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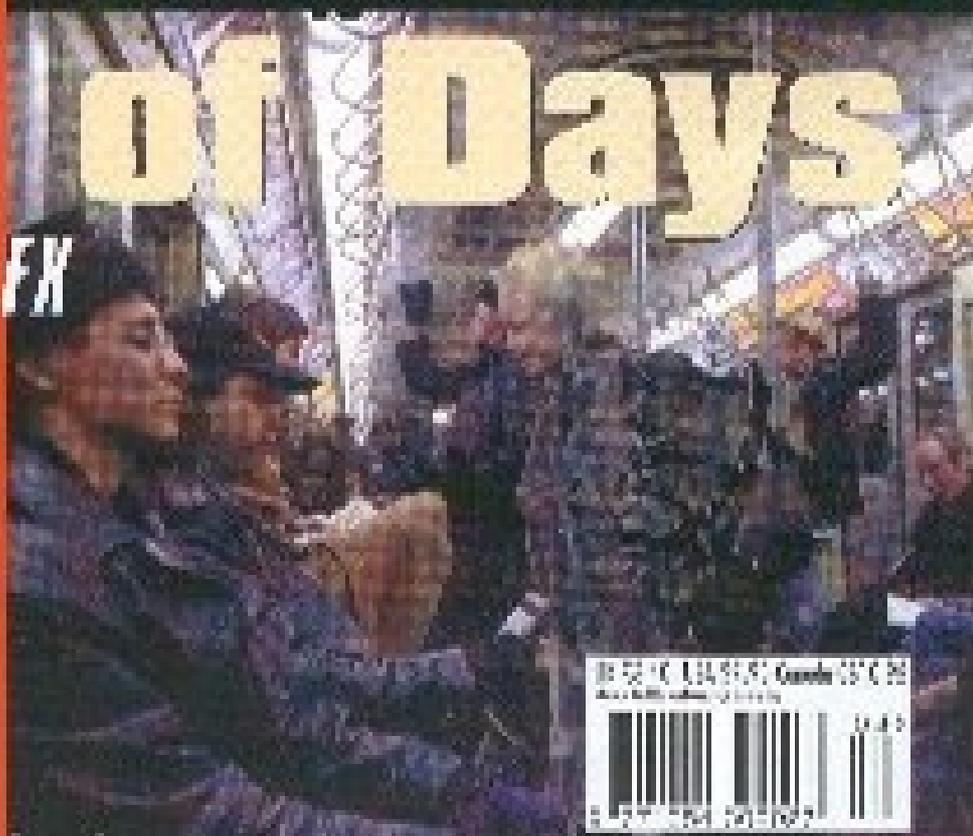
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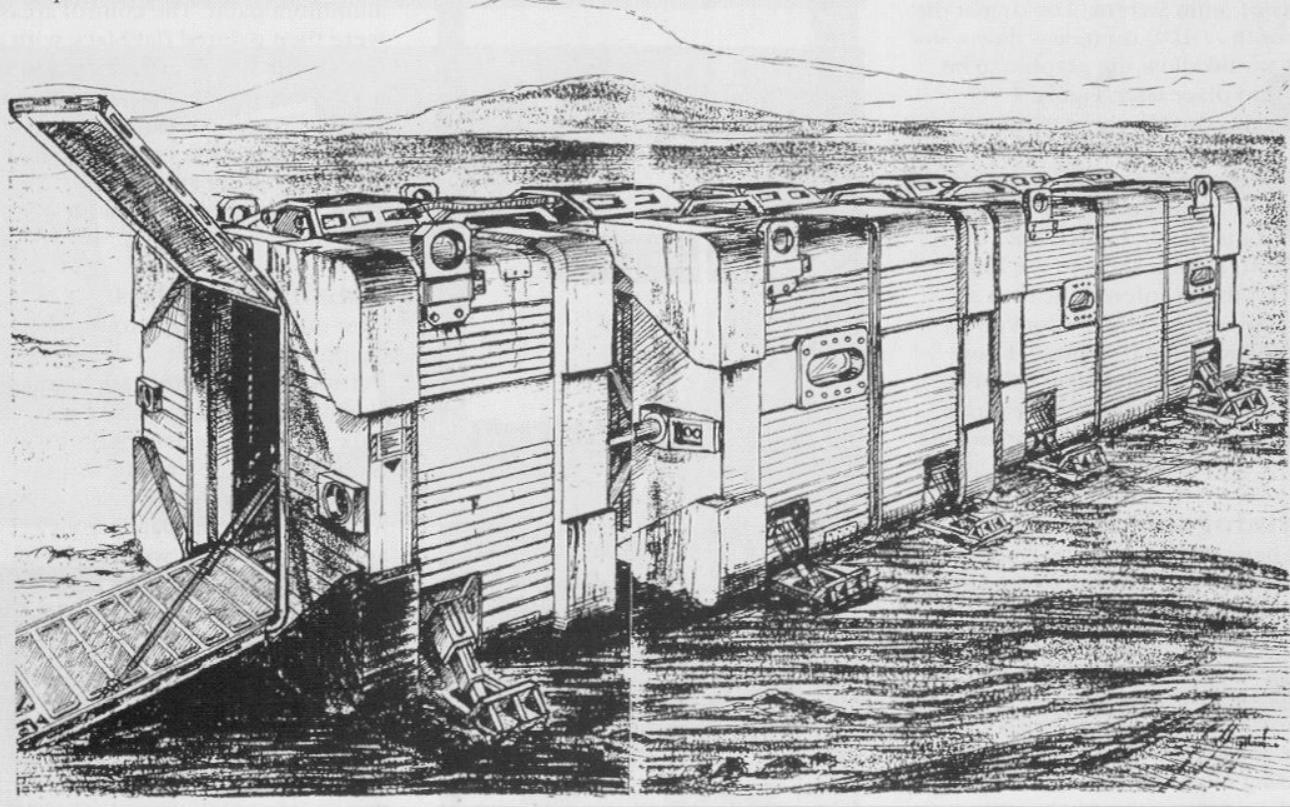
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# The Digital Magic of Space: Above and Beyond—Modeling

