

A large, dark, industrial camera, likely a VistaVision camera, is shown in a close-up, low-key lighting. The camera is primarily black with some metallic accents. A large, circular lens is visible on the left side, and another lens or viewfinder is on the right. The camera has a complex, boxy design with various knobs, dials, and mechanical parts. The background is dark and indistinct.

ILM Technirama "Rama" VistaVision Cameras

Rama Research: Why Cameras?

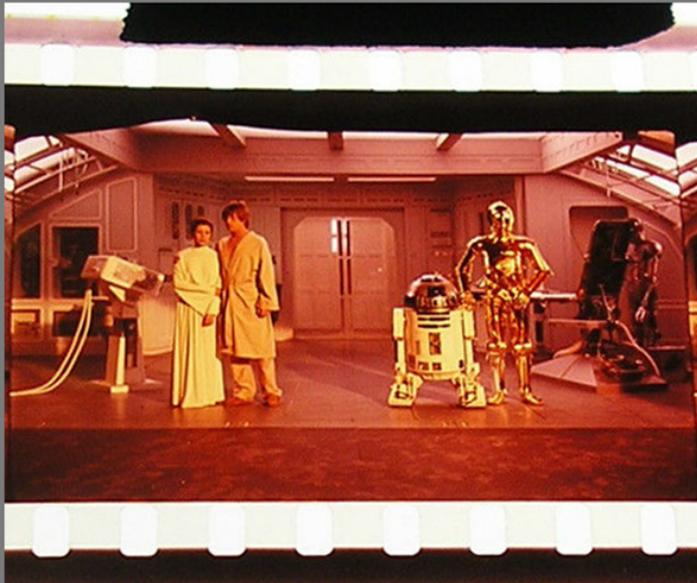
The movie camera has a unique place in a film's production. In the hierarchy of equipment, it is king. Millions of dollars are spent on the various elements of a major film, and all are eventually distilled down to what plays out on a 2" piece of ground glass in the heart of a camera. No camera, no movie. Some of the most memorable shots in 20th century cinema were captured in the movements of these VistaVision beasts.

ILM was all about breaking new ground. The I could have stood for Innovation. The technology needed to put groundbreaking visuals on the screen didn't exist, so it was created. Like a musician tinkering with a guitar to get the right sound, ILM hot-rodged their gear. The modifications serve as unique "tells" that can be used to track and identify the equipment.



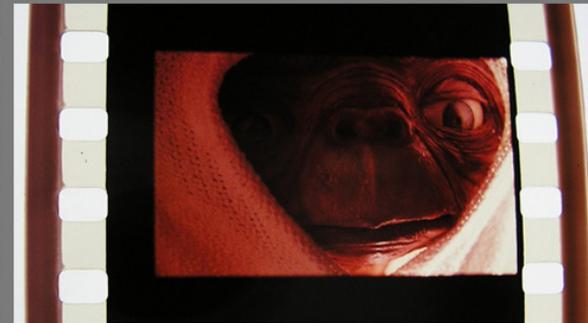
VistaVision and Technirama: A Primer

VistaVision was the dominant format used for visual effects work at ILM from its inception through the late 1980s. Originally developed by Paramount in the 1950s, the VistaVision format takes traditional 35mm negative and turns it on its side, allowing you to expose a larger negative area and essentially have more resolution in the frame. This is necessary for visual effects work where the image will be duplicated, sometimes several times, in an optical compositing process. A copy is never as sharp as the original, so beginning with a larger negative ensures that the final composited effects shots would be just as sharp as the rest of the film, which was shot in the traditional “4-perf” 35mm (anamorphic) format. VistaVision (“8-perf”) also has the advantage of being “flat” and using spherical lenses rather than anamorphic lenses, as anamorphic images are problematic for visual effects work. Some effects films have used larger format film such as 65mm to address these same issues of quality and sharpness, but ILM went with VistaVision because it was affordable – the negative is bought and processed for the same costs as regular 35mm film.



VistaVision 8-Perf

Larger Image Area
Runs Horizontally



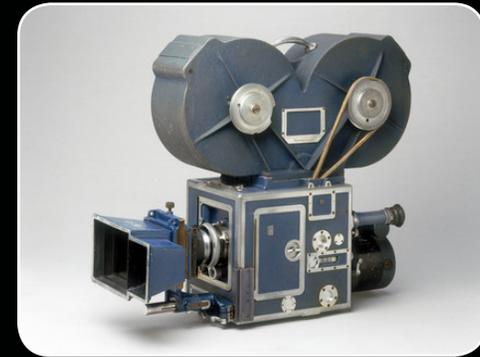
Standard 4-Perf

Runs Vertically

Types of Cameras

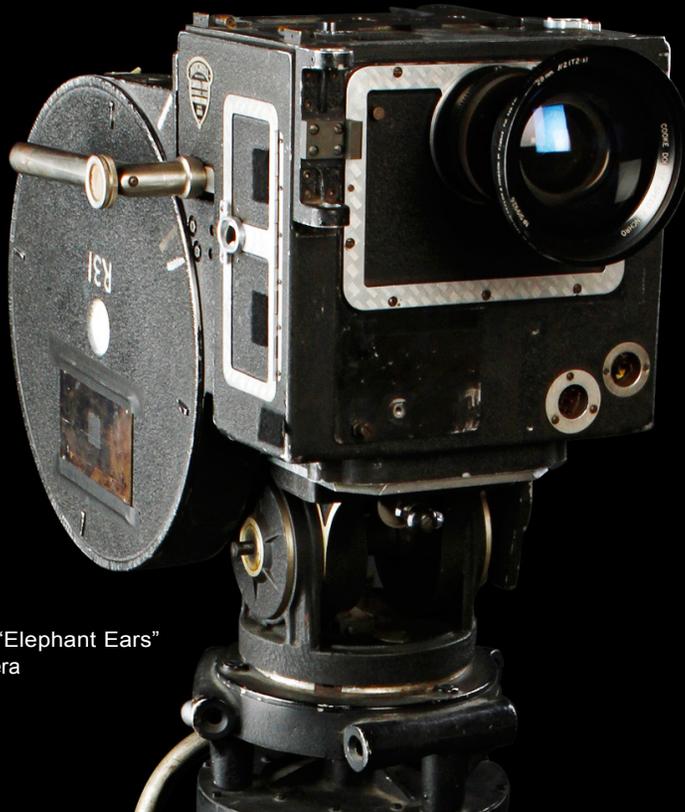
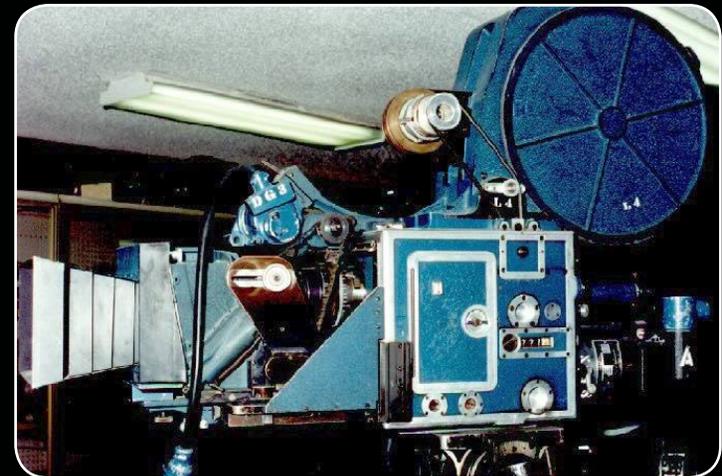
VistaVision cameras were produced for Paramount by Mitchell in the 1950s. The most common models were the studio or “elephant ears” camera (named for the profile created by its magazines) and lightweight or “butterfly” camera.

Additional VistaVision cameras were made by Technicolor. By this time Eastmancolor negative was in wide use and the demand for 3-strip cameras tailed off significantly. Technicolor therefore used a number of 3-strip cameras (“blue box” bodies) as bases to build their VV cameras. These were the very same 3-strip cameras that had been in service since the 30s and shot films like *Gone with the Wind*, *The Wizard of Oz*, and *The Adventures of Robin Hood*. Of the roughly 30 US Technicolor 3-strip cameras, 5 were converted to VV cameras and 6 were converted to “Technirama” cameras. Technirama was essentially anamorphic VV, creating an available image area even larger than VV. The conversion from the 3-strip cameras was an involved process requiring significant alterations to both the body and the internal mechanics. ILM referred to all of their cameras of this style simply as “Ramas.”

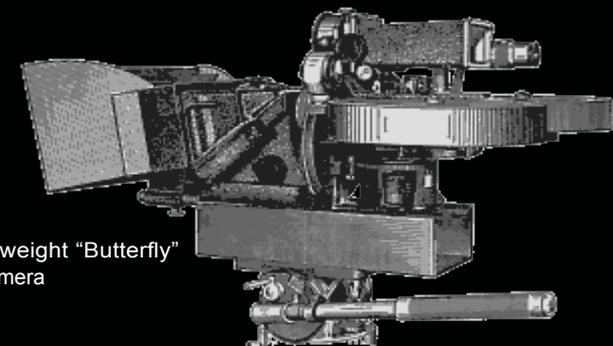


Above: 3-strip Technicolor camera

Below: Technirama camera with anamorphic Delrama lens setup



Mitchell Studio “Elephant Ears”
VistaVision Camera

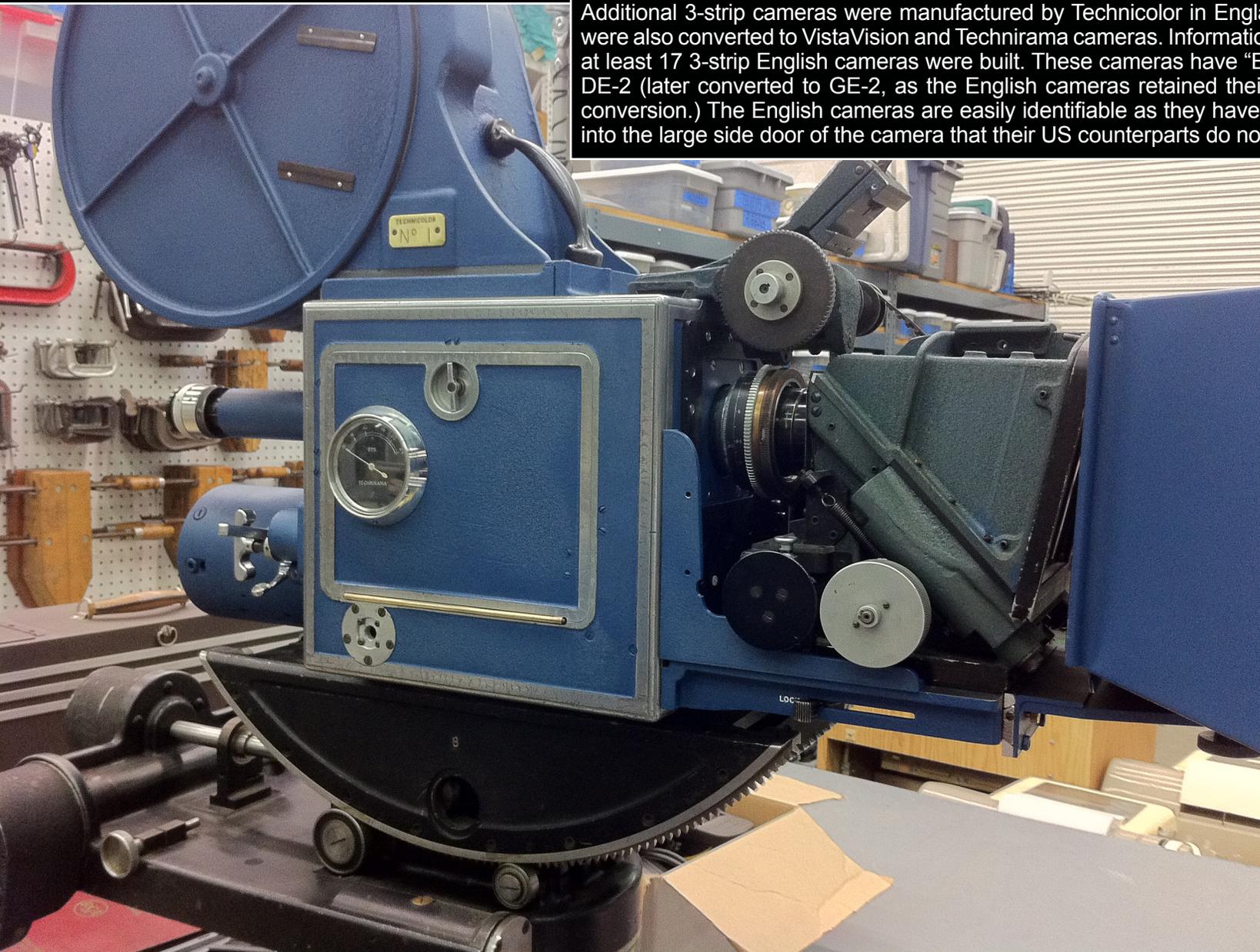


Mitchell Lightweight “Butterfly”
VistaVision Camera

English Cameras

The original 3-strip cameras had "D" serial numbers, e.g. D-8. When they were converted to VV or Rama cameras, the serial number was changed in the order they were manufactured. VistaVision cameras were given a "G" number and Technirama cameras a "DG" number, though the Rama serial numbers frequently left off the "D" and were simply referred to by their "G" numbers as well. For example, 3-strip camera D-8 became Technirama camera DG-3 during the conversion.

