Final Report for George Sanger ADAT Project

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Introduction

The UT Videogame Archive at The Dolph Briscoe Center for American History seeks to preserve materials related to all aspects of videogame design and production. The Archive has taken possession of materials donated by George Sanger, the creator of music and sound for numerous videogames. Calling himself "The Fat Man," Sanger often collaborated with a group dubbed "Team Fat."

One part of the collection is a number of ADAT digital audio tapes with music from the game *The 7th Guest*, which was developed by the company Trilobyte. It was released for multiple platforms by Virgin Interactive beginning in 1993. The game was one of the first to be released solely on CD-ROM due to the large amount of full motion video included in the game, which was also something new to videogames at that point. The game proved to be successful, winning multiple awards and spawning a sequel, The 11th Hour.

As our project for Professor Pat Galloway's class INF 392K "Problems in the Permanent Retention of Electronic Records," we migrated digital audio from ADAT tapes provided by Sanger into WAV format that can preserved long term. This document describes the process undertaken to migrate the recordings in order to provide instructions and insights for posterity. It also details an interview we performed with Sanger, as well as recommendations for the future.

Creator Interview

An interview with George "The Fatman" Sanger was conducted on April 23rd, 2010 at his studio in Austin, Texas. This interview was conducted by George Royer and Justin Kovar and was intended to serve as an oral history of the creation of the music for the 1993 PC game *The 7th Guest*. A transcript of the interview is attached to this report as Appendix C. The content of the interview is summarized below.

George Sanger was discovered by Dave Warhol and began working with videogames in the early days of the console industry, initially producing compositions for Intellevision and Atari games. Following the collapse of the videogame industry in 1984, he focused his efforts on refining his recording and composition skills. During

this time he was using the MIDI format to arrange songs for songwriters. Sanger reentered the videogame music business at Dave Warhol's behest when the mid-1980s arrival of the Nintendo Entertainment System led to a resurgence of the videogame industry. Sanger's experience with traditional composition and digital recording allowed him to produce important works on games such as *Maniac Mansion* and *Total Recall*. His experience working with the MT32 led to his collaboration with Richard Garriott's Origin Studios in Austin, Texas where he created award-winning interactive audio for games including the seminal *Wing Commander*.

The success of *Wing Commander* drew the attention of Graham Devine who was developing *The 7th Guest*. Devine contracted Sanger to create the moody, atmospheric soundscape of what would prove to be one of the early "killer apps" in PC games. Specifically, *The 7th Guest* was one of the first games to use a CD-ROM format. The game's success, in part, helped to motivate consumers to adopt CD-ROM hardware as a part of their PC. Sanger received a generous contract from Devine and Trilobyte and was given a free hand to compose the soundtrack. The Fatman's connections at Roland suggested that he acquire and compose his music on a Roland Sound Canvas using the General MIDI format. The General MIDI format would allow the same MIDI composition to be played on a variety of soundcards. The music for *The 7th Guest* was composed and recorded onto an 8-track Alesis ADAT machine and bounced down to two tracks in DAT format. The two DAT tracks were then bounced back onto the 8 track ADAT and supplemented with additional material before being once again bounced into two DAT tracks. Compositions for *The 7th Guest* may have included as many as four bounce procedures. Some of the music was performed by Sanger's own team of musicians, dubbed "Team Fat," and was considered to be a groundbreaking accomplishment in the videogame industry. Team Fat would go on to work on other important projects, including *The 11th Hour*.

Additional salient topics discussed in the interview include Sanger's relationships with major figures in the audio technology industry, his opinions regarding the evolution of interactive audio in games, explanations of some of the items in his collection within the UT Videogame Archive, and descriptions of the homebrewed software kits used to compose sound elements for games playable on early videogame consoles.

Collection Assessment

We initially viewed the materials on-site with Zach Vowell, archivst for The UT Videogame Archive at the Dolph Briscoe Center for American History. Zach showed us the portions of the archive related to *The 7th Guest*. This included copies of the game itself, as well as materials donated by George Sanger including his ADAT player, ADAT (SVHS) tapes as well as DAT tapes. From *The 7th Guest* collection, the ADAT player and seven ADAT tapes were loaned to us from the Center for American History. These materials were kept in the Digital Archeology Lab at the School of Information during the migration process. The ADAT tapes for *The 7th Guest* are actually S-VHS cassette tapes, kept in individual cases which in turn were placed into a bankers box and given to us to migrate. Each tape is labeled with a reel number. We created an inventory of the tapes and photographed the tapes. No intellectual property determinations were necessary since the materials are being restricted to Briscoe Center users and approved visitors.

Migration Set-Up

Our tapes were migrated from George Sanger's Alesis ADAT machine, where they were stored as pulse-code modulation (PCM) data on S-VHS tape, to WAV extensible files that were ingested into DSpace. PCM is the first and most dominant form of digital audio, from its invention by Denon in 1971, continuing on as the common denominator of DAT, ADAT, CD audio, DVD Audio, as well as WAV and AIFF files. The major innovations of the ADAT machine were that it allowed for recording eight discrete tracks of PCM on a single videotape, synchronization of multiple machines (for a higher track count), and the proprietary ADAT protocol, which allows the digital export of all eight tracks in a single cable.

The ADAT protocol uses a fiber-optic cable to send all 8 tracks of the ADAT at one time, digitally. Our cable was specifically designated as an ADAT cable, but in most cases a TOSLink S/PDIF cable could be substituted. To receive and decode an ADAT signal requires a soundcard that has an "ADAT In" connection. For our migration we used the RME Hammerfall DSP Multiface I card, but it appears that the popular ProTools Digi 001 and Digi 002 racks could be used, or a dedicated PCI card like the Yamaha MY8-AT, which sells for between $150-200 on the used market. We used Sound Forge 9.0 as the audio software for recording the transfers, though any multitrack audio recording software should yield the same results, since the decoding of the ADAT protocol is handled within the sound card.

Sanger's ADAT machine appears to be in good shape, with no obvious clicking, grinding or other noises that indicated problems, except for occasional squealing on rewind. We created a test tape to confirm that the ADAT machine would not damage the collection's tapes, and also to make sure that our migration wasn't changing the audio. To make the test tape, we recorded a series of test tones from the computer, through the RME soundcard's "ADAT out" through an ADAT cable to the ADAT's "ADAT in" to a new S-VHS tape in the ADAT machine. We then recorded the tape back to the computer through the ADAT's "ADAT out", through the ADAT cable, to the "ADAT in" connection of the RME soundcard, in the same way that we would be migrating the collection's tapes. We then performed a null test comparing the original audio to the audio we had migrated back to the computer. This test uses phase cancellation to check if there is a difference between two pieces of audio. To accomplish this, we lined up the original audio with the migrated copy, and then inverted the phase of one set. Because there was no difference, we heard silence on playback, meaning that the two signals had phased each other out, and that there was no difference between them.

After it was established that the migration process was not damaging the tapes or changing the sound, we began migrating the collection.

Migration Procedures and Problems

We migrated all tapes at their original sample rate/bit depth, which is 48kHz/16-bit. To ensure that all group members followed the same migration work flow, we created a migration tutorial. This document is included in this report as Appendix B. It details the settings that needed to be verified prior to migration, such as the sample rate/bit depth and the linking between Sound Forge and the Hammerfall DSP Multiface I card.

For each tape, we created a preservation master file. This file contains all eight tracks from the original ADAT tapes, even in cases where Sanger left individual tracks blank. After creating preservation master files, we created access files. These files retained the original sample rate/bit depth (48kHz/16-bit), but we removed unused tracks as well as leading and end silence. For several tapes, we also removed the first channel on the tape. This channel contained a constant modulating background tone. During the oral history we confirmed with Sanger that

this background tone is a SMPTE time code, which allowed synchronization between the ADAT machine and DAT machines. The multitrack recordings were then 'mixed down' to two tracks using Sound Forge's "channel converter", then saved as 256 kbps MP3 files. The process for creating MP3 access copies is documented in the migration tutorial.

The following details the editing we performed when creating access files, as well as additional metadata that we captured from the tape boxes:

Reel1:
selected tracks: 2-8 (track 1 is a time code)
extra metadata: all MIDI tunes | MIDI Music Archive A

Reel2:
selected tracks: 2-8 (track 1 is a time code)
extra metadata: Skeletons tk3 11:00 |Skeletons T4 16:00 | Skeletons dump MASTER 23:30 | Scrap from "The Game"

Reel3:
selected tracks: 2-8 (track 1 is a time code)
extra metadata: The Game 12:45 | The Game Dump Master 19:00 to 25:00 | Scrap from "The Game," no drums 00 - 12:45

[Reel] 4:
selected tracks: 1-4 (tracks 5-8 are blank)
extra metadata: Compiled Masters

Reel5:
selected tracks: 1-8
extra metadata: MIDI MUSIC ARCHIVE B

Reel7:
selected tracks:1-8
extra metadata: 30 MIN. PROGRAM "ALBUM"
extra metadata: use tks 7 + 8

version two--

selected tracks: 7-8

Reel7B:

selected tracks: 1-8

extra metadata: 30 MIN ALBUM CLONE

Storage and Metadata

The materials will be stored in the UT Digital Repository
(http://repositories.lib.utexas.edu/) under the Dolph Briscoe Center for American
History subcommunity. Below that there is a collection for the George Sanger Papers.
Both project documentation and *The 7th Guest* materials will be stored under this
subcommunity, with a collection for the documentation as well as each ADAT tape.
Initially we proposed a more complex hierarchy that was employed by a group
ingesting materials from the George Sanger archive into the iSchool Digital
Repository. However, Zach had a desire to make modifications to that structure so
we went with his modified collection structure.

