

Audio and the Mac

Sound and Music

Listen, Create and Communicate

Standard Equipment

on consumer Macs

- **Hardware**
 - Microphone
 - Webcam (video)
 - Speakers
 - Line in & out
 - CD/DVD drive
- **Software**
 - iTunes
 - iChat
 - Garageband
 - QuickTime Player
 - Audio MIDI Setup

Freebies

- Media Players
- RealPlayer, Windows Media Player, VLC
- Record & Edit audio
- Audacity and Audio Recorder
- Aria Maestosa MIDI editor
- Telephony & Chat
- Skype, Yahoo Messenger & Adium

Listen

- CDs
- Audio files - QuickTime formats
- Internet radio - real time broadcasts
- Streaming media - programs, podcasts, etc.

QuickTime Formats

Supported File Formats - audio, video & graphic Free Flip4Mac plug-in adds Windows Media formats

- 3DMF (Mac OS 9 & Windows)
- 3GPP
- 3GPP2
- AIFF
- AMC
- AMR
- Animated GIF
- AU
- Audio CD Data (Mac OS 9)
- AVI
- BMP
- CAF (Mac OS X)
- Cubic VR
- DLS
- DV
- FLC
- GIF
- GSM
- JPEG/JFIF
- Karaoke
- MacPaint
- MIDI
- MPEG-1
- MP3 (MPEG-1, Layer 3)
- MP2 (MPEG-1, Layer 2)
- MPEG-2**
- MPEG-4
- MQV
- M4A, M4B, M4P (iTunes 4 audio), M4V (iTunes video)
- PDF (Mac OS X)
- Photoshop*
- PICS
- PICT
- PLS
- PNG
- Quartz Composer Composition (Mac OS X)
- QCP (Mac OS 9 & Windows)
- QuickTime Image File
- QuickTime Movie
- SD2 (Mac OS 9 & Windows)
- SDP
- SDV
- SF2 (SoundFont 2)
- SGI
- SMIL
- Targa
- Text
- TIFF*
- TIFF Fax
- VDU (Screen Video Display List)

