Contents:

Email : Flavio.Antonioli@flashnet.it
World Wide Web **: http://authors.alberts.com/AuthorPages/00013881/ntrack.htm**

Introduction

----

n-Track: *A digital multitrack recorder*.
Version 2.x
(c) 1996-97 Flavio Antonioli (Flavio.Antonioli@flashnet.it).
All rights reserved.

This program is shareware. It is not free.
You may try this program for 40 days.
After this period you must either **register** or stop using the program
------

Welcome to n-Track

This program will turn your computer in to a powerful multitrack recorder:

All you need is a full duplex soundcard, Windows 95 or NT, a microphone and some free space on your hard drive.

There are no limitations on what you can realize with this program:
the most powerful feature is that the tracks (wave files) aren't mixed together in a single wave file and then played. The mixing process is done "on the fly": in this way you can alter the volume and pan settings while listening to your song or even while recording.

Wave files and MIDI tracks are threaten in the same fashion : all the mixer control will act in similar way on a MIDI track or a Wave track.

You can use a wave editor (for example Cool Edit) to add some effects on a particular track: you won't have no more the need of sophisticated and very expensive multieffects devices.
You can add reverb, delay, chorus, flanging etc. via software, listen to the overall result, restore the original track (having made a backup copy before modifying it), make some other changes etc.

The program has no theoretical limitations on the number of tracks:
with a Pentium 100, 32 megabytes of RAM and a quite slow hard drive, I was able to work easily with 6 tracks.

To install n-Track: unzip the file you've just downloaded and run the installation program (since you're reading this you have probably already done this).
To uninstall n-Track select "Installed software" from the Windows Control Panel, select the correct entry and press "add/remove".

Working with n-Track:

Working with n-Track is easy: to start a new song, record the first track (usually the rhythm base), after having selected between MIDI and wave recording.
Once you have finished click on the stop button.
You will notice that the filename of the track you've just recorded will appear on the track list and on the timeline as a filled rectangle. Select it and adjust the volume and pan settings (you can do so while listening to the track).
Now you are ready to add a new track or to **overdub** the one previously recorded: click again on the record button, make sure you are ready to play and click on the OK button.
It's also possible to start playback by pressing and then start recording at a specified point by clicking the record button.

Tracks can contain more than one single wave file: you can drag and drop wave files (represented by rectangles in the timeline window) from one track to another. Also, if enabled from the toolbar, you can adjust the file offset inside a track simply by moving the rectangle sideways.
To edit a track you've recorded with a wave editor (such as Cool Edit), specify a path to it in the preferences dialog box, and the simply double click on the desired track in the track list.

While you are recording, notice the value that will appear near the "lag" writing on the window. Once you have finished recording the track, write this value in the preferences dialog box (accessible via the Options menu).
This values represents the shift that occurs between the recorded track and the ones being played. If this value is < 0, write it positive in the preferences. When playing back, the program will shift all the tracks by this value against the first track. So always check that the first track (the upper one) that appears in the list box, is the first one that you have recorded. Anyway this is not a critical factor, because the lag value usually is some hundreds. To obtain the actual shift divide this value by the sampling frequency (typically 44100 Hz).

If the lag value oscillates too widely, it means that there is some problem and that the program may not work properly.
Once you have finished your song save it via the File menu.
The .sng file that the program will create will contain the mixing information and the compensation value.
Now you may want to mix down all the recorded tracks in to a single wave file using the "render" feature.

When recording, make sure that the recording level is adequate:
use the soundcard mixer together with the program vu-meters to adjust the levels. If the rec level is too high you will notice distortion, while if the rec level is too low, the signal-to-noise ratio will be low.

Writing in the "MIDI file" edit box the filename of a midi file, this will be played back in sync with all the other wav tracks.
Make sure that you have selected the desired MIDI output device in the Multimedia/Midi sheet of the control panel.
If you record any MIDI track, this will exclude the MIDI file you've specified in the MIDI dialog from the playback.

n tracks!