We utilize Qualified Dublin Core to record most of the metadata for objects. This
metadata was entered manually during ingest due to the limited number of materials
being added to the repository. Technical metadata for audio files is recorded using
the AUDIOMD profile (http://www.loc.gov/rr/mopic/avprot/audioMD_v8.xsd) for the
METS metadata standard. This metadata is stored as an XML file that is included with
each audio item in the collection. A full listing of metadata elements (both QDC and
AUDIOMD) is included in Appendix A.

Ingest

Not having the necessary access on the UT Digital Repository, Zach Vowell had the
UTDR administrators create our necessary subcollections. Only after we attempted
an initial ingest did we realize that the normal method of ingest for the UTDR, the
web form, wouldn't work for our purposes due to the large size (between 1-2

gigabytes) of our files. After Zach conferred with the UTDR administrators, it was decided that we should ingest all possible files using the normal web submit form to create the items and the UTDR administrators will manually add the large audio files after that has been completed.

Preservation for the future

We ingested software along with the materials capable of playing the audio files. We chose the Audacity audio editor for MacOS X, Windows and GNU/Linux due to it being both open source and available for all three platforms. While we hope this will be a help for accessing the audio files in the future, the multi-track WAV format we used to migrate the digital audio is a well known, widely used format that is supported by a wide number of programs and platforms with no license required.

Future preservation projects that are migrating ADAT tapes should make sure they have adequate knowledge of the necessary audio hardware and software needed in order to make the transfer from the tapes. We were fortunate to have a group member, Justin Kovar, that had both the requisite knowledge and the necessary audio hardware to do the conversion. Since it was written before the invention of most currently utilized audio hardware, the ADAT manual provides little insight as to how to go about migrating audio onto a computer. Our contact with the creator of the materials, George Sanger, was also very valuable as he gave us insight on how to go about migration as well as how to interpret the different types of audio contained on the tapes.

Appendix A: Metadata elements

Element	Qualifier	Content
Contributor	Author	Creator: The person or organization responsible for the creation of the digital file.
Contributor	Custodian	The name of custodian with primary responsibility for the production of authentic record copies
Date	Accessioned	Date DSpace takes custody of material
Date	Available	Date or date range item becomes available to the public
Date	Created	Date that the digital file was created
Date	Last modified	Date that the digital file was last modified
Date	Harvested	Date that the digital file was harvested for DSpace
Description	Access Privledges	Access privileges concerning the creation, modification, annotation, relocation, and destruction of the item.
Description	Provenance	The history of custody of the item since its creation, including any changes successive custodians made to it (e.g., indication of technical modification)
Description	The State of the Record	Similar to physical condition for "real" objects
Description	URI (Uniform Resource Identifier)	Uniform Resource Locator (URL) of the digital object
Format	Extent	Size
Format	MIME types	Registered MIME types
Description		Description of the item

Description	Abstract	Summary
Description	Sponsorship	Information about sponsoring agencies, individuals, or contractual arrangements for the item.
Publisher		Entity responsible for publication, distribution, or imprint.
Rights		Terms governing use and reprodution
Subject		Uncontrolled index term
Title	Alternative	Varying form of title
Type		Nature of genre of content
audio_data_encoding		Structure for audio data; current known types are pulse code modulation (PCM) and SONY's DSD structure.
bits_per_sample		Number of bits per audio sample, e.g., 16, 20, 24, etc.
data_rate		Data rate of the audio in an MP3 or other compressed file, expressed in kbps, e.g., 64, 128, 256, etc.
data_rate_mode		Indicator whether the data rate is fixed or variable.
duration		Elapsed time of the entire file, expressed using ISO 8601 syntax; see http://www.w3.org/TR/NOTE-datetime.
num_channels		Number of audio channels, e.g., 1, 2, 4, 5, etc. See also sound_channel_map.
sampling_frequency		Rate at which the audio was sampled, expressed in kHz, e.g., 22, 44.1, 48, 96, etc.

Appendix B: Migration Instructions

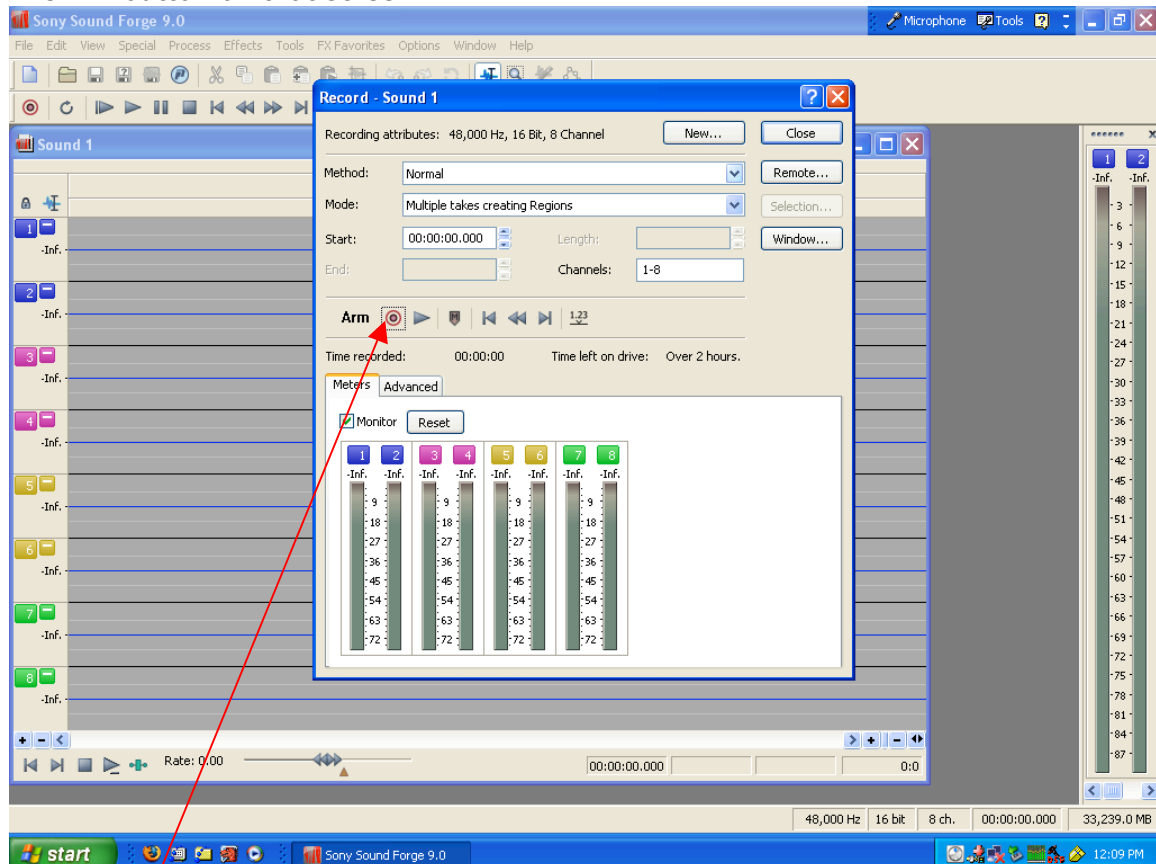**Instructions for migration of ADAT tapes using Sony Sound Forge 9.0**

Account: Lab user
No password needed

*Open Sony Sound Forge 9.0
*Create a new file
*Hit the red record button in the upper left-hand corner. That will bring up the following screen:

This is how Sound Forge should look before recording (48,000 Hz, 16-Bit, 8 Channel). If the kHz & bit rate is not 48 kHz/16-bit, you can adjust it by hitting the "New…" button on that screen.
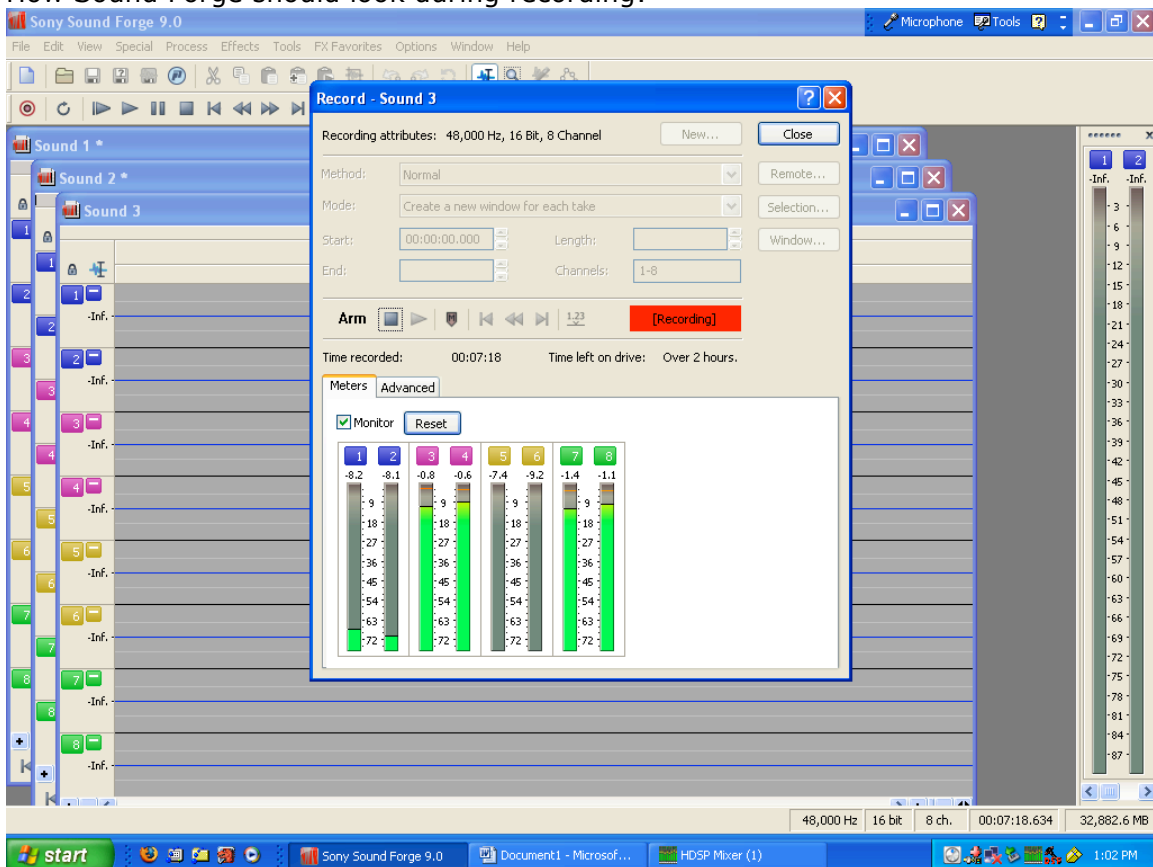

