Collaboration, Communication, Cancellation: Sound and Music Development in Atari's Film-to-Arcade Adaptations[1]

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On November 14, 1979, Atari engineer Jed Margolin proposed a new arcade game, which he called "First-Person Space War."[2] He describes a game in which "the player is assumed to be in the cockpit of a space fighter and is pitted against a similar fighter controlled by the computer (also, two cabinets could be linked together)." The game would have vector graphics (like Atari's *Battlezone* [1980], which was in its final stages of development.)[3] The most important detail of the memo comes near the end: "A tie-in with one of the space movies such as *Star Wars II* might be desirable." The project was greenlit, and development began in May of 1980 with the working title *Warp Speed*. Very little happened for a year and a half, because the engineers assigned to the project were busy working on *Battlezone*, and then a cocktail-cabinet version of *Battlezone*. It was not until July 1,

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[1] This is a typescript of my presentation to the 2020 online edition of the North American Conference on Video Game Music, presented primarily for accessibility and archival reasons. Since I have not yet created figures or tables in, the typescript will be much more effective if read in connection with the video of the presentation, available at https://www.youtube.com/watch?v=MwKR8pbMMOE. I gratefully acknowledge the support of the Gettysburg College Office of the Provost, in the form of a Research and Professional Development Grant, and of the archivists and librarians at the Strong Museum of Play: Jon-Paul Dyson, Beth Lathrop, and Julia Novakovic.

[2] Unless noted otherwise (as in the case of emails preserved online), all Atari documents cited in this essay are held in the *Atari Coin-Op Division Corporate Records* collection, held by the International Center for the History of Electronic Games, housed at the Brian Sutton-Smith Library and Archives in the Strong Museum of Play in Rochester, New York. Individual game collections will be identified by box and folder number at the beginning of each section. Margolis's memo and other *Star Wars* documents are in Box 4, Folder 30-31.

[3] In Margolis's memo, *Battlezone* is referred to by its working title, First-Person Tank (hence the parallel proposed title, First-Person Space War). Margolis also mentions *Red Baron* (1980), and a game called *Baja Racer*, which seems never to have been released.

1982 that a fateful agenda item hinted at the success story the game would become. That day's project notes mention that the team has begun "working on conversion to *Star Wars* theme."[4] A recognizable outline of the final game emerges in a September update, sketching the structure of its three levels: a dogfight, strafing runs of the surface of the Death Star, and the famous flight through the trench.[5] So nearly three years later, Jed Margolin's project got what he envisioned for it: a movie tie-in.

These documents come from the collection of *Atari Coin-op Division Corporate Records*, held at the Strong Museum of Play in Rochester, New York. Last summer I spent several days in Rochester, searching the archives for interesting narratives, technical documents, concept art, memos, and other materials that might shed light on the process of sound and music development. This presentation is a preliminary tour through one of the most fascinating threads I have uncovered within the Strong's extensive and well-documented collection: the process of adapting popular movies for the arcade. In the early 1980s, the Atari corporation collaborated with several major studios to create both arcade and home console games based on popular franchises, resulting in both commercial successes (like *Star Wars*) and infamous failures (*E.T. the Extraterrestrial*, 1982). Drawing on that archival research, this paper examines the process of sound development in *Star Wars,* and in two other Atari arcade titles: *Return of the Jedi* (1983-84), and the cancelled *Gremlins* (1984-85). Development documents from these projects reveal the challenges of creating blockbuster adaptations, including the process of acquiring and incorporating assets for art, sound, and music; the difficulty of designing gameplay sequences based on unfinished movies, which secretive studios refuse to screen in advance; and the competing interests and needs of the engineers, marketers, and movie studios involved.

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[4] Mike Hally, *Warp Speed* Production Status Report, July 1, 1982.

[5] Mike Hally, *Star Wars* Production Status Report, July 1, 1982.