The "n" in the name n-Track stands for the number of tracks that the program can handle: substitute n with any integer number ranging from 0 to infinity!
In fact the number of tracks is limited only by the speed of the computer.
The mixer has only 4 volume and pan sliders only for convenience: to work with other tracks, simply record them and to adjust their volume and pan settings, click on their names and use the "nth track" mixer sliders.
Using the "big mixer", a new couple of volume and pan slider will be created as you add further tracks.

Rendering the final song

Once you'll have finished adding tracks and you'll have adjusted the volume and pan settings, you may want to mix down all the tracks to a single wav file:
just select "Render song" from the file menu and write the destination filename in the requester.
This operation may take a while.

"Rendering" works only on audio tracks, so if you have included a midi file, you'll have to "record" it selecting MIDI as the recording input in your soundcard mixer, so the program will be able to treat it as a wave file.

On slow machines, or when the number of tracks you're using becomes high, it may be a good idea to render some or all the tracks to one single wav file, and then proceed to record other tracks. In this way you'll be able to manage more tracks and you won't suffer from possible synchronization failures that may happen when the computer is too loaded by the high number of tracks.

This feature will work only on the registered versions of the program.

Tracks formats, mono & stereo playback:

Tracks can be either mono or stereo: the pan slider will simply act as a balance control for the stereo tracks while it will actually pan to the left or to the right the mono tracks.
Playback will always be in stereo, but it's possible to disable stereo playback while recording other tracks: in fact many soundcard are capable of full-duplex operation only when used in mono mode. If you get messages such as "waveOutOpen(): undefined error" try to enable the option "mono playback while recording" in the preferences dialog. To verify if your soundcard can work in full-duplex with the recording parameters you have set, use the "Full duplex test" button in the Preferences/Wave Devices dialog box.

For Creative Labs Sound Blaster owners

For Sound Blaster owners:
clicking the right mouse button on the creative mixer and then selecting "Input-output settings", will allow you to set the mic and line-in gain roughly (*1, *2, *4) (not applicable to SB16).
Make sure you have enabled the driver's full duplex support and that you have disabled the stereo enhancement feature.
When operating in full duplex, the sound quality you'll hear while recording will be very poor. In fact the 16 bit audio samples are truncated by the SB's driver to 8 bit. This is not a program's fault, but a limitation of the hardware:

the Sound Blaster hardware can use only one 16 bit and one 8 bit DMA channel at a time, so either the recorded data will be 8 bit (even if the actual format is 16 bit) or the same will happen to the data being played. I've obviously chosen to make the playing tracks sound worse so the recorded one will be effectively 16 bit.
So when playing back all the tracks without recording the audio quality will not be penalized.

With the AWE64 it may be necessary to allow full-duplex operation to disable the software MIDI synthesizer, which in practice uses the wave part of the card as output.

Remember to always **turn off the recording vu-meter before playing back the song**: in fact the vu-meter actually opens the soundcard for recording, so if it is turned on, the playback will be effectively 8 bit.

Troubleshooting & Known bugs

- If, even with few tracks you can often hear **jumps in the music**, try to increase the buffer size in the preferences dialog box. Increasing this parameter however will increase the time delay between any action done with the mixer and its audible result.

- Using **multiple soundcards**, one for recording and one for reproduction or for recording more than one track at a time, will be possible some pitch-shifting effects due to non perfectly matched sampling frequencies of the soundcards. You will be able to notice this while recording watching the lag value. If it keeps to grow and exceeds some thousands, then the problem will be probably hearable.

- If you get messages such as "waveOutOpen(): undefined error" try to enable the option "mono playback while recording" in the preferences dialog.
Also, do the "**full-duplex test**" in the Preferences/Wave devices dialog box. Some soundcards work in full duplex only when recording with certain parameters : if the test fails, try to make some changes in the recording parameters and try again.

- Feedback problems (the tracks recorded after the first all contain the preceding tracks):
Have you selected the correct recording sources (disabled wave out as a recording source using the soundcard mixer software?)
Some soundcards (such as some Gravis's) always record the wave output on one channel (left or right) so to avoid feedback is necessary to pan all output to the other channel.

