

# **Deli14BitGenie-Manual**

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## Chapter 1

# Deli14BitGenie-Manual

### 1.1 Deli 14Bit NotePlayer Genie Manual

Welcome to the

Deli 14Bit NotePlayer Genie V4.20

Dedicated to my love  
Heike

Copyright 1998-99 by Chris Hodges .

WARNING: Read this first before using this software!

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Legal Issue

Introduction  
Installation

Mixing Routines  
Anti-Click Mode  
DSP Routines  
AHI Support

New Players

Known Bugs

Acknowledgements

Version History

Requirements  
Configuration

Panning/3D Modes  
Bass & Treble Controls  
ModSave Routines  
AutoBoost Options

The Future

Contacting the Author

This software is PostcardWare .

### 1.2 Legal Stuff...

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### Copyright notice

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"Deli 14Bit NotePlayer Genie" software is based on the sources of the "14Bit-NotePlayer V2.3" originally created by Delirium Softdesign (Peter Kunath and Frank Riffel) and is therefore Copyright 1994-95 Delirium Softdesign. All rights reserved.

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This software uses the 14 Bit Output Routine by Christian Buchner. It also uses a modified version of the DeliMix sample-mixing technology Copyright by Delirium Softdesign.

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The author reserves the right to make changes to this software or documentation without notice.

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### PostcardWare Notice

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This software is POSTCARDWARE. If you find this program useful, I expect you to send me a postcard of your location (please write your email address onto it!) or at least smash a Wintel machine you come across. You have to agree that this is not much asked and will raise my motivation on Amiga software development. Of course I'm always open to other kinds of gifts aswell! You will receive some sort of keyfile which will remove the about requester which appears each time you start the genie.

By copying, distributing and/or using this software you indicate your acceptance of the above rules.

## 1.3 Introduction...

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### Introduction

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This is a new and pretty enhanced version of the well known 14Bit NotePlayer that came with the original DeliTracker distribution. After Peter Kunath gave me the sourcecode, I was able to add various features (listed below).

\*\*\* THIS ARCHIVE ALSO CONTAINS THE LATEST MOST IMPORTANT DELIPLAYERS! \*\*\*

Please notice that you need at least an MC68020 to use them as the MC68000 routines have been removed!

Even if you don't use the new features, I recommend to use this version for it has a faster chipmem transfer routine than the one in V2.3.

Plenty of cpu power is appreciated (although the Genie will not be any slower when not using the new features). You will need an MC68060 to be able to mix at frequencies higher than 50KHz with Panning and Interpolation and 32 voices 8-D

Short list of new features/improvements:

- Font sensitive GUI with two different layouts.
  - AHI support! Delil4Bit can redirect its output to any AHI compatible sound card for TRUE 16 Bit output!
  - Panning support (e.g. for FastTracker modules).
  - Stereo width slider (so this incorporates the HeadPhones Genie).
  - Various Interpolation modes for high quality mixing (including a table-interpolation routine for MC68020/MC68030 machines).
  - Two Oversampling modes.
  - DSP Routines: Echo (Reverb), Hall (Reverb with feedback) and Reverser (each one is available as Mono, Cross or Center mode).
  - All mixing routines have conditional code for quiet mixing, the panning ones also use optimized routines for mono and 100% left/right code.
  - 3D Panning mode - ideal for headphones or CD recording.
  - Inverted Stereo Mode for fake surround effect.
  - Anti-Click Mode (removes annoying sample-triggering clicks).
  - Treble and Bass filters with adjustable pass frequencies.
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- Seperate Treble and Bass filters for the DSP.
- Frequency can be shifted (half frequency up to double frequency).
- Complex ModSave function (16 Bit AIFF or RAW file):
  - Start of saving can be triggered, silence at the end can be cut off.
  - Resulting wave can be normalized to full volume.
  - Half/Quarter DMA mode records at half/quarter speed for slow machines or people with PAL 28KHz limit.
  - Stop-Motion and Mute modes for slow drives/machines.
- Peak and Optimal Boost display.
- Actual (DMA) mixing frequency is now displayed.
- Uses a 256 samples buffer instead of 200, which speeds things up.
- Complex Prefs management:
  - Settings can be saved individually for each module (either in a separate directory or along with the module).
  - Default settings can also be saved for:
    - whole directories
    - module types
    - amount of channels
    - module type+amount of channels.
  - 4 DSP presets can be stored for quick access using the GUI.
- Default AutoBoost factor can be changed.
- Now uses a faster longword pipelined chipmem transfer.

## 1.4 Requirements...

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### Requirements

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#### Requirements:

- DeliTracker V2.0 or higher
- Kick 2.05 (V37) or higher
- MC68020 or higher
- About 3 KB of Chip memory (without GUI)
- About 350 KB of Fast memory (plus DSP, Table-Interp. or ModSave buffer)
- OCS/ECS/AGA/CGX/P96 machine
- Speakers/Amplifier or Headphones

#### Recommended:

- Kick 3.0+ (V39) or higher
- MC68040/MC68060
- plenty of Fast memory
- ECS/AGA machine with MultiScan screenmode or a CGX/P96 machine

#### Developed on:

- A4000TE/60, 42MB, 3.6GB HD, CDR, ZIP, CV64, FliFix

## 1.5 How to install this great software...

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### Installation

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There is an installer script that does everything for you. But for the ones who want to install it manually:

Just place the main file into your DeliTracker/Genies folder (by replacing the old 14bit NotePlayer). There are two versions:

14Bit-NotePlayer : The standard version with 256 samples per buffer.

14Bit-NotePlayer1024: Large buffer version with 1024 samples per buffer. It is faster, but also a bit inaccurate with the timing. Better use this if you want to use AHI modes.

The ModPrefs drawer used for saving individual settings will be created automatically on first use.

Store this documentation anywhere you want, but I recommend the HELP: directory.

If you want to use the 14Bit-Noteplayer for all your modules, even for the standard 4 channels Protracker modules, remove all other Noteplayers from your DeliGenies directory and enable the Low Chipmem option of DeliTracker.

In the 'DeliPlayers' directory you will find a collection of the latest play back routines, which are courtesy of Peter Kunath. I also did some fixes on the latest ScreamTracker3 NotePlayer and added PingPong loop support and improved SongEnd detection to the FastTracker player :-)

There are some bonus modules which can be tried out to compare the old NotePlayer to the new one.