An Interview with Scott Wheeler

wes sargent

Concept illustration of center-section of APC.



**S**cott Wheeler, formally a veteran at Area 51, also works freelance for shows like *Xena: Warrior Princess*. At the time of this interview he had just finished working on a TV movie for TNT called the *Hunley* at Station X Studios. Scott is also a regular contributor to *New Techniques* magazine and has co-authored the book, *Lightwave 3D Applied*.

Scott Wheeler was one of the first persons to start modeling for *Space: Above and Beyond*. In this interview we'll focus much of our attention on the construction history behind some of SAAB's more memorable spaceships.

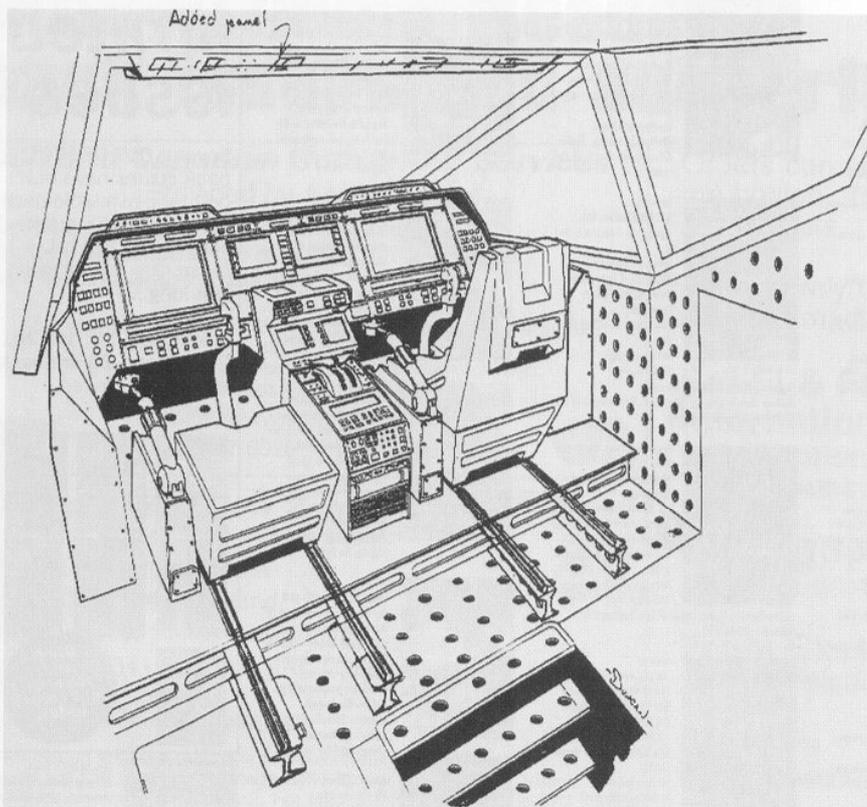
**WS:** Initially, what were you hired to do on *Space: Above and Beyond*?

**Wheeler:** I guess I was hired for my reel. They liked my models and so I originally came out to do much of the pre-production modeling. I started building the *Chig fighter* back in Boston, then they put me on parts of the *APC* (*Armored Personnel Carrier*). I ended up building the entire ship and the *Chig fighter* as well. I also played around with some early versions of the *Hammerhead*

but ultimately that was all modeled by Ken Stanahan.

**WS:** Before we get to some of your modeling, I understand you have a background in still photography and videography. How important were those experiences with respect to understanding how to integrate CGI with film for television?

**Wheeler:** I did a lot of still photography. I taught it at summer camp. I never did anything professionally with still photography but I did do a lot of video. Before I came to L.A. I was running a public access television station in Massachusetts. We had a four camera fixed studio with a three camera



portable studio. I would go around and shoot baseball games and do most of the things local access television does. I had also gone to film school, so it all helped a lot with respect to knowing what good lighting was;

what good motion is; what lenses to use in order to portray a certain feeling; what a good camera angle was to capture certain bits of action and stuff like that. In essence, what makes a pretty picture. It translated

very naturally from the practical into the computer.