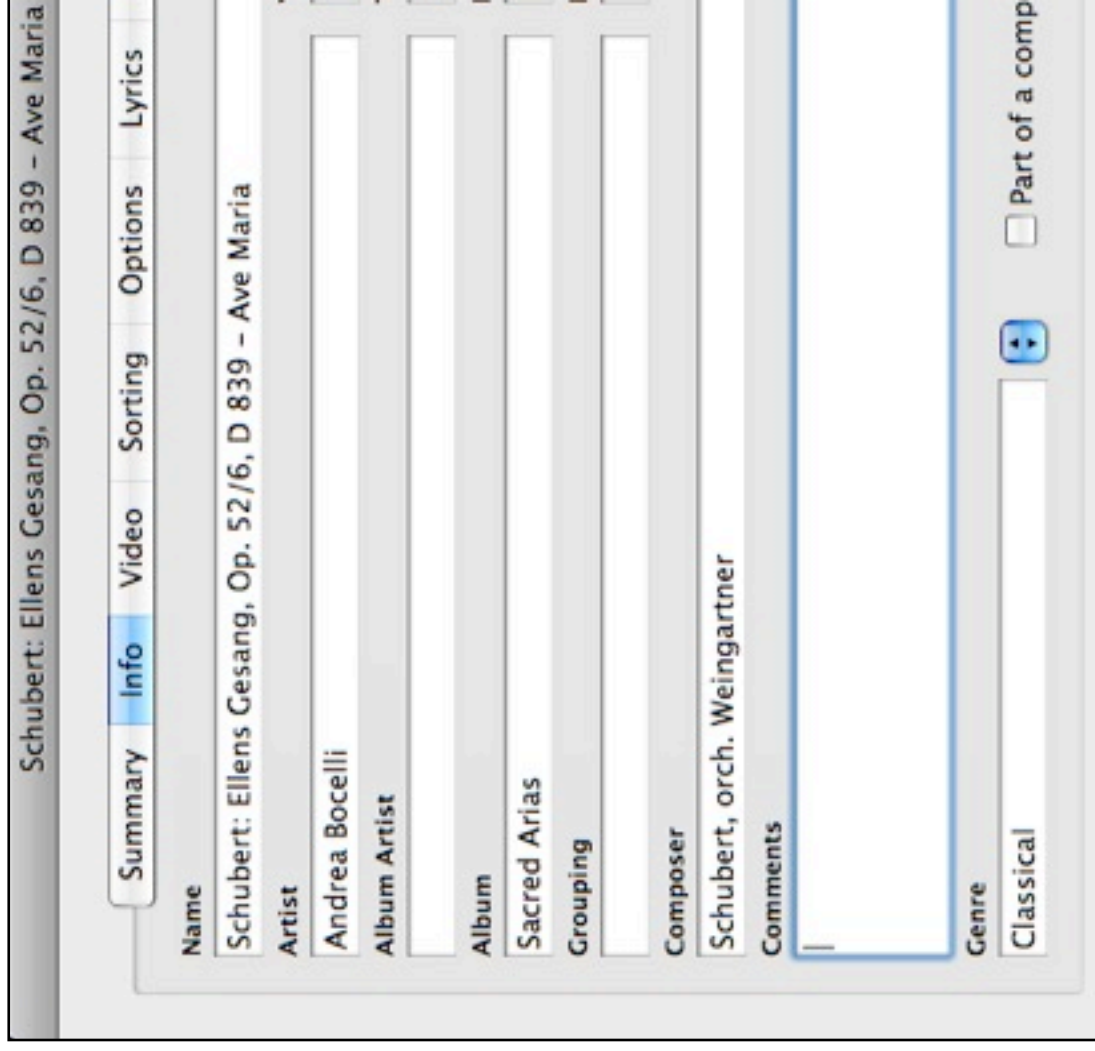
iTunes

the audio centerpiece

- Stores your music library
- Uses tags to display, organize & search
- Play CDs
- Plays audio files (QuickTime formats)
- Access iTunes Music store
- Burn CDs (audio, MP3, data)
- Burn CDs (audio, MP3, data)

What are Tags?

▲	Track #	Time	Artist	Date Added	Album	Genre	Kind	Bit Rate	Con
	4 of 16	2:33	Andrea Bocelli	7/9/09 3:57 PM	Sacred Arias	Classical	AAC audio file	128 kbps	Sch



- Hidden info
- Visible in many programs
- Import from the web (CDDB), or..
- Enter/edit manually

Internet Radio



- Real-time broadcasts
- Access in iTunes
- Hundreds of stations
- Listen from

Stream	▲	Bit Rate	Comment
▶ Alternative			
▶ Ambient			
▼ Blues (30 streams)			
📶 Absolute Blues Hits(1.FM TM)		128 kbps	1.FM's - Classic Blues and Rock blues channels
📶 Bar Rockin' Blues (clubfmra...		128 kbps	As close to Chicago's blues clubs as you can
📶 Bar Rockin' Blues (clubfmra...		64 kbps	As close to Chicago's blues clubs as you can
📶 Bienvenue en Louisiane		64 kbps	All cajun, all zydeco, all the time
📶 Blues Classics		128 kbps	American blues classics of the 30s to the 70s
📶 Blues Classics		64 kbps	American blues classics of the 30s to the 70s
📶 Cajun Fest		128 kbps	Cajun, Zydeco and Bayou favorites.
📶 Cajun Fest		65 kbps	Cajun, Zydeco and Bayou favorites.
📶 Chittlin Circuit Radio		64 kbps	The Chittlin Circuit is where The Blues and R
📶 Chittlin Circuit Radio		32 kbps	The Chittlin Circuit is where The Blues and R
📶 detour BLUES		128 kbps	handpicked selection of all styles of blues fro
📶 GotRadio Bit O Blues		128 kbps	Blues, Blues...Nothing but the Blues!
📶 HellHound Radio		128 kbps	Best of the 80s and below.
📶 IcebergRadio.com - Blues ...		56 kbps	Blues greats new and old: BB King, Etta Jame
📶 jazz89 KUVO		64 kbps	Jazz, Blues & Latin Jazz on Public Radio
📶 jazz89 KUVO		24 kbps	Jazz, Blues & Latin Jazz on Public Radio
📶 KSDS, Jazz 88.3		64 kbps	24/7 Straight-Ahead, REAL Jazz and Blues
📶 Power Radio International (...)		128 kbps	Playing music around the world, for you!
📶 radiolo Blues		64 kbps	Get your mojo juiced with blues music that s
📶 radioio Blues		32 kbps	Get your mojo juiced with blues music that s
📶 RoosterRadio.Net		64 kbps	Your Home For Classic Rock & The Blues
📶 Size Blue 42 Radio		96 kbps	Over eight decades of blues fueled by audioo
📶 Southern Fried Sounds		96 kbps	Playing the best of southern sounds!
📶 Texas Broadcasting Network		128 kbps	Texas #1 Country Station
📶 Texas Broadcasting Network		64 kbps	Texas #1 Country Station
📶 Ultimate Blues		64 kbps	Hosted by Holly Harris, the Ultimate Blues of
📶 THE VOID		128 kbps	Filling 'The Void' with the Best Rock and Blue
📶 The World Net Radio - Blue...		128 kbps	Great Blues Music. Chicago, New Orleans, al
📶 WWOZ 90.7		128 kbps	New Orleans' Jazz and Heritage Station
📶 WWOZ 90.7		24 kbps	New Orleans' Jazz and Heritage Station
▶ Classic Rock			
▶ Classical			
▶ College / University Radio			
▶ Comedy			

