

Opening the Cold War Sky to the Public: Declassifying Satellite Reconnaissance Imagery

Robert A. McDonald

The world of photogrammetry now has a new source of historical remote sensing imagery available for analysis. Nearly a million formerly classified satellite reconnaissance images that were acquired by joint Central Intelligence Agency and Air Force efforts during the 1960s and early 1970s are being declassified and should be available for public access within eighteen months.

On February 24, 1995, Vice President Al Gore announced the declassification of all imagery that was acquired by three early, Cold War satellite reconnaissance programs. Gore made his announcement at CIA headquarters two days after President Bill Clinton signed Executive Order Number 12951, which directed "...imagery acquired by the space-based national intelligence reconnaissance systems known as the CORONA, ARGON, and LANYARD Missions shall, within 18 months of the date of this order be declassified...."

Gore (1995) made it clear that this is just the beginning of declassification. Executive Order 12951 requires the Director of Central Intelligence (DCI) to establish a comprehensive program for the periodic review of imagery from other obsolete imaging satellite reconnaissance systems. The objective is to make available to

the public as much imagery as possible, consistent with the interests of national defense and foreign policy.

E.O. 12951 specifically directs that the review of the imagery acquired by obsolete, broad-area, film-return systems be completed within five years (i.e., by February 2000). Under the order, the DCI has the authority to determine the timetable to review any other imagery he deems obsolete. There continues to be, however, serious sources and methods—as well as foreign policy considerations—that must be addressed and may preclude declassifying much of the more current imagery.

What Was Declassified on February 24th

All four of the reconnaissance images released on February 24th were collected by the CORONA system. CORONA, along with ARGON and LANYARD, were the Intelligence Community's initial reconnaissance satellites that began operating in the 1960s. No examples of ARGON or LANYARD imagery were declassified during the Vice President's announcement. This imagery won't become available until later. ARGON was a mapping system that flew seven successful missions from May 1962 to August 1964. LANYARD was a program

designed to acquire higher resolution imagery for intelligence purposes; however, it only flew one partially successful mission in 1963.

The CORONA program was the longest running and flew missions from August 1960 to May 1972—for nearly 12 years during the height of the Cold War. It initially was flown under the auspices of the DISCOVERER space flight series. With CORONA, President Eisenhower had set into motion—what was for 1958—a daring political and technical attempt to counter the effects of the Iron Curtain. The objective was to use a space vehicle to acquire much-needed reconnaissance imagery. CORONA's potential became apparent after the recovery of its first intelligence target from DISCOVERER XIV on 19 August 1960. This first intelligence image was of a military airfield near Mys Schmidta on the Chukchi Sea in the far-northeastern former Soviet Union. Its resolution was only about 8 meters.

The cover image of the strategic bomber base near Dolon, Kazakhstan is an example of the better quality that was acquired during later missions. The resolution of this image, closer to 2 meters, allowed intelligence analysts to distinguish between heavy bombers and transport aircraft. This was a criti-

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cal intelligence task as analysts tried to determine the air and missile order of battle in order to assess the Soviet strategic capability.

With CORONA imagery, photointerpreters ultimately were able to allay fears of a superior Soviet strategic capability by demonstrating that they did not have an overwhelming number of Intercontinental Ballistic Missiles deployed against the US. In effect, intelligence from CORONA ended the high-level conjecture about a "missile gap." As Acting DCI Admiral William Studeman (1995) pointed out, CORONA "...allowed us to base our national security strategy—and spending—on facts rather than fear, on information rather than imagination."

CORONA collected over 800,000 images that were used for both intelligence and mapping purposes in response to the national security requirements of the time, mainly monitoring the Sino-Soviet Union bloc. On the average, individual images



Figure 2. Klyuchevskaya Volcano, A Composite of Two CORONA Images That Have Been Enlarged 200 Percent.

Highlight Article

covered an area approximately 10 miles by 120 miles.