- The only sample format supported is 16 bit.
- System exclusive MIDI messages are not supported.

Bug reports, as well an any kind of suggestions and comments are welcomed.

Feedback

Any comments, bug reports, suggestions, are welcome:
Send email to *Flavio.Antonioli@flashnet.it*.

n-Track World Wide Web site :
http://authors.alberts.com/AuthorPages/00013881/ntrack.htm

<u>Credits</u>

Thanks to...

Thanks to:

Alessandro De Murtas (**Error! Reference source not found.**)
for his precious help in beta-testing,
Richard Fairthorne (http://webhome.idirect.com/~rfairth),
Lennard G. Cairns (http://www.hurontel.on.ca/~livehart).

Also thanks to **Bruce Springsteen** for having shown what can be done with a 4 track recorder (*Nebraska, 1982*)**.**

Obtaining new versions:

Main n-Track URL :

ftp://shareware.alberts.com/Win95/ntrack10.zip

Simtel site:
ftp://ftp.simtel.net/pub/simtelnet/win95/sound/ntrckxxx.zip

Or at any Simtel mirror (/pub/simtelnet/win95/sound/ntrckxxx.zip) ("xxx" stands for version number i.e. 096), such as :

ftp://ftp.cdrom.com/pub/simtelnet/win95/sound/ntrack10.zip
ftp://ftp.digital.com/pub/micro/pc/simtelnet/win95/sound/ntrack10.zip
ftp://ftp.flashnet.it/pub/simtelnet/win95/sound/ntrack10.zip
ftp://cis.utovrm.it/simtelnet/win95/sound/ntrack10.zip
ftp://nctuccca.edu.tw/mirror/simtelnet/win95/sound/ntrack10.zip
ftp://mirrors.aol.com/pub/simtelnet/win95/sound/ntrack10.zip

Always check for the latest version at the program's web page :

http://authors.alberts.com/AuthorPages/00013881/ntrack.htm

or connect to **www.alberts.com** and search for "ntrack".

Registering Information

- Registered users will get a password to register "on-line" the program, free upgrade to future versions, technical support.
Registration fee is 28$.

If you have access to the internet:

The Registered Version of this program can be purchased and received   immediately on the Internet at **Albert's Ambry**. Registration at Albert's also eliminates shipping and handling costs. Please go to:

**http://www.alberts.com/Ambry/Register?
File_Name=ntrack10.zip&OS=Win95&Source=KeyWord**

Or connect to:

http://www.alberts.com

- Search on: ntrack10.zip
- Click on the "Buy It" Hotlink to register this software.

Or follow the "Get it now" link from the program web page:
http://authors.alberts.com/AuthorPages/00013881/ntrack.htm

Thank you for registering this program.

If you don't:

- To order a diskette containing a copy of the program, add 3$ to the price to cover the mailing expenses.

You can become a registered user of this program by drawing 28$ (or 50000 lire, in italian currency) on this bank account:

**Account number 3354965/01/53
Agenzia n.34
BANCA COMMERCIALE ITALIANA**

Or you can also send a check (drawn on an italian bank) or cash to the address below.
If you can't draw the check in an italian bank, make a normal check and add 6$ to cover for the bank fees.
Italian users can also make a "vaglia postale".

When you'll have done the payment or if you have some trouble making it, contact me via email at
Flavio.Antonioli@flashnet.it, or via snail mail at this address:

Flavio Antonioli,
Via Focilide 44,
00125 Rome,
Italy.

