**Corona Spy Satellite**

**From The Black Vault Encyclopedia Project**



KH-4B Corona satellite



Recovery of Discoverer 14 return capsule (typical for the Corona series)

**Corona** was the name of a series of the U.S. military [reconnaissance satellites](http://www.theblackvault.com/wiki/index.php?title=Reconnaissance_satellite&action=edit&redlink=1) operated under a [CIA](http://www.theblackvault.com/wiki/index.php?title=CIA&action=edit&redlink=1) program run by the [Directorate of Science & Technology](http://www.theblackvault.com/wiki/index.php?title=CIA_Directorate_of_Science_%26_Technology&action=edit&redlink=1) with substantial assistance from the US Air Force, used for photographic surveillance of the [Soviet Union](http://www.theblackvault.com/wiki/index.php?title=Soviet_Union&action=edit&redlink=1), [China](http://www.theblackvault.com/wiki/index.php?title=China&action=edit&redlink=1) and other areas from June 1959 until May 1972. The project name is sometimes given as CORONA, but it is a codeword, not an acronym.

The project was accelerated after the [U-2 incident](http://www.theblackvault.com/wiki/index.php?title=U-2_incident&action=edit&redlink=1) in May 1960.

The satellites were designated **KH-1**, **KH-2**, **KH-3**, **KH-4**, **KH-4A** and **KH-4B**. KH stood for **Key Hole** or **Keyhole** (Code number 1010)[[1]](http://www.theblackvault.com/wiki/index.php/Corona_Spy_Satellite#_note-Yenne#_note-Yenne) , and the incrementing number indicated changes in the surveillance instrumentation, such as the change from single-[panoramic](http://www.theblackvault.com/wiki/index.php?title=Panoramic_format&action=edit&redlink=1) to double-panoramic [cameras](http://www.theblackvault.com/wiki/index.php?title=Camera&action=edit&redlink=1). The KH naming system was first used in 1962 with KH-4 and the earlier numbers were retroactively applied. There were 144 Corona satellites launched, of which 102 returned usable imagery.

**Technology**

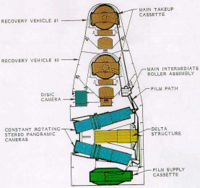


Diagram of "J-1" type stereo / panoramic reciprocating Corona reconnaissance satellite camera system used on KH-4A missions from 1963 to 1969.

The Corona satellites used 31,500 [ft](http://www.theblackvault.com/wiki/index.php?title=Foot_(unit_of_length)&action=edit&redlink=1) (9,600 [m](http://www.theblackvault.com/wiki/index.php?title=Metre&action=edit&redlink=1)) of special 70 mm [film](http://www.theblackvault.com/wiki/index.php?title=Film&action=edit&redlink=1) with a 24 inch (0.6 m) [focal length](http://www.theblackvault.com/wiki/index.php?title=Focal_length&action=edit&redlink=1) [lens](http://www.theblackvault.com/wiki/index.php?title=Lens_(optics)&action=edit&redlink=1). Initially orbiting at 165 to 460 km, the cameras could resolve images on the ground down to 7.5 m. The two KH-4 systems improved the resolution to 2.75 m and 1.8 m respectively and used a lower [altitude](http://www.theblackvault.com/wiki/index.php?title=Altitude&action=edit&redlink=1) pass.

Ironically, the name Corona was more fitting than its originators had ever imagined. The initial missions of the program suffered from many technical problems, among them, mysterious fogging and bright streaks were seen on the returned film of some missions, only to disappear on the next mission. Eventually it was determined by a collaborative team of scientists and engineers from the project and from academia, (among them: [Luis Alvarez](http://www.theblackvault.com/wiki/index.php?title=Luis_Alvarez&action=edit&redlink=1), Sidney Beldner, Malvin Ruderman, and Sidney Drell) that electrostatic discharges (called [corona discharge](http://www.theblackvault.com/wiki/index.php?title=Corona_discharge&action=edit&redlink=1)) caused by rubber components of the camera, were exposing the film. Recommended corrective actions solving the problem included better grounding of spacecraft components and [outgassing](http://www.theblackvault.com/wiki/index.php?title=Outgassing&action=edit&redlink=1) testing of parts before launch. These practices are still used on practically all US reconnaissance satellites today.

**Discoverer**



Corona image of the Pentagon, 25 Sep 1967

The initial Corona launches were obscured as part of a space technology program called **Discoverer**, the first test launches for which were in early 1959. The first launch with a camera was June 1959 as Discoverer 4, which was a 750 kg satellite launched by a [Thor-Agena](http://www.theblackvault.com/wiki/index.php?title=Thor-Agena&action=edit&redlink=1) rocket. The satellites returned film canisters to Earth in capsules, called "buckets", which were [recovered in mid-air](http://www.theblackvault.com/wiki/index.php?title=Mid-air_retrieval&action=edit&redlink=1) by a specially equipped aircraft during their parachute descent (they were designed to float in water for a short period of time, and then sink, if the mid-air recovery failed). The first camera-fitted Discoverer missions failed to return usable film, but following repeated recovery tests on [August 18](http://www.theblackvault.com/wiki/index.php?title=August_18&action=edit&redlink=1), [1960](http://www.theblackvault.com/wiki/index.php?title=1960&action=edit&redlink=1) with Discoverer 14, a bucket was successfully retrieved two days later by a [C-119](http://www.theblackvault.com/wiki/index.php?title=C-119&action=edit&redlink=1).

