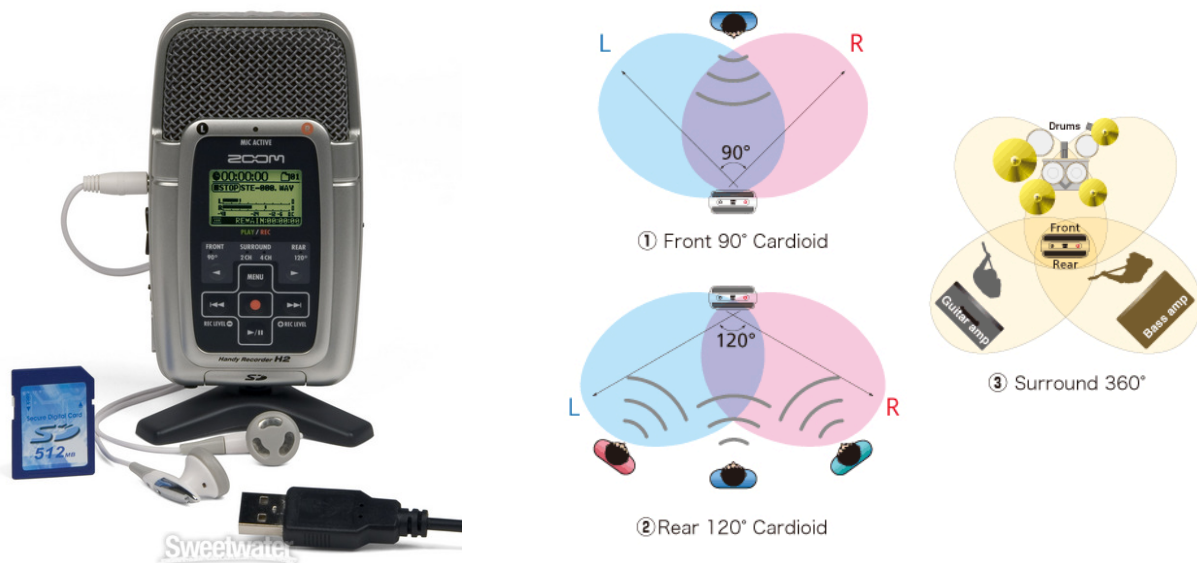


Introduction

This guide describes the process of recording and working with digital audio files for qualitative analysis. Parts of this guide originated as a set of steps for counselors to follow when recording their sessions with participants in a research project. As a result, it provides some fairly detailed instructions for collecting digitally recorded data using a particular recorder and microphone set up we have at CAPS. I have expanded these instructions to include some insights I have gained into software and hardware as well as some methodological observations related to transcription and analysis of digital audio. What you do with the data once it is collected depends on the type of data and the theoretical approach of your analysis, and thus lies beyond the scope of guide such as this. Your needs may be different, and I would be happy to discuss other options using different hardware and software. However, I have found that portable recording equipment designed primarily for musicians and film makers represents a huge advance over recordings made with cassettes, low-resolution digital voice recorders, and even minidisc recorders.

Which digital recorder should I buy? (Update 9-07)

The Samson Zoom H2 is a clear choice. At \$200, this recorder is simply a great buy with no compromises. It is half the price of the Edirol R-09 which has been my first choice up until the release of the Zoom H2. My experiences with the larger, \$300, Zoom H4 have confirmed that Samson products have excellent sound quality. Like the Edirol, the Samson is tiny, records to SD cards (512 MB card included), is powered by 2 AA batteries, and records in mp3 or wav formats up to 24/96 resolution. You can rename files and place them in folders without connecting to a computer. Unlike the Edirol, the H2 has four built-in mics arranged front and back to capture surround sound. The included stand allows you to position the recorder to easily capture focus groups, lectures, or one-on-one interviews in stereo or even four channels.



Product Description: <http://www.zoom.co.jp/english/products/h2/index.php>

Manual: http://www.samsontech.com/products/relatedDocs/H2_user_manual.pdf

An audio review of the H2 recorded with the H2: <http://mefedia.com/entry/3423836/>

Review: <http://www.oreillynet.com/pub/a/oreilly/digitalmedia/2007/09/13/review-zoom-h2-surround-recorder.html>?

What is MP3 and what does it have to do with qualitative research?

Analog recorders store sound as a magnetic coating on thin plastic tape, usually housed inside a cassette. Digital recordings store sound as a series of numbers; each number represents a sample or cross section of the continuous sound vibration. In order to fool the ear into hearing a continuous sound wave, digital recordings capture thousands of samples per second. This results in the rather large computer files. For example, music stored on CD that we buy at the record store consists of large wav files of about 10 megabytes per minute of music. These wav files are so large that they quickly become unwieldy when stored on a computer. MP3 is a standard way to compress these large digital audio files. The growth of the Internet and increasingly powerful home computers have made MP3 a very popular format for storing, organizing, and distributing music files over computer networks. MP3 files sound very similar in quality to the standard wav format that comes on a music CD, but MP3 compression software removes data from the original audio that your ears cannot really hear, such as very high or low frequencies. By removing these frequencies and compressing what is left, MP3 compression software can reduce the size of audio files to one tenth of their original size before you can really notice a difference in audio quality. This compression process is often called “ripping” a CD. You could compress MP3 files even smaller, and reduce the number of samples per second, or bit rate. But the lower the bit rate, the greater the trade-off in terms of sound quality. For this reason, I recommend using what has become a standard MP3 bit-rate: 128,000 per second.