Methodological Notes: Studying the Arcade

Before we get started, there are a few things to keep in mind when studying arcade games of the early and mid 1980s.[6] First of all, hardware was king, as both a regulative and enabling force. Engineers had to take the cost and availability of parts into account, and there is frequent discussion in the archives of building new games up from chipsets and control configurations developed for previous titles. Production and design decisions were also tailored to the arcade sales market, and Atari collected mountains of focus group data on the potential popularity and profitability of a given arcade cabinet, yielding reams of archival material on the preferences and reactions of serious arcade gamers. The centrality of technology and manufacturing could be an asset as well: arcade cabinets were custom built for each game, allowing designers to create the ideal control scheme, and to combine multiple programmable sound generators for its soundtrack. Due to the bespoke nature of these games, and the relative freedom from restrictions like cartridge memory capacity, the graphics and sound capabilities of most arcade games outpace what was available in contemporaneous home consoles.

Becoming *Star Wars*

We will begin by examining 1983's *Star Wars* through the lens of its music and sound. One advertising flyer proclaims:

> *Star Wars* features "random" music. A song will be repeated no more than once every 7 minutes, in stereo. And the music is taken from the original *Star Wars* soundtrack.[7]

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[6] Useful histories of arcade games in general, and the Atari corporation in particular, include Scott Cohen, *Zap! The Rise and Fall of Atari* (New York: McGraw Hill, 1984); Mark J.P. Wolf, ed., *Before the Crash: Early Video Game History* (Detroit: Wayne State University Press, 2012); Raiford Guins, *Game After: A Cultural Study of Video Game Afterlife* (Cambridge, Mass.: MIT Press, 2014); Raiford Guins, "Beyond the Bezel: Coin-Op Arcade Video Game Cabinets as Design History," *Journal of Design* History 28/4 (2015): 405–426; Carly A. Kocurek, *Coin-Operated Americans: Rebooting Boyhood at the Video Game Arcade* (Minneapolis: University of Minnesota Press, 2015); Michael Newman, *Atari Age: The Emergence of Video Games in America* (Cambridge, Mass.: MIT Press, 2017).

[7] *Star Wars* advertising flyer, 1983. ACDCR, Box 4/30.

There are at least two lies in this advertising copy. First, the music of *Star Wars* is anything but random. In practice, the game is underscored by a series of short, recognizable fragments of John Williams's soundtrack.[8] Each theme lasts only 10 to 20 seconds, and contrary to the claim of "randomness," they occur in precisely the same order, each time, separated by several seconds of silence. There are even clear narrative correlates: the transition from the first stage of the game to the second, for instance, is underscored by the very same battle music that accompanies a squadron of X-Wings turning downwards to attack the Death Star in the film.[9] Next, regarding the length of time: there *is* some degree of adaptive variability in the game: if a player takes longer to clear a given wave, they might hear a few more themes. But even the slowest playthrough of *Star Wars* takes only about three minutes.[10] The claim of "seven minutes" between repetitions seems to be true only through some contorted marketing department thinking, perhaps taking into account the attract mode and the high score screen.

While the music may be lacking a bit from what it could be, the selection of dialogue reproduced from the movie is impressive for 1983. *Star Wars* is one of several Atari cabinets to use the Texas Instruments TMS5220 Sound Chip.[11] This chip allowed developers to digitize recorded speech, pausing to clean up the algorithm's many errors frame by frame. As one memo describes the system, "The

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[8] Karen Collins has observed that the aesthetic of continuous, looping music in video games did not take hold until 1984; See *Game Sound*, 19. For a comprehensive guide to the themes of the *Star Wars* franchise, see Frank Lehman, "Complete Catalogue of the Themes of *Star Wars*: A Guide to John Williams's Musical Universe." See https://franklehman.com/starwars/.

[9] It is possible that in the advanced stages of the game, the music is truly random. Atari documents refer to a case in which a player managed a five-hour play session on a single credit, leading engineers to discuss the randomly generated level structures that would be presented to players after their 20th round. As I have not advanced this far in the game, and no YouTube video documents such an extensive playthrough, this speculation remains unconfirmed.

[10] Atari tracked these numbers both before and after their games were released, and numerous memos confirm an average of three-minute playtimes for both *Star Wars* and *Return of the Jedi*. See, for instance, an *ROTJ* Field Test Summary from August 24, 1984 (ACDCR, Box 3/34).