An alternative program named [SAMOS](http://www.theblackvault.com/wiki/index.php?title=Samos_(satellite)&action=edit&redlink=1) included several satellite types that used a different method, taking an image on film, developing the film on board the spacecraft, and then scanning the image and transmitting it to the ground. The Samos E-1 and E-2 satellite programs used this technology, but it was not able to take many pictures and relay them to the ground each day. Later Samos programs, such as the E-5 and the E-6, used the film-return approach, but neither one was successful.

At least two Discoverer launches were used to test satellites for the [Missile Defense Alarm System](http://www.theblackvault.com/wiki/index.php?title=Missile_Defense_Alarm_System&action=edit&redlink=1), an early missile-launch-detection program that used infrared cameras to detect the heat signature of rockets launching to orbit.

The Corona film-return capsule was later adapted for the [KH-7 GAMBIT](http://www.theblackvault.com/wiki/index.php?title=KH-7&action=edit&redlink=1) satellite, which took higher resolution photos.

Discoverer 13 was the first satellite that landed and was recovered on [August 11](http://www.theblackvault.com/wiki/index.php?title=August_11&action=edit&redlink=1), [1960](http://www.theblackvault.com/wiki/index.php?title=1960&action=edit&redlink=1). The last launch under the Discoverer name was Discoverer 38 on 27 February 1962; with a successful midair recovery of the capsule on the 65th orbit (13th recovery, 9th in midair). After that, the launches were entirely [secret](http://www.theblackvault.com/wiki/index.php?title=Classified_information_in_the_United_States&action=edit&redlink=1). The last Corona launch was on [May 25](http://www.theblackvault.com/wiki/index.php?title=May_25&action=edit&redlink=1), [1972](http://www.theblackvault.com/wiki/index.php?title=1972&action=edit&redlink=1) - the project was abandoned after a Soviet [submarine](http://www.theblackvault.com/wiki/index.php?title=Submarine&action=edit&redlink=1) was detected waiting below a Corona mid-air retrieval zone. The best sequence of Corona launches was from 1966 to 1971 when there were 32 consecutive launch-and-film-recoveries.

**Corona Launches**

*Source*: USGS

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Time period** | **No.** | **Nickname** | **Resolution** | **Notes** | **Number** |
| Jun 1959– Sep 1960 | KH-1 | "Corona", C | 7.5 m | First series of US imaging spy satellites. Each satellite carried a single panoramic camera and a single return vehicle. | 10 systems; 1 recovery. |
| Oct 1960– Oct 1961 | KH-2 | Corona′, C′,(C-prime)**\*** | 7.5 m | Single panoramic camera and a single return vehicle. | 7 systems; 4 recoveries. |
| Aug 1961– Jan 1962 | KH-3 | Corona‴, C‴,(C-triple-prime)**\*** | 7.5 m | Single panoramic camera and a single return vehicle. | 9 systems; 5 recoveries. |
| Feb 1962- Dec 1963 | KH-4 | Corona-M, Mural | 7.5 m | Film return. Two panoramic cameras. | 26 systems; 20 recoveries. |
| Aug 1963- Oct 1969 | KH-4A | Corona J-1 | 2.75 m | Film return with two reentry vehicles and two panoramic cameras. Large volume of imagery. | 52 systems; 94 recoveries. |
| Sep 1967- May 1972 | KH-4B | Corona J-3 | 1.8 m | Film return with two reentry vehicles and two panoramic cameras. | 17 systems; 32 recoveries. |
| Feb 1961- Aug 1964 | [KH-5](http://www.theblackvault.com/wiki/index.php?title=KH-5&action=edit&redlink=1) | Argon | 140 m | Low-resolution mapping missions; single frame camera. | 12 systems; 5 recoveries. |
| Mar 1963- July 1963 | [KH-6](http://www.theblackvault.com/wiki/index.php?title=KH-6&action=edit&redlink=1) | Lanyard | 1.8 m | Experimental camera in a short-lived program. | 3 systems; 2 recoveries. |

**\***(The stray "quote marks" are the original designations of the first three generations of cameras, as described in Perry's history.)

**Declassification**

Corona was officially secret until 1992. On [February 22](http://www.theblackvault.com/wiki/index.php?title=February_22&action=edit&redlink=1), [1995](http://www.theblackvault.com/wiki/index.php?title=1995&action=edit&redlink=1), the imagery acquired by the Corona and two contemporary programs ([Argon](http://www.theblackvault.com/wiki/index.php?title=Argon_(satellite)&action=edit&redlink=1) and [Lanyard](http://www.theblackvault.com/wiki/index.php?title=KH-6&action=edit&redlink=1)) was declassified.[[1]](http://www.theblackvault.com/wiki/index.php/Corona_Spy_Satellite#_note-0#_note-0) Review of "obsolete broad-area film-return systems other than Corona" mandated by the order led to the 2002 declassification of the imagery from [KH-7](http://www.theblackvault.com/wiki/index.php?title=KH-7&action=edit&redlink=1) and the [KH-9](http://www.theblackvault.com/wiki/index.php?title=KH-9&action=edit&redlink=1) low-resolution camera system.