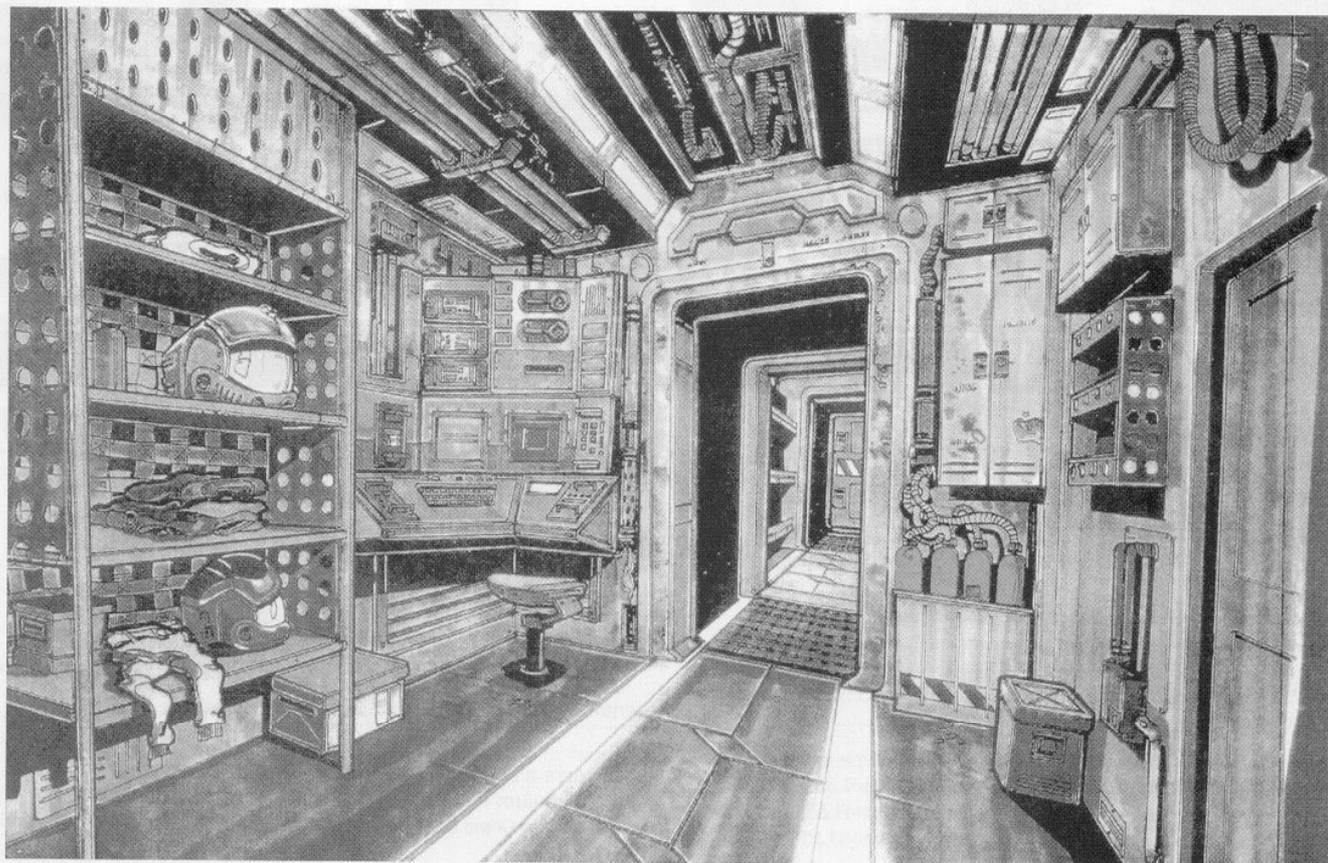
**WS:** How necessary do you feel it is for new animators, who wish to do visual effects, to really understand the nature of film?

**Wheeler:** Understand as an animator? I wouldn't say it's really necessary to understand the whole film process but certainly one should understand what makes good lighting; what makes good motion and what good camera positioning is. All of that is important. Even though I went to film school, I come at things from the other side of the spectrum. The techniques can be learned in video. You don't necessarily have to touch film to learn any of that stuff.

