

Video Production of *Magic Music from the Telharmonium*

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Abstract

Magic Music from the Telharmonium is a 29-minute all-digital video program that recounts the history of the first comprehensive music synthesizer. This article briefly outlines pre-production procedures, including research methods and sources. It then describes in detail the image and sound production techniques of the work, and how these carried out the design choices that were made. Features and limitations of hardware and software are also reported.

Introduction

A brief synopsis of *Magic Music from the Telharmonium*:

It was 1906. "Get Music on Tap Like Gas or Water" promised the headlines, and soon the public was enchanted with inventor Thaddeus Cahill's (1867-1934) electrical music by wire. The Telharmonium was a 200-ton behemoth that created numerous musical timbres and could flood multiple rooms with sound. Beginning with the first instrument, constructed in the 1890's, and continuing with the installation of the second instrument at Telharmonic Hall in New York, the rise and fall of commercial service, the attempted comeback of the third Telharmonium, and ending with efforts to find a home for the only surviving instrument in 1951, this documentary provides a definitive account of the first comprehensive music synthesizer.

I produced this all-digital animated documentary on Macintosh computers and completed it in 1998. It is an outgrowth of the book of the same name. The running time is 28:51. It has been released on VHS and BetaSP videocassette in both NTSC and PAL systems, and on 3/4-inch NTSC videocassette.

I completed a first cut of this work on March 2, 1997, at Windsor Digital, New York. After a presentation on April 4, 1997, at the National Conference of the Society for Electro-Acoustic Music in the United States, University of Missouri, Kansas City, I revised about 7 minutes of the footage. I completed the final version on April 6, 1998, at Unitel Post 38, New York. The première was presented on April 15, 1998, at the National Conference of the Society of Composers, Inc., Indiana University, Bloomington.

In 1998 the program was selected for Synthèse 98: 28e Festival International des Musiques et Créations Électroniques, Bourges, France, and the 9th Annual Festival Téléscience, Montréal, Canada. It was also selected for The Sync Online Film Festival, Laurel, Maryland, and placed on its web site. As of this writing it may be viewed in its entirety at <http://www.thesync.com>. In 1999 it received the Crystal Award of Excellence, History Category, The Communicator

Awards, Arlington, Texas, and was the Viewers' Choice Winner for January 1999, Documentary Category, The Sync Online Film Festival (<http://www.thesync.com/festival/winners.html>).

Pre-Production

When I began to investigate the Telharmonium as a possible research topic in 1981, I was delighted to discover that it was a grand story waiting to be told. Modern accounts were tantalizingly sketchy and confusing, and gave contradictory dates of its use and demise. Even with this limited data, its significance in the history of electronic music was by then well established and accepted. And so I pursued the evidence and told the story in book form.

The world of the Telharmonium was ultimately conveyed to me by over 900 primary sources: letters, patents, court documents, corporate documents, pamphlets, brochures, broadsides, and newspaper and magazine articles. The latter provided words and, of course, pictures. As the pictorial collection increased, I comprehended a visual world that would be too large to include in the book, but that could stand on its own as a way of conveying the history of the instrument.

This realization occurred about a year or two into the book project, at which point my gathering of available pictures had been incomplete and not at the highest resolution available. I re-photographed pictures I had taken earlier, using fine-grain film and a macro lens, and proceeded to acquire copies of any and all new pictures that had any connection to the Telharmonium. I also looked for supplementary images that could be used as foreground and background material. This would enable me to cover the people connected with the Telharmonium (Lee de Forest, Mark Twain, Lord Kelvin, George Westinghouse, Johanna Gadski, Victor Herbert, Walter Damosch), and to recreate the world of New York hotels, restaurants, theaters, and other pertinent scenes and locations (the Maryland Club in Baltimore, buildings on Broadway, various street scenes in New York and Holyoke), and to illustrate developments in invention and technology (acoustics, electrical sound, the telephone, the audion, the radio signal path).

One source that proved to be invaluable was picture postcards—skylines, hotels, restaurants, skyscrapers, and people (using the telephone, eating and drinking, “glamour” pictures). Postcards were quite the rage in the early 1900s, when they were produced in greater quantity and variety than ever before or since. The all-time record number of postcards mailed in one day occurred at Coney Island in 1906—over 200,000 of them. The inexpensive color images were a popular attraction in an era when mass-circulation periodicals were printed in black-and-white. I visited many postcard shows, and found that those with the greatest selection of New York City subjects were held in Florida—where expatriates assemble collections with nostalgic devotion.

The gathering process was essentially completed in 1991 and resulted in a collection of 840 images. The video program incorporates 261 of these.

Image Production

All visual sources are historically authentic still images. There are no live-action images, visual recreations, or mock-ups. I photographed the stills on film transparencies and scanned these onto a computer hard drive. Image processing and animation were created with Photoshop 3.0.4 and Director 5.0.1 on a PowerMac 8500/120 (144mb RAM).