The declassified imagery has since been used by a team of scientists from the [Australian National University](http://www.theblackvault.com/wiki/index.php?title=Australian_National_University&action=edit&redlink=1) to locate and explore ancient habitation sites, pottery factories, megalithic tombs, and Palaeolithic remains in northern Syria.

**Launches**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Mission No.** | Cover Name | Launch Date | [NSSDC ID No.](http://www.theblackvault.com/wiki/index.php?title=International_Designator&action=edit&redlink=1) | Alt. Name | Camera | Notes |
| **R&D** | Discoverer | 21 Jan 1959 | [1959-E01](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1959-E01) | 1959-E01 | none | Mission Failed. Failed to achieve orbit |
| **R&D** | Discoverer 1 | 28 Feb 1959 | [1959-002A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1959-002A) | 1959 BET | none | First object in polar orbit |
| **R&D** | Discoverer 2 | 13 Apr 1959 | [1959-003A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1959-003A) | 1959 GAM | none | First three-axis stabilized satellite; capsule recovery failed |
| **R&D** | Discoverer 3 | 03 Jun 1959 | [DISCOV3](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=DISCOV3) | 1959-F02 | none | Failed to orbit |
| **9001** | Discoverer 4 | 25 Jun 1959 | [DISC4](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=DISC4) | 1959-U01 | KH-1 | Mission failed. Failed to achieve orbit. |
| **9002** | Discoverer 5 | 13 Aug 1959 | [1959-005A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1959-005A) | 1959 EPS 1 | KH-1 | Mission failed. Power supply failure. No recovery. |
| **9003** | Discoverer 6 | 19 Aug 1959 | [1959-006A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1959-006A) | 1959 ZET | KH-1 | Mission failed. Retro rockets malfunctioned negating recovery. |
| **9004** | Discoverer 7 | 07 Nov 1959 | [1959-010A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1959-010A) | 1959 KAP | KH-1 | Mission failed. Failed to achieve orbit. |
| **9005** | Discoverer 8 | 20 Nov 1959 | [1959-011A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1959-011A) | 1959 LAM | KH-1 | Mission failed. Eccentric orbit negating recovery. |
| **9006** | Discoverer 9 | 04 Feb 1960 | [DiSC9](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=DiSC9) | 1960-F01 | KH-1 | Mission failed. Failed to achieve orbit. |
| **9007** | Discoverer 10 | 19 Feb 1960 | [DISC10](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=DISC10) | 1960-F02 | KH-1 | Mission failed. Destroyed just after launch due to erratic attitude. |
| **9008** | Discoverer 11 | 15 Apr 1960 | [1960-004A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1960-004A) | 1960 DEL | KH-1 | Mission failed. Attitude control system malfunctioned. |
| **R&D** | Discoverer 12 | 29 Jun 1960 | [DISC12](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=DISC12) | 1960-F08 | none | Failed to orbit |
| **R&D** | Discoverer 13 | 10 Aug 1960 | [1960-008A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1960-008A) | 1960 THE | none | Tested capsule recovery system; first successful capture. |
| **9009** | Discoverer 14 | 18 Aug 1960 | [1960-010A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1960-010A) | 1960 KAP | KH-1 | First successful recovery of IMINT from space. Cameras operated satisfactorily. |
| **9010** | Discoverer 15 | 13 Sep 1960 | [1960-012A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1960-012A) | 1960 MU | KH-1 | Mission failed. Attained orbit successfully. Capsule sank prior to retrieval. |
| **9011** | Discoverer 16 | 26 Oct 1960 | [1960-F15](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1960-F15) | 1960-F15 | KH-2 | Mission failed. Satellite failed to separate from booster. Failed to achieve orbit. |
| **9012** | Discoverer 17 | 12 Nov 1960 | [1960-015A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1960-015A) | 1960 OMI | KH-2 | Mission failed. Obtained orbit successfully. Film separated before any camera operation leaving only 1.7 ft of film in capsule. |
| **9013** | Discoverer 18 | 07 Dec 1960 | [1960-018A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1960-018A) | 1960 SIG | KH-2 | First successful mission employing KH-2 camera system. |
| **RM-1** | Discoverer 19 | 20 Dec 1960 | [1960-019A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1960-019A) | 1960 TAU | none | Test of Midas missile-detection system |
| **9014A** | Discoverer 20 | 17 Feb 1961 | [1961-005A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1961-005A) | 1961 EPS 1 | KH-5 | See [KH-5](http://www.theblackvault.com/wiki/index.php?title=KH-5&action=edit&redlink=1) |
| **RM-2** | Discoverer 21 | 18 Feb 1961 | [1961-006A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1961-006A) | 1961 ZET | none | Test of restartable rocket engine |
| **9015** | Discoverer 22 | 30 Mar 1961 | [DISC22](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=DISC22) | 1961-F02 | KH-2 | Mission failed. Second stage failed to obtain orbital velocity. |
| **9016A** | Discoverer 23 | 08 Apr 1961 | [1961-011A](http://nssdc.gsfc.nasa.gov/database/MasterCatalog?sc=1961-011A) | 1961 LAM 1 | KH-5 | See KH-5 |
| **9018A** | Discoverer 24 | 16 Jun 1961 | [DISC24](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=DISC24) | 1961-F05 | KH-5 | See KH-5 |
| **9017** | Discoverer 25 | 16 Jun 1961 | [1961-014A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1961-014A) | 1961 XI 1 | KH-2 | Capsule recovered from water on orbit 32. Streaks throughout film. |