For the 1960s, CORONA was a technologically remarkable program. Not only was it the first photo reconnaissance satellite, but during its initial missions it was acquiring images at a resolution of 8 meters. And that quickly improved to 2 meters. An extraordinary achievement considering that when France launched its first commercial remote sensing system, SPOT 1—over twenty-five years later—it was only providing 10 meter imagery! Even today, commercial space imagery generally is not available at finer resolutions than 10 meters (e.g., LANDSAT Thematic Mapper at 30 m; the Japanese Earth Resources Satellite, JERS, at about 18 m; and the French SPOT satellite still at 10 m). Even the Russian KFA-1000 imagery generally offers no better than 2.5 m imagery (Doyle, 1991).

Corona Program Evolved into the NRO

The National Reconnaissance Office (NRO) was born out of the historic achievements of CORONA. After some unique challenges at the beginning, the CORONA program became a highly successful joint effort of the Central Intelligence Agency and the Department of the Air Force. By the mid-1960s the Intelligence and Defense communities formalized this experience-proven approach to develop and operate reconnaissance satellites by creating

the NRO. The NRO was given responsibility for CORONA and any other projects defined as national reconnaissance. Whereas CORONA, ARGON, and LANYARD represented the early successes of this kind of joint effort, the NRO went on to develop and operate more recent reconnaissance capabilities, which played a major role in winning the Cold War and continue to contribute to solving national security problems such as monitoring arms control efforts.

How the Decision Was Made

The President's decision to declassify early satellite reconnaissance imagery was the result of a long history of studying the question and gradually relaxing security constraints. Beginning with CORONA, satellite reconnaissance programs initially were developed under utmost secrecy, and the imagery was tightly controlled in security compartments. Even the "fact of" satellite reconnaissance was classified during these early years, and declassification was never seriously considered.

Some relaxation of security began in the 1970s when President Nixon authorized the DCI to make most satellite imagery more available to military commanders by removing many of the compartmented security controls. But it was not until 1978—when President Carter authorized the unclassified acknowledgment of the "fact of" photo-satellite reconnaissance—

that an environment was created where declassification could be discussed realistically (Carter, 1978). Ultimately, this led in 1992 to the Department of Defense publicly acknowledging the existence of the National Reconnaissance Office. This created an environment that was even more open to a positive policy decision for declassification.

At the same time, the Persian Gulf War had called attention to the utility of satellite reconnaissance imagery. Gen. Norman Schwarzkopf (1991) had praised the value of this kind of intelligence; however, he also raised questions about its availability. While his issue was more related to dissemination, the question of security controls also was relevant.

When the Central Imagery Office (CIO) was formed in mid-1992, it responded to Schwarzkopf's concerns over availability to include conducting a major review of security policy. CIO lead a DCI-chartered Classification Review Task Force (CRTF) whose goal was to make imagery more accessible to customers, principally for military users by removing compartmented controls, but also for others by addressing the question of declassifying archived imagery (Lackman, 1994). The CRTF focused on developing a balanced security policy that would promote the maximum use of satellite reconnaissance imagery for what was seen as an expanding imagery-user community. CIO saw this community including not only intelligence and military users, but also

scientific, academic, and other non-traditional users of reconnaissance imagery.

During the CRTF review, the scientific community's interest in declassifying satellite reconnaissance imagery was strongly articulated by a parallel government-wide task force that had been created in the spring of 1992 by former DCI Robert Gates. DCI Gates formed the Environmental Task Force (ETF) as a result of discussions with then-Senator Al Gore. The ETF was chartered to determine the potential applications of classified national security systems to the study of environmental problems. The task force specifically examined what NRO satellites could do to support environmental, as well as related scientific activities and natural disasters.¹

The ETF concluded there was great potential for the use of satellite reconnaissance imagery in studying environmental problems. At about the same time, the CRTF had concluded that it no longer was necessary to classify all satellite reconnaissance imagery. Specifically, the CRTF saw the earliest, retired, reconnaissance systems as reflecting a technological sophistication that is relatively low, not only by Intelligence Community standards, but also by the standards of what is becoming available in the commercial market. Additionally, other national security concerns no longer seemed relevant to this early imagery. As a result, former DCI R. James Woolsey urged the President to authorize declassification of this early imagery.



Figure 3. The Aral Sea, A Composite of Seventeen CORONA Images That Have Been Reduced by 30 Percent.