Additional 3-strip cameras were manufactured by Technicolor in England, and a number of those were also converted to VistaVision and Technirama cameras. Information is not as clear but it seems at least 17 3-strip English cameras were built. These cameras have "E" in their serial number, e.g. DE-2 (later converted to GE-2, as the English cameras retained their same numbers during the conversion.) The English cameras are easily identifiable as they have an integral tachometer built into the large side door of the camera that their US counterparts do not.



English Technirama camera with prominent Tachometer on door

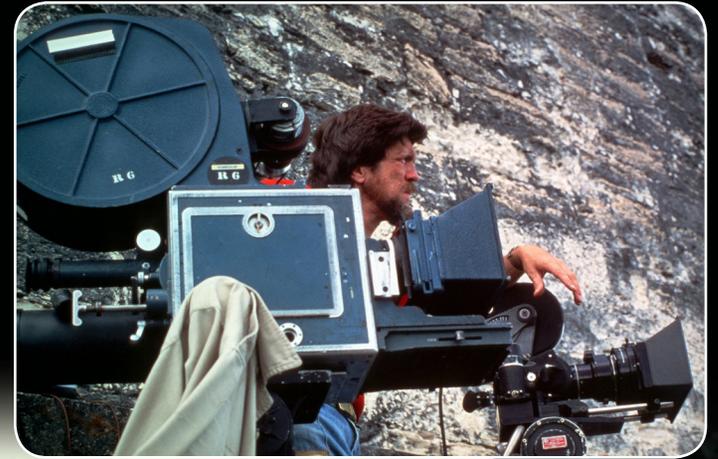
**ILM: The Beginning
1975**

Richard Edlund with G-3 Rama camera in Guatemala,
Star Wars: A New Hope

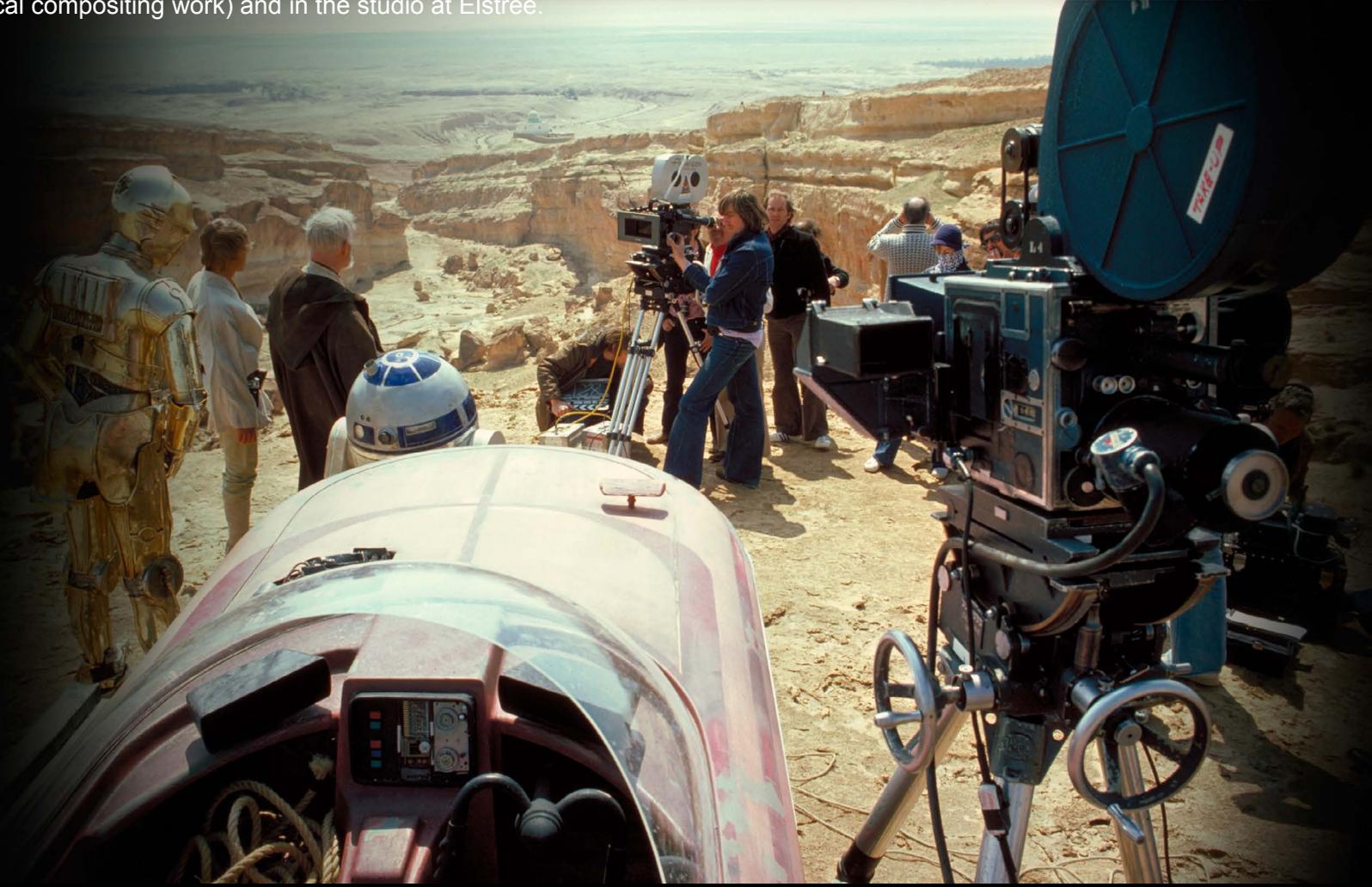
Field Camera

When setting up the ILM facility in 1975, John Dykstra and Richard Edlund had to procure VistaVision equipment. By that time the format was largely dormant and no modern VV gear was being manufactured. Three “Rama” cameras were purchased, two high-speed Paramount studio cameras were rented, and the VV Dykstraflex motion control crane camera was built. One of three Ramas had its movement (the heart of the camera – the internal mechanism that shuttles the film through) removed for use in creation of a VV Moviola for reviewing footage. This left two usable Rama cameras.

One of these Ramas, serial G-3, was set up for field work. For the first SW film G-3 worked on location in Tunisia and Guatemala for shooting VV plates (of any shots that would later require optical compositing work) and in the studio at Elstree.



G-3 Rama camera in Tunisia,
Star Wars: A New Hope



Motion Control Camera

The other remaining Rama camera was set up on a motion control rig that could match the movements of the Dykstraflex. The same movements could be programmed on both cameras, and therefore they could shoot separate elements that could later be precisely combined in optical compositing. This camera shot many of the background elements on the original Star Wars film.

“The other camera, the sister unit for the Dykstraflex which we used for backgrounds and star fields, was a converted Technicolor camera which was about a foot high and about ten inches wide, mounted on a huge head. The angular displacement and all the motions it did were electronically matched ratiowise to the tracking camera [Dykstraflex]. So a shot that was made on the long track could be taken over without the track loop, using only the pan, tilt and roll to shoot the stars at infinity.”

— Richard Edlund,
Cinefantastique Vol 6 No 4



Dennis Muren with Rama camera on motion control setup

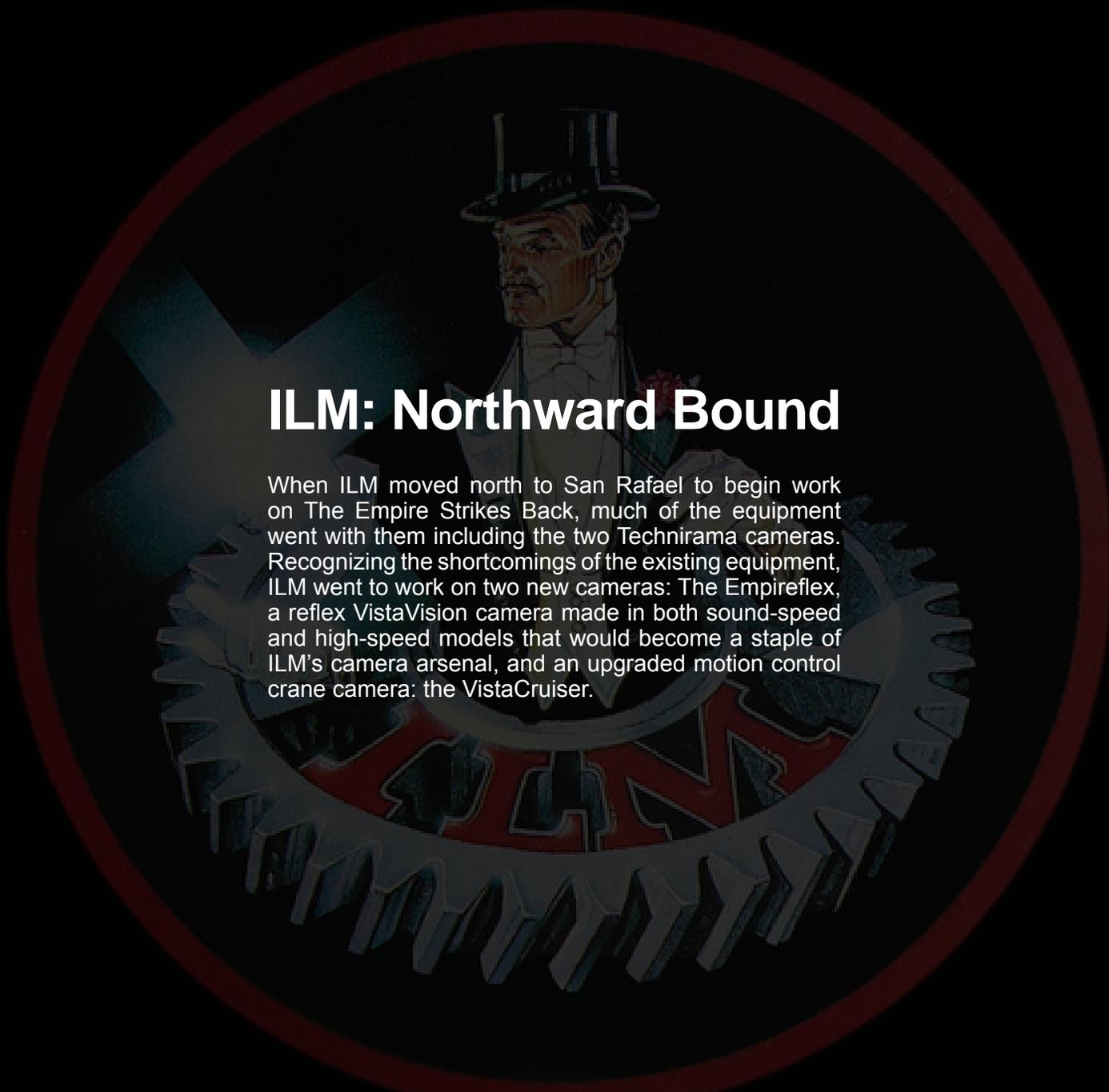
“ ‘Technicolor was selling off their old stuff by the pallet,’ marveled Edlund. Among the equipment items purchased was a bulky Technirama camera, which, after being modified to take Mitchell magazines and outfitted with a motorized head, was used to shoot starfields and other background elements on its fourteen-foot track. ”

– Cinefex 65

Motion control Rama camera on a non mo-co head

After Star Wars, the Rama cameras were used on Battlestar Galactica during the time that Apogee was operating in the same facility with the same equipment, on lease from George Lucas.