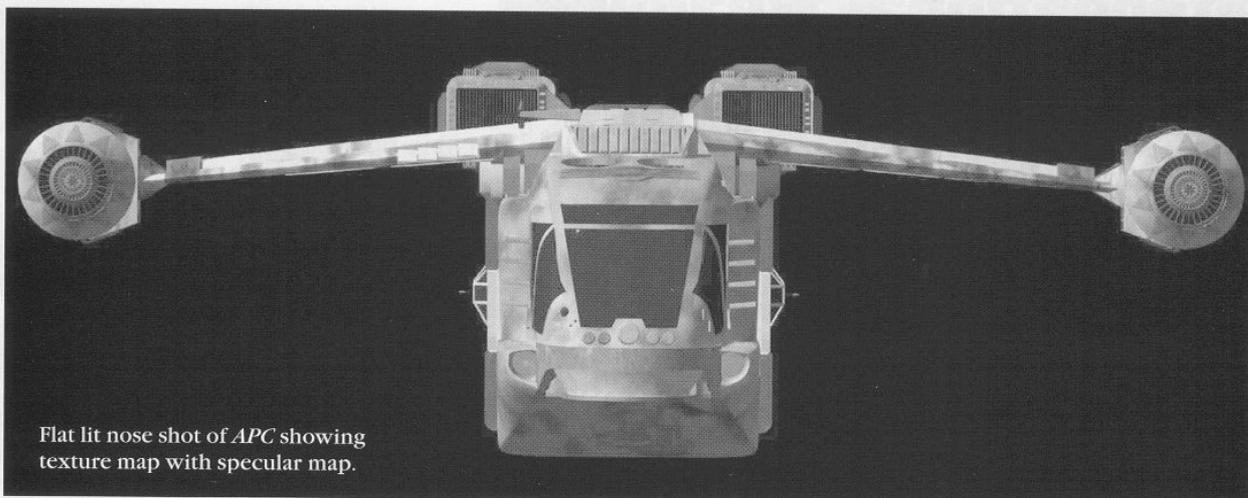
**WS:** As you were responsible for constructing the original APC, can you give us a little history on that ship?

**Wheeler:** I think Dave Duncan did the original layout of the APC. It's safe to say that he did ninety percent of the initial sketches, pre-production and production designs. He also did a lot of the storyboarding.

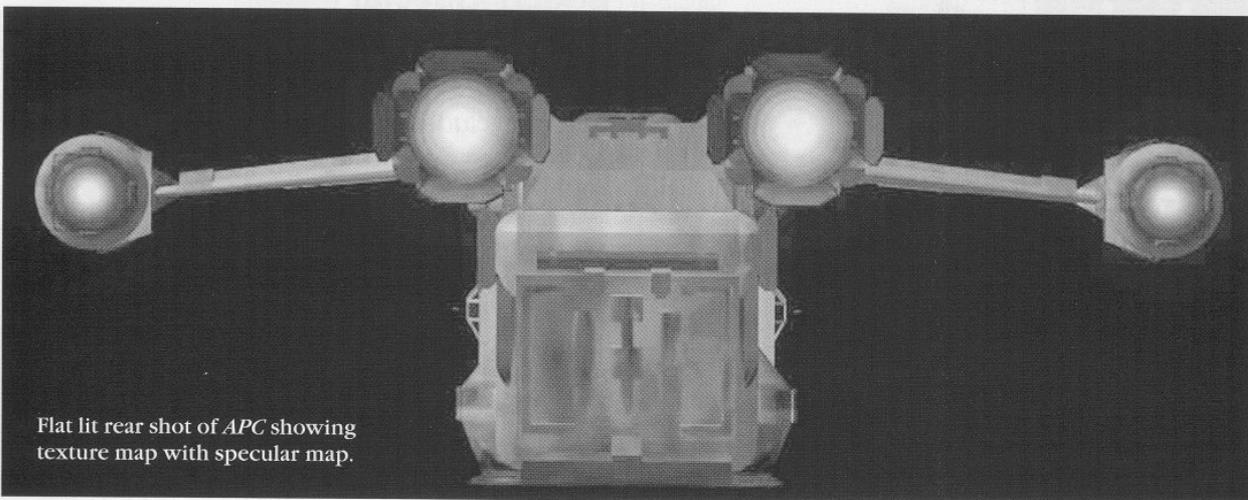
When I first started modeling the APC, I had a drawing from the



Top: design of APC cockpit interior as sketched by Dave Duncan. Above: design illustration of APC interior.



Flat lit nose shot of *APC* showing texture map with specular map.



Flat lit rear shot of *APC* showing texture map with specular map.

production in Australia, some of the artists had sat down to give the people there an idea of what this thing was supposed to look like but they never actually built the full size *APC* for the pilot. They did build one section of the cube (cargo section). They dragged it out in the middle of the desert and then they filmed the actors who would walk out of it. So, during the pilot, we were told that the full scale *APC* would never be built and whatever changes I wanted to make to the design, I could. The basic layout of the ship stayed exactly the way it was shown because it had to do these certain things. The ship had to have that cube section in the center. I had to be very specific about that because the cube was going to be seen in both the live action and also the computer generated shots.

**WS:** Can you tell us a little more about the specific additions or changes you made to the design?

**Wheeler:** We added nurnies (a modeler's affectionate term for little

details) along the spine. Most of the detailing along the sides, under the wings, the wing panels and the cockpit layout was pretty much just what I came up with while I was modeling. The original drawings had this very flat glass type of paneling. I did more of a rounded nose piece because initially the criteria was, "Make it however you want." Well, it created kind of a problem later in the series. They ended up building a full scale *APC* with a nose that was more like the flat paneled drawings. It turned out that the CG version that I had done was next to impossible for them to build on the set. It would have been just too cost prohibitive. So they went back and followed the more flat glass design which almost looks like an *Apache* helicopter. After they brought out their nose section about mid way through the series, I had to then adjust the front section of my model to match the paneling of the onset version. I never actually made it as angular as they did. With the practical set piece, you never got a wide shot of the nose. So my CG

model just had to look similar and I adjusted the panel and window lines accordingly.

