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# (U) National Reconnaissance Office Review and Redaction Guide



## For Automatic Declassification Of 25-Year-Old Information

*Version 1.0  
2008 Edition*

Approved:  
Scott F. Large  
Director

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**(U) Preface**

(U) This document represents the current records declassification policy of the National Reconnaissance Office (NRO). This policy applies to the declassification of all 25-year-old NRO records covered in the amended Executive Order (EO) 12958: Automatic Declassification Review (ADR), Mandatory Declassification Review (MDR), and Systematic Declassification Review (SDR), as well as actions associated with the Freedom of Information Act (FOIA) and Security Review (SR). The need to protect sensitive space intelligence operations and capabilities, and the roles of the Secretary of Defense and the Director of National Intelligence in establishing policies for the classification, declassification, and release of related information, were reaffirmed by the President in National Security Presidential Directive/NSPD-49, *National Space Policy*, 31 August 2006. The Director, Management Services and Operations (MS&O) at the NRO is responsible for overseeing and coordinating NRO compliance with the declassification requirements of EO 12958, as amended, and for the NRO's uniform execution of the policy guidance contained in this document. To achieve the Executive Order's spirit of greater public access to government records, this Review and Redaction Guide is a living document, revised and updated annually. To that end, the NRO Office of Security and Counterintelligence promptly advises the declassification component of the Information Access and Release Team (IART) in MS&O about changes in classification policy that affect this guide. Questions concerning information contained in this guide, or about updating it, should be addressed to MS&O/ASG/IMSC/IART.

**Changes certified as of 17 March 2009**

/s/  
Scott F. Large  
Director

**Changes certified as of 16 January 2007**

/s/  
Donald M. Kerr  
Director

**Changes certified as of 25 November 2005**

/s/  
Donald M. Kerr  
Director

**Changes certified as of 11 January 2005**

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/s/  
Peter B. Teets  
Director

**Changes certified as of 23 January 2004**

/s/  
Peter B. Teets  
Director

**Changes certified as of 4 December 2002**

/s/  
Peter B. Teets  
Director

**Changes certified as of 20 November 2001**

/s/  
Keith R. Hall  
Director

**Changes certified as of 21 July 2000**

/s/  
Keith R. Hall  
Director

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/s/  
Keith R. Hall  
Director

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## (U) Background

(U) On 17 April 1995, the President signed E.O. 12958, "Classified National Security Information." This order, subsequently amended on 25 March 2003, directs the automatic declassification and release to the public of information on a specific date or event determined by the original classification authority, or on the expiration of a maximum period for classification established by the order. It features two simple mandates: classify information only when necessary to do so, and declassify as much as possible as soon as possible. The order also calls for creating the proper balance between the free-flow of information to the public--including 25-year-old information of historical significance--and protecting the nation's legitimate secrets, even when they are recorded in documents of historical significance.

(U) To meet the intelligence demands of the nuclear age and Cold War, the National Reconnaissance Office (NRO) was formally established in the Department of Defense in 1961. It combined major elements of the intelligence community, the military services, and numerous industrial firms to design, build, launch, and operate the nation's reconnaissance satellites and certain aerial reconnaissance vehicles. The NRO mission applied advanced overhead systems technology to collect both signals and imagery intelligence worldwide. The sensitivity of the NRO's Cold War mission required the organization to remain covert until 1992. Significant amounts of the technology developed by the NRO, and the methodologies for employing that technology, remain sensitive today, even though they fall within the 25-year-old framework of E.O. 12958, as amended. The need to protect sensitive space intelligence operations and capabilities was reaffirmed by the President in National Security Presidential Directive/NSPD-49, *National Space Policy*, 31 August 2006.

(U) The NRO serves as the Executive Agent for the Director of National Intelligence (DNI) in providing guidance for protecting the non-product aspects of satellite reconnaissance systems. The release of satellite reconnaissance information as described in this guide is consistent with provisions of PDD-49 and with the DNI's statutory responsibility to protect sources and methods.<sup>136</sup>

(U) This declassification guide is organized around the applicable exemptions from automatic declassification contained in E.O. 12958, as amended (Sec 3.3(b)). Eight of the nine

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exemptions apply to the review of NRO records based on the NRO Files Series Exemption Plan. These eight exemptions pertain to information that would:

- a. (U) "reveal information about the application of any intelligence source or method . . ." (Exemption Number 1)
- b. (U) "reveal information that would assist in the development or use of weapons of mass destruction" (Exemption Number 2)
- c. (U) "reveal information that would impair U.S. cryptologic systems or activities" (Exemption Number 3)
- d. (U) "reveal information that would impair the application of state-of-the-art technology within a U.S. weapon system" (Exemption Number 4)
- e. (U) "reveal actual U.S. military war plans that remain in effect" (Exemption Number 5)
- f. (U) "reveal information that would seriously and demonstrably impair relations between the United States and a foreign government, or seriously and demonstrably undermine diplomatic activities of the United States" (Exemption Number 6)
- g. (U) "reveal information that would seriously and demonstrably impair current national security emergency preparedness plans" (Exemption Number 8)
- h. (U) "violate a statute, treaty, or international agreement" (Exemption Number 9)

### **(U) General Methodology**

(U) The specific guidelines in this document establish the criteria for determining what 25-year-old information shall be declassified and what 25-year-old information must remain classified. To maximize the release potential of a document that cannot be released in its entirety, classified information will be redacted, i.e., rendered unreadable. Before release, certain information elements also may have to be referred to an outside agency that had original classification responsibility, or otherwise has concern for the information.



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(U) Information reviewed is therefore processed for one of three results. It will be recommended for: Redaction, Release as is, or Referral to another authority for further review, coordination, or disposition. The three potential results are explained below. Referred NRO information will be redacted as necessary before leaving NRO control for action by other government agencies. Final approval for release of 25-year-old NRO records in any form always rests with the NRO official designated as the Seal and Release Authority [SRA], who is a government employee.

(U) Release: The main objective of this process is to release as much information as possible without compromising national security. Information not meeting any of the amended E.O. 12958 exemption criteria must be recommended for release.

(U) Redact: Redaction involves removing still-classified portions of a classified document in order to make the document unclassified and releasable. The actual mechanics of redacting information will depend on whether hard copy paper records or soft copy computerized records are being processed. Specific redaction methodology is explained in the NRO Review and Redaction Procedures (RRP) (published separately).

(U) The basic redaction philosophy calls for redacting only information that qualifies under one of the automatic declassification exemptions in E.O. 12958, as amended. Information is never redacted to avoid revealing poor judgment, an illegal act, or an embarrassment to the document's author or any U.S. Government agency or department, including the NRO.

(U) Redacted information can consist of a single word, a phrase or clause, several sentences, and/or several paragraphs, pages, or sections. As little as possible will be redacted, even if the remaining text is awkward.

(U) Rewriting to generalize or smooth the text where redaction has created disjointed phrases or sentences is not permitted. However, additional words, sentences, paragraphs, or entire sections of a document can be redacted for the following reasons:

a. To prevent easy reconstruction of the deleted material, or

b. If the required deletion distorts the meaning of the remaining text or renders it meaningless.

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(U) *Refer*: Some documents are referred to another government agency for review and final release authorization because they were originally classified by that agency. Referral also may be required when documents originally classified by the NRO contain information equities of concern to another agency. The detailed guidelines contained in this document identify information requiring referral to the extent possible. The Information Access and Release Team's (IART) Review and Redaction Procedures manual explains the mechanics of processing information that requires referral.

(U) Effective dates that appear within parentheses in this guide mark the date that a change to the RRG took effect for the specified information elements.

### **(U) File Series Exemptions**

(U) Executive Order 12958, Section 3.3(c) as amended, authorizes the NRO Director to recommend for exemption from automatic declassification certain file series of NRO records that invariably contain classified information falling into one or more of the nine exemption categories specified in Section 3.3(b). A list of exempted Records Control Schedule (RCS) item numbers is contained in the NRO Review and Redaction Resource Binder, also published separately. For detailed information regarding NRO exempted file series, see the NRO File Series Exemption Plan submitted by the DNRO to the Information Security Oversight Office (ISOO) in October 1995, subsequently approved by the President on 9 March 1999.

### **(U) Continued Exemption from Declassification**

(U) All NRO documents *exempted* from automatic declassification in full or in part during the baseline review will be declassified if they are not otherwise re-evaluated and properly exempted by 31 December of the year in which they become 50 years old. Any document(s) given follow-on exemption will be individually marked in compliance with the 25X code and assigned a future date or event for declassification.

# **(U) Release and Redaction Guidelines**

**1. (U) Reveal Information that Involves the  
Application of Intelligence Sources and Methods  
(25X1)**

## 1.1 (U) Document Administration

### Redact:

a. (U) All names and signatures of National Reconnaissance Program (NRP) participants unless they appear in Appendix B or have been released under 1.2.2. For those whose names have been approved for release in these references, line-through all signatures of NRP participants; see Section 9 for exemption authority.<sup>105, 135</sup> (Effective 22 August 2005) Signatures of OSD officials (SECDEF, DEPSECDEF, DDR&E, etc.), however, can be released.<sup>121</sup>

b. (U) All Social Security Numbers wherever they appear.

c. (U) All cable address slugs, and administrative, security, and codeword markings not identified below for release.

### Release:

a. (U) Document Control Numbers:

(1) (U) The BYE prefix to BYEMAN Document Accountability Numbers (DAN) and numbers associated with the BYE prefix.<sup>130</sup> (Effective 21 May 2005)

(2) (U) BIF DANs/message-cite numbers and specific program-related document control numbers/message-cite numbers associated with the BYEMAN control system.

(3) (U) BYEMAN Cover Sheets and BYEMAN security terminology, to include the word BYEMAN and its abbreviations "BYE," Bravo and references to "B" system.<sup>130</sup>

b. (U) Non-BYEMAN document control numbers or message cite numbers, or similar designators associated with officially declassified and acknowledged former BYEMAN programs, i.e., CORONA, OXCART, IDEALIST.<sup>26</sup>

c. (U) "SPECIAL HANDLING" caveats that were predecessors to the BYEMAN control system for protecting satellite reconnaissance programmatic information.<sup>26</sup>

d. (U) Identification markings for specific copy numbers assigned to a document, i.e., "copy 4 of 10 copies."<sup>26</sup>

e. (U) The security channel code words TALENT-KEYHOLE and the abbreviation "TK."<sup>8</sup>

f. (U) The satellite imagery product code word "RUFF."<sup>8</sup>

g. (U) The satellite imagery product code word "DAFF."<sup>27</sup>

h. (U) The satellite SIGINT product code word "ZARF."<sup>54</sup>

i. (U) References to "continued control" control markings.<sup>8</sup>

j. (U) References to the term, "Sensitive Compartmented Information" and its abbreviation "SCI."<sup>5, 25</sup>

k. (U) The following SIGINT product code words:<sup>25</sup>

ACORN	CREAM	FLARE	KIMBO	PIXIE	THUMB
AMBLE	KRONE	FROTH	LARUM	SABRE	TRINE
BASTE	DAUNT	GAVEL	MAGIC	SAPPY	TWEED
CANOE	DENIM	GLINT	MORAY	SAVIN	ULTRA
CHEER	DINAR	HERON	PEARL	SPOKE	UMBRA
CHUTE	EIDER	HYSON	PINUP	SPRIG	USHER
COPSE	BOOTY	IVORY	PIVOT	SUEDE	WITCH

l. (U) The following SIGINT Exchange Designators:<sup>25</sup>

ARCA	FRONTO	NECTAR	SARDINE
DIKTER	KAMPUS	PROTEIN	SEABOOT
DIVERSITY	KEYRUT	PYLON	SETTEE
DRUID	MUSKET	RORIPA	THESPIS

m. (U) The following COMINT flags:<sup>25, 77</sup>

DELTA (Effective 9/7/01)  
ECI  
GAMMA  
Handle via COMINT Channels Only  
Special Intelligence (SI)  
Very Restricted Knowledge (VRK)

n. (U) The following SIGINT-related paragraph portion-marking conventions:<sup>25</sup>

(1) (C-CCO) "CONFIDENTIAL-Handle via COMINT Channels Only"

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- (2) (G) "GAMMA"
  - (3) (S-CCO) "SECRET-Handle via COMINT Channels Only"
  - (4) (SC) "SECRET SPOKE"
  - (5) (SCX) "SECRET MORAY"
  - (6) (TS/C) "TOP SECRET SPOKE"
  - (7) (TS-CCO) "TOP SECRET Handle via COMINT Channels Only"
  - (8) (TS-TKC) "TOP SECRET-Handle via TALENT-KEYHOLE COMINT Control Systems Jointly"
  - (9) (TSC) "TOP SECRET UMBRA"
- o. (U) Distribution lists as long as classified or unacknowledged activities and/or personnel that might be present in such lists are redacted.<sup>26</sup>
- p. (U) Citations of or references to classified records in the body of the document or as part of a bibliography, as long as any classified information is redacted from within the citation or reference itself.<sup>42</sup>
- q. (U) Barcodes.<sup>100</sup>

**Refer:**

(U) To the National Security Agency (NSA): Any information controlled by the security code word, "ZARF" or any document identified by the releasable SIGINT product code words, SIGADS, and the COMINT flags listed above.<sup>54</sup>

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**1.2 (U) About the National Reconnaissance Program (NRP)**

**1.2.1 (U) Fact of Satellite Reconnaissance**

**Redact:**

a. ~~(TS//TK)~~ Information that reveals:

- [REDACTED] b)(1)1.4c. (b)(3)
- the fact of [REDACTED] b)(1)1.4c. (b)(3)
- [REDACTED] b)(1)1.4c. (b)(3)
- general association of [REDACTED] b)(1)1.4c. (b)(3) [REDACTED] b)(1)1.4c. (b)(3) with the NRO.
- details beyond the fact of NRO radar/synthetic aperture radar (SAR) intelligence collection from space, [REDACTED] b)(1)1.4c. (b)(3)