Why use digital audio for data analysis?

The MP3 format not only sounds a lot better than traditional audio-cassettes, but it is easier to store and takes less time to duplicate and transfer to a computer. When we record interviews or counseling sessions using MP3, this results in clearer sound and better sound means less time and fatigue involved in transcription and analysis. Gone is the sense that you are listening to your informant’s voice through a wall of static and rumbling bass that is typical with analog tape recorders. MP3 files can be stored on an MP3 player, a CD-R, or a computer hard drive. For example, if a standard music CD can hold 80 minutes of music in wav format, you can fit ten times more, i.e. 800 minutes or 13 hours of MP3 audio onto one CD-R. CD-R’s are less expensive than audio-cassettes, and digital files can be transferred onto CD at very high rates without any loss of sound quality. Having multiple backup copies ensures you won’t lose your data and that you have it with you when you need it. Each time an analog tape is dubbed, e.g. to send to a transcriptionist, some of the audio quality is lost with each copy. This is not a problem with copies of digital files because each copy is essentially identical to the original. Digital files can also facilitate data security. CD-R’s and computer folders containing MP3 files can be password protected or even encrypted so that only the researcher can access the audio data. You can also “bleep” out identifying information from an interview (e.g. “My boyfriend’s name is *bleeeep*. He lives on *bleeeep* street”.) This means that you can edit out personal health information so that your project complies with HIPAA regulations. You can also change the pitch of a voice while retaining the speed of the recording, effectively altering the sound a voice, without slowing it down. This is useful for presentations where you want to play a segment of audio but make the voice unrecognizable.

Besides the better sound quality and ease of duplication and storage already mentioned, digital audio has some distinct advantages over analog tapes (cassettes or microcassettes). Because MP3 files are recorded at a fixed bit rate, MP3 files always play back at the same speed with which they were recorded. Changes in pitch are a common problem with tapes, in that they may

record at one speed on one tape machine and then when played on another machine, they will play either faster or slower. The resulting change in playback speed alters the pitch and the feel of the voice. Even the slightest drop in pitch or speed can lead one to interpret what they are saying differently. Slower playback makes them sound drunk, and faster playback makes them sound nervous or on speed. Although, MP3 files record and play at a fixed speed, playback speed can be manipulated to make a recording play at a slower or faster tempo while preserving the pitch. This is very useful for transcription.

Another advantage of a constant playback and record rate is the ability to precisely index or bookmark a selection in an audio file. For example, you have noted in your transcript that there is an unintelligible utterance at 2 minutes and 32.457 seconds in the recording. You want to ask someone else to listen to it and see if they can make sense of it. If you give them a tape, they will have trouble finding it because their tape player may play at a different speed; what happens at 2:32.457 on their machine may be different than with your tape player. However, this segment will always be found at a precise time on a digital recording, no matter what computer or MP3 player you are using to listen to it. Using one of the audio editing software programs described below, you could also cut and paste a short segment and attach it to an email. You could store your audio data on an ftp server so a transcriptionist could download it. You can also play segments of your data in a presentation or make it available on the web so that readers can hear what your transcript is attempting to represent.

The difficulty of working with cassettes for analysis has led many qualitative researchers to rely heavily on text transcriptions as a basis for their analysis. This reflects a particular view of spoken language as merely a *window* into concepts, beliefs, experiences that are seen to exist in the mind of the speaker. According to this view, there is little difference between written words and the spoken words they represent. This is a bit like saying a dead butterfly specimen pinned down in a display case is equivalent to watching a live specimen fluttering and interacting in its environment. More recently, following the linguistic turn initiated by Wittgenstein, Garfinkel, and Sacks, social science researchers have increasingly come to view language use as a phenomenon in itself.¹ According to them, we cannot separate the content of language from its contexted, situated practice. Meaning resides not in the fixed semantic definitions of the words used, but in the situated context and manner of an utterance's delivery. Language and meaning is a social phenomenon, not a shared code through which fixed meanings are transmitted and decoded by individual minds. In light of the complexity and situated character of spoken discourse, no transcript, no matter how detailed, can ever completely represent what is communicated in spoken interaction. Much of what we say is communicated before we even say a word, for example, in the in-breath preceding an utterance, little clicks or pops of the tongue or lips, a pause, a certain tone or timbre of voice, or simply in the intensity of the voice or the rhythm of and syncopations of an utterance. In addition to these musical aspects of spoken discourse, a great deal is communicated through bodily gestures, especially with the eyes. This has led some researchers to use video instead of audio, however this is no panacea as it greatly magnifies the size and complexity of the data one is working with.² For example, where do you focus the camera lens, and how do you transcribe gaze and bodily movements and synchronize these with speech? One of the reasons I use digital MP3 audio is because it allows me to focus my analytical attention not only on the content, the words, of what my informants are saying, but

¹ Wittgenstein, L. (2001). *Philosophical Investigations*, trans. G.E.M. Anscombe. Oxford: Basil; Blackwell; Sacks, H. (1995). *Lectures on Conversation*. Oxford: Blackwell.