## 1.6 Changing and storing the settings...

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### Configuration

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Load up DeliTracker, select the 14Bit-NotePlayer from the list of Genies and click on Show to open up the GUI window. If you want the window to pop up at start already, checkmark the 'Settings/Popup' menu item.

Deli14Bit uses a two-way approach for the prefs. There are global prefs and ModPrefs. The global prefs store the menu settings, window position etc. and a set of preset DSP settings ('1'-'4' buttons) whereas ModPrefs (Channel Toggles, Boost Value, Frequency, Panning, Interpolation+DSP Settings) can be stored individually with each module.

Why do I think this is useful? Each module has different properties: volume, number of channels, beats per minute, etc. Especially modules with more than 4 voices normally need custom Boost settings as the AutoBoost can't guess the real usage of the channels. Moreover, the DSP settings are very dependant on the speed and the type of the module. So it really makes sense to save individual ModPrefs.

At any time you may reload or save the global current settings with the

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'Settings/Load Global Prefs' and 'Settings/Save Global Prefs'.

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### Font/GUI

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Starting with V4.20 the GUI is finally font sensitive. You can select either to use the topaz/8 font (or its replacement), the system default font or any other custom font (selectable by picking the 'Select Font...' menu item). Moreover, there's now an option to layout the GUI horizontally instead of vertically, which I think will be much appreciated by people with small screens.

By default, topaz/8 and a horizontal layout will initially be used. This creates a window that is exactly 640 pixels wide, nicely fitting on a PAL screen. If you're using a small screen I would recommend to use one of the fonts included in the distribution.

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### ModPrefs

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Individual prefs files are normally stored in a drawer called "ModPrefs" in your DeliConfig directory. There are several ways to store settings (sorted by priority):

1. a) \$DELICONFIG/ModPrefs/<modfilename> (e.g. "../ModPrefs/mod.area51")  
 b) <modfilename>.14b (e.g. "ST-00:Modules/mod.area51.14b")

Method 'a' is my favorite one. It saves the prefs in the ModPrefs drawer in your DeliConfig directory. This method has got two disadvantages:

- You cannot have two different settings for modules carrying the same name but residing different directories.
- Distribution of setting files along with the module is more difficult.

Method '~b' has been implemented as a cure for these disadvantages. It saves the prefs along with the modules with a '.14b' suffix appended. Disadvantages:

- You have to filter the '.14b' from the playlist (trivial solution).
- If the file name of the module already consists of 30 characters, the prefs cannot be saved (Solution: use a file system that allows longer filenames, like PFS, AFS, SFS etc.). Don't be afraid to overwrite the module with the prefs file, this case is ruled out automatically.

You can select method 'b' by checkmarking the 'Settings/ModPrefs/Alt. Saving Path' menu item. Note that this only refers to saving the prefs either using the 'Settings/ModPrefs/Save ModPrefs' item or the 'M' button in the Store section of the DSP-Settings. For loading both paths will be checked.

2. \$DELICONFIG/ModPrefs/\_<type><channels>.prefs ("ChanTypePrefs")  
 (e.g. "../ModPrefs/\_Protracker04.prefs" or "../ModPrefs/\_TFMX08.prefs")

This allows you to store default prefs for module classes with a certain amount of used channels. This can be reasonable to set different mixing frequencies depending on the number of channels or similar.

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The number of channels consists of two digits and is always even.

3. \$DELICONFIG/ModPrefs/\_<type>.prefs ("TypePrefs")  
(e.g. "../ModPrefs/\_FastTracker2\_0.prefs")

This is similar to the ChanTypePrefs above, but this time the prefs are used for a certain module class, no matter how many channels are used. TypePrefs can be saved with 'Settings/ModPrefs/Save TypePrefs as...' and might be interesting for example to enable panning on FastTracker modules.

4. \$DELICONFIG/ModPrefs/\_Generic<channels>.prefs ("ChanPrefs")  
(e.g. "../ModPrefs/\_Generic16.prefs")

ChanPrefs are useful to give defaults on a per-channels basis. They can be saved using the 'Settings/ModPrefs/Save ChanPrefs as...' menu item.

5. <drawername>.14b ("DrawerPrefs")  
(e.g. "../Modules.14b" to a corresponding "../Modules" directory)

DrawerPrefs allow you to give default prefs for a whole directory. Just save the prefs with the name of the drawer into the parent directory of the modules you want to provide default prefs.

The 'Settings/ModPrefs/Save DrawerPrefs as...' will provide you with the correct path and name for the current module playing.

As you can see, Deli14Bit provides a very versatile Settings system for all purposes.

ModPrefs can be deleted again by manually removing the settings file or loading the module and using the 'Settings/ModPrefs/Delete ModPrefs' item.

Again, 'Delete ModPrefs' will not delete the module file if the file name already contained 30 characters and the prefs file would accidentally point to the module. However, this function does not remove ChanTypePrefs, ChanPrefs, TypePrefs or DrawerPrefs.

The Genie will always try all ways to find a prefs file. If a valid file is found (further called ModPrefs-Mode), the current prefs will be backed up and the ModPrefs will be loaded. When ejecting the module, the last settings will be restored again. In ModPrefs-Mode, the 'M' and 'B' buttons become available. The 'B' gadget allows to load the backup DSP Prefs and 'M' restores the ModPrefs.

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### More Settings

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Starting with V3.00, there's an option ('Frequency Override') that will fix the frequency to the value you entered (e.g as global frequency), even if the individual ModPrefs would like to use different values. This can be handy if you temporarily have to work with a PAL-screenmode which only supports 28KHz but all your individual ModPrefs use 44KHz.

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In conjunction with this feature, you can checkmark the 'Auto-adapt DSP' option, which will ensure that the DSP Delay remains the same, even if you change the frequency (either by hand or when using ModPrefs).

Sometimes it can be handy to turn off the ModPrefs system totally, you can do this by checkmarking the 'Settings/ModPrefs/Ignore ModPrefs' menu item.

If you have loaded a module with conjugated ModPrefs and want these settings to remain even after the module has been unloaded, you can use the 'K' (Keep) button in the DSP QuickPrefs Get panel.

