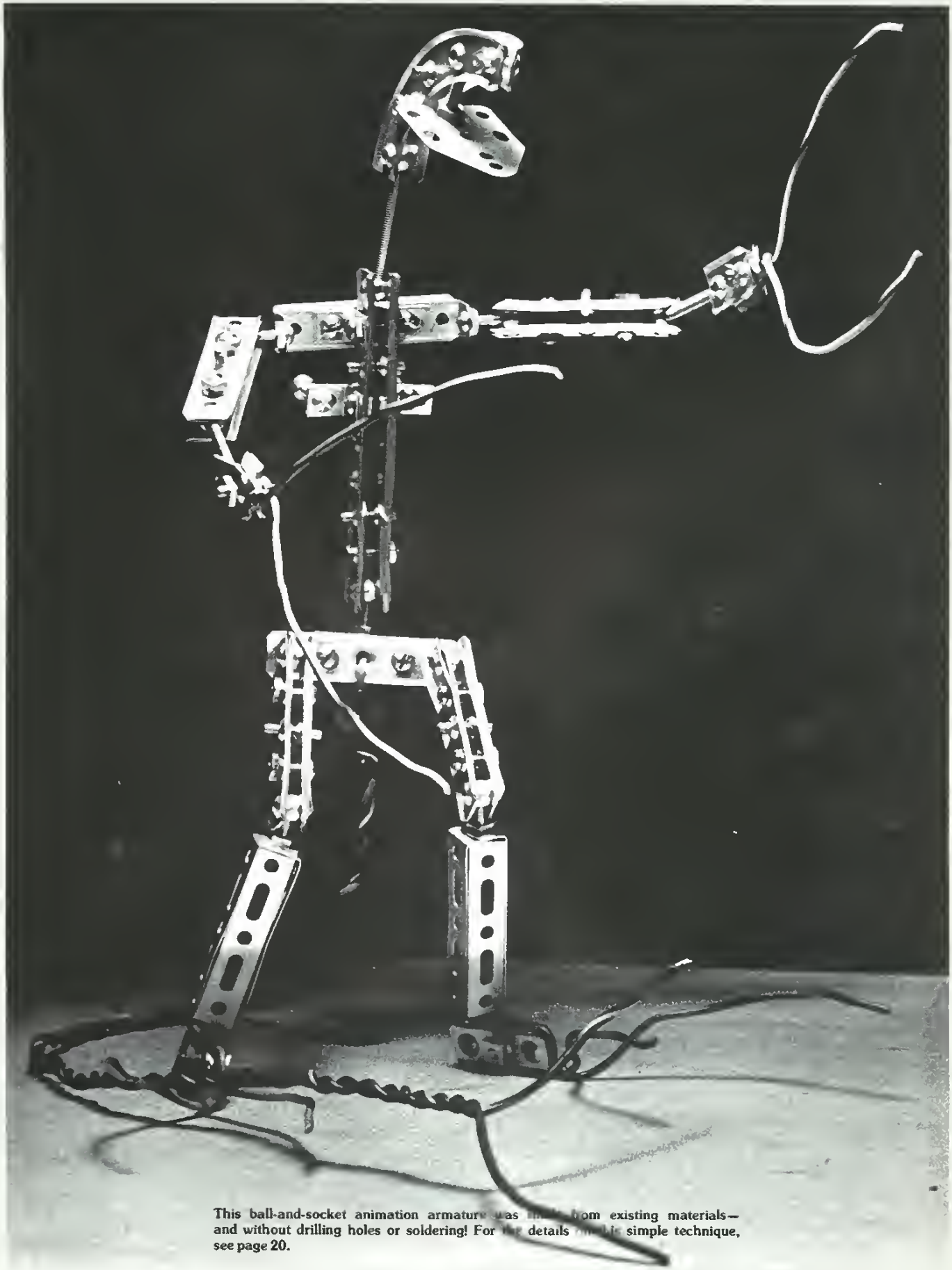
CINEMAGIC

Number 11 - $2.00



This ball-and-socket animation armature was made from existing materials—and without drilling holes or soldering! For the details on this simple technique, see page 20.

CINEMAGIC

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Cover: Tim Hammell's rendering of a Tyrannosaurus "armature" being menaced by two grotesque creatures—proof that even bare armatures are intriguing critters!

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LETTERS

CINEMAGIC, P.O. BOX 125, PERRY HALL, MD. 21128

Ernest D. Farino
Irving, Texas

I think Wes Corliss has missed the point with his remark about gradual, inevitable deterioration of animation models (LETTERS, CM #10). In the case of "the pros," this is not due to inferior skills or sub-standard craftsmanship as Corliss imlplies, but rather to the somewhat fragile nature of the figures themselves. Foam rubber is only so durable, and the constant, daily handling of models over long periods can easily wear out the figure. (The Gwangi model was surely employed during the bulk of the some 18 months of post-production animation.) Minor retouching is often required, but when the appearance of a model erodes beyond such superficial surgery, total re-casting might be the only practical solution.

I must say that I'm flattered at CINEMAGIC's enthusiasm for my ALIEN FACTOR title work. Naturally I hope others enjoy the sequence as well, inspite of its shortcomings. Though I realize you were making a comparison with the titles in STAR WARS (and not the entire film), such a generous analogy might lead many to expect more from the sequence than it actually deserves. Like any filmmaker, I would hope that the work is ultimately taken on its own merits, without undue comparisons.

Tim Caldwell
Wyandotte, Michigan

I've found an interesting alternative for making a stop-motion "skeleton" (such as in 7th VOYAGE OF SINBAD). You use pipe cleaners or solder wire as the basic armature and you build onto this with "polyseamseal," a type of caulking that can be worked with well using damp sculpting tools. This material dries to a rubbery, flexible consistency which is ideal for model positioning. A plastic skull from a keychain or model kit can be added for realism. Then merely paint the entire skeleton model with acrylic paints. The caulking material is available in hardware stores at a cost of $2.39 for about 7½ounces.

Gavin Doughtie
Houston, Texas

Although I enjoyed CINEMAGIC #10, I believe that many filmmakers can be spared the discomfort John Cosentino had to endure in the making of his full-body cast. A material known as "plaster bandage" can be used instead. This substance is available at any large hospital supply company and comes in small rolls for about 80¢ each.

The person to be cast should be supported from the ceiling of the work area with a padded belt and ropes, so that the weight of the plaster bandages does not cause him to collapse. The bandages should be soaked in water and applied in thin layers, with each layer being allowed to dry before the next is applied. If you put several layers on at once, the heat generated by the drying plaster could burn the person.

After about a half-inch layer of bandages is applied and fully dried, the entire mold is cut in half with an electric cast-cutting saw (used by surgeons) and removed from the subject. It's best to cast the mold in two sittings: one waist down and one waist up.

After separation, the two mold halves are wired together and then filled with liquid foam plastic (available from hobby stores or Edmund Scientific Co., 660 Edscorp Bldg., Barrington, NJ 08007). After the foam has set the excess is trimmed from the casts and the molds removed. The top and bottom sections are glued together with white glue and the whole thing is coated with fiberglass cloth and resin after it has been sealed with silicone spray (which prevents the foam plastic from being dissolved by the resin).

Mark Chorvinsky
Silver Spring, Maryland

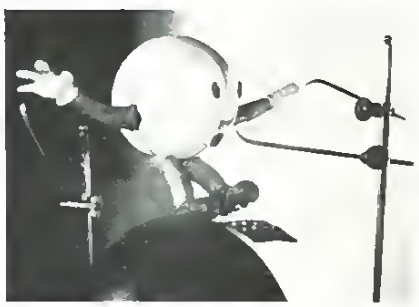
Perhaps you can help me with a question rising out of Doug Beswick's "Phantom Island" article in CINEMAGIC #5. Doug mentions that he "knew nothing at the time about the use of a surface guage to keep the puppet steady."

What exactly is a "surface guage" and how is it used?

Editorial Comment: *To answer this we queried Ernie Farino, who has much experience in using a surface guage for stop-motion work. Ernie's reply: "A surface guage, also known as a "head guage" or "center finder," is an adjustable pointer on a base and originally designed for machinists (available from industrial machinist supply companies, one popular brand being made by the Starrett Company of Athol, Mass.). However, even a piece of sturdy, bendable wire on a wooden base would serve the purpose.*

The principle is such: the guage is placed on the set near the model, and the pointer is adjusted to point at any reference point on the figure (the tip of a horn, a wart, etc.). The model is moved to its next position, the guage removed and the frame exposed. Since the pointer remained stationary while the model was being physically moved, the tip of the pointer represents, in effect, the "last" position of the model (i.e., the position on the previous frame). Since one can't refer to previous drawings in the series—as with cartoon animation—the guage helps to check the distance of the move, whether the figure is moving in the proper position, in a straight line, or whatever the case may be. Often, several guages are used simultaneously; since only so much can be absorbed by peripheral vision on the part of the animator, he might want to set a guage at the tail of an allosaurus so that he can animate the torso, and then go back and animate the tail. The guage will tell him where the tail was in the last frame, since by now it has been jostled out of position by the movement of the torso. Even though it tends to slow down the animation process, the use of guages can be invaluable in trying to achieve smooth, accurate animation."

A Farino model with 2 surface guages in position.



EDITORIAL

We continue to receive a huge amount of mail about THE ALIEN FACTOR and we're certainly appreciative of this response. Many letters contain requests for continued and more detailed coverage on the film, and although this could easily be done in CINEMAGIC, I'd prefer to keep the magazine slanted more toward amateur and how-to information. THE ALIEN FACTOR, although an independent production, was made on a budget and scope beyond most amateur filmmakers, with final expenses reaching well over $100,000. Hardly an amateur budget, and as tempting as it is to keep talking it up in these pages, I still feel that it's somewhat out of place. What we are planning is a separate one-shot publication on the making of THE ALIEN FACTOR. This would cover all the details of the entire production, the special effects, the plot, the characters—everything. But as I've said—this is strictly in the planning stages and we'll let you know when it is available.

I will tell you that the film has undergone a major facelift and more than 20 distributors are scheduled to view the final 35mm print, so a distribution deal seems inevitable. For another small tidbit on one of the film's changes, see the Press Notices section in this issue.

Our two new staffers have a few things they'd like to say, so until next time, I'll turn over the reins...

—Don Dohler

I've really been enjoying my work on CINEMAGIC and I've been doing my best to keep up with orders, subscriptions, and correspondence. But one area of the job really discourages me: our subscribers not informing us of their address changes. For issue #10 alone more than 30 copies were returned to us because readers did not bother to send their change of address. These returned copies are increasing issue by issue, and not only are many people missing out on something they've paid for, we have to pay a return postage fee of 39¢ per copy! The postal regulations have it that address corrections do not apply to bulk rate and third-class, so unless you let us know of an address change personally, we'll never have a way of knowing where you've moved.

I urge you to please take a moment to send us your new address if you're moving. It will save us a lot of time, trouble, and money. And you will continue to receive the CINEMAGIC copies that you have paid for and deserve!

—MaryAnn Merenda

As you may have read last issue, I have joined the CM staff as Graphic Artist and Advertising Director. I have more than 15 years experience in this field and I want you to know that I fully intend to give my all to do everything possible to improve the format of the magazine, as well as increase its quality, content, and design appeal. This will enable us to develop a vehicle worthy of top-of-the-line advertisers and at the same time give you more pages, more color, and better quality.

Don and I have recently completed a rather lengthy meeting concerning the future of CINEMAGIC. Our primary purpose was to evaluate where we are now and where we can be in one year. With your help, we can be one of the "biggest and the best" fantasy/film publications on the market.

I'd like to tell you what we've decided to do with CINEMAGIC in the next year and how you can help. First, we have developed a rigid advertising campaign that will saturate key market areas. This campaign is structured mostly with the thought in mind of recruiting new and loyal subscribers. Second, and most important, is that you will be receiving a questionnaire with issue #12. Your cooperation in filling it out completely and returning it as soon as possible will be instrumental in helping us determine what sort of readers we have, what they do, what they like, and how they feel about CINEMAGIC in general. It will help us determine what we can do to offer a more interesting and informative magazine.

We can also use your help in passing the word to others about CINEMAGIC— friends who may want to subscribe or dealers and bookstores in your area which may like to carry the magazine.

With your cooperation in these areas, we can all strive to make CINEMAGIC "the biggest and the best."

—Tom Griffith

THE TECHNIQUE OF

Article & Photos by
BEN BURTT

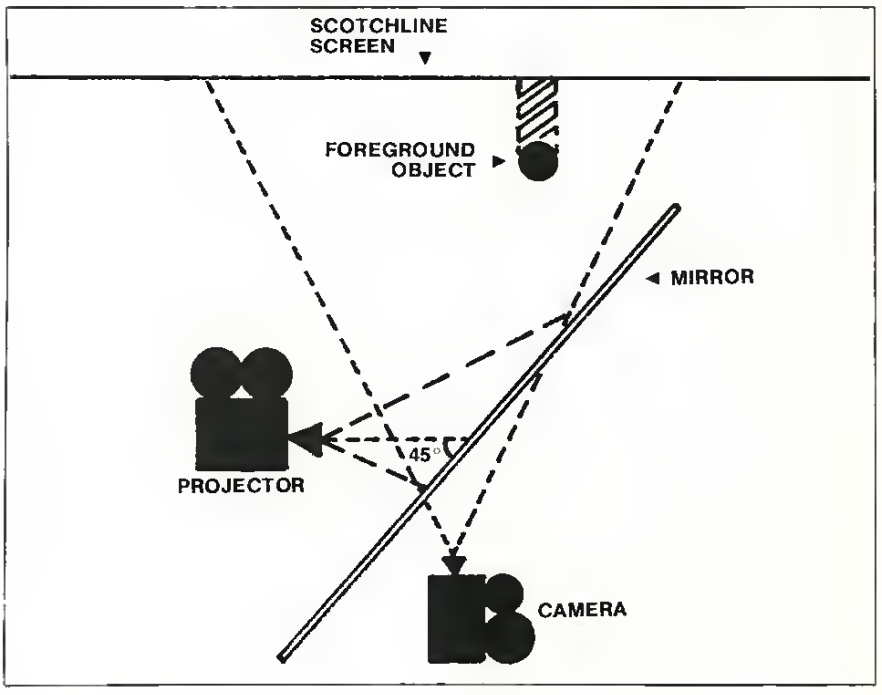
Filmmakers interested in special visual effects have constantly strived to combine two or more images on separate pieces of film into one composite picture. Generally, the goal has been to combine foreground and background action filmed at different times into one shot. Either because of financial or physical limitations, certain images are impossible to obtain. When this happens, the filmmaker has to rely on one, or several special effects processes. One of these processes is front projection, the subject of this article.

The basic front projection process is not a new idea, although only in recent years has it been developed and refined for use in such movies as 2001: A SPACE ODYSSEY, and SILENT RUNNING. By no means, however, has it become a widely accepted technique. An excellent and early summary of the process can be found in AMERICAN CINEMATOGRAPHER, April, 1962.