| **9019** | Discoverer 26 | 07 Jun 1961 | [1961-016A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1961-016A) | 1961 PI | KH-2 | Main camera malfunctioned on pass 22. |
| **9020A** | Discoverer 27 | 21 Jun 1961 | [DISC27](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=DISC27) | 1961-F07 | KH-5 | See KH-5 |
| **9021** | Discoverer 28 | 03 Aug 1961 | [DISC28](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=DISC28) | 1961-F08 | KH-2 | Mission failed. No orbit. Satellite guidance system failed. |
| **9022** | Discoverer 30 | 12 Sep 1961 | [1961-024A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1961-024A) | 1961 OME 1 | KH-3 | Best mission to date. Same out-of-focus condition as in 9023. |
| **9023** | Discoverer 29 | 30 Aug 1961 | [1961-023A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1961-023A) | 1961 PSI | KH-3 | First use of KH-3 camera system. All frames out of focus. |
| **9024** | Discoverer 31 | 17 Sep 1961 | [1961-026A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1961-026A) | 1961 A BET | KH-3 | Mission failed. Power failure and loss of control gas on orbit 33. Capsule was not recovered. |
| **9025** | Discoverer 32 | 13 Oct 1961 | [1961-027A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1961-027A) | 1961 A GAM 1 | KH-3 | Capsule recovered on orbit 18. 96% of film out of focus. |
| **9026** | Discoverer 33 | 23 Oct 1961 | [DISC33](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=DISC33) | 1961-F10 | KH-3 | Mission failed. Satellite failed to separate from Thor booster. No orbit. |
| **9027** | Discoverer 34 | 05 Nov 1961 | [1961-029A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1961-029A) | 1961 A EPS 1 | KH-3 | Mission failed. Improper launch angle resulted in extreme orbit. Gas valve failed |
| **9028** | Discoverer 35 | 15 Nov 1961 | [1961-030A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1961-030A) | 1961 A ZET 1 | KH-3 | All cameras operated satisfactorily. Grainy emulsion noted. |
| **9029** | Discoverer 36 | 12 Dec 1961 | [1961-032A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1961-032A) | 1961 A KAP 1 | KH-3 | Best mission to date. |
| **9030** | Discoverer 37 | 13 Jan 1962 | [DISC37](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=DISC37) | 1962-F01 | KH-3 | Mission failed. No orbit. |
| **9031** | Discoverer 38 | 27 Feb 1962 | [1962-005A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1962-005A) | 1962 EPS 1 | KH-4 | First mission of the KH-4 series. Much of film slightly out of focus. |
| **9032** | Discoverer 39 | 18 Apr 1962 | [1962-011A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1962-011A) | 1962 LAM 1 | KH-4 | Best mission to date. |
| **9033** | FTV 1125 | 28 Apr 1962 | [1962-017A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1962-017A) | 1962 RHO 1 | KH-4 | Mission failed. Parachute ejector squibs holding parachute container cover failed to fire. No recovery. |
| **9034A** | FTV 1126 | 15 May 1962 | [1962-018A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1962-018A) | 1962 SIG 1 | KH-5 | See KH-5 |
| **9035** | FTV 1128 | 30 May 1962 | [1962-021A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1962-021A) | 1962 PHI 1 | KH-4 | Slight corona static on film. |
| **9036** | FTV 1127 | 02 Jun 1962 | [1962-022A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1962-022A) | 1962 CHI 1 | KH-4 | Mission failed. During air catch |
| **9037** | FTV 1129 | 23 Jun 1962 | [1962-026A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1962-026A) | 1962 A BET | KH-4 | Corona static occurs on some film. |
| **9038** | FTV 1151 | 28 Jun 1962 | [1962-027A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1962-027A) | 1962 A GAM | KH-4 | Severe corona static. |
| **9039** | FTV 1130 | 21 Jun 1962 | [1962-031A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1962-031A) | 1962 A ETA | KH-4 | Aborted after 6 photo passes. Heavy corona and radiation fog. |
| **9040** | FTV 1131 | 28 Jun 1962 | [1962-032A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1962-032A) | 1962 A THE | KH-4 | No filters on slave horizon cameras. Heavy corona and radiation fog. |
| **9041** | FTV 1152 | 02 Aug 1962 | [1962-034A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1962-034A) | 1962 A KAP 1 | KH-4 | Severe corona and radiation fog. |
| **9042A** | FTV 1132 | 01 Sep 1962 | [1962-044A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1962-044A) | 1962 A UPS | KH-5 | See KH-5 |
| **9043** | FTV 1133 | 17 Sep 1962 | [1962-046A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1962-046A) | 1962 A CHI | KH-4 | Capping shutter malfunction |
| **9044** | FTV 1153 | 29 Aug 1962 | [1962-042A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1962-042A) | 1962 A SIG | KH-4 | Erratic vehicle attitude. Radiation fog minimal. |
| **9045** | FTV 1154 | 29 Sep 1962 | [1962-050A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1962-050A) | 1962 B BET | KH-4 | First use of stellar camera |
| **9046A** | FTV 1134 | 09 Oct 1962 | [19762-053A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=19762-053A) | 1962 B EPS | KH-5 | See KH-5 |
| **9047** | FTV 1136 | 05 Nov 1962 | [1962-063A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1962-063A) | 1962 B OMI | KH-4 | Camera door malfunctioned |
| **9048** | FTV 1135 | 24 Nov 1962 | [1962-065A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1962-065A) | 1962 B RHO | KH-4 | Some film exposed through base. |
| **9049** | FTV 1155 | 04 Dec 1962 | [1962-066A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1962-066A) | 1962 B SIG | KH-4 | Mission failed. During air catch chute tore |
