISTA only)

It is possible to use AudioScore to play MIDI notes directly into other MIDI programs, using your own voice or performance. It is recommended that you are proficient recording into AudioScore as explained in **1. CREATING TRACKS** as this will give you a feeling for how best to perform in order to make the most of AudioScore.

Firstly you need to ensure the **Neuratron AudioScore Input Assistant** icon is present in your computer's system tray (area at the bottom-right of your screen containing the current time). If it is not, run **Program Files> Neuratron>AudioScore Input Assistant** from the **Start** menu.

Ensure it is active by right-clicking on the system tray icon and choosing **Enable Neuratron AudioScore MIDI Input** if necessary. If AudioScore is running you will need to close this first.

Next open the MIDI program you want to perform into, go into its recording settings, and choose **Neuratron AudioScore** as the MIDI input device. When you start recording you should find that the AudioScore input level window opens. You should then be able to sing or play into your microphone and the notes should appear in the MIDI program.

Note: Due to the way some MIDI programs work, AudioScore starts listening for notes as soon as you open the MIDI program and the input level window appears. If you find this annoying, you can manually enable and disable **Neuratron AudioScore MIDI Input** by right-clicking on its icon in the system tray and choosing **Enable/Disable Neuratron AudioScore MIDI Input**, or by simply double-clicking on it.

It is important to remember that AudioScore requires a small amount of time (called latency) to precisely recognize the note being performed into the microphone (in fact people also take some time to recognize pitch). This means notes will appear in the MIDI program a short time after you perform them which may cause issues, for example, when you are performing along to a metronome. You may be able to set the recording device's latency in your MIDI program to counteract this. Alternatively you may wish to set the latency in AudioScore to be exactly the duration

of one bar to ensure your notes appear in the MIDI program one bar after you perform them.

To change the **Neuratron AudioScore MIDI Input** latency, right-click on the icon in the system tray and choose **Preferences...** Under the **Processing** tab you will be able to drag a slider to adjust the latency.

The duration of a bar in seconds can be calculated using the following formula:

Bar duration = $240 \times \text{Time sig top} \div \text{Time sig bottom} \div \text{Tempo}$

Example: If time signature is $\frac{3}{4}$ and tempo is 100 BPM, bar duration is $240 \times 3 \div 4 \div 100 = 1.8$ seconds.

Important notes regarding latency

Notes will not be recorded properly if the latency is set too low. If this happens, **Neuratron AudioScore MIDI Input** will show a message in the input level window suggesting a better value. You should disable **Neuratron AudioScore MIDI Input**, adjust the latency to the value suggested, and then re-enable.

If you see the message **MIDI Input has fallen behind - Try disabling and re-enabling** or it recommends changing the latency to a value higher than you would normally expect (for example over a second) you should ensure no more programs than necessary are running on your computer (they could be using valuable processor time) and then disable and re-enable **Neuratron AudioScore MIDI Input**.

POSSIBLE PROBLEMS

Wave Input: Nothing is recorded

- *If no bars are shown in the input level window during recording –* Ensure your microphone is switched on and plugged into the microphone socket of your computer. In addition, make sure your sound card drivers are installed correctly and that you have the latest versions. The correct recording source (e.g. Microphone) must be selected from the **Recording** tab in the preferences dialog box (**File>Preferences...**). Also ensure the recording level is turned up from these preferences. Try singing or playing closer to the microphone.

Wave Input: Performance isn't recognized correctly

- AudioScore is not designed to recognize more than one note played at a time – in other words, no chords.
- Avoid blowing directly into the microphone (especially when whistling or playing a wind instrument) as this causes a great deal of noise making it difficult for AudioScore to hear the notes being performed. Also avoid touching or moving the microphone as this can also create unwanted noise.
- AudioScore may have trouble recognizing unnatural or synthesized sounds. You should perform using, for example, voice, whistle, wind, string or brass instruments, rather than synthesized or processed sounds (including many sounds from MIDI keyboards and sound cards).
- Perform clearly and cleanly (e.g. for violin or guitar, ensure silent movement of fingers changing strings and avoidance of bow/fingers tapping on the instrument's body).
- Perform at a steady tempo and, if possible, no faster than 120 QPM (Quarters Per Minute).
- If you are performing using a bass instrument such as a tuba, ensure that the microphone you are recording with is capable of capturing the low frequencies – otherwise AudioScore will not be able to hear what you are playing!
- Avoid recording when a significant amount of background noise is present. Also, sensitive high quality microphones can pick up low

frequency noise like traffic or household appliances air conditioning or heating systems.