² Heath, C. (1997). The Analysis of Activities in Face to Face Interaction Using Video. In Silverman, D. *Qualitative Research: Theory, Method and Practice*. London: Sage pp. 183-200.

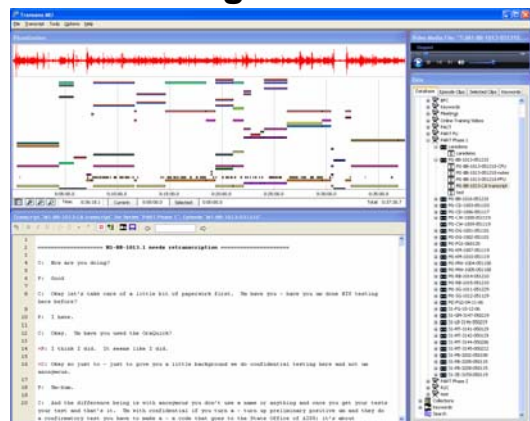
how they say it, when they say it (in relation to prior utterances and actions), and what they are doing by saying it in the context of interaction. All these details tend to be lost when analog recording technology is used or when spoken discourse is transcribed, i.e. translated into written text.

The fixed playback speed of MP3 files also makes it possible to index, or divide a digital music or video file into smaller chunks to facilitate comparative analysis, something that is not possible with a tape recording. The ability to instantly access a segment of a larger file using digital indexing represents one of the key advantages of digital media for qualitative analysis. This also makes it possible to code an MP3 file by selecting segments and linking these to notes, codes and memos. In ATLAS.ti, you can rename the segments with key terms or concepts exemplified by the segment you have selected. You can then sort them in network views allowing you to juxtapose segments from multiple interviews. **This means you can do much of your selection and annotation and analysis of your data without bothering with any transcription or coding.** Once you have a better idea of what segments are important to your current research questions, then you can selectively transcribe what you need for further textual analysis and decide before hand what level of transcription detail you will need to support the analysis, e.g. from detailed Jeffersonian transcription to traditional verbatim transcripts, to a rough gloss of the topics discussed at different points in the interview. This approach can help you avoid the enormous expenditures in time and money that typically go into transcription and “cleaning” of transcripts that you may never even use in your final analysis. Keep these potential savings in mind when I describe the cost of MP3 recording equipment below.

This ability to index a digital file enables you to synchronize your transcription to the source audio. This is important if you want to refer to the original recording rather than rely solely on your notes or text transcripts as your “data.” Certain software programs used for qualitative analysis, like Transana, will allow you to synchronize transcripts to a digital audio file, much like a Karaoke machine. Such synchronizing and linking is not possible with cassette tapes. Finally, if you want to measure how long a particular phenomenon takes, digital audio and video allow you to precisely measure the temporal unfolding of social interaction. For example, in my research, I measure and tabulate the amount of time counselors spend discussing various issues with their clients. By indexing the counseling sessions in this way, I can also retrieve related segments for further comparison and analysis. I can even create time lines that chart the sequence and distribution of various communication formats over the course of the session.

Approaches to transcription of digital audio recordings

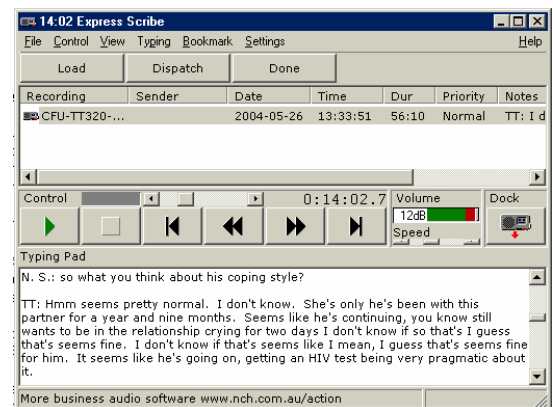
Transana: My preferred program for transcribing and annotating digital media files is Transana (<http://www.transana.org>). Transana allows you to synchronize the playback of your video or audio files with the transcript and it provides support for Jeffersonian transcription. It provides a waveform that helps you navigate the file precisely. . Aside from transcription, Transana’s Multi-User version also provides a number of tools to assist data management and analysis among a dispersed team of researchers. The Secure Resource Broker allows users to send large files for transcription and analysis by others via secure ftp. Transana 2.20 introduced a



number of visualization features that uses colored matrices to show the sequence and distribution of keywords in time. Transana is unique among qualitative analysis software programs in its use of time as the metric, rather than line numbers in text transcripts. This allows users to link multiple notes and transcripts to the same audio/video file, thus facilitating methodological triangulation by multi-disciplinary research teams. More information on ways to use Transana can be found here: <http://www.palmpal.org/Transana2.20MUTraining0707.pdf>.