If in doubt, redactors should consult the Redaction Quality Control (RQC) Supervisor for guidance.

b. ~~(TS//TK)~~ [REDACTED] b)(1)1.4c. (b)(3)

[REDACTED] b)(1)1.4c. (b)(3)

[REDACTED]

**Release:**

a. (U) Fact of satellite photoreconnaissance for peaceful purposes, including intelligence collection and monitoring of arms control agreements.<sup>3</sup>

b. (U) Fact that satellite photoreconnaissance includes a near-real-time capability and is used to provide defense-related information for indications and warning and the planning and conduct of military operations. The near-real-time capability can be quantified in terms of generic reference to minutes or hours.<sup>3, 75</sup>

c. (U) Fact of satellite photoreconnaissance for the collection of mapping, charting, and geodetic (MC&G) data for the development of global geodetic and cartographic materials to



support defense and other mapping-related activities, and the fact that such data is released to authorized federal agencies.<sup>3</sup>

d. ~~(S//TK)~~ Fact of NRO radar satellite reconnaissance, including Synthetic Aperture Radar (SAR) (b)(1)1.4c. (b)(3)  
(b)(1)1.4c. (b)(3)

b)(1)1.4c. (b)(3) This guidance does not apply to the former developmental Space Based Radar/Space Radar system, cancelled in 2008, which remains largely unclassified and releasable.

e. (U) Fact that scientific and environmental data and data on natural or human made disasters can be collected by satellite photoreconnaissance assets and disseminated to authorized federal agencies.<sup>3</sup> (See guidance RE Civil Applications Committee in section 1.2.3)

f. (U) Fact that photoreconnaissance assets can be used to image the United States and its territories and possessions.<sup>3</sup>

g. (U) Fact that the U.S. conducts satellite collection of signals intelligence (SIGINT), to include the SIGINT component disciplines of communications intelligence (COMINT), electronic intelligence (ELINT), and foreign instrumentation signals (FISINT).<sup>3, 5</sup>

h. (U) Fact that U.S./NRO systems perform overhead measurement and signature intelligence (MASINT) collection<sup>3, 53</sup> (see section 1.5).

i. (U) General facts surrounding official disclosure of the U.S. satellite reconnaissance program in the summer of 1962 to all NATO heads of government, Foreign Ministers, and Permanent Representatives to the North Atlantic Council.<sup>20</sup>

j. (U) Fact of and generic information about the NRO/NRP association with tactical reconnaissance and the Tactical Exploitation of National Capabilities (TENCAP) program within the Department of Defense.<sup>2</sup>  
(Effective 8/7/02)

k. (U) Fact of intelligence sharing relationships with second-party countries (UK, Canada, Australia, and New Zealand), and of second-party imagery sharing.<sup>155</sup>

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### 1.2.2 (U) National Reconnaissance Program Information

#### Redact:

a. (U) Details of early but still classified, current, or planned future programs including design, manufacturing, testing, schedules, operations, and funding; geographic locations of Mission Ground Stations; and vulnerability and survivability information.

b. ~~(S//TK)~~ Any references to ~~(b)(1)1.4c, (b)(3)~~  
~~(b)(1)1.4c, (b)(3)~~  
~~(b)(1)1.4c~~ activities provided by Program D or its successor support organizations within the NRO.

c. (U) Details about and methodologies used in security practices and cover planning, SCI adjudication and appeals practices, counterintelligence, and covert contracting, except as detailed later in Section 1.15.<sup>56</sup>

d. (U//FOUO) Names of NRO personnel (SAF/MSS and SS, SAF/SP, Programs A, B, C, and D), including names of service personnel that the Air Force acknowledged to be working on the Discoverer (CORONA cover) project, unless they appear in Appendix B or are identified for release below, at Release g.<sup>148</sup>

e. (U) Names of NRO contractor personnel unless they appear in Appendix B.<sup>148</sup>

f. (U) The number of persons planned for, employed by, assigned or detailed to the NRO or its components, or the occupational series, grade or salary of any NRO person.<sup>148</sup>

g. (U//FOUO) All contract numbers associated with NRP contractors (on all overhead programs), and identification of all contractors whose NRO association or scope of association has not been approved for release. See 1.11.3.

h. (U) All information not specified below for release.

#### Release:

a. (U) Fact of the NRP and NRO.<sup>1</sup>

b. (U) Fact of the Intelligence Community participation in the NRO.<sup>1</sup>

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c. (U) Fact that the NRO is an agency of the Department of Defense (DOD), and that the Secretary of Defense (SECDEF) has ultimate responsibility, exercised in concert with the DNI, for its management and operation.<sup>1</sup>

d. (U) Fact that the NRO executes programs through the CIA and DOD.<sup>1</sup>

e. (U) The following "facts about" DNI NRP responsibilities:<sup>1</sup>

(1) (U) Establishes NRP collection priorities and requirements for the site-targeting of NRP satellites and their frequency of coverage,

(2) (U) Establishes the NRP budget with the Secretary of Defense (SECDEF),

(3) (U) Provides security policy guidance for the NRP,

(4) (U) Guides/participates in formulation of the NRP through the DNRO.

f. (U) Fact that the NRP is a part of the National Foreign Intelligence Program/National Intelligence Program (NFIP/NIP).<sup>21</sup>

g. (U) Identities of the following people:

(1) All past and present DNROs.<sup>1, 9</sup>

(2) All past and present NRO Deputy Directors (DDNROs), and past Directors of NRO Programs A, B, C, and D.<sup>36</sup>

(3) Past Directors of the NRO Staff (SAF/SS).<sup>70</sup>

(4) Past and present directors or deputy directors of NRO Headquarters Directorates, Offices, and Staffs.<sup>148</sup>

(5) NRO authors publishing papers at the unclassified level.<sup>148</sup>

h. (U) Only those program mission numbers associated with the declassified CORONA, ARGON, LANYARD (CAL) imaging systems and the KH-7 and KH-9 imaging systems (see section 1.3.2).<sup>8</sup>

i. (U) Vague, generic information about covert satellites without reference to possible specific components,

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methodologies, technologies, or specific goals that would constitute a potential covert intelligence, surveillance, or reconnaissance (ISR) satellite capability.<sup>50</sup>

j. (U) Fact of the Satellite Operations Center (SOC) located in the Pentagon and generic information surrounding its function of forwarding collection requirements from the U.S. Intelligence Board (USIB) for implementation/tasking by the satellite ground stations.<sup>8</sup>

k. (U) The association of NRO with NASA without identifying specific projects or activities, except for the following: (Effective 6/29/01).<sup>53, 69, 71</sup> (See also, Section 9)

(1) NASA's limited role in the P-35 and P-417 programs of the Defense Meteorological Satellite Program (DMSP).

(2) NASA's use of NRO SAMOS E-1 payload technology in its 1966 Lunar Orbiter mission.

(3) NRO support of NASA's lunar reconnaissance operations in the 1960s that involved unmanned and manned [Lunar Orbiter and Apollo] projects, as established in the 28 August 1963 "DOD/CIA-NASA Agreement on NASA Reconnaissance Programs" and associated correspondence (E06-0005).<sup>144</sup> **Note:** The code word associated with support to the Apollo Project has not been declassified.

l. (U) Fact of and general information about the DNRO's role in chairing the Interdepartmental Contingency Planning Committee (ICPC). This body served as a mechanism to ensure a fully coordinated US Government response to contingencies relating to satellite or air vehicle overflight of denied territory.<sup>55</sup>

m. (U) The fact that the NRO provided classified remote sensing data to other federal agencies for civil support purposes, to include general information about the following aspects of that support.<sup>98</sup> (Effective 3/11/03)

(1) Classified overhead imagery support to other federal agencies began in the mid-1960s under the auspices of the Presidential Science Advisor. (See ARGO/CAC in Section 9.5)

(2) In 1969 a special facility, operated by the U.S. Geological Survey, was established in the Washington DC area to support use of classified remote sensing data by federal civilian agencies.

(3) A Presidential Executive Order created the Civil Applications Committee (CAC) in 1975. The CAC provided and continues to provide interagency oversight and advocacy for the collection and use of classified overhead imagery and data by federal civil agencies.

**Refer:**

a. (U) To Secretary of the Air Force SAF/AQ Security: All reconnaissance aircraft information after 1974.

b. (U) To the National Security Council (NSC): Any records addressing the 5412, 303, or 40 Committee meetings and their role in approving specific overflight reconnaissance operations.<sup>26</sup> (These committees are sometimes referred to as the "Special Group.") **Note:** fact that these committees reviewed and recommended overflights for Presidential approval is unclassified. (See 1.2.3. Release (d))

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### 1.2.3 (U) Organizational Relationships

(U) This section contains redaction and release guidelines for legacy organizations within the NRO, CIA, and Department of Defense: Secretary of the Air Force Space Systems (SAF/SS);<sup>145,146</sup> Secretary of the Air Force Special Projects (SAF/SP) Program A; CIA Office of Engineering and Development (OD&E) Program B; Naval Research Lab and elements of Naval Security Group, Program C); NRP Aircraft Reconnaissance through July 1974 (Program D) (See also 1.14); and Defense Reconnaissance Support Program (DRSP) and its Defense Support Project Office (DSPO).

#### 1.2.3.1. (U) SAF/SS

##### Redact:

a. ~~(S//TK)~~ Details concerning the association of the NRO headquarters unit, Secretary of the Air Force Space Systems (SAF/SS), with the NRO at large. One specific example is the

(b)(1)1.4c. (b)(3)

organization. (b)(1)1.4c. (b)(3)

Thus, this fact and any information indicating or implying an individual (b)(1)1.4c. (b)(3) needs to be protected. (Effective 6/29/01)

b. ~~(S//TK)~~ Details concerning SAF/SS support provided to personnel at NRO mission ground stations, (b)(1)1.4c. (b)(3) certain government and contractor activities, and wherever it appears that a SAF/SS association is other than at

(b)(1)1.4c. (b)(3)

c. (U) All references to office designations in SAF/SS in the Pentagon **that are not identified** in **Release** below.

d. (U) Names and signatures of all NRO personnel not identified in **Release** below, in 1.2.2 (**Release**), or in Appendix B for release.<sup>141</sup>

##### Release:

a. (U) Fact of the creation of the Office of Missile and Satellite Systems (SAF/MSS) in September 1960 under the direction of Air Force Undersecretary Joseph Charyk.<sup>22</sup> Fact that SAF/MSS became the National Reconnaissance Office (NRO) in September 1961, with its name changed to SAF/SS. **Fact that** the NRO is currently governed by the "Agreement for Reorganization

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of the National Reconnaissance Office" dated 11 August 1965, signed by the Deputy Secretary of Defense and the DCI. This agreement, with the exception of paragraphs three and four in Appendix A, is releasable.<sup>114</sup>

b. (U) Fact that the early NRO satellite reconnaissance Programs A, B, and C were associated with the Air Force, CIA, and Navy, respectively.<sup>1</sup> Also the fact that Program A was associated with high resolution imaging and SIGINT satellite development; Program B was associated with imaging (to include electro-optical) and SIGINT satellite development; and Program C was associated with SIGINT satellite development.<sup>62</sup> (Effective 9/13/00)

c. (U) Fact that in early 1964 an NRO Executive Committee was established and its members consisted of Director of Central Intelligence (DCI) McCone, Deputy Director of Central Intelligence (DDCI) Carter, Deputy Secretary of Defense (DEPSECDEF) Vance, Office of the Secretary of Defense/ Director, Defense Research and Engineering (OSD/DDR&E) Fubini, and Director NRO (DNRO) McMillan.<sup>16</sup>

d. (U) General information regarding SAF/SS. From 1961 to April 1995, SAF/SS was the unclassified designator for the advisory element of the NRO that performed staff functions for the Director and Deputy Director. The following "facts of" and "facts about" SAF/SS and its SAF/MSS predecessor organization also are releasable.<sup>57, 68, 145, 146</sup> (Effective 6/29/01)

(1) (U) Fact that personnel assigned to SAF/SS and SAF/MSS provided support to the Secretary, Under Secretary and Assistant Secretary of the Air Force (Space) on aircraft and space reconnaissance matters.

(2) (U) Identities of all past SAF/SS and SAF/MSS Staff Directors.

(3) (U) General association of SAF/SS with the CORONA, ARGON, LANYARD, GRAB, and POPPY programs.

(4) (U) General description of SAF/SS operations and support functions if not associated with currently classified NRO information.

(5) (U) SAF/SS office designators and respective titles **only** for SS-1 through SS-9, P&B, L&A, S&T, Programs & Budget, Policy & Security, Liaison & Administration, Systems &

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Technology, DD for Systems, DD for R&D, DD for Programs & Analysis, Assistant for Security, and Director TENCAP, all of them located at the Pentagon headquarters.

(6) (U) Fact of the SAF/SS role as Secretariat for the Interdepartmental Contingency Planning Committee (ICPC.) Fact of and general information about the DNRO role in chairing the ICPC. Fact that this body served as a mechanism to insure a fully coordinated US Government response to contingencies relating to satellite or air vehicle overflight of denied territory.<sup>55</sup>

1.2.3.2. (U) SAF/SP (Program A)

Redact:

a. (U) Any references to the identity, functions, missions, and locations of the various office components of the Secretary of the Air Force Special Projects (SAF/SP) designated **SP-7 and higher**.