Keyboard Layout

To adjust more easily the mixer settings, you can use the keyboard in this way :

Q   W   E   R   T   Y   U   I

A   S   D   F   G   H   J   K

will add (Q) or subtract (A) 1 from the volume setting of tracks 1 to 8 respectively.
Holding down the **SHIFT** key or activating **CAPS-LOCK** will increase the step to 10 units.
Holding down **CONTROL** key or activating **SCROLL-LOCK**, will switch the preceding keys to operate on the pan settings.
For tracks other that the first four, you'll have to first select them in the list-box, and the use **C** and **V** to move the volume and pan sliders relative to the track selected.
Use **Z** and **X** to adjust the master volume setting.
P starts playback, **O** starts recording, '**.**' and **L** stop recording and playback.
Use **M** and **N** to move the time scroll bar.

Overdubbing

Overdubbing is intended as substituting part of a wave file with a new recording. No sound-on-sound. The preceding   and following parts of the track will be left as the were. For example, if you're recording a song with a guitar solo in the middle, you can record the guitar track once, and then overdub the solo until you come with a satisfying result, without having to play all the time all the other parts of the song.

To overdub a track, do one of the following actions :
 - select the wave file by clicking on it in the timeline window and choose "Overdub selected track" from the track menu;
 - if you have the option "Ask for name of wave files to be recorded" from the Preferences/General Settings activated: remove the wave file to be overdubbed from the track list, move the time slider to the instant at which you want to start the dub and press the record button, then select the file to be overdubbed;
 - remove the wave file to be overdubbed from the track list, select "Overdub" from the track menu, enter the correct values and select the track to be overdubbed.

Once you'll have done this, the program will start dubbing the track starting from the instant you've selected. Recording will continue until you will press the stop button.
If you are recording from multiple soundcards, the overdubbed track will receive the input from soundcard #1.
Currently, the time resolution is in seconds.

License

n-Track is shareware. This means:

1. All copyrights to n-Track are exclusively owned by the author - Flavio Antonioli.

2. Anyone may use this software during a test period of 40 days. Following this test period of 40 days or less, if you wish to continue to use n-Track, you must **register**.

3. Once registered, the user is granted a non-exclusive license to use n-Track on one computer (i.e. a single cpu), for any legal purpose, at a time.   The registered n-Track software may not be rented or leased, but may be permanently transferred, if the person receiving it agrees to terms of this license.   If the software is an update, the transfer must include the update and all previous versions.

4. The n-Track unregistered shareware version, may be freely distributed, provided the distribution package is not modified. No person or company may charge a fee for the distribution of n-Track without written permission from the copyright holder.

5. **n-Track is distributed "as is".   No warranty of any kind is expressed or implied.   You use at your own risk. The author will not be liable for data loss, damages, loss of profits or any other kind of loss while using or misusing this software.**

All rights not expressly granted here are reserved by Flavio Antonioli.

6. Installing and using n-Track signifies acceptance of these terms and conditions of the license.

7. If you do not agree with the terms of this license you must remove n-Track files from your storage devices and cease to use the product.

Thank you for using n-Track,
Flavio Antonioli.

Preferences

- **Sampling Frequency :** Sets the sampling frequency of the recorded tracks. Make sure that all the tracks are recorded using the same frequency.
- **MONO/STEREO :** Choose here if you want to record a track in mono or stereo. Mono and stereo tracks can be used together in a song.
- **16/8 bit :** Only 16 bit format is supported.
- **Mono playback while recording :** Many soundcards work in full-duplex only in mono mode. If you experience some problems while recording, try this option.
- **Wave Devices :** choose here which soundcard to use as input device and which to use as output.
- **Playback buffer dimension :** Decrease this value to decrease the time between an action operated on the mixer and its effective result. Be aware that low values of this parameter will make the program more resource consuming : if you can hear jumps in the playback, try to increase this parameter. Default value = 32720
- **Playback buffers:** sets the number of playback buffers. The same consideration made above hold also for this parameter. Default = 10
- **Recording buffers dimension & recording buffers number:** For recording, the only advantage in decreasing this parameter is in the faster response of the vu-meter while recording.
  Default: Recording buffers dimension = 32720, recording buffers = 16.
- **Compensation :** While you are recording, notice the value that will appear near the "lag" writing on the window. Once you have finished recording the track, write this value in the preferences dialog box (accessible via the Options menu).
  This values represents the shift that occurs between the recorded track and the ones being played. If this value is < 0, write it positive as the compensation value. When playing back, the program will shift all the tracks by this value with respect to the first track. So always check that the first track (the upper one) that appears in the list box, is the first one that you have recorded. Anyway this is not a critical factor, because the lag value usually is some hundreds. To obtain the actual time shift divide this value by the sampling frequency (typically 44100 Hz). Default = 0
- **Wave Editor Path :** Insert here the path to your wave editor. By double-clicking on a track in the tracks list box the program will launch the wave editor to edit that track.