Streaming media

programs, lectures and podcasts stored on a server

- Audio on demand
- Free media players, audio (and video)
- RealPlayer, most popular



http://www.publicradio.org/tools/media/player/phc/2009/07/04_phc.ram

- Windows Media
- QuickTime
- VLC

Create

- Digitize records & tapes
- Grab and edit anything you hear
- Live recording
- Garageband - a hybrid music studio

Recording Format

- Tradeoff between quality and file size
- CD quality - AIFF or WAV = 10 MB/min
- Compressed (lossy) - MP3 or AAC
 - music 128 kbps = 1 MB/min
 - speech 32-48 kbps mono = 0.3 MB/min

Digitize Records & Tapes

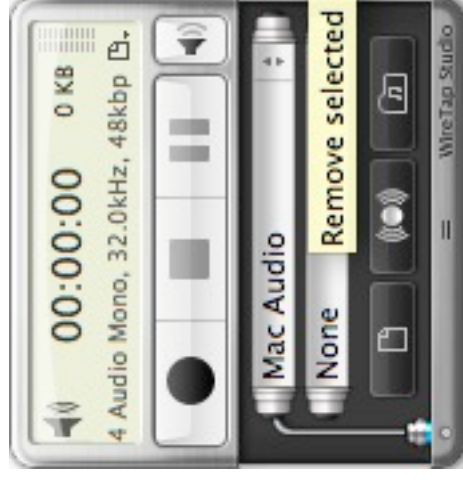
- Record/Tape player with preamp (Hi-Fi)
- USB Turntable
- Recording/editing software



Record from the web

- Internet radio, YouTube, streaming media
- iChat, Skype
- Audio device: mike, line in
- Audio Hijack Pro, \$32
- Wiretap Pro Studio, \$69

