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UNCLASSIFIED//FOR OFFICIAL USE ONLY**(U)CRYPTOLOGIC ALMANAC****Luna 9, the First Soft Landing on the Moon(U)**

(U) Due to the success of the U.S. Apollo program landing the first man on the moon, few people remember that the USSR made the first soft landing of a spacecraft on the moon. When the USSR successfully launched Sputnik, the first man-made artificial earth satellite, on October 4 1957, it caught the world by surprise and caused great consternation in the free world. The U.S. was perceived to be far behind the USSR in space. This led to the formation of the National Aeronautics and Space Administration (NASA) and President Kennedy's pledge to land men on the moon and safely return them by the end of 1969. Although the USSR program was shrouded in secrecy, it was widely thought that they had a similar goal. The race to the moon was definitely on.

(U) In order to land a man on the moon, one first had to study the lunar surface and then develop the proper system to achieve that goal. At that time there was great speculation on whether the lunar surface could support a spacecraft. Indeed, some scientists believed that the moon was covered with hundreds of meters of dust while others posited a fragile honeycomb structure incapable of sustaining the weight of a spacecraft. As a result, both the U.S. and USSR sent many probes to the moon. Each of these probes transmitted back information before going into orbit around the moon, going off into space or crash-landing on the moon and self-destructing.

(U) The USSR landed the first lunar probe in 1959. This was followed by five landings by the U.S. between April 1962 and March 1965. Then the USSR landed their second, third, and fourth probes in rapid succession between May and December of 1965. This spate of activity raised eyebrows, but the real surprise came two months later.

(U) On February 3, 1966, the USSR shocked the world by making the first soft lunar landing and transmitting signals from the spacecraft. The spacecraft was named Luna 9 in the USSR program.

(U) Sir Bernard Lovell, Jodrell Bank's director, acknowledged this "Historic achievement" and stated that this put the USSR "ahead in the space race." Dr. L.R. Shepherd, president of the British Interplanetary Society, stated that he rated the Soviet achievement as "much more difficult than the orbit rendezvous recently achieved by the Americans."

(U) In those days, when the USSR was truly operating behind an iron curtain of secrecy, there were thousands of people, many of them reputable scientists, who believed this was a precursor to the colonization of the moon by the USSR. Some saw the USSR placing nuclear weapons on the moon and using it as a launch site. Against this backdrop, President Johnson and other U.S. leaders were pushing the U.S. intelligence community to give them ground truth on what the Soviets had achieved with Luna 9.

(U) The initial transmissions from Luna 9 were intercepted by U.S. intercept sites and by the British at their Jodrell Bank radio telescope near Manchester. The transmissions were facsimile pictures. The scientists at Jodrell Bank were able to process some of the pictures and released them on February 4. This upset the Soviets because they had not released anything yet and because the Jodrell Bank pictures were distorted and not scaled properly. On February 5 the Soviets released their version of the pictures previously released by Jodrell Bank with some angry comments and criticism about the British pictures. They did not release any other images. The response to Luna 9 from the Johnson administration was very muted, but what did they know and what role did NSA play?

(U) On the morning of February 4, John O'Hara, a young electrical engineer in the Telemetry Systems Division (R52) was in the Telemetry Analysis Laboratory (K47) training fellow engineer [redacted] and electronics technician [redacted] on how to use a piece of equipment John had designed. [redacted] stated that he had to leave the training to attend a meeting on "how to process the Luna 9 transmissions." He invited O'Hara to attend the meeting.

(U) The meeting was chaired by Navy commander [redacted]. Attendees included representatives from the analytic shops as well as several contractors under contract to process NSA intercept. A technical description of the signal was given, and the tenor of the meeting was not very good. No one from the analytic shops had any recommendations. The contractors had some ideas, but they involved the purchase of new, fairly expensive equipment, and they speculated that it would take several weeks to acquire and assemble the equipment. This upset [redacted] who stated words to the effect that "the entire White House and Congress were looking to NSA for answers and we were not producing."

(U) After the meeting O'Hara and [redacted] had some additional discussions during which O'Hara stated that he thought he could process the pictures with equipment in the lab and a "Black Box" he had recently designed. He created a list of the needed equipments and sketched a diagram of how to interconnect them. Then he and [redacted] started putting it together. The pictures would be printed out on a relatively new device designed by R52 engineers called the [redacted] system. The [redacted] output display was generated by exposing film rolls controlled by a Honeywell 1612 Visacorder. Early in the afternoon the system was lashed together. O'Hara and [redacted] confidently fed the signal from the tape into the system fully expecting to get pictures out. When they got nothing but garbage out, they were momentarily crushed and embarrassed.

(U) O'Hara decided to do a spectral analysis of the signal, which revealed that the spectral content was below the passband of the [redacted] system. He went back to the R52 lab and hastily built a chopper to sample the signal and translate its frequency into the [redacted] passband. When the chopper was inserted, the system worked and produced excellent pictures of the lunar landscape. Due to a characteristic of the [redacted] system, the contrast of the designated areas of the images could be changed. This helped significantly in analyzing the pictures.

DOCID: 3075834

(U) A crowd gathered immediately and someone noticed that one of the pictures showed a footpod of the lander. The footpod contained some Russian words and numbers. Someone suggested getting a Russian linguist to decipher the words, and within minutes there were about a dozen Russian linguists pouring over the images. Everyone was somewhat disappointed when the linguists decided that it was just equipment parts identification and serial number information. Dr. O'Hara thought that everyone was expecting some expression like "Up yours America" from the Soviets.

(U) When the pictures were produced, they were of high quality, but it was evident that they did not have the proper aspect ratio. This was because our model of the visicorder could not run slow enough. O'Hara knew that the Honeywell Corporation had created three 1612 visicorders with slower speeds. He contacted the local Honeywell representative and asked if the Agency could borrow one of them and stated that it was very critical. The representative called back about thirty minutes later and said the only one available was in an operational system located in Denver. After some negotiating between O'Hara and the Honeywell representative, it was agreed that NSA would swap an Agency high-speed recorder for the Honeywell slow-speed recorder.

(U) Honeywell shipped the slow-speed recorder by overnight air freight to what was then Friendship Airport. On the morning of Saturday, February 5, O'Hara and [redacted] an R5 electronic technician, went to the airport in [redacted] pick-up truck along with the Honeywell representative and claimed the slow-speed visicorder. They took it to the lab where they swapped the visicorders and took the shipping crate containing the high-speed recorder back to Friendship where it was sent to Denver.

(U) O'Hara and [redacted] returned to work, installed the new recorder and tested the system. It produced perfect pictures. Then they turned the system over to K47 for production. They were later told by Charley Tevis, a senior executive who was then the head of the Director's Advisory Group on Electronic Reconnaissance (DAGER), that the pictures were on the desk of the president that afternoon. Mr. Tevis stated, "Our national leaders now have ground truth."

(U) As a footnote, it should be added that at the time O'Hara was a GS-12 engineer who had been with NSA for only two years. His instincts as an engineer and a former Air Force radar maintenance technician were to just "solve the problem." As a result, his negotiations for the swap of the visicorders had been done without the involvement of any NSA legal or purchasing folks. When the legal people found out what had happened, they called O'Hara on the carpet for "exceeding his authorities." When Charley Tevis was informed of this, he intervened and the issue was dropped.

(U) The original pictures from Luna 9 have been declassified and turned over to the National Cryptologic Museum.

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