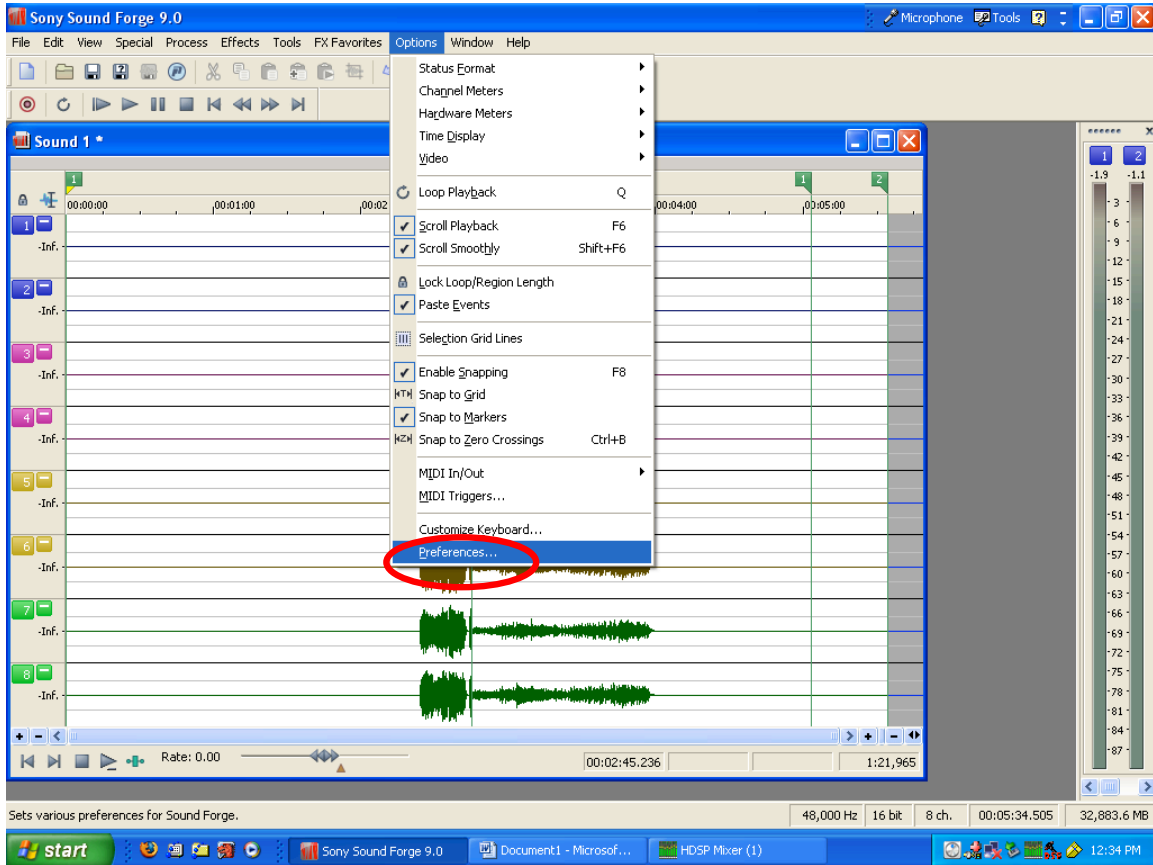Press the "record" button to begin recording

Then, press play on the ADAT tape drive.

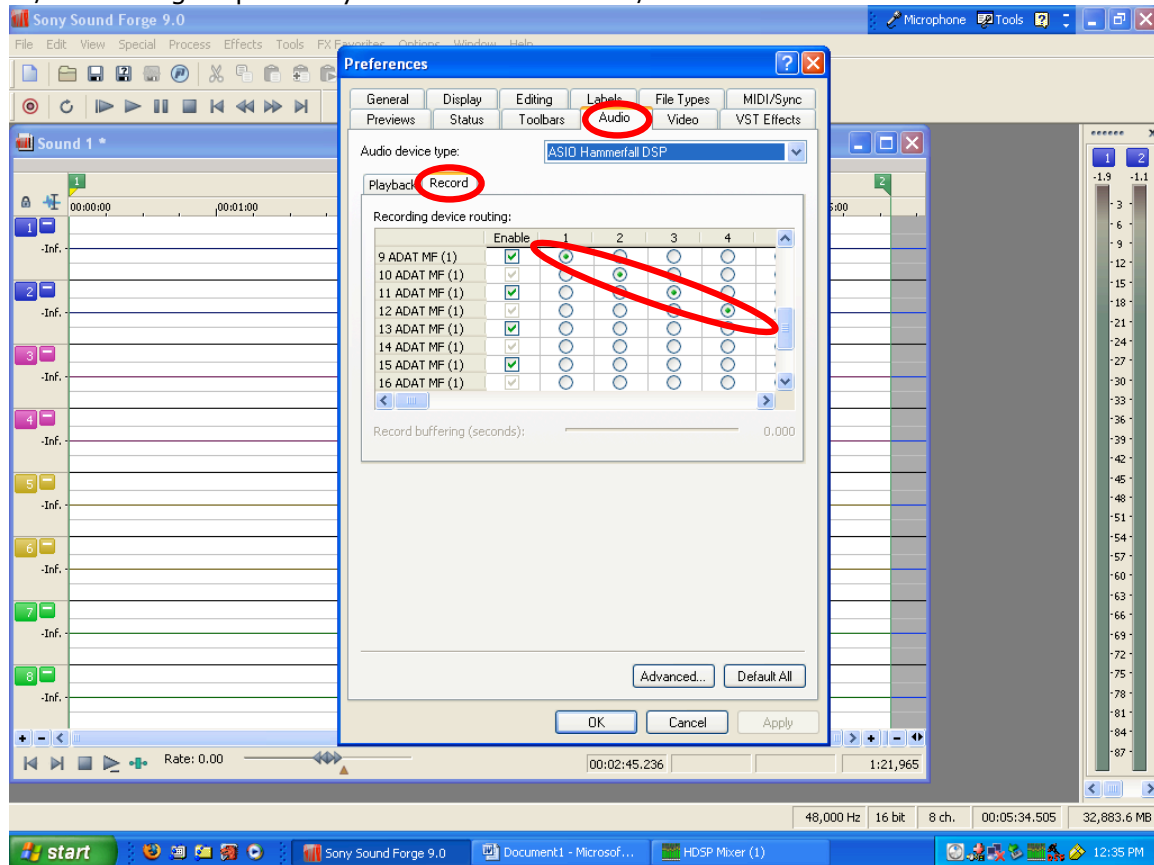Check that Sound Forge accurately mirrors the 8 track levels displayed on the ADAT machine.

How Sound Forge should look during recording:

If there are problems starting the recording, or levels don't match ADAT, open *Preferences*:

In Preferences, select the *Audio* tab, then the *Record* tab, and make sure only ADAT MF inputs 9-16 are enabled (checked), then assign 9 ADAT MF to 1 / 10 ADAT MF to 2 /continuing sequentially to 15 ADAT MF to 7 / 16 ADAT MF to 8

Note:
If you hear abnormal playback noises coming from the ADAT machine, hit the stop button twice to disengage the machine.

If you want take a look at the HDSP mixer interface, you can open that screen from the bottom right-hand corner. There is an icon for it. That being said, unless something is going horribly wrong, you really don't need to worry about that screen.

Naming convention:
Please name the file using underscores, and use all the words on the tape's spine.
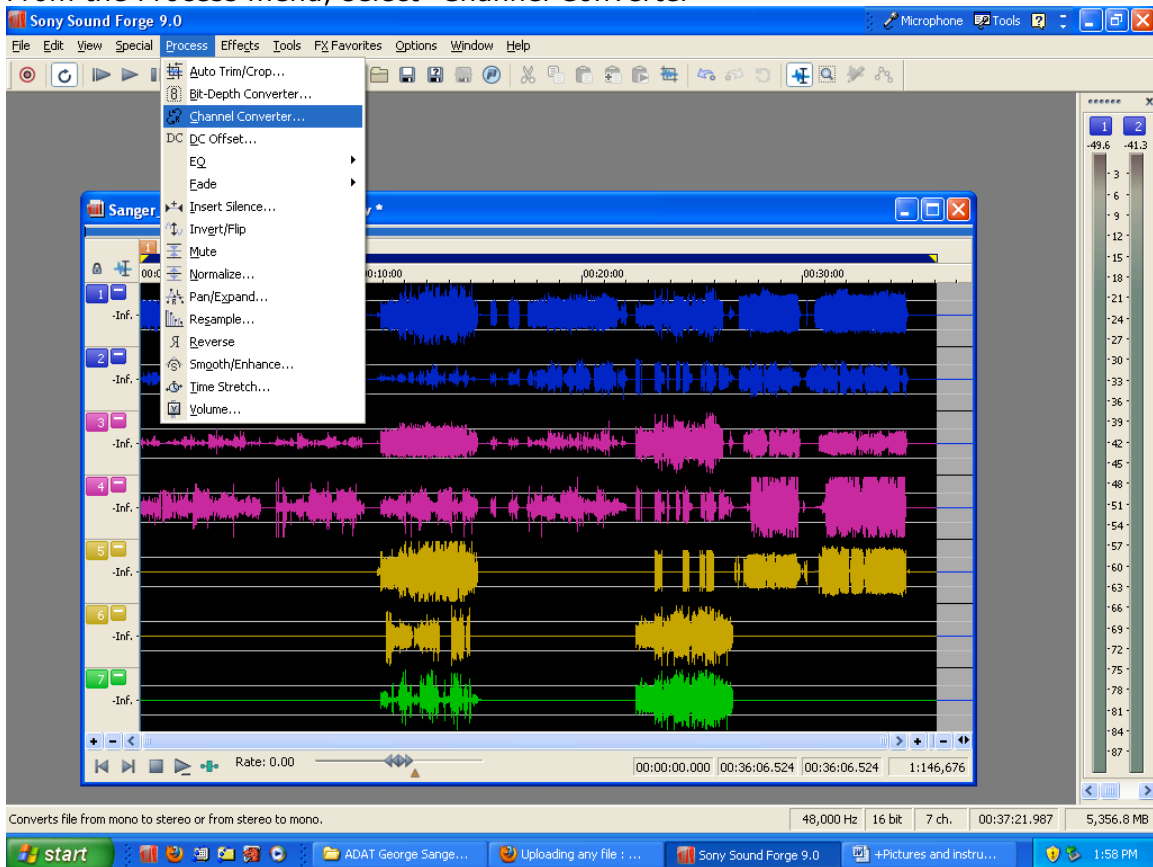Do not truncate the tape name! Start the file name with Sanger.