Please note that the configuration format of versions below V2.65 had to be extended and is not compatible anymore (and will not be imported). I've introduced a new prefs format introduced with V3.00, but the old V2.65-V2.67 prefs files can be loaded without problems, but I recommend to save the prefs back in the new format for future compatibility.

## 1.7 The Mixing Modes...

## The Mixing Routines

These are the main new features of my Deli 14Bit NotePlayer Genie. But let's have a look at the internal data stream first:

```
|Channel 01|--->|      DeliMix:      |      DSP Routines:      |      Bass&Treble      |
~~~~~|      ~~~~~|=====|      ~~~~~|=====|      ~~~~~|
_____|Samples are|      Stream is saved|      ~||~~~~~|
|Channel 02|--->|mixed together|      .=>|and fed in after|      |'----.|
~~~~~|      :depending on|      :|||certain delay|      |__o____|
_____|      :the current|      :|||_|      |      ||Inverted|
|Channel 63|--->|mixing mode.|      |||~~~~~|~~~~|      ||Stereo|
~~~~~|      |(Panning, 3D,|      |||_____|_VV_|      |~~|~~~~~|
_____|      |Anti-Click etc)|      '=|=|DSP|=|DSP|      |.----'|
|Channel 64|--->|      |      |Filters|      |Buffer|      ||
~~~~~|      ~~~~~|      ~~~~~~|      ~~~~~|      ||_____|
                                          .=====***==>|Booster|
                                          |||      ||~||~~~~
                                          _____||_|      ||____|
_____|      |      |      |14 Bit Output:|      |||AHJ|
|Left Speaker|<-|-----|      |~~~~~|      |||Interface|
~~~~~|      |Audio Channel 3|<-|created using the|      |_|_____
          =====|boost table,|      |ModSave|
_____|      |Audio Channel 1|<-|peak search etc.|      |~~~~~|
|Right Speaker|<-|-----|      |32bit pipelined|      |:=====:
~~~~~|      |Audio Channel 2|<-|chipmem writes|      |SaveTask|
          ~~~~~~|      ~~~~~~|      ~~~~~~|
```

There's a peak display which can be toggled using the 'Settings/Mixer/Calculate Peak' menu item.

## Mixing Modes

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Starting with V4.00, there are seven mixing modes:

1. Normal Mixing:

This is the slightly modified mixing routine (DeliMix Technology) from the original 14Bit NotePlayer. It's the fastest, but as all normal mixing routines it suffers of sample aliasing effects (very audible on flutes etc.).

2. Exact Interpolation (15:16):

This is a linear interpolation mixing routine which works by calculating the sample values inbetween two sample bytes of an instrument, removing the large steps. On the one hand, this will remove any aliasing effects, but on the other hand, it also makes some instruments sound a bit damp or filtered (especially percussion instruments as hihats). I DO NOT recommend it for most chip tunes, as they loose much of their~'natural' sound :)

Exact Interpolation does one MULS instruction for each sample word with a 15Bit factor and a 16Bit value and therefore has an resolution of 15:16Bit. Therefore it has an noticable drain on the cpu power and is only recommended for users with an MC68040/MC68060 cpu (on MC68060 a muls instruction normally only takes 1 cycle).

As interpolation removes the aliasing effect you can lower the mixing frequency a lot and normally still get pretty good sound quality (for Protracker Modules 28KHz is normally sufficient).

Please note that this routine does ONLY interpolation and NO SMOOTHING. So a sample with higher sample rate than the mixing frequency is not interpolated in any way (Normal Mixing is used instead). The same rule can be also applied to Table-, 1-Bit- and 2-Bit-Interpolation.

3. Table-Interpolation (08:08):

Many users don't have an MC68060, so I added a routine that uses a 128KB table to do interpolation (so no MULS Operation is needed). The drawback is the poor resolution of this method: Only 256 steps are available and the only 8 bits of the 16 bit sample value are used to calculate the interpolation part of the resulting sample word.

Table-Interpolation can be used on modules with loud samples (e.g. 4 channel modules), but it really sounds poor on multi channel mods.

MC68060 users: Don't use this interpolation mode as it's slower on your machine (memory access is slower than the 1-cycle MULS instruction) and the quality is really poor.

4. 1-Bit Fast Interpol. (01:16):

This is an attempt to gain quality without much cpu power invested. The 1-Bit Fast Interpolation routine calculates one step between two samples using simple shift commands.

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1-Bit Interpolation does not kill much of the aliasing, but then again, it doesn't remove the high frequencies either.

This routine is rather fast and recommended for users with MC68020 and MC68030. MC68040/MC68060 users will also gain some CPU power.

#### 5. 2-Bit Interpolation (02:14):

Like 1-Bit Fast Interpolation, in this mode the samples will be interpolated, but instead of using just one additional value, three inbetween steps are evaluated.

As this routine uses a different internal approach (not enough registers to hold all the sample values, so they're stored in memory), it's slower than the Exact Interpolation routine at least on my MC68060.

#### 6. "P. Meng Sucks!" Mode (01:16) (2xOversampling):

Some rude swiss guy told me I should trash my interpolation routine and go for oversampling instead, so take this my friend. The sample is calculated as if it was rendered at twice the speed and downsampled afterwards.

If you don't hear any differences, I can assure you that there are. It's just for 2xOversampling doesn't improve quality much and doesn't get rid of the aliasing effect. If the author of Symphonie thinks that oversampling is the solution to all mixing disadvantages, he can't be wrong, can he? Send Patrick Meng <pmeng@vtx.ch> a mail please and tell him what you think about the oversampling mode.

#### 7. Infinite Oversampling (16:16):

After introducing the 2xOversampling mode, Patrick Meng still argued that Symphonie would render (!!!) much better samples in 4xOversampling modes and above 1MHz.

I'm very proud to present you the new Infinite Oversampling mode, which mixes the samples as if they were rendered with normal mixing at a rate of above 1 GHz. This completely removes all the aliasing effects, but doesn't filter the HiFi samples as the Interpolation modes do.

In fact, Infinite Oversampling will generate the same output as if there was no mixing involved (compare!), at least if the given mixing is higher than the highest sample rate in the module.

Infinite Oversampling is normally a bit faster than Interpolation and is recommended for chip tunes.