The background of the slide is a dark, circular graphic. In the center is a stylized illustration of a man wearing a top hat, a white shirt, and a dark jacket. Below him is a large, grey gear with the letters 'ILM' in a red, stylized font inside it. The entire graphic is set against a dark, almost black background.

ILM: Northward Bound

When ILM moved north to San Rafael to begin work on *The Empire Strikes Back*, much of the equipment went with them including the two Technirama cameras. Recognizing the shortcomings of the existing equipment, ILM went to work on two new cameras: The Empireflex, a reflex VistaVision camera made in both sound-speed and high-speed models that would become a staple of ILM's camera arsenal, and an upgraded motion control crane camera: the VistaCruiser.

For some time after the relocation, only the Dykstraflex and the motion control Technirama camera were in use. Development and construction of the new cameras took time, and the VistaCruiser was not completed until the production of E.T. began after Empire.

“When we arrived, the ILM building was still under construction. Walls were being set, equipment was being shipped up from Los Angeles, storyboards were being redone, and the script was in its final stages. And we only had two cameras up until August of 1979 to shoot with — the Dykstraflex and the old Technirama. I think it took eight months to complete the facility. There wasn't much time to test out shots. It wasn't as though we were playing around for six months trying to figure out the best way to do things, because we were shooting the asteroid sequence and the Vader ship and other things constantly. The only cameras we had running during that period were the Dykstraflex and the Technirama, for months and months.”

**— Dennis Muren
Cinefex 3**



English Ramas

The need for more equipment was clear, and Brian Johnson was able to secure a batch of additional English Rama cameras from Technicolor in London.

“Brian Johnson found five Technirama cameras in England and we have been systematically dragging those out, one at a time, and more or less retuning them and putting up-to-date electronic drive systems into them in order to increase the number of cameras that we have available, so that we can commit a camera to each shot.”

— **Richard Edlund**
American Cinematographer, June 1980

Why did each shot need a camera?

“There are certain shots which require tweaking. Because they are R&D shots of a type that you haven't exactly done before, you are taking a chance. In order to do that kind of shot, you have to commit a camera to the shot for a period of time, and if you don't have enough cameras to commit to such shots, then you have to shoot the scene, give it your best shot, and go on. The more cameras we have to commit to shots, the less personnel we have to tie up on each set-up. One person can work from set-up to set-up. He can do a test on one set-up, while he moves on to another set-up and leaves the first camera where it is. This system enables us to try a greater variety of shots and spend more time on certain problems that require finessing. We'll have probably eight cameras before we are finished.”

— **Richard Edlund**
American Cinematographer
June 1980

The G-3 camera, now known as the “Matte Rama” (as it was used for shooting plates that would be combined with mattes) was once again set up as a field camera. It was the primary VistaVision camera on location in Norway (the Empireflex or E-flex was completed just in time and was sent to Norway, but had trouble and required further tweaking) and in the studio at Elstree.

Presumably the new English Rama cameras were also used at some point on Empire, though it is not clear how many were used or how they were used. Several may have served as donor cameras for spare parts, as needed.



G-3 Rama camera under heating barney in Norway, Star Wars: The Empire Strikes Back. Also present is a butterfly camera sourced in the UK (under black barney.)



G-3 Rama camera at Elstree Studios, Star Wars: The Empire Strikes Back

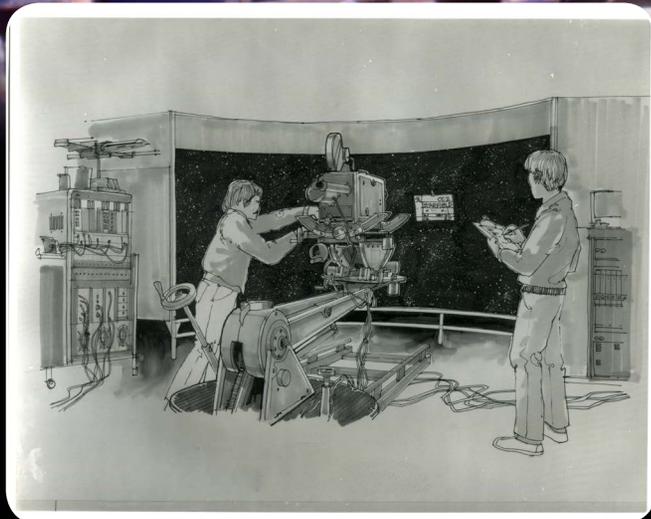
ILM: Return of the Ramas

By the time work began for Return of the Jedi, the Empireflex cameras and the VistaCruiser were up and running. The Technirama cameras were also still in usage on account of the size of the show and the number of different shooting units. The G-3 camera was again used as the primary VV camera at Elstree studios, though it was replaced on location by the Empireflex, the Paramount studio camera VV-3, and the Paramount butterfly camera used with the Steadicam to shoot plates for the speeder bike chase.

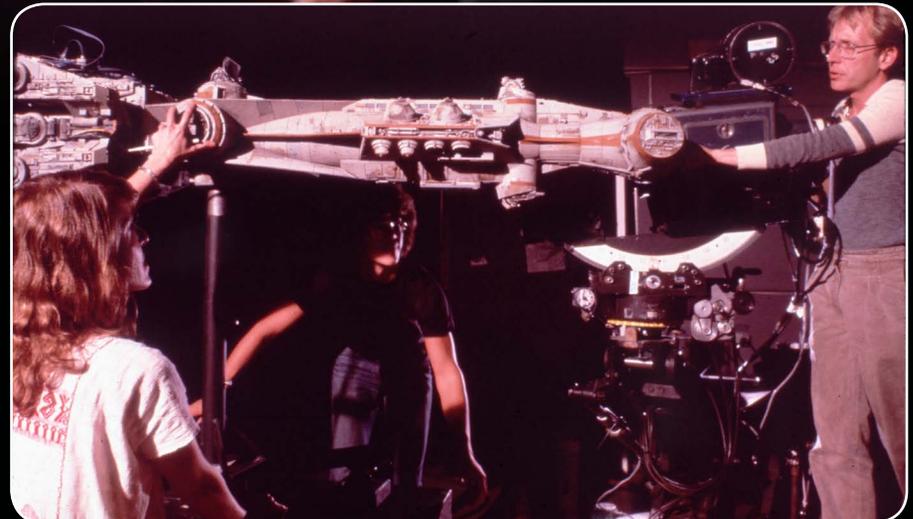


The original motion control Rama camera saw heavy use once again. It had been in use on other films since Empire, including Poltergeist. For Jedi, the motion control system was upgraded.

Motion control Rama camera at ILM, Star Wars: Return of the Jedi



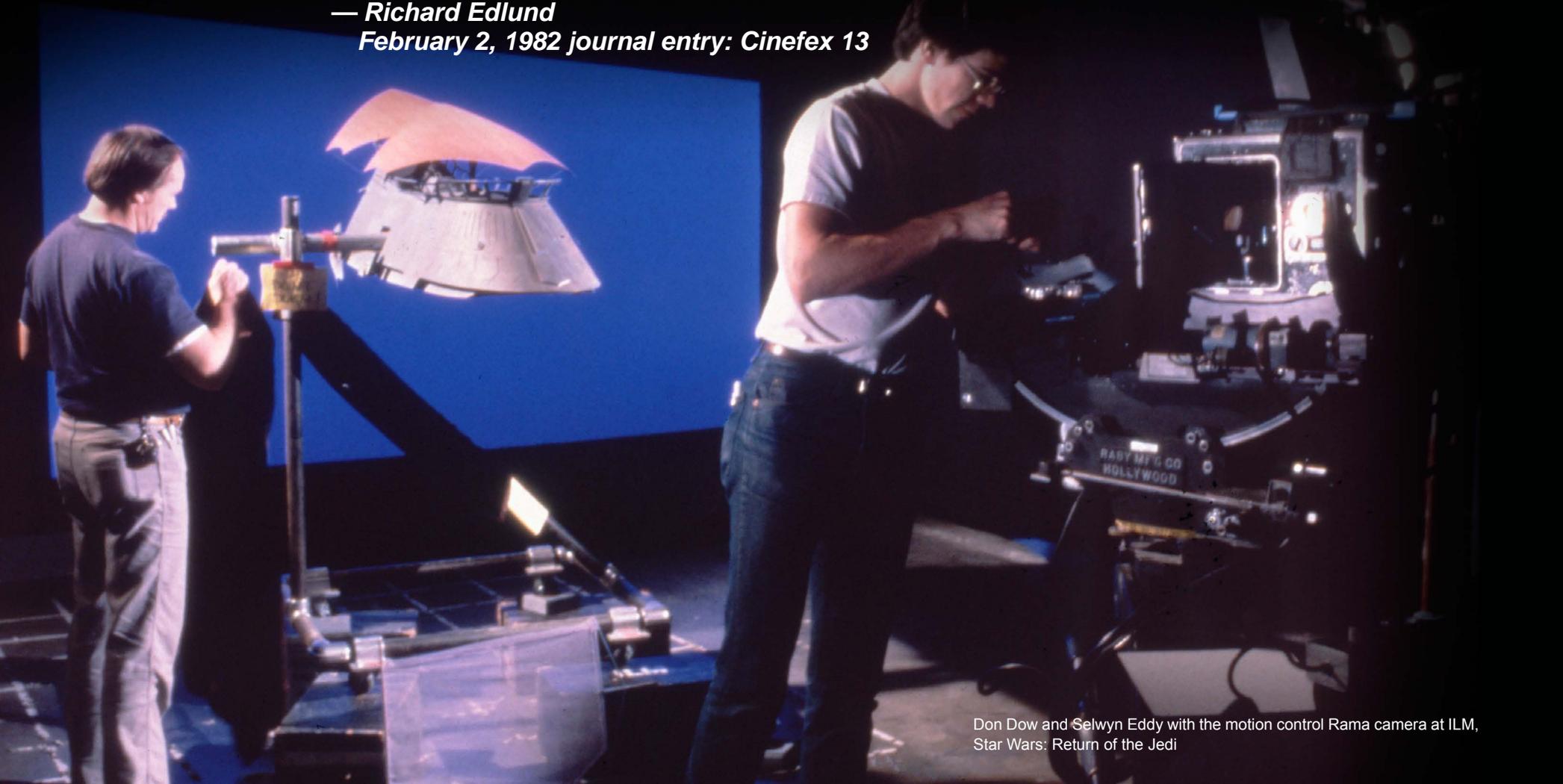
ILM artist rendition of motion control Rama setup