Corona Camera as a Symbol of Cold War Reconnaissance

In anticipation of declassifying this early reconnaissance imagery, former DCI Woolsey approved the declassification of an engineering model of the CORONA camera. The camera, which had been assembled in 1972 from available hardware, had been in storage since the end of the CORONA program. At that time, the camera was placed in a classified display at the CIA's National Photographic Interpretation Center by then DCI Richard Helms. In DCI Helms's dedication speech, he said, "A decade of Glory," as the display is entitled, must for the present remain classified. We hope, however, that as the world grows to accept satellite reconnaissance, it can be transferred to the Smithsonian Institution."

The world now accepts satellite reconnaissance, and Helm's wish will come true on May 24th 1995 when the camera will be moved to the Air and Space Museum for the 35th Anniversary Commemoration of the CORONA program.² It will become part of a future exhibit and will satisfy a 22-year Smithsonian quest to acquire the camera: first in 1973 shortly after it received a U-2 camera and material on the Cuban Missile Crisis; next in 1976 when Michael Collins became Director of the Air & Space Museum, then again in the early 1980s when it wanted to incorporate the camera in its "Looking at Earth" reconnaissance exhibit; and yet

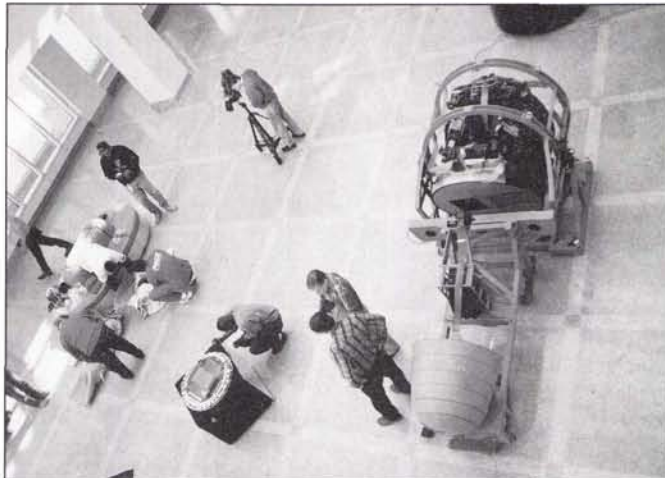


Figure 1. Corona Camera and Film Return Bucket.

again in 1990 when the Museum was planning an exhibit on treaty verification. When the Smithsonian opened its "Looking at Earth" exhibit, it already had acquired a CORONA Recovery Vehicle (RV) capsule. However, each successive DCI had disapproved all requests for the camera because of sources and methods concerns and national space policy restrictions.

Now that the camera has been declassified, the Intelligence Community already launched it on the first leg of its journey to the Smithsonian. One early Saturday morning, a team quietly moved the camera and its last film return bucket from NPIC to the CIA Headquarters building (See Figure 1). It was held at CIA, ready for its first public display during Vice President Gore's announcement of the declassification order.

Of Interest to the Civil World

The opening of the classified reconnaissance world—a world that repre-

sents what was a revolution for intelligence in the 1960s—can become the beginning of a new revolution for the civil remote sensing world. Imagery experts in the intelligence community have suggested that this reconnaissance imagery has the potential to contribute significantly to the analysis and understanding of many remote sensing and scientific problems.

Two of the four images released by the Vice President suggest the potential for civil applications. Figure 2 is a composite of two CORONA images that have been enlarged 200 percent and show the Klyuchevskaya Volcano. The Klyuchevskaya group of volcanos, in Russia's far east, is one of the most active seismic and volcanic areas in the world. Klyuchevskaya erupted as recently as November 1994. Volcanologists could use recent coverage of this 1994 eruption to compare it with the earlier 1962 CORONA image. This could provide an opportunity for insight into the evolution of volca-

nic activity on the Kamchatka Peninsula.

Figure 3 is a composite of 17 CORONA images that have been reduced by 30 percent. The area covers approximately 210 by 230 nautical miles and shows the full extent of the Aral Sea as it existed on August 29, 1962. This image provides scientists an opportunity to assess specific changes in water levels during the past 33 years. Some estimates currently suggest that the lake may have lost a volume of water equivalent to one and a half times that of Lake Erie over the past 30 years.