## 1.8 The Panning/3D Modes...

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### Panning

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Panning is AFAIK currently only supported by FastTracker and OctaMed

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Soundstudio Modules, but you can enable it at any time to reduce stereo width (e.g when listening with headphones or recording a module to tape or when burning it to CD). The panning routine is rather fast and will not use much additional cpu power unless you use it together with some high-quality mixing routine (especially interpolation which nearly doubles the time used for mixing).

The additional cpu drainage really depends on the mixing mode and the cpu you're using. For there is additional code in the panning routines to speed up mixing, modules using 'mono' instruments (left volume is the same as right volume, this can be forced by pulling the stereo separation to 0%) or with 100% stereo separation (left or right volume is zero) are mixed with a much lower cpu usage than normally expected:

Panning can be much faster than in the V3.00 release! In V4.00 playing modules without panning support (Protracker, S3M, etc.) with Stereo Width of 0% or 100%-200% will NOT cost any additional cpu power.

The stereo width slider can only be dragged with panning enabled. A setting of 0% yields to perfect mono sound whereas 200% tries to increase the separation. Settings between 100% and 200% do not make any difference on Players without panning support.

You can add simple sine panning (instruments will move from the left to the right and back automatically) with the 'Settings/Mixer/Add Sine Panning' option for modules that don't support panning (i.e. it will be turned off automatically if panning is supported). Normally, the sine panning output is not balanced to 50%:50% left<->right. This might cause major distortions when Anti-Click is not enabled. Therefore you can chose an alternate balanced sine panning mode which forces 50%:50% panning.

Try the sine panning modes on Protracker modules and with 3D Mode enabled.

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### 3D Mode

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V4.00 adds a nice 3D Mode. It takes more cpu power than the normal panning mode (should be about twice the usage of the normal mode) and has no conditional code at all that could speed it up.

The 3D Mode is ideal for listening with headphones. Like normal panning, it outputs the instrument somewhere between two channels, but the left or right signal is a few samples delayed. Therefore it creates phased sound which emphasizes the dynamic impression.

I dunno how it affects the playback on a surround amplifier, but it should sound pretty nice.

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### Inverted Stereo

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Starting with V4.00 I've also added an experimental Inverted Stereo mode, which can be toggled with the 'Settings/Mixer/Inverted Stereo' menu item. Hence the name, it inverts the amplitude of the right sample. You can only

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hear a difference with Panning and/or 3D Mode enabled.

There should be a vast difference when playing it in an environment with surround decoder.

## 1.9 Anti-Click Mode...

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### Anti-Click Mode

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Now this is a very nice new feature. It removes most of the clicks that appear when a new note is triggered. Internally, there are 4 additional channels that are used to slowly fade out the instruments instead of cutting them off at a high amplitude (which normally is the cause of the click). This is also the reason why the volume is a bit lower with Anti-Click enabled.

Note that this cannot remove clicks due to bad samples or repeat loops. A good example for the removal of clicks can be found in the Modules drawer of the Delil4Bit distribution ("mod.superfroglevel4").

Unfortunately, this anti click mode is not 'compatible' with every module, but the exceptions are very scarce: Some of them have got multiple instruments in one sample, one after another and just with a few milliseconds of silence between each sample. Now when the sample is not cut off at the intended moment, the next part is audible for a few milliseconds (a good example for this 'bad behaviour' is "mod.7thheaven" by dj joge/chrome).

## 1.10 Bass & Treble Controls...

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### Bass & Treble Controls

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This new feature is a 2-pass equalizer for bass and treble with changeable frequency cut off point. There are two sliders each for both bass and treble.

The slider to the left controls the bandpass frequency. If it's all to the left, the filter will not be performed.

The second slider changes the intensity of the filter. The setting ranges from -100% to +100%. A negative value will reduce the bass/treble, a positive value will increase it. Placing the slider in the middle will not perform the filter.

I suppose you have to try it out yourself. Play around with it, but note that the filters suck some cpu power, apparently more than in V4.00beta.

Note that there are additional filter sliders for the DSP starting with

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V4.20.

## 1.11 DSP Routines...

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### DSP Routines

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The DSP is something I always wished to have in the 14bit Genie. The effects performed by these routines give most modules a whole new dimension and depth of sound.

The DSP effects can be applied to the same channel (Echo, Hall, Reverser) or alternating between the channels (Cross-Echo, Cross-Hall, X-Reverser) or in the middle (Center-Echo, Center-Hall, Y-Reverser).

Echo-DSP: Adds a single echo to the audio stream after the given delay.

Hall-DSP: Adds a echo to the audio stream which will be reused for the next echo (feedback).

Reverser: The original source is written to the audio stream after the specified delay. Several echos with increasing volume are added before the delay point (this creates an effect as if the sound is played reverse, but in fact it isn't).

There are two parameters to play with. The first one is the Delay (the delay is measured in units of milliseconds). How much time passes until you will hear the feedback depends on the slider setting aswell as the DSP buffer size and the mixing frequency. The second parameter is the volume: It controls the loudness of the DSP feedback. Just play around with it a little bit.

V4.20 introduced bass and treble filters to the DSP too. This allows you to finetune the Echo and Hall effects.

Please notice that you should lower the main volume when using DSP volumes of 100% or 50% by the same amount. Otherwise you probably will get some distortions (watch the maximum peak level and avoid getting a 100% peak). In depth explanation: If you look at the Mixing Diagramme, you can see that DeliMix uses 8 bit samples, that have been scaled to produce no 16 bit overflow when added (so the with full main volume, the maximum peak is 100% when all channels are playing with full channel volume). Now the DSP stores this stream and feeds it back to the buffer, resulting in a maximum peak above the 100% which may be cut off if the peak was too high already. With multichannel mods this not a problem as they often don't play all channels at the same time, but 4-channel modules tend to do so. The solution is to lower the main volume, so that the stream does not exceed the 16 bit range after the DSP.

Remember that you can save the DSP and other settings individually per module and you should really do this.

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### DSP QuickPrefs

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Starting with V3.00 there is also a bank of presets which can be stored and fetched at any time by clicking on the appropriate button. This allows very fast switching between favourite effect settings. The two gadgets 'M' and 'B' are ghosted unless you've loaded a module with individual settings (ModPrefs-Mode). In this case, 'M' (Module) will restore the DSP settings from the ModPrefs, whereas 'B' (Backup) returns the DSP values used before you've loaded the module.