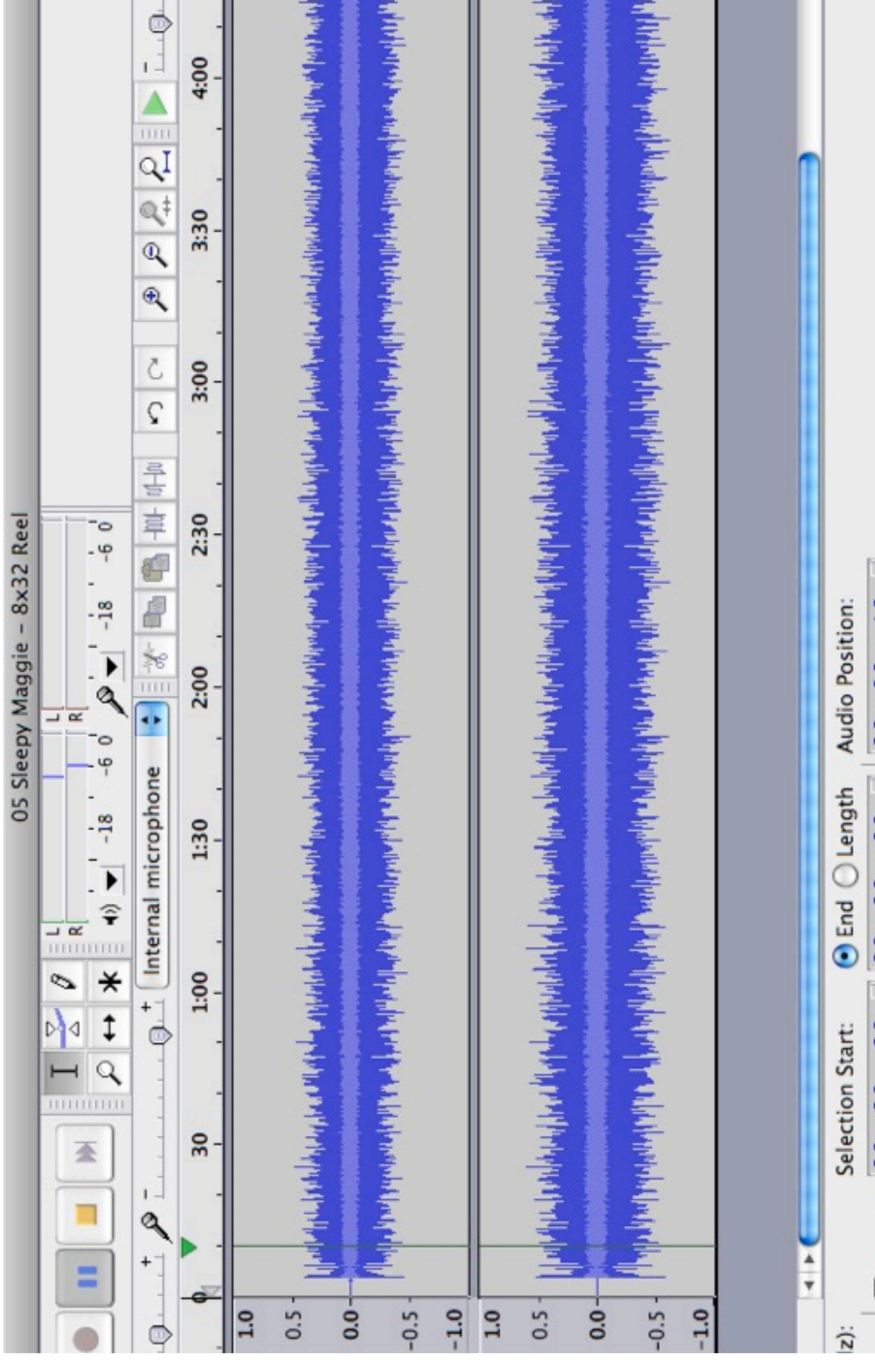
It's also an editor



Recording/editing S/W

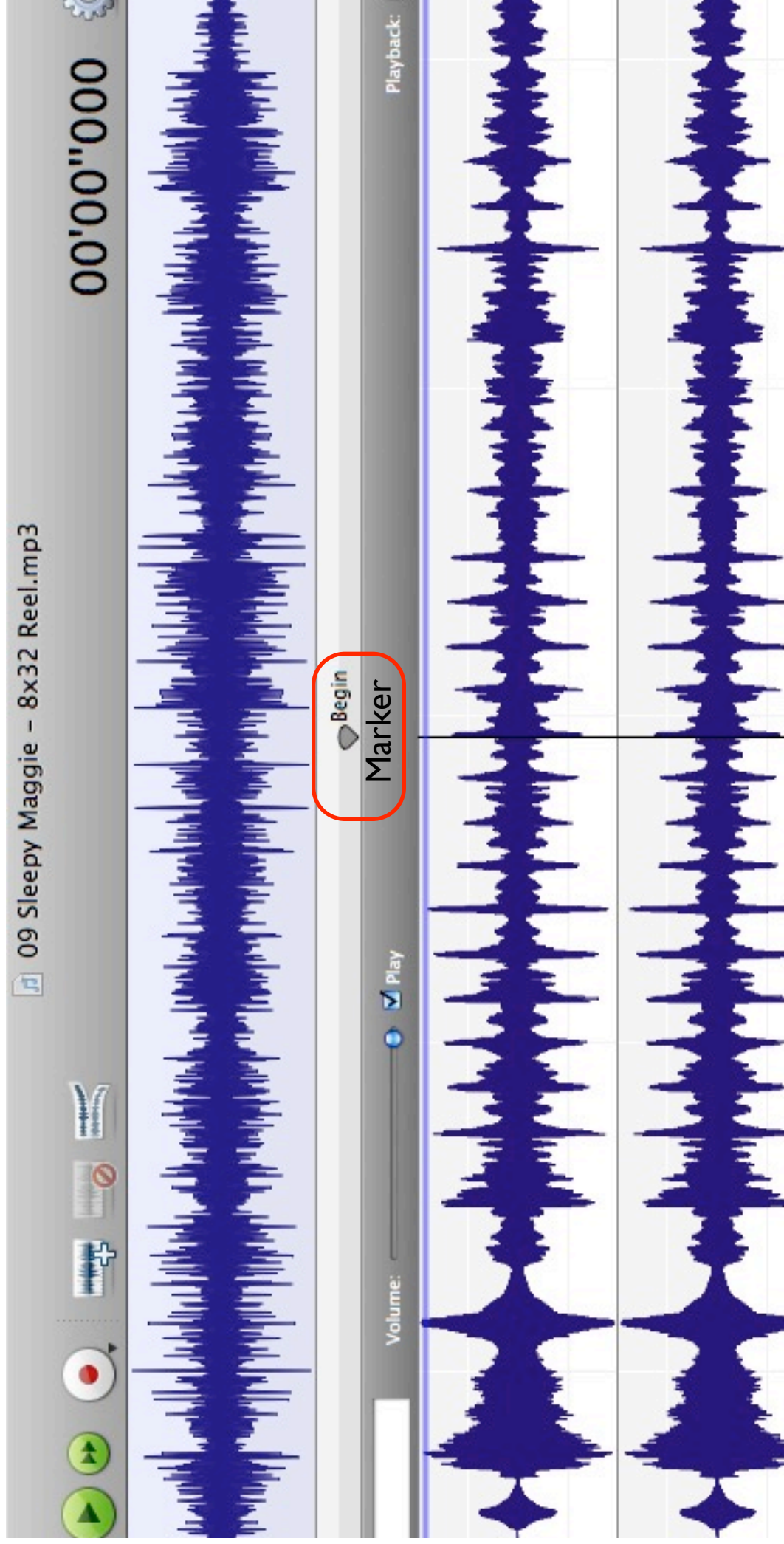
- Free
- Audacity (open source)
- Audio Recorder - limited
- Amadeus II \$40
- Sound Studio \$80
- Spin Doctor (w/Toast)

