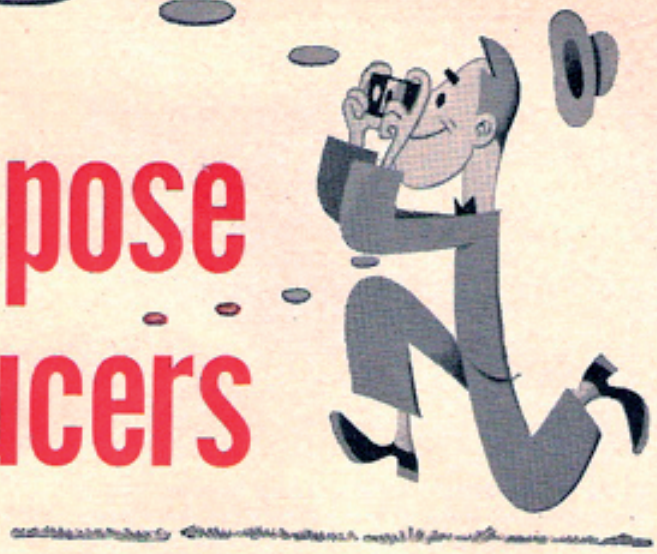
How to Expose Flying Saucers



You're invited to join the Air Force's new project for studying saucers by photographing them through a diffraction grating—a device that reveals the chemical composition of a source of light.

By Ralph Steiner

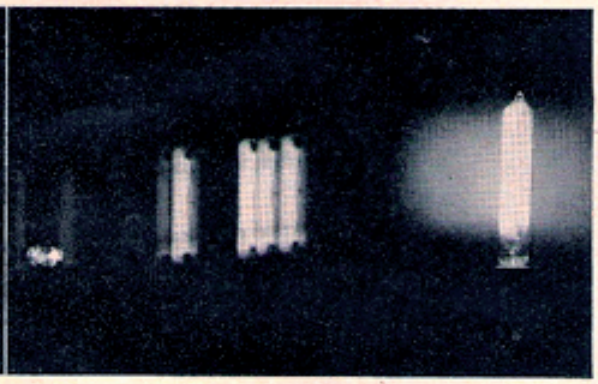
THE U.S. Air Force has set a new squad of 200 detectives on the trail of the flying-saucer mystery. These sleuths are photographers armed with cameras specially equipped to take pictures that may reveal the source of strange lights in the sky. Because similar equipment is available to anybody, you, too, can join the hunt.

And even if you never get a chance to shoot a flying saucer, you can still have a lot of fun with a homemade version of the saucer camera with which the Air Force hopes to separate hoax and hallucination from scientific reality.

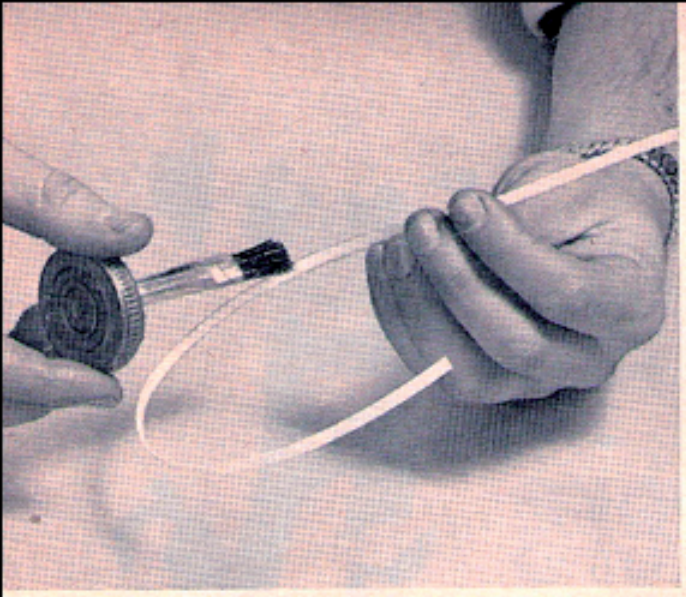
The camera the Air Force will use is the Videon Stereo with twin matched lenses of 35-mm. focal length and a maximum aperture of f/3.5. It takes standard 35-mm. film cartridges. A stereo camera was chosen, not because it takes stereoscopic pictures, but because it offers a convenient means of taking two pictures at the same time.