When these historically authentic stills first faced me on the computer monitor, any respect for preserving their original appearance faded altogether. The importance of clarity superseded any notion of conveying the actual form in which these venerable gems arrived on my hard drive. As examples, some techniques employed in the image processing and animation may be cited:

Scene 1. Starting with the very first image (ballroom dancers), I “dodged” (lightened) faces to make them clearer and “sponged” areas to increase color saturation. Broadcast television conveys some colors better than others—good blues are everywhere but just try to get a decent orange, let alone a yellow. Photoshop has an NTSC color filter and Director an NTSC color palette. Director’s is about as thin and wan as television

color can possibly become, and inexplicably lacks magenta, so it can't even be used for color bars. I eventually found I could ignore the stock palette and rely on the on-line video editing studio to rein in and "legalize" my colors where necessary.

Scene 9. Here I used a split screen to present a composite of several locations. In fact there is no such thing as a video-type independent split screen in Director (picture within picture). All the images are partially overlaid. I set up borders to place three pictures in the video frame and cover their edges, and each picture was given its own movement (pan, tilt, or diagonal). In the beginning of this scene, the Ritz-Carlton (top) is moving right, the St. Regis (lower right) is moving down (from underneath the Ritz-Carlton), and the "Cozy Nook" (lower left) is moving diagonally left-down (underneath the other two). The edge of a picture moving straight up/down/left/right can form the frame edge of a split screen, which eliminates the opportunity for multiple diagonal movement (a limitation not at all disagreeable).



Ritz-Carlton Roof Garden



Hotel St. Regis Dining Room

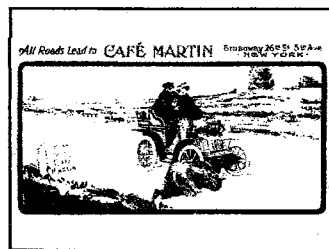


"A Cozy Nook"

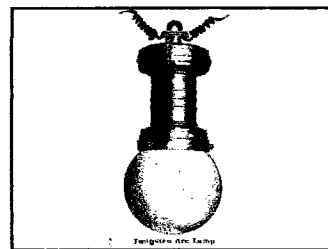
Three Original Images Used for Split-Screen Composite Image

Scene 10. The cartoon of the couple in the roadster presented an interesting opportunity to work with color transitions. Several color transformations were created in Photoshop and the animation dissolved from the original to several radical color renderings, aimed at centering on the couple. This violation of the original directs the viewer's eye and moves to a simplification of the content.

The long fade of the tungsten arc lamp at the end of the scene looks vigorously animated with flashing colors. Would that I could take credit for an arduous week of frame-by-frame creativity, but it is only an 8-bit NTSC-palette color fade. I cannot say whether it was a feature or a bug, but fades using this stock palette consistently refused to hold stable color. Each change in luminance level called up a new set of colors unrelated to those before or after. This turned a fade into a fascinating romp through a range of darkly flickering colors, reminiscent of the northern lights.



"All Roads Lead to Café Martin"



Tungsten Arc Lamp

Scene 11. The two pictures of Mark Twain were typical of many shots photographed directly off screens of microfilm newspaper readers in libraries. There are flare and glare in these displays, and the use of a polarizing filter on my still camera helped to raise the quality from mediocre to indifferent. As any user of these readers knows, the films are often heavily scratched. As long as the words remain barely legible, the quality is more than satisfactory for library patrons. I spent many Zen-like hours patiently retouching the images in Photoshop to remove spurious marks. After that,

Mark in bed underwent the Photoshop filter treatment—I dissolved his original to a version with a halo of yellow-white light, followed by a sepia dust-and-scratches-filter blur. It functions primarily as a long fadeout without lowering the luminance, as the filters degrade and remove information. Perhaps there is also a sense of changing the writing-in-bed scene to a deathbed scene, illuminated dimly at the end by an NTSC-palette fadeout.

- Scene 12. The color image of the Casino Theatre roof garden came from a printed program found at a used book shop. The cheap paper cover retained intense chroma for over 100 years. Its original image is followed by a transformation with a red color cast, which dissolves to a washed-out lighting filter.

Color here is a way to observe time flow and to emphasize the graphical, black and white content, the only thing that remains consistent. Historical purists who wish to see their original colors unsullied may not take kindly to this admittedly subversive treatment. However, the problems of video color make the medium marginal at best for their kind of faithfulness, and using coloristic devices over time helps to create movement and flow in a video built up entirely of stills.



Mark Twain Writing in Bed



Casino Theatre Program

- Scene 15. Director is an engine that obsessively throws its power into doing a few things remarkably well. (Synchronization to audio is not one of them, which is probably why audio people avoid working with the program.) Re-sizing and re-proportioning animated images is one such forte. Here I was able to combine two images of the audience at Telharmonic Hall—one a photograph, the other a pantographic line drawing of that photo. These images appeared in different publications, and naturally their aspect ratios had shifted slightly. Director handled the re-alignments with ease, so that a slow dissolve between the two was accomplished while they remained perfectly lined up.



Audience at Telharmonic Hall
PHOTO



Audience at Telharmonic Hall
DRAWING

The next shot, Elliott Schenck at the keyboard, was a black-and-white picture that was rendered as a duotone. This comes from the pre-press printing side of Photoshop. A color is selected and assigned to a range of gray levels, and then the image is printed both with black ink and the colored ink. It is an inexpensive way of adding color to an image, such as a cover or label, without going to the expense of the full four-color process. The effect is subtle and muted, very pastel-like on video.