- Mains hum and electrical interference can be a problem and often contains far more than just the 50/60Hz hum. This can typically be observed as a large amount of 'green' showing in the input level window even when you are not performing. To minimize any mains hum effects:
 - Use as short a microphone cable as possible
 - Avoid rooms with fluorescent lighting and dimmer switches
 - Keep the microphone cable away from computer monitors and mains power cables
 - Perform more loudly or closer to the microphone (taking care not to touch or blow directly onto it)
 - If the worst comes to the worst, obtain a better shielded microphone and/or sound card.

Wave Input: Recording takes a long time

- *If AudioScore continues to process your performance for a while after you click **Stop recording*** – If you are only editing in **MIDI mode** or do not mind a slight reduction in sound quality when adjusting pitch or stretching time in **Wave mode**, check the **Boost speed** option from the **Wave** tab in the preferences. If you require further improvement, try choosing a lower **Recording quality** from the **Recording** tab in the preferences. A faster processor also improves performance and increasing your RAM (computer memory) or shutting down other applications whilst AudioScore is running can also make a significant difference.

If all else fails...

Please check the Neuratron web site www.neuratron.com for answers to Frequently Asked Questions and, if supplied, technical support sheets included with AudioScore.

If you cannot find a solution to the problem then please contact your AudioScore supplier.

KEYBOARD SHORTCUTS

Available from composition window:

Ctrl+A	Select all notes in output
Ctrl+B	Create Bar rest
Ctrl+C	Copy note(s) to clipboard
Ctrl+E	Strip ends of song
Ctrl+F	Flatten pitch of note(s)
Ctrl+1	Join notes
Ctrl+2	Split note into two
Ctrl+3	Split note into three
Ctrl+O	Open files
Ctrl+Q	Quantize pitch to nearest semitone
Ctrl+R	Make note(s) ritenuto (sound held-back)
Ctrl+S	Save .wav/.mid file (depends on mode)
Ctrl+X	Cut note(s) to clipboard
Ctrl+V	Paste note(s) from clipboard
Ctrl+Z	Undo last editing action
Ctrl+Y	Redo last undone editing action
Delete <i>or</i> Backspace	Delete selected object
Escape	Deselect selection/Cancel recording
F1	Open online help
F5	Toggle scale mode temporarily
F6	Toggle note mode temporarily
F7	Toggle playback mode temporarily
O	Start/stop current track playback
P	Start/stop score playback
Space Bar	Start/stop recording
Tab	Select next object, losing previous selection
Shift+Tab	Select next object, keeping previous selection
Shift+cursor left/right	Select previous/next object, keeping selection
Ctrl+keypad+	Zoom in to display
Ctrl+keypad-	Zoom out of display
Cursor up/down	Move note up/down
A-G	Set selected note pitch

Available from score window:

⌘A or Ctrl+A	Select all objects
⌘C or Ctrl+C	Copy object to clipboard
⌘X or Ctrl+X	Cut object to clipboard
⌘V or Ctrl+V	Paste object from clipboard
⌘Z or Ctrl+Z	Undo last editing action
⌘Y or Ctrl+Y	Redo last undone editing action
Tab	Select next object
Shift+Tab	Select previous object
Cursor left/right	Select previous/next object
⌘ or Ctrl+cursor left/right	Select first object in previous/next bar
Shift+cursor left/right	Extend selection to previous/next object
⌘ or Ctrl+Shift+cursor left/right	Extend selection to previous/next barline
Delete or Backspace	Delete selected object(s)
⌘keypad+ or Ctrl+keypad+	Zoom in to display
⌘keypad- or Ctrl+keypad-	Zoom out of display
Q (Windows)	Display clef menu
K (Windows)	Display key signature menu
L (Windows)	Display line menu
T (Windows)	Display time signature dialog box
Alt+B (Windows)	Display multi-rest dialog box
H (Windows)	Create crescendo
Shift+H (Windows)	Create diminuendo
S (Windows)	Create slur (above staff)
Shift+S (Windows)	Create slur (below staff)
Ctrl+Alt+T (Windows)	Create tempo text
⌘L or Ctrl+L	Create lyrics text
⌘B or Ctrl+B	Create bar rest
Shift+K (Windows)	Create chord diagram
⌘K or Ctrl+K	Create chord symbol
⌘2 to 9 or Ctrl+2 to 9	Create tuplet of typed number
2 to 9	<i>Normal staff:</i> Higher interval to add to note
Shift+2 to 9	<i>Normal staff:</i> Lower interval to add to note
0 to 9	<i>Tablature staff:</i> Fret number of selected note
X	Flip selected note's stem
Cursor up/down	<i>Normal staff:</i> Move note up/down
	<i>Tablature staff:</i> Select note above/below in chord
Alt+cursor up/down	Select note above/below in chord
P (Windows)	Play/stop score

GLOSSARY

Accelerando a musical term meaning gradual acceleration. In AudioScore, applying Accelerando to note(s) (from Notes>Timing) causes the note(s) to gradually speed up.

