# Audio recording of rock/metal music using personal computers

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**Abstract:** Personal computers and their relevant technologies have been widely used by artists and musicians to create and record their own music and electroacoustic compositions. "Laptoppers" are famous for using their laptops for their dance/electronic beats and music. A genre that has not relied on the use of PCs for the production of its music is rock/heavy metal, since bands of these genres usually book recording studio time where professionals take on the task of the production using expensive equipment. This study shows that in today's day and age, and with the software and hardware currently available, it is possible for rock/metal artists to use their PC to record and produce their own CD successfully and at an extremely competitive cost. The effort's of a rock band that does just this is followed from the beginning and the results of their CD production and song successes is presented. The article also serves as a "HowTo" guide that bands on a low budget can follow to make good quality demo CDs and enter the music business industry.

**Key words:** personal computers; hardware; software; audio; budget; music; production

## 1. Introduction

There has been extensive use of personal computers for the recording and production of decent-to-high quality music. "For the music industry, the changes brought on by software have been revolutionary, similar to the way computers replaced typewriters in the business world."[1] Mainly though, the genres of music where computers are used are for electronic music, and dance genres like house, techno and trance. Artists and producers of these genres usually sit at home and record by themselves at their own time and cost using their laptops or desktop computers. Rock and metal music, however, is rarely done this way. This is because these genres of music rely on multiple audio track recordings and require several input sources. Moreover, in rock/metal music, the hardware and software used is expensive and thus bands save up a budget and book recording studios, where professionals produce the music using high-tech and expensive equipment. Studios usually charge by the hour and it takes several weeks for bands to record a 3-4 song Demo CD. The per hour studio rate varies between sixty and two hundred dollars[2]. Another approach chosen by musicians of these genres is that of a home studio, where equipment similar to that of recording studios is used. Using the computer for these genres of music has not been the preferred method for bands. The process proved to be too complicated, and the results have been disappointing and costly. We believe that in today's world, computers have come far both in digital as well as analogue production techniques. "A simple computer-based studio consists of the same basic components as a typical million-dollar professional studio complex – they're just in a different physical format."[3] Also, there are numerous books out now that provide guidelines for home-recording like "Home Recording Power!"[4].

In this paper we will describe how software and hardware currently available has been used by a rock band to make good quality recordings of its own music CD at low cost.

We begin with some brief background information about the band and its recording

experience so far. Next the methodology of the creation of their Demo CD is detailed along with a listing of all the software and hardware used and the associated costs. Following this we present the results of the study and back up our findings with results of entering the songs on the CD in respected competitions.

## 2. Background

The Unleaded (the band) were formed in early 1998 in Nicosia Cyprus. They are unsigned and have no management. Their genre is classified as a mixture between rock and metal, and the vocals are in English. During their first year, the band entered a Live national "Battle of the Bands" contest in Cyprus where they ranked in 1st place. Following this, they entered the studio and recorded a full-length album which the band felt cost them too much for their budget and that it could have been of a better recording standard. Recently the band self-recorded a new Demo CD. We detail the production of the CD and provide a breakdown of the costs. Furthermore, we discuss how the demo was perceived in the rock/metal music world and use the band's success to make recommendations.

## 3. Methodology

The aim was to record and produce a 3-song demo CD which would consist of a new recording of an older song that they had "Lie", as well as 2 new songs that they had written specifically for this purpose, namely "Scream at the World" and "Revenge". The songs were recorded in the above order, all following the same methodology that follows.

An IBM-compatible Pentium III (600 MHz) desktop PC was used. The PC ran on Windows 98 and had 256MB RAM. The audio card used was the one that came with the PC and was 16-bit stereo. The sound was tested using the speakers of a Samsung home stereo, as the PC speakers were not very loud. The instruments used were a vintage electric guitar, a fender squire bass guitar, a 50W Peavey amplifier, and an unbranded microphone.