| **9050** | FTV 1156 | 14 Dec 1962 | [1962-069A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1962-069A) | 1962 B PHI | KH-4 | Best mission to date. |
| **9051** | OPS 0048 | 07 Jan 1963 | [1963-002A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1963-002A) | 1963-002A | KH-4 | Erratic vehicle attitude. Frame ephemeris not created. |
| **9052** | OPS 0583 | 28 Feb 1963 | [1963-F02](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1963-F02) | 1963-F02 | KH-4 | Mission failed. Destroyed by range safety officer |
| **9053** | OPS 0720 | 01 Apr 1963 | [1963-007A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1963-007A) | 1963-007A | KH-4 | Best imagery to date. |
| **9054** | OPS 0954 | 12 Jun 1963 | [1963-019A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1963-019A) | 1963-019A | KH-4 | Some imagery seriously affected by corona. |
| **9055A** | OPS 1008 | 26 Apr 1963 | [1963-F07](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1963-F07) | 1963-F07 | KH-5 | See KH-5 |
| **9056** | OPS 0999 | 26 Jun 1963 | [1963-025A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1963-025A) | 1963-025A | KH-4 | Experimental camera carried. Film affected by light leaks. |
| **9057** | OPS 1266 | 18 Jun 1963 | [1963-029A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1963-029A) | 1963-029A | KH-4 | Best mission to date. |
| **9058A** | OPS 1561 | 29 Aug 1963 | [1963-035A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1963-035A) | 1963-035A | KH-5 | See KH-5 |
| **9059A** | OPS 2437 | 29 Oct 1963 | [1963-042A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1963-042A) | 1963-042A | KH-5 | See KH-5 |
| **9060** | OPS 2268 | 09 Nov 1963 | [1963-F14](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1963-F14) | 1963-F14 | KH-4 | Mission failed. No orbit. |
| **9061** | OPS 2260 | 27 Nov 1963 | [1963-048A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1963-048A) | 1963-048A | KH-4 | Mission failed. Return capsule separated from satellite but remained in orbit. |
| **9062** | OPS 1388 | 21 Dec 1963 | [1963-055A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1963-055A) | 1963-055A | KH-4 | Corona static fogged much of film. |
| **9065A** | OPS 2739 | 21 Aug 1964 | [1964-048A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1964-048A) | 1964-048A | KH-5 | See KH-5 |
| **9066A** | OPS 3236 | 13 Jun 1964 | [1964-030A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1964-030A) | 1964-030A | KH-5 | See KH-5 |
| **1001** | OPS 1419 | 24 Aug 1963 | [1963-034A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1963-034A) | 1963-034A | KH-4A | First mission of KH-4A. Some film was fogged. Two buckets but 1001-2 was never recovered. |
| **1002** | OPS 1353 | 23 Sep 1963 | [1963-037A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1963-037A) | 1963-037A | KH-4A | Severe light leaks |
| **1003** | OPS 3467 | 24 Mar 1964 | [1964-F04](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1964-F04) | 1964-F04 | KH-4A | Mission failed. Guidance system failed. No orbit. |
| **1004** | OPS 3444 | 15 Feb 1964 | [1964-008A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1964-008A) | 1964-008A | KH-4A | Main cameras operated satisfactorily. Minor degradations due to static and light leaks. |
| **1005** | OPS 2921 | 27 Apr 1964 | [1964-022A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1964-022A) | 1964-022A | KH-4A | Mission failed. Recovery vehicle impacted in Venezuela. |
| **1006** | OPS 3483 | 04 Jun 1964 | [1964-027A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1964-027A) | 1964-027A | KH-4A | Highest quality imagery attained to date from the KH-4 system. |
| **1007** | OPS 3754 | 19 Jun 1964 | [1964-032A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1964-032A) | 1964-032A | KH-4A | Out-of-focus area on some film. |
| **1008** | OPS 3491 | 10 Jun 1964 | [1964-037A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1964-037A) | 1964-037A | KH-4A | Cameras operated satisfactorily |
| **1009** | OPS 3042 | 05 Aug 1964 | [1964-043A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1964-043A) | 1964-043A | KH-4A | Cameras operated successfully. |
| **1010** | OPS 3497 | 14 Sep 1964 | [1964-056A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1964-056A) | 1964-056A | KH-4A | Small out of focus areas on both cameras at random times throughout the mission. |
| **1011** | OPS 3333 | 05 Oct 1964 | [1964-061A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1964-061A) | 1964-061A | KH-4A | Primary mode of recovery failed on second portion of the mission (1011-2). Small out of focus areas present at random on both cameras. |
| **1012** | OPS 3559 | 17 Oct 1964 | [1964-067A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1964-067A) | 1964-067A | KH-4A | Vehicle attitude became erratic on the second portion of the mission necessitating an early recovery. |
| **1013** | OPS 5434 | 02 Nov 1964 | [1964-071A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1964-071A) | 1964-071A | KH-4A | Program anomaly occurred immediately after launch when both cameras operated for 417 frames. Main cameras ceased operation on rev 52D of first portion of mission negating second portion. About 65 % of aft camera film is out of focus. |
| **1014** | OPS 3360 | 18 Nov 1964 | [1964-075A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1964-075A) | 1964-075A | KH-4A | Cameras operated successfully. |