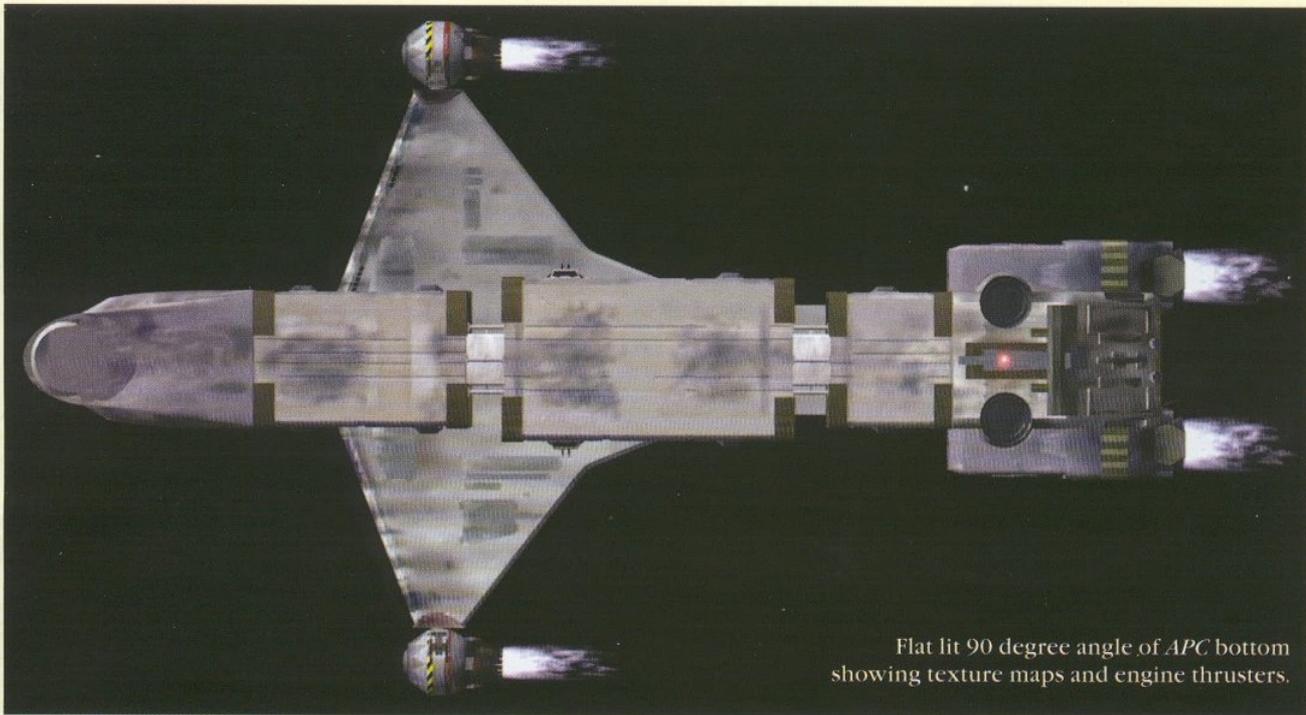
**WS:** I don't recall seeing that set piece in any external shot.

**Wheeler:** They used the cockpit section mostly in the Christmas episode *River of Stars*. You saw the cockpit from the exterior looking in but they never pulled back far enough so that you got to see the whole nose section.

**WS:** So what was really important then was to match the interior of the set piece with the exterior of the CG model?

**Wheeler:** Yeah. You had to believe that when you saw them sitting in the cockpit and then you cut to the CG model that at least the glass was cut similar even though the cockpit that I ended up doing was still very smooth.

**WS:** It must have been somewhat challenging back then to model the



Flat lit 90 degree angle of APC bottom showing texture maps and engine thrusters.

nose section without *nurbs* (or as they're called in *Lightwave*, *Meta-Nurbs*)?

**Wheeler:** I did the front section with *Metaform* actually. (A plugin for *Lightwave* that allows for *nurb*-like modeling) Some of the stuff I spline patched just because that to me makes more sense. For parts of the *APC*, the *Chig* fighter and for some of the other models, I'd build a simple spline cage first and then I would use that to go ahead and a play with *Metaform*.

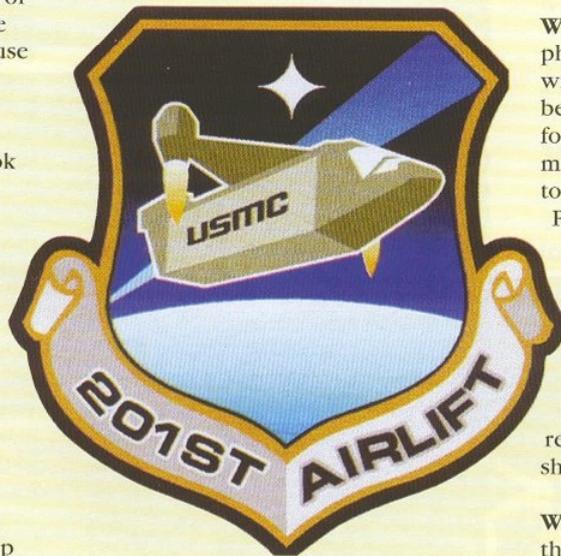
**WS:** How long would you say it took to build the first *APC*?