Audacity



Amadeus II

- My favorite, full-featured audio editor
- Reads and saves many formats



Communicate

- Share iTunes library on a local network
- Stream wirelessly to your Hi-Fi with Airport Express, \$100
- Instant Messaging (IM)
 - Chat, Skype, Yahoo Messenger



Instant Messaging = Chat

- iChat - Mac only
- Yahoo Messenger (free) - Mac & PC
- Adium - multiple IM networks
- Skype (free) - Mac & PC
- Call landlines (2-3¢/min)

MIDI

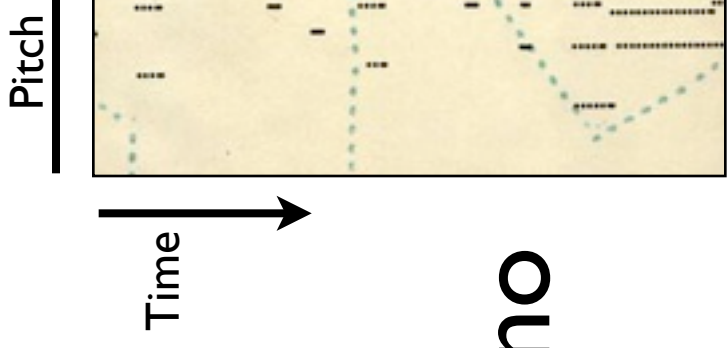
Musical Instrument
Digital Interface

A segue into Garageband

It's totally different.

- It doesn't store the audio wave
 - It stores commands, like a player piano
- Music created by a synthesizer

- Software, e.g. QuickTime Player, Garageband
- Hardware, e.g. external keyboard/synth



Advantages

- Files are extremely small - 8 KB/min typical
- Millions on the Internet - 4,600 Piano rolls
- Easily change tempo and pitch
- Edit notes
- Convert to music notation
- Multi-track recordings (orchestra)
- Assign instruments to tracks

MIDI Sequencer

Software

- Record, edit and play MIDI files
- Garageband
- Most sequencers are for Pros \$\$
- Aria Maestosa player/editor - free
- MIDI players
- QuickTime & iTunes
- Q-Midi

Garageband

A Hybrid Music Studio

- Digital audio (Real Instruments) sequencer
- Live audio (microphone)
- Sound files (e.g. iTunes)
- MIDI (Software Instruments)
- Loops - includes short, prerecorded snippets

The screenshot displays the GarageBand software interface. At the top, the title bar reads "GarageBand - 01 - Garage Doors". The interface is divided into two main sections: a track area at the bottom and a piano roll area at the top. The track area shows several tracks with their respective icons and names: Piano, Drums, Bass, Guitar, and Percussion. The piano roll area shows a grid of notes and MIDI data for various instruments, including "Upbeat Electric Piano 03", "RnB Horn Section 8.5", "Edgy Rock Bass 01.1", "Funky Electric Guitar 06.2", "Funky Pop Drum 08", "Funky ...rum 07", and "Funky Latin Drums 06.1". The piano roll area is color-coded: green for piano and drums, orange for horns and bass, and blue for guitar and drums. The piano roll area also shows a time axis from 0 to 13 seconds.