e.g. Sanger_T7G_Reel7B_30_MIN_ALBUM_CLONE

Please save the files in Sanger the folder created on the computer's desktop.
CREATING ACCESS COPIES

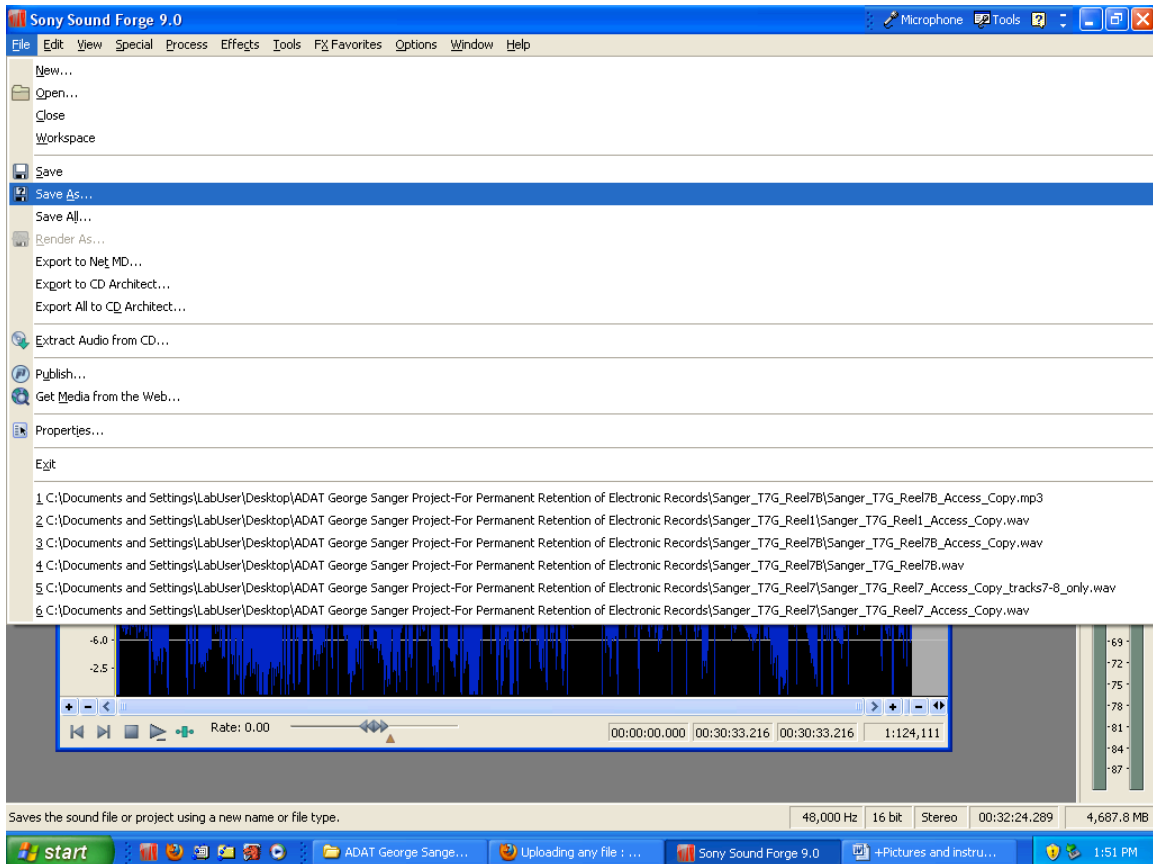Open the .wav file in Sony Sound Forge 9.0. Select the tracks for the access copy by clicking on the desired tracks and highlighting with your mouse. Make sure not to include the time code track, if there is one. Crop out the ending and beginning silence sections.

Converting Multitrack to Stereo:
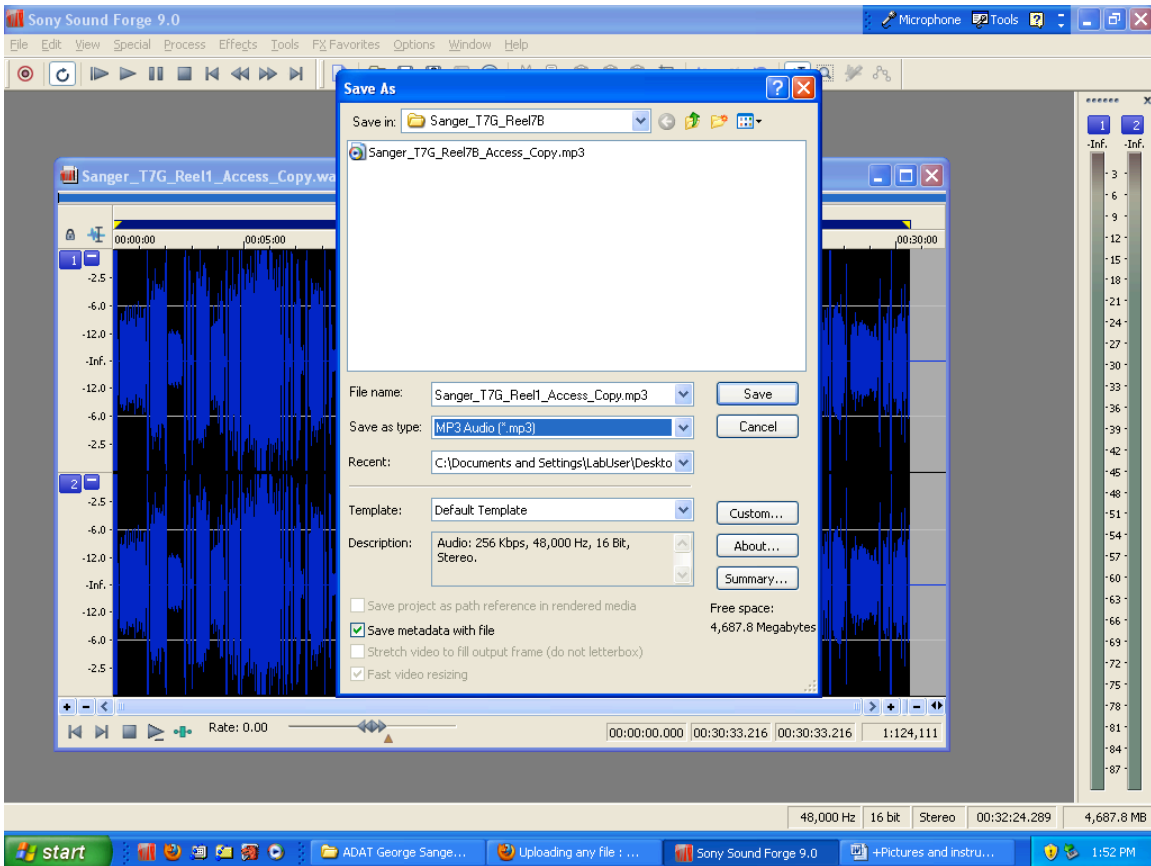From the Process menu, select "Channel Converter"

Saving MP3:
From the File menu, select "Save As", then "Save as type" of .MP3

Add "_Access_Copy" to the end of the file name. Make sure that the description shows the bit-rate as 256 kbps, 48,000 Hz, 16-bit, and then save to appropriate folder.

Appendix C: Sanger Oral History Transcript

George Sanger: Hi, its recording. The front is you guys the back is me. Do a backup, this will be a backup so I'll email it to you or whatever. I'll let you be the tech, as long as that lit thing is lit

Justin Kovar: Ah, ok.

GS: Good old rule of thumb, if the meters are moving and the red light is lit then we're good. If you see it overmodulating or anything you can move the mic level setting…did I finish telling that one. Yeah I did. That's good tech, it was recommended by Bobby Prince. Good.

George Royer: I think this one's running now as well. So, uh should we say our names or something for posterity?

JK: Sure.

GR: This is George Royer

Cindy Fisher: And what do you do?

GS: No, that's how do you do?

GR: I, uh, stay out of trouble.

GS: We're teaching you smart people about courtesy. Not what do you do, how do you do!

JK: This is Justin Kovar in an interview with George Sanger for the…

GR: UT Videogame Archive regarding the Seventh Guest.