““ The Dykstraflex is still intact, and we have another camera system — the Technirama — that’s been completely rebuilt. It has a new follow-focus, tilts ninety degrees on its side and forty-five the other way, and is on a great big 250-pound gear head on top of a boom arm which sits on a twenty-foot track. It looks like something from outer space. That’s just on the verge of being finished now, and it’ll be a high-speed servo-drive system capable of going from one end of the track to the other in maybe five seconds — including a slow-in and slow-out—so you can do very fast moves. In contrast, most of the motion control equipment around Hollywood is set up with stepper motors, and moves very slowly because you’re normally only shooting about one frame a second. The Rama camera will run 42 frames a second in motion control, so we’ll be able to do shots involving actors or smoke or things — any kind of shot where 42 frames a second would be sufficient. ””

— **Richard Edlund**
February 2, 1982 journal entry: Cinefex 13

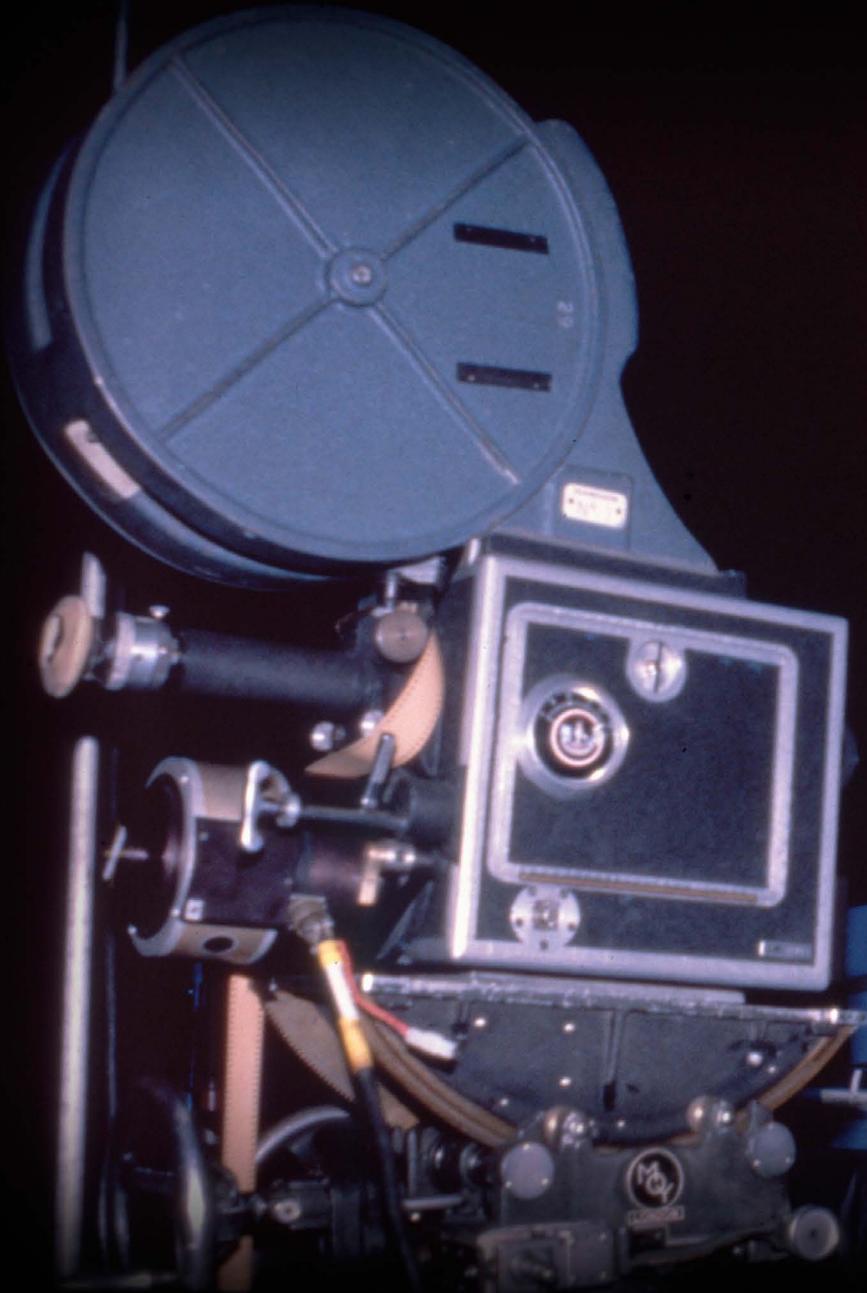
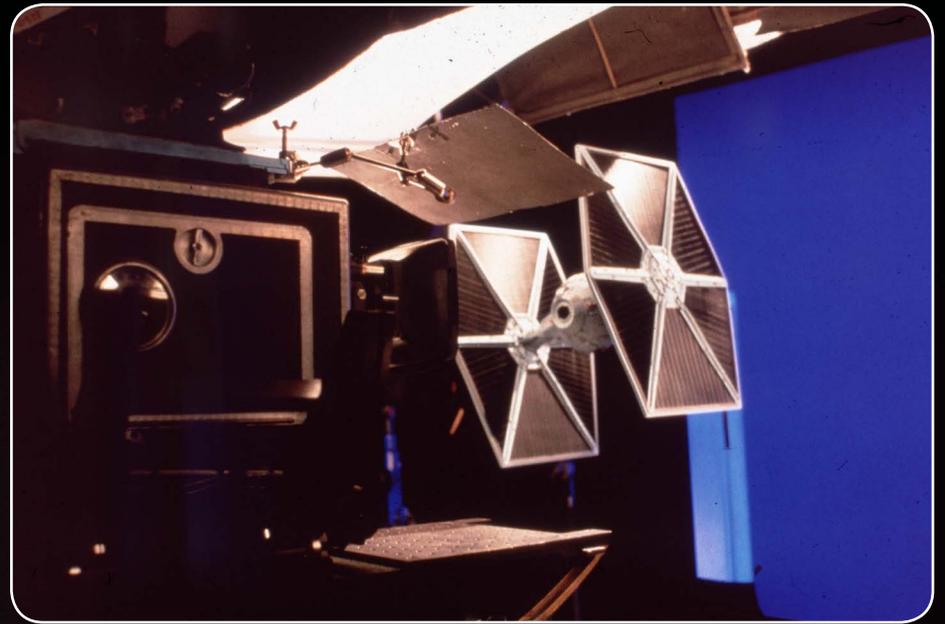
The rebuild Edlund describes may have been accompanied by a name change—this may be where the term “VistaRama” was introduced.



Don Dow and Selwyn Eddy with the motion control Rama camera at ILM, Star Wars: Return of the Jedi

Unknown English Rama camera on mo-co head shooting a TIE Fighter, Star Wars: Return of the Jedi

Production photos show at least two of English Rama cameras (with the large tachometers on the door) being used on Jedi as well, one of which looks to be on the motion control head.



English Rama camera (with ILM magician sticker on tachometer) shooting elements, Star Wars: Return of the Jedi

VistaFlex: Technirama Killer

For the production of *Who Framed Roger Rabbit*, ILM constructed several custom-made modern VistaVision cameras known as the VistaFlex cameras. Several Technirama cameras sacrificed their movements to this cause, leaving a number of empty "blue boxes" no longer capable of running film.

Rama camera use at ILM probably stopped around this time, though it's unknown when the VistaRama went out of service. At least one photo exists of a Rama camera working on *Indiana Jones and the Last Crusade*, which would have been after *Roger Rabbit*.



Unknown Rama camera shooting elements for *Indiana Jones & The Last Crusade*

ILM Control boxes for G-Nine Rama (field camera) and VistaRama (motion control system)

Camera Controllers

ILM built custom control units for all of its cameras, including the Ramas. Many (all?) of these control units worked with custom-made servo motors that were installed to drive the cameras.

For use in a motion control system (such as the VistaRama), these controllers were paired with a Motion Master, a device that stored and played back the cameras movements.

The names on the camera controllers are useful in identifying the various cameras.



ILM Control box for Matte Rama (field camera)

Rama Research: Identifying the Cameras

Researching the camera controllers and ILM documents from the period, various names are listed for Technirama cameras. Names identified to date are:

- G-3 "Matte Rama"
- G-9 or G-Nine
- VistaRama
- D-Rama
- GE-7 and G-7 (likely the same camera)
- Rama 2
- Rama 4
- Rama 5



Brass Plaques

The names “Rama 2”, “Rama 4”, and “Rama 5” likely refer to brass plaques that are present on the smaller doors of the Rama cameras. These plaques appear to have been installed at some point by ILM, though this is not confirmed. The original door plaque contained the full serial number, i.e. G-3, but the ILM cameras all have a simple brass plaque with a single number on it.

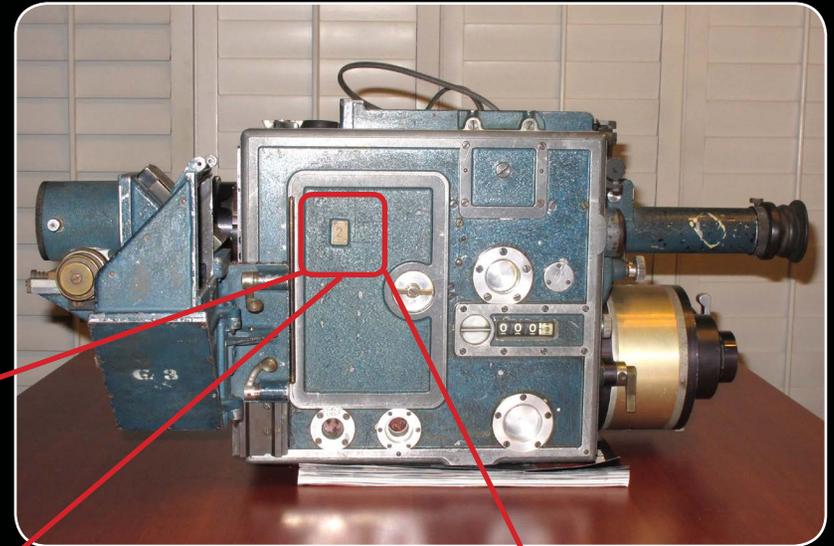
The original motion control Rama camera is numbered 1.

The G-3 matte Rama is numbered 2.

Rama 3 is MIA. Since paperwork never specifically references “Rama 3”, perhaps this is the Vista Rama camera.

Rama 4 exists and is English camera GE-9. It has been re-painted and has no movement.

Rama 5 exists and is English camera GE-2. It has been heavily stripped of components including the movement.



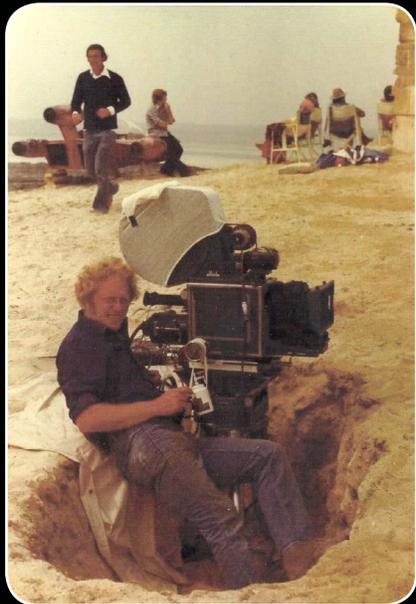
G-3 “Matte Rama”

This was the primary field camera used for shooting live action plates that would require VV compositing on SW, ESB, and ROJ. The camera also worked on Dragonslayer and Indiana Jones and the Temple of Doom in the same capacity. It is clearly identifiable by the G-3 mark on the side viewfinder.



G-3 “Matte Rama” camera today

Geoff Glover recalls using the camera in Tunisia and the studio on A New Hope:



Camera operator Geoff Glover with the G-3 Rama he dubbed "dinosaur"

“We also inherited from ILM their VistaVision camera. It arrived without a technician. However, it did not take myself and assistant Tony Browning long to work it all out.

This camera started its life as a Technicolor 3-strip of about 1930s vintage and was later converted to Technirama/VistaVision. It came with a mismatched series of lenses.