MIDI Piano Loop

Audio

Audio Loops

MIDI Drum Loops

ment Tracks

Garageband

Learning Mode

The screenshot displays a music production software interface with two main sections: a tracks view and a score editor.

Tracks View (Top):



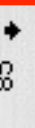
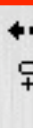
- Tracks:** A list of tracks including "Electric Piano", "Section", "Bass", "er", "Electric Guitar", and "Acoustic Bass". Each track has a volume knob and a solo button.
- Timeline:** A horizontal axis with markers from 1 to 9. A red vertical line is positioned at approximately 2.5.
- Track 1:** "Upbeat Electric Piano 03" (green). The piano roll shows a sequence of notes.
- Track 2:** "RnB Horn Section 8.5" (orange). The piano roll shows a sequence of notes.
- Track 3:** "Edgy Rock Bass 01.1" (blue). The piano roll shows a sequence of notes.
























Score Editor (Bottom):

- Track:** "Upbeat Electric Piano 03" (green).
- Timeline:** A horizontal axis with markers from 1 to 2. A red vertical line is positioned at approximately 1.5.
- Score:** A piano roll showing notes on a staff. A red vertical line is positioned at approximately 1.5.
- Keyboard:** A virtual keyboard is visible at the bottom.
- Controls:** A "no Roll" button and a "Score" button are visible.

A musical score for piano, showing a sequence of notes on a staff. The notes are primarily eighth and sixteenth notes, with some rests. A red vertical line is positioned at approximately 1.5.

Q-Midi Player, \$12 software

Pitch  85  +0   003:02

Tempo                       

Open

Gilbert & Sullivan

Auld Lang Syne.mid
buttercup.mp3
I am the Captain of the Pinafore.mp3
pinafore_overture.mid
Tit Willow.kar
When I was a Lad.mp3
why_and_wherefore.kar