JK: We can do all tradoffs like that… just stop in the middle of a question and I'll ask the rest.

GR: We can do good interviewer, bad interviewer.

GS: I'd like to uh, this is George Sanger on April 22

JK: Or, 23rd

GS: 1810

GR: We're not in 1810.

GS: And this is Cindy, lets say Fisher. She's the reason you're upset that this is only an audio interview. Ah, whats important is the space between the notes. Silence. We can use that for noise reduction later. Oh, and I made a huge mistake, I thought that you guys had like, flown in from Georgia.

CF: Yeah, that's why I was like where are you guys from?

GS: Yeah, that's why we have bagels.

GR: We appreciate it! Um, I am from Alabama.

GS: Oh really, you know Bobby Prince?

GR: I don't but I was actually a lawyer in Alabama for two years.

GS: Get out! How do you guys be so young and married and

GR: It's the blades. Triple blades.

CF: Do you guys have kids?

GR: Ah, no. Not that I know of. Glad that statement is going in the archive for posterity.

GS: What kind of law did you do?

GR: I did mass torts and class actions with a large firm in Alabama. I did medical device litigation and I worked with defective pacemakers.

GS: Holy crap!

GR: And I did white collar, um, fraud stuff as well for two years.

GS: So, is it just my prejudice or am I thinking not everybody can do this and it ought to be a fairly lucrative gig.

GR: It is, was.

GS: And now you're into recording old men

GR: Yeah

GS: in smelly… love ya.

GR: I decided that I'd do something that I enjoy. That I thought was really important. Long term. *clapping* thank ya. Somebody's got to be making sure that the future knows about this the newest art form. In my opinion.

GS: Well, it won't be the newest forever that's for sure.

GR: No, but it is right now.

GS: Well, let me tell you why I think you're smart. Cause theres a lot of things about videogames that I think will be interesting things to people in the future. One thing, what the attitude of people here has been over the last ten or twenty years towards these games. Because you people listening to this with your prosthetic eyes and your laser navels and flying cars will uh, and by the way that's funny because we don't have flying cars. You're probably thinking oh, games, sure interactive entertainment. I remember when they called that games, we called it living.

GS: So when I started doing uh, I was doing rock and roll and trying to be like the Beatles and I played a couple of the original videogames that I would find entirely on my own it was like I discovered them I was Christopher freaking Columbus, you know I went to the Ralph's grocery store in Eagle Rock and found a Missile Command machine. I dropped a quarter in and was like, wow I understand what this is. There's these dots and see those are like targets and there's this trackball ok so and then I'd tell my friends about it. And so, it wasn't like we were buying into something that everybody else was doing. It was like we were discovering stuff with these videogames while everybody else was interested in, commercially, was interested in movies, television, disco music, you know, cocaine, and what else am I missing anything? That's pretty much it.

CF: That sounds good.

GS: Yeah, and then there was a lot of people trying to get into banking because that's where the money was. And, in an effort to be like the Beatles I saw that most of what needed to be done in rock and roll had been done by them. The beauty of the Beatles is partly that they were innovators and that they were trailblazers and that they had something to hit their machetes against. And, since all that had been done in rock I looked at these videogames and said, this, this is the future.

GS: Guys, at that time it wasn't obvious that those were the future. And it was generally considered a complete waste of time to do videogames. There was no such thing as a career in videogames, all these things that were being done in little shops in foreign countries by mysterious weird people. We didn't know, to have a career in videogames would be like thinking about having a career in making those little plastic toys that go in the grocery store bubbles. You know, the crane machine things. It just wasn't an intelligent career choice. That was 78, 79. By the time I started doing this, 83 even, people would say why would you want to do music for games? They'd say oh, boop beep boop huh? Hahah. By 86, 87, it was oh, you're the guy who makes that ice cream truck music. So while we were pushing it forward, people were saying why would you want to do that?

GS: When I would find the occasional serious position that was doing videogames, which for the most part I couldn't find, they would say things like George, if I wrote something good do you think that I would give it to these people? So it was not a career in which people were saying, ahhh there's money in games. They were saying, ahhh what could you do that could possibly be more random? And that's why I liked it. The bar was very low, it was very easy to raise the bar. Uh, what a fighter pilot calls a target rich environment. That's when you're surrounded by the enemy.

GS: What was really nice is somebody could say do some music for me and they'd either move on and say great thanks we got the music or they'd say that's really nice music. And that, by itself, is psychologically so healthy its so good and you almost can't get that anymore. Because its like, make some music, what I want is something that's exactly like this song but I want it to be more, we were picturing sort of a jazz thing and you turn in a jazz thing and they say well… you know the producer really likes Dixieland and we were thinking more like that might be good too. So back then you could pfffft and Seventh Guest was really kind of a peak for it. Um, you guys aren't earning your money here. Want me to just keep going? I'm happy too.

GR: Actually, yeah. I was going to ask you to start at the start which you did and uh, sort of work our way into how they came to contact you for Seventh Guest, where game audio was then and how it sort of transformed it and what sort of uh, what your influences were, what led you to make the decisions. And then we can talk too about technical aspects.

GS: Ok. That's a really good way to approach it and I think I can do that in a finite amount of time. Did you guys get your bagels and what-not? Get what you needed?

GR: Uh, I'm good.

JK: I'm almost about to start into the bagels.

GS: Brief, very shallow history of working up to Seventh Guest. Dave Warhol was my brother's roommate in college they were just buddies and uh, he went to work for Intellivision. When I found that out, and he's still in the business under the name Realtime Associates. So when I found out he was in the business I did the thing that you are supposed to do in rock and roll I said hey can I work for ya I'll do anything I'll take out the trash I don't need money. He said, well, George you're a musician why don't you write a tune for me? So I said ok, short version I wrote a tune for him. He needed to pay me so they came up with a contract which I just brought over. I could show you my first contract. I had to charge him something so I charged him a thousand bucks for a ten second tune.

JK: Nice.

GS: And the company, Intellivision, folded a little bit later but I got a couple more gigs with my ex-girlfriend's brother-in-law who did a couple of things for Atari 2800 games. So first game it was like I just wanted to get into it and I wanted to compose. There was no MIDI so I ran on that 3440 machine, you know, I ran my four track machine and played a bass line on guitar and punched it in where I messed it up. And then I rewound it, got on the second track, played a melody on top. When I got something I thought sounded good I wrote it down in music notes and then mailed that through the us mail to Dave Warhol who, as a musician in the marching band at Pomona was able to translate those notes into code. And so that was thin ice for Intellivision.

GS: The next two games for Atari, I used a little music composer kit cartridge and uh, Dave, Eddelstein, uh first name, uh Eddelstein lost his first name but he's still in the business too.

CF: Want me to get your book?

GS: Naw, don't get my book, that can be done offline. He uh, broke open the code from the cartridge that the cartridge spit out. And that was an interactive tune too, what I did for him. It had little chunks of bass line that would shuffle in between eachother and depending on the tension level they would go faster and slower and

GR: Can we tell the people from the future what interactive, uh

GS: Oh, what interactive

GR: When it stopped being just linear composition models and started being

interactive.

GS: Well, for me it was right in 83.

GR: Ok.

GS: I did my first one in 83 and I think my second one in late 83 or 84. And it was Eddelstein's idea to do something that would change dynamically. This was a first person maze game which John Romero went back and said this was a big influence on me.

GR: Oh really?

GS: Yeah. It was capture the flag which was the two player sequel to Wayout. Basically you're in a maze and you're chasing a monolith. But in capture the flag you've got two players who can each see the other guy's monolith on a split screen on an Atari 800. That predates Wolfenstein by a longshot.

GR: Oh yeah. Definitely. I was not aware of that game. Interesting. I've never seen that written up much.

GS: Yeah. But it was one of the first things that Romero told me ever was that that was a big influence on him. Generally its not believed that there was a lot of interactive audio around those days but I imagine that if you broke apart some of the Japanese arcade games that you'd find some interactive audio. You didn't hear people talking about it very much.

GS: I was in the right place at the right time. The programmer was in the mood to do it. After the videogame home market crash of 84 all these companies went out of business because the Nintendo hadn't come out yet. During that time I pretty much laid low and learned my recording craft. Later in the decade, I can't remember exactly when, late 80s Dave Warhol surfaced again and he was doing Nintendo games. I had MIDI now and I had been using MIDI to score songwriters and I had been, you're a songwriter, here I'll do an arrangement of your tune for 29 bucks. 39 bucks. 49. 49.95. And then if I got too busy I'd raise the price. So I think I was up to about 49.95 at that point and Dave started hiring me at that rate to do game music. So he would call me up and be like so this for games like Dick Tracy on Gameboy and Total Recall and a lot of these left right punch kick save the princess games which had been reskinned for various intellectual properties. And then a couple of neat things like Qbert, you know for the consoles not for the arcade.

GR: I remember the Total Recall game on the NES because when you walked through the scanners it would replace your sprite with a skeleton and that was the first time I'd ever seen dynamic sprite replacement in an NES game that I remembered. I thought it was totally cool.

GS: I owe you a great apology because I wrote a lot of music for that game but the way in which it was implemented, you have to get, you hear one tune over and over and over and over and it went all the way up you finally even you kill your wife and you're going ok, this has gotta be a turning point…

GR: Nope.

GS: Even after that it's the same tune. I'm like, dude! In that sense it was interactive audio because it has different tunes for different levels. That's kind of where things were at. Even though Warhol has a mind that's always thinking about music based games and algorithmic composing and things like that, um, still the way to do a game was a tune per level, which I hated so I learned that its better to have several tunes per level that get drawn from a pool and then you should throw more tunes from that pool as you get to the next level. In fact, somewhere around here, it might be at the archive, I put this out as the pool theory—the team fat pool theory. I charted it out for the boys to look at.