| **1015** | OPS 3358 | 19 Dec 1964 | [1964-085A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1964-085A) | 1964-085A | KH-4A | Discrepancies in planned and actual coverage due to telemetry problems during the first 6 revolutions. Small out-of-focus areas on film from aft camera. |
| **1016** | OPS 3928 | 15 Jan 1965 | [1965-002A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1965-002A) | 1965-002A | KH-4A | Smearing of highly reflective images due to reflections within camera. |
| **1017** | OPS 4782 | 25 Feb 1965 | [1965-013A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1965-013A) | 1965-013A | KH-4A | Capping shutter malfunction occurred during last 5 passes of mission. |
| **1018** | OPS 4803 | 25 Mar 1965 | [1965-026A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1965-026A) | 1965-026A | KH-4A | Cameras operated successfully. First KH-4A reconnaissance system to be launched into a retrograde orbit. |
| **1019** | OPS 5023 | 29 Apr 1965 | [1965-033A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1965-033A) | 1965-033A | KH-4A | Cameras operated successfully. Malfunction in recovery mode on 1019-2 negated recovery. |
| **1020** | OPS 8425 | 09 Jun 1965 | [1965-045A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1965-045A) | 1965-045A | KH-4A | All cameras operated satisfactorily. Erratic attitude caused an early recovery after the second day of 1020-2. |
| **1021** | OPS 8431 | 18 May 1965 | [1965-037A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1965-037A) | 1965-037A | KH-4A | Aft camera ceased operation on pass 102. |
| **1022** | OPS 5543 | 19 Jun 1965 | [1965-057A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1965-057A) | 1965-057A | KH-4A | All cameras operated satisfactorily. |
| **1023** | OPS 7208 | 17 Aug 1965 | [1965-067A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1965-067A) | 1965-067A | KH-4A | Program anomaly caused the fore camera to cease operation during revolutions 103-132. |
| **1024** | OPS 7221 | 22 Sep 1965 | [1965-074A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1965-074A) | 1965-074A | KH-4A | All cameras operated satisfactorily. Cameras not operated on passes 88D-93D. |
| **1025** | OPS 5325 | 05 Oct 1965 | [1965-079A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1965-079A) | 1965-079A | KH-4A | Main cameras operated satisfactorily. |
| **1026** | OPS 2155 | 28 Oct 1965 | [1965-086A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1965-086A) | 1965-086A | KH-4A | All cameras operated satisfactorily. |
| **1027** | OPS 7249 | 09 Dec 1965 | [1965-102A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1965-102A) | 1965-102A | KH-4A | Erratic attitude necessitated recovery after two days of operation. All cameras operated satisfactorily. |
| **1028** | OPS 4639 | 24 Dec 1965 | [1965-110A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1965-110A) | 1965-110A | KH-4A | Cameras operated satisfactorily. |
| **1029** | OPS 7291 | 02 Feb 1966 | [1966-007A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1966-007A) | 1966-007A | KH-4A | Both panoramic cameras were operational throughout. |
| **1030** | OPS 3488 | 09 Mar 1966 | [1966-018A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1966-018A) | 1966-018A | KH-4A | All cameras operated satisfactorily. |
| **1031** | OPS 1612 | 07 Apr 1966 | [1966-029A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1966-029A) | 1966-029A | KH-4A | The aft-looking camera malfunctioned after the recovery of bucket 1. No material was received in bucket 2 (1031-2). |
| **1032** | OPS 1508 | 03 May 1966 | [1966-F05A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1966-F05A) | 1966-F05 | KH-4A | Mission failed. Vehicle failed to achieve orbit. |
| **1033** | OPS 1778 | 24 May 1966 | [1966-042A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1966-042A) | 1966-042A | KH-4A | The stellar camera shutter of bucket 2 remained open for approximately 200 frames. |
| **1034** | OPS 1599 | 21 Jun 1966 | [1966-055A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1966-055A) | 1966-055A | KH-4A | Failure of velocity altitude programmer produced poor imagery after revolution 5. |
| **1035** | OPS 1703 | 20 Sep 1966 | [1966-085A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1966-085A) | 1966-085A | KH-4A | All cameras operated satisfactorily. First mission flown with pan geometry modification. |
| **1036** | OPS 1545 | 09 Aug 1966 | [1966-072A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1966-072A) | 1966-072A | KH-4A | All cameras operated satisfactorily. |
| **1037** | OPS 1866 | 08 Nov 1966 | [1966-102A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1966-102A) | 1966-102A | KH-4A | Second pan geometry mission. Higher than normal base plus fog encountered on both main camera records. |
| **1038** | OPS 1664 | 14 Jan 1967 | [1967-002A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1967-002A) | 1967-002A | KH-4A | Fair image quality. |
| **1039** | OPS 4750 | 22 Feb 1967 | [1967-015A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1967-015A) | 1967-015A | KH-4A | Normal KH-4 mission. Light from horizon camera on both main camera records during 1039-1. |
| **1040** | OPS 4779 | 30 Mar 1967 | [1967-029A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1967-029A) | 1967-029A | KH-4A | Satellite flown nose first |
| **1041** | OPS 4696 | 09 May 1967 | [1967-043A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1967-043A) | 1967-043A | KH-4A | Due to the failure of the booster cut-off switch |