[11] See Karen Collins, *Game Sound: An Introduction to the History, Theory, and Practice of Video Game Music and Sound Design* (Cambridge, Mass.: MIT Press, 2008), 19. Collins points out that the same chip powered the popular "Speak and Say" children's toy. The most comprehensive, enthusiast-driven accounting of Atari's arcade hardware profiles can be found at www.system16.com.

sound quality is a little unnatural but preserves some of the speaker's identity and expression."[12] Through this grainy synthesis, Obi-Wan Kenobi (Alec Guinness) advises the player to "Use the Force, Luke"; Darth Vader growls menacingly, "I have you now." The dialogue reacts to the player's performance: taking a hit will sometimes cause Luke Skywalker (Mark Hamill) to say, "I'm hit but not bad; Artoo, see what you can do with it." Should the player make it to the end of the game, they will hear Han Solo give the all clear to take the shot that will destroy the Death Star: an achievement that will be greeted with another appropriately timed, anything-but-random, soundtrack sample from the film.

Return of the Jedi

Star Wars appeared in arcades in May 1983, a year in Atari's history that may sound familiar for other reasons: it kicked off what we now call the Video Game Crash. Atari's *E.T.: The Extra Terrestrial*, for the Atari 2600, famously flopped at Christmas 1982, and the ripple effects of that failure—among numerous other factors—were felt across the company, and across the video game industry for the next few years.[13] I have not yet found a direct reference to the crash in the Coin-Op division's documents, though it seems impossible that those events wouldn't have affected their actions in 1983 and 84. What's more, archived communciations from the time point to layoffs, reorganizations, and a generally unhappy atmosphere within the company.[14] In the second half of this talk, I will look at two more movie adaptation games: one that was completed and one that

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[12] Atari VAXmail, "Sound Chips," January 19, 1984. See http://atariemailarchive.org/thread/sound-chips-20. Another message in the same thread indicates a gendered component to the system's accuracy, noting that its default 8 kHz sampling rate is ideal for male voices, but not female. The note recommends several settings that should be changed in order to facilitate 10kHz sampling for women's voices; see "TI Speech Option, Yamaha & Pokey Clock rates," March 21, 1984.

[13] For more on the crash, see Mark J.P. Wolf, "Introduction," in *Before the Crash: Early Video Game History*, 2–5.

[14] The Atari Email Archive, which preserves Atari's internal messaging archives from 1983 – 1992, includes a category entitled "Goodbyes," which chronicle numerous resignations from the company, primarily from 1983 to 1985. See www.atariemailarchive.org/categories/goodbyes.

was cancelled. While I do not wish to read these games entirely against the crash, it is an event that pokes out between the lines of many of the memos and documents circulating at the time.

After the success of *Star Wars,* Atari quickly turned its attention towards a sequel, though they looked to the franchise's most recent installment to do so, adapting 1983's *Return of the Jedi* rather than *The Empire Strikes Back* (1980), which they wouldn't get around to until 1985. The game features an isometric rather than first-person perspective, and it uses filled, sprite-based graphics rather than vector graphics.[15] Like *Star Wars*, Atari's *Return of the Jedi* (1984) featured three "phases" based on scenes from the film: the player controls Leia for a speeder bike chase in the forest[16]; a combined second wave intercuts between Chewbacca in his commandeered Imperial walker, and Lando Calrissian in space, flying towards the Death Star in the *Millennium Falcon*; and a final wave in which Lando blows up the Death Star. Marketing copy focuses especially on the game's "split wave" feature, which mimics the cinematic intercutting between the action on the surface and out in space.[17] The game's much discussed voice samples prime the player for these transitions—a moment before each shift in perspective, we hear Han, Leia, or Lando speak about the state of the mission.

Return of the Jedi has perhaps the most documentation of any of the games I examined in the Strong Museum archives, at least in terms of sound. An October 1983 document lists the sound effects that were planned;[18] a March 1984 memo to Lucasfilm gives an even more comprehensive list. The developers were clearly committed to reproducing the varied soundscape of the movie as closely as possible, rather than relying on generic laser, explosion, and engine sounds. The

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[15] The gameplay is similar to titles like *Zaxxon* (1982) and *Blue Max* (1983). Some Atari notes from 1984 actually refer to "Zaxxon perspective" directly, indicating how influential the game was.