GS: That was interactive music, but um, at an important point in there I was sending MIDI files to Dave Warhol and he had pretty much the only American software that could make tones for Gameboys and NES and he was known for his tones which had things like decay and echo. While Mark Miller had pretty much the only authoring system for SEGA. There were just a couple of ways that you could get a Japanese game developed in America. So I had a lot of the American games through Dave Warhol, because he had the software. Then after a certain amount of time of this Wing Commander came along

GR: May I ask a question?

GS: Yeah.

GR: You said Dave Warhol had the software?

GS: He made it.

GR: He made it? It was his? Ok. So he crafted his own proprietary software?

GS: Yeah, I think he reverse engineered how the hardware worked, or he was able to, the legend was and I don't know if I'm perpetuating something nasty that isn't true but the legend was that the small amount of documentation that you could get from Japanese manufacturers might have had intentionally screwed up instructions in the English version.

GR: Interesting.

GS: But, that's also, you hear things like that and you also hear stories that oh, that gross food they serve you in the orient with the maggots in it that's just special, they do that to bug the Yankees because they're still mad about the war. I really don't give a lot of weight to stories like that. That was sort of the attitude. I think the important part of that is that we all felt it was difficult to just pop in and start making noises on these machines and since Dave had the key to the NES, Mark Miller had the key to the SEGA. Mark Miller's stuff was even offering tools that a musician could use. That was how we were able to move forward.

GS: Meanwhile, I was still doing arrangements for songwriters and stuff on this MT32 which was this huge breakthrough in synthesizers. It wasn't so much for the excellent tone as much for the number of voices you could get. You could run eight different instruments at the same time and a drum kit. Or was it seven and a drum kit. Or was it—I don't remember. But then you could theoretically get 32 different notes at the same time which you really couldn't. But, that in an affordable package was just crazy good. Because a synthesizer used to cost thousands of dollars. A

synthesizer that could do two voices was unheard of. And here's this little box that could do all these things. So, I was using that to make arrangements for people and Dave Warhol says hey you should call Richard Garriot. He's doing a high-end PC game, he's in Austin and he's looking for someone who can write on MT32. So I start writing letters to Richard, and um those stories are documented but I got the Wing Commander gig.

GS: Again, Chris Roberts decided that he wanted that to be interactive, so that was a big breakthrough too. The idea was, Chris' idea was, you'd have a tune for you a chasing a missle, have a tune for the missile is chasing you, you have a tune for your wingman's been hit. He had no idea what the beat situation would be or the musicality of it but fortunately Dave Govett wrote the battle music. He kinda already had battle music going in his head. And so he arranged that for an MT32, I brought it in, Chris liked it and that was significant too because we were, Chris had asked to do a cross between Star Wars and Star Trek the movie which was like movie orchestration and nobody had tried that before for a game. Now everybody does it but for us it was like a great challenge. I gotta say Govett nailed it, it hasn't really, even though the tones are better now the composition really is no better than what he did for that. So Govett did the main theme and the battle music for Wing Commander. The interactivity level for Wing Commander was very cut and paste. You know, theres a tune that goes * music noises * and then you'd have another one that went *music noises* so these things would intercut and it didn't really matter what the beat was.

GS: Now our local guy, Mark Schafkin, who I still jam with, he was the main implementer. So, even though we were just providing the tunes Mark worked over at Origin and he's the person you would talk to about how the system worked for playing those little random bits. But that was so state of the art that when they showed that game at the CES show it was the hit of the floor. People were raving about the interactive audio when in fact it was just Dave's piece playing through linearly and a recorded clip of dogfighting video. Everyone was like, did you see how interactive the audio was? When the game came out it was interactive and it was loved, but people were so hungry for that at that point and the buzzword worked so well that they got all excited. But really, I think what they were excited about was the level of composition. I think what they were excited about, which they thought was technology, was that this was beautiful music that was interesting. Because before that, game music kind of went dow-dow-dow-dow-dow-boo-boo-boo-boo-boop, instead of * orchestral music noises *, you know?

GS: So, I gave a talk at a game developer conference, my first talk, I went to game developer conference after Wing Commander came out and at the first game developer awards show there was a sound category and Loom and Wing Commander were both nominated and then one of the King's Quest games I think. Loom and Wing Commander were both mine and Wing Commander won for that, and that was a really nice moment. And the next year I spoke at the game developer conference. Art, Music, and the Blue Sword of Graufalnublart, which was an attempt to get people to break out of the genres and to stop doing things that had the aesthetic level of the paintings you used to see on the side of a van in the 70s with caveman holding his loinskinned chick with a dead dragon in the background all airbrushed. You know, I thought this is a world in which there are more beautiful and subtle aesthetics than that. That was what I called for.

GS: After that, after that lecture, um, I got a call from Graham Devine who couldn't

believe he was talking to the famous Fatman. So that was a really nice moment for me. I hadn't heard of him, I didn't know what he was doing, but what he described sounded very very cool. He sent me out a video that pretty much just had climbing up the stairs from Seventh Guest, right? And I think it also maybe had one of the picture transformations. I thought, oh man, this is great!

GS: So, um, he was excited about working with me, I was excited about working with him. I got a contract that gave me a percentage of the sales. It was like, the only contract I really worked hard on with my friend Andrew Hallbright. It was a generous contract and Graham agreed to it. And so I thought, well, I'm on board with this thing. The better it does, the better I do. So, I just gave it everything I had. And I probably would have anyway.

GS: But, while I was writing it, there was this sense that somebody was gonna listen to it and that I would have a captive audience of maybe 100,000 people. I wanted to give them the best show that I could. Um, that brings us up to the start of the Seventh Guest. So I think that's the first bit.

GS: I want to say it was rare, it was rare to have access to the kind of resources before, and by the way in the long run I got enough money to buy a Miyata.

GR: Nice.

GS: And that was about it, because Trilobyte stopped getting their checks from Virgin and so I stopped getting my checks from Trilobyte.

GR: Why did they stop getting their checks from Virgin?

GS: That's up to you, historians. It is generally considered to have been, just, bad form on the part of Virgin.

GR: Yeah, I should say so because it sold around two million copies didn't it?

GS: A million and a half right out of the gate. You could ask Rob Landeros, he'd be a good guy to go to for that. He runs the facebook page for Trilobyte.

GR: Right, yeah, I was looking at that the other day.

GS: Um, lets see. So then comes the artistic story of doing the music and how I approached it for Seventh Guest right?

GR: Yeah, I guess the question I would ask is, so they approached you and showed you a bit of a tech demo of what they had going on and offered you a pretty generous contract and it was a pretty sweet deal so you got on board and you were pretty enthused about it. How did they communicate their needs to you? Or did they just approach you and were really excited to have you and they were just like, do what you want?

GS: Yeah. It was that.

GR: Ok.

GS: Yeah, it was that. And that is the best way to get good work. If you figure you're

going to be doing something that comes from the heart you need to be in sort of a certain mood to do it really well. If you get up there and someone is saying ummmm can you show me three other successful games that use this style of music? That's like, you know, you're making love to your person and they say uhh, can you do it right please? I mean, just the fact that you're being asked that is just a groove killer.

GR: Right. Gotcha.

GS: So, for Seventh Guest I was very motivated by Graham's confidence in me. And the video that I saw, which for you people in the future was simply an animation that starts at the bottom of the stairs and goes up the stairs in 3d. By animation I mean that it was a linear, rendered 3d graphic which was very very state of the art and was being done because of Graham's amazing compression algorithms. He had shown it at a couple of shows years before and had been consistently accused of cheating. So, at the show he showed the computer playing it and people were always looking under the table for a video machine.

GR: Really?

GS: Mm-hmm. To the extent that when he finally gave a talk at the GDC himself his attitude was very poisonous. It was a look I told you I could do this and you all said that I couldn't, so nuuuuh. You know, I mean he did that as a joke, so something I want to say is nah nah naaah nah, now getting back to business. Right?

GR: Right.

GS: But it was really there. That feeling was very resentful. He's a very emotional guy, very brilliant, wonderful. He has famous blogs, he used to put his blog in Wired magazine. Very personal, very open, and it got him in trouble more than once. He doesn't filter.

GR: Gotcha.

GS: Yeah. So, they sent me that video and we came up with a deal where Graham pretty much said sure Fatman anything you say. We signed the contract and I just then had been on the phone with my connection at Roland who was Tom White. Who, ever since then was head of the MIDI manufacturer's association. But at that time he was that and he was the interface between, oh wait, he wasn't the head of the MMAA yet, he became that a couple of years later. But he was the artist liaison for Roland. And I was talking to him about MT32 stuff and I was trying to get him to put out an avatone sound sheet. Yeah there's one, a little paper record. I was trying to get him to do that for some of my MT32 music from Wing Commander and put it out in the game development magazines to encourage people to develop from MT32s. That was from the back of a cereal box.

CF: I played it.

GS: So we were playing around with those ideas and I said you know for my last computer game I was really frustrated. I was talking to Tom and said you know, I have to write one version of the music for the PC speaker, just one voice beep beep beep. I had to write another three voice version for the consoles. I had to write a five voice version for the oh, there was a Disney soundcard or something. By the time I

wrote all these different versions it was no longer interesting to write music. I had one tune that worked on all platforms, its about two minutes long, and I'm exhausted, right? And now I gotta write the second tune and go through and make sure it works on all the, you know. So Tom said George, why don't you use the uh, why don't you write for general MIDI? I said general MIDI? Whats that? How do I do that?