If you want to keep the individual ModPrefs even after the module has finished (i.e. you want to make the ModPrefs your default prefs), press the 'K' (Keep) button. This also comes in handy after you manually loaded a ModPrefs file.

The 'M' button on the Store side of the panel will save the current ModPrefs for the module (just like the menu option 'Settings/ModPrefs/Save ModPrefs').

Luckily, the DSP Routines are quite simple and normally don't need much cpu time to perform (I'd say it's roughly the power of 3-4 additional channels. The Reverser however, needs a bit more time than the Echo or Hall effects.

## 1.12 The ModSave Routines

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### ModSave Routines

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For the ModSave Genie which comes with the DeliTracker distribution only supports 8 bit output I've added this feature to the 14Bit NotePlayer. After adding all these new mixing routines etc, it becomes even more valuable as the ModSaver can be used to create Audio CDs of Amiga Modules.

You can either save the music as standard AIFF 16bit stereo sample or as raw pulse coded binary file (the left/right channel words are saved interleaved and in Motorola format). You can select either kind in the 'Settings/ModSave' menu. An AIFF-ADCPM4 mode, which uses the ADCMP routines by Stéphane Tavenard is about to come, if I get the time do add it.

If you need other sample formats, I recommend to use (Ami)Sox to convert the file to the required sample format.

To save a module as a sample you need to enter a valid filename in the string gadget and then tag the save checkbox (before loading the module). If you press return (or tab) in the empty filename string gadget, a filerequester will pop up asking for the name of the file to save. This will also happen if you tag the save checkbox and no name is given in string gadget. Starting with V2.67, there's also a simple button ('\*') which will pop up the file requester.

Please note that the Boost-Slider will have no effect on the overall volume of the written sample (see Diagramme for details)! If you're using DSP Effects PLEASE keep the master volume low enough so you will NOT get a 100%

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maximum peak (or the resulting sample could be distorted), especially when using this sample for burning it onto CD.

After any successful (!) saving process the Save checkbox gets untagged automatically to avoid overwriting the previously saved samples by a new one.

A short note: The AIFF file will use the frequency value you've entered in the Mixing Freq. box. If this value differs from the actual DMA output rate, the pitch of sample might be a bit offset on other computers. On the other hand, this allows you to create e.g. '44100 Hz' samples (which are in fact mixed at 44336 Hz) to burn them onto CD (as some programs don't accept other rates).

The saving will be automatically stopped when any error occurs (there might not be an error message though (i.e. no memory for buffers)).

Note that enabling the ModSave feature increases the amount of (Fast) memory required by 256KB.

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#### ModSave Options

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The ModSave routines are auto-sensing for the beginning and the end of the sample (so there will be neither NULL-bytes in front or at the end). You can toggle these features with the 'Settings/ModSave/Trigger Saving' and the 'Settings/ModSave/Cut Trailing Zeros' options in the ModSave menu.

There is an option to automatically Normalize the resulting sample (i.e. to make it as loud as possible without distorting it). For this step, the maximum peak of the sample is scanned for during the mixing process (so this needs very little additional cpu power if you enable it) and will then adjust the volume of the sample AFTER the saving has been stopped (so don't worry if your drive gets busy after the module has finished). The ModSave Normalize process now runs asynchronously and will not block your machine anymore. Please tell me, if you have any problems with this new mode.

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#### More Options for slow machines

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To save modules in realtime you need a fast machine and a fast harddrive (preferably SCSI for AT-IDE needs cpu power to poll the data). If you get Overflow-Errors, try to lower the sample rate or use a faster drive.

There are also a lot of methods to reduce cpu usage:

1. Mute while Saving:  
Turns off the sample output while saving (only!). This gives a marginal speed up, because it only turns off the fast to chipmem transfer.
  2. Stop-Motion Mode:  
In this mode, the module is paused during the harddisk access. It is experimental (for there's no internal way to tell DeliTracker to pause
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the module) and requires REXXMAST running and the RX command in your C: drawer (NOTE: you really need RX in your C: drawer, it will not be found in SYS:REXXC!). Please report if it works on your computer. However, the Stop-Motion mode will not cure the problem that your machine might be too slow for mixing the sound already (so if your machine drops the frequency while playback already, this option is no use for saving the sample).

### 3. Half DMA Mode:

This is the most effective way of saving a module if you run out of CPU power. It halves the sound output frequency, but leaves the mixing frequency the same (so it all sounds wrong, but it is saved correctly). The module playback speed is also halved, but this requires the Player to use the internal interrupt of DeliTracker (all Players with NotePlayer support normally do this).

### 4. Quarter DMA Mode:

Just like the Half DMA Mode, but instead of halving the sound output frequency, only 1/4 of the normal speed will be used. For very slow machines only.

The ModSave subtask runs at priority +1 to avoid being locked out for a too long period.

## 1.13 AHI Support

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### AHI Support

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Many people have sound cards and they don't want 14bit Paula output. I've invested much time to add the AHI Support to this Player and I'm not very satisfied with it:

1. AHI is inaccurate. No, that's not exactly the right term. It's just that it needs huge sample mixing buffers to work correctly (at least the Paula modes need 832 bytes) and for DeliTracker is doing the mixing asynchronously, the notes will not be mixed at exactly the right time.
2. AHI is slow. If you don't have a sound card, please don't use the AHI Paula modes. They will not generate a better output, no, it just needs more CPU power and the volume is softer.
3. You cannot change the mixing frequency while playing.
4. Stereo samples only seem to work with modes that support panning.
5. There's no automatic downrating. So if you haven't got the CPU power, good bye then!

And please notice: It doesn't really matter what kind of AHI mixing mode you select, because the mixing will still be done by the Genie and not by AHI. At least with the Paula modes you have to select one that does panning (++) , otherwise you will only get left channel output.

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As I don't own a sound card yet, I need your report on how well it works.

## 1.14 AutoBoost Options

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### AutoBoost Options

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With the 'Auto'-Button enabled, the Genie calculates the volume boosting factor automatically by counting the amount of channels used with a module. Now some guy had told me, that he noticed the AutoBoost calculation being to low for most modules. So he asked me, if I couldn't add an option to customize this factor.

