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Battlestar Galactica reportedly cost Universal Studios a million dollars per hour to film for television. Now Universal has spent closer to a million per minute adding a Galactica show to its famous studio tour on the Universal lot (near Hollywood). A tram loaded with 120 tourists is hijacked by Cylons manning a laser cannon, taken aboard an immense spaceship which is only moments away from lift-off, and threatened by a reptilian Imperious leader who intends to feed them to the insect-like Ovions. Just before a Sensurround rumble indicates departure, a rescuing Colonial Warrior, brandishing a laser pistol and a photon bazooka, blasts his way through a wall.

A dizzying laser battle begins, leaving three cylons split in half and spewing smoke, the Ovions going up in flames and a gaping hole in the side of the ship, through which the tour guide directs a hasty escape. It went from abduction to escape in only two minutes and 45 seconds. Five seconds after, the tram goes on toward a collapsing bridge, the next attraction on the tour, and the Cylons, Ovions and 'BTA Uglies' are again in their place and in perfect order. The smoke has cleared as the next tram-load enters and hears actor Patrick McNee's voice once again coming from the Imperious Leader, gloating over the extermination of the human race.

Private Motivation

Bob Zraick, one of the chief developers of the exhibit says, "when I saw Close Encounters, I wished I could have gone aboard with the spacecraft, and I wanted to participate in the excitement of one of the battles in Star Wars, not just watch it, but experience it. Now I think we have succeeded in providing people with this kind of experience".

It wasn't easy, according to Zraick, and he should know! He was involved with writing the script, developing the special effects, art direction, costuming and even choreography. The enthusiast Zraick (dressed in jeans and a Mickey Mouse T Shirt) says with pride that he and members of his team had "worked 121 hours the week before the exhibit opened" to whip the multi-media SF experience into shape.

The initial idea for the exhibit came from Jay Stein, chief executive of MCA (Universal's parent company) Recreational Services. "Stein's first idea, even before Galactica arrived", says Zraick, "was to fly a tram full of tourists into outer space, or at least give the illusion. Thinking back", Zraick laughs, "it would have cost a small fortune!" Then Battlestar Galactica came along. Zraick was brought in to analyse the problem, and was shown the 3 hour Galactica pilot, only a week or so before its air date. "Then we knew what we wanted to do", he said. The first major problem: how to do it all in just over two minutes. The time limit is imposed by the frequency with which trams are dispatched from the gate area.

From the moment he previewed the Galactica pilot, Zraick envisioned the abduction and laser battle. His initial 2 minute draft script convinced him that you can't do a show with nothing but robots. There's just no way to animate a humanoid hero realistically. So we decided to use a live Colonial Warrior, but there was one other problem. How on earth were we going to do the lasers? Zraick says that in a film you can animate the laser beams, but here we had to deal with the real life setting. We first considered using hidden strips of light in the walls. You know, a Warrior Cylon would raise his gun and touch it to the wall and out would come a beam, apparently. But that wouldn't have been convincing. Then, we started asking ourselves if we really needed a laser battle.

Realistic Effects

Terry Winnick, director of architectural services at Universal, then arranged for a demonstration of real lasers through Dr. Sandor Holly of Interscience Technology Corp. "Terry

was instrumental in pulling the project together", says Zraick. "He was also responsible for the use of DiscoVision (MCA's video disk system) to provide the video monitor read-outs and images from the TV show that are used in the exhibit."

In order to conform to the standards of the U.S Bureau of Radiological Health, which governs the public use of lasers, a system was devised using photoelectric devices that automatically shut the system down, should the tram stray towards the danger area.

There are actually only two laser generators employed, and these are situated underground. The beams travel through a trench, where they are split with prisms into 22 watts of blue and green beams and five watts of red. The prism-split beams are further directed by computer-controlled mirrors, until the resulting effect is that of lasers blasting from everywhere.

The audio portion of the explosion-illusion was accomplished by Bruce Davy, acoustical engineer with Long-Davy & Associates. "There was just no way to solve the first problem" says Zraick. The first explosion occurs outside the Cylon ship, as the Cylons fire the laser cannon at the tram.

In the end, Davy included a track for Universal's theater-rattling Sensurround low-frequency generator in the 16-track directional soundtrack recorded for the tour show. Sensurround is now used to augment explosions and to create a rumble as the ship prepares for take-off.