Transana requires an audio file in order to use the time codes and charts. You can create an audio file from a text transcript using text to speech software and insert time codes between each word automatically. This enables you to use Transana to analyze file for which you have no source audio, either because it was destroyed or because it never existed, i.e. you are working with written documents rather than recorded interviews. Instructions for analyzing text only documents in Transana are available here: <http://www.palmpal.org/atc.html>.

Express Scribe functions much like a tape transcription machine, with the usual play, stop, forward, backwards buttons. You can even buy a foot pedal for your computer that starts and stops the tape, leaving your hands free to type. You can also select certain keys to start and stop to playback (e.g. F10, F11, etc.). The software is free and available at <http://www.nch.com.au/scribe/>.



Transcriber (<http://www ldc.upenn.edu/mirror/Transcriber/>), is designed produce segmented transcripts in XML, a hypertext format used mostly for online publishing. Alan Stockdale has written a guide for using Transcriber available at (<http://caep.edc.org/QualAudio.pdf>).

For more on digital transcription, see

- David Woods' Transana Documentation (<http://www.transana.org/support/documentation.htm>)
- Jim Drisko's pages on transcription (<http://sophia.smith.edu/~jdrisko/transcription.htm>).
- Graham Gibbs on preparing data (http://onlineqda.hud.ac.uk/Intro_QDA/preparing_data.php)
- Comparison of multimodal annotation tools – a workshop report that discusses ELAN, EXMARaLDA, TASX, and Anvil software for annotating video and audio files (<http://www.gespraechsforschung-ozs.de/heft2006/tb-rohlfing.pdf>)

Converting Digital Audio to Cassette

If you work with a professional transcriptionist who only transcribes from cassettes, you will need to record the files from the digital recorder, CD, or computer onto a cassette tape recorder. This process is similar to recording a music CD to a tape, only connect the line in jack of a tape recorder to the headphone or line out jack of your computer. Going from digital source to analog tape, you will still end up with better quality audio than if you had made the source recording with an analog cassette recorder. The transcriptionist will still benefit from the improved audio quality and this will cut down transcription time and cost. However, there is no substitute for selecting, analyzing and transcribing your own data. By outsourcing transcription you are relying on the transcriptionist to translate it into written language and thus to select and analyze the data for you.

Speech-to-text software

In the future it may be possible to have computers transcribe our interviews for us, but this is not currently possible. The problem is that computers have mainly been designed to work with written language which follows predictable rules that can be anticipated by a computer. Spoken language, such as a face to face interview, follows very different rules from written language. Computer software cannot turn spoken conversational dialog into text because computers are not able to understand the complex grammar, overlaps and constant back and forth of spoken interaction. Computers can be trained to take dictation from one voice at a time, but that is essentially a person speaking in written prose. This dictation software is called, Dragon Naturally Speaking Standard (<http://www.nuance.com/naturallyspeaking/standard>).

Dragon can be used as an aid to transcription, basically as a replacement for the keyboard, but you still need a human transcriber to listen to a spoken utterance, e.g. from a recording of an interview, and then pause the recording, and speak a version of what they heard in prose. In the process, the transcriber is converting spoken conversation into whole words, correcting grammar and adding sentence structure and punctuation. The text appears about couple of seconds after speaking it and the software will “type” it into any text entry window you happen to have your cursor set on. Using dictation software saves you the task of typing, but, like typing, the dictation software is prone to errors, and it doesn't understand acronyms or slang. The software works best with a relatively new computer with at least a Pentium 4 and 512 MB, although 1 GB of ram is recommended. The software works best with a good headset mic that uses its own analog to digital converter and plugs into your USB port, rather than into your soundcard. I recommend the Plantronics DSP500 which costs around \$50. I use transcription software program to play the recording back one phrase at a time so that I can dictate it into the headset mic. Dragon is also useful to help you “write up” memos, by simply dictating them into the computer.

Recording Phone Interviews

If you would like to digitally record phone interviews, you can either record them onto your computer using a free software called Wav Pad <http://www.nch.com.au/wavepad> or onto an MP3 recorder described in the next section. You will also need a phone line splitter (Radio Shack model 279-604) and an adapter (Radio Shack model 43-1237) to port the phone interview from the phone jack on the wall to your recording device.

Using the Nomad Jukebox 3

(Note: This information is provided for people who are using the Nomad Jukebox 3 with the Sound-Professionals SP-PASM2 microphone. This recorder is a real workhorse and but it has been supplanted newer flash based recorders, such as the Samson Zoom H2 recorder. I still lend my Nomad gear to other researchers who do not want to purchase the Zoom for their project this section describes how to use the Nomad.)