Release:

a. (U) General information regarding the fact that SAF/SP was the overt office designator for NRO Program A and was based in Los Angeles, CA. Fact that its Director overtly served as Deputy Commander of the Air Force Ballistic Missile Division and its successor organizations. Fact that other acknowledged SAF/SP locations included Los Angeles Air Force Station (AFS), CA (later named Los Angeles Air Force Base [AFB]), Sunnyvale AFS (later named Onizuka AFB), CA, Washington, D.C., Vandenberg AFB, CA, and Cape Canaveral Air Station, FL. All past Program A Directors can be acknowledged. SAF/SP offices designated SP-1 through SP-6, along with the office titles, can be released unless such disclosure would reveal information regarding classified operations and technologies.<sup>23,68,74</sup> **Office designators SP-7 and higher are not releasable.**

1.2.3.3. (U) CIA (Program B)

Release

a. (U) Fact that CIA/Office of Development and Engineering (OD&E), previously the Office of Special Activities (OSA), a part of the Directorate of Science and Technology (DS&T), was the overt office designator for Program B, and was located in the Washington, D.C. area.<sup>1</sup>

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1.2.3.4. (U) Navy (Program C)

Redact

a. ~~(S//TK)~~ Historical relationships between the NRO and the following Navy organizations: ~~NSA/CSS A-2 (NSA/CSS)~~

~~(b)(1), 1.4c, (b)(3)~~

~~(b)(1), 1.4~~ (Effective 12/20/02)

Release

a. (U) Fact that Program C was located in the Washington, D.C. area and consisted of elements of the Naval Research Laboratory and the Naval Security Group.<sup>1,93</sup> (Effective 12/20/02)

1.2.3.5. (U) CIA/Air Force (Program D)

Release

a. (U) Subject to the redaction guidance at section 1.14, general information surrounding Program D, which was associated with the research & development, testing, and operation of airborne collection assets, including the U-2, A-12/OXCART, and the D-21 TAGBOARD Drone designed to be launched from the A-12. Fact that Program D managed many aspects of the SR-71 project for the Air Force and that Program D also managed several other reconnaissance drone projects in addition to TAGBOARD.<sup>6,55</sup> Fact that aerial overflight operations were coordinated with and approved by the NSC's 5412,303, and 40 Committees, and that manned overflights of foreign/denied territory were approved by the President.<sup>115</sup>

1.2.3.6. (U) Defense Recon Support Program (DRSP/DSRP)

Redact:

a. (U) All information associated with the Tactical Intelligence and Related Activities (TIARA) budget line that supported the DRSP and supports what is now the Defense Space Reconnaissance Program (DSRP).

b. (U) All details about the methods, procedures, systems and equipment (tasking, communicating, etc.) involved in providing overhead intelligence in support of tactical forces.

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**Release:**

a. (U) The fact that the Secretary of Defense established the DRSP (renamed DSRP in 1994) on 14 May 1980 to provide space reconnaissance products to tactical combat forces in response to President Jimmy Carter's NSC/PD-37, *National Space Policy* (1978).

b. (U) The fact that this effort expanded the Tactical Exploitation of National Capabilities (TENCAP) program and that it was funded separately through a defense budget line, not through the NRP.

c. (U) The fact that the defense department established the Defense Support Project Office (DSPO) on 16 November 1981 to manage and provide oversight of the DSRP/DSRP.

d. (U) The names of the directors of the DSPO (originally the DNRO), and successors in DDMS & BPO after the DSPO was disestablished in 2002.

e. (U) The fact that the defense department established the Airborne Reconnaissance Support Program on 19 November 1987 in response to Congressional pressure, to include all U.S. airborne reconnaissance platforms funded within the GDIP, and assigned management of it to the DSPO.

**1.3 (U) Satellite Imagery (IMINT) Systems**

**1.3.1 (U) Imagery System Information**

**Redact:**

a. ~~(S//RSEN)~~ Any information indicating or implying the following outside association with the CORONA, ARGON, or LANYARD imaging systems. (Effective 5/16/03)<sup>101</sup>

(1) ~~(S)~~ [redacted] (b)(1)1.4c. (b)(3)

(2) ~~(S//RSEN)~~ [redacted] (b)(1)1.4c. (b)(3)  
[redacted] (b)(1)1.4c. (b)(3) imaging operations.

(3) ~~(S)~~ Imaging operations [redacted] (b)(1)1.4c. (b)(3)  
[redacted] 140  
[redacted] (b)(1)1.4c. (b)(3)

b. ~~(S)~~ [redacted] (b)(1)1.4c. (b)(3)  
[redacted] (b)(1)1.4c. (b)(3)

(1) ~~(S)~~ Information that refers to a [redacted] (b)(1)1.4c. (b)(3)  
[redacted] (b)(1)1.4c. (b)(3)  
[redacted] 123 (Effective 11/12/04)

c. ~~(S)~~ All information on payload/sensor performance, to include collection parameters [redacted] (b)(1)1.4c. (b)(3)  
[redacted] (b)(1)1.4c. (b)(3)  
[redacted] (b)(1)1.4c. (b)(3) response time to tasking, and image quality achieved.<sup>140</sup>

d. ~~(S//TK)~~ All information that discloses satellite vehicle planned/actual on-orbit lifetimes or planned/actual dates of Initial Operational Capability (IOC) and Full Operational Capability (FOC). [redacted] (b)(1)1.4c. (b)(3)  
[redacted] (b)(1)1.4c. (b)(3)  
[redacted] (b)(1)1.4c. (b)(3)

e. ~~(S//TK)~~ All other information not cited below for release including any references that connect the NRO to [redacted] (b)(1)1.4c. (b)(3)  
[redacted]

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(b)(1)1.4c. (b) and the code words and mission numbers associated with these activities (e.g., (b)(1)1.4c. (b)(3) etc.).

**Release:**

a. (U) Fact of and limited information about electro-optical imaging (EOI).<sup>2, 61</sup> (See paragraph 1.3.2) (Effective 7/31/00)

b. (U) The fact that NRO spacecraft employ control moment gyroscopes as long as it is not associated with a specific vehicle or program.

c. (U) Fact of NRO radar satellite reconnaissance, including use of SAR, (b)(1)1.4c. (b)(3)

(b)(1)1.4c. (b)(3)

(b)(1)1.4c. (b)(3)

d. (U) KH-11 system designator, used in isolation or related in a general way with intelligence activities, without reference to specific intelligence operations, organizations, or related national security matters.<sup>2</sup>

e. (U) Fact that an EOI satellite was first launched on 19 December 1976 and that President Gerald Ford declared it operational on 20 January 1977.<sup>61</sup> (Effective 7/31/00)

f. (U) Fact of research and development in Image Fusion Techniques.<sup>2</sup>

g. (U) General IMINT program acquisition management plans and schedules for commercial off-the-shelf sub-systems without program association.<sup>2</sup>

h. (U) Fact that IMINT systems use non-specified relay satellites for data return.<sup>2</sup>

i. (U) Fact that data return is near-real-time. Note that exact response times are classified S/TK).<sup>2</sup>

j. (U) Conceptual line, non-scale silhouette drawings of IMINT satellite vehicles (SV) without antenna size and location and/or interior detail.<sup>2</sup>

k. (U) Development documentation and usage documentation of program star catalogs.<sup>2</sup>

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l. (U) Number of stars used to create catalogs and source catalogs.<sup>2</sup>

m. (U) Documentation relating to how star catalogs are applied.<sup>2</sup>

n. (U) Position accuracy of the stars in a star catalog.<sup>2</sup>

o. (U) Fact that the IMINT program uses a particular star catalog.<sup>2</sup>

p. ~~(S//TK)~~ The name "Defense Mapping Agency" or "DMA" when related to satellite reconnaissance or IMINT programs **but not to**

(b)(1)1.4c (b)(3)

(b)(1)1.4c (b)(3)

q. (U) Data content of the raw DMA/Special Mission Tracking Program (SMTP) collection.<sup>2</sup>

r. (U) Performance characteristics of the mapping, charting, and geodesy (MC&G) mission derived via the DMA segment, i.e., stereo image, linear error, circular error.<sup>2</sup>

s. (U) Fact of the Southwest Geodetic Control Network (SWGNCN) and its characteristics.<sup>2</sup>

t. (U) Utilization of the SWGNCN to verify MC&G performance on IMINT systems.<sup>2</sup>

u. (U) Title, "Metric Assessment Program" (MAP).<sup>2</sup>

v. (U) The best-achieved resolution of any imaging system as being 2 feet. [See section 1.3.2, release g as this guidance relates to KH-7] (Effective 3/11/03) The single exception is the projected one-foot resolution associated with the failed P-camera experiment flown on CORONA mission 9056 in late June 1963. Information relating to this experiment and its anticipated resolution is releaseable.<sup>109</sup> (Effective 3/1/04)

w. (U) References to the NRO's role in establishing the requirements for initiating and managing the first operational polar orbiting meteorological satellite program. Other NRO-related facts about this program and its relationship to imaging reconnaissance satellites, as detailed in the unclassified NRO history of this effort issued in 2001, are also releasable.

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a. (U) To National Geospatial-Intelligence Agency (NGA), formerly the National Imagery and Mapping Agency (NIMA): all Defense Mapping Agency (DMA) computer hardware (minus crypto) and software modules, computation algorithms not related to NRO IMINT systems activities, and overhead imagery not already released in CAL and KH-7 and KH-9 actions.<sup>2</sup> (Effective 11/24/03)

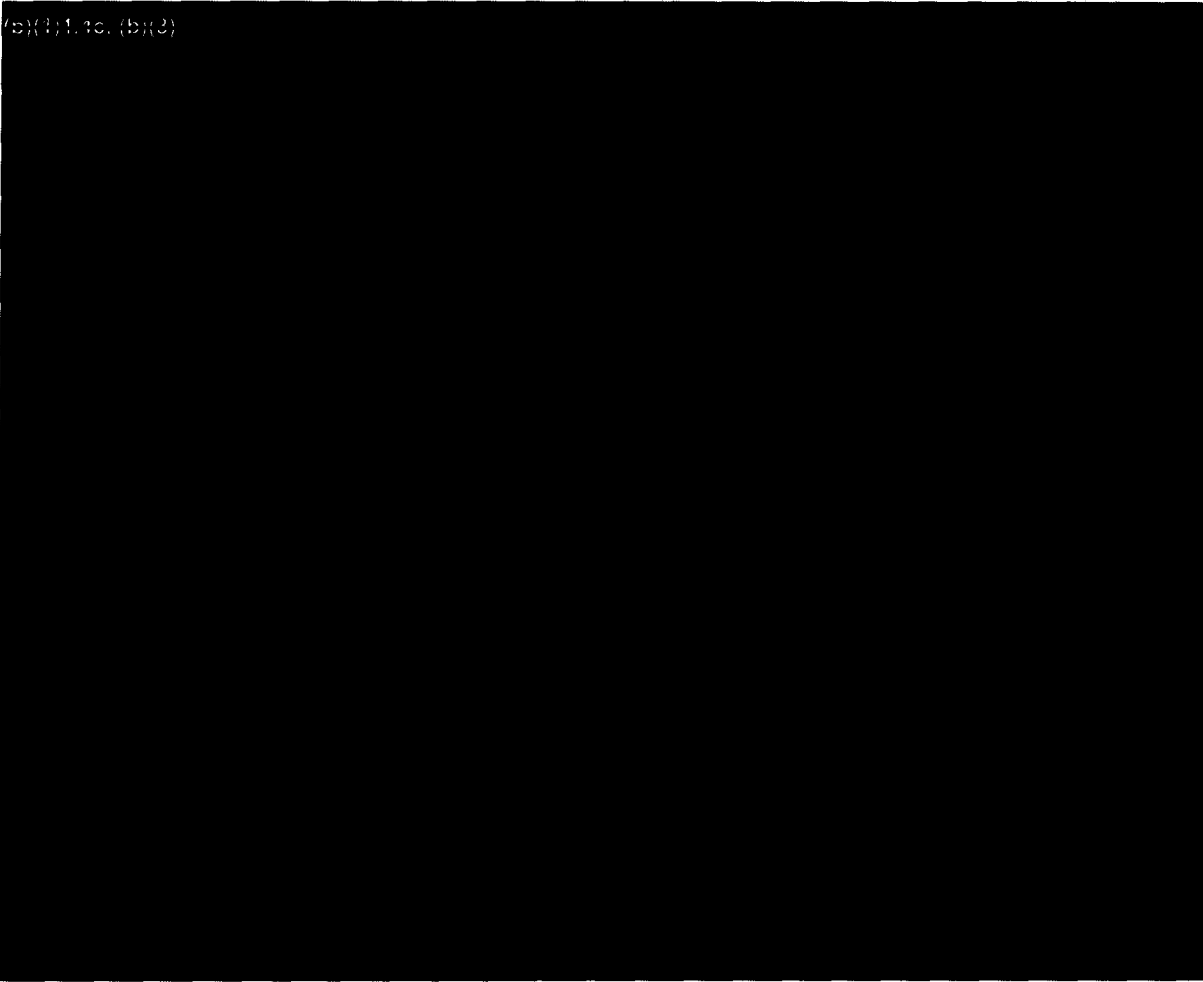
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**1.3.2 (U) Non-Operational IMINT Systems**

~~(S)~~ The NRO has declassified most of the information on the CORONA, ARGON, and LANYARD (CAL) IMINT systems (see Appendix F) and the SENTRY/SAMOS IMINT systems (see Appendix E). All other non-operational IMINT systems remain classified. A few selected facts about the (b)(1)1.4c (KH-7), (b)(1)1.4c (KH-9), and (b)(1)1.4c (KH-11) systems also have been declassified as specified below under "Release."

**Redact:**

a. ~~(S//TK)~~ All information concerning non-operational IMINT programs that remain classified. This includes the IMINT terms and code words listed below. Should a redactor encounter a term or code word that may still be classified but is not on this list, consult the Redaction Quality Control Supervisor for guidance.