Front projection is exactly what it says it is. A projector (still, or motion picture) is utilized to project an image onto a special screen made of Scotchlite. Scotchlite is a 3M product which comes in several different grades and colors. That which gives the best results for use as a screen is 7610, or 7611, the latter having a thicker base. There exists a slightly inferior brand, 3270, which is much less expensive but is adequate for many purposes. The primary difference between the 7610 series and 3270 is that the former material gives a much brighter reflection. Scotchlite generally comes in two-foot wide rolls. It has a peel-off adhesive backing so that it can be mounted onto a rigid flat surface which will support it as a screen.

Scotchlite is composed of millions of carefully-oriented glass beads. Unlike conventional screens, Scotchlite has the unique property of not scattering the light uniformly through a full 180° arc in front of the screen. Rather, the light is reflected back parallel to the direction in which it emanated from the projecting lens. (See diagram.) This results in a concentration of light returning straight back from the screen to the source rather than being scattered in all directions. The advantage of a screen like this is that it provides an extremely bright image.

Since the light falling onto a Scotchlite screen is bounced back into the projector, the brightest viewing position is anywhere along the optical axis of the projecting lens. However, if one was to place a camera at a point along this line to record the bright image, the camera itself would obstruct the light going to the screen from the projector and make the photography of the screen image impossible. How then, can a picture be taken of the image on the screen? The answer is to use a beam splitter. This is a partially silvered mirror placed at a 45° angle from the optical axis of the camera. The camera itself is placed at a 90° angle to the optical axis of the projector. This arrangement has the result that the optical axes of both the camera and the projector are made to coincide. The camera can photograph the brightest possible image off the screen. This set-up permits another very important phenomena to occur. When the optical axes are correctly aligned, any object placed in front of the screen will matte out its own shadow. The screen itself gives such a bright image that once the foreground object has been illuminated to match the background, the portion of the projected image that falls on the foreground object is completely washed out. The 7610 Scotchlite has a reflective index approximately 1600 times brighter than the reflection of white paper. The portion of the plate image



FRONT PROJECTION

which is reflected off the foreground object is thus too dim to be recorded by a film emulsion which is being correctly exposed by the background. Most films do not have the latitude to read such a brightness ratio.

Obviously, the most crucial aspect of this process is to properly align the mirror, projector, camera, and screen, so that the most succesful combination of foreground objects and background plates can occur. The capability of making precise alignments will depend on the nature of the shot and the equipment available to the filmmaker. I will attempt here to describe how I achieved certain success with front projection when operating with minimal equipment and an even more minimal budget.

Scotchlite 7610 is usually available in 2 ft. by 10 yard rolls which cost approximately $135.00. However, Scotchlite 3270 is available in small pieces and can be purchased in sign stores for approximately 2 dollars per square foot. I chose to purchase 6 square feet of the latter material. This was all I needed to build a small screen which would be an adequate size for the scale of miniatures I intended to use. The material only comes in 2-foot widths so if one was planning to build a screen for miniatures which had a dimension greater than 2 feet in any direction, two or more pieces must be cut out and fitted together puzzle-fashion to fill the area desired. For my first screen I tried this, but it was almost impossible to disguise the edges of the 3270 where two pieces are butted together. These joints show up as discontinuities in the projected background plate. To avoid this problem, I decided to use a single piece of 3270 and make a 2 ft. by 3 ft. screen.

The Scotchlite has to be peeled off the paper backing that it comes on and carefully mounted onto a rigid, flat surface. My first attempt was to make a screen which could be hung on the wall. I fastened a smooth piece of masonite to a plywood board. To apply the Scotchlite, I found it best to peel off the paper along one edge and stick it to the edge of the masonite. Then, I slowly peeled off the rest of the paper and pressed the Scotchlite with a squeegee to smoothly adhere it to the board. The important thing is to keep moving once you start peeling it off. If you stop, creases will sometimes develop at the point where the paper and the Scotchlite are separating. Once Scotchlite sticks, it cannot be moved. However, I discovered that a thin layer of soap and water on the surface where the Scotchlite is applied (except glass) will prevent sticking long enough for precise positioning and smoothing out of ridges and bubbles that could occur.

Unfortunately, the wall screen turned out to be physically inadequate, for it made the positioning of lights and the accessibility to a foreground set and miniatures quite difficult. A new screen was made which was an improvement in many ways. This one was mounted on plate glass (a much smoother surface than masonite) and was in a frame on a homebuilt wooden stand. In this way, the screen could easily be moved about and able to stand upright anywhere. Lights and related equipment could be placed behind the screen to provide backlighting on foreground subjects. Also, the access to the foreground objects on a miniature landscape set in front of the screen was much easier. The screen could even be removed completely from the set to allow convenient maintenance on either the set or the screen without disturbing the set. The screen could also be raised or lowered on its base to fit the needs of the foreground set-up and its perspective as seen by the camera. This portable screen seemed to be a most flexible design. Total investment in the 2 ft. x 3 ft. screen was about $25.00.

The beam-splitter is a Titanium Oxide -coated mirror, which is designed to have a 60% transmission of light and a 40% reflectance. These mirrors cost about 8 cents per square inch. The mirror that I used is one foot square and is mounted in a wooden frame with a flat base. A tripod head for the camera is bolted into position on this base. This unit (camera and mirror) is then adjusted to align with either the slide or motion picture projector.

To try out this new screen and front projection, a short film demanding a variety of special visual effects was written and put into production. Richard Anderson, a friend of mine, was building a wire and latex dinosaur which he was intending to use for an animation project. Together, we decided to use his dinosaur in combination with the front projection process to create a short science fiction comedy in 16mm. The resultant 7-minute film was ROD FLASH CONQUERS INFINITY.

Our goal in ROD FLASH was to combine both live action photography and dinosaur animation in the same shots. Front projection was to be used with both 35mm slides and 16mm photography as backgrounds. For the still backgrounds, 35mm transparencies were shot on both Kodachrome and Ektachrome stock. The motion picture backgrounds were recorded on Commercial Ektachrome 7252. The

(please turn page)

Below: A typical front-projection set-up. (Scotchlite screen not visible here). The black cloth beyond the silvered mirror prevents unwanted reflections.

Photo Jim Caldwell

transparencies were projected by a carousel projector and the 16mm material was projected frame by frame with a Kodak Analyst II projector, using a 500-watt bulb. Both types of images were re-photographed off the front projection screen by a 16mm Beaulieu camera. Tests were shot for each background plate using different f-stops to determine the best exposure for each scene. To minimize the problem of visible grain, particularly with the 16mm backgrounds, it is important that the maximum possible picture area in the original background plate be the area re-photographed off the screen. If, for instance, the camera zooms in to record an enlarged portion of some area of the background plate, the grain will be re-photographed proportionately larger. The actual granularity of the Scotchlite can also become noticeable at close distances, particularly in areas with a uniform tonal quality, such as the sky. To best avoid all of these problems, careful thought must be given to the composition, lighting, and perspective in the scene. You must have in mind exactly what background and what foreground will later be combined in one shot. Here, a story board is an absolute necessity, so that scales, distances, and camera angles can be planned precisely.

In ROD FLASH the dinosaur was to appear to actually be in the scene with people, behind rocks, emerging from a cave, etc. For shots showing just the creature, 35mm slides of various backgrounds were utilized. Since these 35mm backgrounds were being re-recorded on 16mm, they gave excellent quality, particularly when re-photographed in their entirety. For each slide, the studio lighting of the dinosaur had to be arranged so that it matched the directional characteristics of the sunlight recorded in the background plate. The lighting is a very important factor in creating the illusion that the dinosaur is "in the picture." For the motion picture work, the characters were photographed on location, fighting an imaginary monster. This film was developed and threaded up into the analyst projector, then re-photographed frame-by-frame off the front projection screen in juxtoposition with the miniature dinosaur. The 9-inch high dinosaur stood in front of the screen and was animated to correspond to the actions of the people in the picture. Small rocks and bushes were placed in front of the miniature to help establish the illusion that it was part of the background picture. Even though rocks used on the set were taken from the actual location where the backgrounds were filmed, they had to be painted so that under studio lighting conditions their color matched the rocks in the background image. To place the dinosaur into the picture, it was mounted on a 5-inch by 1½ inch high wooden base. The front edge of this platform was covered with a piece of Scotchlite. Thus the background plate was projected onto this "foreground" screen as well and was therefore rendered invisible. The dinosaur thus appeared to be "floating" against the background plate. The camera, seeing only two-dimensionally, helped to "ground" the miniature into the scene. The first problem inherent in this technique is that of maintaining projector focus on both the background screen and the foreground screen. In addition, this closer screen will reflect an even brighter image than the background screen because the light is more intense at the point nearer the projector. Thus, the dinosaur base must be placed as close as possible to the screen to maintain focus and similar brightness with the background. If the foreground object gets too close to the screen, however, then some of the studio lights may cast noticeable shadows of the

Top: Ben Burtt's set-up for the dinosaur scenes in ROD FLASH. Bottom: The same shot as seen through the silvered mirror, with image-direction reversed. Note thin line going down dinosaur's neck and back, due to improper alignment of the lens—something to be aware of when shooting with front projection.

object onto the screen. This arrangement will necessitate critical positioning of lights and miniatures with painstaking care. The use of foreground screen was also employed to hide the base which supported the spaceship when it flies in over the landscape and lands. The success of this method depends primarily on keeping the foreground Scotchlight screen precisely aligned at 90° to the optical axis of the projector, or a thin shadow line will appear at its edges. This effect in ROD FLASH is not perfect, for a small line does appear. Another use of "frontal" screens for a different effect is employed in the scene in the interior of the spaceship. Many small discs and rectangular pieces of colored Scotchlite were pasted on a "control panel." A colored pattern was then front projected onto these individual screens, as well as the background screen, and they lit up to resemble little dials and indicators, adding production value to what was essentially a non-existent set.

One interesting aspect of front projection discovered during the making of ROD FLASH CONQUERS INFINITY is a technique which I refer to as "front reflection." The mirror used as a beam splitter in a typical front projection set-up will also reflect into the camera lens any light reflected off the surface of the glass on the camera's side of the mirror. Normally these extraneous reflections are eliminated by hanging black velvet in the room on that side of the mirror which is picking up reflections. However, I found that objects placed and lit so that they are deliberately reflected in the glass are effectively superimposed over the image on the front projection screen. Taking advantage of this "double-exposure" technique, the ray gun blasts, the rocket flame, and the titles of the film were superimposed by front reflection at the time of shooting. The ray gun blast, for instance, was no more than a narrow slit cut in black posterboard and covered with a red gel. When back lit and lined up properly, the reflection of this bright red line was superimposed over the muzzle of the ray gun, and animated frame by frame to match the action in the front projected image. The titles were created by reflecting a back-lit Kodalith negative off the glass and positioning the graphics in a proper location. By intervening a piece of black cardboard between the Kodalith negative and the mirror, the graphics can be made to wipe-on and off in a variety of forms.

Many problems were solved in the production of ROD FLASH, but there are obviously still some improvements which could be made. One particular weakness in the front projection effects is the frequent mis-match of contrast between the front projected motion picture image and the foreground objects. This problem seems to have arisen from several sources. First of all, some of the background material was, unfortunately, slightly overexposed when it was re-photographed. Secondly, the use of the Commercial Ektachrome 7252 original camera film (a low-contrast print stock) as the material to be front projected was not the wisest choice. My thought was that using the 7252 original would have two advantages: first, the composite photography would only be one generation away from the original, thus maximizing picture quality. Secondly, it was evident that contrast would increase by re-photographing footage off the screen, so it seemed that the low contrast 7252 original would be the best source to start from, for an increase in contrast might be minimized by "printing" from 7252. However, this fact was not evidenced by the washed-out looking results.

My feeling now is that it might be wiser in the future to not use the low contrast original for front projection, but an Ektachrome or Kodachrome dupe instead.

If a brighter projection bulb had been available, certain effects would have been improved. A brighter image would allow the camera lens to be stopped-down, giving an increase in depth of field. The foreground objects could then be pulled out further from the screen, and the problem of studio shadows on the screen would be eliminated. Some light which does tend to flatten out the front projection image could be kept off the screen, preventing an additional component of washout.

Certainly, the advantages and potential of the front projection process to the budget-minded filmmaker are terrific. He can achieve certain effects with equal quality to that of rear projection, blue-screen, or sodium vapor, with far less the cost. The basic principle has been known for some time, but a full exploration of the range of front projection techniques has only begun. I have a notebook full of ideas for further experiments, modifications, and off-shoots of the process. I feel that some day front projection will achieve a much greater status among the professionals than what it has at the present. ■

Please turn page for info on Scotchlite, and a biographical profile on Ben Burtt.

Below: A composite front projection scene from ROD FLASH, as Rod (Ben Burtt) "battles" the dinosaur.

Scotchlite is available from the following companies:

Electronic Flash Backgrounds, Inc.
535 Jon Lane
Des Plaines, Illinois 60016
(Phone 312-299-6320)
This company will sell full screens or pieces. No minimum amount. Last known prices: $3.14 per square foot, unmounted; $6.00 square foot, mounted. Write or phone for current prices.

Photo-Control Corporation
5225 Hanson Court
Minneapolis, Minnesota 55429
(Phone 612-537-3601)
Remnant pieces sometimes available at $3.50 per square foot, unmounted; $9.00 per square foot, mounted.

Lumi-Tek, Inc.
2200 Lehigh Avenue
Glenview, Illinois 60025
(Phone 312-729-8820)
Minimum order: 2 x 8 foot screen at $54.95, plus $2.00 shipping.

Ben Burtt, born and raised in Syracuse, New York, made his first film when he was 10 years old. Like most amateur offings his childhood productions were mostly comedies and superhero/horror spoofs. Everyone has different reasons for being involved in elaborate amateur filmmaking, but Ben offers this theory about himself: "I always had a penchant for play-acting and living inside of my imagination. I guess part of my desire not to "grow up" was to grow into motion pictures, where I could still put on costumes and carry a spacegun and run around acting out various fantasies."

ROD FLASH was Ben's first seriously made 16mm effort involving a story and characters. Earlier he had made a creation-of-the-universe film, GENESIS, also in 16mm. Both of these films were used as samples to show Universal producers who were looking for a special-effects person a few years ago for the TV movie, KILLDOZER. Ben got the job of creating the opening sequence for the film, which depicted a planet exploding and a meteor fragment zooming down to the African Continent on earth. Ben shot this sequence in 16mm and Universal blew it up to 35mm and cut it on as the opening of KILLDOZER. Oddly enough, the KILLDOZER producers had originally planned to use stock shots from their mid-50's sci-fi film, THIS ISLAND EARTH, for the sequence.

Incidentally, the meteor for that sequence was merely a piece of sponge which had been cut to size, painted, suspended on a black thread (against a "star" background) and photographed with a zoom lens. The "earth" in the scene was a glass sphere painted flat white, with slide projections on it. The slides were of paintings of earth continents that Ben had rendered.

For most of his life Ben Burtt has had a special interest in sound and music effects. He amassed a huge collection of various sound effects and musical pieces over the years, and his "hobby" finally paid off. Three years ago Ben got the job of engineering/creating all of the special sound effects for STAR WARS. Although Ben contributed many more sounds, his delightful computer gibberish for Artoo-Detoo are obviously the most favored and famed sound effects in the entire film.