I don't want to explain more on this topic. Just try it.

## 1.15 New Players

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### Short notice for the new players

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There is an update package for some players for DeliTracker in the DeliPlayers drawer. The changes mentioned here might be incomplete and refer to the last official release of these players.

DataType	Bugfixed for the AHI-Protracker DataType.
FastTracker2	Bugfixes and enhanced panning support. Support for Ping-Pong Loops (requires additional memory). Improved SongEnd detection.
Impulse	More features, bugfixes, but still no support for packed samples.
MED_note	Now plays both MED and OctaMED (8 channels) modules correctly, you don't need OctaMED_note anymore!
Mline	Is now a NotePlayer.
OctaMED	Plays some of the OctaMED SoundStudio modules. This is no NotePlayer and won't use the Deli14Bit Genie.
ScreamTracker3	Various fixes and enhanced SongEnd detection, support for very scarce 16 bit modules.
TFMX_note	Fix for very short notes etc. and a compatibility hack for TFMX1.5 tunes.

All players are courtesy of Peter Kunath (FastTracker2 and ScreamTracker3 player improved by me), who is still doing a few bits for the Amiga!

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## 1.16 Known Bugs

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### Known Bugs

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The only 'bug' I'm aware of, is that the Peak and DMA displays are not updated when the window is not active. But there are some other 'DO NOT's:

- AHI: · Don't use Stop-Motion ModSave, doesn't seem to work correctly. You shouldn't use AHI for ModSave anyway, because it's inaccurate.
- Automatic sine panning seems to create some clicks in the sound. Dunno what the cause is.
- Don't change the mixing frequency while the DSP is turned on. This will not do any harm, but may cause odd sounds for the buffer is not cleared.
- Changing the buffer size while playing will clear the old buffer. Just be aware of it (there's no way to avoid this).
- Don't fiddle with the mixing frequency while using the ModSave function. This just causes the sample to sound wrong (you can't have different frequencies in one sample file).
- Please don't toggle the Panning setting while using the ModSave function. This could cause some 'leaks' in the resulting file (this has not been tested though).
- Please don't change the type of file to write while saving. This probably just will cut off the beginning of the sample or will give you a useless AIFF header.
- Turning on the Normalize Wave function (or resetting the Peak with the Return key) after saving has started (and the Calculate Peak option is not being used) may lead to distorted samples if the maximum peak already has been passed.

The Genie has been tested with Enforcer and MungWall, but if you encounter any bugs or flaws, please report them. I also appreciate any comments on the new features or suggestions for further versions.

## 1.17 Acknowledgements

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### Acknowledgements

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The first big thank-you has to go Peter 'Deli' Kunath for his sources and help on various issues whenever I needed it. Okay, he's now a pretty sad PC-fanatic, but anyway, he still seems to do some DeliTracker stuff on the Amiga aswell. You are welcome to bugger him to release Deli3, which is about 90% finished since 1995, so write a mail to Peter Kunath <kunath@informatik.uni-muenchen.de>.

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Special thanks must go to all beta testers and supporters:

Frederico Borges  
Christian 'Flowerpower' Buchner  
Crown/Cryptoburners  
Negulescu Istvan  
Victor Steve Haaz (DSP Presets, 3D mode)  
Jan R. Haugan  
Keith Halstead  
Stéphane Tavenard (ADPCM routines)  
Richard 'Zeg' Wagenführer  
Dion Wooning  
Crab (Bugreports)  
Gunther Nikl (Bugreports)  
Vit Sindlar  
Kyzer (Moral Support, Hints)  
Neurodancer

Thanks must also go to all those people who already sent me their comments and bug reports.

Best regards go to the following people who have sent me a postcard (in no particular order):

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## 1.18 The Future

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### The Future

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Last time you could read here, that I was about to stop development for being pissed off by the lack of response to PostCardWare etc.. Okay, the situation has become a bit better and as you can see in the Acknowledgements Section, 28 postcards (or other gifts) have been sent to me so far. This is still a really bad outcome, so do something to get me motivated. There must be more than 28 people using Deli14Bit on a regular basis. Anything is appreciated and better than nothing. And remember that there are only a few programmers left on the Amiga. We're one big community and we've got to share before we may enjoy.

But now, there's another problem: Time. You might know, I'm currently studying computer science/information technology and moreover, have found a wonderful girlfriend, and for students always seem to be low on cash, I've got some work to do for living (but any financial support is also appreciated of course ;-)). To make it short: Time has become a very valuable and scarce item (that's why this release has also been late for several weeks). New features are only to be added, if they're really required. You just have to convince me :-)

I originally planned to do a V5.00 in summer 1999, but this is very unlikely to happen as far as concerned. V5.00 and its modular concept would allow you to control the audio stream at any point and use as many DSPs, filters, buffers as you like. Sorry, but I just don't have any time to do it.

----- Original text of the V3.00 release: -----  
Since the first release in June 1998 nobody seems to use this Genie, as I didn't receive a single postcard. So I consider further development just a waste of time. If you don't agree, LET ME KNOW THIS. I've invested a lot of time and work already, maybe it's time for you act now? I didn't request money, no, all I asked for was a tacky postcard. Even this seems to be too much for all of you people. Amiga users don't seem to give a shit about software authors unless you cripple down the software to unusable crap (and I really thought about crippling the Genie). You're thinking I'm feeling bitter? Yeah, to tell the truth, I'm really pissed off!

Some people gave their feedback and motivated me to keep on working on the Genie (thx again ppl!). There have been quite a lot interesting suggestions as adding a Binaural feature (creating alpha brain waves), real 3D and surround modes, ADCMP4 saving mode etc. but at the time writing, I'm not willing to add these features. Make my day.