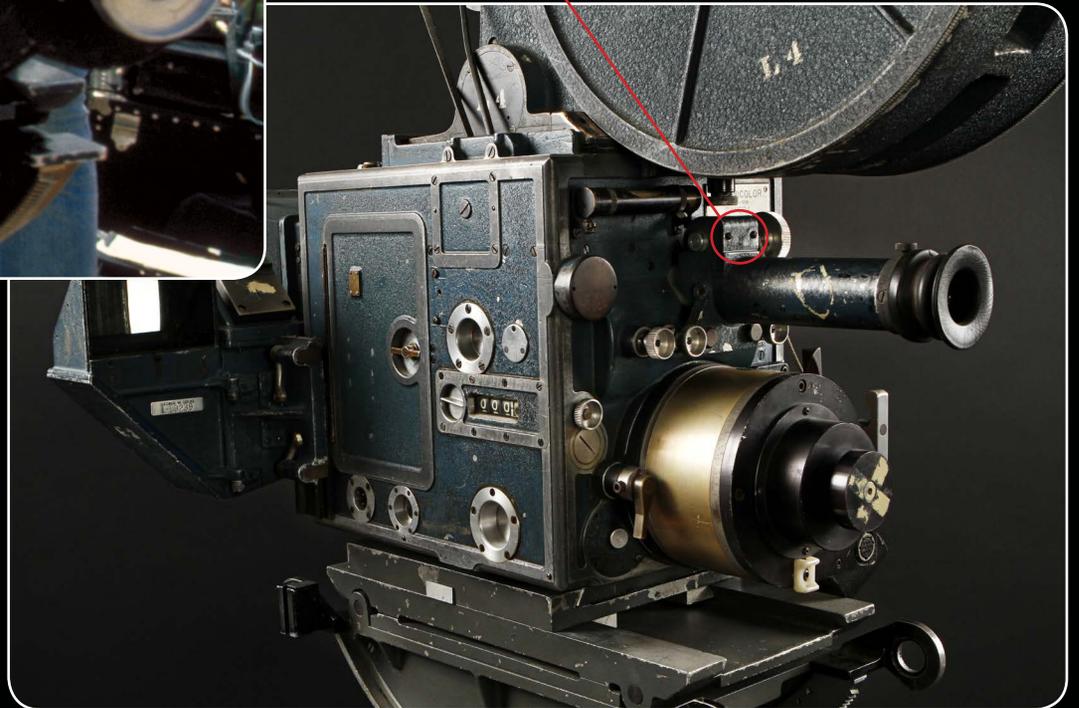
28mm Angenieux, (French), 35mm Canon (Japan), 50mm Ziess(German), 75mm/100 Taylor-Hobson(U.K.). Much of the Matte work was shot with the 28mm. The big problem that I had with this Lens was with the old camera optics made it difficult to see the complete picture area. The other big problem with this camera was the obsolete 96volt DC motor. Manageable in the Studio, but in the Tunisian desert? We got over this problem by connecting 10x12volt batteries. This meant another van to transport it all & an electrician.”

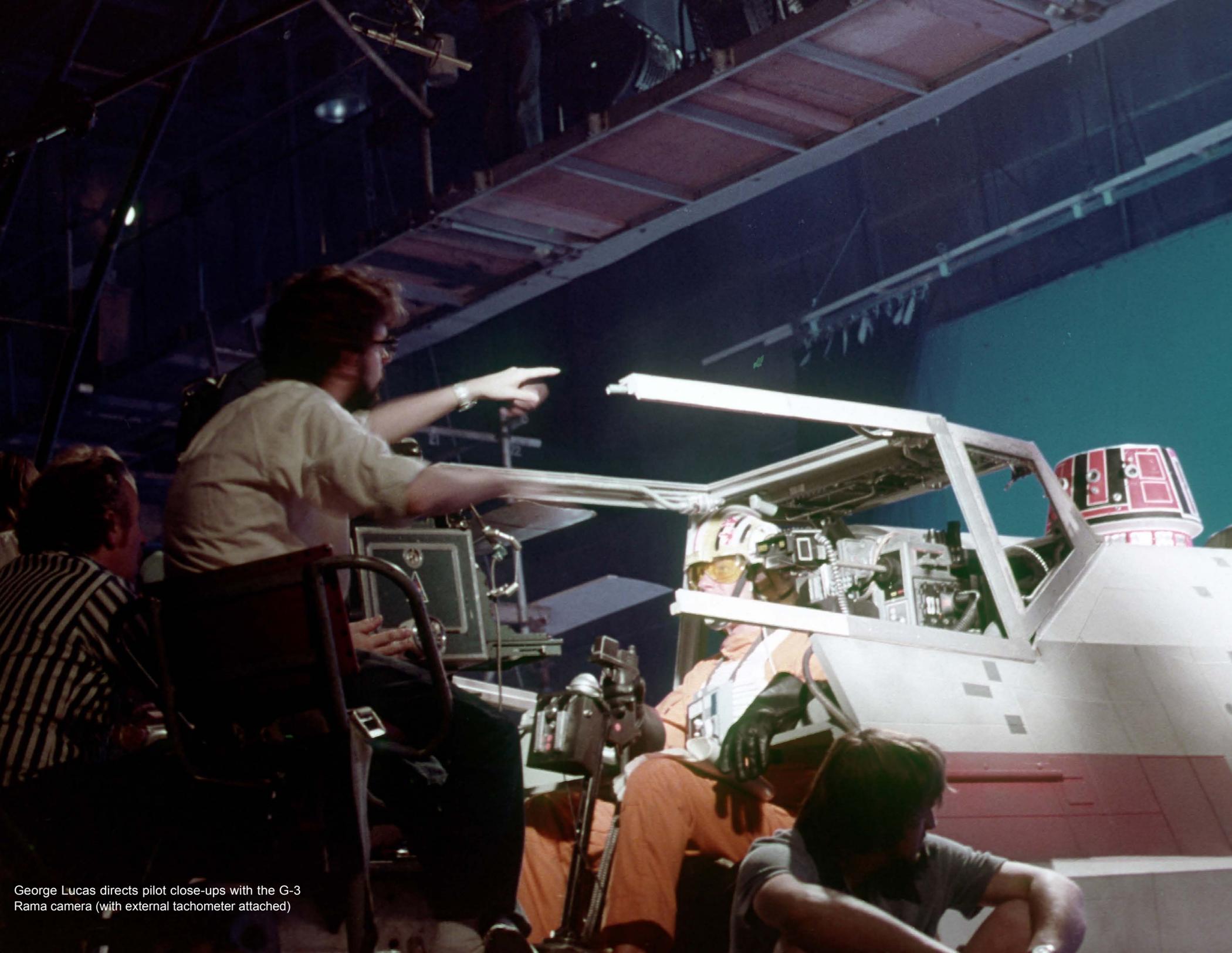


Gary Kurtz takes the helm of the G-3 Rama



Paint flaw indicating the G-3 camera is the same one in the Tunisia photo





George Lucas directs pilot close-ups with the G-3 Rama camera (with external tachometer attached)

The same Rama camera accompanied Richard Edlund, Lorne Peterson, and a small crew of ILMers to Guatemala.

“‘By this time, most of the show was in optical, so they could afford to let us go,’ recalled Edlund.

With a production scout, we went to the Mayan ruins at Tikal. There we met up with Lorne Peterson who was on vacation by now and decided to join us on his own. We hired some local peónes and schlepped our incredibly heavy Technirama camera – in its case with a two-hundred-foot magazine and a car battery to run it – to the top of a giant pyramid still covered over with jungle. We were there for about ten days and did a bunch of shots – three or four of which wound up in the movie.’”

– Richard Edlund, *Cinefex 65*



Distinct paint scratches identify G-3 camera as the same one in the Guatemala photos



Kershner lines up a shot with the viewfinder,
Star Wars: The Empire Strikes Back



On The Empire Strikes Back, G-3 once again served as the field plate camera and was sent to Norway.

“I again inherited this camera, (now named Dinosaur) for our Norway shoot for ESB. It now had a more manageable 18Volt motor but the whole camera had to be winterised and rewired by Samuelsons here in England and additional heaters fitted. We also requested a heated Barney to be made from the U.S. That arrived on the day we ourselves did in Norway. So it was untested. However, it did work and very well, all together we had 800watts of heat in in the camera. To supply all this heat it meant that we had to transport a 2kw petrol generator with us plus petrol etc. All our camera equipment had to be towed on sledges at temperatures of minus 25 centigrade. Much of the credit to keep this and our other cameras running must go to my camera assistants John Campbell and Mike Brewster. It must be appreciated to reload our cameras in these conditions was a big problem. Even to touch bare metal was a danger to your hands sticking to it.”

On returning from Norway, we handed the ‘Dinosaur’ over to the main unit. I wonder if they had as much fun with it as we did.”

– Geoff Glover, camera operator

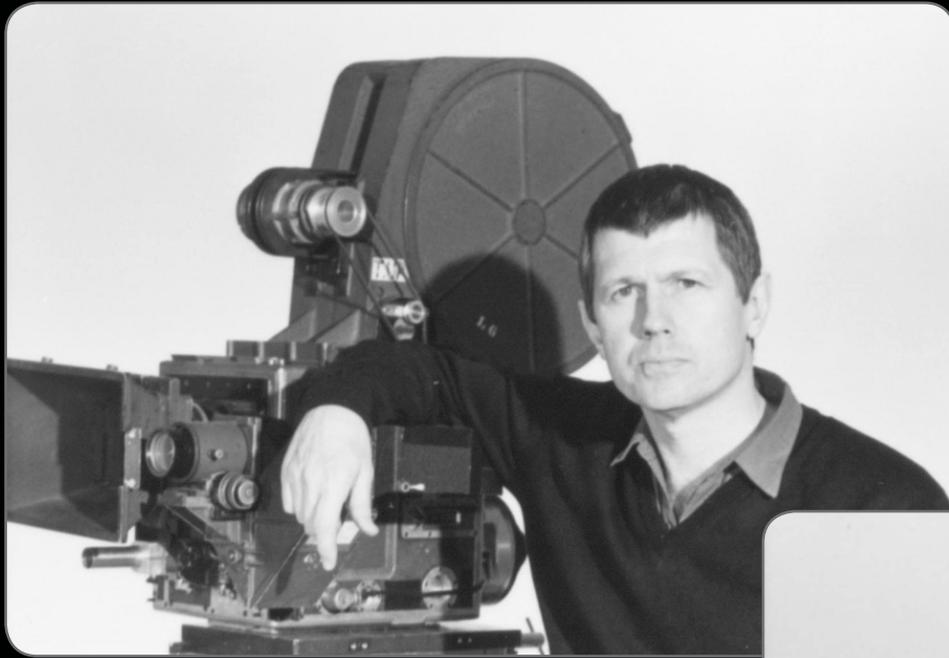


Camera operator Bob Smith with the G-3 Rama camera in Norway,
Star Wars: The Empire Strikes Back



Irvin Kershner with the G-3 Rama camera at Elstree Studios,
Star Wars: The Empire Strikes Back

The G-3 camera worked as the plate camera at Elstree Studios on ROJ, though it was not used on location.