REVIEW:

THE ELMO 1000S CAMERA

by

James Caldwell

With the myriad of single system sound cameras being offered on the market today, the serious filmmaker has a tough time choosing one which will fit his needs and still offer him the quality he deserves. Although Elmo offers quite a few different models in its line, I decided to go with the top: the 1000S. Perhaps my evaluation can help someone limit or narrow his choice.

The 1000S is priced in the upper middle scale of the sound camera price structure. Although retailing at about $750.00, it can be found at discounted prices usually below $500.00. Even at that price, one would expect a lot of camera. And in this regard the Elmo both delights and disappoints.

Elmo chooses, like many other manufacturers, to put the batteries (six AA's) in the handle. Nothing wrong with that, except the handle isn't removable or won't fold up next to the camera body which means the camera must sit precariously on its handle when mounted on a tripod. To be fair, the camera is well balanced and can even be sat on a level surface without falling over. Although I still like a low profile on a tripod, I can't complain about an unsteady picture due to the handle. The handle is a bit hefty, though, and if you have a small hand it may become uncomfortable to hold after a long shoot.

The body of the camera is a rugged black plastic with the controls fairly logically located. The only thing that really bothered me was the fact that the automatic zoom controls on the left hand side of the camera seemed to be reversed. The button for telephoto is located to the rear, and the wide-angle is located forward. Every other camera I have ever used has these two the other way around. This doesn't take too long to get used to, but could be a problem if you use several cameras.

The rest of the controls (except for the filter switch) are on the right hand side of the camera. At the bottom is a run/lock switch for continuous run or for preventing the camera from accidentally being operated. Next is an external battery plug (nice for cold weather filming). Near the middle are a 24/18 fps switch, a zoom control for fast, slow or manual zoom, and a diopter eyepiece adjuster for those who wear glasses. At the top are an automatic fade button (both picture and sound fade), a monitor button for sound monitoring before the camera is run, an ALC and volume control (more about that in a minute), and plugs for remote run, microphone, auxiliary input, and earphone.

On the rear of the camera are a battery check and a footage counter which has a unique feature. It has a separate needle which you can move manually so if you use a partially used roll of film after it has been removed from the camera, you can tell when it should reach the full fifty feet. On the upper top is another microphone input for an optional boom mike mounted on top of the camera.

The sound circuit is excellent. The sound quality at both 18 and 24 fps is very constant and clear. The camera is capable of taking two microphones at the same time in addition to a tape recorder or phonograph. Elmo has a unique feature that when you pull the trigger, there is a momentary hesitation for the sound levels and exposure to set before the film is set into motion. This means there is no 'blurp' on the soundtrack or hot frames.

The so called volume control mentioned above is practically useless. It is NOT a volume control. Rather, it controls the recording head AFTER the ALC circuit has set the sound levels. In other words, you cannot boost the recording level any, just lower it. The only purpose you can really use it for is as a sound fade control.

One more thing about the sound capabilities of the 1000S. Although I may have received a lemon, I would rather mention this than let it pass. After using the camera for three months, the sound circuit broke down and stopped recording. To be fair, Elmo honored their warranty (which covers two years!) and repaired it in a couple of weeks. It was still a hassle nonetheless. Also, in the warranty card, Honeywell's address is given as a repair station. Honeywell notified me that they haven't repaired the Elmo line since 1973.

The optics of this camera are its one big asset. It boasts a 10-to-1 (7-to-70 mm) zoom with Macro focusing. And that Macro goes in at the 70mm end of the zoom for the closest possible picture. The lens is very sharp and the manual zoom is quite smooth. Although I would personally like a lens that offered more on the wide-angle end (at least 6mm) and a zoom throughout the macro setting, I gladly forgot about those for a lens as sharp as this one is.

The viewfinder is also very clear and sharp. It offers a green running light, a red recording light, the f-stop of the lens, and a little red arrow that pops into view should the film end or jam. A split image ring in the middle of the viewfinder is supposed to help with the focusing, and although better than most methods, it is still inadequate for most situations.

Since the Elmo 1000S is a sound camera, there is one more thing I should mention. The motor is one of the quietest in a Super 8 camera — sound or silent— that I have ever heard. This is quite important if you will be doing a lot of filming indoors in acoustically live rooms where the camera motor could be picked up on the soundtrack.

All in all, I have been very pleased with the 1000S. I would like for it to have a 1/frame contact switch for double system recording (which the Elmo 110R has). It would also be nice if the camera had a 1 frame at a time plug for animation — a consideration if this will be your only camera and you wish to do animation. I would gladly trade the little blinking light (cue light) on the front of the camera for just one of these. But I can't, and if you want a good single system camera with sharp optics, no frills, then I would not hesitate to recommend the Elmo 1000S.

The camera comes in its own nice carrying case with all necessary straps and a fairly decent dynamic microphone. Also included are the filter key for the built in type A filter, lens hood, eyecup, and a very poorly written instruction manual. Elmo also sells a line of options that range from filters, headphones and a 9V power pack to a boom microphone and remote control units.

■

AFTERMATH

Article & Photos by
DAN NOGA and GARRY FERRINGTON

In our last film, IF TIME IS A CIRCLE, one of a pair of astronauts successfully ejects from a meteor-damaged spaceship which passed through a time warp into the Earth's past. A companion astronaut was left struggling in the cabin of the spaceship, apparently bound for a certain death as the craft plummeted toward the ground.

AFTERMATH continues the story of the trapped astronaut, as he regains control of the ship and takes it back through the time warp. He ends up in New York City in the year 1985 and discovers that Manhatan Island — and the rest of the world — lies in the decay of a past atomic war.

The astronaut subsequently discovers a race of survivors who live in the depths of the New York subway system. They are being lead, however, by a psychotic. The astronaut finally convinces the others in the group that they can escape from the nuclear ruins to another time and place, and just as they are about to enter his craft, the psychotic appears and machine-guns them all to death — and is left standing alone in the sudden realization that he is now the sole occupant of a lifeless, burned-out planet.

Making The Film

After polishing the script of AFTERMATH into something that could be filmed, only two full-scale sets were needed: a subway car interior and a tunnel interior. Other settings were created by special effects, except the spaceship set, which was left over from our earlier film, IF TIME IS A CIRCLE.

An 8-foot long wall and a 5-foot projection wall were built to make up the subway car interior. Hardboard was nailed onto a strong wooden frame which extended from the floor to the ceiling (in this case the rafters of my basement). The set was painted with orange house paint, dressed with modernistic chairs purchased from a discount department store, and other paraphernalia. Black velvet was hung outside the door and two windows, to simulate unlit subway tunnel walls.

The subway tunnel itself, as envisioned by the script, would have been twenty feet long by thirty feet wide, but eventually a smaller version was built inside of my garage. The garage had an open loft where our camera could be placed for a high-angle view, desirable for cinematic reasons. Subway tracks were imitated by two-by-fours painted silver and spray paint "dusted" black. For the tunnel floor we used a great amount of real dirt, and old bricks, also dusted black. The subway wall was a bedsheet covered with a gluey enamel, then draped over a workbench that was arranged to leave a rough "look" when the glue dried. The stiffened sheet was coated with gray, then dusted with brown and black. The shots of this set were lit carefully to hide rough edges, but they appeared convincing, except for an artificial rock an actor bumped with his foot in the final take.

The spaceship set consists of a full cabin interior, six feet high, eight long, and five wide; about half of the projected fuselage, and two-thirds of one wing as viewed from the front. The set is complete inside, and outside. It was made as a self-contained unit to save space.

A wood framework formed the base of the set, and a great sturdiness was insured because the frame was bolted together, strengthened with wood blocks, and in some portions tightened with steel bands. Outside walls were panels of plywood, doubling as interior walls with the wooden framework designed and disguised into the cabin's decor. The front end was made of hardboard. To make the curve on the bottom of the front end, eighth-inch hardboard was bent over the frame (see drawing), wet down with warm water, wrapped in damp towels, heated with a steam iron, and clamped down into place in graduated steps (altogether a three-day process). The comer curves were made of plastic car-body putty. Textured paint was painted over the frame to give the wood an unsmooth, metallic texture. Silver housepaint completed the exterior.

The design of the spacecraft's interior was based on a reasonable amount of comfort and logic. The wooden frame was covered with blue vinyl, and special objects—computer, radio, and similar equipment—were colored black or brown to stand against the background without jarring it.

Below: The tabletop miniature of the ruined subway shaft entrance.

In the film each astronaut had a separate job to do, and the instrument panel was separated accordingly. The pilot's side held two throttles, a scanner, power switches, and landing-gear controls. The Commander's side held the central computer's voice-actuated controls, the computer's readout screen, camera equipment, a destruct switch, and an ejection switch.

The spaceship's back portion included a console on either side, with space between for the ship's occupants to perform their duties.

Suits and special equipment were stored here, too. The suspended-animation chamber was presented as directly behind the airlock doorway, but was built separately.

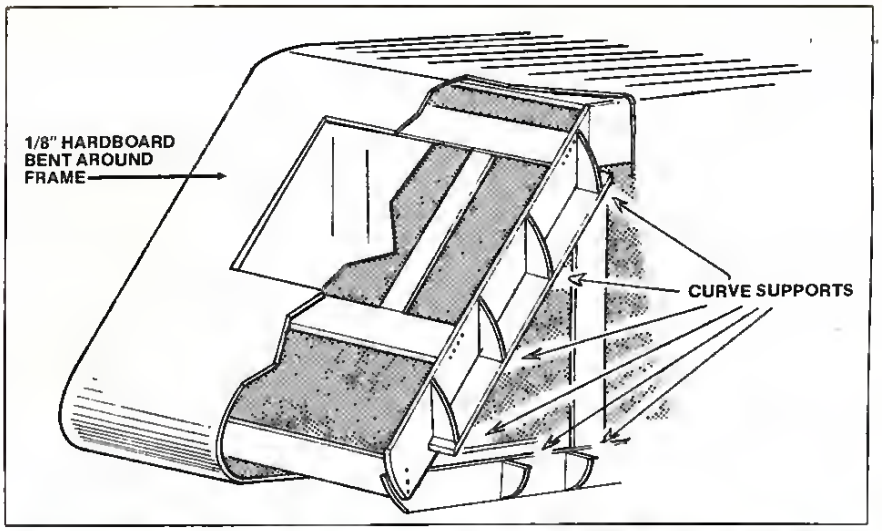
Some devices purchased for the interior included the front of a Burroughs computer panel, actual aircraft throttles, and a large amount of switches of many kinds. The small computer panel with flashing lights was scratch-built to hold sixty-four square sections with a light inside each one of them, each light separately connected to a terminal with a rotating arm. Pin connections allowed the wires to be changed around on the circle of rotation, if desired, to alter the pattern of blinking lights. The readout screen on the pilot's side of the panel was the front of an Azimuth gunsight, behind which we put a rotating disk with a wedge sliced out, backed up with crumpled aluminum, and connected to a clock motor to mechanically simulate the radar effect.

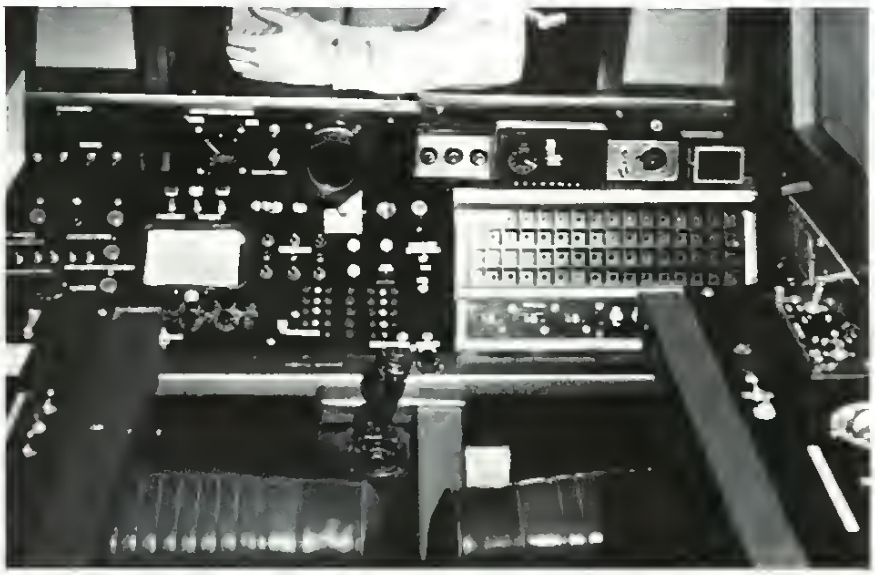
Special Effects

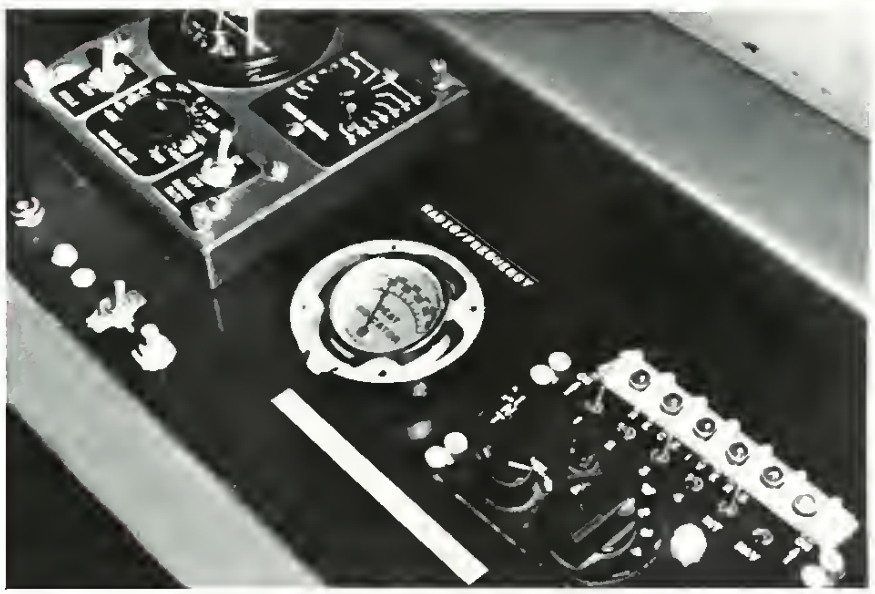
Special photographic effects were used to create the time-warp sequence, the blasted city, and the subway tunnel. These scenes required a great deal of ingenuity and practicality, as the super 8 film and its accompanying equipment did not offer many obvious possibilities. Mattes and double-exposures, for instance, were unavailable, and any transparencies had to be kept to a size no larger than two-feet-by-two-feet.

