

Shadows of Canaveral: The Application of VR to a Post World War II Subject

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Abstract

Shadows of Canaveral is a 3-dimensional, interactive and immersive journey through time utilizing the backdrop of historic Cape Canaveral. Visitors to the project's website explore key moments in the history of the Cape through its launch pads, mission control, assembly areas, and launch vehicles. Their exploration goes beyond the gates at the Cape and extends to an examination of the larger historical picture and culture of the era.

Key words: *Virtual Heritage, Virtual Environments, Flash, Cape Canaveral*

1 Introduction

Today's learners have a multitude of opportunities to engage in activities they want to spend time on, from movies, television, vacations, visiting museums and theme parks to the Internet. The web has risen as a venue where rich environments can be explored in an interactive fashion, and this new addition to free-choice learning brings depth and breadth not possible in earlier media. The intergenerational nature of this website experience provides a rich foundation for learner discussion during and after their visit to the site.

2 Cape Canaveral Background

The very name, Cape Canaveral, evokes images of an inseparable triad -- billowing rockets, towering gantries, and silver clad astronauts (see fig. 1). It was here along the eastern coast of Florida that the United States established its most noted launch facility. Although missiles arose from the desert at White Sands and Vandenberg AFB in California, it was the Cape that held the imagination of the world captive. Cape Canaveral, with its bright orange gantries lining sun-drenched shores, stands as one of the great temples of exploration.



Compiled from NASA Images

Figure 1. Launch Complex 14 & Gordon Cooper

History books have enshrined John Glenn and Neil Armstrong alongside explorers Ferdinand Magellan, Captain James Cook and Roald Amundsen. Aerospace museums will ensure that future generations will be able to see the hardware that transported the astronaut-explorers into space.

But what of the last member of that once steel clad triad – the aging launch facilities at the Cape?

The Cape supported its first launch on 24 July 1950. Bumper-8, a two stage hybrid missile consisting of a captured German V-2 and a WAC Corporal second stage, marked the beginning of Cape Canaveral's role as the nation's premier launch facility. From Launch Complex 26a, America's first satellite began its orbital voyage of discovery – ultimately revealing the existence of the Van Allen Radiation Belt. John Glenn's Atlas missile rose from Launch Complex 14, propelling him to become the Free World's First Man in Orbit. The confines of Launch Complex 17b witnessed the launch of the World's first active communications satellite, Telstar. Project Gemini laid the foundation for the success of our journey to the Moon from Launch Complex 19. From Launch Complex 39a, humanity took its first steps to another celestial body.¹

Unfortunately, most of these historic launch gantries were sold for scrap long before the sites inclusion in the National Historic Landmark Program in 1984.² The Air Force Space & Missile Museum at Cape Canaveral's Launch Complex 26 maintains a Redstone/ Jupiter-C service tower as part of its collection. While it stands as the oldest remaining gantry at the Cape, it serves as only a partial link to the past. Each missile system under development at the Cape in the 1950s and 1960s had a unique launch facility. The complex supporting the Atlas Intercontinental Ballistic Missile was as different from the Navaho Cruise Missile as the Empire State Building is from the Sears Tower.

Weed-riddled concrete and rusting steel ruins occupy the sites where aerospace workers toiled to launch many of our nation's significant space firsts (see figs. 2 & 3). What permits such decay at such a recent historically significant site? In part it is the mindset behind the development of missiles. Each system was designed to advance the field and once it reached a successful conclusion or proved to be a dead end, the associated launch complex at the Cape was no longer needed. While several

facilities would find a second life through repurposing such as Launch Complex 37, most launch towers would be sold for scrap and the remaining concrete structures were "Abandoned in Place."



All images held by Media Convergence Lab, University of Central Florida unless otherwise noted

Figure 2. Launch Complex 14 Today



Figure 3. Launch Complex 19 Today

3 Initial Development Concept

Shadows of Canaveral was initially envisioned as an effort to provide historically accurate reconstructions of the launch structures at the Cape through the application of virtual reality. Our focus was to reconstruct Cape Canaveral as it appeared during various points in its first twenty years and provide users the ability to simply 'time

¹Launch Complex 39a is on Kennedy Space Center property adjacent to the Cape Canaveral Air Force Station.