The first thing that the band wanted to record was the different drum parts. After some discussions between the band members they decided to record the drums as computer music, rather than to record real drums through microphones. This decision was made for two reasons: Firstly, some aspects of the songs were written with electronic drums in mind. However the band members wanted the drums to sound "real" in the rest of the parts, which was a very challenging task for the rock genre. Secondly, only one microphone was available, while the drum kit had 10 different drums/cymbals. They wanted to mix each drum sound individually, but this would not be possible as with only 1 microphone there would only be one input source picking up all the drums. Therefore, the software of choice here, was a program called "HammerHead Rhythm Station"[5]. Fig. 1 shows the interface of HammerHead.
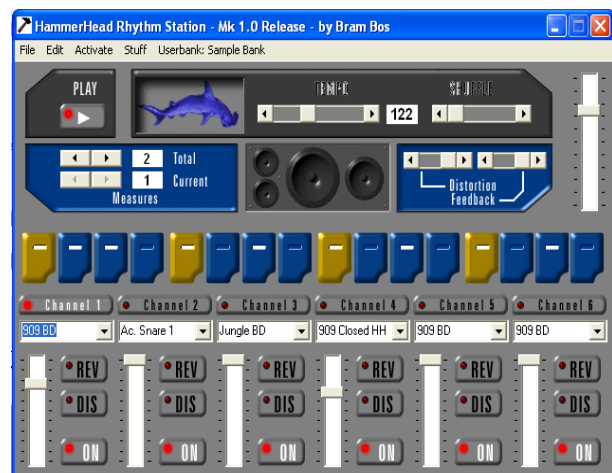


**Fig. 1　Screenshot of the interface of HammerHead**

HammerHead is Freeware, which meant the band could use it for free with no restrictions. Furthermore HammerHead is very simple to use. First, the different drum sections of the songs were entered into the program. Each individual drum was exported as a *.wav file, which enabled the band members to later mix them individually. The wav files were then pasted

at the appropriate places in a wave program (Goldwave), which also created the desired song structure. This kind of programming made the drums the lengthiest part of making the Demo.

The next step was to record the bass guitar and the electric guitars. The bass guitar was plugged directly into the line-in of the soundcard. The software used for this step was n-Track Studio (Fig. 2). With n-track studio[6] it is possible to record a new track while simultaneously having the previously recorded tracks as playback. Because of this, if performed accurately, the recording of the live instruments would be perfectly in sync with the drums.

Recording the guitars was done in a slightly different manner, but using the same software (n-track Studio). The guitar was initially plugged into a multi-pedal effects processor which plugs into an amplifier (a 50 Watt Peavey), and a microphone (unbranded) was placed in front of the amplifier and used to record the sound to the computer.
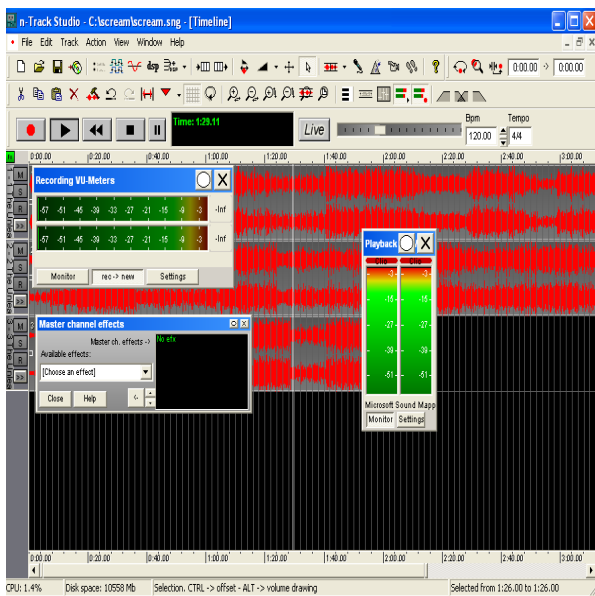


**Fig. 2   The interface of n-track studio**

Next, the synth parts were to be made. These included string ensemble sounds and other electronic sounds. The program used here was NoteWorthy Composer (Fig. 3).