The miniature of the city was made of plastic buildings, melted with matches and painted, then topped off with small cars, light poles, and a brick wall that represented the side of a factory. The models were set in Celluclay, which was spread wet to resemble streets and sidewalks, and sprayed all over with flat black paint. A commercial slide of New York City was rear-projected behind the miniature,

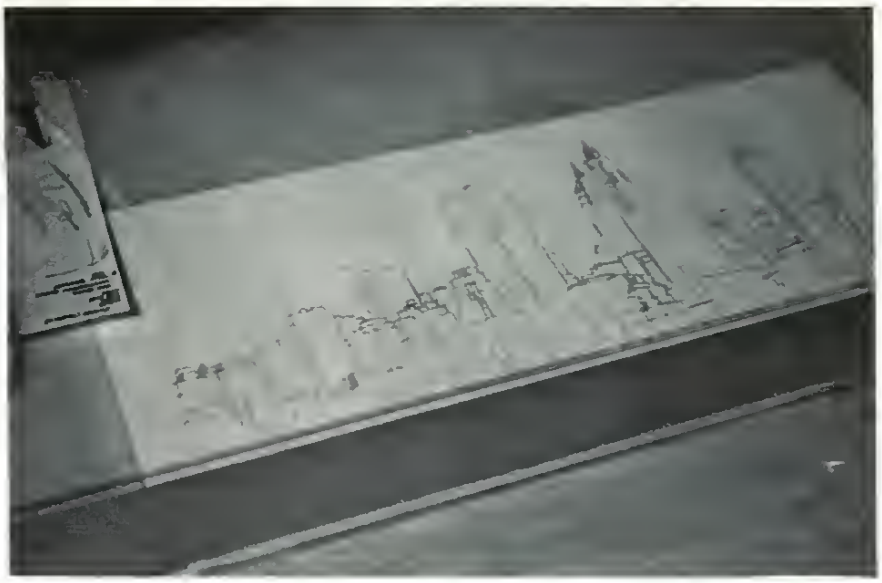
(please turn page)

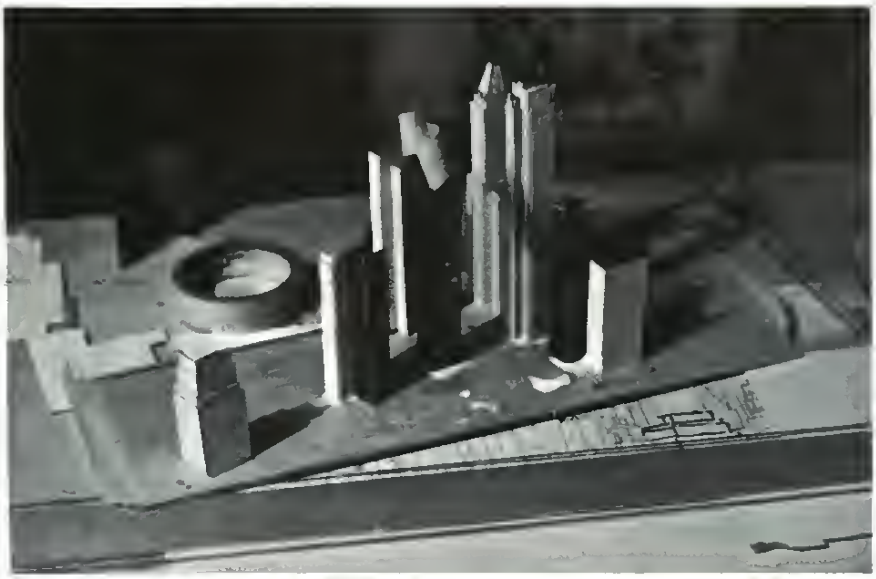






Top: Cutaway diagram showing construction of the full-scale spacecraft. Middle: View (looking forward) of the pilots' control panel inside the craft. A lot of intricate electrical wiring was required for the various switches and lights, which all "functioned." Bottom: Close view of a section of the control panel.





Top: Tracing of New York City slide projection. Middle: Miniature buildings under construction, made of plastic and balsa wood. Bottom: Buildings with plaster and melted wax added, for "devastated" appearance.

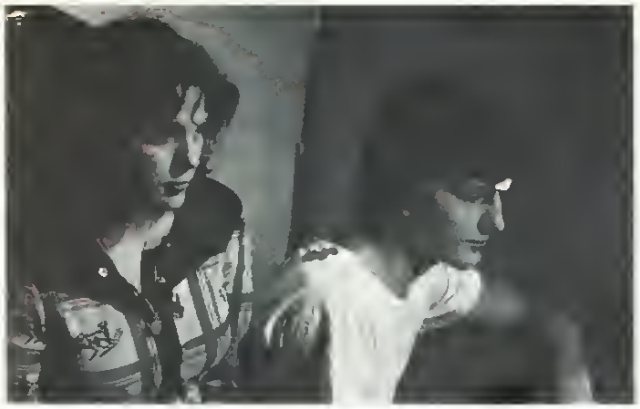
but later was discarded because there was no good way to make the photograph look like a city that had been demolished. A "flat" miniature was designed by tracing the slide from a projection, and then made into a model out of illustration board and plastic, plaster, dripped wax, and dusted with flat spray paints. A sky drop completed the miniature city.

Lighting the model city was a ticklish affair. Incandescent lights were placed above and off to both sides for fill, which made the miniature look exactly like a miniature. On a chance trip to a photographic supply store, we picked up some 500-watt blue photofloods on the theory that a wide beam of blue light would be a good assist in simulating sunlight. The idea worked.

The subway tunnel began with a drawing which included a miniature rear-projection in its design. This miniature was about eighteen inches long, twelve inches wide, and ten inches high. A Star Trek "Galileo" model was altered in a few ways, painted yellow, lettered with dry transfer letters, pinstriped with model airplane striping tape, and dusted with flat black spray paint. The walls were made out of balsa wood brick, sloped inward to exaggerate the perspective. Other miscellaneous touches included girders, wires, 0-guage railroad tracks, and Celluclay. Tiny light bulbs, wired to a Lionel transformer, illuminated the tunnel ceiling, which was made of rough textured illustration board. The projection screen at the rear was perfectly accessible: just inside the model, completely open at the projector's end.

During the course of the film, an actor had to atomize a brick with a laser pistol. Either a matte or a superimposition was out. The film cartridge could not be backwound, so a glass shot was the only way open. The beam was painted onto the glass with white acrylic paint, between the gun and the target, which were already aligned. An incandescent light next to the camera provided the illumination, separate from the background set so the beam could be over-exposed. The glass was only a few inches from the camera, to put the beam out of focus, which made it appear transparent.

The time-warp was the hardest problem to solve. Dennis Essa, a chemistry student, created a number of varying shots of colorful chemicals mixed with fluids to utilize as backgrounds. The spaceship had to be included in these shots, but again, there was no way known to us to backwind a super 8




Top, left: Fran Cracchiola and Barry Domenick (the astronaut) on the full-scale spacecraft set. Top, right: One of the miniatures of the ruined city, with a slide projection in the background. Bottom, left: Dan Noga makes a final adjustment to the miniature subway set. Bottom, right: Dan sets up cardboard cutouts which represent a silhouetted view of New York City.

cartridge (one small step for Kodak, one giant headache for filmmakers). The principle devised for these shots later formed the basis of all but two shots of the spaceship in action. The model was photographed as a still in a variety of positions, then each spaceship was cut out of the print with an X-acto knife, and, when required by the shot, retouched with acrylic paint. The spaceship was glued onto a large sheet of glass. Then the flat spaceship, placed in front of the rear-projection screen, could be composited with the chemical effects. By moving the glass over a flat table, the ship was made to travel across the time-warp quite smoothly. In addition to the chemical stuff, slides of flashy, off-the-wall artistic designs were also projected onto the process screen which created a double-exposure effect without actual double-exposure. The chemical-slide combination had the advantage of an organic look, something that was noticed and taken advantage of. The warp had a feeling of something "alive."

Variations of the glass shot were also used at the beginning and end of the sequence. The very first time-warp shot envisioned the spaceship's flight into a "hole" in the sky. A cardboard backing was painted to resemble a dark sky, a hole was cut out of it, and a 200 watt incandescent light was placed behind the hole. When moved straight towards the highly over-exposed light, which glowed enough to hide its placement, the ship appeared to fly right into the blazing "hole." To show the ship's exit from the warp, another backing was painted to resemble outer space, a large sheet of glass was painted full of stars to create an impression of depth, and the backing had a hole cut out of it into which the rear-projected time-warp was fit. As the ship moved across the warp over the hidden dividing line and in front of the space backdrop, it appeared to fly out of the warp and into space.

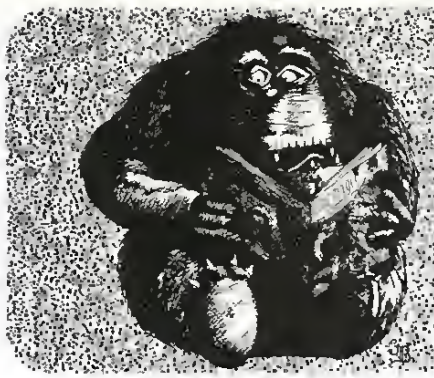
Another shot showed the spaceship's near collision with the top of a forest. The model ship was hung on nylon thread, which was fixed at the top to a "Hot Wheels" race car on "Hot Wheels" track suspended between basement rafters. The idea worked, but the shot failed, due to a poor job of lighting and a less than impressive miniature of the forest.

For the final scene, in which Harry machine-gunned everybody, an attempt was made to place bullet "hits" in the wall of the subway car. Holes were drilled in the wall, which was open at the other side, and plaster plugs inserted with wires in them—all connected to a stick which theoretically would, when pulled, rip the plugs out of the wall in the pattern a machine gun would make. The plaster plugs ripped out on one side but, unfortunately, not the side that faced the camera. Stop-motion was then tested. A plug was removed, a few frames of film exposed, another plug pulled, a few more frames exposed, and so on. The result looked exactly like a stop-motion shot, so the idea was finally dropped completely. ■

Dan Noga is a 21 year old filmmaker in his second year at Wayne University in Detroit, Michigan. His interest in film began at age 12, when he used to experiment in special effects with his father's old 8mm camera.

Dan and co-author Garry Ferrington are currently working together on a 16mm cartoon animation film. Garry has been making short films using model and cartoon animation since 1968.

Both filmmakers reside in East Detroit, Michigan.



PRESS NOTICES

Have a horror, science fiction, or fantasy film currently in production? Send the details about it (title, names of actors, effects, type of film, etc.) and, if available, a publicity photo to: PRESS NOTICES, c/o CINEMAGIC, P.O. Box 125, Perry Hall, Maryland 21128 and we'll include a write-up about your film in this section.

Rick L. Moore of Ventura, California is currently working on his third stop-motion film, VISIONS OF A 12-INCH NIGHTMARE. This film is actually a third re-make of a similar film made in 1973. The story centers on an animated model affectionately called an "Obierayforth."

EARTH 3000 is being filmed by B&J PRODUCTIONS of Acton, Massachussetts. The super 8 color film is a science fiction comedy about a scientist and his companion robot who flee the destruction of earth, and go back into time. The special effects include laser shots, stop-motion animation, and intriguing make-up for the robot. The cast includes Jeff Jewison, Roger Towne, and Jamie Burke, who also created the effects and make-up.

Mark Behrend of Brookings, South Dakota, is planning an elaborate science fiction film (title not yet decided) that will contain many special effects and an intricate full-scale set. Co-producers of the 8mm color film are George Perkins, Ken Fredrickson, and Rich Woolworth. The film will be 15 to 30 minutes long and is slated for a Spring, 1978 completion.

LIGHTHOUSE PRODUCTIONS of Livonia, Michigan is lensing CRAGERNIA 7602 A.D., a film about a drab 1984-type world and one man's attempt to buck the system. Bill Boles will handle effects such as lasers, superimpositions, miniatures, matte shots, and a possible stop-motion model. The film will run about 10 minutes, in 16mm.

Scott Farris of LaFollette, Tennessee, has been into production on THE BEAST IN THE CELLAR for more than a year. The story is about a monster that lives in the cellar of an old mansion. Several families move into the house, with disastrous results. Rena Farris, Connie Miller, Sandy Madron, and David Deavours star in the super 8 sound film.

Michael Rahn's RAHNAMATION PRODUCTIONS of Dayton, Ohio is currently working on three films. BOBBY'S DREAM: FARRAH FAWCETT-MAJORS will employ two-dimensional cut-out animation with a live actor. THE ALMIGHTY KONG will resemble the original KING KONG in many ways, and has been in production since February of 1976. Matte-shots and several animation models are being used in this 45-minute film. COMING ATTRACTIONS will be an animated montage of scenes from films such as PHANTOM OF THE OPERA, FRANKENSTEIN, and THE EXORCIST. All three films are 8mm color/silent.

An amateur version of LOGAN'S RUN is being made by H.M.&J. PRODUCTIONS of Graham, Texas. The super 8 color/sound film will run one hour and will be titled LOGAN'S RUN, JR. Danny Johnson will play "Logan" and Connye Miller will play "Jessica." Alan Huffine is producing and directing, and Mable Caldwell is designing costumes.

EPIC PRODUCTIONS of Springfield, Missouri is currently producing BUCK COSMOS: SPACE RANGER, a science fiction farce set in the year 2299. Robert Berlin portrays the title character—a space ranger on a mission to stop an interplanetary conflict before it starts. Mutated aliens, meteor showers, and an evil wizard threaten to stop Buck before he completes his mission. The film includes a full size spacecraft interior set, four large miniature sets, multiple exposure effects, and freon-powered spacecraft takeoffs. In the cast are Jon Bell, Chris Powers, Claire Dwyer and Mark Toliver. Special effects for the super 8 sound film are being handled by Tom Hudson, Steve Dailey, Brian Jacobsmeyer, and Jon Bell. Completion is set for the early part of 1978.

DAYDREAM is being made in super 8 color/sound by Brian Edgar of Oakland, California. The film is a fantasy about a college student who, bored with a sociology lec-

This unique creature is called a "Regensitis," a stop-motion model created by Chris Anderson of San Francisco, California.

An addition to the feature film, THE ALIEN FACTOR, is a new "Lemoid" sequence by animator Ernest D. Farino. Left, the ball/socket armature for the beast was constructed by Ernie in one weekend, due to the tight deadline imposed upon him. Right, Ernie applies latex skin to the model, which has foam rubber glued and shaped to the armature. The final 2-minute sequence caps the film's climactic ending.

ture, lapses into a daydream where he pictures himself as a dynamic hero, "Kid Hanson." Kid is out to stop the diabolical "Dr. Yes" (ine reality the sociology professor) and save the innocent young heroine (a fellow classmate). Special effects include a stop-motion dinosaur, flying sports cars, giant tarantulas, and various other trickery conjured up by Dr. Yes. The stars of the film are Laura McCutcheon, Mark Seyfried, Kim Shugart, and Brian Edgar.

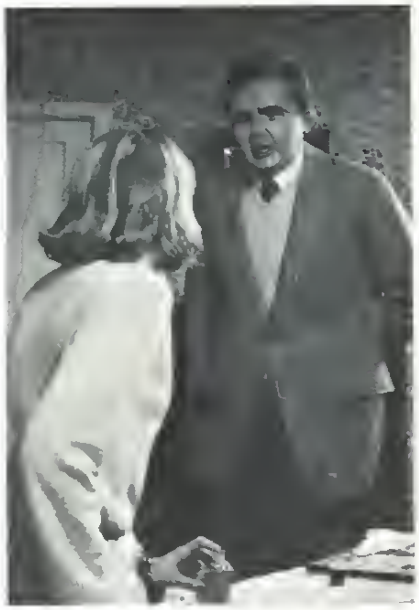
GALAXY FILM PRODUCTIONS of Bridgeport, Connecticut is doing pre-production work for a theatrical feature entitled, RUDE AWAKENING. The film, to be shot in 16mm for a 35mm blow-up, will be a science-fiction spectacular with many visual effects, spacecraft, opticals, and so on. Producer Robert Ondira is currently gathering a cast, which might include a name "star." Filming is to commence this spring.