The recording equipment you will be using to record your interviews consists of two items: a pre-amplified microphone and an MP3 recorder. MP3 recorders are complex little machines that have more in common with a laptop computer than a tape recorder. Instead of using tapes or minidisks, MP3 recorders store audio as digital files on flash memory or an internal hard drive. Hard drive models generally come in 20 or 40 gigabyte (GB) capacities. One GB equals 1000 megabytes (MB). There are so many MP3 players on the market and many also record sounds in addition to playing MP3 files. You may ask, what is so special about the Nomad Jukebox 3 (Nomad JB3) and isn't there something less expensive on the market? First of all, do not confuse this with other Nomad models such as the Nomad Zen, or the Nomad Jukebox 2.



My choice of the Nomad Jukebox 3 is based on too many variables to discuss here. My main considerations in choosing this model were its functionality for in-the-field recording and as a way to move large files from one computer to another. These advantages boil down to battery capacity, connectivity, cost in terms of storage capacity, and most importantly, sound quality. The Nomad is no longer made, but used ones can be found on Ebay for \$150-200. An alternative recorder that is currently made is the M-Audio Microtrack 24/96 (see below). The Nomad does not come with a case, but you can use any case designed for a portable CD player. Choose one with an extra pouch for the microphone, AC-adaptor and headphones.

Microphones for recording with the Nomad Jukebox 3

The Nomad does not have a built in microphone unlike like many tape recorders, minidisc recorders, and some mp3 players. Built-in microphones are generally a bad option since they pick up so much noise from the recording machine itself. MP3 players that do have a built in microphone are usually set up so that you can only record low quality mono wav files, not stereo

MP3 files. To record MP3, most players provide a line-in port that accepts either an analog or a digital (optical) signal. A line in port is different from a mic-in port in that the latter usually has a pre-amplifier, while a line-in port does not because line level signals are amplified by their source. Because it lacks a mic-in port, the Nomad requires an external amplifier to boost the signal coming from the microphone up to line level. This means you cannot use a regular walkman type external microphone with the Nomad because the resulting recording would be much too faint. You need to spend some extra money for a microphone with a built-in amplifier. I recommend the Sound Professionals SP-PASM2, pictured at the right. (<http://www.soundprofessionals.com>). It costs \$200 but, like the Nomad, it is well suited for field recordings and is a very simple-to-use, all-in-one device.



The SP-PASM2 microphone/amplifier is powered by a 9volt battery, the rectangular kind with the two silver snap on connectors on one end. **Be sure that you switch the microphone off at the end of the session so that you don't run this battery down.** I store my microphone with the knobs facing down in a paper drinking cup so that the switch is not accidentally turned on when stored in my bag. The battery is supposed to last for 70 hours, but that also means that, if left on, it will be dead in three days. It also has a red or green light that illuminates when the microphone is switched on. The light is very helpful for preserving batteries, since it helps remind you to turn it off. You may want to use rechargeable batteries that would be changed often to ensure that there is always enough charge left to record an interview. The light becomes somewhat faint when the battery is low, so be sure to check that it is bright and that you are getting a strong signal on the Nomad's level meters. **When in doubt, replace the microphone battery.** You can buy 9volt batteries at drug stores (like Walgreens here in CA) in packages of 8 for much less than most stores.

If you follow the directions for recording below, you will make consistently great recordings. In addition to the "on" and "off" switch and the gain knob, the SP-PASM2 has a small, three setting switch to control the level of amplification. The silver on and off switch is pretty simple, up for on and down for off. You know which way is up because the top of the recorder has a silver sticker with printed writing on it. The pre-amplifier can be set to boost the signal (gain) at one of three levels: 0dB, 29dB, or 50dB. Intermediate levels can be adjusted using the round knob. **To record an interview, the three-way switch should be set in the "up" position at 29dB.** The middle setting (50dB) is too loud and the down position (0db) is too soft. This is a bit counterintuitive, but just remember that when you are recording an interview the small black switch should be pointing up and the round knob should always be turned up to the maximum setting.

You can also use the Nomad to record live music. In fact, the JB3 replaced the minidisc and DAT machines that "tapers" have traditionally used for bootleg recordings. Because live music has a much wider range of volume than a voice recording, use the 0db setting to record live music. It will be faint but if you amplify it using one of the audio editing programs discussed above you will have great results. The 50dB setting is probably intended for nature recording, i.e. very faint bird sounds in quiet environments. Do not use the "mic-in" or recording gain

settings in the Nomad, as they only add distortion the recording. The built in microphones on the SP-PASM2 are very good but you can also bypass them with higher quality microphones and still use the pre-amplifier. This pre-amp/microphone unit also has a bass roll-off feature, handy for recording very loud live music, such as a rock band.