Noteworthy Composer is a "software music composition and notation processor for Windows", and "it allows you to create, record, edit, print and playback your own musical scores in pure music notation"[7]. Using this software Unleaded were able to write the music scores of these instruments in music notation and export the files as *.MID.
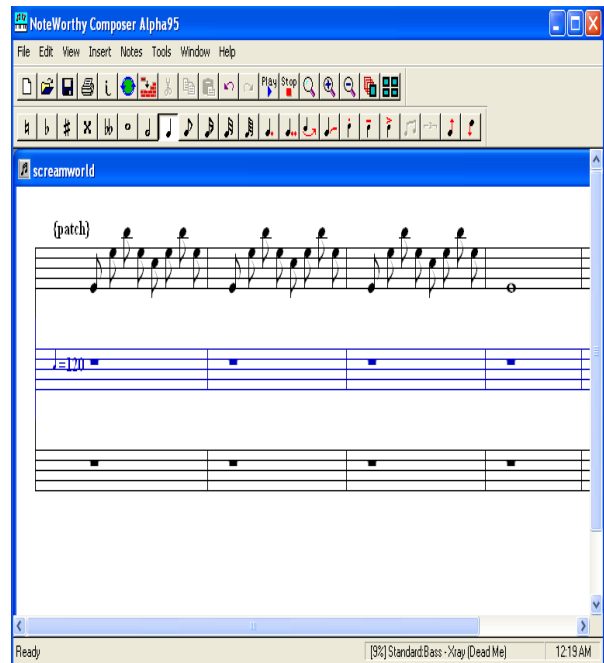


**Fig. 3   Screenshot of the interface of NoteWorthy composer**
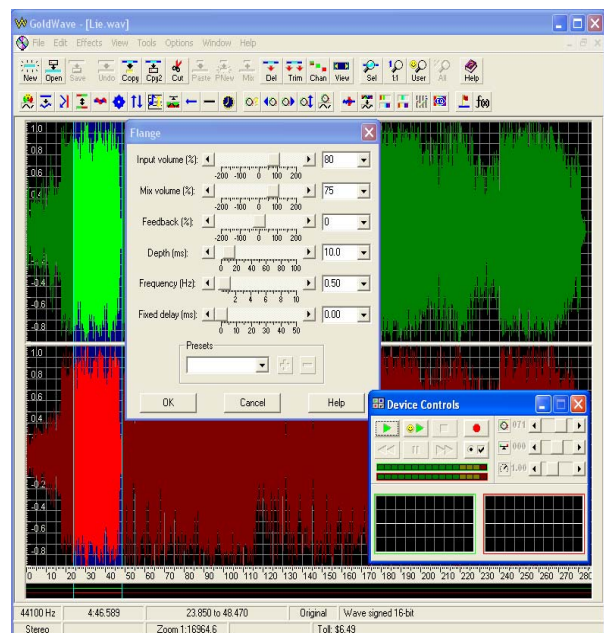


**Fig. 4   The interface of GoldWave**

The final step in getting all the recordings done was the vocals. The lead and backing vocals were recorded separately using the single microphone in n-track studio, like the bass had been. With all the music parts recorded, the band now had to mix the song. Effects were added using the GoldWave[8] audio software (Fig. 4).

All the .wav and .mid files were now entered into a song file (*.sng) in n-track studio, where the band adjusted track volumes. At this point the band burned different volume adjustments on CDRs and took them around to various friends' places and cars, so that they could hear how it sounded on different hi-fi systems. From the feedback, they made several adjustments and repeated this step a few times until they were satisfied with the mixing of the volumes of the different tracks in the songs.