One lens will shoot a conventional picture. The other—and here we come to the gimmick the Air Force is pinning its hopes on—will be covered by a diffraction grating. This is a glass or plastic plate ruled with extremely fine lines—as many as 15,000 to the inch—scratched on the surface with a diamond point. The original grating is created on a special "ruling machine"—an instrument so sensitive that the heat of an approaching human body can upset its accuracy. Reasonably priced replicas are

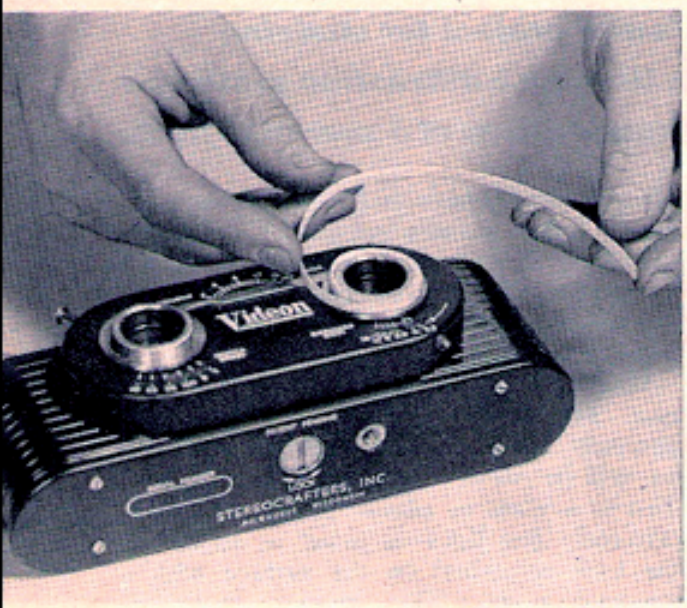
A SOLID LIGHT SOURCE like this mazda bulb projects a continuous spectrum through a grating. Red end of spectrum is most intense.



A GASEOUS LIGHT SOURCE—a mercury-vapor sun lamp—produces a discontinuous or broken spectrum, mostly violet, blue and green.

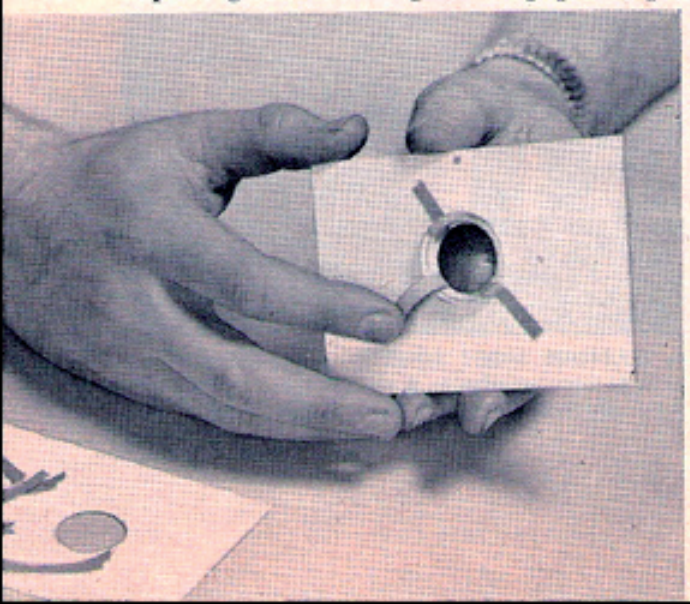


1 TO MAKE YOUR OWN grating holder, cut a cardboard strip a bit wider than lens projection. Coat both sides with rubber cement.



2 WIND STRIP around the front of the lens, loosely at first, then tighter, to form ring 1/8-inch thick. Fasten end with Scotch tape.

3 CUT HOLES the size of your lens out of cardboard square slightly larger than grating. Tape ring to card with gummed paper strips.



made by using this costly original as a mold.

Like a prism, a diffraction grating breaks up light into its component colors. The fine slits in the grating bend the light rays as they pass through—separating them into bands that range from the violet end of the spectrum through the blue, green, yellow and orange sections to the red end of the spectrum. The way in which these bands are projected onto the film reveals the nature of the light source.

Light Source May Be Solid or Gaseous

For example, the light from a mazda bulb produces an unbroken or continuous spectrum, indicating a *solid* light source—the heated tungsten wire. On the other hand, a fluorescent tube projects a number of separated bands of light—a discontinuous spectrum—indicating a *gaseous* light source.

It is not necessary to use color film. The Air Force itself is using black and white. It is the arrangement and intensity of the light bands on the film that provide the information the scientists want.

Suppose you send the Air Force two saucer pictures photographed through a diffraction grating. The first shows a continuous spectrum of greatest intensity at the red end, the second a discontinuous spectrum most intense in the area which would be green on color film.

The trained analyst will interpret the light source in the first photo as a solid (continuous spectrum) of relatively low temperature (greatest intensity in red area) and conclude that your first saucer is probably a reflection of a mazda light source on the ground—a car headlight perhaps. Your second photo, indicating gaseous matter at high heat as the light source, will most likely be set down as a meteor—the well known "green fireball" saucer.

Of course if the Air Force discovers that your negative indicates the existence of an element not found on this planet, you and your camera will go down in history.

Diffraction Gratings Have Other Uses

Like the photographic technician, astronomers, criminologists and industrial scientists use diffraction gratings to analyze unknown materials. The astronomer shoots a new star through a grating to discover its composition. The FBI agent puts a bit of the dead man's cuff in the crater of an arc light and studies its spectrum.