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b. ~~(TS//TK)~~ Fact of and all references to [redacted]  
[redacted]

c. ~~(TS//TK)~~ All references (explicit or implied) [redacted]  
(aka KH-9) programmatic information including [redacted]  
[redacted] All references (explicit or implied) to the

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(b)(1)1.4c. (b) (KH-9) mapping camera system except for the limited information identified below for release. All references to (b)(1)1.4c. (b)(3) the film used, and the facilities where (b)(1)1.4c. (b)(3) (b)(1)1.4c. (b)(3) <sup>134</sup> (The KH-9 program, from R&D to last flight, covered the years (b)(1)1.4c. (b)(3) )


d. ~~(S//TK)~~ All references (explicit or implied) to the (b)(1)1.4c. (b)(3) program and to programmatic information associated with it. All references to (b)(1)1.4c. (b)(3) the film used, and to the (b)(1)1.4c. (b)(3) <sup>34</sup> covered the years (b)(1)1.4c. (b)(3) All references (explicit or implied) to the (b)(1)1.4c. (b)(3) (KH-7) camera system except for the limited information identified below for release. (The KH-7 program, from R&D to last flight, covered the years 1960-1967.)

e. ~~(S)~~ All references to the (b)(1)1.4c. (b)(3) except for the limited information on the KH-11 designator at the previous "Release" (see a. under paragraph 1.3.1.) Other redaction exceptions are the limited information designated for release below and in other parts of this document as follows:

- (1) Paragraph 1.3.4, IMINT Systems Ground Operations
- (2) Paragraph 1.6.4, Relay Satellites
- (3) Paragraph 1.10.3, Launch Dates
- (4) Paragraph 1.11.1, Development and Acquisition, General Participant Relationships
- (5) Appendix B, Releasable Names (Effective 7/31/00)

f. ~~(S//TK)~~ The non-operational IMINT mission numbers listed below:

(b)(1)1.4c. (b)(3)



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g. (U) All other information not cited below for release.

Release:

a. The non-operational IMINT mission numbers listed below can be released as a mission group (all flights) and individually, associated with mission dates and operations:

- 9000 CORONA (KH-1 - KH-4, Feb 59 - Dec 63)
- 8000 LANYARD (KH-6, Mar 63 - Jul 63)
- 9000A ARGON (KH-5, Feb 61 - Aug 64)
- 1000 CORONA (KH-4A, Aug 63 - Sep 69)
- 1100 CORONA (KH4-B, Dec 67 - May 72)

b. The non-operational IMINT mission numbers listed below can be released only as a mission group, but not individually when associated with mission dates and operations:<sup>158</sup>

- 1201-1220 KH-9
- 4001-4038 KH-7

c. ~~(S//TK)~~ Without any connection to (b)(1)1 4c (F) the fact that the S-2 program was a development effort sponsored by Program A (SAF/SP) in the early to mid-1960s as a follow-on to the CORONA photo-satellite system.<sup>16</sup>

d. (U) Fact of charge-coupled device (CCD) array technology used in the E.O. imaging satellite.<sup>61</sup> (Effective 7/31/00)

e. (U) Association of Program A with a post-CORONA high resolution imaging satellite system.<sup>62</sup> (Effective 9/13/00)

f. (U) Fact that NRO high resolution imaging satellite payloads have a distinctive pointing capability.<sup>62</sup> (Effective 9/13/00)

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g. (S//TK) Without any association to the program code word [REDACTED] fact of the KH-7 surveillance system and the following facts about it.<sup>91</sup> (Effective 9/24/02)

- (1) (U) The Intelligence Community's first high resolution surveillance or spotting satellite.
- (2) (U) Operational from July 1963 to June 1967.
- (3) (U) Flew 38 missions; duration of missions spanned one to eight days.
- (4) (U) Mission Numbers (4001-4038).
- (5) (U) Returned single bucket of film to earth for each mission.
- (6) (U) Successfully returned film on 34 of 38 missions; usable images were obtained from 30 of those 34 missions.
- (7) (U) Returned 19,000 frames, totaling 43,000 linear feet.
- (8) (U) "Footprint" on the ground was approximately 10 nm by 12 nm; total ground coverage for all missions was about 6.6 million square nm.
- (9) (U) Best resolution was initially four feet (1.2 meters) on ground; by 1966, best resolution improved to two feet (.6 meters).
- (10) (U) Capable of imaging areas 12nm wide, ranging from 5 - 400 nm long.
- (11) (U) Provided cartographic information for large scale (1:50,000) maps for Department of Defense.
- (12) (U) Priority targets for the system included Soviet and Chinese nuclear installations and ICBM sites.

h. (S//TK) Without association to the program code word [REDACTED] fact of the KH-9 Mapping Camera System and the following "facts about" it.<sup>91</sup> (Effective 9/24/02)

- (1) (U) Operational from March 1973 to October 1980.

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(2) (U) The KH-9 system was associated with mission group numbers 1201-1220.

(3) (U) The mapping camera was flown on 12 missions (1205-5 through 1216-5), all of them successful; duration of these missions ranged from 42 to 119 days.

(4) (U) This "frame camera" imagery system was devoted solely to mapping, charting, and geodesy (MC&G).

(5) (U) Returned single bucket of film to earth for each mission.

(6) (U) Returned 29,000 frames totaling 48,000 linear feet.

(7) (U) "Footprint" on the ground was approximately 70 nm by 140 nm; total ground coverage for all 12 missions was about 104 million square nm.

(8) (U) Provided key cartographic information for Level 1 Digital Terrain Elevation Data (DTED) and 1:200,000 scale maps.

(9) (U) Coverage of key control point areas was imaged in stereo or tri-laps (three times) on a single operation to provide analysts with enough detailed information.

(10) (U) Average resolution initially about 30 ft on the ground; improved to about 20 ft on later missions.

(11) (U) Designed to support foreign and domestic mapping requirements and global geodetic positioning; biggest users were the Defense Mapping Agency (DMA) and United States Geological Survey (USGS).

i. (U) General Information concerning the following LANYARD roll joint capabilities.<sup>101</sup> (Effective 5/16/03)

(1) Roll steering was accomplished in three discrete angles of 0°, + 15°, and + 30°, offering a total available target swath width of 192 nautical miles.

(2) A maximum response time of 30 seconds was required for rolling from one 30° extreme to the other. Approximately 3 seconds were required for rolling a 15° increment.

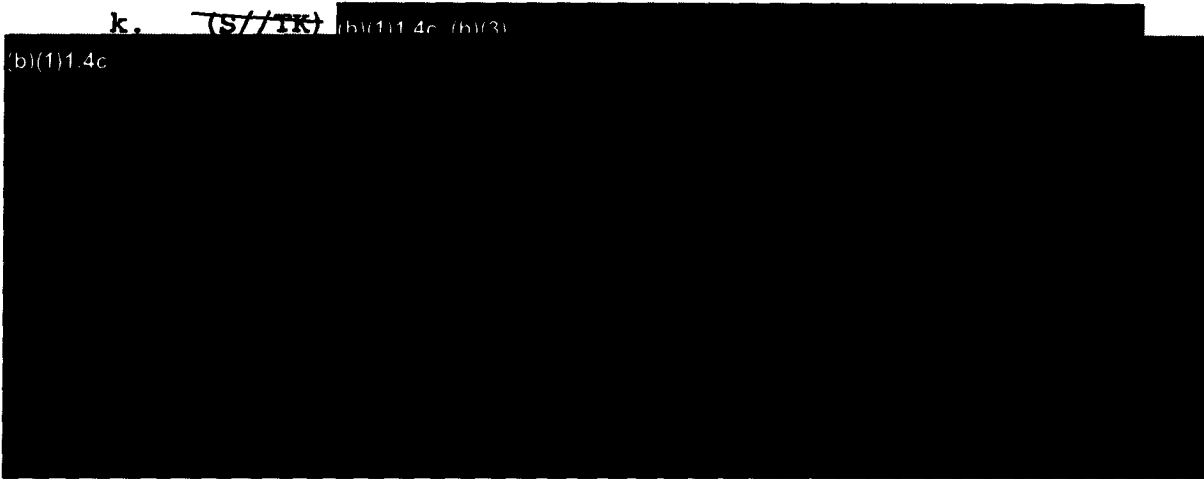
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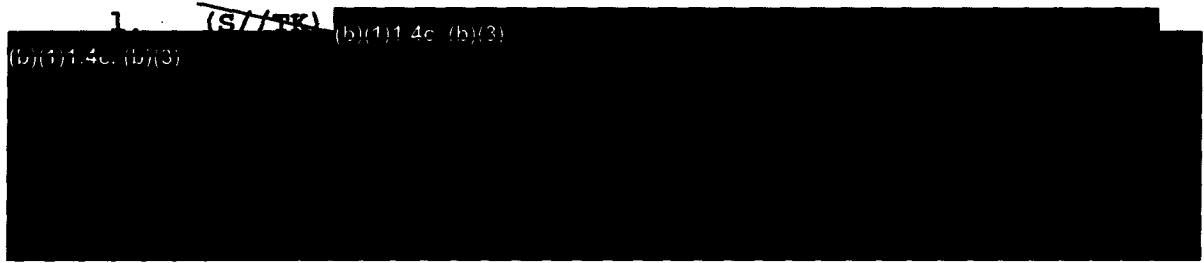
(3) The roll joint was capable of 200 maneuvers per mission.

j. (U) Fact that NRO spacecraft employ control moment gyroscopes provided there is no association of CMGs with specific vehicles or programs.<sup>157</sup>

k. ~~(S//TK)~~ (b)(1)1.4c (b)(3)  
(b)(1)1.4c



l. ~~(S//TK)~~ (b)(1)1.4c (b)(3)  
(b)(1)1.4c (b)(3)



m. (U) The fact of, but no facts about, an NRO program named (b)(1)1.4c

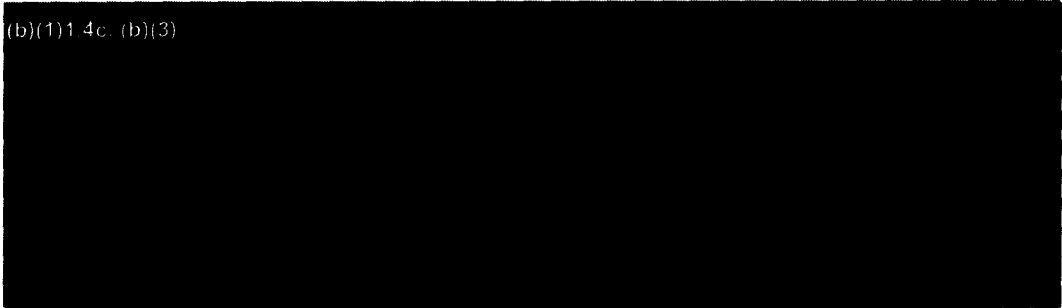
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1.3.3 (U) Current and Future IMINT Operational Systems

Redact:

~~(S//TK)~~ All information concerning current and future IMINT systems that might be reflected in 25-year-old records.



Release:

(U) None. No information about these IMINT systems has been declassified.

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### 1.3.4 (U) Meteorological Forecasting

**Redact:**

(U//FOUO) Any information related to funding of the low altitude polar orbiting meteorological satellite (Program 35, 417, etc.) while a part of the NRP before 1966, and to the amount of (percent of) cloud free imaging that the military weather satellites allowed and continue to permit.

**Release:**

a. (U) All information about the NRO's role in the early-1960s initiating and developing what became the Defense Meteorological Satellite Program (DMSP) to support satellite imaging operations. General release information includes the various program designators used during DMSP development and operation (e.g., Program 35, Program 417, and Program 698BH).<sup>12,34</sup>

b. (U) Fact that the following agencies provided (and continue to provide) meteorological forecast data and atmospheric point analyses to IMINT projects.<sup>2</sup>

- (1) HQ USAF/XOW
- (2) USAF Air Weather Service
- (3) USAF Global Weather Central
- (4) USAF Environmental Technical Applications Center
- (5) USAF Space Forecast Center

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1.3.5 (U) IMINT System Ground Operations

Redact:

a. ~~(S//TK)~~ Any information indicating or suggesting the presence of a ~~(b)(1)1.4c. (b)(3)~~

~~(b)(1)1.4c. (b)(3)~~

~~(b)(1)1.4c. (b)(3)~~ the Air Force Special Photographic Processing Facility (AFSPPF) at Westover AFB, Massachusetts.<sup>80</sup> (Effective 2/7/02)

b. ~~(S)~~ Information that refers to the ~~(b)(1)1.4c. (b)(3)~~ processing of color film after the termination of the CORONA Program in 1972.<sup>126</sup> (Effective 12/02/04)

c. ~~(S//TK)~~ Any information indicating or suggesting that ~~(b)(1)1.4c. (b)(3)~~

d. ~~(S//TK)~~ In addition to guidance above regarding the IMINT mission ground stations, any information indicating or implying the specific location of these ground stations (e.g., ~~(b)(1)1.4c. (b)(3)~~<sup>85</sup>

e. ~~(S//TK)~~ All post-1972 references to ~~(b)(1)1.4c. (b)(3)~~

~~(b)(1)1.4c. (b)(3)~~

f. (U) All other information not cited below for release.

Release:

a. (U) Without revealing its actual location, fact that the ground station for the electro-optical imaging satellite system is located in the continental U.S.<sup>61</sup> (Effective 7/31/00)

b. (U) The term "Area 58" or "A-58" when limited to the context of a very general association with the NRO, intelligence

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activities, imagery intelligence, or satellite reconnaissance but not revealing any geographic location information.<sup>85</sup>

c. ~~(C)~~ The AFSPPF can be acknowledged as being part of NRO Program A. Located at Westover AFB, Massachusetts, it has been acknowledged as a site for processing CAL program film. ~~SECRET~~

~~(b)(1), (4c), (b)(3)~~  
~~(b)(1), (4c), (b)(3)~~ until it was closed in 1974-75.)<sup>98, 103</sup> (Effective 10/13/03)

d. (U) Fact that the 544<sup>th</sup> Reconnaissance Technical Wing at Headquarters Strategic Air Command processed some of the film from NRO satellites after the closure of the AFSPPF in 1974-75.<sup>124</sup> (Effective 11/15/04)

e. (U) Descriptions of film processing equipment and of film processing problems, provided that this information does not disclose classified facts about the satellite systems.<sup>126</sup> (Effective 12/02/04)

**1.4 (U) Signals Intelligence (SIGINT) Systems**

**1.4.1 (U) Signals Intelligence System Information**

(U) Three NRO SIGINT satellite systems have been declassified to a limited degree: the GRAB program (see Appendix A), the WS-117L SENTRY/SAMOS program (see appendix E), and the POPPY program (see Appendix G). All other NRO SIGINT systems remain classified. Selected general facts about the systems that have been declassified appear below under "Release."