Versions history:

New to 2.0
- Recording from multiple soundcards
- New mixer ("Big mixer")
- Recording control dialog box turned into a toolbar
- Punch-in (start recording while already playing)
- A single wave file can now be inserted multiple times in the song
- Color time & recording indicators
- Bugfixes

New to 1.6
- Compression effect
- Stereo tracks splitting

New to 1.5.2
- Bug fixes

New to 1.5.1
- Effects parameters shown on their dialog boxes
- Bug fixes

New to 1.5
- Real-time effects: chorus, echo & auto-volume/pitch shift
- Zooming

New to 1.4
- Waveform display
- Fade In/Out (drawn volume now mutes at the lower end of the scale)

New to 1.3
- Volume and pan automation
- Volumes in decibels

New to 1.2.1
- Fixed bug that made the program crash with Windows NT.
- Timeline zoom
- Build number (starts from 1000!).

New to 1.2
- Wave files drag & drop
- Windows layout
- Bug fixes

New to 1.1.97 BETA
- Improved timeline: added "interactive" time scale.
- Fixed a Midi importing bug.
- Rewind button

New to 1.1.91 BETA

- Tracks can now contain more than one wave file, which can start at a specified point in time.
- Timeline
- Time expressed in MM:SS

New to 1.1.2:
- Final MIDI sequencer engine

New to 1.1.1:
- Fixed the blank property sheet bug
- new MIDI sequencer. Still needs improvements.
- Master Volume slider hanging

New to 1.1 beta 3:
- Added MIDI file exporting.
- Pressing the record button and then Cancel on the file requester crashed the program.
- New MIDI sequencer "engine", but still not so good.
- MIDI program changes filtering filtered every control message.
- Various bugfixes.

Volume/Pan automation:

If you click on the volume icon on the toolbar, a line will appear on the timeline for every track of the song.
This line represents the volume (or pan) evolution during the song. If the volume button is pressed, you can draw the "wave form" with the mouse. While you are drawing you will be able to see what values you are entering by looking at the right most section of the status bar at the bottom of the main window.
To switch between volume and pan drawing check the desired option from the Track/Volume menu.
Mixer's volume values are multiplied by the values drawn, while pan values are summed (if the mixer value is –50, which means that the track volume in the left channel is double the volume on the right one, and the drawn value for that particular moment is +100, the overall value is +50, i.e. the track will be panned to the right channel).
Drawn values are currently "sampled" every tenth of a second. For this reason, too fast volume changes may result in hearable clicks: if you encounter this problem, try to decrease the slope of the curve.
The automation may be separately disabled for MIDI and wave tracks from the preferences dialog box.

Back to the index

Realtime audio effects

By pressing the **DSP** button on the toolbar (which stands for *Digital Signal Processing*), a dialog box will pop up with all the available effects listed and all the selected track current effects.
To add an effect to the track simply select it ad press the -> button (or double click on the effect name). Effects can be arranged in any combination and one single effect type can be repeated several times for a single track (for example you can add two separate echoes with different delay times). Each track can't have more than 256 effects.
To make some changes on a particular effect on a track, open the effects dialog box and select the desired effect on the track list box. The effect dialog box will appear and you will be able to make the desired changes.

When using effects, be aware that they are calculated by the program while the song is being played back, so **the load on the computer processor increases quite heavily**. On the other hand, **all the adjustment you make are not destructive**, and the track that the program processes isn't really modified, so you can experiment without having to worry to ruin the wav file and mostly without having to wait for a wave editor to process the whole track.