You don't need a Videon Stereo camera to

join the saucer hunt. Any stereo camera will do. In fact, when I phoned the Pentagon to inquire whether the Air Force would be interested in photos taken with single-lens cameras, I was assured that *any* shot of a flying saucer made through a diffraction grating—even with a box Brownie—would be more than welcome.

You can get replica gratings from the Central Scientific Co., 441 Clinton Avenue, Newark, N. J. For a small lens with front opening no greater than 20 mm., order their grating number 86705, with a ruled area 20 mm. by 22 mm. on a two-inch-square glass. It costs $3.53. For larger lenses, they have grating number 86706, with a ruled area of 60 mm. by 70 mm. on a 82-mm. by 100-mm. glass, for $12.83. The pictures show you how to mount your grating.

A few general suggestions. First off, remember a flying saucer won't wait. Have your camera loaded and ready, tripod-mounted if possible, focused at infinity. Use panchromatic film. The highest shutter speed consistent with good exposure will help freeze your saucer.

Experiment to Get Exposure

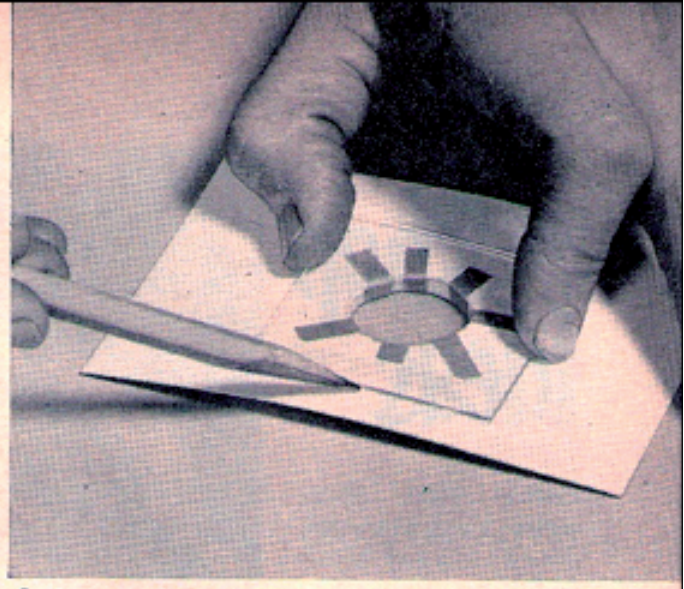
The problem of what exposure to use is tricky. It is impossible to give a general prescription suitable for both a dark object in a cloudy sky and a shining fireball at night. Perhaps the best idea is to experiment with such readily available light sources as the moon, Venus, neon lights, sodium arcs, incandescent and fluorescent lamps. (Just for fun, try a few color shots.)

In daylight hours, set your camera for prevailing weather conditions. At night the lens should be wide open and the shutter at 1/25 second. If your saucer is brilliant, you can stop down your lens and speed up your shutter in a hurry.

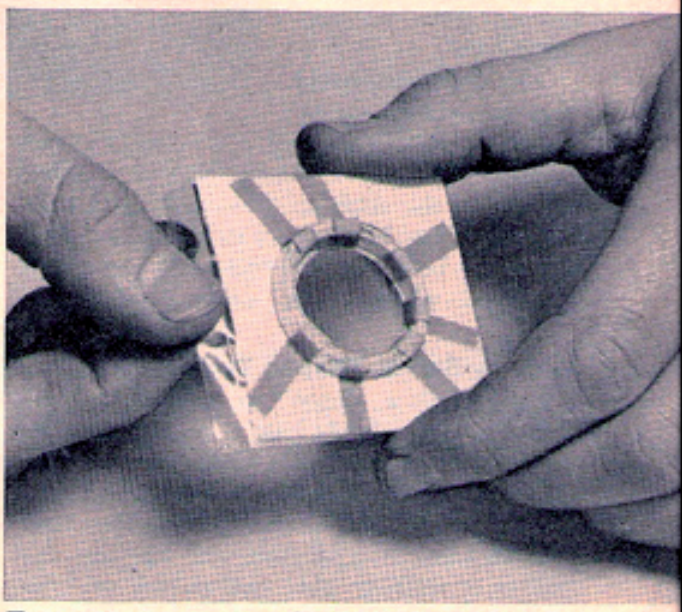
It will help the Air Force to determine the size and elevation of the saucer if you can manage to include a landmark such as a tree, house or telegraph pole in the picture. After shooting, mark the spot where you stood, or measure it off in two directions and write down the measurements.

Don't develop the film. Make a note of the lens and shutter speed, describe the conditions under which you shot the picture and mail this data and film to:

Air Technical Intelligence Center
Wright-Patterson Air Force Base, Ohio
Attention: Unidentified Aerial Objects
Investigation.



4 CENTER THE GRATING face up on flat side of card over hole. Trace around glass and cut card to size. Cut second card just like first.



5 NOW BIND GRATING between the two cards with Scotch tape. When grating is on camera, only plain glass is presented to weather.

6 MOUNT GRATING with lines running up and down. Aim so the subject is offset near side of field, to avoid cutting off the spectrum.