**Redact:**

~~(S//TK)~~ All information about R&D, operational and non-operational NRO SIGINT collection and processing programs, with the exception of the three programs noted above and the general information cited below for release. Information to be redacted will typically include signal parameters against which a system is designed to collect, system descriptions, technology, capabilities and operations [redacted] (b)(1)1.4c (b)(3)

[redacted] (b)(1)1.4c (b)(3) program names and mission numbers, dates, contractors, funding, facility locations, and satellite vulnerabilities including susceptibility to denial, deception, and countermeasures. It also includes information about [redacted] (b)(1)1.4c (b)(3) on LEO, HEO, and GEO SIGINT spacecraft, [redacted] (b)(1)1.4c (b)(3)

[redacted] (b)(1)1.4c (b)(3)

**Release:**

- a. (U) Fact of satellite SIGINT collection capability.<sup>3, 5</sup>
- b. (U) Fact of satellite COMINT collection capability.<sup>5</sup>
- c. (U) Fact of satellite ELINT collection capability.<sup>5</sup>
- d. (U) Fact of satellite FISINT collection capability.<sup>5</sup>
- e. (U) Generic references to U.S. government SIGINT relationships with unspecified foreign governments.<sup>129</sup>

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f. (U) Fact that SIGINT satellites incorporate a direction finding capability for locating electronic emitters on earth.<sup>5</sup>  
149

g. (U) NSA as the RANGER SPO.<sup>5</sup>

h. (U) Fact that NRO SIGINT satellites operate in LEO, HEO, and GEO orbits.<sup>156</sup>

i. (U) Fact that NRP SIGINT satellites support military Combat Search and Rescue (CSAR) operations. All facts about CSAR remain classified.<sup>142</sup> (Effective 2/14/2006)

j. (U) Fact that SIGINT reporting by NRP space systems is conducted in near real time.<sup>143</sup> (Effective 2/27/2006)

k. (U) The following facts regarding NRO Program A SIGINT satellite systems.<sup>62</sup> (Effective 9/13/00)

(1) (U) Capable of on-orbit processing of complex intercepted signals

(2) (U) Featured wideband distributed amplifiers and pulse signal processors

(3) (U) Developed a long-life, multi-purpose SIGINT satellite system in the 1960s that proved to be the model for follow on systems.

(4) (U) Developed satellite constellations for broader coverage.

l. (U) The following "facts about" SIGINT Ground Data Processing (Effective with public release of the GRAB history brochure in June 1998.

(1) (U) Data collected by SIGINT satellites are delivered to the National Security Agency (NSA) for processing.

(2) (U) The Strategic Air Command (SAC) received duplicates of ELINT data and processed them primarily for ELINT Order of Battle analysis of significance to the Single Integrated Operations Plan (SIOP).

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1.4.2 (U) Non-Operational SIGINT Systems

(U) See Appendix E for guidance on SENTRY/SAMOS SIGINT information, Appendix A for GRAB, and Appendix G for POPPY SIGINT information.

Redact:

a. ~~(S//TK)~~ All information concerning non-operational SIGINT programs and missions that remain classified. This includes but is not limited to those programs and missions listed below. Should a redactor encounter a term or code word that may still be classified but is not on this list, consult the Redaction Quality Control supervisor for guidance.

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(b)(1)1.4c. (b)(3)

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- b. (U) Any other SIGINT program and code words not indicated under Release, below.
- c. ~~(S//TK)~~ All information indicating or implying in a fact of context that any (b)(1)1.4c. (b)(3)  
(b)(1)1.4c. (b)(3)

Release:

(U) Fact of and general information about the GRAB ELINT satellite project (see Appendix A).<sup>31</sup>

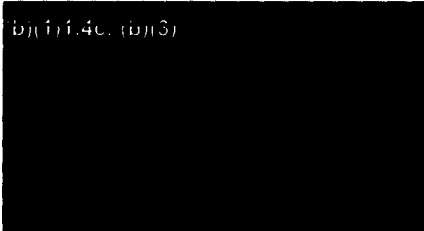
(U) Fact of and general information about the POPPY ELINT satellite project (Effective 12 September 2005; see Appendix G).<sup>128</sup>

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1.4.3 (U) Current and Future SIGINT Operational Systems

Redact:

~~(S//TK)~~ All information concerning the following current and future SIGINT systems.



Release:

(U) None. No information about these SIGINT systems has been declassified.

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1.4.4 (U) SIGINT Signal Parameters

Redact:

(U) All information on SIGINT collection, uplink, and downlink parameters except the very limited releasable information regarding GRAB, POPPY, and SAMOS Ferret Payloads. See appendices A, E, and G.

**1.4.5 SIGINT System Ground Operations**

**Redact:**

(U) All information on ground operations and remote tracking stations except for the limited information approved for release in the GRAB, SAMOS, and POPPY Appendixes: A, E, and G respectively.



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### 1.5 (U) Measurement and Signature Intelligence (MASINT)

(U) No NRO MASINT programs have been declassified. Only a limited amount of general information about MASINT has been declassified, as specified below under "Release."

#### Redact:

(U) All information about R&D, operational and non-operational NRO MASINT collection and processing, with only a few exceptions, as indicated below. Information to be redacted includes system descriptions, technology, capabilities and operations, program names and numbers, dates, contractors, funding, facility locations, and satellite vulnerabilities, including susceptibility to denial, deception, and countermeasures.

#### Release:

- a. (U) Fact that NRO systems perform MASINT collection.<sup>53</sup>
- b. (U) General information surrounding the fact that the NRO is associated with MASINT in an R&D connotation.<sup>40</sup>

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## 1.6 (U) Communications

### 1.6.1 (U) General Communications Information

(U) No dedicated NRO communication programs have been declassified. A limited amount of communications information related to CORONA, ARGON, and LANYARD programs (see Appendix F), the GRAB and POPPY SIGINT satellite programs (see Appendix A and G), and the WS-117L: SENTRY/SAMOS program (see Appendix E) has been declassified. A limited amount of general information about NRO communication programs has been declassified and is releasable, as indicated under "Release" below and in the remainder of Section 1.6.

#### Redact:

~~(S//TK)~~ All information about R&D, operational and non-operational NRO communications programs, subsystems, and architectures, with the exception of the information cited in the appendixes noted above and the general information cited for release below in sections 1.6.2 through 1.6.4. Information to be redacted includes all references to [REDACTED] b)(1)1.4c, (b)(3)

[REDACTED] b)(1)1.4c, (b)(3)

All system and architecture descriptions, including any mention of the [REDACTED] b)(1)1.4c, (b)(3), frequencies, technology, capabilities, or operations. Also, redact all references to [REDACTED] b)(1)1.4c, (b)(3) program names and numbers, dates, contractors, funding, organization, and facility locations, and system vulnerabilities, including susceptibility to countermeasures.

#### Release:

a. (U) Space Ground Link System command and telemetry (SGLS CMD/TLM) frequencies when associated with Air Force Satellite Control Network (AFSCN) Inter Range Operational Number (IRON).<sup>2</sup>

b. (U) Fact of NRO link with the Defense Satellite Communication System (DSCS).<sup>5</sup>

c. (U) Fact of space-to-space lasercom tests and usage.<sup>122</sup>

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**1.6.2 (U) Communication Satellite Payloads**

**Redact:**

(U) All information except for the limited release authority concerning the NRO relay satellite (see section 1.6.4).

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**1.6.3 (U//FOUO) Relay Backup Mission Control Center**

**Redact:**

(U) Redact all references to the backup mission control center for the relay satellites. Sensitive information includes, but is not limited to, the term Backup Relay Satellite Operations Center (BRSO) when associated with a specific location; operational reason(s) for activation date and time; and details of transfer timelines and functions transferred to the backup facility.<sup>125</sup>

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#### 1.6.4 (U) Relay Satellites

##### Redact:

~~(S//TK)~~ All information about [REDACTED] (b)(1)1.4c. (b)(3) or about NRO relay satellites not indicated below for release. This includes but is not limited to: design data, [REDACTED] (b)(1)1.4c. (b)(3) is a relay satellite program sponsored by the NRO, general capabilities or the orbits and frequency bands used, number of satellites, or subsystem details. Also any information that reveals specific vulnerabilities and any reference to the [REDACTED] (b)(1)1.4c. (b)(3)

(Note: On 23 December 2004 the NRO acknowledged [REDACTED] (b)(1)1.4c. (b)(3) [REDACTED] (b)(1)1.4c. (b)(3) without identifying any functions that it performed on orbit.<sup>127</sup>)

##### Release:

a. (U) The fact that the NRO sponsors a relay satellite program.<sup>53</sup>

b. ~~(S//TK)~~ Without disclosing program names [REDACTED] (b)(1)1.4c. (b)(3), the fact that a relay satellite was developed at Hughes in the 1970s to operate with the first near real time E.O. imaging satellite.<sup>61</sup> (Effective 7/31/00)

c. (U) Fact that the relay satellite operated in a higher orbit than the E.O. imaging satellite, thus providing long periods of joint visibility over the USSR and the continental U.S.<sup>61</sup> (Effective 7/31/00)

d. (U) Fact that the relay satellite functioned perfectly the first time it operated in conjunction with the E.O. imaging satellite in 1976, at a data rate equivalent to 100 digital TV channels.<sup>61</sup> (Effective 7/31/00)

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## 1.7 (U) Satellite Ground and Space System Vulnerabilities and Countermeasures

### Redact:

a. ~~(S//TK)~~ All information that identifies *specific* threats to and vulnerabilities of satellite ground and space systems, deception and denial countermeasures to which space systems are susceptible or that they may employ, and defensive countermeasures taken to minimize damage or disruption to ground and space systems, or reduce susceptibility to deception and denial.<sup>116</sup> (Note: "Defensive countermeasures" are sometimes termed measures for "Survivability." For guidance on reconnaissance aircraft countermeasures, see Section 1.14.5)

b. ~~(S//TK)~~ ~~(b)(1)1.4c (b)(3)~~  
~~(b)(1)1.4c~~ may certify that 25-year-old and older technical information otherwise redacted per (a.) above is outdated, offers no substantial assistance to potential adversaries, and represents no substantial risk to currently operational systems. Such certification renders the information releasable in the absence of additional concerns.

c. ~~(S//TK)~~ All references to ~~(b)(1)1.4c (b)(3)~~  
~~(b)(1)1.4c (b)(3)~~

### Release:

a. (U) Generic fact that satellite ground and space systems are vulnerable to attack, but without specific program identification, system node or program orbit locations, or countermeasures in place to mitigate vulnerabilities.

b. ~~(S//TK)~~ Technical information 25 years old and older otherwise covered by redact (a.) above that ~~(b)(1)1.4c (b)(3)~~ has certified as outdated, offering no substantial assistance to potential adversaries, and representing no substantial risk to currently operational systems may be released in the absence of additional concerns.

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## 1.8 (U) Collection Planning, Targeting, and Support

(U) Only a few specified facts about collection planning and targeting in the CAL and GRAB programs have been released. Information concerning other NRO operational and non-operational programs remains classified.

### 1.8.1 (U) Overall Targeting Strategy

#### Redact:

(U) Information that refers to the methods used to identify, select, prioritize, and process target sites for NRO overhead reconnaissance systems. This includes but is not limited to the content of regional and mission-specific data bases; software and documentation or special collection parameters that reveal special imaging capabilities or (b)(1)(4c) (b)(3) or any details about NRO support to law enforcement, counternarcotics, and counterterrorism.

#### Release:

a. (U) Generic fact that satellite reconnaissance operations stem from a systematic process within the Intelligence Community that plans collection against designated areas of interest.

b. (U) Fact of NRO support to law enforcement, counternarcotics, and counterterrorism.<sup>139</sup>

c. (U) Fact that NRO satellites can collect scientific and environmental data as well as data on natural and man-made disasters, and that such data can be furnished to authorized federal agencies.<sup>139</sup>

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**1.8.2 (U) Ground Collection Planning and Computer Software**

**Redact:**

(U) Information about NRO ground collection planning including but not limited to computer software specifications, algorithms, and documentation of ground processing programs; target and requirements databases; and schedules, contracts, and costs for the development and implementation of collection planning activities.

**Release:**

(U) Fact that the Committee on Imagery Requirements and Exploitation [COMIREX] Automated Management Systems (CAMS) [predecessor to current Requirements Management System (RMS)] was developed to support tasking of IMINT programs without reference to specific program names or national system mission numbers.<sup>29</sup>

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### 1.8.3 (U) Satellite Tasking

**Redact:**

(U) Information about tasking of NRO satellites including but not limited to satellite ephemerides when associated with specific target information or prior to imaging; target areas when associated with operational systems; targeting accuracy; real time operations planning capability including tasking of spacecraft; and the general response time to tasking.

**Release:**

a. (U) Generic references to the fact that collection operations by reconnaissance satellites result from "tasking" actions transmitted from the ground to the satellite in orbit.

b. (U) Identification of the following computer programs relating to CORONA satellite operations:<sup>111</sup> (Unclassified in CORONA context only; Effective 03/31/04.)

(1) (U) CORONA Target Program (CTP): orbit-by-orbit camera operation selection based on weather (WX) forecasts and on displays of operational information and accomplishments.

(2) (U) CALICO: determined camera operations and displayed operational information.

(3) (U) CACTUS: listed target locations for photo-interpreting.

(4) (U) COMET: determined orbit selections.

(5) (U) LETHAL: program for automatic command and control of the satellite.