| **1042** | OPS 3559 | 16 Jun 1967 | [1967-062A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1967-062A) | 1967-062A | KH-4A | Small out-of-focus area in forward camera of 1042-1. |
| **1043** | OPS 4827 | 07 Aug 1967 | [1967-076A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1967-076A) | 1967-076A | KH-4A | Forward camera film came out of the rails on pass 230D. Film degraded past this point. |
| **1044** | OPS 0562 | 02 Nov 1967 | [1967-109A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1967-109A) | 1967-109A | KH-4A | All cameras operated fine. |
| **1045** | OPS 2243 | 24 Jan 1968 | [1968-008A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1968-008A) | 1968-008A | KH-4A | All cameras operated satisfactorily. |
| **1046** | OPS 4849 | 14 Mar 1968 | [1968-020A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1968-020A) | 1968-020A | KH-4A | Image quality good for 1046-1 and fair for 1046-2. |
| **1047** | OPS 5343 | 20 Jun 1968 | [1968-052A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1968-052A) | 1968-052A | KH-4A | Out-of-focus imagery is present on both main camera records. |
| **1048** | OPS 0165 | 18 Sep 1968 | [1968-078A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1968-078A) | 1968-078A | KH-4A | Film in the forward camera separated and camera failed on mission 1048-2 |
| **1049** | OPS 4740 | 12 Dec 1968 | [1968-112A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1968-112A) | 1968-112A | KH-4A | Degraded film |
| **1050** | OPS 3722 | 19 Mar 1969 | [1969-026A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1969-026A) | 1969-026A | KH-4A | Due to abnormal rotational rates after revolution 22 |
| **1051** | OPS 1101 | 02 May 1969 | [1969-041A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1969-041A) | 1969-041A | KH-4A | Imagery of both pan camera records is soft and lacks crispness and edge sharpness. |
| **1052** | OPS 3531 | 22 Sep 1969 | [1969-079A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1969-079A) | 1969-079A | KH-4A | Last of the KH-4A missions |
| **1101** | OPS 5089 | 15 Sep 1967 | [1967-087A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1967-087A) | 1967-087A | KH-4B | First mission of the KH-4B series. Best film to date. |
| **1102** | OPS 1001 | 09 Dec 1967 | [1967-122A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1967-122A) | 1967-122A | KH-4B | Noticeable image smear for forward camera |
| **1103** | OPS 1419 | 01 May 1968 | [1968-039A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1968-039A) | 1968-039B | KH-4B | Out-of-focus imagery is present on both main camera records. |
| **1104** | OPS 5955 | 07 Aug 1968 | [1968-065A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1968-065A) | 1968-065A | KH-4B | Best imagery to date on any KH-4 systems. Bicolor and color infrared experiments were conducted on this mission. |
| **1105** | OPS 1315 | 03 Nov 1968 | [1968-098A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1968-098A) | 1968-098A | KH-4B | Image quality is variable and displays areas of soft focus and image smear. |
| **1106** | OPS 3890 | 05 Feb 1969 | [1969-010A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1969-010A) | 1969-010A | KH-4B | The best image quality to date. |
| **1107** | OPS 3654 | 24 Jun 1969 | [1969-063A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1969-063A) | 1969-063A | KH-4B | Forward camera failed on pass 1 and remained inoperative throughout the rest of the mission. |
| **1108** | OPS 6617 | 04 Dec 1969 | [1969-105A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1969-105A) | 1969-105A | KH-4B | Cameras operated satisfactorily and the mission carried 811 ft of aerial color film added to the end of the film supply. |
| **1109** | OPS 0440 | 04 Mar 1970 | [1970-016A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1970-016A) | 1970-016A | KH-4B | Cameras operated satisfactorily but the overall image quality of both the forward and aft records is variable. |
| **1110** | OPS 4720 | 20 May 1970 | [1970-040A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1970-040A) | 1970-040A | KH-4B | The overall image quality is less than that provided by recent missions and 2 |
| **1111** | OPS 4324 | 23 Jun 1970 | [1970-054A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1970-054A) | 1970-054A | KH-4B | The overall image quality is good. |
| **1112** | OPS 4992 | 18 Nov 1970 | [1970-098A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1970-098A) | 1970-098A | KH-4B | The forward camera failed on pass 104 and remained inoperative throughout the rest of the mission. |
| **1113** | OPS 3297 | 17 Feb 1971 | [1971-F01A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1971-F01A) | 1971-F01 | KH-4B | Mission failed due to failure of Thor booster. Destroyed shortly after launch. |
| **1114** | OPS 5300 | 24 Mar 1971 | [1971-022A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1971-022A) | 1971-022A | KH-4B | The overall image quality is good and comparable to the best of past missions. On-board program failed after pass 235 |
| **1115** | OPS 5454 | 10 Sep 1971 | [1971-076A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1971-076A) | 1971-076A | KH-4B | Overall image quality is good. |
| **1116** | OPS 5640 | 19 Mar 1972 | [1972-032A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1972-032A) | 1972-032A | KH-4B | Very successful mission and image quality was good. |
| **1117** | OPS 6371 | 25 May 1972 | [1972-039A](http://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1972-039A) | 1972-039A | KH-4B | Last KH-4B mission. Very successful mission |