**Wheeler:** Well, it was never really finished. The first basic version we did for the pilot probably took about two months to get done. That includes modeling on my part and some amazing texturing by Karl Denham.

**WS:** There were various cargo sections as well, weren't there?

**Wheeler:** After I built the first drop cube for the pilot, the configuration was altered for the series. So I had to change that interior crew compartment layout. The original *APC* for the pilot, the *ISSCV*, just had the forward mounted gun turret and no other armament whatsoever. It was kind of a crew carrier, pretty much unarmed. Then they made it into the *ISSAPC* for the series. They

changed the configuration of the drop cube and put a side mounted waist gun on it so at least the people in the cube wouldn't just have to sit around and get shot at. They could participate in the battle. Later, they added a retractable rotating gun turret along the spine near the back.



When it got to that point, at least the *APC* could take care of itself.

They also made an *ISSTV* which was a stubby version of the *ISSCV*. For the *ISSTV*, we had to adjust the wings and the engines to accommodate the smaller cargo section. The *ISSCV* had three cubed sections; one long and

two small that were all attached to each other. The cargo section on the *ISSTV* was just one long cube. They only used it for one episode and then decided it was really too ugly so it went away. I also made an ambulance variant; the *EMV*.

**WS:** I seem to recall an *APC* that had no guns at all.

**Wheeler:** There was a publicity photo that got out showing the *APC* without the guns on the front. I've been trying to get rid of that picture forever. It shows the *APC* in the middle of its development. I still had to finish modeling the guns and the PR people came in and wanted a picture. They said it would go to this one thing and after that it would never be seen again. Then the picture just started showing up everywhere; in all these magazines. I wish it would go away because it's really not an accurate representation of what the actual ship looked like.

**WS:** Were there low-res versions of the *APC*?

**Wheeler:** We had three different versions of it. There was a highly detailed version which had all the moving parts. There was a medium version that had most of the polygonal data but it was all one piece. Nothing moved on it. The engines didn't swivel and that sort of thing. Then there was a super low-res

**APC** we used for long shots. It was something like five or six hundred polygons.

**WS:** You also built many of the alien ships, did you not? How many different types were there?

**Wheeler:** I guess I thought more like a *Chig* so I got to model most of the *Chig* stuff. I kind of became the all things alien person for the show. There was the *Fighter* which took the longest to build since it was the first one. I had some early drawings that I used to make the original ship from. Most of my time was spent getting the textures right since those were the hardest to get correct. I designed a lot of those myself. Nobody really had an idea of what they should look like so I was given a large amount of freedom to come up with a look that I liked. There was also the *Red Fighter*, the *Bomber* and the *Prototype Fighter (Chiggy Von Richtoven)*. The ship's designs themselves were fairly well established, however I was able to both design and create the *Chig* energy weapons. *Amiga* owners will be interested to know that the weaponry were the last *Chig* designs I created entirely on the *Amiga* computer.

**WS:** Was any of the honeycomb-like detail modeled or did you use bump maps to get that look?

**Wheeler:** Those were all bump maps. The *Fighter* basically looked like a lawn dart so I separated the ship up into different surfaces. Everything would then go straight up or straight across. If you projected most of the textures along a planar axis, the surfaces would come out looking right.

**WS:** Were there other ships built for the series that we would have seen if **SAAB** had been picked up for another season?

**Wheeler:** Well, there was a *high altitude bomber* that I was playing around with. There were some *Chig*-like *battle cruisers* that we were putting together. They probably would have shown up. One of the set pieces for the *Saratoga* had a list of the entire ship's complement. It also listed a whole mess of other aircraft. Many of different types. We were all kind of figuring out what these would look like and I assume that, eventually, you would have started to see them if **SAAB** had gone another season.

**WS:** Many of the battle scenes involved shots with multiple space craft, explosions and pieces of debris flying every where. There must have been some serious render times and a lot to sort out. How did you go about building up your scenes so that you wouldn't waste too much time doing test renders?

**Wheeler:** What we ended up doing for the really super complicated stuff, where we had five or six hundred *Hammerheads* and *battle cruisers* in a shot, was to break up the scene. We figured out the motion of the scene by doing one rough low res version of it. Then we separated it out into three levels: background, midground and foreground. We took all the objects out that were in the midground and foreground and just rendered the background. Then we'd use that as a background image to render the midground. Then we'd use that as a background to render all the foreground. That way we could get

five or six hundred objects in one scene without ever actually having them all occupying the same scene file.

There were a lot of times where we were pushing the edge of the computer's capability. Even to the point where it would just crash. We started out trying to do everything as one complete render and over time that became less and less possible. So we ended up trying to break things down. We had always started with the thought that we would try to do it in one pass and if it crashed then we would start separating things out. Certainly by the time we got into the fleet battle at the end of the season, we could anticipate the number of things that would make the thing crap out. So we knew the scenes we would need to break apart right from the start. Then the shots were designed that way.