Richard Marquand poses with the G-3 Rama at Elstree Studios, Star Wars: Return of the Jedi

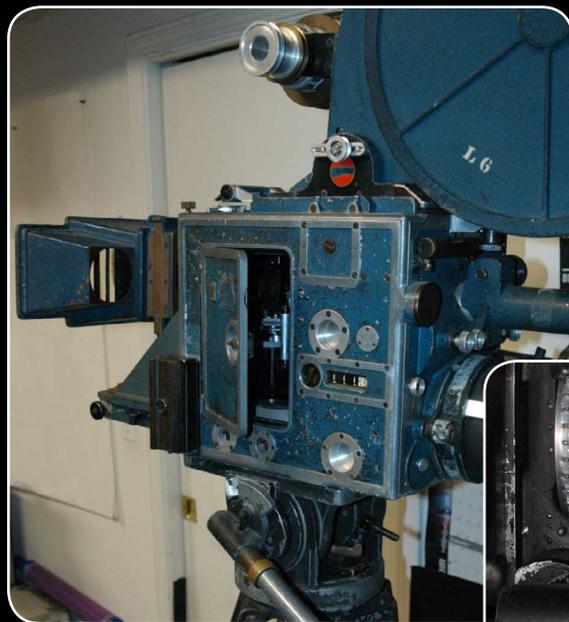
Camera assistants Martin Kenzie and Chris Tanner with the G-3 Rama at Elstree, Star Wars: Return of the Jedi



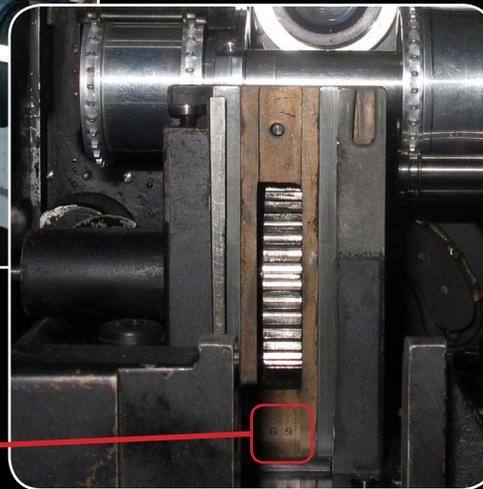
G-9 Rama

The G-9 Rama is the other original ILM Rama camera that dates to the first SW film, used on the motion control setup. This camera's location is known today and markings on the body can be matched to photos of the motion control Rama camera on ANH, ESB, and ROJ. Internally the camera is marked "G-9" in several areas.

On the first film, the G-9 (motion control) Rama was used extensively by Dennis Muren.



G-9 Rama camera today



G-9 Rama on the motion control setup at ILM, Star Wars: A New Hope



“I was to shoot backgrounds using our limited, older Technirama camera, and Richard was to shoot foregrounds using our custom built, flexible ‘Dykstraflex’ camera.”

– Dennis Muren, Cinefantastique Vol 6 No 4

Among other things, this camera was notably used for the jump to hyperspace shot.



“Another shot comes to mind. It looked like a cluster of white stars bursting into a nebula. [Jump to hyperspace] That was done with streak photography, by increasing the amount of streaked distance per frame. I originally did it as a test and they liked it and used the test! It wasn’t done on the Dykstraflex but on the secondary camera. I had a 14-foot track on it and the memory system could repeat moves. Technically it was something similar to the slit-scan process.”

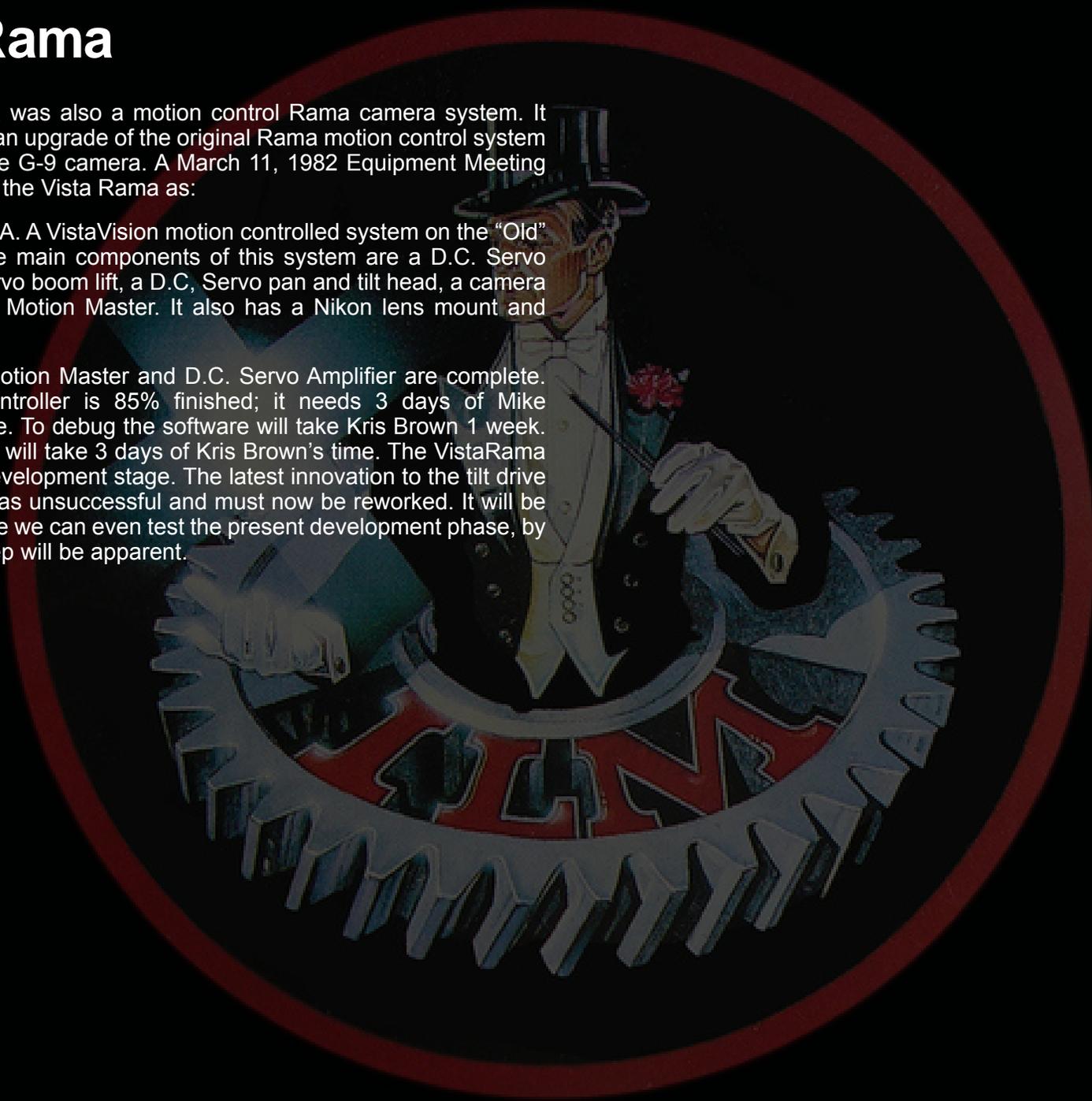
– Dennis Muren, Cinefantastique Vol 6 No 4

Vista Rama

The Vista Rama was also a motion control Rama camera system. It may have been an upgrade of the original Rama motion control system which utilized the G-9 camera. A March 11, 1982 Equipment Meeting report describes the Vista Rama as:

THE VISTARAMA. A VistaVision motion controlled system on the "Old" Rama track. The main components of this system are a D.C. Servo track, a D.C. Servo boom lift, a D.C. Servo pan and tilt head, a camera controller and a Motion Master. It also has a Nikon lens mount and follow focus.

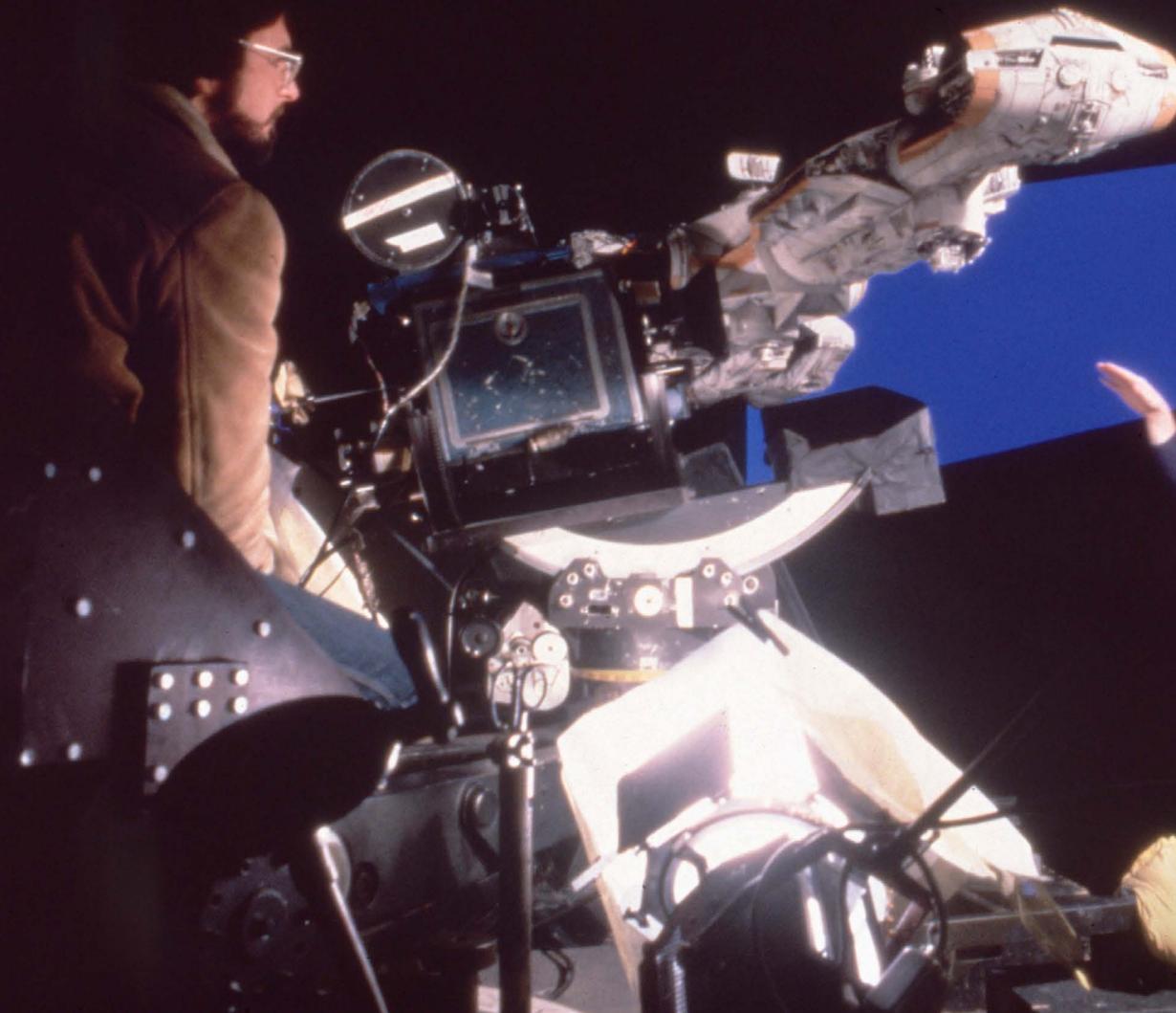
STATUS: The Motion Master and D.C. Servo Amplifier are complete. The camera controller is 85% finished; it needs 3 days of Mike MacKenzie's time. To debug the software will take Kris Brown 1 week. The follow focus will take 3 days of Kris Brown's time. The VistaRama head is in the development stage. The latest innovation to the tilt drive motor gearing was unsuccessful and must now be reworked. It will be two weeks before we can even test the present development phase, by then the next step will be apparent.



Which camera was used with the VistaRama system? If the VistaRama is indeed the same motion control system that Edlund described in use on Jedi (essentially an upgrade of the system used on the earlier SW films), then the G-9 camera was used as the VistaRama on ROJ.