[16] Communications between Atari and Lucasfilm indicate a debate about whether the player should control Luke or Leia. While Atari added a helmet to obscure the avatar's gender, a close viewing of the opening cinematic reveals that the player controls Leia. See the correspondence between Mary Fujihara (Atari) and Steve Arnold & Maggie Young (Lucasfilm), April 24 and 26, 1984.

[17] *Return of the Jedi* marketing document, May 25, 1984.

[18] "Jedi Sounds," handwritten note, October 2, 1983.

game would run on four Atari "POKEY" sound chips (referred to as "quad pokeys" in memos), which provide two sound channels each, and one TMS5220 voice chip, like *Star Wars* used. The team imagined a rich soundscape based on dozens of sounds and speech samples from the film, and there was concern that there were not enough channels—a familiar challenge facing audio programmers in the 1980s. One issue was the idea of using continuous engine noises, such as the distinctive whine of the speeder bike engines. Combined with music, which would occupy at least two tracks, there wasn't much left for the game's many sound effects: laser blasts, explosions, enemy speeder bikes and TIE fighters, and so forth. In the end, the developers mostly restricted music to the beginning and end of each level, with the exception of the Imperial March playing as the player flees the exploding Death Star at the end of the game. Presumably, this was possible because there are no enemies in that sequence, only obstacles.

Throughout the development process, Atari's team was in frequent contact with Lucasfilm. Their correspondence indicates the scope of the game's sonic ambitions, with long lists of quotations and detailed, unique sound effects. Atari made their first soundtrack requests in September 1983, asking for *forty-two* lines of dialogue on 1/4-inch reel-to-reel tape, ranging from plot-critical exposition to exclamations from supporting characters; yes, including "It's a trap!"[19] After their initial request, Atari would repeatedly ask for more sound and music. While the Strong only has Atari's side of the correspondence, there must have been concerns raised at Lucasfilm; a January letter pleads for more tapes from *Jedi,* promising that none of the sounds will see personal use, and that direct audio quotes are essential to "increase the game player's interest and fantasy about living in the *Star Wars* experience."[20] In March 1984 Atari wrote again,

[19] Letter from Dennis Harper (Atari) to Rita Dodson ATTN: Gary Summers (Lucasfilm), Sept. 15, 1983; see Strong Archives.

[20] Strong archives: letter from Dennis Harper (Atari) to Susan Leahy (Lucasfilm), Jan 3, 1984.

mentioning 18 lines of dialogue that were reproduced poorly on the tapes that Lucasfilm had previously sent, and also requesting 14 *new* lines.[21]

An internal memo in March lists the progress on the game's sound production, noting the rough condition of many sounds: the *Falcon* sound is "all wrong," while numerous sound effects "need work" or are "too soft." The *Star Wars* theme, the memo notes, needs to be shortened by half, and numerous sounds based on the film were still missing from the game, despite plans for a field test in only a few days. Atari was also concerned with securing the rights to reproduce John Williams's music: every status update from April to July of 1984 proclaims, "Still do not have rights to use music ... 'not to worry.'" All of this evidence points to a working method in which placeholder sounds were used, before being filled in with samples from the films. It also points to a gradual reduction in ambition, as the great majority of dialogue samples requested here were cut from the final game. Still, the appendix offers a fascinating glimpse at the team's brainstorming process.

Along with providing access to video, audio, and music samples, Lucasfilm had the right to approve or suggest improvements to the game. One of the most amusing details from this collaborative process is a memo from late in the development process: "Ewoks are part of the Rebel forces and are players [sic] friends," wrote two Lucasfilm executives in an April 1984 letter to Atari, about the apparently mischievous antics of the game's original Ewoks. "[They] must be more consistent with role in film – they are player's ally, and should not cheer when player gets caught in traps."[22] Atari responded: "We will try to overcome any potential misinterpretation of the Ewok character by using apologetic Ework phrases if player is unintentionally victimized. Would this be acceptable?"[23]

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[21] Letter from Dennis Harper (Atari) to Katherine Gruhn (Lucasfilm), December 5, 1983; see Strong Archives.