Once the 3 songs were finalized, n-track studio was used to mix them down into *.wav files (44K 16-bit stereo), and then also converted into mp3s (192Kb/s and 128 Kb/s). At this time the song order of the demo CD was also decided:

1. Revenge
2. Lie
3. Scream at the World

Nero Express (a CD-burning software supplied with the PC) was used to normalize the tracks and burn the wav files on CDRs in audio CD format. As everything so far had been done on a PC, the band decided to do the printing of the CD labels on the PC too. A CD was scanned to obtain the print area and then edited in MS Paint with the bands design. They opted to go with black and white as they did not have a color printer and this would also be cheaper when making copies. The label was then printed on sticker paper (special CD labeling paper) and stuck on the CDR. The master copy of their new demo CD was now ready and further copies could easily be made.

Furthermore the mp3s were placed on their website in an attempt to enter the music world, and the songs were also sent to various music competitions for evaluation and feedback.

## 4. Results and cost analysis

To put the demo to the test we wanted to check the three factors that we consider important for a rock/metal band to successfully produce its own CD, namely:

Factor 1: Good Live Performance (instrument playing/vocal ability)

Factor 2: Good Songwriting Technique

Factor 3: Good Production.

Results for Factor 1: Good Live Performance (instrument playing/vocal ability). The Unleaded were winners of the live battle of the bands in their country. The results of this competition supported our first 1st factor: Good Live Performance (instrument playing /vocal ability).

Results for Factor 2: Good Songwriting Technique

In order to test the 2nd factor the songs were entered in a very respectable songwriting competition. In "VH-1 Song of the Year"[9] vocal ability and production are not taken into account and only the songwriting is assessed. The competition had an elite-panel of judges which included Grammy Award winners and individuals from ABC television, and Rolling Stone Magazine. In May 2004, "Revenge" was declared the Winning song in the "Rock Category" thus backing up our 2nd factor.

In addition, the song "Lie" was entered into the "UK songwriting Contest" which like the VH-1 contest only assesses songwriting and not performance or production. "It is supported by some of the most highly respected names in the music industry including the BRIT Trust (of BRIT Awards fame), the World Music Foundation, Music Aid, the BRIT School, the Guild of International Songwriters and Composers, The British Academy of Composers and Songwriters, Sibelius, Backbeat Books, Virtual Studio Systems, American

Songwriter Magazine, Sound Control and other leading UK and international music industry professionals and organizations."[10] "Lie" was a Rock/Indie Category Finalist in the 2004 "UK Songwriting contest".

Result of Factor 3: Good Production

In addition to the songwriting competitions, the songs were also uploaded to several online competitions in mp3 format. One of these competition sites was GarageBand (GarageBand, 2004). Garageband was named as one of the "50 best websites of 2003"[11] among the giants of Google, eBay, Amazon and Paypal. "Garageband.com's charts are gaining recognition as the definitive listing of the best new independent music" as their "anonymous review process and comparative ranking algorithms eliminate biases that are inherent in every other form of Internet voting"[12]. The Unleaded tracks did exceptionally well in these charts.

Revenge was voted "Most Rocking Track" for 2004 out of over 15,000 songs. "Scream at the World" is currently #1 in the All-Time Industrial Charts out of 1218 songs.  We look closer at a certain type of chart that Garageband has specifically for production to test our 3rd factor. The production for "Scream at the World" ranked #2 out of 1218 songs in the Industrial genre, and the production for "Revenge" ranked #19 out of 1486 songs in the progressive rock genre. More than decent results for a self-produced demo, especially since many of the bands in Garageband record their songs in studios.

Another point worth noting is that an earlier recording of the song "Lie" was entered in Garageband's contest a few years back and was unable to break into the top 500 of its genre. The same exact song with the new recording/production reached #116 of 1453 songs in the experimental rock genre.