Film & Fantasy Publications

CLOSEUP #3—published irregularly; 48 pages; offset; slick paper; B/W cover. Although the newest issue of this stop-motion oriented publication suffers a bit in design quality, the material inside is certainly worthwhile. The entire issue is devoted to KING KONG, old version and new. Despite detailed coverage (including lots of reproductions of old ad mats, publicity materials, etc.) on the 1933 KONG, the most interesting feature is an in-depth interview with Rick Baker, the make-up artist who played the giant ape in De Laurentiis' version. Lots and lots of intriguing insights into how Rick was lied to and cheated out of the credit he deserved. Many nicely reproduced photos, and some line drawings of the "censored" scenes in the original KONG, but the Baker conversation alone makes this issue worth buying. Available for $3.35 per copy from: *David Prestone, 46-16 Marathon Parkway, Little Neck, New York 11362.*

FANFARE #1— published irregularly; 68 pages; offset; slick color covers. This magazine, formerly titled GRAPHIC STORY MAGAZINE, is a MUST for fans of film, television, cartoon animation, old movies, and current cult heroes. The design throughout is superb, with tons of beautifully reproduced photographs, drawings, and comic strips. Some of the features are an interview with MAD Magazine editor, Al Feldstein, in his own right once a terrific comic book cartoonist; an article about "Super Heroes of TV" covering the likes of Batman, Superman, and Shazam, and an additional part to the article all about Lynda Carter, the current WONDER WOMAN. There are also features about Abbott and Costello, and Russell Myers, the cartoonist who draws "Broom Hilda." This magazine is just plain fantastic, and an unbelievable bargain at only $2.00 per copy (or 3

The monster from the independent feature, DEAD TO RITES, produced by the Atlantic Film Group out of Florida. This mask was created by Bill Placko and Fred Ray, and is worn by Rusty Hobart.



Photos by Steve Yeager


Left: George Stover as Bosley Gravel argues with wife Peggy (Mink Stole) in this scene from John Waters' latest feature film DESPERATE LIVING. A fight ensues and Peggy hits Bosley over the head with a liquor bottle. Center: Make-up artist Van Smith applies stage blood to Stover while Ms. Stole relaxes between takes. Right: A bloodied George Stover writhes in pain after being struck by his wife. DESPERATE LIVING is the most lavish John Waters film to date. Shot in 16mm in the Baltimore area on a budget of $65,000, the color production was a year in the making. Distributed by New Line Cinema, the film had a gala sneak world premiere in Baltimore over the Memorial Day weekend and had its theatrical premiere (in blown-up 35mm) in three theatres in New York on October 14th.

issues for $6.00) from: *Bill Spicer, 329 North Avenue 66, Los Angeles, California 90042.*

SPFX: THE WAR OF THE WORLDS—published irregularly; 32 pages; offset; slick paper; color covers. This special 25-year tribute to the George Pal classic, WAR OF THE WORLDS, has been meticulously researched by editors Ted Bohus and Jay Duncan. Many never-before-seen photos are contained, including 20 production scenes in full color. George Pal, Byron Haskin (Director), Al Nozaki (Art Director), and Les Tremayne (the General) are all interviewed. One unique article covers a spectacular amateur version of the film entitled THE CONQUEST OF MARS. Includes diagrams of the Martian war machines and a beautiful front-to-back cover painting by Paul Stinson. Available for $4.00 per copy from: *Ted Bohus, 70 West Columbia Avenue, Palisades Park, New Jersey 07650.*

New Series of Books Announced

A new series of books on science fiction, fantasy, and horror films has been scheduled for publication by Chelsea-Lee Books of Los Angeles. The first volume covering 1940, 1941, and 1942 will be published in the spring of 1978.

Included in the 1940-42 volume will be such titles as THE WOLF MAN, THIEF OF BAGDAD, FANTASIA, DR. JEKYLL & MR. HYDE, and ONE MILLION YEARS BC. More than 125 feature films from all over the world will be discussed, as well as dozens of shorts, serials, animation, and independent films.

Additional volumes will follow at about 6-month intervals, with the first three volumes devoted to the fantastic films of the forties. Ultimately, the series will cover the 1890's to the present in considerably greater detail than any film genre has previously been explored. A total of 25 volumes are planned.

Each volume will contain 80 thousand words of text and about 100 pages of photos. Price for the hard-cover volume covering 1940-42 with dust jacket will be $14.95. A pre-publication price of $9.95 is available through February 1978, from: *Chelsea-Lee Books, Box 66273, Los Angeles, California 90066.*

Collectors Guide

"The Collectors Guide to Monster Magazines" is a new, softbound book which will include cover photos of all the different monster magazines published since 1958 (over 300 photos in all, many in color). There will also be informative articles about each publication, and price guides to buying and selling such magazines. Includes a special Introduction by Forrest J. Ackerman (editor of FAMOUS MONSTERS). Price and additional information is available from: *Collectors Guide to Monster Magazines, 211 Fort Pitt Blvd., Pittsburgh, Pennsylvania 15222.*

Film Expo

The 1978 Los Angeles International Film Exposition will feature filmmaker discussions, midnight movies, a tribute to a major star (who will be in attendance), an animation workshop, and 100 other events. The Expo will be held at the Plitt Century Theatres, ABC Entertainment Center in Century City.

Films in any length and produced in any format (super 8, 16mm, 35mm, or 70mm) with optical or magnetic sound may be entered in the Expo's "non-competitive Movie Extravaganza." Features, shorts, documentaries, animation, experimental, and student films will all be accepted. For details and entry forms, write: *The Direc-*

tor, Filmex, P.O. Box 1739, Hollywood, California 90028 or phone (213) 556-3589.

Balticon 12 Wants Films

The twelfth annual convention of the Baltimore Science Fiction Society, "Balticon 12," will be held at the Hunt Valley Inn in Baltimore County on Easter Weekend, March 24, 25, and 26. For the fourth year in a row, Balticon will have its gala amateur fantasy/science fiction film program. Amateur filmmakers are invited to bring and show their sci-fi, horror, fantasy, animation, and comedy films at the convention, or they may be mailed to Baltimore for inclusion in the program. Films may be in single or super 8 or 16mm, sound-on-film or cassette, or silent (no regular 8, please). If you would like to have your film shown, send some information about it (title, type of film, running time, etc.) to: *Dave Ellis, 4221 White Avenue, Baltimore, Maryland 21206.*

Reader Exchange

I'm interested in writing sf/fantasy scripts and would enjoy corresponding with CINEMAGIC readers with a film on the drawing boards who might consider taking a look at my product. Write to: *Leigh Hanlon, 413 Elias #2, Rock Springs, Wyoming 82901.*

I'm interested in working and corresponding with other amateur filmmakers—especially, but not necessarily, those in the New York-New Jersey area. I'd also like to collect copies of amateur films. Please write to: *Kevin G. Shinnick, 30 Hill Street, Bogota, New Jersey 07603.*

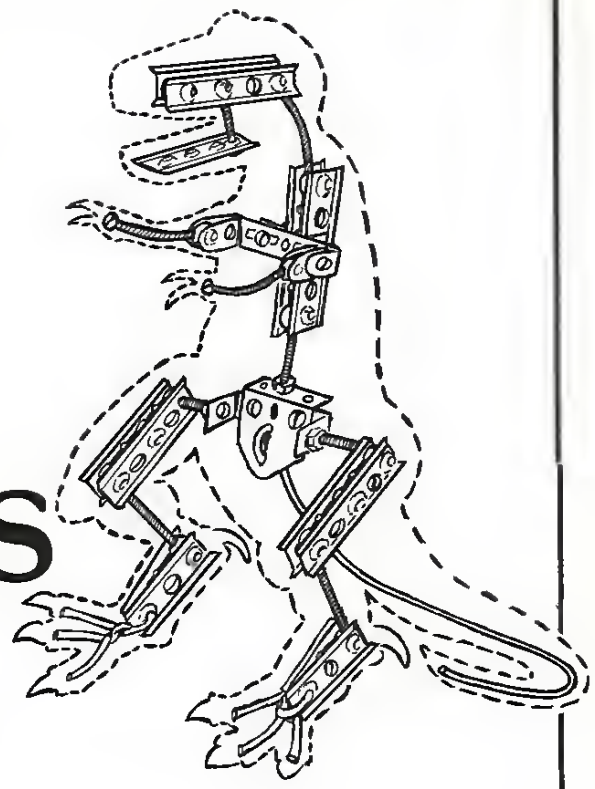
Film Festival Results

Here are the winners of the CLINTON SUPER 8 MOVIE CONTEST, held in Clinton, Ohio this past summer:

First Place	"Music Box" (7:43) by Phil Preston of Trenton, Mich. Scenario: A poignant film on the humanities and inhumanities of two depending upon one another to survive.
Second Place	"Trees" (2:33) by Roger Rodgers of Miami, Florida. Animated-experimental: A humorous satire on Joyce Kilmer's classic poem.
Third Place	"Sorceress" (11:00) by Keith Bowsza of Torrance, California. Experimental: Women play a prominent role where a strange telepathic power overcomes a man's mind.
Fourth Place	"Alive or Dead" (19:30) by Dan Ordal of Sioux Falls, S. Dakota. Scenario: Has the ingredients of the old west; the desperados, the posse and a violent showdown.
Fifth Place	"Arebell" (12:00) by Don Venturini of Eldridge, Calif. Scenario: A beautiful tale of a man and a mysterious woman in a world of their own.
Sixth Place	"The Impotsible Dream" (5:00) by Roger Rodgers of Miami, Florida. Animated-Scenario: Love conquers the impossible when a potted head conjures up a mate.

EASY-TO-MAKE BALL AND SOCKET ARMATURES

by BLADE GALENTINE
(with Britt McDonough)
Illustrations by Blade Galentine
Photos by Britt McDonough



I recently made a film entitled THE LEGEND OF TERRORDON, which utilized four stop-motion models. Each model required a ball/socket armature for smooth movements, and since I had no prior knowledge about such armatures, it became a difficult (but exciting) challenge to find the parts that I needed.

After several weeks of searching various types of stores and supply houses, I finally found exactly what I needed to construct simplified ball/socket armatures. Here are the basic components (see photo) and where to get them:

THREADED BRASS BALLS (used as decorative stop-nuts to hold on lampshades) — available at lamp supply companies. These may come in varying sizes, but I use quarter-inch and half-inch diameter balls. The thread size takes an 8/32 screw.

GILBERT ERECTOR SET — strange as it seems, the "girders" from these toy construction sets are ideal for the sockets of armatures. Each girder has a series of holes within a concave pocket, and luckily enough, these make perfect socket areas for the brass balls. Since there are plenty of extra holes between the sockets you'll use with your ball-stems, there is no drilling necessary for the center connecting screws. The only thing you'll have to do is snip off the squared corners of both ends of the girders, and then grind them smooth (Mongomery-Ward sells a $10.00 grinder which is fine for this work). And, of course, depending on the design of your armature, you'll have to cut the girders to the desired lengths. The "Mark 10" Erector Set will give you plenty of parts to make armatures. When you buy an erector set you will find an order blank inside for ordering extra parts. Sets of the girders are available at very little cost. Erector Sets are, of course, available in all toy and hobby stores.

8/32 THREADED BRASS ROD — these can be cut down to 3/4-inch lengths to be used as the stems or ball connectors. This rod can be easily and neatly cut with a hacksaw. Available from most hardware stores.

LOCK NUTS — used for important joints in the armature which will be subject to the greatest amount of stress, such as the neck-joint for a large-headed creature. These are available in hardware stores for about 15c each.

TAPERED HARD-RUBBER WASHERS — used between the plates midway from either ball/socket end, these washers help tension on the girders and prevent the middles from "sagging" under the strain of the connecting screws and nuts. You may also use plastic pearls or wooden beads (hobby stores) in the same diameter as your brass balls for this purpose.

Other items needed to build these armatures are a standard screwdriver, pliers (or a vise), a pair of tinsnips, a can of silver Rustoleum spray paint, and a few tubes of strong-bonding adhesive, such as "Super Glue" or "Krazy Glue".

Building The Armatures

The first step in creating an armature is, obviously, to determine its dimensions on paper. Once the lengths of all parts are calculated, and you have cut the girders and brass threaded rod to the desired sizes, lay ALL of your parts — including the brass balls, screws and bolts, etc. — out on a newspaper and spray one good coat of the silver Rustoleum. This will protect your

metal parts from the chemical attack of the foam latex formula, and will prevent the armature from rusting. When the entire armature is built, spray it with a second coating of the Rustoleum. Not only will this give you added protection, but it will conform the parts visually, giving you a beautiful, gleaming, silver armature!

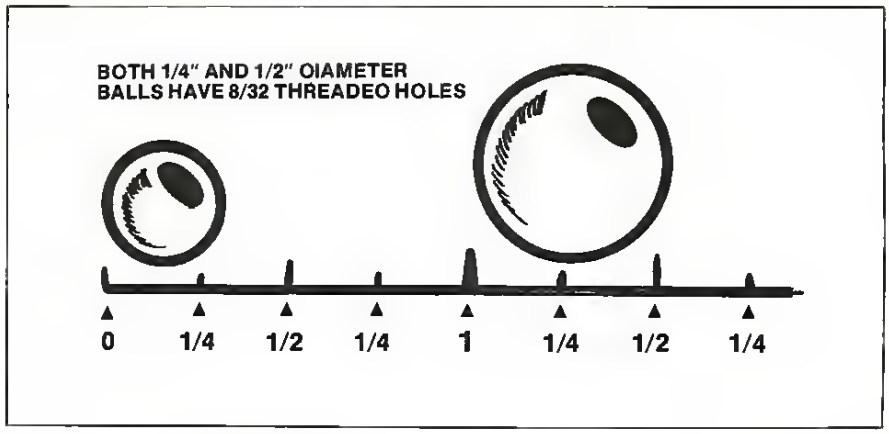
One thing to keep in mind prior to cutting your Erector Set parts: Since the metal is relatively thin, we have found that it aids strength immeasurably by tripling up on ALL girders. Since the holes and sockets are identical, the triple girders fit together nicely when sandwiched. It is not necessary to glue the sandwiched girders together.

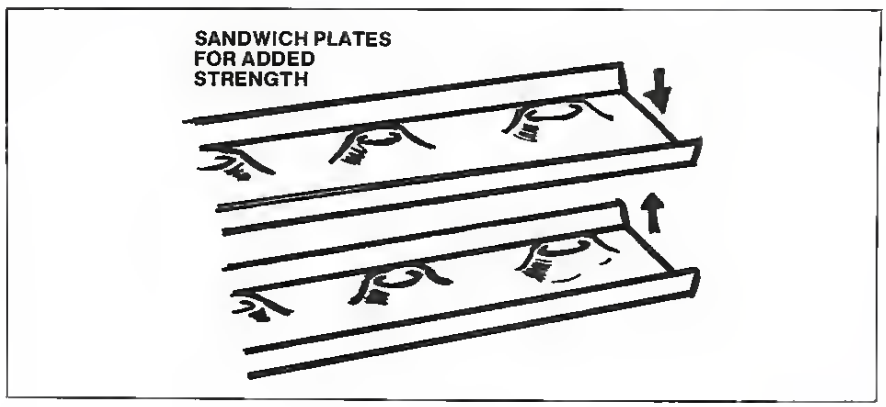
A good guide to keep in mind when measuring girders for your armature is that three holes equals 1½ inches and five holes equals 2½ inches. In most cases, your girders will be either three holes or five holes. Avoid any that are cut to four holes, since the two end holes would be used for the connecting screws and nuts. If you don't allow the fifth hole in the center for the tapered washer for tension, a four-hole plate would tend to sag in the center and there's a good chance of the balls popping out of the end sockets. On a three-hole plate, you only need one screw and nut in the center, and because of the shorter length, tension will be fine.