**1.9 (U) Mission Ground Stations (MGS)**

(U) Except for a few releasable facts about satellite mission ground and remote tracking stations, virtually all information about NRP mission ground stations remains classified. This includes their manning, functions performed, connectivity, etc. A few general facts about them have been declassified, as indicated below under "Release."

~~(S//TK)~~ (b)(1)1.4c. (b)(3)  
(b)(1)1.4c. (b)(3)

~~(S//TK/REL)~~ (b)(1)1.4c. (b)(3)  
(b)(1)1.4c. (b)(3)

**1.9.1 ~~(S//TK)~~ MGS and Remote Tracking Station Locations**

**Redact:**

a. (U) Any information indicating or suggesting that the:

(1) ~~(S//TK)~~ (b)(1)1.4c. (b)(3)  
(b)(1)1.4c. (b)(3)

(2) ~~(S//TK)~~ (b)(1)1.4c. (b)(3)  
(b)(1)1.4c. (b)(3)


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(b)(1)1.4c. (b)(3)



(3) ~~(S//TK)~~ (b)(1)1.4c. (b)(3)

(b)(1)1.4c. (b)(3)




(4) ~~(S//TK)~~ (b)(1)1.4c. (b)(3)

(b)(1)1.4c. (b)(3)




(5) ~~(S//TK)~~ (b)(1)1.4c. (b)(3)

(b)(1)1.4c. (b)(3)



(6) ~~(S//TK)~~ (b)(1)1.4c. (b)(3)

(b)(1)1.4c. (b)(3)



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(7) ~~(S//TK)~~ (b)(1)1.4c. (b)(3)  
(b)(1)1.4c. (b)(3)

(8) ~~(S//TK)~~ (b)(1)1.4c. (b)(3)  
b)(1)1.4c. (b)(3)

(9) ~~(S//TK)~~ (b)(1)1.4c. (b)(3)  
(b)(1)1.4c. (b)(3)

(10) ~~(S//TK)~~ (b)(1)1.4c. (b)(3)  
(b)(1)1.4c. (b)(3)

b. ~~(S//TK)~~ (b)(1)1.4c. (b)(3)  
(b)(1)1.4c. (b)(3)

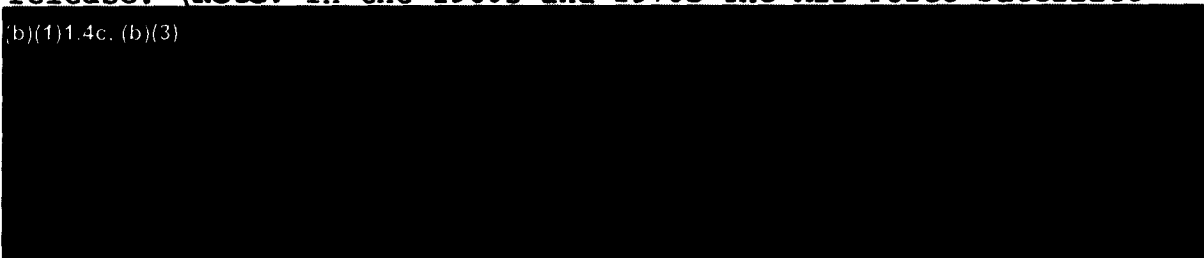
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(b)(1)1.4c. (b)(3)



c. ~~(S//TK)~~ All other information not cited below for release. (Note: In the 1960s and 1970s The Air Force Satellite

(b)(1)1.4c. (b)(3)



Release:

a. (U) Fact that the Woomera Satellite Tracking Station in Australia was used to support DISCOVERER (CORONA) (at least for Agena 1101/Rm-1).<sup>15</sup>

b. (U) Fact that the following remote tracking stations (RTS) supported DISCOVERER (CORONA) and/or SAMOS reconnaissance satellite programs.<sup>19</sup>

- (1) Annette Island, Alaska
- (2) Fort Greeley (aka Donnelly Flats), Alaska
- (3) Fort Stevens, Oregon
- (4) Kaena Point, Hawaii
- (5) Kodiak (aka Chiniak), Alaska
- (6) New Boston, New Hampshire
- (7) Ottumwa, Iowa
- (8) Palo Alto, California
- (9) Point Mugu, California

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(10) Vandenberg AFB, California

(11) Christmas Island

(12) Guam

c. (U) Term, "MGS" or "Mission Ground Station" without reference to programs/systems or a specific geographical location.<sup>10</sup>

d. ~~(S)~~ Generic references to NRO Mission Ground Stations

(b)(1)(4), (b)(3)

e. (U) The fact that SAF/SP was the overt office designator for NRO Program A and was based in Los Angeles, CA. Other acknowledged SAF/SP locations include Los Angeles Air Force Station (AFS), CA (later named Los Angeles Air Force Base [AFB]), Sunnyvale AFS (later named Onizuka AFB), CA, Washington, D.C., Vandenberg AFB, CA, and Cape Canaveral AFS, FL.

f. (U) The fact of Aerospace Data Facilities East, Colorado, and Southwest (ADF-E, ADF-C, ADF-SW) as NRO Mission Ground Stations and their mission as multi-mission ground stations responsible for supporting worldwide defense operations and multi-agency collection, analysis, reporting, and dissemination of intelligence information, providing data to defense, intelligence, and civil agencies supporting the U.S. government. Also release the locations of ADF-E (Fort Belvoir, VA), ADF-C (Buckley AFB, CO), and ADF-SW (White Sands Missile Test Range). See NRO MGS Declassification Guide for additional details. (Effective 10/15/08).<sup>62</sup>

g. (U) The fact of an NRO presence at the Joint Defence Facility Pine Gap (JDFPG) and Royal Air Force Menwith Hill Station (MHS) as of 15 October 2008. See NRO MGS Declassification Guide for additional details. (Effective 10/15/08).<sup>62</sup>

h. (U) The fact that NGA and NSA are present at ADF-E, ADF-C, ADF-SW, MHS, and JDFPG, and that the CIA is present at ADF-E. See NRO MGS Declassification Guide for additional details. (Effective 10/15/08).<sup>62</sup>

i. (U) The fact that the NRO supports the joint missions at JDFPG and MHS through the provision of technical systems and shared research and development. The NRO participates with the

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consent of the Host governments and contributes to the national security of the countries involved. See NRO MGS Declassification Guide for additional details. (Effective 10/15/08).<sup>62</sup>

**1.9.2 (U) MGS Functions/Operations**

**Redact:**

(U) Information about NRO SIGINT and IMINT MGS functions/operations including but not limited to descriptions of general functions performed; identification/identity of ground station personnel; description or details of specific functions performed at any of these MGS that reveal possible vulnerability or survivability issues; design and performance characteristics of all ground segments at these ground stations; and MGS antenna locations.

**Release:**

a. (U) The fact that AFSCN is responsible for providing tracking, telemetry, command and control support functions for satellite operations.<sup>5</sup>

b. (U) The fact that the AFSCN supports the NRO.<sup>2, 5</sup>

c. (U) System program office (SPO) designation MCS (Mission Control Segment).<sup>2</sup>

d. (U) The fact of Aerospace Data Facilities East, Colorado, and Southwest (ADF-E, ADF-C, ADF-SW)missions as multi-mission ground stations responsible for supporting worldwide defense operations and multi-agency collection, analysis, reporting, and dissemination of intelligence information, providing data to defense, intelligence, and civil agencies supporting the U.S. government. See NRO MGS Declassification Guide for additional details. (Effective 10/15/08).<sup>62</sup>

e. (U) The fact that the NRO supports the joint missions at JDFPG and MHS through the provision of technical systems and shared research and development. The NRO participates with the consent of the Host governments and contributes to the national security of the countries involved. See NRO MGS Declassification Guide for additional details. (Effective 10/15/08).<sup>62</sup>

f. (U) Acknowledge support of a specific operation or mission- for example named military operations, counter-narcotics, GWOT- consistent with classification of the operation in question. If the support reveals a specific type of intelligence capability (SIGINT, IMINT, etc.), that support is protected as S//TK/REL USA, FVEY. See NRO MGS Declassification Guide for additional details. (Effective 10/15/08).<sup>62</sup>



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Refer:

(U) All information that provides details of Air Force Satellite Control Network (AFSCN) support to NRO will be referred to Air Force Space Command (AFSPC).

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## 1.10 (U) Launch Activities

### 1.10.1 (U) Pre-Launch Activities

(U) Although a great deal of launch-related information about various NRO programs (CAL, DMSP, GRAB, POPPY, STEX, GeOLITE, and SENTRY/SAMOS) has been declassified and released, the NRO continues to classify information that connects specific NRO satellite programs to specific pre-launch events.

#### Redact:

(U) Information about NRO pre- and post-launch activities, categories which include but are not limited to: flight mission objectives, program names (platform identifiers), planned launch dates, trajectories selected, collection mission numbers, capabilities, operational configurations, vulnerabilities, satellite vehicle (SV) replenishment needs or strategies, and program and SV plans or requirements. Specifically protected launch-related information includes descriptions of SV size, shape, weight, mechanical characteristics and structural dynamics, and operational planning and requirements for launch.

#### Release:

- a. (U) Fact that NRO satellites are launched from Cape Canaveral Air Station, FL, and Vandenberg AFB, CA.<sup>7, 11</sup>
- b. (U) Fact that as of December 1996 the NRO has had "well over 300" launches since 1959, including 145 CORONA, ARGON, LANYARD launches from Vandenberg AFB between 1959-1972. Also see Appendix A for launch history associated with the GRAB ELINT satellite.<sup>7, 11</sup>
- c. (U) Fact that NRO launch support assets were (and continue to be) located at Onizuka Air Force Station (later AFB), CA (formerly Sunnyvale Air Force Station [AFS]), Cape Canaveral Air Force Station, FL, Los Angeles AFS, CA (later LA AFB), NRO Operations Squadron, Schriever AFB, CO, and Vandenberg AFB, CA.<sup>7, 11</sup>
- d. (U) Fact that some NRO satellite vehicles were integrated, launched, and operated under Air Force Program (AFP) designators. Only selected AFP designators can be released, as indicated in the following paragraphs.<sup>11, 96</sup>

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e. (U) The following AFP numbers associated with the CORONA, ARGON, LANYARD imaging satellite programs.<sup>96</sup>  
(Effective 12/20/02)

- 162
- 241
- 622A
- 846

f. (U) The following AFP numbers associated with the SAMOS satellite program.<sup>96</sup>  
(Effective 12/20/02)

- 101B (related to the E-5 payload that evolved into the LANYARD imaging satellite)
- 201 (related to the E-6 film return imaging payload)
- 315A (related to the revamped E-6 imaging payload)
- 722 (related to the E-6 film return imaging payload)

g. (U) The fact that the following AFP numbers also are NRO programs (without identifying the specific payload).<sup>11</sup>  
(Effective 12/20/02)

- 104
- 141
- 259
- 326
- 465
- 475
- 491
- 557
- 580
- 623
- 732
- 774
- 843
- 868
- 878
- 946

h. (U) The fact that NRO satellite vehicles have been integrated and launched using NROL designators since December 1996.

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### 1.10.2 (U) Launch Vehicle (LV) Utilization

#### Redact:

(U) Information about NRO launch vehicle utilization that includes but is not limited to the association of specific NRO payloads (by platform identifier, collection mission number, or AFP number) with specific launch vehicles (except for the declassified CAL, SAMOS, DMSP, GRAB, STEX, GeoLITE, and POPPY launch vehicles).

#### Release:

(U) Fact that NRO payloads launched during the 25-year-old timeframe of RRG guidance were carried by the following launch vehicles (LVs) without associating them with specific program payloads, AFP numbers, or specific launches, unless so indicated below.<sup>30</sup> Fact that the NRO launched payloads on the Space Transportation System (STS or Space Shuttle), was acknowledged in 2001.<sup>78, 108</sup> (Effective 3/1/04)

- (1) Atlas/Agena (SAMOS)
- (2) Atlas IIA (NROL-5)
- (3) Atlas IIAS (NROL-1, 10, 12, 13, and 18)
- (4) Atlas III (NROL-23)
- (5) Scout (One unsuccessful GRAB launch attempt)
- (6) Scout/MG-18 (Five launches, Program 417/DMSP)
- (7) Thor/Agena (CORONA, ARGON, LANYARD, POPPY)
- (8) Thor/Able-Star (Launched GRAB payloads)
- (9) Thorad/Agena (CORONA, ARGON, LANYARD, POPPY)
- (10) Thor/Burner I (DMSP)
- (11) Thrust Augmented Thor (TAT)/Agena (CORONA, ARGON, LANYARD, POPPY)
- (12) Titan 3B
- (13) Titan 23D

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- (14) Titan 401/Centaur
- (15) Titan 4/Centaur
- (16) STS (Space Shuttle)
- (17) Taurus (STEX)
- (18) Delta II (GeoLITE)
- (19) Delta IV (NROL-22)

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### 1.10.3 (U) Launch Dates

(U) The launch dates of declassified/partially declassified NRO programs including CAL, GRAB, POPPY, SAMOS, STEX, GeoLITE, and DMSP have been released. Beginning on 20 December 1996, the NRO has released the launch dates of NRO satellites without disclosing their specific, classified missions. All other NRO launch dates before 20 December 1996 remain classified.

#### Redact:

(U) All information about NRO satellite launch dates not specified below for release.

#### Release:

a. (U) Fact that NRO launches were (and continue to be) placed in the UN Launch Registry by U.S. Space Command and its predecessor organizations.

b. (U) List, schedule, or manifest of the following acknowledged NRO launches:

(1) (U) CORONA, ARGON, and LANYARD launches from Vandenberg AFB between 1959-1972.<sup>7, 8</sup>

(2) (U) GRAB/DYNO launches between 22 June 1960 and 22 April 1962 from Cape Canaveral Air Station, Florida and Point Arguello, California.<sup>31</sup>

(3) (U) POPPY launches between 13 December 1962 and 14 December 1971 from Vandenberg Air Force Base, California.