G-9 Rama camera today. Scratches on the body identify it as the Rama on the motion control rig as seen with Ken Ralston in the production still at ILM, Star Wars: Return of the Jedi

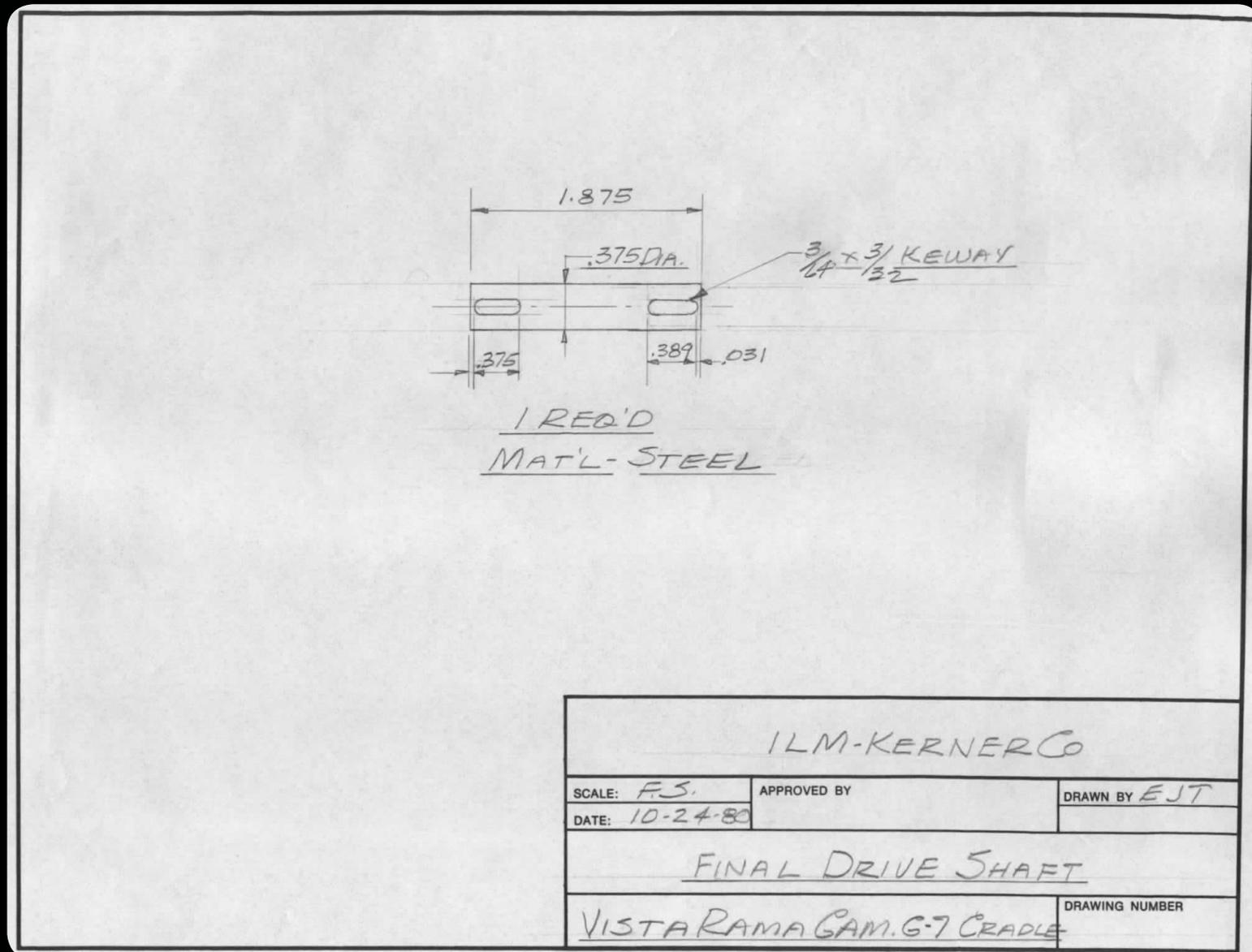


An ILM document titled "Major work for Spring 1983" bears a handwritten note:

**“Swap Cameras: (GE-7 > Rama)
(Old Rama > Field)”**

Therefore G-9 may be the "Old Rama" camera used on the motion control setup (AKA Vista Rama) which was later swapped out for the GE-7.

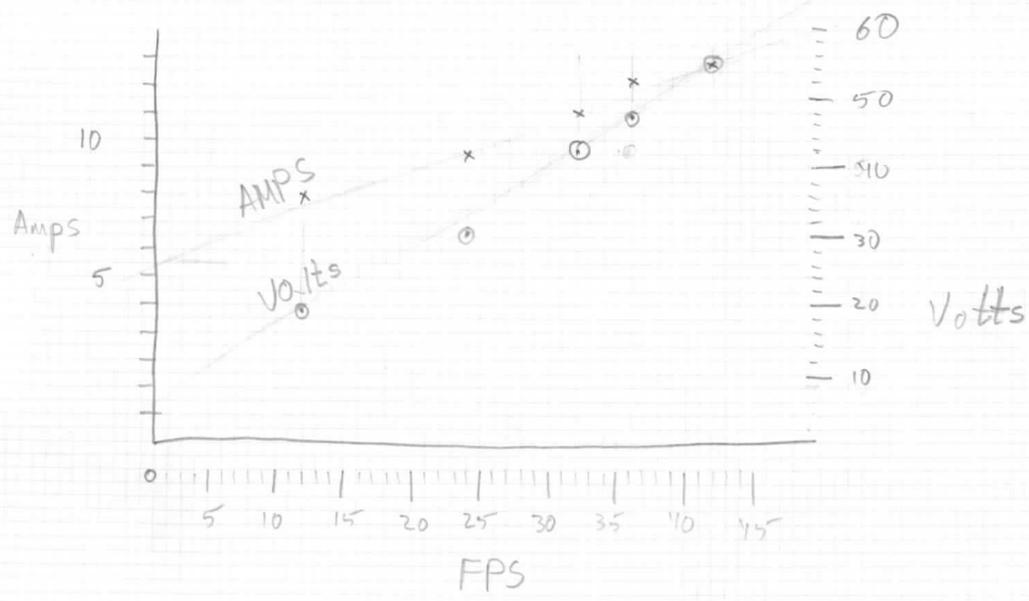
However, technical drawings exist labeled "VistaRama G-7" exist, dated 1980.



1980 mechanical drawing labelled VistaRama Cam G-7 (or does it say G-9?)

Camera controllers also exist for both "G-9" and "VistaRama", implying they were separate cameras. Perhaps the G-9 controller was created after it was swapped off of the VistaRama rig.

The location of the GE-7 camera (which may have been the VistaRama at one time) is not known today, nor the locations of the original Rama motion control setup (head, boom, etc) or the upgraded VistaRama setup.

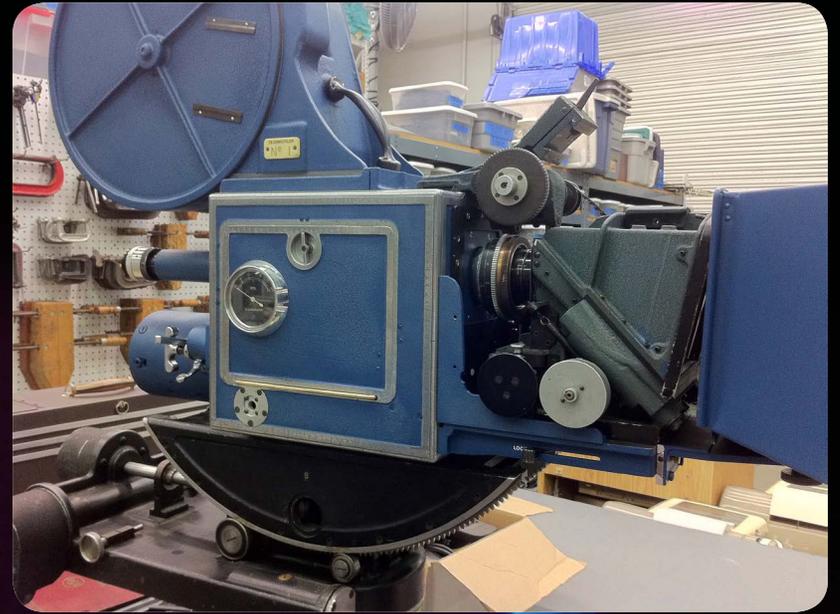


GE 7
RAMA
new Gear

A vintage ILM diagram indicates English Rama camera GE-7 was used at some point.

Rama 4

Rama 4 is an English camera, serial GE-9, believed to be the unit seen in these ROJ production stills. It has been re-painted and has no movement.



Rama 5

All of ILM's English Rama cameras were obtained located in London by Brian Johnson during the production of Empire.

Rama 5 is also an English camera, serial GE-2. No production stills of it in service have been located at this point. Today it is heavily stripped of components.



English Rama camera DE-2 today



“I bought the VistaVision Cameras in the UK. Gary Kurtz asked me to find any remaining VV cameras - or parts - anything.

Years before Empire I worked for Les Bowie at a tiny studio at Technicolor's base on the Bath Road by Heathrow to shoot some effects shots and Matte paintings. This was around the time that the Technicolor engineers [including George Pink, George Menassian, John Alder, Ron Cross, Alan Bryce etc] were sorting out the old Three Strip Technicolor [Mitchell movement] cameras and enhancing the Tech Rome Technirama cameras for some special studio use. I came in one morning and saw a skip outside our office window that was full of Three Strip and Vista Vision cameras and accessories. Tech USA had decided that 8 perf was a dead duck and no more money was to be spent. That afternoon the skip departed.

What had happened in the mean time was that one of the Technicolor UK engineers had backed his estate

wagon up the the skip and picked out the VV 8 perfs and one Three Strip camera. All in boxes. He had to load some on the roof rack with extra strapping as he had to take them to the Bath area where he was setting up a Chemist/Photo shop. He was going to use the VV cameras as projectors and load his customers happy snaps and print the results. I found out about this when many years later, and when Kurtz requested VistaVision equipment I contacted Peter, the engineer.

'Come down,' he said, 'and see what I have.' The next day I found Peter and climbed into his loft to find 6 cameras [5 VVs and a Three Strip] the movements/gates all covered in oiled cloth and everything liberally coated in anti-rust compound.

I think I paid him £12,000 in cash and that was a huge bargain. Single VV movements were passing hands in the USA for about \$20,000+ at the time. ”

– Brian Johnson

D-Rama

D-Rama is listed on a November 1980 ILM budget (which also lists the VistaRama) – no other information is available. What is this?

ILM budget document listing "D-Rama"