²National Historic Landmark Application, <http://www.nps.gov/history/nhl/themes/Scanned%20Nominations/Aviation/Cape%20Canaveral00.pdf>.

travel' to a specific point. For example, if someone were interested in the Cape's configuration in 1959 they could enter 1959 into the interface and pre-rendered videos would provide a 3-dimensional tour of each launch facility. A slider interface would provide the user with the changing landscape of the Cape over time. The goal was to focus on the architecture of the Cape – not the missile hardware or the human contribution to the history. This vision was not unlike many projects that applied virtual reality to historic sites. While larger in scale, Rome Reborn is designed to provide researchers with an understanding as to how Rome may have appeared at a moment in time.³

4 Beyond Architecture

While planning the pure architecture approach, it became clear our selection of a post World War II topic provided a unique opportunity – the incorporation of the human element from those who were actual participants in the events. The proximity of the University of Central Florida to Cape Canaveral provided a wealth of first hand accounts of Cape activities through oral history. The lead author had been working with the US Space Walk of Fame Foundation capturing the reflections of space workers. Their memories would ultimately provide the most important element for our virtual recreation – the human element. This will be even more important when the project moves into its next phase with the inclusion of avatars. Currently, space workers are represented through the reflections of Calvin C. Fowler who serves as the docent in *Shadows of Canaveral: Phase I*.

During early planning it was realized Cape Canaveral did not end at the security fences. The impact of the facility extended beyond the confines of the military installation into the nearby communities. It was decided to have the City of Cocoa Beach serve as a representative community and include aspects of the missile/space influence in the virtual recreation. Known as *Missileland: USA* in the 1950s/1960s, Cocoa Beach was ideal with the amount of businesses sporting Space-Age names and Space-Age architecture. and

a significant proportion of its citizenry working at Cape Canaveral.

5 *Shadows of Canaveral: I*

Production on *Shadows of Canaveral: Phase I* was initiated with the support of a grant by the State of Florida - Bureau of Historic Preservation. With hundreds of historical launches at the Cape throughout the 1950s and 1960s, the team needed to select one for the first virtual experience. We elected to begin with the 20 February 1962 launch of John Glenn for numerous reasons.⁴ The oral history efforts of the lead author revealed a significant percentage of interviewees either participated in Project Mercury or possessed a strong personal reflection of the launch. A document and image scanning effort by the lab provided a wealth of materials pertaining to Launch Complex 14, Project Mercury as a whole and Glenn's launch specifically.⁵ Finally, few astronauts have the name recognition of Glenn, the very presence of which would raise the interest of Internet users.

University of Central Florida Digital Media students were recruited to assist in 3D asset development. The students worked directly with project historians Walters and Michelle Adams to determine what images and documents were required to create models. The lab possessed a large collection of photographs, blueprints and film footage of Launch Complex 14 and other facilities associated with Glenn's flight. As a post World War II subject, students were afforded the opportunity to directly interact with individuals who were associated with Project Mercury. Calvin Fowler, test conductor at Launch Complex 14 for three of the Mercury orbital flights, was instrumental in not only filling in the pictorial gaps, but in maintaining the historical accuracy of the overall Internet experience (see fig. 4).

To provide users with an experience rather than a limited architectural tour of Cape Canaveral facilities associated with Glenn's launch, users take on the persona of a reporter from John

³ For additional information on Rome Reborn visit <http://www.romereborn.virginia.edu/>

⁴ "Boom that Space Built." *US News and World Report*, 21 March 1962, 50-54.

⁵ Walters, Lori C. "The World Was There: A Photographic History of Launch Complex 14 at Cape Canaveral," *Florida Historical Quarterly*, 82 (Winter: 2003), 43-58.

Glenn's hometown paper, *the Daily Jeffersonian*. Through a Flash interface the user begins a journey at the *Starlite Motel* in Cocoa Beach. The motel room serves as a portal point for the reporter's arranged tour of the Cape and a variety of props place Glenn's flight into the context of the early 1960s.