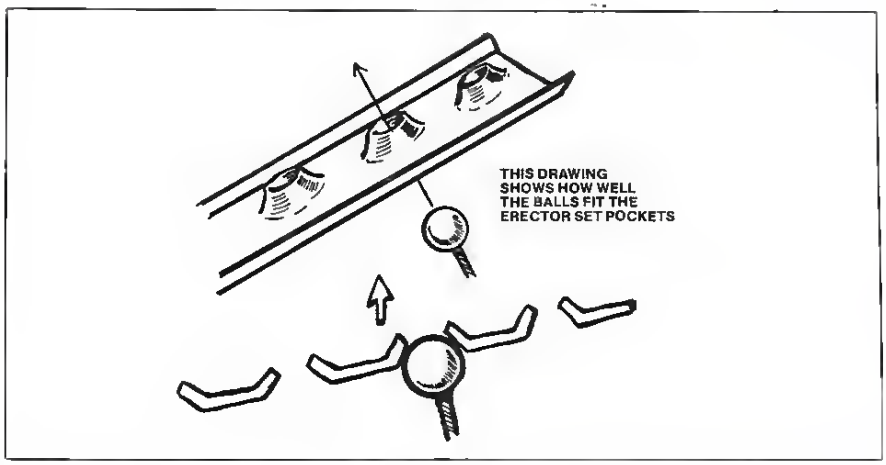
When attaching the 8/32 threaded rod to the brass balls, apply a generous amount of Super Glue into the ball threads. Tighten the ball onto the rod with pliers, and give it a few seconds to adhere properly. Be certain to put more of the Super Glue into the balls threads than you think is properl We've found that just a few drops is not sufficient, and the balls have a chance of becoming loose.

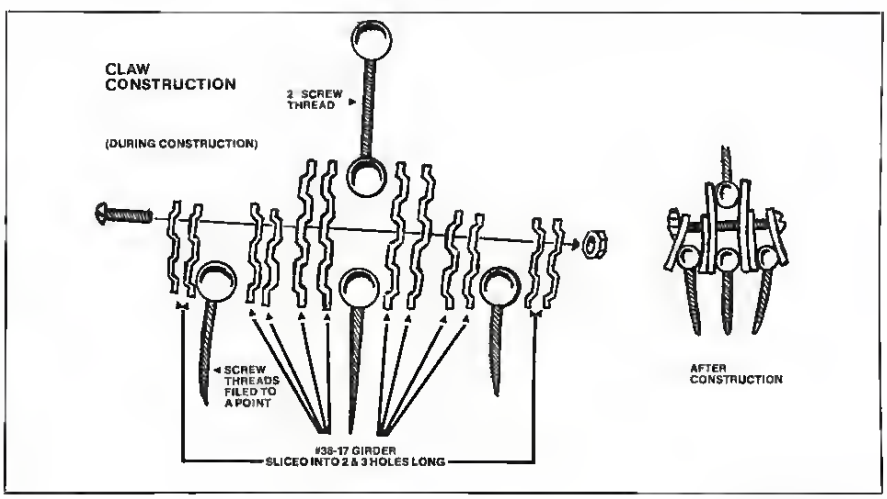
The stop nuts mentioned earlier are a must for the screws which will be connecting the plates together when

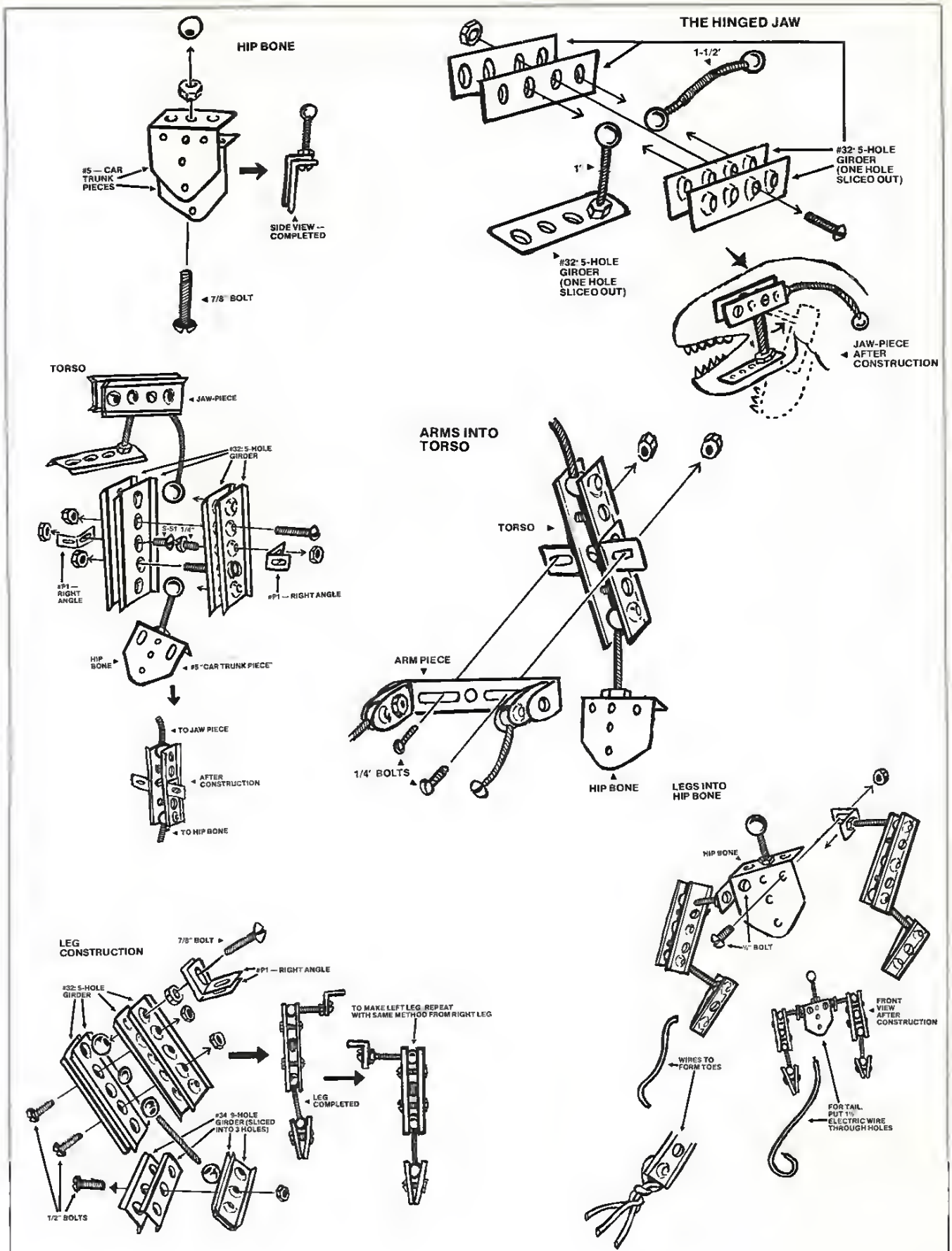
Below: The basic parts needed to create simple armatures.










HIP BONE
#5 — CAR TRUNK PIECES
SIDE VIEW — COMPLETED
7/8" BOLT
THE HINGED JAW
1-1/2"
1"
#32 5-HOLE GIROER (ONE HOLE SLICED OUT)
#32 5-HOLE GIROER (ONE HOLE SLICED OUT)
JAW-PIECE AFTER CONSTRUCTION
TORSO
JAW-PIECE
#32 5-HOLE GIRDER
#P1 — RIGHT ANGLE
#P1 — RIGHT ANGLE
HIP BONE
#5 "CAR TRUNK PIECE"
TO JAW PIECE
AFTER CONSTRUCTION
TO HIP BONE
ARMS INTO TORSO
TORSO
ARM PIECE
1/4" BOLTS
HIP BONE
LEGS INTO HIP BONE
HIP BONE
1/2" BOLT
WIRES TO FORM TOES
FRONT VIEW AFTER CONSTRUCTION
FOR TAIL PUT 1½ ELECTRIC WIRE THROUGH HOLES
LEG CONSTRUCTION
7/8" BOLT
#P1 — RIGHT ANGLE
#32 5-HOLE GIRDER
TO MAKE LEFT LEG REPEAT WITH SAME METHOD FROM RIGHT LEG
LEG COMPLETED
#34 9-HOLE GIRDER (SLICED INTO 3 HOLES)
1/2" BOLTS

sandwiching them over the balls. Conventional nuts and washers (even when glued) tend to work loose, where the lock nuts seem to hold up well.

Besides the girders, other parts of the Erector Set will be useful. The large base plates are terrific for trunk sections of many armatures. Other parts make fine connecting points, such as a hip "bone."

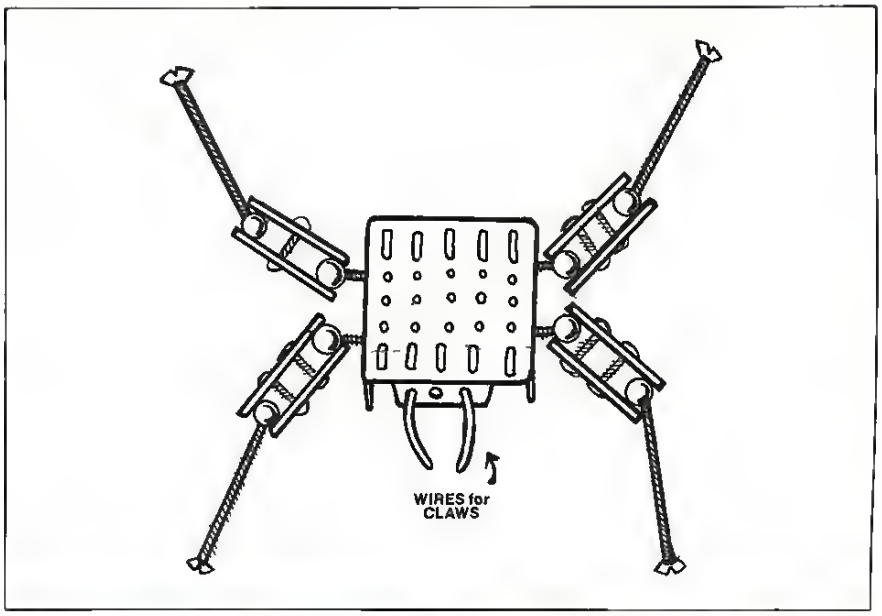
That is essentially the basics you need to know to construct literally any size or shape armature you desire. We could go on and on with small details here, but instead we have provided several captioned drawings. We feel that these will provide much better details and insights into what is possible with this simplified ball/socket armature technique.

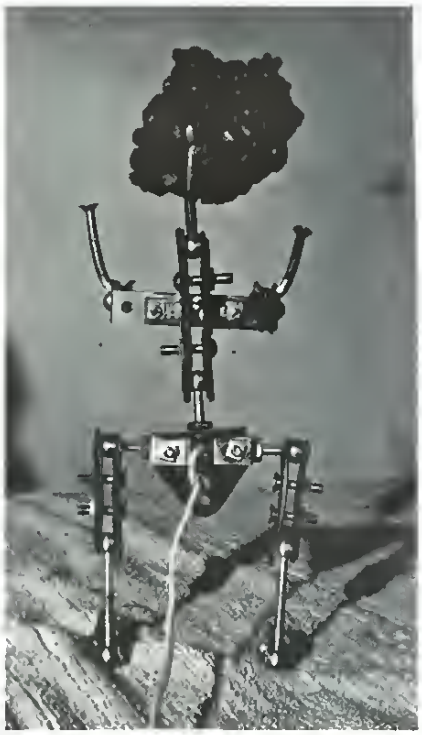
NOTE ON OBTAINING THREADED BRASS BALLS

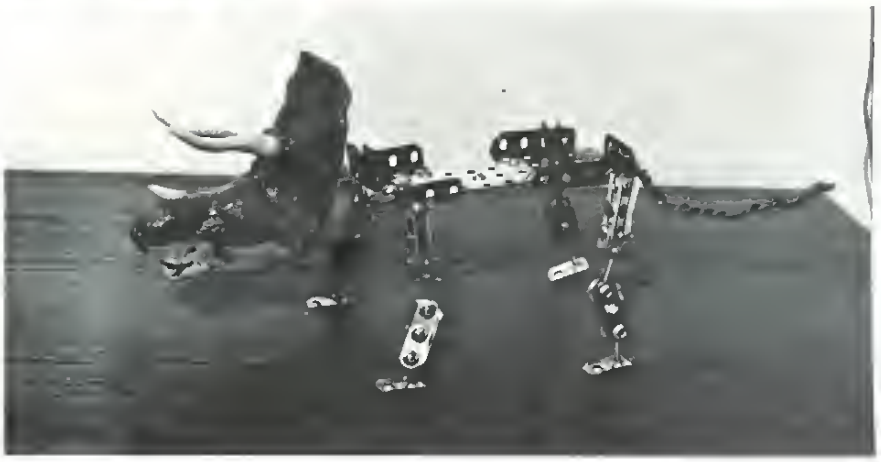
Although we have had little difficulty in obtaining the brass lamp balls in our local areas, you may not be as fortunate. If a lamp supply company does *not* have them in stock we suggest that you have the company order a fairly large quantity of them. One hundred balls should be a convincingly-sized order for your dealer and will supply you with enough balls to build six or seven armatures. If you do not have a lamp supply company in your area, you might check local hardware stores (we found the brass balls there ourselves). If all else fails, you can get in touch with the supplier we use (although we can't guarantee this company will be willing to mail-order and ship the balls — a letter of inquiry is in order first):

Smith's Lamp Shop, Inc.
8246 Richmond Highway, Route 1
Alexandria, Virginia 22309

(Phone: 703-780-3099)







Right, top: This insect design is an example of the sort of armatures possible with this technique. Middle, left: Rear-view of a tyrannosaurus armature, with latex head attached. Although wire is used here for the tail, a jointed tail-piece is easy to do with the Erector Set parts. Middle, right: A near-completed Blade Galentine model, revealing only the leg armature. Bottom: Further evidence of this technique's versatility: a triceratops armature, with top portion of head attached. Virtually any sort of design you can think of is possible with this simple, easy-to-build armature method.

CAPSULE PROFILE

THE SORCERERS OF ELTHRADIN

Article & Photos
by
Richard Geiwitz & Mark Supensky

The idea of doing a fairy tale sort of adventure film came to us about one year ago. After many script changes, we decided that THE SORCERERS OF ELTHRADIN would be about the abduction of a King's daughter by an evil magician who is attempting to overtake the world. After having his army demolished by several terrible beasts in an attempt to regain his daughter, the King finally seeks the aid of an old wizard and his apprentice.