**See also**

* [KH-5](http://www.theblackvault.com/wiki/index.php?title=KH-5&action=edit&redlink=1)-ARGON, [KH-6](http://www.theblackvault.com/wiki/index.php?title=KH-6&action=edit&redlink=1)-LANYARD, [KH-7](http://www.theblackvault.com/wiki/index.php?title=KH-7&action=edit&redlink=1), [KH-8](http://www.theblackvault.com/wiki/index.php?title=KH-8&action=edit&redlink=1)-GAMBIT
* KH-9-HEXAGON "[Big Bird](http://www.theblackvault.com/wiki/index.php?title=Big_Bird_(satellite)&action=edit&redlink=1)"
* [KH-10](http://www.theblackvault.com/wiki/index.php?title=KH-10&action=edit&redlink=1)-DORIAN or [Manned Orbital Laboratory](http://www.theblackvault.com/wiki/index.php?title=Manned_Orbital_Laboratory&action=edit&redlink=1)
* [KH-11](http://www.theblackvault.com/wiki/index.php?title=KH-11&action=edit&redlink=1), [KH-12](http://www.theblackvault.com/wiki/index.php?title=KH-12&action=edit&redlink=1), [KH-13](http://www.theblackvault.com/wiki/index.php?title=KH-13&action=edit&redlink=1).
* [Satellite imagery](http://www.theblackvault.com/wiki/index.php?title=Satellite_imagery&action=edit&redlink=1)

**Popular culture**

The 1963 thriller novel [*Ice Station Zebra*](http://www.theblackvault.com/wiki/index.php?title=Ice_Station_Zebra_(novel)&action=edit&redlink=1) and its [1968 film adaptation](http://www.theblackvault.com/wiki/index.php?title=Ice_Station_Zebra_(film)&action=edit&redlink=1) were inspired, in part, by news accounts from April 17, 1959, about a missing experimental [Corona](http://www.theblackvault.com/wiki/index.php?title=Corona_(satellite)&action=edit&redlink=1) satellite capsule (Discoverer II) that inadvertently landed near [Spitsbergen](http://www.theblackvault.com/wiki/index.php?title=Spitsbergen&action=edit&redlink=1) on April 13 and was believed to have been recovered by Soviet agents.

**References**

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* [Dwayne A. Day](http://www.theblackvault.com/wiki/index.php?title=Dwayne_A._Day&action=edit&redlink=1), John M. Logsdon, and Brian Latell (Eds.), *Eye in the Sky: The Story of the Corona Spy Satellites*. Washington, DC: Smithsonian Books. [ISBN 1-56098-773-1](http://www.theblackvault.com/wiki/index.php/Special:BookSources/1560987731) (paperback) or [ISBN 1-56098-830-4](http://www.theblackvault.com/wiki/index.php/Special:BookSources/1560988304) (hardcover).
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* [Curtis Peebles](http://www.theblackvault.com/wiki/index.php?title=Curtis_Peebles&action=edit&redlink=1), *The Corona Project: America's First Spy Satellites*. Annapolis: Naval Institute Press. [ISBN 1-55750-688-4](http://www.theblackvault.com/wiki/index.php/Special:BookSources/1557506884).
* Phil Taubman, *Secret Empire: Eisenhower, the CIA, and the Hidden Story of America’s Space Espionage.* New York: Simon & Schuster, 2003 [ISBN 0684856999](http://www.theblackvault.com/wiki/index.php/Special:BookSources/0684856999)

**External links**

* [US Geological Survey overview and image search](http://edc.usgs.gov/products/satellite.html)
* [Corona page at NRO](http://www.nro.gov/corona/facts.html)
* [GlobalSecurity.org: Imagery Intelligence](http://www.globalsecurity.org/space/systems/imint.htm)
* [A Point in Time](http://www.archive.org/details/point_in_time), an hourlong CIA film documenting the program