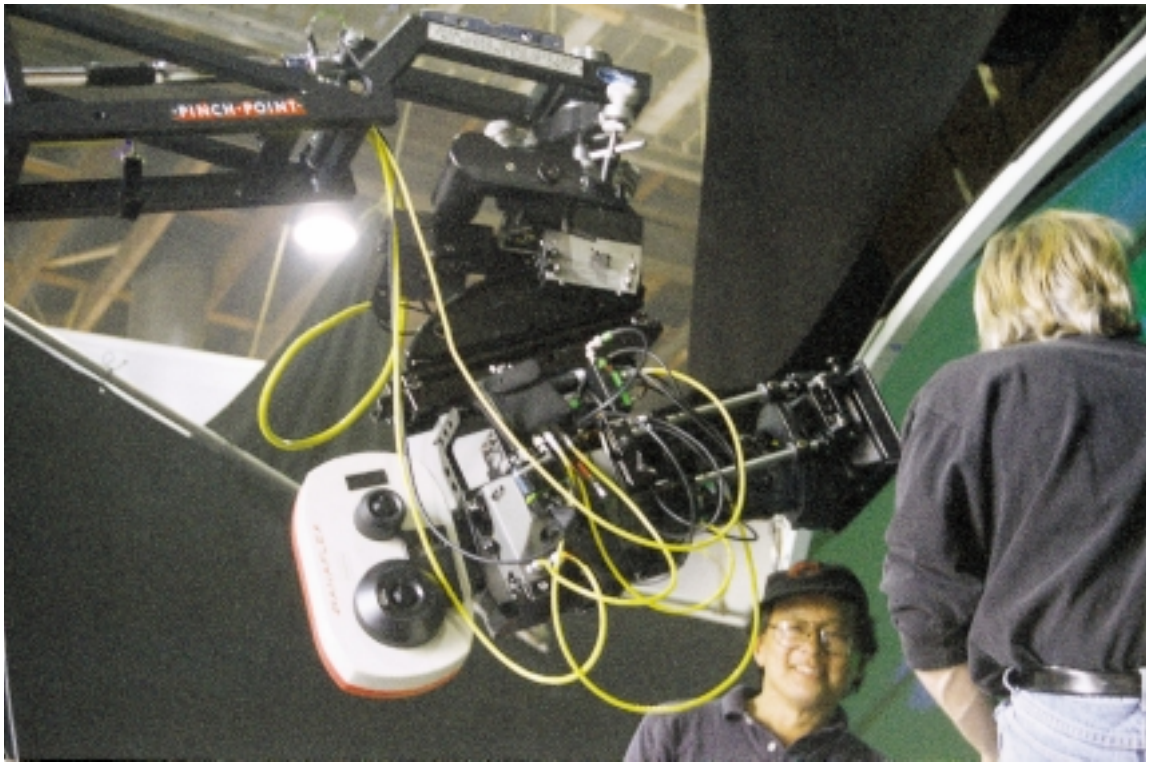


This scene from *Star Trek: Voyager* shows the Hot Gears equipped Panahead inverted on a Javelin Crane. A reversing switch on Hot Gears allows for normal operation in this mode.

Repeat a move perfectly with HOT GEARS

by Matthew Cheplic

PRODUCTION PHOTOS FROM
STAR TREK: VOYAGER
BY DAVID TROTTI

HOT GEARS PRODUCT SHOTS
BY MEHRAN SALAMATI

Mehran Salamati was actually building an airplane when he began work on what would eventually become Hot Gears. And while he still tends to his aircraft when time permits, plenty of DPs and Camera Operators are thankful that Salamati brought his priorities back down to earth.

"I started building the plane about five years ago, which led me to work with people who were proficient with aerospace technology," recalls Salamati, who has worked as a Director of Photography for about 12 years. "One day around that time, I was on a crane, doing a drive-by shot that called for a 180-degree pan and a boom up on the crane. I knew there had to be an easier way than struggling with the camera and bumping into the assistant." So he drew from his new well of experience and contacts and conceived of a new remote

camera package.

"I wanted to build an inexpensive and smart remote system we could take with us, leave in the truck, and use when we needed it," Salamati recounts. "Instead of reinventing the wheel, I preferred to use what already existed. The Arriflex and Panavision geared heads are prime examples of industry-standard tools. So why not build an electronic package which complements those?"

A "soft limits" function allows the operator to designate a precise spot where a panned shot needs to stop.

Indeed, Salamati refers to Hot Gears as "the smart remote system," and there is ample evidence to support the claim. The unit is 10.5 x 16 x 5.5 inches, and weighs eight pounds. It requires only a single umbilical cable between the camera and the controller. And while it contains some pretty advanced software, the controller itself is, in Salamati's words, "dead simple."

"If you look at the control panel, it's very straightforward," he explains. "The software is doing a lot of the work." Part of that work includes a "soft limits" function which allows the operator to designate a precise spot where a panned shot needs to stop. After moving the camera toward that spot, the operator simply presses a button, and the Hot Gears software essentially takes over, guiding the shot and feathering it to a stop at the designated edge. This can be employed with tilting moves as well. In a similar vein, the operator can rely on the soft limit when executing a dramatic whip pan.

Marvin Rush, DP on *Star Trek: Voyager* has been one of the first to test the waters with Hot Gears. In fact he's already purchased a unit with the show's Camera Operator, Douglas Knapp SOC.

