

ANALYSIS OF POSSIBLE LUNIK III PICTURE HOAX

Merton E. Davies
The RAND Corporation
Engineering Division

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In a recent magazine article Lloyd Mallan suggests that the pictures of the back side of the moon taken by the Lunik III payload may have been faked. In fact, Mr. Mallan is personally convinced that the release of the picture is a gigantic Soviet hoax.⁽¹⁾ I should like to examine some of the evidence he presents, together with independent observations, and attempt to assess the credibility of Mr. Mallan's assertion.

The releases concerning the Soviet space program have never satisfied either reporters or scientists in the West. The Soviets furnished no description or pictures of their launching site and have failed to reveal their location. Similarly, they have not described their booster rockets by word or picture, and tracking data for the lunar firings has frequently been very skimpy. As a consequence, it is nearly impossible for Western scientists to confirm in detail the trajectories reported for the Soviet moon rockets.

The only reliable tracking of Lunik III by the West was done by Jodrell Bank for a short period on the basis of coordinates furnished by the Soviets. Lunik III transmitted upon command from the ground. Since the commands were timed to coincide with the monitoring capability of the Soviet tracking stations, it never transmitted when over the U. S. Nevertheless, the announced Soviet trajectory was confirmed by Jodrell Bank.

Faced with the problem of acquiring pictures of the back of the moon, one could find many solutions. The particular method chosen by the Soviets, according to their releases, is a perfectly sound approach and neither the design nor fabrication of any components should involve any overwhelming

technical problems. For one purpose or another, sun seekers, stabilization systems, cameras with aperture control, dry-film processors, automatic readout devices, and communication systems have been built, and the problems associated with them are understood. This is not to detract from the accomplishment, but merely to point out that there is no technical reason to doubt that the Soviets did acquire pictures in the manner that they describe.

TASS News Agency as well as USSR magazine⁽²⁾ have stated specifically that two of the three pictures released were unretouched. Yet at the meeting of the American Rocket Society in Washington, D. C. on November 17, 1959, L. I. Sedov said that the "obvious effects of radio noise have been cleared" from these same two pictures.⁽³⁾ The retouching is unmistakable, and can readily be seen on photographic reproductions of the originals. It may have been this contradiction with the official story that prompted Mr. Mallan to write his article.

One of the two pictures under discussion is a full-moon shot, reportedly taken with a f/5.6 200 mm (8 in.) focal length lens. The other picture is of a portion of the moon, taken with a f/9.5 500 mm (20 in.) focal length lens. A third picture is a full-view photograph that has been annotated with the names of the most important regions.

The high-resolution (20 in. focal length) picture was reproduced by Mr. Mallan for specific comment. I would like to discuss one by one the six points he raises.

1. "Only area in entire picture that shows foreshortening. One would think the moon was flat from rest of the picture. No photo ever made from earth of the moon's visible face shows it flat like this."

Life Magazine performed an interesting experiment which bears on this subject.⁽⁴⁾ They took a picture of the front face of the moon and projected it

on a sphere. By photographing this sphere from the side, it was possible to determine approximately what the moon would like from that angle. By the same method, using Lunik III pictures, the appearance of the back of the moon can be recorded from the same angle as those of the front of the moon. These views were then compared over the region common to both, which included approximately 40 per cent of the terminator. They matched fairly well over this area, indicating that the foreshortening was similar in both pictures.

2. "'Valleys' on edges so deep they would cause moon to change shape. Its weight distribution would shift under such fissures according to a famous scientist. The 'valleys' might result from a paint brush skipping over a rough surface."

The rough edges are very apparent, however, this region can be viewed from the front side of the moon, and so its structure is understood. I suspect that the jagged edge is due to imperfect registration of the line scan. Brush marks are not apparent along this edge, so I would rule out retouching.

3. "Textures here are of different qualities; one is much coarser than the other. Throughout picture the texture is uneven. It would not be if the photo was transmitted by television, as claimed."

Texture variations are most likely caused by radio noise and by the directional characteristics of the transmitting antenna which was rotating at the time of readout.

Mallan's points 4. and 6. refer to zones where brush marks are noticeable. These points are reasonable since there has obviously been so much retouching, but he does not discuss why there has been retouching in particular areas.

5. "Two areas immediately noticed by Professor Thomas Gold of Cornell, one of the world's authorities on subject of the moon's evolution. 'Now these are odd shapes for the moon,' he said. 'From what I know about lunar evolution, all the shapes should be more circular.' However, he refused to doubt the validity of the 'photo.'"

The Soviets are well aware of the appearance and structure of the moon. If they were trying to fool someone, it is unreasonable that they would use odd appearing or unexpected shapes in their simulation.

Professor Gold's reaction seems to have been similar to that of other scientists whom Mallan interviewed. The scientists' response is summed up later in the article as follows:

"His attitude was typical of many other scientists. None of whom I showed the photos would admit they were faked -- although none of them could find anything of real scientific value in the photos."

The implication is that scientists are gullible and easily fooled. This is certainly not fair; the scientist just likes to examine the evidence and at this time the evidence the Soviets present is more credible than that which Mr. Mallan discusses.

Mr. Mallan discussed the pictures with many art experts in an attempt to establish the validity of his hypothesis that the "photographs" are actually paintings. The scan lines are "explained" as texture in water color paper. Unfortunately, Mallan did not talk to any television engineers who, I am sure, would recognize the scan patterns. In fact, these patterns could probably be duplicated in the laboratory. However, there is little incentive to do so since it would prove little.

Let us, for a moment, speculate about a plausible method of faking the pictures, and then see if the evidence fits. A reasonable start would be to duplicate the Life Magazine experiment and project the image of the front side of the moon on a ball. This could then be observed from the view angle to be simulated, and a faked picture drawn. Next, this picture would be taken to a television laboratory, scanned by a television camera, and the image photographically recorded from a monitoring scope. This would be called

the 8 in. focal length picture. Thereafter, the television camera could be moved closer and another photo recorded, to be called the 20 in. focal length picture. Instead of the television, a wire photosystem might be used to superimpose the line scan and, of course, a model could be substituted for the drawing. Basically, these systems are all similar.

Does the large-scale (20 in.) picture look like a higher quality enlargement of the small-scale (8 in.) picture? The answer is no! For instance, Mare Crisium (Sea of Crisis), when viewed from the front side, resembles the small-scale (8 in.) picture, since the camera's angle with the lunar surface is about the same in both pictures; however, the large-scale (20 in.) picture is very blotchy and is not recognizable. Other formations (such as the sea of Moscow) also show that the contours of the same objects are different in the two pictures. Moreover, if the pictures were faked, why is there need for retouching? What is the explanation?

I will venture a guess. At the time that Lunik III broadcast its many pictures, it is likely that, because of the great distance and low transmitter power, the signal-to-noise ratio was so low that no two of the resulting pictures looked alike. Because of interference and noise the pictures would be distorted and blotchy. This phenomenon can be visualized at home by tuning in a very weak television station, for instance, by tuning in a Baltimore station from the Washington area. The best procedure in the presence of noise is to use a statistical approach and to determine, from many samples, the most likely shape and location of each formation. I think this was done, and a composite picture was made that would represent the best, or most probable, view of the back of the moon. This technique is sometimes used in astronomical work, however, the pictures are usually

carefully labeled as such. The composite was then annotated with the names and descriptions of the physical features. The two other released pictures were retouched in such a way as to resemble this picture and at the same time illustrate typical results from each of the two lenses. If this explanation is correct, the Soviets could have saved some people a great deal of trouble by explaining the retouching right off.

REFERENCES

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