Smoke effects turned out to be another problem, Zraick admits. "Finally, after investigating other possibilities, we decided that CO₂ was the way to go. Universal was reluctant to use CO₂ because they had had some bad experiences with it. But I told them it was better to go with something that we're familiar with rather than start with some entirely new process. Carbon dioxide gas is harmless and dissipates rapidly. Backstage, one can see stretches of steamy frozen pipes that carry the explosive puffs. So far, engineers have had no problems with moisture condensation, and their \$150,000 smoke system is running smoothly. CO₂ is not real smoke though, and has no lingering effect. An atmospheric haze was desirable for several reasons; the haze obscures details and makes the spaceship interior seem more vast. It augments the CO₂ smoke effect, and more importantly it makes the laser beams glow much more brilliantly.

"We consulted one pyrotechnical advisor after another", Zraick explains. "We were directed to a mad scientist with frizzy wispy hair, who assured us he had just what we needed. We went to his shop to see what turned out to be a rig on a wooden plant, held together with staples and bailing wire, that had a spoon wired to dip into a container, scoop out some powder and drop it onto a hotplate. Pure Rube Goldberg stuff. The gadget was not just a mock-up - this was it! "I thought maybe we could use the powder though, if it was certified safe". The scientist assured the Universal engineers that it was certified for use in toys, but he could not find the certification papers. We had it checked by an independent lab, and it turned out to be toxic as hell. The testing lab suggested an alternative powder... one that passed with flying colours and produces a haze that is odorless and non-toxic.

The most complex feature of the exhibit is the robot actors for the action drama. It is more expensive and time-consuming to produce than even the building and it's spaceship facing, made of plastic, wood, sheet steel and fire-resistant finish polyurethane.

Sophisticated Robots

"Humans have played robots, and robots have played humans" Zraick says. "But as far as I know, this is the first time in the history of theatrical events that robots have played robots, unless you want to count R2D2." Zraick enlisted the services of the foremost robot maker, Alvaro Villa, to engineer the Cylons and aliens of the exhibit. Villa worked on the Audio-

Animatronic figures at Disneyland and Walt Disney World. Villa also assisted Zraick with special effects and in interfacing the robot circuitry with the computers.

There are 20 mechanical actors in the show; two Cylons manning the cannon outside, and 18 more characters in the ship itself. Zraick explains, "in an alcove is the navigational equipment manned by two Cylons. These two are blown up by a blast from the hero's Bazooka. They only have three movements; sitting erect with their heads oscillating, leaning back in surprise and falling forward in death.

In the opposite alcove are three Ovions which have only up and down movement, plus they can wiggle when they laugh or scream. The Ovions appear and laugh when the Imperious Leader says, "The Captives will make tasty morsels for our Ovion allies". They disappear in flames made with Mylar, fans and CO2 smoke at the end of the gun battle.

Then there are the BTA Uglies. You know how it is, even things without names get names in a project like this. Everybody around here knows just what a BTA Ugly is.

They're in the alcoves behind the tram. BTA = behind the tram alcoves. These are aliens mainly there for decoration and distraction. They laugh when the Ovions do. The BTA Uglies were designed by Gary Meyer and sculpted by Zraick.

The major animated figures stand on the floor directing their attention to the most highly articulated figure of all, the Imperious Leader. These are three Cylons, two silver, one gold, and an alien referred to as "the Tall Ugly". The Cylon shells were taken from the moulds used for the TV Cylons. The Tall Ugly is a Zraick creation which provides a moment of comic relief for any tourist!

Fun For All

The final ingredient to be added to the show was the actor for the Colonial Warrior scene. His actions had to be choreographed to coincide with alien movements and laser blasts. It could hardly be expected that one actor gives a strenuous performance every two minutes for 16 hours a day. So Universal hired ten actors, with at least three of them on duty at any given time. "The performers really get into it" says Zraick. "It's really exciting for them to dress up and play hero".

Bob Zraick is a perfectionist. "I'm still not pleased with the Imperious Leader. He has one syllable out of sync".

At the time of this interview, Zraick and his crew had one more week of fine-tuning to do, including setting audio levels, refining robot movements, resetting lights and bringing the lasers up to full power, after which he planned to just disappear, and take a well-earned vacation where nobody can find him!

Zraick can be confident that he and his team, and the creative planners at Universal have provided a spectacular and perpetual monument to television's most ambitious science-fiction series.

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