[22] Letter from Steve Arnold and Maggie Young (Lucasfilm) to Mary Fujihara (Atari), April 24, 1984.

[23] Letter from Mary Fujihara to Steve Arnold and Maggie Young, April 26, 1984;

One of the most interesting archival finds from my trip to Rochester comes from another handwritten note from October 1983.[24] This one reveals that there was a second *Jedi* title in the works at Atari. While the arcade game that eventually saw release is referred to as the "digital *Jedi*," there is also talk of a "Video Disk *Jedi*" that sounds like it would follow in the footsteps of the influential *Dragon's Lair*, which had been released earlier that year. The game would be "strictly a speeder-bike sequence, and a fancy cabinet with molded speeder bike and large projection screen." We can imagine what this game might have looked like—probably a reaction-time based re-enactment of the sequence from the film, with footage from the movie and directional cues for avoiding trees and other obstacles. While the memo notes that the "deal to get *Jedi* footage for Video Disk game is 'finalized' with Spielburg [sic]," the document also recommends cancelling the game, noting that others at the company did not want to produce two games based on the movie.[25] In my research, I have been able to find no other references to the game, and so far as I can tell, it is never mentioned on the many Atari enthusiast websites, so this other version of *Return of the Jedi* remains a mystery.

Gremlins

The cancellation of that *Dragon's Lair*-style speeder-bike game brings us to our final topic: when these projects fail. I'd like to end by discussing a project that was never completed. In 1983, while they were developing *Jedi*, Atari was also working on an adaptation of the upcoming movie *Gremlins*, under the codename *Gargoyles*. Unlike *Star Wars*, a game that began speculatively with the hope of later attaching the name of a successful franchise, *Gremlins* was a licensed game from the outset. This *Gargoyles* summary offers a treatment of the movie's plot, and proposes gameplay elements based on recognizable scenes and locations. A close reading

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[24] The memo is a handwritten note on white graph paper from Chris Dowend to Dan [unknown], returned to him with annotations and answers; October 24, 1983.

[25] A letter dated Feburary 24, 1984 in reference to a *Jedi* audio licensing question is careful to clarify that it refers to the "raster" (sprite) game, further indicating the existence of two separate *Jedi* projects.

of the production documents from *Gremlins* reveal a troubled design process. And they show, among other things, just how far behind the rest of the development process sound design can sometimes lag. Much of that probably has to do with the place of sound effects and soundtracking within the *cinematic* production process; both tend to come very late in the timeline.

To give a brief overview: the project was initiated on September 14, 1983 (recall, this overlaps with *Jedi*). An early October meeting with Warner Bros. and Steven Spielberg's nascent Amblin Entertainment "went well," and the team left with production stills and a 16mm film reel of a Gremlin walking, for reference.[26] In November, Atari executives attended a marketing meeting with the studio; a memo circulated days later on the need for "absolute secrecy" on the project; hence, the codename.[27]

While early interactions with Warner and Amblin were positive, production was difficult from the outset. An October 21st memo notes that the 3-D graphics hardware the team was using—borrowed from the upcoming title *I, Robot*, then nicknamed *Ice World*—wasn't working, and the company's engineers were spread too thin on more urgent projects to fix it. On November 7, the team weighed the sunk cost of previous development time against the prospect of continued slow progress on buggy hardware that wasn't right for the game at hand. On November 23, they switched to a chipset called "Faster Raster," Atari's next generation of 2-D hardware, which would go on to power *Paperboy* in 1985.[28]

That some engineers were busy with other projects would become a theme for *Gremlins*; their sound programmer, Synthia Petroka, was often being called away as well. In 1984 she was already working on *Return of the Jedi*, and later would be involved with the arcade title *Roadrunner*, based on the Looney Toons franchise.[29] On March 16, a memo notes, "We are still waiting on [a] music and

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[26] *Gremlins* Production Status Report, October 7 1983. All *Gremlins* documents are held in the Atari Coin-Op Division Corporate Records, Box 1, Folder 49, and Box 2, Folder 9.

[27] "Gremlins," memo from Don Osborne to Distribution List, November 4, 1983.