Karaoke Files MP3/AAC

Audio Files

Cancel Open

MIDI GS Effects

REVERB Hall 2

Level Time Feedback

CHORUS Chorus 3

Level Rate Depth

MIDI Mixer

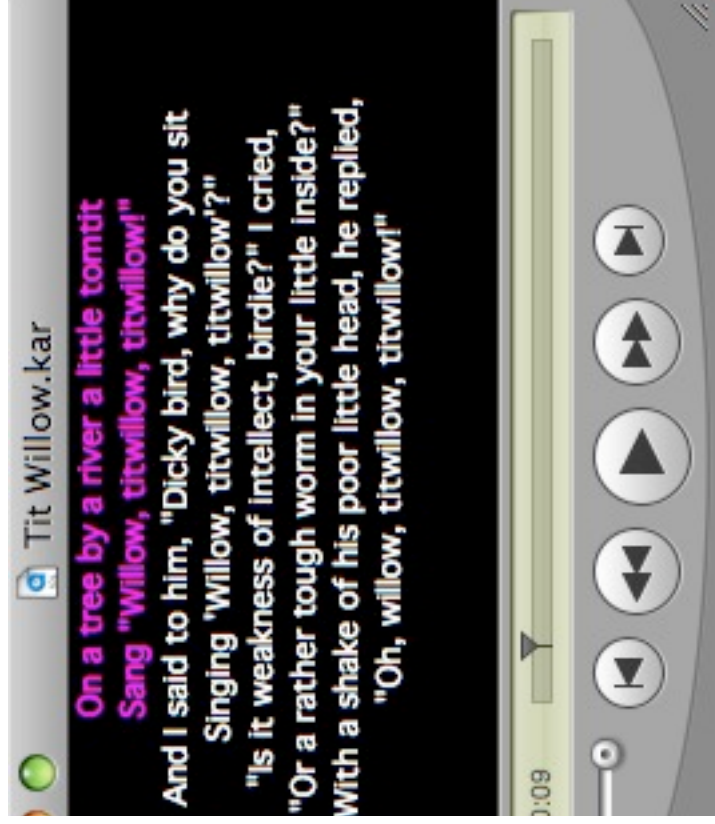
PATCH

01 Oboe
02 String Ensemble 1
03 Drawbar Organ
04
05
06
07
08
09
10
11
12
13

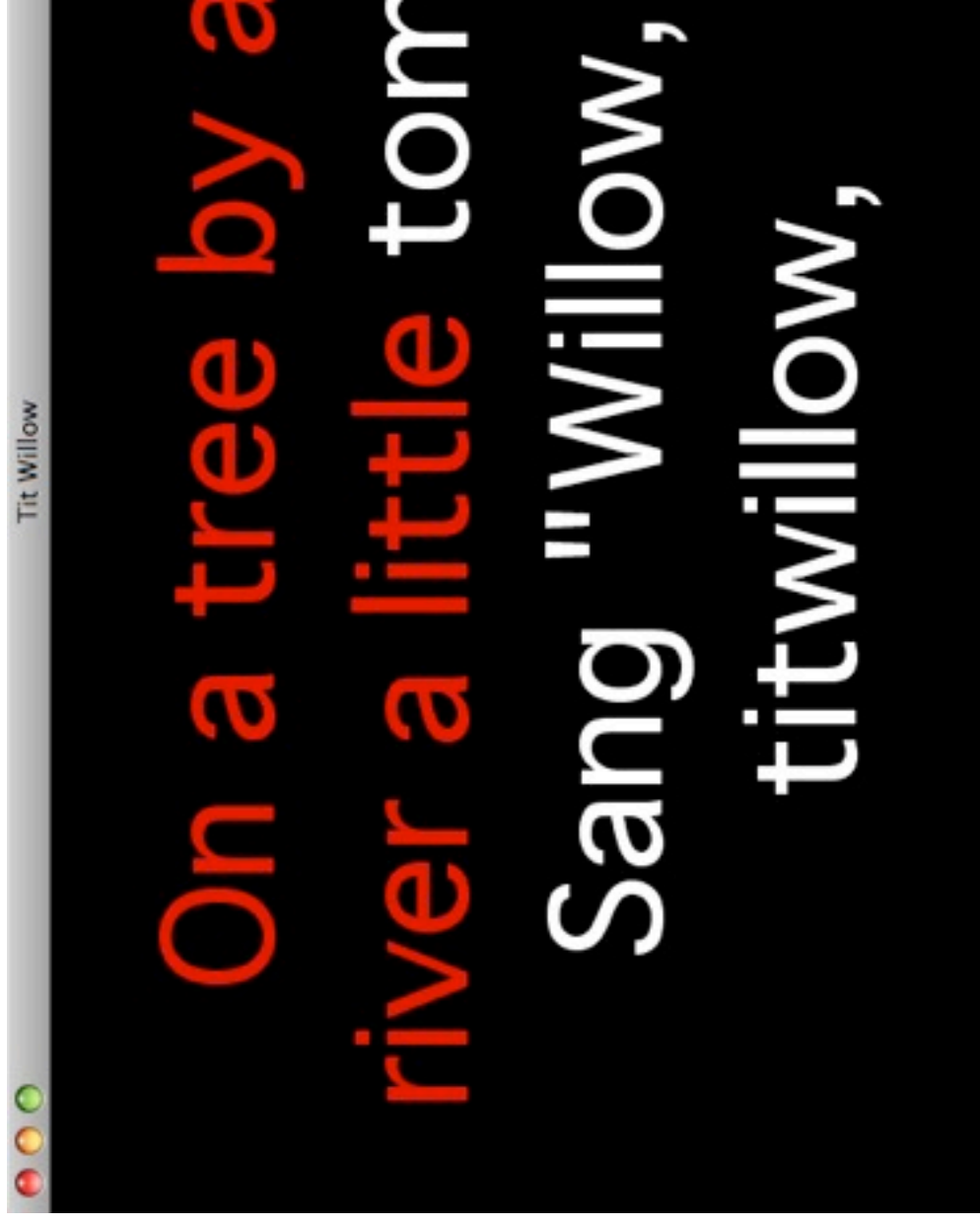
VOLUME PAN

as supported

Karaoke



QuickTime Player



Q-Midi

External MIDI Device

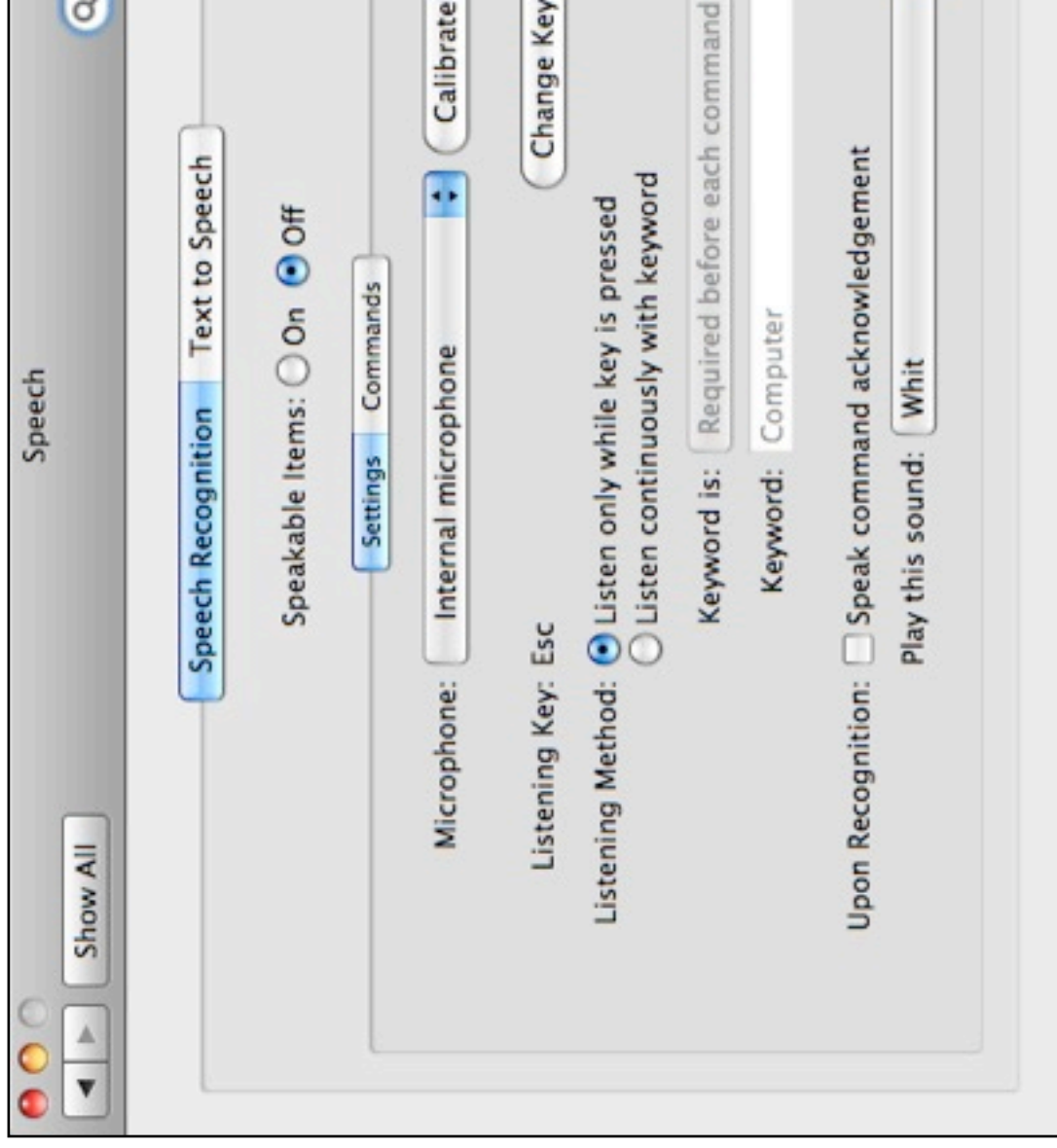


- **USB Interface. Apple's Audio MIDI Setup**
- **Play MIDI files - superior sound →**
- **Send MIDI data to the Mac ←**
- **Training: Ear training, Learn-to-play CDs**
- **Notation entry (sheet music)**

Speech

**Macs talk &
listen (control)**

Visually Impaired



Voice Recognition

Dictation Software

- MacSpeech Dictate, \$150
- MacSpeech iListen MX , \$45
- IBM ViaVoice, \$46
- Dragon NaturallySpeaking, currently not available - engine licensed to MacSpeech

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