**WS:** Were you using any software packages other than *Lightwave*?

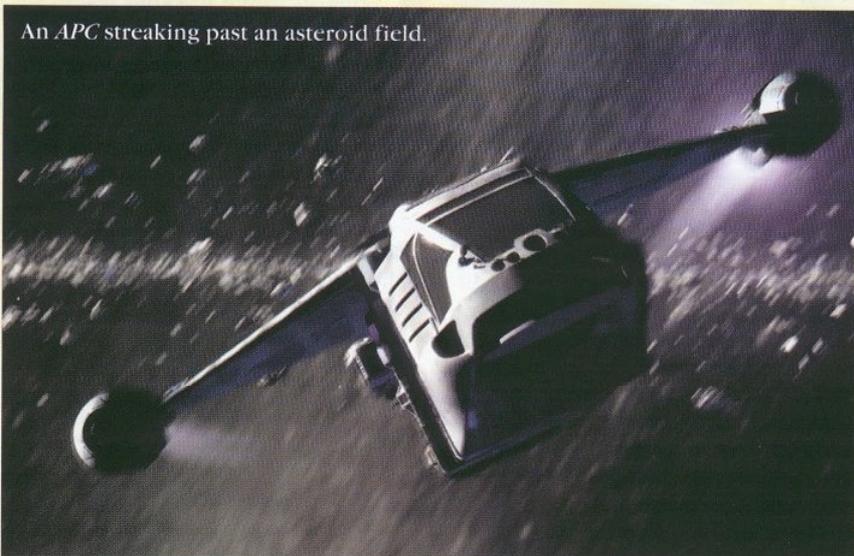
**Wheeler:** The series was purely *Lightwave* rendered with the exception of the blue screen stuff that was all done in the bay. Glenn would go into the post-production facility and pull up all the blue screen or green screen shots. We would render the background element which may have been somebody's view outside a window and then mate that with the live action shot that was done on the set. We didn't do any of the blue screen in house until after **SAAB** actually ended. Then we'd start doing it all with *After Effects*. So, with that exception, all the work we did for **SAAB** was by using *Lightwave*.

**WS:** Why was everything rendered out in *NTSC widescreen*?

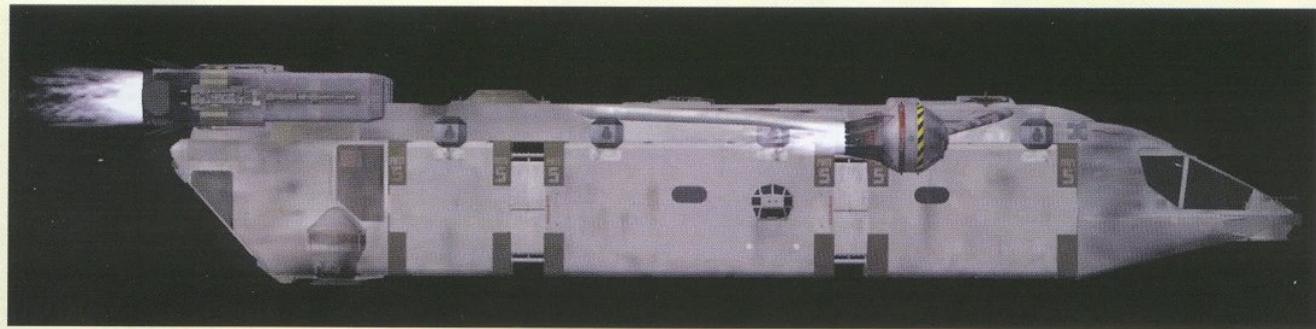
**Wheeler:** Well, that was a *Fox* mandate. *Fox* had decided henceforth to do all their shows with *HDTV* in mind. So everything was rendered out as *NTSC widescreen*, 720 by 486.