The beasts in the film presented many challenges in stop-motion process work. The animation for these sequences was supervised by Larry Schlechter, who also built all of the models out of ball/socket armatures and foam latex build-up. To conquer the problem of generation loss from filming in super 8, we shot all the live-action footage in 16mm, which was later projected on a front-screen set-up using Scotchlite. The higher resolution and sharpness of the 16mm compensated for the re-photography in super 8, and the results are excellent.

Probably the most realistic effect in the entire film is one using "forced perspective." What we wanted was a "giant" walking up and abducting the King's daughter. To achieve this, we dressed one of our actors in the "giant" garb and make-up and placed the camera in an open field. Our giant stood about ten feet from the camera, while the other actors stood fifty feet from it. The actors in the background and the giant in the foreground were cued to react to each other and the scene was filmed. By using a wide-angle lens setting and stopping down, plus splitting the field of focus, both the giant and the background actors were in sharp focus. The end result is quite convincing.

One of the biggest challenges in the film was the need for a 50-man army of medieval soldiers. We were fortunate here to locate a re-enactment group known as the Maryland Medieval Mercenary Militia, comprised of members in both Baltimore, Maryland and the neighboring Washington, D.C. area. MMMM provided us with costumed axmen, swordsmen, archers, and even a catapult crew. Since we had only one day to film the sequence involving the 50 soldiers, the action was filmed simultaneously with 3 different super 8 cameras and one 16mm Bolex (for the animation background plates). The whole sequence was filmed on a hot day in a 9-hour span, and the MMMM— despite their

strenuous garb—completed the task in fine fashion.

The major priority throughout the film was realism and believability, so we went to great lengths to keep the production from looking "amateur." Despite our $1500.00, we still had to find ways of having a "big" look without spending big money. To this end, we got the use of an old church basement for a scene in the King's chambers where he is addressing his court. The church's basement was perfect: huge arches and columns, a fantastic 14-foot oval wooden table, and turn-of-the-century chandeliers gave the look of a top-notch Hollywood set!

Another set which we built in the basement of one of our actor's homes looks equally convincing, yet was constructed for very little cost. This one was the evil magician's ceremonial chamber. The set was comprised of black tapestry, to suggest depth, and white tree branches hung from the ceiling, covered with fish net and angel hair (also called aquarium filter material). The illusion of a strange, cavernous chamber was made possible by lighting the set with red, blue, and green floodlamps. We shot these scenes with Ektachrome 160, and the lighting came out perfectly. To add to the illusion of depth in the set, the actor's voice was recorded through an Echo-Plex, which adds an echo to sounds played through it.

One final set, that of the good wizard's home, was very subtle. It consisted mainly of shelves covered with books and magical apparatus. We lit it with orange lights to give it a warm effect. These lights were bounced off the ceiling to cut down on the glare on the actor's face, and at the same time give the effect of the room being lit by candles (we had more than 25 candles on the set—but they just don't provide enough light to film by).

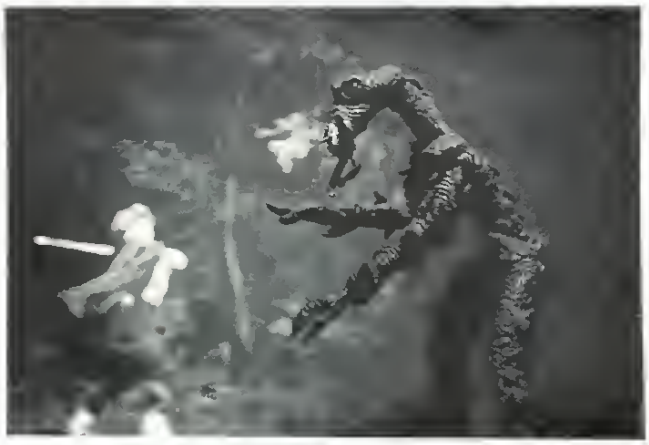
Although we used a pretty big budget for THE SORCERERS OF ELTHRADIN, a good deal of the money went into costume rentals. The rest of the film's authenticity and "Hollywood" look was accomplished by searching out various locations and groups (such as MMMM) which were utilized without cost. If nothing else, going to the extra trouble of such local contacts has paid off by giving our film a professional flare, and without the usual trappings of amateur productions—cheap sets, unauthentic costumes, and sloppy visual effects. We feel that any amateur filmmaker can take the extra time, the extra care—and treat his production as though it were a feature motion picture—to get a polished and convincing end result, without spending a great deal of money.

CREDITS

Directed by ..... Richard Geiwitz
Written by ..... Richard Geiwitz
Chris Gummer
Stop-motion by ..... Larry Schlechter
Richard Geiwitz

CAST

Earlic ..... Chris Gummer
Princess Serina ..... Eleanor Herman
Kaligan ..... George Goebbel
Shandor ..... Albert Renaud
Sir Malcolm ..... Jamie Zemarel
The King ..... Dave Ellis
Maran ..... Wartan Kasparian
The Page ..... Mark Supensky



This page; top: More authenticity is provided by the Maryland Medieval Mercenary Militia, a re-enactment group which is fully costumed and provided their own props—even this catapult. Middle: A photo of the front projection set-up used by Larry Schlechter for his animation scenes. This creature and several others were created by Larry for the film. Bottom: Larry manipulates one of his models—a dragon—during animation shooting. Note the front projection screen behind the model.

Opposite page; top to bottom: Director Richard Geiwitz discusses a scene with Warten Kasparian (Maran) and Dave Ellis (the King). Next, Kasparian and Ellis in a scene from the film, and below that, Tony Malanowski and CM editor Don Dohler in cameo appearances, as they discuss the fate of the King's daughter. The bottom shot shows the authenticity of the King's Court scene, due mostly to the look of the set, which was the basement of a turn-of-the-century church.

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CREATING FULL-BODY MONSTER SUITS

PART 2

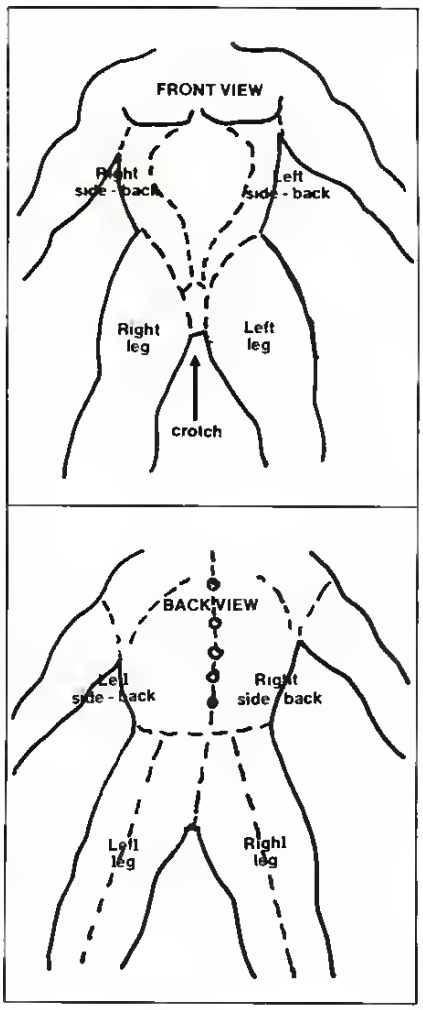
IN PART 1 OF THIS ARTICLE (LAST ISSUE) WE PRESENTED THE TECHNIQUES OF MAKING A WHOLE BODY MANNEQUIN, SHAPING THE CREATURE'S MUSCLE STRUCTURE, AND DOING THE CLAY SCULPTURE OF THE CHEST, STOMACH, AND ARMS. THIS SECOND INSTALLMENT COVERS FUR APPLICATION AND CASTING/BAKING THE FOAM LATEX ARMS AND CHEST-STOMACH PIECE.

FUR TECHNIQUES

The Zagatile fur was applied by using upholstering and tailoring techniques. The foam muscle structure is the base upon which the leg fur is attached and a cotton t-shirt is the base for the fur that is applied to the upper body. The finished legs resemble a fur covered pair of pants that have their own built in leg structure, while the upper body resembles a fur coat that fastens up its back and is attached at its waist to fur legs.

Before the upholstering can be started the fur must be cut into pieces that will fit specific areas of the creature (drawing #1). These areas are: each leg, the crotch, and each side of the back. In order not to damage the fur the cutting is done along the smooth backside of the fur material using a stanley knife, or any type of safety razor cutting tool. The pieces are cut so that they are larger than the areas to be covered. This is necessary because the material moves quite a bit in unexpected and unpredictable directions when it is being upholstered. Also, the fur must be cut so that its pile all lays in the same direction when it is attached to the creature. This means that if the material is brushed its long fur strands will all move up or down in the same direction throughout the costume. Joining the fur in this manner makes the seams less noticeable.

The fur upholstering is begun by placing one piece of the leg fur so that its seams will run along the crotch area, over the hip bone, down the rear end, and vertically down the back of the leg. Sewing the fur to the foam strips starts along the crotch. I used a curved needle for this and a heavy waxed thread (available at carpet supply stores or fabric and upholstery stores). Occasionally the thread must be tied off so that the stitches do not unravel themselves. To do this, as the last stitch is being pulled tight its loop must not be completely closed. The needle is twisted around this open loop once or twice and then pushed through it and drawn tight to close the loop which will automatically knot it (drawing #2).



Top drawing shows front view, and bottom drawing shows back view of fur sections required. Dotted lines indicate seams and places of joining.

Next, the fur is wrapped around the leg and stitched to the foam so that it conforms to the shape. All of the air pocket bubbles between the fur and the foam must be eliminated in this manner, but with as few stitches as possible.

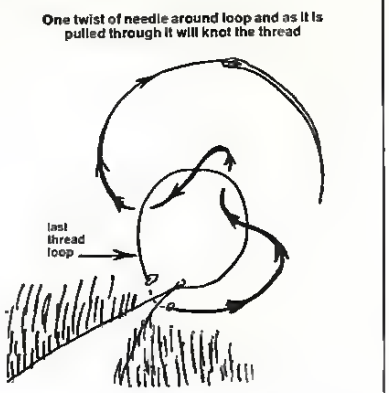
Eventually the fur is going to "bunch up" at indiscriminate places along the leg because it cannot conform to the compound curves. Upholstering methods were used to eliminate the excess bunched up material. The first step is to cut most of this material off, but not all of it. Just enough must be left so that the ends can be turned (folded) under and seamed (joined) together (drawing #3). As the two pieces are being drawn together (using a curved needle and thread), the fur strands must be pulled out from under the stitches and also from under the material itself so that the fur can hide the stitches and the seam. Throughout this article all of the seaming and joining of the fur is done by using the turn under technique just described.

In order for the fur to stay attached to the foam and yet be able to bend

(please turn page)

Article, Photos, & Illustrations by John Cosentino

Drawing 2



Drawing 3

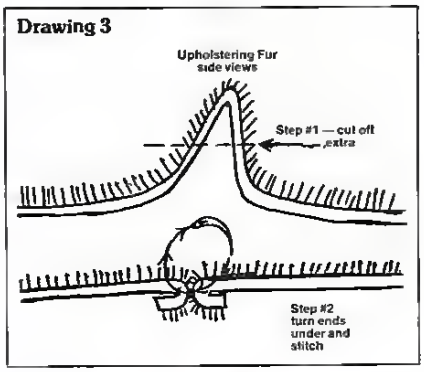


Photo 1

Top and middle: These drawings show how to stitch up the fur seams. Bottom: The leg fur is completed, with the fur around the stomach loose so that it could be evaluated as to look and fit.

with the leg, various stitching procedures were applied. First, the crotch, waist, and rear end areas of the leg fur must be sewn all the way down to the nylon base material. This assures that the fur, foam, and nylon will remain as one unit. Next, the crotch insert piece is attached between the legs with no stitches going through the foam. It is sewn to the adjoining fur of the legs, and nothing else. This insert was made large enough and fit loose enough so that the legs could move freely. And finally, there are no stitches of any kind used behind the knee at the leg joint for a radius of about four inches, which allows the leg to bend freely.

By applying the described principles of tailoring and upholstering (first to one leg, then the other, and lastly to the crotch insert area) a finished set of fur covered legs is obtained (photo #1). Although fur is still needed along the sides and back of the Zagatile, it can not be added until the chest-stomach section has been made and attached to the body.

CHEST-STOMACH SECTION

Since the chest-stomach area of the creature does not need to meet extensive flexibility requirements it was constructed by using a liquid latex and foam build-up process within a negative fiberglass mold.

To begin making the chest-stomach section a negative mold of the clay sculpture was required. Fiberglass was chosen as the mold material because it is lightweight and easy to work with. The clay sculpted Zagatile arms were sawed off from the mannequin and stored until they were needed. The mannequin was taken outside and the fur (photo #2) was covered to protect it from the fiberglass materials. The first coat of polyester-MEKP had a thickening agent called "cab-o-sil" added to it which allowed the small sharp curves of the sculpture to be more easily reproduced. It was applied directly to the clay sculpture (photo #3) with no release agent on the clay. Various sizes of the fiberglass cloth (I46-44 TR) were dabbed into the polyester MEKP coating that was over the clay. After this first fiberglass layer had dried a second was applied. The next day the fiberglass mold (photo #4) was pulled loose from the clay sculpture. The clay was cleaned off of it and the mannequin, and then both were brought back indoors. For more details on fiberglassing see part one of this article or ask your local fiberglass supplier.

The chest-stomach piece of the Zagatile suit could now be made by using

Photo 2

Photo 3

Photo 4

Above: Clay chest, clay chest covered with fiberglass, and completed fiberglass mold.

the fiberglass mold. The mold must have liquid latex brushed into it and then a layer of foam glued to it to strengthen it. After the latex and foam combination is pulled from the mold and the excess rubber trimmed off, it will be ready for attachment to the Zagatile's body.

The liquid latex that I applied into the fiberglass mold was colored brown by mixing four ounces of acrylic burnt umber paint into one quart of latex. I used Ruba Mold Latex, which is available from local arts and crafts stores or from Deep Flex Plastic Products, Fort Worth, Texas, 76110. It costs about sixteen dollars a gallon. After two layers of the latex were brushed into the mold and had dried, a piece of one-inch thick foam was cut to fit the stomach area and glued to it with latex. The chest pectoral cavity was filled by trimming a foam pillow cushion to fit in it. After the latex was dry this chest-stomach piece was pulled from the mold so that it could be attached to the body.

Before attaching this piece to the body, certain problems were considered and solved. The major one being how to get the piece to fit tight to the body of the person in the suit and at the same time be independent of the fur to which it is to be attached. Body movement would tear the fur loose from the rubber or cause bulges in it if the fur was simply attached to the chest-stomach piece and then fastened together up the back. The solution was to give the piece elastic straps which would hold it tight to the body of the person inside the suit. The fur that is to be attached to the sides of the chest-stomach piece will have elastic expansion strips of its own which are described later in this article.