Furthermore, "Revenge" reached #1 in a number of other Internet charts including Mp3Songs.org.uk and Vitaminic, and was the winning song in Nov 2004 "Loopwise Songwriting Contest". However it can be argued that the most important criterion for production

feedback is that of media exposure. Would a highly respected radio station or movie company air the music of a band or use their songs in soundtracks just because the songs are good, even if it has bad production? Probably not… Over the past few months The Unleaded have made several live radio interviews and received radio airplay on the major radio stations in Cyprus (including: KissFm, Radio One, BFBS, CyBC2, CyBC3, Radio Elios, Radio Mega). Their song "Scream at the World" was invited to appear on a Various Artists compilation CD[13] and is part of the soundtrack of the movie "Carpe Diem 2"[14]. "Lie" was used in a snowmobiling movie called "Liquid Adrenaline"[15], and "Revenge" appears in the trailer of the horror film "Rip Cage"[16]. The band is also one of the Editors' pick in the music section of the popular Download.com[17].

The band members already possessed their instruments and used the PC that one of the members already had. Therefore these costs are not included in our calculations. We calculated the total cost of the software needed and also included the cost to print 100 CD's with labels (Table 1).

**Table 1   Cost of recording and producing 100 Demo CDs**

| Computer software | Price |
|---|---|
| HammerHead Rhythm Station | $0 |
| n-Track Studio | $49 |
| NoteWorthy Composer | $39 |
| GoldWave | $40 |
| Software total | $128 |
| 100 CD-R's | $32 |
| 100 CD Labels | $36 |
| 100 CDs with Labels total | $68 |
| TOTAL PRICE (for recording / producing/ printing 100 Demo CDs) | $196 |

The total cost for producing the Demo CD and making 100 copies was under $200. Once the band members became familiar with the necessary tools, it took them about a month, working 3-4 hours a day including weekends, to record and produce their demo

CD. Therefore, assuming that any member of rock/metal band has a PC of minimum specifications of a Pentium III with a graphics editor (like MS Paint) and CD burning software (like Nero Express), then yes, using a PC proves to be a cost effective way for such bands to record their own demo CD's.

## 5. Discussion

At the time of writing of this paper, The Unleaded have already received over of 30,000 downloads of their mp3s from new fans worldwide, mainly from the United States, and the United Kingdom. In the meantime, the band was invited to play in an international rock festival, and to showcase for major record labels.  Below are two official demo reviews of The Unleaded's demo CD. In both reviews, positive comments are made about the production.

Official Demo Review 1[18]: "Excellent work guys. Very original sounding material. Well done instrumentation, orchestration, production and overall musicianship. In our opinion this material could be easily marketed to the right audience of Music Industry Pros!"

Official Demo Review 2[19]: "Thank you very much for sending in a submission of such an excellent standard. The tracks are all well produced (especially "Revenge"), and the vibe created is excellent on all the songs."

The band also received hundreds of emails with comments from new fans made after producing their demo CD. These, and other comments, can be found at the band's website[20]:

Pete (getafixrecords.com): I heard you CD. WOW!!! I must say the quality (vocal, percussion, guitars, bass and excellent production) made it sound like I was listening to a commercial product.

BrentLawson: i want to know how you got the vocal sound just so perfect in the verses, is this a home studio deal, doesn't sound like it!

Reclusum: The first thing that jumps out at the listener when listening to this tune is the great production. The sounds you created are excellent and fill the void of GB bands, which have a tendency to sound mediocre when it comes to production. You guys nailed it and found your sound.

## 6. Conclusions

In this study we followed the process that an unsigned rock band from Cyprus took to record and produce their own Demo CD. We detailed the production of their music from the beginning of the recording, up until the making of the audio CD's. We described the hardware and software they used, and also calculated the costs they inherited. We believed that 3 factors were important in order for the band to achieve a good quality demo CD using a PC and tested these by entering the songs in various competitions where the results were impressive. Our final conclusion is that, in today's world, a PC proves to be a very cost effective way for rock/metal bands to self-produce their own CDs. Bands with low budgets will no longer have to save up to book recording studio time, and by using equipment that they already possess as well as some low cost music software programs, bands of these genres can now successfully record their own demo CDs.

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