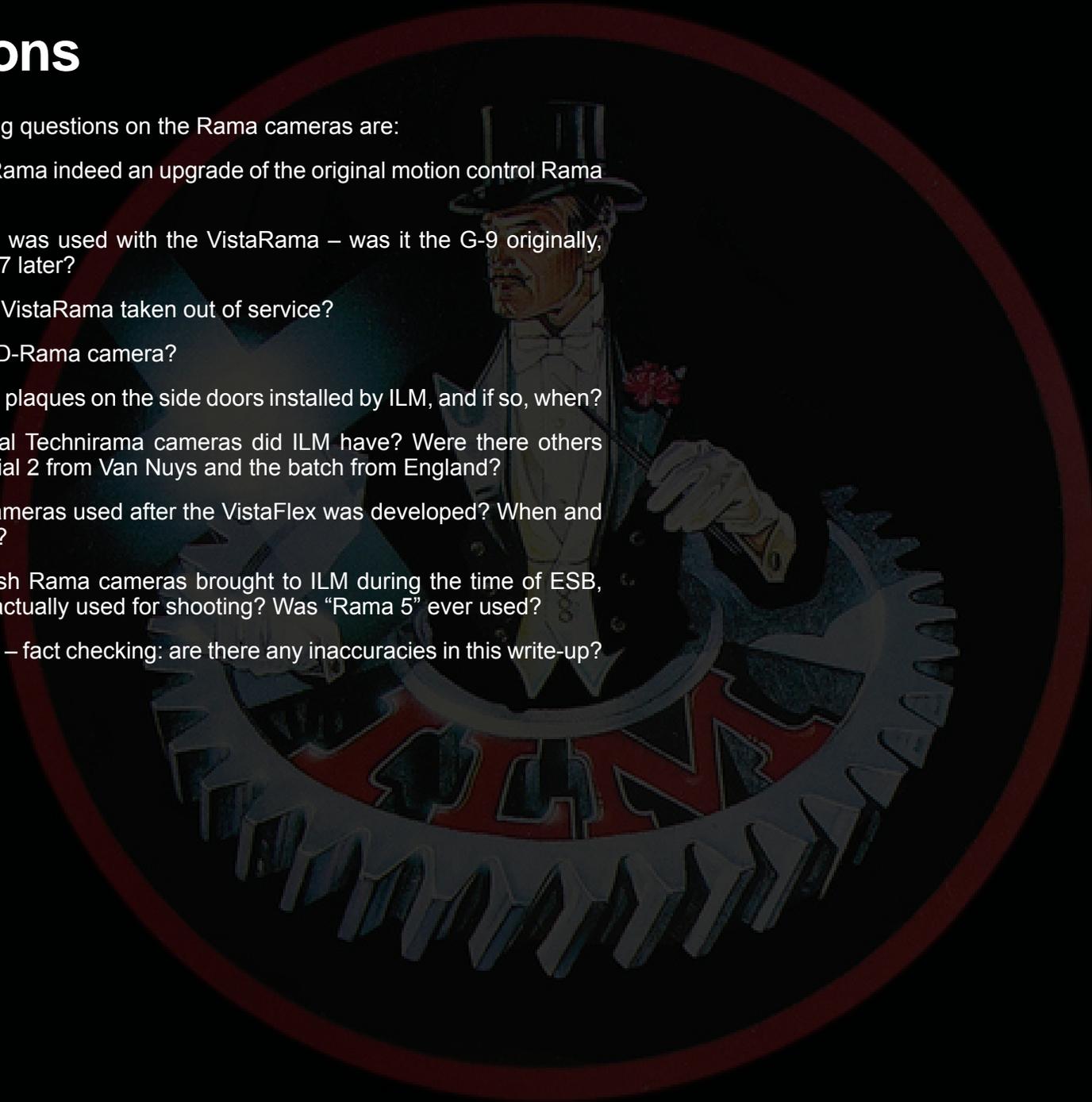
2

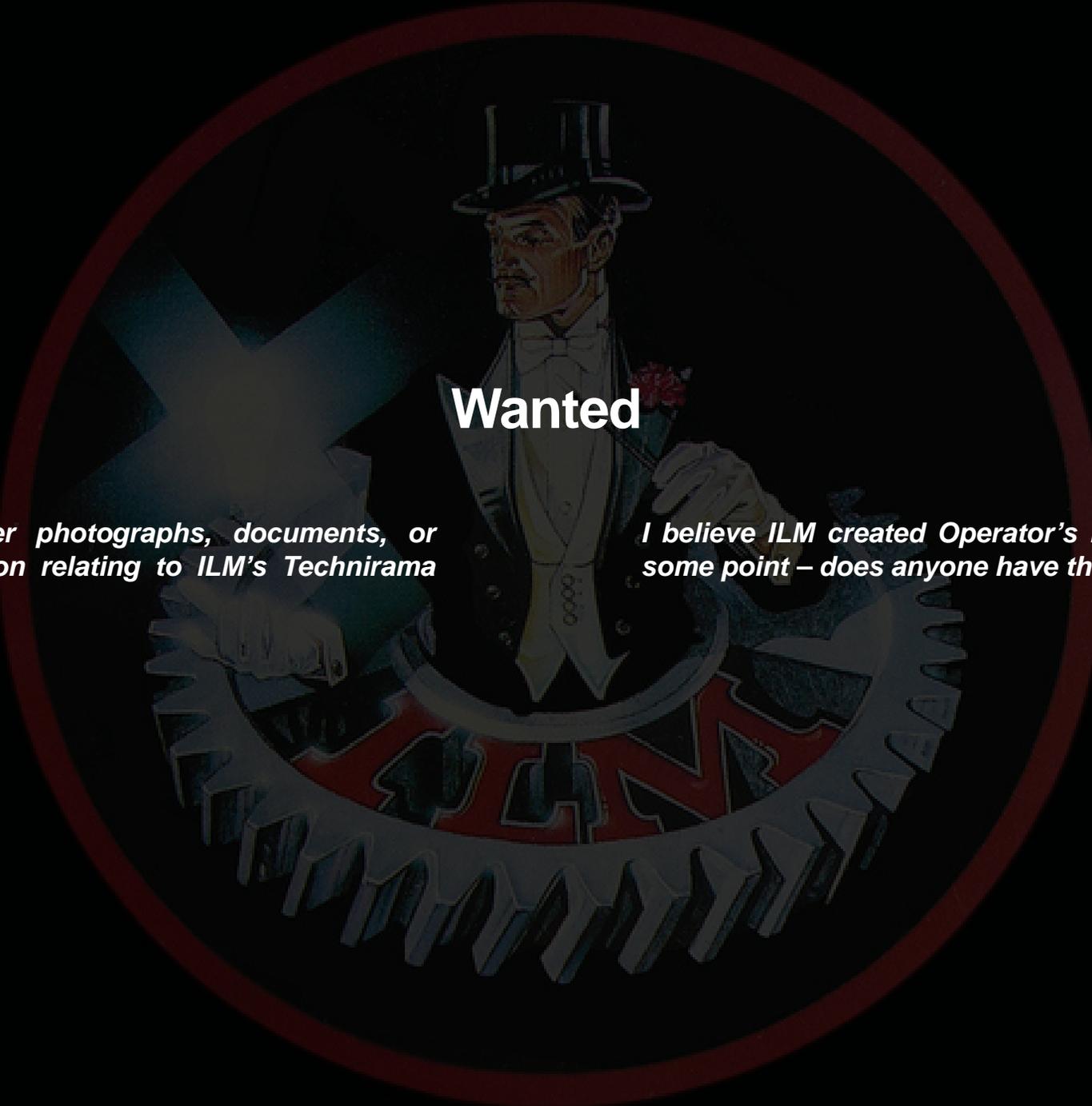
D - FLEX NEW CON'T HP 9875 tape deck	2,600.00
misc. overhead	5,000.00
	21,510.00
D - RAMA NEW: 16 channel motion master w/ cables	13,910.00
LABOR - 45 man days	
misc. overhead	5,000.00
	\$18,910.00
VISTARAMN: 16 channel motions master w/ cables	7,510.00
LABOR - 45 man days	
Vistarama Camera Controller	20,000.00
LABOR - 30 man days	6,899.59
HP 85 w/ buss	8,500.00
HP 9875 tape deck	2,600.00
misc. overhead	7,000.00
	\$43,310.00
OXBERRY: 16 channel motion master w/ cables	13,910.00
LABOR - 45 man days	
Oxberry Camera Controller	15,000.00
LABOR - 25 man days	1,306.71
HP 85 w/ buss and floppy discs *	8,500.00
misc. overhead	5,000.00
	\$42,410.00

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Questions

1. The outstanding questions on the Rama cameras are:
2. Was the VistaRama indeed an upgrade of the original motion control Rama system?
3. Which camera was used with the VistaRama – was it the G-9 originally, and then the GE-7 later?
4. When was the VistaRama taken out of service?
5. What was the D-Rama camera?
6. Were the brass plaques on the side doors installed by ILM, and if so, when?
7. How many total Technirama cameras did ILM have? Were there others outside of the initial 2 from Van Nuys and the batch from England?
8. Were Rama cameras used after the VistaFlex was developed? When and for what purpose?
9. Of the 5 English Rama cameras brought to ILM during the time of ESB, how many were actually used for shooting? Was “Rama 5” ever used?
10. And of course – fact checking: are there any inaccuracies in this write-up?





Wanted

Any other photographs, documents, or information relating to ILM's Technirama cameras.

I believe ILM created Operator's manuals at some point – does anyone have these?

Additional Reading

[ILM equipment development budget 1980-1981](#)

[ILM Camera Controller Operation Instructions](#)

[Equipment Maintenance notes on ILM Cameras](#)

[Additional EM notes on cameras](#)

[ILM Electronic Work for Spring 1983](#)

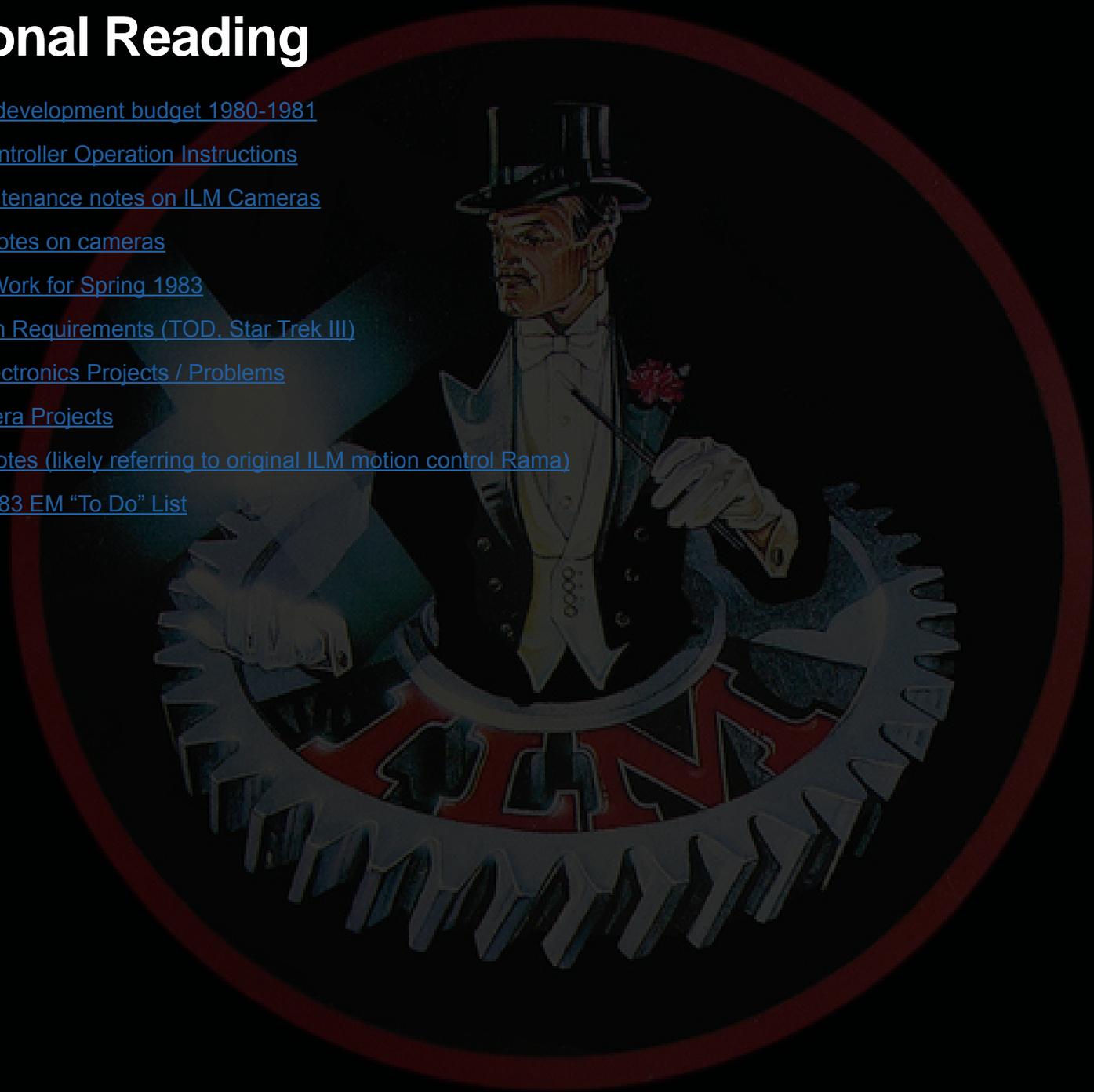
[1983 VistaVision Requirements \(TOD, Star Trek III\)](#)

[ILM Camera Electronics Projects / Problems](#)

[Additional Camera Projects](#)

[Rama system notes \(likely referring to original ILM motion control Rama\)](#)

[February 28, 1983 EM "To Do" List](#)



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