The chest-stomach piece must be reinforced in order to attach its elastic straps. Strips of nylon were glued with latex to the rubber and foam of the piece where the elastic was to be attached. One-inch wide elastic was sewn to the chest-stomach piece (photos #5&6) which was then placed on the mannequin. The straps were pulled tight around the body and positioning marks were made on them where the eyes and hooks are to be sewn on. This piece of the suit was temporarily taken off the mannequin while the eyes and hooks were sewn on.

Before the chest-stomach piece is put back on the mannequin, a common base material is needed between it, the side fur, and the leg fur. I used a cotton t-shirt for the upper body base material. After placing the shirt on the mannequin the waist area of it is sewn all the way down to the nylon base of the connecting leg fur. Next, individual strips for each elastic strap were cut into the side of the t-shirt. The chest-stomach piece was now placed over the t-shirt and the elastic straps were pushed through the slits in the t-shirt (photo #7). The straps were drawn tight around the mannequin, fastened under the t-shirt, and the outside edge of the chest-stomach piece was sewn to the t-shirt. The piece will remain tight to the body of the person within the suit regardless of body movement, t-shirt movement, or leg movement.

Photo 5

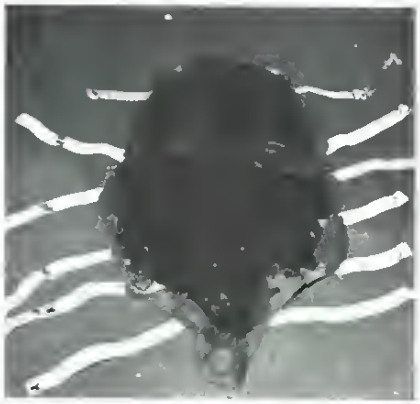


Photo 6

Above: Front and back views of the chest-stomach piece, with straps attached. Note the foam rubber inside, with nylon reinforcement at seams.

UPPER BODY FUR

The upper body fur is attached in two pieces: one for the left side and one for the right, with their joining area being down the backbone. The fur is sewn to the edges of the chest-stomach piece and the waist. It is then wrapped around the body and toward the center of the back. As this is being done the fur will bunch up much the same as when the leg fur upholstering was being done. But this time the material is manipulated so that it bunches up just beneath the shoulder blade. The reason for this is that an elastic expansion strip can be added to allow the fur to move with body movements. The next step is to cut the excess material so that one piece will overlap the other at an angle of forty-five degrees. Then a ten-inch long piece of elastic is sewn to the backsides of both pieces of overlapping fur (drawing #4). These two overlapping fur pieces can now slide over one another a distance of five inches to compensate for body movement. Eyes and hooks were sewn along the backbone area of the fur so that it overlapped itself about six inches when closed. The eyes and hooks worked fine, but a large ski jacket zipper would have made it easier to get in and out of the suit fast.

ARMS

The Zagatile fur was now a completed part of the costume, so I began working on the arms. The clay arm sculpture (photo #8) would have to be transfered into form fitting foam latex arms. The stop-motion animation model analogy was used as my guideline. My arms

(please turn page)

Drawing 4

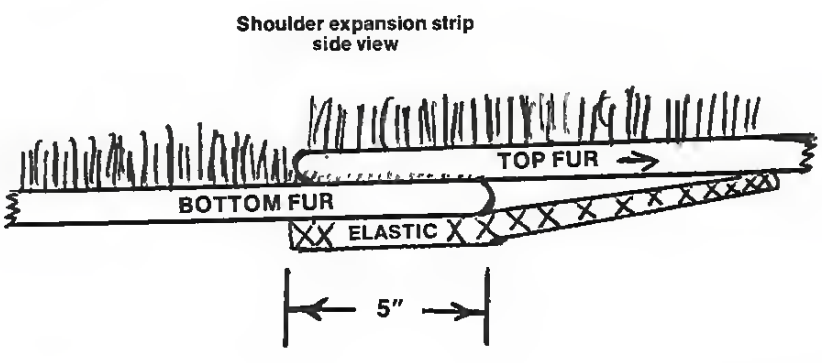


Photo 7

were the counterpart to a ball and socket assembly. Therefore negative and positive plaster mold making procedures would be used to make the arm duplicates.

First, the negative plaster molds of the Zagatile's clay arms would be made. Form fitted casting boxes (photo #9) were constructed to minimize the weight of the molds. The bottom of the box was three quarter inch ply-wood and the sides were made of six-inch high cardboard strips that were taped to the bottom. The cardboard followed the contour of the arm at a distance of about three inches. Automobile oil was my release agent and it was brushed onto the cardboard and wood. Then molding plaster was poured into the bottom half of the mold until it reached the half way parting line of the arm. After the plaster was hard the cardboard was trimmed so that it was only three inches above the highest point of the clay arm. The top half of the mold was now begun. An oil release agent was brushed onto the plaster and cardboard and then the plaster was poured over the exposed top half of the clay arm. As the plaster thickened I pushed it into a mound over the arm. A second batch of plaster was mixed having the consistency of thick mud and it was applied in a heap on top of the first mound of plaster. This made the plaster walls of the top half of the mold about one-inch thick. After the plaster was dry the cardboard was removed, the two halves of the mold were separated, and the clay was cleaned off.

Photo 8

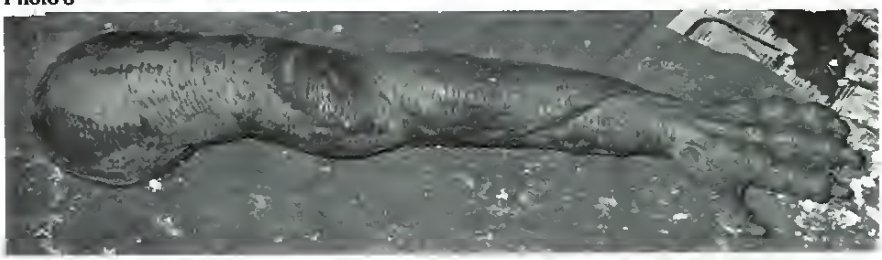


Photo 9

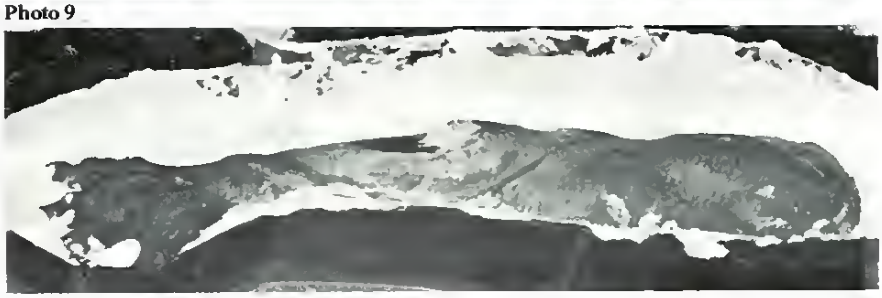
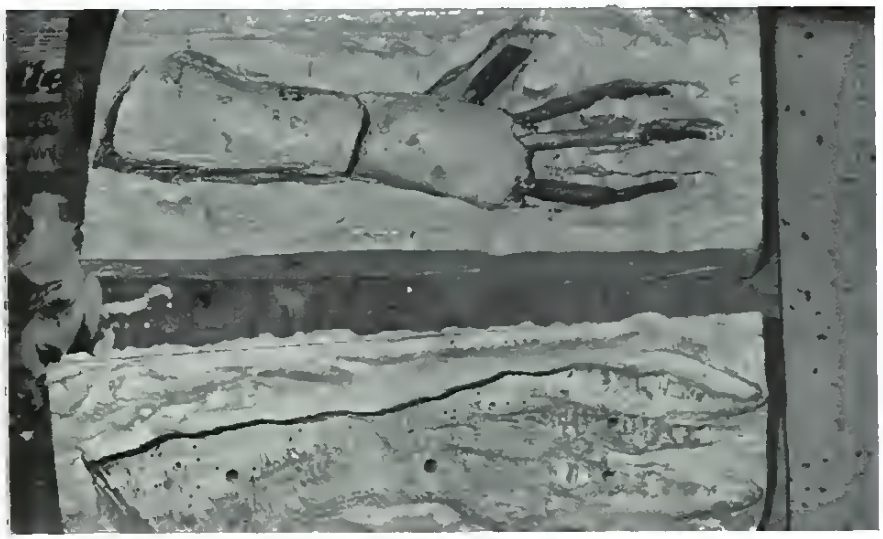


Photo 10



Top: T-shirt base for connecting the chest-stomach piece and the legs. Middle photos: The clay arm prior to cutting into 3 pieces, and the bottom half of the negative plaster arm molds. Bottom: The mold for the first version of the Zagatile hands, with wooden replacement fingers.

The second thing that was needed was a plaster duplicate of my arm which must be placed within the negative Zagatile mold during the foam latex casting. The fiberglass mannequin duplicate of my arm could not be placed into a hot oven because it would burn. Therefore negative plaster molds were made of the fiberglass arms and then positive plaster duplicates made from these.

Since I now had negative plaster molds of the Zagatile's arms and positive plaster duplicates of my own arms they could be prepared for the foam latex. The first thing that had to be done was to make the molds small enough to fit into the kitchen oven. To do this the plaster copies of my arms were set within the negative molds and the molds were cut into three sections: fingertips to wrist, wrist to elbow, and elbow to shoulder. Next, the plaster fingers of my arm duplicate were broken off and wooden fingers substituted (photo #10). This was done because the plaster fingers kept breaking. These wood fingers did not burn in our electric stove oven, but if a gas stove is used, experimentation should be done. Third, castor oil is brushed onto all the plaster parts that the foam latex will come into contact with. Fourth, small latex pegs were placed under the plaster copy of my arm as it lay within the negative copy of the Zagatile mold. These pegs raised the plaster arm up off the negative mold so that the foam latex could flow all around it. Pegs were also placed on top of the arm for the same reason. Because the pegs are made of latex they become a permanent part of the completed arm. A thin coat of liquid latex was applied to all the plaster parts that were to be in contact with the foam latex. This liquid latex makes it easy to remove

the cooked foam latex from the molds. I used foam latex which costs about six dollars a quart, available from:

Alcone Company
32 West 20th Street
New York, NY 10011

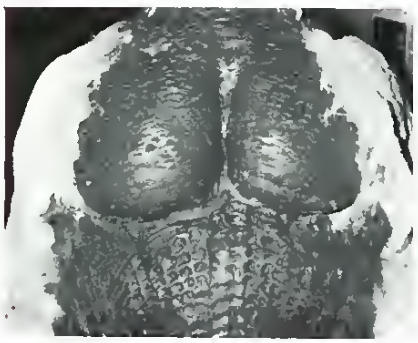
The preliminaries were now complete and the foam latex mixing, pouring, and cooking were started. Mixing the foam latex is simply a matter of following the instructions which are supplied with the foam. The last step in the mixing procedure is the addition of a "gel" agent which at times created problems for me. If a little bit too much gel is added it will cause the foam to become an unpourable mass of rubber, while too little of it causes the foam to not thicken at all. Quite a few times I got caught with the foam all lumped up on the electric beaters. Each arm casting required that eighteen ounces of liquid be whipped up to three quarts of foam latex in order to fill it.

Simplicity was my guideline for pouring the foam latex into the molds. No vent holes, overflow spaces, or clamps were used. The general procedure was to lay each separated three-piece mold on the floor, fill them until they overflowed with foam latex, close them up, and then place them into a pre-heated oven until the foam latex was cooked.

I carried out the foam latex casting procedure in the following manner: First the necessary mold halves and the positive arm piece that fit within it were laid side by side on the floor. Next, the negative bottom half of the Zagatile arm mold was filled with foam latex. Then the plaster positive copy of my arm was placed into it. Foam was poured over the exposed top half of my arm copy and also into the top half of the negative Zagatile arm mold. The top mold was quickly flipped over and onto its bottom counterpart. The excess foam squirts out of the sides and end of the mold. If there is not enough foam in the molds to squirt out of the sides then there will be areas of the mold that are not properly filled. The end of the mold where the arm had been sawed into sections must be blocked off to stop all the foam from flowing out of the mold. After the latex gelled it was placed into an oven pre-heated to 300° and baked. During the baking a pan of steaming water was also kept in the oven to keep the plaster damp and lessen the chance of it cracking. After the latex was "properly cooked" I pulled the mold out of the kitchen oven. To my surprise I saw that the grill upon which the mold sat was bent out of shape like a pretzel. The

Photo 11

Photo 12



Top: The foam latex arms attached to the body. Bottom: Close view showing cotton-latex build-up to hide stitches and blend arms into body.

45-pound mold was too much for the oven grill to hold up so a new grill was needed and a method to keep it from bending. To reinforce the new grill two three-quarter inch steel rods were placed under it. The rods were as wide as the oven and sat upon the support track that normally held the grill. The grill no longer bends with the molds on it and it also rolls into the oven easily.

To get the foam latex baked properly was another of my problems. The suggested cooking times did not work well for me. For example, I followed their instructions and cooked the first mold at a temperature of 300° for one-half an hour. When I took the mold out of the oven and opened it up I found an uncooked mass of rubber that became caved in and stuck to itself during the opening procedure. Therefore I compensated on my own and cooked a new batch of foam in the same mold for two hours. This time I got a hard, dry, singed and burned foam product. This trial and error method was becoming expensive and time consuming. I needed some kind of common sign or key that would let me know when the latex was properly cooked. This turned out to be "odor." As the foam cooks there comes a time when a definite and strong odor permeates the room. It resembles burning rubber. The overcooked excess rubber on the sides of the mold is probably the cause. But, whatever the cause, it is at the exact moment when the burning rubber odor occurs that the foam latex inside the mold is perfectly cooked. This method never failed me. Foam latex cooking of the various arm sections took from one-half an hour to two and one-half hours. The cooking times varied because of the different mold sizes, amounts of moisture within the molds, and inaccurate mixing of the foam latex components.

After the foam latex had cooked, the mold was removed from the oven and wrapped in damp towels. This retards the cooling process which lessens the possibility of the mold cracking. An hour and a half later the mold was opened up while it was still very warm. The foam latex is pliable and easy to remove from the plaster mold when it is warm. It was removed and the mold was closed back up and left to cool naturally on its own. These casting procedures are repeated to obtain all six foam latex arm sections. Then the excess rubber is trimmed off the foam parts and they are prepared for attachment to the Zagatile body.

Each of the three arm pieces are assembled together before they are attached to the body. A nylon reinforcer strip was contact glued with latex to the inside of the arms at the wrist, elbow, and armpit. Next, the ends of the three arm pieces were contact glued together using latex. To further strengthen the joint areas of the arm they were sewn together. Latex and cotton is applied over the stitches to hide them.

The assembled arms were ready to be attached (photos #11 & 12) to the Zagatile's body. The inside of the fur and the rubber chest-armpit areas were reinforced with nylon before the arms were sewn to them. Latex and cotton was used to hide the stitches wherever it was necessary.

NEXT ISSUE

The third and concluding article of the series covers creation of the steel platform "feet" of the creature, which raised John one-and-a-half feet off the ground.

Ben Burtt is the man who created most of the weird, galactic sound effects and "voices" for STAR WARS—including See-Threepio and Artoo-Detoo pictured here. Inside you'll find a comprehensive article by Mr. Burtt on creating special effects with front projection techniques.

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