CORONA imagery has the potential to make an enormous impact on the analysis of historical data and global environmental phenomena. The imagery can provide an opportunity to look back in history and provide information on a level of detail unmatched by even current, publicly available remote sensing space imagery.

Obtaining the Declassified Imagery

The full archive of CORONA, ARGON, and LANYARD imagery will become declassified after it is transferred from the National Photographic Interpretation Center to the National Archives and Records Administration (NARA). A copy of all the declassified imagery also will be sent to US Department of Interior US Geological Survey's (USGS's) Earth Resources Observation Systems (EROS) Data Center located in Sioux Falls, SD.³

It may take up to eighteen months before the

imagery is available to the public.⁴ First, the Intelligence Community will need to prepare what is expected to be at least 2.1 million feet of film that is stored in some 39,000 film canisters. Once transferred to NARA and EROS, these agencies will then have to index the imagery and integrate it into their existing ordering and distribution systems.

By July 1996, either NARA or the EROS Data Center will be in a position to provide the public with duplicate negatives, positive transparencies, and black and white photographic prints at the cost of reproduction. Information about ordering the declassified imagery will be possible via Internet through the USGS's Global Land Information System (GLIS).⁵ If coverage exists, the GLIS graphical tools will offer an opportunity to plot an outline of the coverage on a world map and view a sample "browse image." This browse image will provide an overview of the larger features on the image and indicate cloud cover.

Internet access to data about the four initially declassified images is currently available through the World Wide Web. The Universal Resource Locator (URL) address for the home page is: <http://edcwww.cr.usgs.gov/dclass/dclass.html>. Sample digital images of these four photographs also are available through this anonymous FTP server: <ftp://edcftp.cr.usgs.gov>.⁶

Conclusion

The declassification of this early imagery will open

the Cold War skies of satellite reconnaissance for all to see. This imagery has the potential to fill an information gap for the remote sensing community. It will offer coverage as good as 2 to 8 meters for much of the world going back to 1960—a thirty-four year look into history! Moving this formerly classified national security imagery into the public research and scientific communities is a fundamental change in how the US Government does business and controls satellite reconnaissance imagery. It should be a challenging time for all of us. The true value of this newly available imagery only can be assessed after it has been examined by the remote sensing community. And this may take years of analyses.

About the Author

R.A. McDonald is a Professor of National Security Policy and the DCI Representative to the National War College, Fort McNair, Washington, DC 20319-6000.

Footnotes

1. For years the Intelligence Community has used satellite reconnaissance systems to support humanitarian responses to natural disasters. All government agencies—both civil and military—have had access to this information. Whenever there was a requirement—whether it was in response to an earthquake, hurricane, or flood—the Community turned to these classified data and translated the critical information into maps, drawings,

and textual information that was essential for the civil agencies to target their aid.

2. At the CIA announcement ceremony on February 24th, the Vice President symbolically transferred the camera to the Secretary of the Smithsonian.
3. You should direct any inquiries for purchase of declassified satellite reconnaissance imagery to the National Archives at College Park, MD (301-713-7030) or the EROS Data Center at Sioux Falls, SD (605-594-6151).
4. Limited additional information is expected to be released in connection with two events that will celebrate the 35th Anniversary of the CORONA program. On May 24, 1995, the CIA Center for Studies of Intelligence plans a symposium during the day, and the NRO and National Space Club are chairing a commemoration that evening at the Smithsonian's Air and Space Museum.
5. For X terminal graphic-based queries, use Internet: xglis.cr.usgs.gov. For text-based queries: use Internet (STELNET glis.cr.usgs.gov) or direct dial (605-594-6888 via modem 8 bits, no parity, 1 stop bit.)
6. Enter "anonymous" at the logon prompt; enter your e-mail address at the password prompt; change directory by entering "cd pub/data/-DCLASS;" enter "ls" to view an alphabetical listing of the files; set the file transfer mode by typing "binary" at the prompt; enter "get" followed by the selected filename.

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