"It's an exceedingly well thought-out product, which answers a real fundamental need," says Rush. "The basic problem with remote heads in general is that they're very expensive. They're good, but I'd like to have a remote head all the time, to use when the mood strikes me. But there's no way to afford that."

Rush also points out that Hot Gears distinguishes itself in how quickly it can be connected and put into use.

"Very often, we'd have to budget a minimum of 45 minutes to prepare one shot with other systems. Then there's a lot of cables, weight, a whole process of balancing the parts. With Hot Gears, you strap it onto an existing setup, run the cable, and it's ready in about five minutes.

And when you take the Operator out of the equation, the Dolly Grip doesn't have to push nearly as much weight, so there's much less of an inertia issue with each shot."

Rush is also impressed with another function offered by Hot Gears: The unit has a 63-second "memory."

The unit will record a complex move which can then be played back repeatedly.

It will record a complex move which can then be played back repeatedly. This way, when an element besides the camera move itself doesn't make the grade—an actor's performance, for example—the pressure is off the Camera Operator to duplicate the move time and again.

But more than these features, more than the simplicity or the way Hot Gears sidesteps time and budget constraints, the *quality* of Salamati's invention is what Marvin Rush is most complimentary of. "It has the most fidelity of any unit I've tested," Rush discloses. "When you turn the gears,➢

you get an immediate reaction, as if it were hooked up to your hands. It's so precise, there's no feeling of lag

whatsoever. Don't get me wrong—the other remote units are good, but they're always a little spongy. Hot Gears feels like a completely one-to-one ratio."

Rush also speaks highly of the precise range of speeds offered by the unit. Hot Gears boasts 10 speeds, which offers a decisive advantage over manual controls. As Knapp puts it, "I've yet to find a situation I can't handle very elegantly with Hot Gears.

We've used some very long lenses on people moving about while the camera moves the whole time. They look locked in, and the background slides behind them. You can keep them accurately in the same position in frame throughout the shot."

Knapp and Rush are so confident about the package's performance, in fact, that they've been implementing it in ways that even Salamati never imagined.

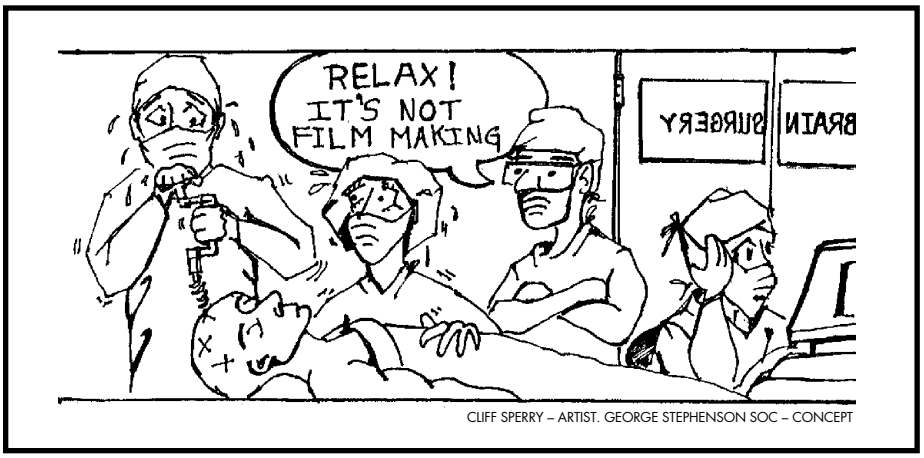
"We've been rigging it inverted, so that the camera and geared head are upside down," explains Rush. "We use a Javelin, which goes out at three-foot increments. So the camera hangs beneath the gear head, and it

gets lower than a Hothead. We needed a mounting plate to pick up the magazine mount at the top. Panavision made that for us, as well as a bracket for the lens at the front of the Panaflex."

Salamati proved just as accommodating as Panavision when it came to indulging Rush and Knapp's innovations.

"They asked me what would happen if the geared head were upside down on the crane," Salamati remembers. "That meant the wheel positions would be reversed. I made some modifications so the Operator can press a few buttons and turn the wheels the way he's used to controlling them. It's nice, because they can do that to get some neat over-the-shoulder shots where the assembly

Columns 1 and 2: Hot Gears Controller Unit. Column 3: Hot Gears motors attached to Arri Geared Head. Above: A Javelin Crane with inverted Hot Gears/Panahead on the set of *Star Trek: Voyager*.



Where is the focus?
First Assistant doesn't know.
Depth-of field fakes it.
—RG

would get in the way if the camera were top-loaded."

Salamati also implemented the necessary switch to insure the picture would register rightside-up despite the rigging.

Rush remembers another instance where Salamati made a few tweaks to Hot Gears on the fly: "Doug wanted to have digital readouts for the pan and tilt, so Mehran devised some LCD read-outs which are re-settable, so we can index the shots and repeat them."

For all the praise Rush and Knapp are prepared to direct at Salamati, the father of Hot Gears is surprisingly modest about his invention.

"This device was not meant to compete with other systems," he insists. "With the Libra system and Power Pod, for example, there are times when you need three-axis remote systems on the job. But for most day-to-day applications, Hot Gears is there to support and help the Operators."

Hot Gears at work on the *Star Trek: Voyager* set.

One such Camera Operator, Doug Knapp, is slightly less diplomatic: "This is one of the finest camera inventions to come along in many years."

For information on Hot Gears, please contact Mehran Salamati at (310)455-7201 or Salamati@Earthlink.net.