(4) ~~(S)~~ Without revealing the b)(1)(1.4c) program name, fact that the first launch of the near real time electro-optical imagery satellite occurred 19 December 1976.<sup>61</sup> (Effective 7/31/00)

(5) (U) The date and place of launch activities identified with an NRO Launch (NROL) designator, without disclosure of specific missions, for all NRO satellites launched after 20 December 1996.

(6) (U) STEX launch on 3 October 1998 from Vandenberg AFB.

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~~TOP SECRET//TK//RSN/NF~~

(7) (U) GeoLITE launch on 18 May 2001 from Cape  
Canaveral.

~~TOP SECRET//TK//RSN/NF~~

~~TOP SECRET//TK//RSEN/NF~~

#### 1.10.4 (U) Payload Integration and Pre-Launch Support

##### Redact:

(U) Trailblazer/Pathfinder plans, activities, requirements, and schedules that reveal satellite vehicle (SV) programmatic information, to include mission, objectives, capabilities, vulnerabilities, priorities, constellation size and status, operational and technical limitations, and operational infrastructure and interfaces.

##### Release:

a. (U) Without revealing a specific program (platform identifier, collection mission number, or an AFP number):<sup>11</sup>

(1) SV/Launch Vehicle (LV) combined lift-off weight.<sup>11</sup>

(2) LV-provided SV destruction system or termination system details that do not reveal the Flight Termination System (FTS) Receiver flight code.<sup>11</sup>

(3) SV support equipment that does not reveal SV mission, capabilities, operational configuration, vulnerabilities, or identify the contractor providing the equipment.<sup>11</sup>

(4) The fact of an SV anomaly during integration, ground processing, or launch operations and its affects on launch schedule, processing, or base assets.<sup>11</sup>

(5) Association of the launch vehicle or launch system integration contractors with the NRO.<sup>11</sup>

(6) A specific NROL LV or launch service or launch date.<sup>11</sup>

(7) Space launch manifests after December 1996 when identified by an NROL number.<sup>11</sup>

b. (U) Transportation of an SV, SV ASE, and/or SV AGE that does NOT reveal an AFP number, methods, and/or off-site routes.<sup>11</sup>

~~TOP SECRET//TK//RSEN/NF~~



~~TOP SECRET//TK//RSEN//NF~~

### 1.10.5 (U) Launch Operations, Trajectory, Tracking, Telemetry

#### Redact:

(U) Information about NRO launch operations to include launch window, planned launch time, and any identification of the specific NRO payload except by NROL designator. All information about planned SV operations during ascent and on orbit.

#### Release:

- a. (U) Without revealing IRON or an AFP number.
  - (1) Range operations numbers.<sup>11</sup>
  - (2) AFSCN or Range radar and telemetry coverage estimates.<sup>11</sup>
  - (3) Transportable/mobile AFSCN assets, deployment plans or locations supporting a launch.<sup>11</sup>
- b. (U) Real time pictures, video, and/or optical data from on-board imaging systems prior to 60 seconds before SV separation.<sup>11</sup>
- c. (U) Real time pictures, video, and/or optical data from ground-based imaging systems.<sup>11</sup>
- d. (U) Flight of an LV from lift-off through spacecraft separation for a program identified with an NROL designator, including: fact of successful SV separation, real time/actual trajectory, tracking, and metric data; flight operations; mark event items, numbers, and descriptions; and command or telemetry data after separation.<sup>11</sup>
- e. (U) Fact of SV communications security (COMSEC) capabilities to include fact of encryption.<sup>11</sup>
- f. (U) Fact that an SV has station keeping and/or attitude control capability.<sup>11</sup>

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~~TOP SECRET//TK//RSEN/NF~~

## 1.11 (U) Development and Acquisition

### 1.11.1 (U) General Participant Relationships

#### Redact:

a. (U) Any references to contractors having an NRO association unless otherwise indicated below.

b. (S) Unless identified for release at Annex F (CORONA), any references to CIA covert contracting/procurement relationships with any contractor.<sup>103</sup>

c. (U) All other participant relationship information not cited below for release.

#### Release:

a. (U) In addition to Eastman Kodak's previously acknowledged film R&D role in the CORONA Program, their role in processing the CORONA film at their Hawkeye facility.<sup>14</sup>

b. (U) Defense Meteorological Support Program (DSMP) contractors included:<sup>34</sup>

- (1) (U) RCA (spacecraft)
- (2) (U) Chance Vought (prime booster)
- (3) (U) Minneapolis Honeywell (guidance and control)
- (4) (U) Aerojet General (solid-fuel rocket fabricators)
- (5) (U) Thiokol (solid-fuel rocket fabricators)
- (6) (U) Allegheny Ballistic Laboratories of Hercules Powder Company

c. (U) Contractors associated with the SAMOS Program:<sup>42</sup>  
(See Appendix E for more complete list)

- (1) (U) General Dynamics/Astronautics (Atlas booster assembly and test)
- (2) (U) Space Technology Laboratories (Atlas Systems Engineering and Technical Direction)

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~~TOP SECRET//TK//RSEN//NF~~

- (3) (U) General Electric Company (Atlas guidance)
- (4) (U) Burroughs Corporation (Atlas ground based computer guidance)
- (5) (U) Rocketdyne Division of NAA (Atlas propulsion)
- (6) (U) Lockheed (AGENA prime contractor)
- (7) (U) Bell (AGENA propulsion)
- (8) (U) Philco (AGENA ground-based communications)
- (9) (U) Eastman Kodak<sup>45</sup> (Effective 7/7/99)
- (10) (U) TRW<sup>63</sup> (Effective 10/4/00)
- (11) (U) ITEK<sup>63</sup> (Effective 10/4/00)

d. (U) Eastman Kodak's role in developing and processing the mission film for Program D U-2 and A-12/OXCART aircraft systems.<sup>48</sup>

e. (U) Autometric role in the ARGON satellite mapping program.<sup>59</sup>

f. (U) Fact that Hughes was the primary contractor that built the relay satellite in the 1970s in conjunction with the operational concept for the E.O. imaging satellite.<sup>61</sup> (Effective 7/31/00)

g. (U) Fact of Aerospace Corporation association with declassified Program A imaging systems.<sup>62</sup> (Effective 9/13/00)

h. (U) Fact of TRW association with Program B SIGINT satellite systems.<sup>62</sup> (Effective 9/13/00)

i. (U) Fact of Advent Systems association with Program A SIGINT activities.<sup>62</sup> (Effective 9/13/00)

j. (U) Fact of General Electric association with Program B development of the E.O. imaging satellite system.<sup>62</sup> (Effective 9/13/00)

~~TOP SECRET//TK//RSEN//NF~~

~~TOP SECRET//TK//RSEN/NF~~

k. (U) Fact of Lockheed association with E.O. imaging satellite development in support of Program B. <sup>62</sup> (Effective 9/13/00)

l. (U) Fact of Lockheed association with Program A SIGINT satellite activity. <sup>62</sup> (Effective 9/13/00)

m. (U) Fact of Technology Services Corporation (TSC) association with and support of SAF/SP in the early 1970s time frame. <sup>81</sup> (Effective: 2/7/02)

n. (U) Fact that the Stanford Electronic Laboratory (SEL) at Stanford University supported NRO SIGINT programs during the 1960s until the university terminated all government contracts in 1969. <sup>89</sup> (Effective: 8/7/02)

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1.11.2 (U) Funding and Budget

Redact:

a. (S) All information about NRO funding and budget, which includes but is not limited to: funding of the National Reconnaissance Program (NRP) or of the National Foreign Intelligence Program (NFIP), percentage of increase or decrease in fiscal year budgets, data that may directly or indirectly expose NFIP/NRP funding profiles, or that may reveal the

(b)(1), (b)(2), (b)(3)  
(b)(1), (b)(4), (b)(5), (b)(6), (b)(7), (b)(8), (b)(9), (b)(10), (b)(11), (b)(12), (b)(13), (b)(14), (b)(15), (b)(16), (b)(17), (b)(18), (b)(19), (b)(20), (b)(21), (b)(22), (b)(23), (b)(24), (b)(25), (b)(26), (b)(27), (b)(28), (b)(29), (b)(30), (b)(31), (b)(32), (b)(33), (b)(34), (b)(35), (b)(36), (b)(37), (b)(38), (b)(39), (b)(40), (b)(41), (b)(42), (b)(43), (b)(44), (b)(45), (b)(46), (b)(47), (b)(48), (b)(49), (b)(50), (b)(51), (b)(52), (b)(53), (b)(54), (b)(55), (b)(56), (b)(57), (b)(58), (b)(59), (b)(60), (b)(61), (b)(62), (b)(63), (b)(64), (b)(65), (b)(66), (b)(67), (b)(68), (b)(69), (b)(70), (b)(71), (b)(72), (b)(73), (b)(74), (b)(75), (b)(76), (b)(77), (b)(78), (b)(79), (b)(80), (b)(81), (b)(82), (b)(83), (b)(84), (b)(85), (b)(86), (b)(87), (b)(88), (b)(89), (b)(90), (b)(91), (b)(92), (b)(93), (b)(94), (b)(95), (b)(96), (b)(97), (b)(98), (b)(99), (b)(100)  
(Effective 3/23/04)

Release:

a. (U) Any funding figure for SAMOS that falls within the funding previously allocated by the Advanced Research Projects Agency (ARPA) in millions as of 30 June 1960.<sup>19</sup>

(1) Funding in fiscal year (FY) 1959 and prior years	\$105.6
(2) Amounts Programmed in FY 1960	\$164.5
(3) Cumulative Obligations	\$247.2
(4) Cumulative Expenditures	\$187.8

Above figures do not include \$85.7 million programmed by the Air Force during FY 1958 and prior years for a broader scope WS 117L program. **Note:** SAMOS funding figures for FY 1961 and thereafter are not releasable.

b. (U) Fact that Presidential Science Advisor Kistiakowsky indicated in a 6 June 1960 memo that a \$30 million supplemental increase for satellite reconnaissance would be helpful but not essential.<sup>17</sup>

c. (U) Fact that the CORONA program started with initial funding of \$7M from the CIA.

d. (U) Any budget or spending figures that clearly are not related to the NRP or NFIP. For instance, although the NRO used the BIG SAFARI testbed aircraft program in the 1970s, this activity was a pure Air Force effort funded through the normal Department of Defense budget (as opposed to the NFIP) since at least the early to mid-1950s. (See section 1.14.6, information

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element a.) Other examples include MIDAS satellite funding under the old WS-117L Air Force satellite development project, and/or Air Force funding for launch services that are not, directly or indirectly, related to NRO programs but may be in documents that also address NRP activities.<sup>99</sup> (Effective 3/11/03)

e. (U) Funding figures for the DISCOVERER program (CORONA's cover project) found in Air Force (but not Program A) documents may be released. Those figures include items unrelated to intelligence activities, such as the care and feeding of chimpanzees, were presented to Congress each year for approval, and appear in unclassified congressional records.

~~TOP SECRET//TK//RSEN/NF~~

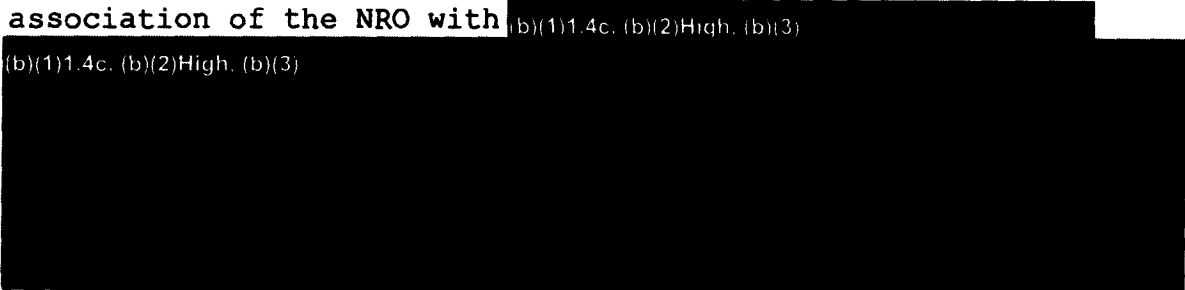
~~TOP SECRET//TK//RSEN/NF~~

1.11.3 (U) Contract Administration

Redact:

a. (S//TK) All information related to NRO contract administration including but not limited to any explicit association of the NRO with

(b)(1)1.4c. (b)(2)High. (b)(3)  
(b)(1)1.4c. (b)(2)High. (b)(3)



Release:

- a. (U) Fact that the NRO does covert procurements.<sup>4</sup>
- b. (U) Without revealing details, fact of special banking mechanisms and transaction procedures.<sup>4</sup>
- c. (U) Any standardized federal or Department of Defense contract clauses or provisions so long as they have not been modified to include NRO-specific information or reveal sensitive aspects of NRO business practices. Questions regarding release of specific clauses or provisions must be referred to the NRO Office of Contracts.<sup>38</sup>
- d. (U) Entire contract numbers that begin with the prefix "NRO," (e.g. NROxxxx-xx-x-xxxx).
- e. (U) Last four digits of a contract number not covered by other portions of 1.11.3.<sup>4</sup>

**1.12 (U) Product-Related Information**

**1.12.1 (U) IMINT-Related Products**

(U) The classification of disseminated IMINT-related products and the methods used for exploiting them is under the purview of the National Geospatial-Intelligence Agency (NGA). Classification of certain product-related activities within NRO mission ground stations remains under NRO control and, in general, has not been declassified with the exception of the general facts identified below and in CAL-related information contained in Appendix F.

**Redact:**

~~(S)~~ All information about NRO-controlled product-related activities that is not referred to NGA or specifically cited below or in Appendix F for release. This includes but is not limited to the [redacted] data; format of film image when in context of system type; ground coordinates of reconnaissance imagery; image quantity, quality, and resolution [redacted]; and imagery support data.