## 1.19 Version History

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### Version History

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## V4.20 (05-Dec-99): (36692 Bytes)

- Fourth Aminet release.
- Lots of changes to the automatic sine panning, adding a method again which doesn't cause 100% balanced sound, also changing the old method not to jump between left&right so much. Added a menu item to choose either method.
- Added keyboard shortcuts for the mixing modes (keys '1' to '7').
- Fixed the AHI mode bug that caused a crash on eject in certain cases.
- Fixed a bug within the AHI support that caused ModPrefs modules to be played at the previous frequency and not the ModPrefs one.
- Fixed a longstanding bug that could cause a crash or at least freeze the machine for some time when ejecting a module in rare circumstances.
- ADDED FONT SENSITIVITY! Added four new menu items to select between the original layout (topaz/8), the system default font and a selectable custom font. It was a lot of code to add (750 lines), please honour it.
- Slight changes of gadget widths and heights.
- Added an option to layout the GUI horizontal rather than vertical. Made it default for this creates a window that is exactly 640 pixels wide when using an 8x8 pixel font and fits neatly on a PAL screen again.
- Little bug overwriting some bytes of prefs data fixed.
- DSP speed increased a little bit.
- ADDED FILTER SLIDERS FOR THE DSP. Yes, now the DSP effects can be combined with the high pass and low pass filters.
- AHI requester now shows up only panning supporting modes. This rules out the Paula DMA mode, but it didn't work anyway.
- Added quarter DMA mode for saving on \*extremely\* slow machines (this was requested by Keith Halstead).
- Unchecking the ModSave gadget during saving will now pop up an abortion requester.
- NOW COMES WITH INSTALLER SCRIPT!

## V4.10 (17-Jun-99): (32472 Bytes)

- Third Aminet release.
  - Removed MC68000 code. Should have done that long ago.
  - Fixed a memory trashing bug introduced with late V4.00beta.
  - Internal changes on how the channels are toggled.
  - AHI: peak search was even done when Normalize Wave was enabled, even when no ModSave was in progress.
  - AHI: output was trashed when with no peak search being done. Silly bug, just forgot one line in the routine. This was reported by Crab.
  - Added menu item 'Restore Default Prefs'.
  - ADDED BASS & TREBLE CONTROLS (if anyone wonders why this is noted down for V4.00 and not V4.00beta, there's a simple reason: it didn't work the supposed way).
  - Added two new sliders to finally get the Bass & Treble Sliders working.
  - Bug in Frequency Override option found: Frequency was not overridden if the GUI window was closed. Now it should finally work.
  - Fixed inaccuracy of left<->right balance; speeds up mono modes now as supposed.
  - New mixing mode: Infinite Oversampling. This mode is probably rather slow, but it calculates the samples as if they were mixed at a infinite sampling frequency (okay, it's about 65000xOversampling). I think it's worth a revision bump to V4.10.
  - Increased accuracy of the Fast Interpolation mode by one bit and fixed a bug in the routine.
  - Fixed sine panning to always produce a 50% left, 50% right output so there will be no overflow anymore on mods with four channels and w/o
-



Anti Click enabled.

V4.00beta (17-May-99): (31972 Bytes)

- Public beta available from my homepage.
- Oops! Due to a wrong flag while assembling, the interpolation did only use 08:16 bit accuracy in V3.00 instead of the usual 15:16 bits.
- Added 'Ignore ModPrefs' option to temporarily disable the loading of custom module preferences.
- Fixed a possible problem for machines using virtual memory (did not use MEMF\_PUBLIC on the program variables, shame on me).
- Reduced size of the executable by more than 1200 bytes by optimizing some more data structures etc. :)
- ADDED an inaccurate interpolation-by-tables mode for slow processors. It uses an 08:08 bit table (128KB) which works fine on modules with 4-8 channels, but produces a lot of noise/distortion on music with very low peaks (8 channels and more). Warning: The table-mode is *\*slower\** on fast machines (MC68060 and probably also MC68040), on MC68020/30 the table mode *\*should\** be faster, but this hasn't been tested yet! Remember that the quality of the table interpolation is rather poor. Go for the RealThing(TM).
- ADDED ANTI-CLICK MODE. This will reducing the clicking on instrument switching but takes some additional cpu time (4 additional channels for mixing).
- ADDED CONDITIONAL CODE to speed up the mixing process in certain cases (volume zero or panning >=100% left or right).
- Added (senseless?) 'Mute While Saving' option, again for very slow machines. This saves the time required for chipmem copying.
- Changed the gui layout a bit, adding the required new sliders and buttons for treble and bass control, frequency shifting, and ahi mode.
- Max peak can now be reset to zero by pressing the Return key on the keyboard.
- Changed the creation of the 16 bit mixing tables. This might make some modules louder but yields in a generally higher quality with multi-channel modules (there was a bug in an early alpha, this is fixed now).
- ADDED SUPPORT FOR AHI! As AHI requires a sample buffer of at least 1024 samples (Deli14Bit uses 256 samples), it might sound a bit inaccurate (notes being played at not exactly the right time). Therefore there now are two different versions, one using 1024 samples directly (faster) and another one which mixes 256 samples four times after another (more accurate). I think the AHI support justifies a version bump.
- Fixed a minor bug which would do the auto boost value calculation when the genie window had been closed and reopened.
- I wonder why nobody had reported me this bug: the frequency was always overridden by the current setting, no matter how you set the 'Frequency Override' item (i.e. the ModPrefs Frequency setting was ignored). This bug (introduced with V3.00) has now been fixed.
- ADDED by-number-of-channels, by-type-of-module and by-type-and-channels prefs. This means you can store prefs files in the ModPrefs drawer which will be used as default for a module. The priority of the prefs is the following:
  - Module-specific Prefs in drawer ModPrefs ("ModPrefs/<modname>")
  - Module-specific Prefs attached to Module ("<modname>.14b")
  - Type/Channel Prefs in ModPrefs ("ModPrefs/\_<fmtname><chans>.prefs")
  - Type Prefs in ModPrefs ("ModPrefs/\_<fmtname>.prefs")
  - Channel Prefs in ModPrefs ("ModPrefs/\_Generic<chans>.prefs")
- Added two more menu items to provide a save requester for storing by-number-of-channels and by-type-and-channels prefs.

