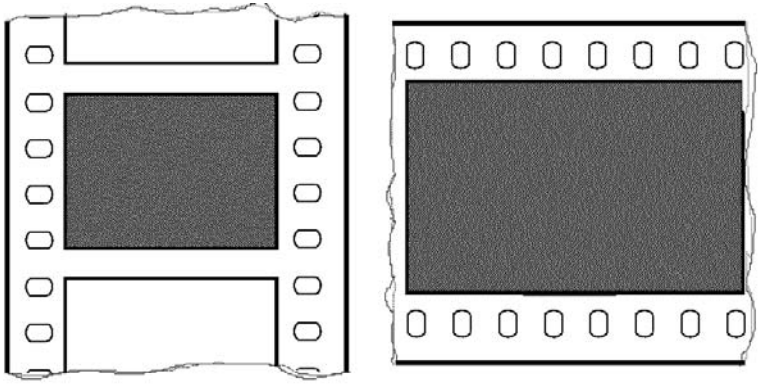
Dykstra and Edlund recognized that one drawback of the blue screen process was the generation loss, with each subsequent image dub looking worse and worse (the more complex scenes required many dubs to create). If the final version needed to have 35mm film quality, then the starting frames had better be super-high resolution. In film, the way to higher resolution was through film frames with more area. Dykstra began exploring his options.



Two 35mm film frames of the same aspect ratio, but the one of the right, VistaVision, has a much larger area—providing for better resolution and easier handling.

An obvious solution was to start the process with the largest commercial film format, 70mm. This size also accommodated a physically larger frame, which slightly decreased the challenges of drawing on teeny little images. The difference between working on 35mm and 70mm film was like drawing on a big postage stamp versus drawing the same thing on a postcard. The equipment, however, was rare and extremely expensive. Films released to theaters in 70mm were generally shot in 35mm and later "up-converted" to the larger frame.

Dykstra uncovered a long abandoned camera format called VistaVision that used 35mm film (by Hollywood standards, cheap to buy and process) that could make reasonably high-resolution images. Its unique property was that the orientation of the frames on the strip of film ran lengthwise along the sprockets, as opposed to the usual stacked-up tiny rectangles. Consequently, the 35mm frames were the same shape, but had more area and thus much higher quality.

In the ILM parking lot: Richard Edlund preparing to shoot the Death Star model with a high-speed VistaVision camera.

VistaVision had been Paramount Pictures' attempt to develop its own theatrical standard. Paramount first used it in Bing Crosby's *White Christmas* (1954).[12] By the end of the '50s, however, it was all but dead. ILM scrounged everywhere for VistaVision equipment—from Paramount's deep storage in L.A., to backrooms at Pinewood Studios, London.

Edlund knew of a VistaVision format optical printer that was sitting dormant. "We walked into the room to look at the machine," recalled Edlund, "and there was a camera report sitting on the machine from the last time it had been used. It was for *The Ten Commandments* (1956). They wrote up the last shot and then closed the door and no one ever went back."

[12] Well, actually second. But no one has heard of the first film done that same year.

Making a composite image for Star Wars on the ILM-rebuilt optical printer originally created for Columbia's Marooned (1969).

By 1975, ILM had bought the printer and every piece of VistaVision equipment they could find.

Kurtz and Edlund, both technophiles, were always interested in ways computers might be useful, but in 1975 computer graphics was in its infancy. Still, in *Star Wars,* there were a half dozen or so shots *of computers* that seemed to require displays produced *by* a computer—*computer-like* graphics that were essential to the story. These included the targeting displays on the Millennium Falcon, X-wing and Tie fighters, the Death Star maps of the power generator, and the most important plot device in the film: the stolen Death Star plans that would reveal the way to blow up the ship.

Even though all of these elements could be created by traditional hand-drawn animation means—and most of them were—the one-minute animation sequence of the Death Star plans needed more. ILM put the effect out to bid from outside contractors.

Larry Cuba, a computer graphics artist, competed against a couple other burgeoning computer effects teams to propose how he could accomplish the 3-D animation. Cuba had made some pioneering films. He worked primarily in the art world, but he was beginning to think about commercial projects.