Figure 4. Fowler & students reviewing materials.

Careful attention was paid to the historical accuracy of all minor details within the experience. Not only is the telephone the correct model for 1962, the telephone number on the dial is that of the actual *Starlite Motel* in 1962. The television program clips are taken from the precise episodes airing for the week of Glenn's launch. The weather data contained within the reporter's notebook were researched from the now defunct *Cocoa Tribune* newspaper. The reporter's notebook also serves as a mechanism to note other significant events happening concurrently with Glenn's launch period to remind users no historical event occurs in a vacuum (see fig. 5).

Taking on the persona of the *Daily Jeffersonian* reporter, users tour the Cape following the proper protocol for the period. Currently Calvin Fowler serves only as an audio escort, meeting users at the South Gate (see fig. 6). Future plans call for an avatar of Fowler to assist in creating a deeper sense of realism. Meeting users at the South Gate, Fowler drives them in a model of the same black VW Beetle he drove in 1962. The tour proceeds to go throughout areas of the Cape relevant to Project Mercury – including: Launch Complex 14 (see fig. 7), Mission Control, Press Site and Hangar S.



Figure 5. Interactive Motel Room Desk



Figure 6. Entering South Gate of Cape



Figure 7. Interior Launch Complex 14 Blockhouse

Autodesk's Maya served as the primary software in model development. Blueprints of most of the structures aided in the creation of accurate wireframe models. Photographs and film clips

were utilized to maintain accuracy of model textures. However, even with the availability of blueprints and thousands of images, there were instances in which our retiree volunteers were critical in providing the required information to maintain accuracy. In one instance, our team constructed the Ready Room structure at Launch Complex 14 based on blueprints and exterior images. However, research could not uncover interior images of the structure. While blueprints provided the correct placement of interior walls, we did not know colors and most importantly what was inside the Ready Room. Again, Fowler and other retiree volunteers proved instrumental to providing the required details.

6 *Shadows of Canaveral: II*

With the successful completion of Phase I, the team proceeded to consider a subject for a follow-on phase. Our decision was predicated on a desire to capture the transitional moment of the Cape's history – from its significance as a maritime sentinel to missile testing facility. Erected in 1868, the Cape Canaveral Lighthouse served as an observation point for the first missile launches. While the majestic black and white lighthouse structure still stands, the lighthouse keeper's cottage complex was demolished in 1967. Phase II centered on a recreation of the entire lighthouse complex and nearby Launch Complex 3 as it prepared for the Cape's first launch on 24 July 1950.

The development and mechanics of Phase II was identical to that of Phase I – pre-rendered scenes accessed through a Flash based portal. As the *Starlite Motel* in nearby Cocoa Beach did not exist in 1950, it was necessary to find another historically accurate portal point. Careful consideration had to be given to what individuals would have been present at this military launch, their location and how we could again provide users with an understanding of events beyond the confines of the Cape. Our team elected to have users take on the persona of a photographer stationed at nearby Patrick Air Force Base. To create an accurate photographer's darkroom from

1949/1950, photography books of the period were consulted. From this darkroom (fig. 8) users could explore aspects of political and cultural history from 1950, the lighthouse complex and the historic launch of Bumper 8.



Figure 8. Photographer's Darkroom

7 Conclusion

Recent historic sites share all the same preservation issues as their older cousins, with one major exception – the respect age can bring. The events that unfolded at Cape Canaveral in the 1950s and 1960s are perhaps some of the most historic of the 20th Century – here humanity took many of its first steps toward the stars. In reconstructing these recent ruins we are presented with numerous resources unavailable to others applying virtual reality to historic sites – perhaps none more important than interacting with those who made those steps.

Bringing the larger societal environment into the experience allows the learner to more fully understand the context of the historical events. For the space program, we have the opportunity to gather video and audio footage of their first-hand experiences, and transfer that knowledge to the younger generation. That is powerful content that can be designed into rich virtual environments for free-choice learning.

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