Troubleshooting the Nomad

If the Nomad will not turn on, or turns on but appears to be locked up, there is a reset button on the underside. You need to straighten a paper clip and insert it into a small hole next to one of the rubber feet to reset the Nomad. This problem should not occur in normal recording situations, as this problem generally occurs when the Nomad is interfacing with another computer. But, just in case, **keep a paper clip handy at all times**. I also suspect the Nomad is less likely to freeze up if it is **not** hooked up to the AC adapter, and running off the rechargeable battery.

One feature on the Nomad you should always turn off is the Infra Red Remote receiver. In any case, the infra red receiver may cause the unit to freeze during recording unless it is turned off. To turn this off, go the main menu (or press the “menu” button). Scroll down to “Jukebox Settings”, scroll down to “IR Remote: On,” and make sure it says “IR Remote: Off.” This can be toggled on and off by pressing the scroll wheel.

I have used seven Nomad recorders in my research and have had very few problems with freezing once I set the IR receiver to “Off.” If your Nomad starts acting strangely, e.g. freezing up, you can perform various maintenance functions in “rescue mode” as described here: <http://www.nomadness.net/modules.php?name=FAQ>

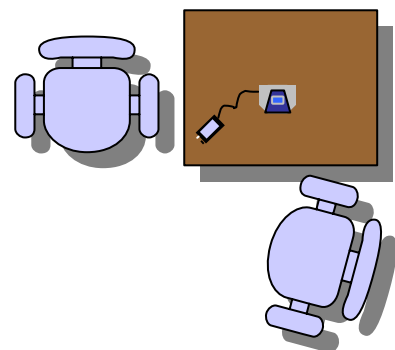
Troubleshooting the Microphone

If you aren't getting a signal from the microphone and all settings are set as suggested above, change the battery in the microphone. Make sure you have a spare battery or know where to find one.

Set Up the Room and Recording Equipment Before Interviewee Arrives in the Room

I have found that human error is the most common reason for lost recordings. A bit of preparation before the interview can greatly reduce the risk of lost data.

Microphone placement: This is a stereo microphone, so think of it like a head with two ears. Like a human head, the microphones are located on the sides of the box toward the front panel of switches. Because interviewees tend to whisper when they know they are being recorded, it's important to place the microphone a little closer to the client than to you. Ideally, one of the microphones (ears) should be pointing to you and one to the client so that the front panel of switches is facing perpendicular to a straight line drawn between you and the client. A common way to set up the microphone would be to place it on a desk between you, or if there is no desk, place the recording equipment on a chair. If you prefer to use Lavelier-style microphones, clipped



to the clothing of the speakers, these can be plugged into the SP-PASM2, which will amplify the signal for the Nomad.

Setting up the Nomad to record: Before participant enters the room, check that the Nomad is ready to record. Doing this without the participant in front of you will reduce the chance of human error in the recording process. It will also avoid focusing participant’s attention on the recording process as you fiddle with the recorder.

Check the battery level on the Nomad: The Nomad is powered by a rechargeable battery that should last around 10 hours when recording MP3. The Nomad will turn itself off to conserve power when it is not being paused to record. Make sure power cord (AC adapter) is plugged in, or that the battery indicator in the lower left hand corner of the screen is fully charged (i.e shows at least two of the three bars remaining).

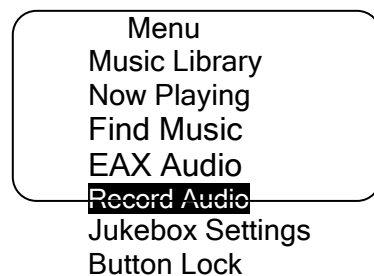
Plug in the microphone: Check that the microphone is plugged into the white Optical/Line In port on the left hand side (not to be confused with black headphone jack on the right). To help you remember which plug is which, refer to this diagram:



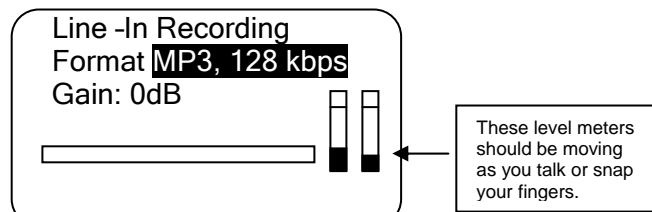
The following guidelines assume you are using firmware 1.32 on the Nomad. The “firmware” is the operating system.

Turn on the Nomad: Press the on/off switch on the left side of the Nomad **for at least two seconds**. (To turn it off you also need to hold it down for two seconds.) Wait a few seconds for main menu to appear as the recorder “boots up.” If you don’t see the main menu, press the “MENU” button to go to the main menu.