GS: He said you just get a Sound Canvas. Can you give me a discount? No! So I got a Sound Canvas and I wrote for it and uh, and then I thought well some people had ad lib cards. And the idea of general MIDI was it's a MIDI file that can play on all different playback platforms which was a new idea and I really liked it. So, I wrote that first tune on the Sound Canvas. I think the first one I wrote was Doorbell. *hums tune* I call it Doorbell because *hums tune like a doorbell* and then the second one I wrote was * hums * which I mean, that was the first thing I wrote on a Sound Canvas right. So this is good, this is fun, I'm going to write my stuff on this. I'm going to somehow get these same files to play on all the other different machines. So, I'll work with the programmers and get it so that this file plays on all the other synths. So, by then I had Kevin working with me and he and I went into the FM synthesis editor and made a general MIDI soundset for FM which is still in Windows . Anything that supports FM at this point still has our general MIDI soundset in it. Then I wrote a huge sysex file that if you fit it to an MT32 that MT32 would do general MIDI. More or less. There are technical questions about that.

GS: John Miles was a neighbor of mine and does the Miles sound drivers that everybody was using for PC. He had just called me up and taken me out to lunch and said hey I got a couple questions for you. He took me out to eat and he said, ok, what does MIDI stand for? And why are there black and white keys on a keyboard? That kind of thing, right? He went on to become the hugest guy in game audio software and he's still giant. Um, we shared a BBS together. I paid for the phone line at our house, he paid for the computer and kept it maintained so theres a little black and white, green and black monitor on the shelf I think you can see it in that making of video. And it was, when a game developer wanted to make a PC game it would dial up our modem, our phone would ring, it would *modem noises* and it would download the Miles drivers including the libraries I had that would allow other cards to emulate general MIDI.

GR: So the developers would dial into the computer you guys had setup to get the drivers? To develop the sound software?

GS: Yeah.

GR: So you were running a distribution point out of your house?

GS: Yeah. Yeah. Because John didn't want to pay for another phone line for himself and we wanted access to some kind of a bbs system so we could make things available which I was very kind of clunky at but I had uh I think we had been 300 baud modeming our MIDI files to Dave Warhol.

GR: And what year would this have been?

GS: Wing Commander.

GR: Was that 90?

GS: A little earlier. I don't know.

GR: Yeah, I don't either, not off the top of my head.

GS: So a lot of the uh, things like Maniac Mansion, from that back to Total Recall was among the very first, er Dick Tracy was among the very first ones that I did for Dave. So that was like that second era and that was all done by 300 baud modem. And then occasionally we'd step up. And uh, um, we couldn't use, there wasn't general MIDI so what I would do is I would write the name of the instrument into the file for each track. And it would be like bass drum, high hat, and those would never have two notes at the same time. Ok, so that's the pfft track. *drum sounds* And then I had two other tracks which was like bass or, if I had or if I wanted to use a positura to make it sound like more instruments then there was always the piano and the flute, piano piano piano single note flute piano piano piano piano arpeggio, flute arpeggio, but always just one voice there and then the next two voices always just one at a time. Or, you had two boops, a beep, and a pfft. And so I'd make MIDI files like that which I could probably dig up for you. And then I'd email those, email, I mean modem them to Dave.

GS: So, ah, for Wing Commander they didn't know what MIDI was yet so I had to kind of bring them up to speed on that and if that's not true then Mark Schafkin will set you straight. Oh, and remember when I'm talking about, this is important, when I'm talking about the state of interactivity and the state of digital audio for games this is my perception of it and there's a whole freaking world going on on Amigas, and in Japan, and Europe that I was completely oblivious to.

GR: Ok.

GS: So, whatever was going on over there just wasn't in my world. I didn't learn anything from them, I didn't copy anything from them. So we might have been doing, I don't think that they learned anything from me or copied anything from me so there was some nice stuff going on over there but it was different techniques, different world, and they may have beat some of the things that I claim to have been the first to do. So, um, in all credit to them, I mean, guys like Rob Hubbard, Fern Gallway, badass mofos.

GS: So, back up to Seventh Guest, I'm making these general MIDI files now and they've got sort of complex setup things at the beginning of them. The first thing that you have to play in the game is this sysex file that tells your MT32, if you have an MT32 it sets the pitch bend range. Oh, the MT32 doesn't have an adjustable pitch bend range and it defaults to, um, it defaults to if you move the pitch bend wheel all the way up it goes up a whole octave. The Sound Canvas has an adjustable pitch bend range and it defaults to one step. So, the only way you can make a file compatible is to send a sysex file, send a sysex message to whatever instrument is out there listening to set its pitch bend range. And that only gets listened to by the Sound Canvas. So what happened in a lot of cases was that message didn't get sent so there are a lot of versions of Seventh Guest out there where the pitch bend range just goes woooooo instead of booooo *escalating pitch*. Um, but that's fallout of you know, this technical dilemma.

GR: Uh-huh.

GS: So you'll hear tunes where its supposed to go *sounds*. I think the CDI version, which was a really good way to play Seventh Guest had it, I think it had everything right. I think that the Apple version, where they also used a digital rendering, I think they got it wrong. They got the tones right but they didn't get the pitch bend right. So you got a pretty good experience on FM, MT32, on Sound Canvas and then um, there was no sort of digital in game music. There was meant to be. Ah, there wasn't meant to be on their account but I had a conversation with Graham at one point where I said ok Graham so this thing that you're writing for it's a CD? He says yeah, it's a CD-ROM. So is it kinda like a regular CD? Well, kind of. Can you put digital music on it? Yeah I think so. Can you play it like CD, like a record? I think so, I'm not sure. Well, how about if I write a bunch of real music for you and put it on there for free. If I write this extra can you put it on there and maybe make it a selling point for the game? Sell more copies. And then my little royalty thing pays off. He says sure Fatman, whatever you say. So that's where the little violin flourish at the beginning comes in that's where team Fat singing *tune* that's where my brother's song Skeletons in My Closet comes in that was all extra that my imagination said ok these can be Easter Eggs for the game. So if you see that character who is supposed to be singing Skeletons in My Closet if you click on her maybe it will play that song. Or, you open a book and a weird chant comes out of nowhere. Well that's the Mister Farast, in the script it says that you hear this chant so I thought well some son of a gun has got to create that chant so obviously its gonna be in the game somewhere they can't be just assuming its gonna be written by itself. So I called up the writer Matt Costello and left him a phone message which were done on cassette tapes and I said how do you pronounce the words in the script and he called me back and left a message on my phone tape and says Mistar Fara Astra..

GR: I see where this is going.

GS: You see where this is going?

GR: Yeah, I do.

GS: Minotus Morto Ra, Halla Halla Astaroth, Has Has

GR: You totally tricked him. That's great.

GS: And so I recorded that over to the reel to reel and played it back at a couple of different speeds at the beginning of that song. At the beginning of the game. So you hear him pronouncing it there * chant * then you even hear the beep right, remember that? Do you know what I'm talking about have you heard it?

JK: Kind of.

GS: Well, I'll play it for you. Um, then I had team Fat come in and by then we had just assembled and I had no idea how to do a choir but it turned out they could all kind of sing so we could talk technically how I did it but I wrote the pieces out in MIDI so that I could hear that the harmony worked then I played back each part *hums* I started the ADAT tape and we all four sang ba ba ba ba ba and then I ran it again and punched in ba ba ba ba ba so we all sang together on the bass line and we all sang on the baritone line and we all sang on the tenor and we all sang all four parts. We'd never sung before I didn't know whether they could sing or not. But I think it just sounds very great.

GS: And, we put a little band thing together with my brother on drums and Robert Harrison who's in Cotton Mather, was a local kind of legendary group,

GR: Your brother was in Asleep at the Wheel?

GS: All those grammy things up on the wall behind you by my sound effects, those are all his.

GR: He won, what, four?

GS: Four or five.

CF: There's a bunch of them everywhere.

GS: And his wife is the singer in that now too. And their baby is what, those three follow behind the tour bus. In the baby bus.

JK: Nice.

GS: So, you people in the future, since the internet will never be erased, see if you can find milesandmilesofdiapers.blogspot.com you'll see the history of my brother and my sister in law

CF: Another guilty mom, that's what most of her blogs are about.

GS: She's sick, I think it's the pot, that Willie brought on.

CF: That's why she's not on the bus. That's why they have their own bus.

GR: Willie Nelson?

CF: Shes a good mom, a super good mom.

GS: Willie loves Elizabeth. And the did a tour together and when its time for them to do their duet he's like and now heres the reason I'm on this tour.

GR: Awesome.

GR: Is she singing in the Seventh Guest?

GS: Elizabeth, no.

CF: No, she was a baby.

GS: She was a baby. She did not exist at that time.

CF: Shes only 33.

GS: So how old would she have been? Math lawyer?

GR: Uhhh. Well. Lets see, I'm 29 and Seventh Guest came out when I was in middle school

CF: So not quite a baby but

GR: I primarily went the lawyer route to avoid math. So…

GS: How about you? Do you add?

JK: No, no, I'm liberal arts.

** DISCUSSION OF MATH FOR A BIT ** from 54:30 to 57:00

GS: I'll tell you what, I couldn't write music to save my life. It was very hard to write music until MIDI came along. And I've since had my brain kind of tested, jus to see if I was kind of nuts. It turns out that no, im not nuts, when I try to make a point I can make a point, it takes a while to get around to it sometimes and that's kind of different. If you remove from my IQ scores the things that have to be done in real time and in a hurry, if you unweight for that, I'm really smart. So I couldn't do live music that well but once I got MIDI I could move the notes around in space and wow, I could write pretty well. Now, theres a program called Mathematica that Wolfram wrote to do his work and its public and I've got a copy of it and it is to math what MIDI is to music for me.

** DISCUSSION OF MATH FOR A BIT, AND DISCUSSION OF FRIENDSHIP WITH RALPH BAER** from 58:20 to 1:02**

GR: So, one of the things that I…

GS: We put a band together, we got those guys playing, we did Skeletons in My Closet and with I can't remember her name singing but we can look it up and with Robert singing the game. There.

GR: One of the things I noticed about the Seventh Guest is, uh, I was reading about the soundtrack and um you assigned specific musical themes to each character.