Bit-rate (e.g. 8-bit or 16-bit) the higher the number of bits, the higher the sound quality. 16-bit is CD quality.

Chromatic (mode) in this mode, AudioScore displays pitch on a linear scale of semitones.

Decelerando a musical term meaning gradual deceleration. In AudioScore, applying Decelerando to note(s) (from Notes>Timing) causes the note(s) to gradually slow down.

Bends (mode) in this mode, AudioScore displays the nuances (detailed pitch changes) in your performance. These nuances are also heard during MIDI playback and can be edited by clicking and dragging with the mouse.

Diatonic (mode) in this mode, AudioScore displays pitch on a scale resembling musical score notation grouped in octaves. This is displayed non-linearly due to there being varying numbers of semitones between the stave lines.

Hertz (Hz)

Kilohertz (kHz) is the number of times something happens per second – kilo meaning thousands of times per second. The higher the hertz, the better the sound quality. 44100Hz (44.1kHz) is CD quality.

Latency how delayed the output AudioScore has recognized is compared to the actual current performance.

MIDI (mode) in this mode, AudioScore allows editing of MIDI notes without affecting the original 'Wave' performance. During playback, the interpreted MIDI notes are also played. It is possible to choose various MIDI instruments to play back the performance with.

MIDI (.mid) a standard specifically designed for the communication and storage of the data that a music sequencer records and plays. Also a file format saved by AudioScore that can be opened by most music programs.

MusicXML (.xml)

NIFF (.nif) file formats saved by AudioScore Professional which can be opened by various notation programs. See www.neuratron.com/fileformats.htm.

Scanned music (SCMS/.opt) the special music file format designed by Neuratron to store musical scores, and to make it easier to transfer such music to music notation programs such as Sibelius.

Note (mode) in this mode, AudioScore allows editing and play back of notes with continuous pitch and volume. AudioScore also displays notes in varying shades between black and red – the redder the note is, the more off MIDI pitch (middle A having a frequency 440Hz) it is.

Pitch-shifting adjusting the pitch of the original 'Wave' performance without changing its duration.

Processor usage the percentage of the computer's processing power that AudioScore is using. The faster the processor, the lower this is likely to be.

Quantize adjusting pitch or timing so that it fits a discrete set of values. For example, AudioScore allows notes to be quantized (adjusted to) the nearest semitone.

Real-time if a program runs in real-time it is said to be processing at the same rate that information comes in. In AudioScore this means that as the user performs to the computer, AudioScore is continually processing it, so that when the performance is over, everything is already recognized and ready for editing.

Recording quality the higher the recording quality (usually controlled by the sample rate and bit rate – see above and below) the more it sounds like the original real-life performance.

Recording source is what AudioScore 'hears' and processes. Examples are 'Microphone' and 'Line-in'.

Ritenuto in AudioScore, applying ritenuto to note(s) causes them to sound held-back.

Sample rate usually in hertz, the number of pieces of sample information that are available per second. The higher the sample rate, the more the recording sounds like the original real-life performance.

Sound card the card/circuitry in your computer containing speaker/headphone and microphone sockets. The sound card converts the analogue input from a microphone into a digital signal which

computer software can process. It usually also contains a bank of MIDI instrument sounds for playing MIDI data.

Sound card driver the program which tells the computer what type of sound card you have so that it can be controlled correctly; analogous to a printer driver.

Time-stretching adjusting the duration of the original 'Wave' performance without changing its pitch.

Vibrato adding vibrato to a note in AudioScore causes its pitch to rapidly vary slightly. Singers often naturally add vibrato to their performance to give it a fuller sound.

Wave (mode) in Wave mode, AudioScore allows editing and playback of the original 'Wave' performance.

Wave (.wav) a digital format for storing recorded music in its original form which AudioScore is capable of saving. Wave (or .wav) files are usually pure digital data converted from your original analogue performance by your sound card.

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