The main menu lists the following choices:



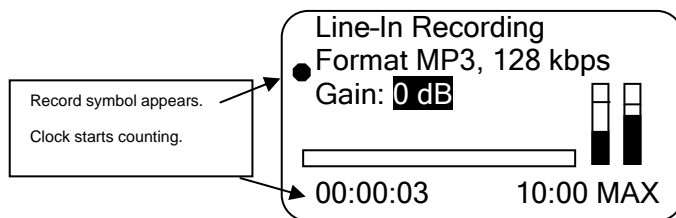
Use the scroll wheel on the right side of the player to scroll down to the bottom of the screen and select the just visible, “Record Audio”. Press the scroll wheel **twice** to select “Line-In Recording” as the type of recording. You should see the following on the screen at this point:



00:00:00 10:00 MAX

The recording format MP3, 128 kbps is the default and desired setting. You can now switch on the microphone. You should see some black in the vertical level meters. These give you a sense of the strength of the incoming signal from the microphone. If it is too high, there will be distortion. You can tell if it's too high if the level consistently hits the top part of the meter bar. If it's too low, then it will be too faint to hear during playback. Make sure the round knob on the microphone turned all the way to the right.

When you are ready to to start recording, press play button for 2 seconds. The play button is in the middle of the player. You will see a dialogue box that says "Preparing Recording" and then you will see the record symbol appear on the left of the screen and the counter clock begin counting the seconds.



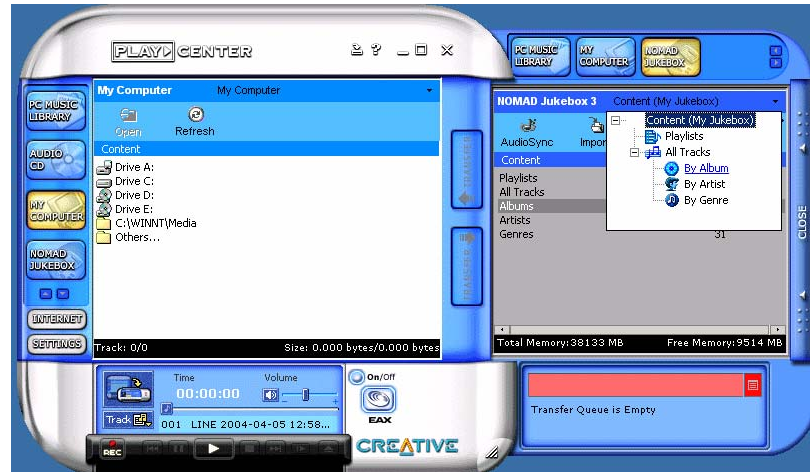
Now press play again, and the recording will pause. Note that you need to hold the play button for a second or two to initiate the recording process, but to pause or unpause, you can just push it quickly and there is no need to hold it down. Instead of the recording symbol at the left (●), you will see a double line indicating that it is paused. (▬▬) The player will stand by on pause for a long time while you get the interviewee into the room. If it's just left on "stop" not on "pause," it will eventually turn off to conserve power. Now you are ready to begin recording with a quick push of the play button. This preparation will save you a lot of anxiety over whether it recorded properly and will also minimize the disruption at the start of the session.

Before beginning the interview, state your name, the date, the interview id number, and any other relevant information that you will need to label the MP3 file once you transfer it to your computer. This is discussed in further detail below.

At the end of the interview, press "stop" (■) to save the recording. You can also hit the fast forward button during a recording session to save the previous recording onto the hard disk and immediately open a new recording in one step. The new recording begins after about five seconds as the previous file is saved to disk. Each recording will be saved as a different file so you might want to do this at a particular juncture in the interview, such as taking a break. This is a nice feature so that you can be certain not to lose an entire interview if the Nomad freezes up or loses power for some reason. This can happen, although it has occurred rarely (<1%), and only when others were using my equipment so I can't be certain what caused it. Be sure to disable the infra-red remote receiver under Menu->Jukebox Settings, as I suspect this may cause the Nomad to shut off unexpectedly.

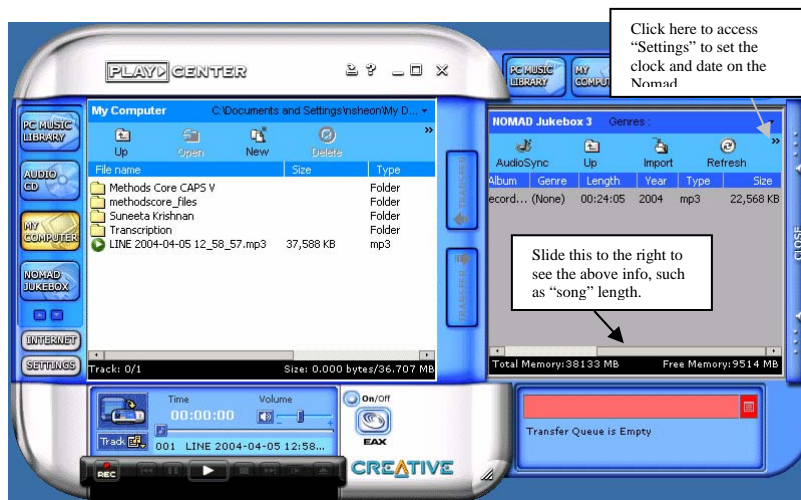
Transferring data from the Nomad to the computer

The Nomad comes with a USB cable and a firewire cable. These cables usually have small plugs at one end and big plugs at the other end. If you need a firewire cable with small (four pin) plugs on both ends, you can order these online or find them at CompUSA. This type of cable is necessary to move files from one Nomad to another Nomad. Install the drivers and software that came with the Nomad onto your PC(s). Turn the Nomad on and plug the small end of the cable into its port on the back. Then plug this into your PC. This will launch the software to transfer music files. For other types of files (i.e. not sound files such as mp3, wmf, or wav), launch the Creative File Manager 2 from the Start menu after you have plugged in the Nomad. The file transfer software consists of two windows, one displaying the contents of the Nomad (usually on the right), and the other the contents of your computer on the left.