Of course it's possible to make the changes permanent by loading a single track, applying the effects and rendering the track alone (although this will create only stereo tracks).

Available effects: pitch shift, chorus, **echo**, **compression**.

Back to **contents**.

Effects: Echo

Bypass: Bypass the effect

Depth: Sets the delay time between echoes

Decay: Sets the coefficient by which the delayed signal is multiplied before re-processing it. High values tend to create a more reverb like sound. Very **high values may lead to instability** (the sound will increase until it reached the maximum dynamic range allowed: very high volumes).

Mix: Mix between the processed signal and the original signal. 0% outputs only the original   signal while 100% outputs only the echoed signal.

Delay: Delay volume (only one echo: delayed signal is not fed back multiplying it by the decay value). This can be summed to the normal echo to increase the volume of the "first reflection" or can be used alone (setting decay to 0).

Input & Output gain: Sets the input gain before processing the signal and the gain by which the signal is amplified after processing. Recommended value is 0 dB. Decrease it if the CLIP sign appears often.

Read more about **Realtime audio effects**.

Recording more than one track at a time

If you need to record two tracks at the same time (for example if you sing while playing guitar) you can do this with a single soundcard simply by plugging two different microphones one for each channel of the soundcard (left and right) and then recording in stereo mode. Once finished recording, you can separate the stereo track in two single wave files by using the option "**Split stereo track**" from the track menu. This will allow you to manage each track independently from the other (i.e. adding different effects).
It is also possible to use **multiple soundcards** to be able to **record more than two tracks at the same time**:
Just select the correct wave input sources from the Preferences/Sampling/Wave devices dialog box by dragging the devices with the mouse or selecting them while pressing CTRL key.
When using the vu-meter, you'll have to select from which soundcard monitor the input using the up/down control in the vu-meter.

Back to **Contents**.

Effects: Compression

Bypass: Bypass the effect

Attack: Sets the time after witch the effect adjust the gain after the signal level exceeds the threshold level.

Decay: Sets the time after witch the effect adjust the gain back to 1 after the signal drops below the threshold level.

Threshold: This value represent the RMS value at witch the gain will decrease as the signal level will exceed it.

Compression: Sets the gain used when the signal level is below the threshold level. This will make quieter signal sound louder. Exceeding in this value will bring up the so called "breathe" effect: during the moments when the signal is quieter the gain will increase making the background noise quite hearable. Compression value of 10 is what is usually called "limiting".

Output gain: Sets the gain by which the signal is amplified after processing. Recommended value is 0 dB. Decrease it if the CLIP sign appears often.

Compressor Input/Output Characteristic
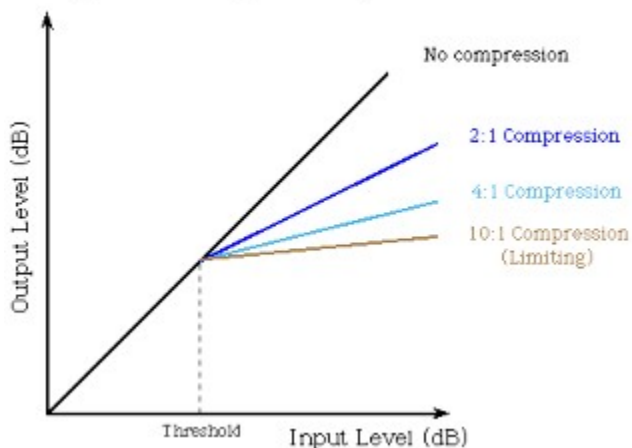
The compression effect will be useful for example on vocal tracks: as the singer moves away from the microphone the effect may be able to keep the signal level constant.

On stereo track, the change in the gain is triggered from both channels: the RMS mean is the sum of that of the two channels. An increase in the level of a channel will make the effect decrease the gain also in the other one.

Read more about **Realtime audio effects**.