[28] See *Gremlins* Production Status Report, October 21, 1983; "Do We Switch or Don't We?" memo from Franz Lanzinger to Distribution List, November 7, 1983; "Project Gargoyles Game Description Version D," memo from Ross Cox to Don Osborne, November 23, 1983.

[29] *Gremlins* Production Status Report, November 9, 1984.

sound effects tape from Warner Bros. We understand that the final music hasn't been recorded yet."[30] The development team did not receive a tape of sound effects from the film until May 25.[31]

The movie's release date, June 8, came and went; a widely panned *Gremlins* game for the Atari 2600, developed by a separate team, was released on time. The *Gremlins* team lost lead programmer Franz Lanzinger, who resigned from the company in July 1984, citing Atari's financial woes.[32] Perhaps because of this, production continued well past the summer, and into the spring of 1985. As development continued, a planned focus group was delayed more than two months, from late March to late May. Despite reports that the focus group went "better than expected,"[33] a curt project cancellation memo came down on June 14, 1985. Although the game was cancelled before being completed, some footage of *Gremlins* exists. It was posted online a few years ago by Atarigames.com, and discussed more recently by video game historian Frank Cifaldi.[34]

Preliminary Conclusions

I'll finish by offering some brief thoughts on what we can learn from an archive like this, and from analyzing movie tie-in games. First, many licensed titles began that way from the outset, tied to an upcoming Hollywood blockbuster—or at least, a property that everyone *hopes* will be a blockbuster. While early communication and licensing aid in their development, they do not ensure success on their own, as we saw with *Gremlins*. And some titles, like *Star Wars*, can become successful

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[30] *Gremlins* Production Status Report, March 16, 1984.

[31] *Gremlins* Production Status Report, May 25, 1984.

[32] Franz Lanzinger, "Auf Wiedersehen," July 12, 1984, at http://atariemailarchive.org/thread/on-leaving-atari-and-money-on-the-table-58.

[33] *Gremlins* Production Status Report, May 24, 1985. The focus group took place on May 21st. A "Pre-Focus Review" document dated May 16, 1985 hints at the problems afoot. The question "Is the basic gameplay fun, given that there are still many enhancements to be made?" is answered with a blunt "No" in ballpoint pen.

[34] See https://www.youtube.com/watch?v=MjfbkAdLa-o. For a fuller account of the *Gremlins* development process, see Andrew Borman, "Game Saves: Unreleased *Gremlins* Arcade Game," *Play Stuff Blog*. https://www.museumofplay.org/blog/2020/02/game-saves-unreleased-gremlins-the-arcade-game-by-atari

even when they do not start out with a license, and are converted to support a new franchise only late in their development. Even beyond adaptations, it's clear that many Atari arcade titles began as gameplay concepts which only later had themes attached.

Another thing we learn from these documents is the relatively solitary and speculative life of the audio programmer. All of the memos I've read about these games indicate that soundtracks were constantly preliminary. Early builds of a licensed game were filled with placeholder sound effects, and games often went far into their development cycles, past numerous focus groups and marketing reviews, without music or sound.[35] Whether these delays in sound design contribute to project delays (such as the long and ultimately doomed development process of *Gremlins*) remains to be seen, but an image emerges that often places audio on the periphery of the game design process, beyond periodic updates that audio development is proceeding on schedule... or sometimes that it is not happening at all.

I am heartened, however, that there are also examples like *Jedi,* for which developers seem to have let their sonic imaginations run wild, striving to recreate the cinematic experience as fully as possible. And I am heartened as well that through the many stories contained within archives like the Strong, and through the efforts of archivists and researchers from many disciplines of game studies, there seem to be many, many more behind-the-scenes stories to be told about the processes of film adaptations, of arcade development in general, and of sound and music programming in particular.

[35] See, for instance, a *Gremlins* update from June 1, 1984 (one week before the film's release), which states: "Sound development has not started. We are waiting for Cindy to be available, and for the new sound circuit from assembly. We will not have music for the Marketing Review or Focus Group. We will have sound effects, though SOMEDAY (can't tell when just now). We hope to have Music and SFX mostly done for a 7/21/84 3rd Marketing Review."