To find the recordings you have made with the Nomad, you need to locate them on the Nomad hard drive. Files on the Nomad are assigned musical labels or “tags” for Artist Name, Album Name, Genre. All the recordings made on the Nomad will, by default, be given the Artist Name: “Line-In”, and Album Name will be “Recordings.” You can find all the recordings on the Nomad by selecting to display all the tracks by Album name. Choose the Album called “Recordings.” Double click on “Recordings” to see all the “tracks” in that album.

The default name for the file is composed of the word “LINE,” the date, and time of recording. To set the clock and date on the Nomad, you do this by connecting it to the computer and selecting the “settings” button above the Nomad pane of the PlayCenter software (see screenshot below). It may not be visible unless you click on the “>>.” A recording made on June 3, 2004 at 1:57:56 pm would have the following file name: LINE 2004-06-03_13_57_56.mp3. You will want to rename these files (see next section) and add descriptive “tags.” These tags can be changed using the PlayCenter software and can be very helpful for organizing your data. For example, I had a set of 85 counseling sessions by eight counselors from three sites with 26 different clients. I use the “Genre” tag for the Project name. I assigned the site and counselor ID as the “Artist” tag, the participant ID was the “Album” tag. To find all the sessions with one particular client, I would open that Album and find all the sessions between that counselor and client. I could quickly select other work by the same counselor by choosing that “Artist.” Thus each counseling session was labeled with and indexed so that it can be easily found on the Nomad’s little display using the “Find Music” dialogue, as well as with the PlayCenter software when the Nomad is connected to the PC.



If you made a number of recordings on a particular date and you are not certain which one is the interview you are seeking, you can see the length of the files by scrolling horizontally to the right in the Nomad Jukebox 3 window. Knowing the length helps you know which file from a particular day is the recording you want to transfer. Once you have selected the file(s), highlight them in the

Nomad Jukebox 3 window and click transfer after having selected the directory in the My Computer window. Depending on the size of the file, it will take several seconds to transfer. The file size is displayed in KB, so 22,568 KB equals 22.568 MB. This works out to 24:05 minutes or about 1 MB per minute.

Labeling your Recordings

The default names given by the Nomad to your recordings are not a particularly useful file names for organizing your data. As soon as the file is transferred onto your computer, you will want to rename the file so you know what it is. This is analogous to sticking a label on a cassette. **It is good practice to state the essential information such as date, your name, and the interviewee's study ID at the beginning of the interview once the recorder has started, so that you know what to label the recording when you transfer it to the computer.** To rename the file, simply open up a Windows Explorer window of that directory, right click on the file, select rename, and type in the name. The name should include information like the study ID number, interviewer's initials, the date, the research site, etc. This information should be coded so that you know what it means but it is not obvious to others. When devising a naming system for your files, think about how they will sort in a list so that you can find the files you want easily when doing the analysis. For example, you may want to group all the focus groups together in order to distinguish them from individual interviews. So you could label the focus groups like this:




FG01-060303-NS.mp3
 FG02-071403-NS.mp3
 etc.

and the interviews like this:

IV01-062703-NS.mp3
 IV02-062903-NS.mp3
 etc.

Or you could have the focus groups start with 101, 102, etc. and the interviews start with 201, 202, etc. and not use the FG or IV prefixes. These file names are just suggestions, use abbreviations of the "face sheet" variables that make the most sense to you.

Comparison of costs of digital media vs. audio cassette

Media	Unit Costs	Capacity	\$ per hour
cassette 	\$1.50	90 minutes	1
Compact flash 	\$50 ¹	2000 MB ²	1.5 ³
Compact disc 	0.20	700 MB ²	.18 ³

1. Prices for flash cards vary but have decreased steadily.
2. 1 GB = 1000 MB. Capacities available from 64 MB – 16 GB
3. Stereo mp3, 128 kilobits per second = approx. 1MB/minute

This is a very crude comparison of storage capacity that does not take into account the versatility of digital media. CF cards have many more uses as a portable read and write storage device (e.g. for camera, PDA, mp3 player). Cassettes and CD that are mainly useful for archiving data or playing it back. Cassette is really only suited for audio and cannot be used to store video or text files. Unlike the digital media, cassettes have moving parts that can and do break. Cassettes cannot be easily duplicated and can only transfer data in real time (i.e. by playing it), while CD and CF can transfer data at very high speeds.