GS: If you look in the archive you'll see there's a little sketch paper this is just me wanting to do a good job you I tried to take all these things that had been crammed into me at Occidental College, you know, my music program and I decided well I didn't have to be strict about this but if I had sort of a structure, sort of an idea then I could avoid writing everything in the key of A. Or doing the obo over and over for everything. So I just kind of made a little grid of each character and I think I also had like general magic or the dolls so I had the things I thought needed to be identified emotionally and then I assigned a main instrument and a style and a key to each one. And I thought, you know that's a nice idea and I thought every once and a while when I'm writing for one of those characters I would go to the chart and say ok ok what h appens here is that Stauf takes over this person's soul so we'll start in this key and this person's style and we'll end if Stauf's key. No one will hear it but by going through that exercise, well I recommend it, as a student you can reverse engineer it and say ah this is what Wagner was doing, but he wasn't doing it so that you could analyze it and see what he's doing. He was doing it so that it strikes your ear in a way that strikes the back of your mind. And it doesn't always have to hit there. But it creates a little pattern that your mind might pick up on. Or might not. And whether you analyze it or not you feel something changed.

GR: So you wove a narrative structure into the composition too, in a subtle way.

GS: Yeah, the most unsubtle version of it is when the characters are all being introduced um it is one tune that clicks along at a certain tempo and it medlies from each person's theme to the next. Its easy to hear it comes early in the game. Might even be in the intro. They just walk in one by one and say one line and walk out. So you hear the music for each of them happen as it goes. So that's where you can hear it.

GR: Yeah.

GS: If you go to the archive and dig around you'll find something that looks kind of like a grid that's got scrawled notes about obo piano.

GR: What do you think the legacy of the work you did with Seventh Guest was? I guess, I guess I'm asking about trying to put it in its context as you understand it in terms of the medium and the industry.

GS: Well, first of all like anything of this nature, including what Ralph did and what Erdosh did, it's a big beautiful world and at some point someone would have done it. Someone would have come up with the first hot-selling CD-ROM game. Or maybe it would have taken a while longer if these guys hadn't been dedicated to that project anyway. Maybe it would have happened differently. But I think what is significant about this game being the first one is that it for a brief moment it looked like the aesthetics of the new medium were going to be interesting. It looked like it was going to be a renaissance of beauty and craftsmanship and elegant compression algorithms combined and scholarly analyses of interactive dynamics between men and machines and uh it you know here was a place where I could be free. If you read the little manifatso up there that was the mood that I was in. This internet this interactive stuff was going to be a new frontier and its up to us to make it free of compromise and it looked like it was going that way. I'm sure at some level the energy that was put into that game is still cycling around among independent game developers or young people who got the crap scared out of them ah, you know probably around the level of you know what if there had been no the Twilight Zone. That's kind of what it would be like if there had been no Seventh Guest. Kinda gimmicky kinda corny but theres and artistic statement to it, there's a feel to it, there's a personality to it, an aesthetic, a sound. Which by the way I did record the guy who played guitar on that. I did record him myself. One of the first things I was a professional engineer on was a Tommy Todesco record so theres another connection.

Discussion of Tommy Todesco and Justin's records 1:08:50 – 1:12:02

JK: One of the big things I was wondering was with the PCM tracks what was the final destination format for those to go onto the CD-ROM, were those wave files or

GS: DAT.

JK: Huh?

GS: DAT. And I think I might even have a couple of the DATs here that might not have made it into the archive. But yeah, Digital Audio Tapes. Background, during that gap between 84 and when Dave Warhol hired me again in the late 80s, I was learning my recording chops and such, oh wait no it was before that so around 81 to

83 um I worked with Van Webster in LA and he had a digital two track recorder, a Sony PCM 1600. And it was like the only independently owned one in LA. There was one at Sony and there was Vans. When somebody wanted to make a digital compact disk they would call up Van and have his send his boy over to the mastering labs and I would set up this 3 cases like this one was a big microwave looking thing which was the processor and two of them were Numatic ¾ inch video decks both recording simultaneously because the tiniest dropout was a click. There was no error correction to speak of. So I'd set that up in the mastering labs where they had the lathe and were cutting vinyl. So I got to hear, if anyone ever got to hear the difference between half inch tape and 16 bit digital through good monitors that was me. So I had experience at recording digital which a lot of people kind of didn't at that time. I had a little DAT recorder which was a nice thing to have but really the technical breakthrough, ever once and a while something comes along that you gotta have, I almost count the H2 as that. There was a keyboard the DX7, when that came out all the keyboard players were like did you get yours yet? Right? You had to have it. And when the ADAT came out, it was like oh dude gotta have it. The amount of greatness that you could get up until then you could only dream of having four tracks of audio analog and maybe one guy Joe had an 8 track analog recorder deck and it never worked you know and was a huge and hard to drag around and very expensive and high maintenance and the tape was very expensive. Then these things come out that would record onto videocassettes freaking brilliant. I got to hang out with the guy who invented those too, who also invented the Pod and the Veriaxe.

JK: Oh wow. Who's that?

GS: Marcus Rile.

JK: Were you hanging out with him when he invented the ADAT?

GS: I hung out with him when between the pod and the veriaxe.

** Discussion of Veriaxe** 1:16:01 – 1:17:00**

GS: The ADAT has that one little button that digital to analog button. Now it could have had a million variables exposed to the user but they bury it. The veriaxe is the same way… ADAT was a huge breakthrough and all of the sudden I was able to do all of the stuff I learned at Vans studio on the 24 track analog and all of the stuff that I learned from digital recording I was able to throw out a lot of the caution and practice that we used to use because we couldn't bounce tracks very much. And we had to record, it was always very good practice to put all of your effects on ahead of time when you're recording to analog tape

JK: Oh, because you didn't want to lose a generation?

GS: You didn't want to lose a generation. And you wanted it, yeah that's a good way to put it. I found that I could record, as long as I got something onto the tape I could effect it on the way back, I could get something back out of it because theres no tape noise. And I could do, I gave myself permission to do infinite bounces.

JK: Nice.

GS: So for Seventh Guest I had one ADAT machine and one DAT machine and I can't remember exactly how I synced to video tape I believe what I did was a I made a

copy of the videos that they gave me and made a VHS to VHS copy and put audio on one channel and SIMPTI on the other as I bounced.

JK: Ok, because on the first track of a lot of the ADATS I noticed

GS: beeeep.

JK: Yeah, I was thinking that was SIMPTI timecode. Was that?

GS: Yeah. So that was on the ADAT? So what was chasing to what? Oh, the MIDI would chase to the ADATs. Now, how did I I didn't have video that would chase so I must have at some point, oh sure I would have the I would do as much as I could in the, yeah that makes sense, I would run the video and I would be composing in MIDI in sync with the video. So, the computer that can chase to the SIMPTI real easily. I believe that anything that's in sync with video for the Seventh Guest is all MIDI. And then I would have put it on the, then, then, I don't remember why I would have put it on the ADAT, maybe just as a reference for where the video would go. I don't really remember. For eleventh hour I had a second ADAT at a BRC. I was able to do SIMPTI offsets and stuff like that and I didn't have to record SIMPTI onto the tape.

JK: I just know the BRC is a remote control for the

GS: It's a big remote control but it also uh, allows you to offset where each tape is located in relation to the other one. Whereas if you don't have that and you have two ADATS then they run exactly in sync. So on Seventh Guest again I had just the 8 track ADAT and a DAT machine and what I would do is I would take 8 tracks of ADAT and mix em onto two tracks of DAT. I'd find a blank ADAT tape and bounce the two tracks of DAT back up to that and add a couple of more things. Then I'd do a mix of those tracks down to two tracks and then I'd go back and bounce it again. I did sometimes up to four bounces I think. It never seemed to sound bad. Um, I was delighted, I felt like I was free. I could never do anything like that in the 24 track recording studio and I always challenged myself you know, like if I had four tracks like the Beatles I could do infinite stuff. And there I was with 8 tracks, better than the Beatles, so better put something good out. Um, so I did. Or I tried too.

JK: So as you were bouncing back and forth, there wouldn't necessarily be multitracks of everything then?

GS: You could, unless I went back and erased some things which for the most part I think I didn't, You could do a complete remix but you'd have to be very careful. You'd have to first do a submix, you'd have to find the oldest tape that had the least instruments on it. You'd have to find something that has individual instruments on it. And like for instance the session that it shows just a little bit of us doing the game you see a little bit of session in that video. That probably has a bass, 2 guitars, and 5 tracks of drums. Or something like that. And then so that's theres probably that exists. Then I would have mixed that down onto a two track, the game instruments only, or basics, we would have called that basics or rhythm tracks and I would have bounced that back to a clean tape had the vocalist come in now he sings along with that tape now if there are any leads to add to that then I can add those to that too.

JK: Ok. Do you think with the timecode on there do you think there's any point on there where to reconstruct it you'd have to have MIDI tracks? Or is everything on there, on the ADAT do you think?

GS: That's a good question. You might very well need the MIDI tracks but the MIDI tracks all exist and everything I have is at the archive in one form or another, um, if you bring it up in mode 2 performer it will come upt with the correct SIMPTI offset built into it. It will probably come up waiting for external sync. It will probably, if its something that needs to be synced, and isn't just an independent in game tune it will probably come up with something like waiting for SIMPTI. You know, so it should reproduce pretty well I think. So things like, what would be a good combo piece? Well, Skeletons in My Closet has horn parts that are on the synth. So, that would be, theres somewhere the MIDI file that has the horn part for Skeletons in My Closet and theres one audio track that's got vocals, instruments and a SIMPTI track so you can play the two together. And who knows, I mixed that directly to DAT, I might have mixed that directly to ADAT, who knows? I don't know. Ah, what else? Technically?

** Discussion of the band European Sex Machine , discussion of what he thinks Archivists should do with his materials** 1:26:00 - finish