- ADDED HALF DMA MODE for ModSave. What does this mean? Users with slow cpu can now record in half-realtime, halving the cpu usage. Moreover, users using a pal monitor which can't go beyond 28KHz can now also save 44.1KHz samples.
- Added inverted stereo mode (faked surround). Best on panning modes and modes with tight DSP Delays.
- Added drawer prefs and a option in the menu to save them (so you can define default prefs now for whole drawers). Just create a .14b file with the name of the drawer and place in the same directory where the drawer resides.
- Increased the number of supported channels to 64 (some ImpulseTracker Modules use more than 32 channels!).
- Rearranged gadgets to fit the AC (Anti Click) checkmark in the Genie window (Panning renamed to Pan, Interpolation renamed to Interpolate). Anti Click setting is now a ModPrefs setting and not global anymore.
- Added conditional code for PAL:Screen (256 pixels screen height) that will leave away the About and Hide buttons so the window still fits on the screen.
- MODSAVE NORMALIZE does not block the Genie anymore and is performed in the background (asynchroneously). The Genie will pop up a requester if you try to save another file while ModSave is still busy.
- INCREASED SPEED of DSP functions a bit on MC68060 (and probably other CPUs as well).
- EVEN MORE CONDITIONAL CODE added to speed up panning ('mono' output is now nearly as fast as without panning).
- Many AHI changes, especially the boosting now works.
- Fixed a bug in the Table-Interpolation table creation.
- Moved Interpolation and Table-Interpolation into a cycle gadget and ADDED 2xOversampling (01:16) and 4xOversampling (02:14). Renamed checkmarks back to 'Panning' and 'Anti-Click'. Removed Table-Interpol. menu item and changed internal prefs format.
- Tidied and shortened the mixing routines a bit.
- Finalized the AHI Support.
- Found a possible crash in the ModSave routines, fiddled many hours with it, I hope it's now gone.
- Fixed a bug in the ModSaver which swapped two samples when saving in a non-panning mode.
- Renamed "2xOversampling" to "1-Bit Fast Interpol.", "4xOversampling" to "2-Bit Interpolation" and added "Patrick Meng Sucks!" Mixing Mode (real 2xOversampling).
- Slightly optimized some mixing routines, didn't check how much speed was gained though.
- ADDED 3D MODE. Sucks CPU power like hell, but this is the best mode for the use of headphones.
- Added sine panning mode (menu item) which forces modules without active panning (Protracker, S3M etc.) into a oscillating panning mode (but de-activates itself on modules with panning!).
- Improved Anti-Click.
- Added 'K' (Keep) button for ModPrefs.

V3.00 (17-Jan-99): (21736 Bytes)

- Second Aminet release.
  - Nearly all of the gui routines and other internals have been rewritten. (GadToolsBox code really sucks and so does direct/absolute addressing). Doesn't make much difference when looking at it, but object code size apparently became smaller than the first V2.65 release (before adding all of the new features). This is the reason for the bump to version 3.
-

- Fixed some enforcer hits introduced with V2.67.
- Introduced new (IFF) prefs format to store all the new options. Old V2.65/V2.66 prefs files will still be read correctly.
- Added quick Get/Store DSP preset buttons as requested.
- Fixed a possible crash on Kick 2.0 machines for the BusyPointer that should have been showed while normalizing the waveform after ModSave, as it is a Kick 3.0+ only feature.
- Found and fixed a bug in the peak level routine. Added an option to calculate the maximum peak even when not actually using ModSave. Moreover, the optimal boost level is also displayed. This new peak search routine is somewhat faster than the old one.
- Maximum Boost has been increased from 8.00 to 9.99.
- ModSave file requester didn't split path and filename into its components when popping up with the old file path.
- Implemented Stop-Motion Mode for ModSave for very slow machines. This allows you to do ModSaving if your machine is not fast enough to do both mixing and saving at the same time.
- Increased ModSave buffer size to 256KB (so the saving doesn't get aborted when using opaque window movement etc.).
- Added two options in the ModSave menu to control the triggering and the removal of trailing zero samples.
- Increased speed of chipmem transfer once more (at least for fast machines).
- Implemented alternative ModPrefs saving path option. This allows prefs being saved along with the module.
- Added menu options to load, save (with file requester) ModPrefs and delete existing ModPrefs.
- Added option to modify AutoBoost factor (as requested).
- Implemented Frequency Override. When this tag is enabled, ModPrefs and DSP presets do not change the global frequency but stick to the global one.
- Added Auto-adapt DSP (as requested). This option ensures that the DSP delay stays the same if you change the frequency.
- Converted doc file into AmigaGuide.
- DSP buffer was not cleared on stop. Fixed.

#### V2.67 (07-Oct-98): (22216 Bytes)

- Internal version.
- ModSave Filename was not stored anywhere. This could cause problems (enforcer hits?) when the save flag was enabled, but the genie window had been closed. Also the file name was lost when the genie window had been reopened. This problem has been fixed.
- ModSave CheckBox setting is not used with local ModPrefs anymore. This caused a lot of confusion when trying to record a module with custom module settings.
- Some gadgets were not updated (Stereo Width slider), when loading new prefs.
- Effect Delay slider was not updated when frequency went down due to too high cpu load. Fixed.
- Effect Delay slider now displays the amount of milliseconds up to 9999 (requested by Dion Woening), beyond this value it switches back to the old seconds display.
- Changed the layout of some gadgets a bit and added a simple button for the ModSave file requester.

#### V2.66 (16-Jun-98): (21552 Bytes)

- Doubled the ModSave Buffers (now 128KB) for slower machines to avoid
-

- overflows. This flaw has been reported by Ralph Bernecker.
- Detected a bug which would not flush the last ModSave Buffer if a PCM RAW file should have been written. Fixed.
- Added feature to cut off trailing NULL-samples when doing a ModSave.
- Added busy pointer during truncating or normalizing process.
- Now you'll get a file request when pressing return in an empty Filename string gadget.
- All settings can now be saved individually for each module.
- Interpolation routine now uses 15bit accuracy instead of 8bit for subsample factor calculation (just a little bit slower).

V2.65 (06-Jun-98): (19988 Bytes)

- First public (AmiNet) release of the new version.
- Added DSP and ModSave.
- Added DMA Freq display.

V2.52 (22-May-98): (14386 Bytes)

- Internal version, never released to public.
- Added Interpolation.

V2.40 (10-May-98): (12584 Bytes)

- Internal version, never released to public.
- Added Panning and Stereo Width slider.

V2.30 (13-Aug-95): (11504 Bytes)

- Original 14Bit Player from Delirium.

## 1.20 Contacting the Author...

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Contacting the Author...  
-----

Feel free to contact me. And send me a Postcard or something. Or ask me for the keyfile, so that I can torture you mentally for not sending me a postcard.

Any mail, comments or donations welcome:

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