**WS:** Of all the shots you were assigned, which were your favorites?

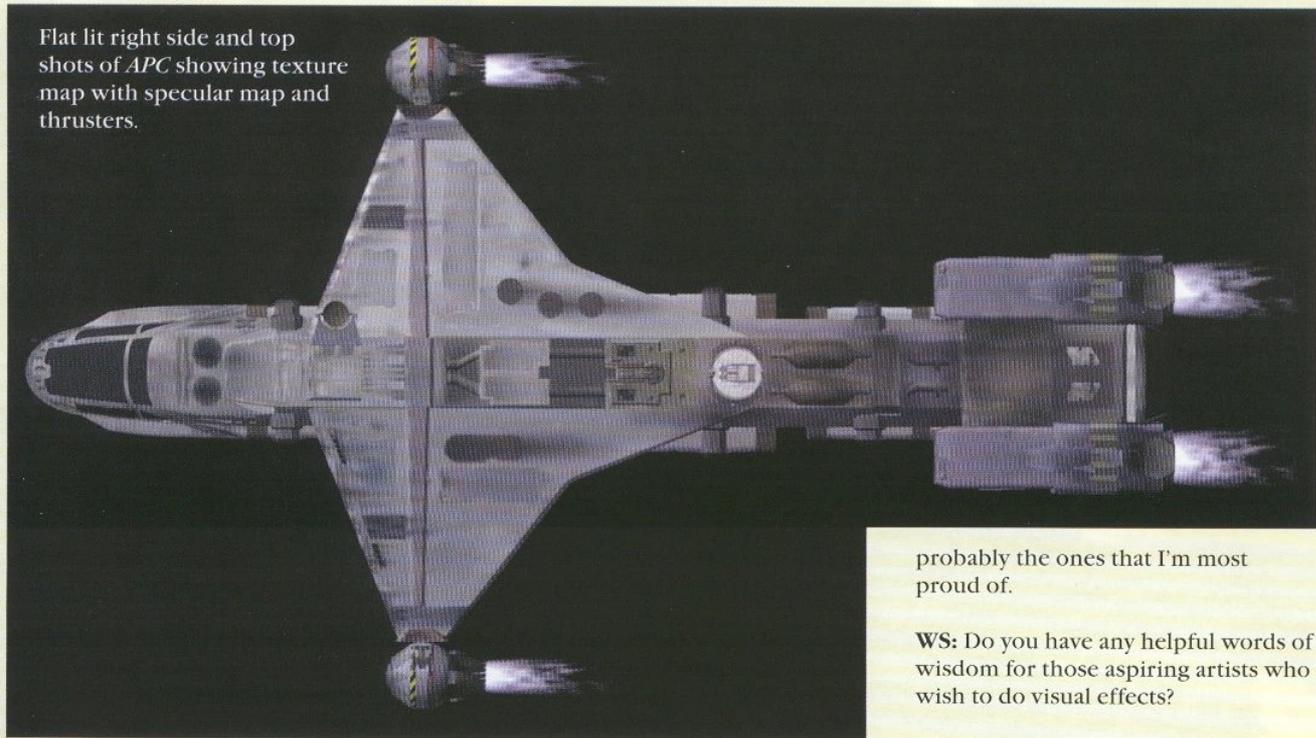
**Wheeler:** Probably the ones that included the digital matte paintings. I did one for the episode *Mutiny* which was an interior of the cargo spaceship. Then I did this moonbase interior for the episode *Eyes*. That was fun because they basically just



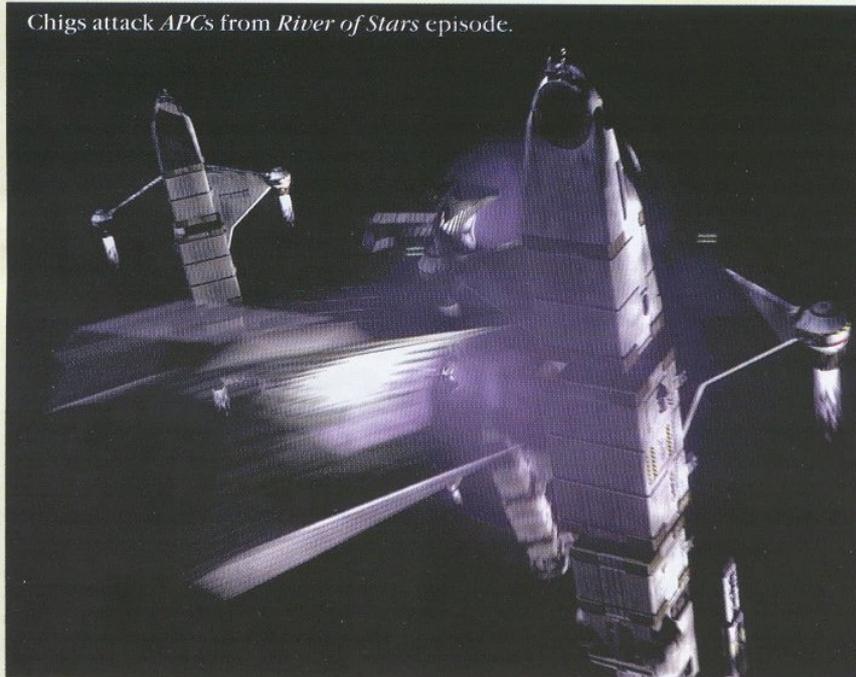
An APC streaking past an asteroid field.



Flat lit right side and top shots of APC showing texture map with specular map and thrusters.



Chigs attack APCs from *River of Stars* episode.



probably the ones that I'm most proud of.

**WS:** Do you have any helpful words of wisdom for those aspiring artists who wish to do visual effects?

**Wheeler:** Just play around. Don't be afraid to experiment. Take a look at what you see on TV and either try to duplicate it or try to make it better. That's probably the best way to get your creative juices flowing. That's what I ended up doing to try to get things going. I would see something and try to duplicate it as close as I could get.

**WS:** How would you describe your experience working on SAAB and with *Area 51*?

**Wheeler:** I enjoyed it thoroughly. I wouldn't trade it for anything. It was a lot of fun.

You can visit Scott Wheeler's web site at <http://www.uberfx.com/>

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went down and shot it. There was one wall on the set for the interior of the cargo hold. I got to put the rest of it

in. It was the first time I'd ever done anything like that and so it was kind of a trip. Out of all the shots, those are

The final instalment of our **S:AAB** series will appear in issue 46.