**Release:**

- a. (U) The phrase, "Image Data Exploitation."<sup>2</sup>
- b. (U) The acronym "IDEX" (Image Data Exploitation System).<sup>2</sup>
- c. ~~(S//TK)~~ Existence of IAG (Imagery Analysis Group, formerly IAD) **absent any associations with:**<sup>2</sup>
  - (1) Its location
  - (2) [redacted]
  - (3) [redacted]
- d. (U) The relationship between IAG and the U.S. Army Topographic Engineering Center (TEC) (formerly ETL).<sup>2</sup>
- e. (U) The interagency composition of IAG.<sup>2</sup>



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**Refer:**

(U) To NGA: All product-related information not identified above for release.

~~TOP SECRET//TK//RSEN/NF~~

~~TOP SECRET//TK//RSEN/NF~~

1.12.2 (U) SIGINT-Related Products

Refer:

(U) To NSA: All product related information.

~~TOP SECRET//TK//RSEN/NF~~

**1.13 (U) Terms and Code Words**

**Redact:**

- a. ~~(S//TK)~~ All Project Study Numbers that are clearly associated with the NRO/NRP or are associated with study efforts, in an NRO context, that came into existence during CORONA development or after creation of SAF/SP in September 1960.<sup>107</sup> (Effective 1/12/04)
- b. ~~(S)~~ The imagery Code words (b)(1)1.4c. (b)(3)
- c. ~~(S//TK)~~ All other NRO/NRP code words, KH- suffixes, and project terms not listed below or in Appendix C.

**Release:**

- a. (U) Mission designator prefix, "KH-."<sup>8</sup>
- b. (U) CAL system KH suffixes: KH-1, KH-2, KH-3, KH-4, KH-4A, KH-4B, KH-5, KH-6.<sup>8</sup>
- c. (U) The mission suffix KH-7.
- d. ~~(S)~~ The mission suffix KH-9 when identified in conjunction with the mapping camera payload subsystem. (Note: (b)(1)1.4c. (b)(3))
- e. (U) All pre-1960 Air Force program numbers (e.g., WS-461L, WS-119L, WS-117L), and the code words/terms listed in Appendix C.<sup>107</sup>

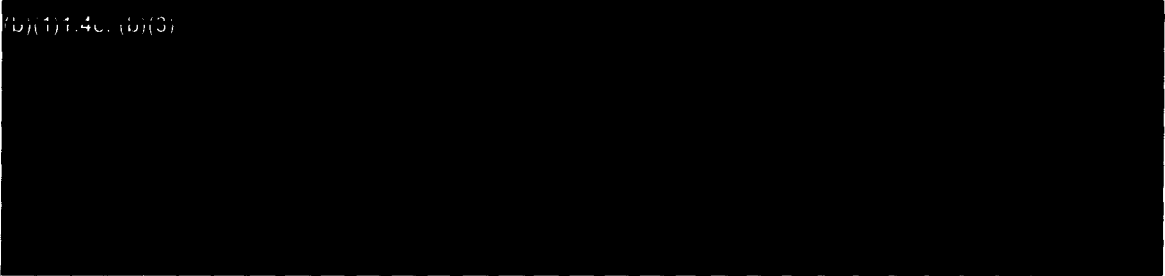
**Refer:**

- a. ~~(C)~~ To CIA: (b)(1)1.4c. (b)(3)  
(b)(1)1.4c. (b)(3)
- b. (U) To CIA: Information regarding project CAROUSEL, code name for the contingency and cover plan supporting the January 1966 deployment of three OXCART aircraft plus associated personnel and support equipment to Kadena AB, Okinawa.<sup>37</sup>

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**1.14 (U) Residual Classified Information - Program D**

~~(S//TK)~~ Although the NRO no longer considers as sensitive most information related to the former aerial reconnaissance Program D, the following sections address information that remains classified.<sup>55</sup> It primarily reveals or implies a connection with

(b)(1)1.4c. (b)(3)  


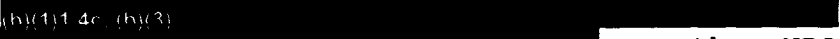
**1.14.1 (U) Program D - General**

**Redact:**

a. ~~(S)~~ All references to Program D funding, regardless of project.

b. ~~(S//TK)~~ References to any study numbers and in particular to the following Program D-related study numbers:

- (b)(1)1.4c. (b)(3)
- 
- 
- 
- 
- 

c. ~~(S//TK)~~ References to coordination and liaison between NRO/Program D and  or other NRO program offices, including references to site access, clearances, etc.

d. ~~(S//NF)~~   
(b)(1)1.4c. (b)(3)

e. ~~(S//NF)~~ Fact that as a result of the Program D realignment in 1974, manpower formerly assigned to the Program D

(b)(1)1.4c. (b)(3)

f. ~~(S//TK)~~ Fact that as a result of the Program D realignment in 1974, (b)(1)1.4c. (b)(3) were the Air Staff points of contact (POC) for coordinating continuing NRO requirements for (b)(1)1.4c. (b)(3) activities.

g. ~~(S//NF)~~ Fact that as a result of the Program D realignment in 1974, (b)(1)1.4c. (b)(3)

(b)(1)1.4c. (b)(3)

h. ~~(S//TK)~~ References to the possibility of using the

(b)(1)1.4c. (b)(3)

i. ~~(S//NF)~~ References to (b)(1)1.4c. (b)(3)

(b)(1)1.4c. (b)(3) and to the benefit that the NRO could bring to making such a capability a reality.

j. ~~(S)~~ Information revealing or inferring that (b)(1)1.4c. (b)(3)

(b)(1)1.4c. (b)(3)

k. ~~(S//TK)~~ References to (b)(1)1.4c. (b)(3) association with (b)(1)1.4c. (b)(3).

l. ~~(S//TK)~~ Association of (b)(1)1.4c. (b)(3)

(b)(1)1.4c. (b)(3)

**Release:**

- a. (U) General information about Program D not identified above for redaction.
- b. (U) The identities of all Program D directors.

**Refer:**

~~TOP SECRET//TK//RSN/NF~~

a. (U) To CIA any information that mentions:

- CIA U-2 and OXCART flight operations
- U-2 or OXCART aircraft maximum speed/height
- Code words for U-2 various worldwide missions
- Identification of countries that participated in covert U-2 flight operations, that provided bases or otherwise provided support to covert overflights
- Non-photographic intelligence collection
- Electronic countermeasure

b. (U) To the Air Force: any information concerning the missions, flight performance, or vulnerabilities of the U-2 and SR-71 aircraft.

c. (U) To JCS/JRC: information concerning tasking and targeting for U-2, OXCART, and SR-71 missions.

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1.14.2 ~~(S//TK)~~ [redacted] (b)(1)1.4c. (b)(3)

Redact:

~~(S//TK/NF)~~ All information that reveals or implies [redacted] (b)(1)1.4c. (b)(3)  
[redacted] (b)(1)1.4c. (b)(3)

[redacted] (b)(1)1.4c. (b)(3) This information includes but is not limited to:

a. ~~(S//NF)~~ [redacted] (b)(1)1.4c. (b)(3)  
[redacted] (b)(1)1.4c. (b)(3)

b. ~~(S//TK)~~ References to the fact that the NRO provided [redacted] (b)(1)1.4c. (b)(3)  
[redacted] (b)(1)1.4c. (b)(3)

c. ~~(S//TK)~~ References to any NRO association with the [redacted] (b)(1)1.4c. (b)(3)  
[redacted] (b)(1)1.4c. (b)(3)

d. ~~(S//TK)~~ References to any NRO association with [redacted] (b)(1)1.4c. (b)(3)

e. ~~(S//TK)~~ Fact that Program D provided [redacted] (b)(1)1.4c. (b)(3)  
[redacted] (b)(1)1.4c. (b)(3)

f. ~~(S//TK)~~ [redacted] (b)(1)1.4c. (b)(3)  
[redacted] (b)(1)1.4c. (b)(3)

g. ~~(S//TK)~~ References to the following [redacted] (b)(1)1.4c. (b)(3)  
[redacted] (b)(1)1.4c. (b)(3)

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(1) ~~(S//TK)~~ (b)(1)1.4c. (b)(3)  
(b)(1)1.4c. (b)(3)

(2) ~~(S//TK)~~ (b)(1)1.4c. (b)(3)  
b)(1)1.4c. (b)(3)

(3) ~~(S//TK)~~ (b)(1)1.4c. (b)(3)  
(b)(1)1.4c. (b)(3)

(4) ~~(S//TK)~~ (b)(1)1.4c. (b)(3)  
(b)(1)1.4c. (b)(3)

**Release:**

a. (U) Information not identified above for redaction. If in doubt, the redactor should consult the Redaction Quality Control supervisor for guidance.



1.14.3 (U) Logistics Support to NRP Facilities and Locations

Redact:

(U) Information relating to logistics support of NRP facilities and locations. This information includes but is not limited to:

a. ~~(S//TK)~~ Information revealing or inferring that the

b)(1)1.4c. (b)(3)  
[Redacted]

b. ~~(S//TK)~~ Information revealing or inferring that the

(b)(1)1.4c. (b)(3)  
[Redacted]

c. ~~(S//TK)~~ Explicit or implied association of the NRO with the terms, [Redacted]

b)(1)1.4c. (b)(3)  
[Redacted]

d. ~~(S//TK)~~ References to [Redacted]

(b)(1)1.4c. (b)(3)  
[Redacted]

e. ~~(S//TK)~~ References to the [Redacted]

(b)(1)1.4c. (b)(3)  
[Redacted]

f. ~~(S//TK)~~ Fact that the [Redacted]

(b)(1)1.4c. (b)(3)  
[Redacted]

g. ~~(S//TK)~~ Fact that the [Redacted]

(b)(1)1.4c. (b)(3)  
[Redacted]

h. ~~(S//TK)~~ Use of [Redacted]

b)(1)1.4c. (b)(3) testing.

~~TOP SECRET//TK//RSEN//NF~~

i. ~~(S//TK)~~ Temporary space at various Air Force installations in support of [redacted] (b)(1)(1.4c), (b)(3)

j. ~~(S//NF)~~ References to any NRO association with [redacted] (b)(1)(1.4c), (b)(3)

k. ~~(S//TK)~~ [redacted] (b)(1)(1.4c), (b)(3)  
[redacted] (b)(1)(1.4c), (b)(3)

l. ~~(S//TK)~~ Any reference that locates the [redacted] (b)(1)(1.4c), (b)(3)  
[redacted] (b)(1)(1.4c), (b)(3)

m. ~~(S//TK)~~ Fact that the [redacted] (b)(1)(1.4c), (b)(3)  
[redacted] (b)(1)(1.4c), (b)(3)

n. ~~(S//TK)~~ Association of the [redacted] (b)(1)(1.4c), (b)(3)  
[redacted] (b)(1)(1.4c), (b)(3)

o. ~~(S//TK)~~ Association of the [redacted] (b)(1)(1.4c), (b)(3)  
[redacted] (b)(1)(1.4c), (b)(3)

p. ~~(S//TK)~~ All references to [redacted] (b)(1)(1.4c), (b)(3)  
[redacted] (b)(1)(1.4c), (b)(3)

Release:

a. (U) Information not identified above for redaction. If in doubt, the redactor should consult the Redaction Quality Control supervisor.

1.14.4 ~~(S//TK)~~ [redacted] (b)(1)1.4c, (b)(3)

Redact:

~~(S//TK)~~ All information about [redacted] (b)(1)1.4c, (b)(3)  
[redacted] (b)(1)1.4c, (b)(3) This information includes but is not limited to:

a. ~~(S//TK)~~ References to [redacted] (b)(1)1.4c, (b)(3)  
[redacted] (b)(1)1.4c, (b)(3)

b. ~~(S//TK)~~ References to the [redacted] (b)(1)1.4c, (b)(3)  
[redacted] (b)(1)1.4c, (b)(3)

c. ~~(S//TK)~~ Information revealing or inferring Program D  
[redacted] (b)(1)1.4c, (b)(3)

d. ~~(S//TK)~~ Information revealing or inferring Program D  
[redacted] (b)(1)1.4c, (b)(3)

e. ~~(S//TK)~~ Information revealing or inferring Program D  
[redacted] (b)(1)1.4c, (b)(3)

f. ~~(S//NF)~~ Fact of and information about [redacted] (b)(1)1.4c, (b)(3)  
[redacted] (b)(1)1.4c, (b)(3)

~~TOP SECRET//TK//RSEN/NF~~

1.14.5 ~~(S//NF)~~ (b)(1)1.4c. (b)(3)

Redact:

~~(S//NF)~~ Information about (b)(1)1.4c activity includes but is not limited to:

a. ~~(S//NF)~~ Information that reveals or implies (b)(1)1.4c. (b)(3) including:

(1) ~~(S//NF)~~ (b)(1)1.4c. (b)(3)

(2) ~~(S//NF)~~ Program D management of the (b)(1)1.4c. (b)(3)

(3) ~~(S//NF)~~ (b)(1)1.4c. (b)(3)

(4) ~~(S//NF)~~ Program D technology support for (b)(1)1.4c. (b)(3)

(5) ~~(S//NF)~~ (b)(1)1.4c. (b)(3)  
(6) ~~(S//NF)~~  
(7) ~~(S//NF)~~  
(b)(1)1.4c. (b)(3)

(8) ~~(S//NF)~~ Program D technology support for SAF/SP  
(b)(1)1.4c. (b)(3)

(9) ~~(S//NF)~~ References to Project (b)(1)1.4c. (b)(3)  
(b)(1)1.4c. (b)(3)

~~TOP SECRET//TK//RSEN//NF~~

(10) ~~(S//NF)~~ References to tests using the [REDACTED]

[REDACTED]  
(b)(1)1.4c. (b)(3)

b. ~~(S//NF)~~ References to R&D efforts in the late 1960s to develop [REDACTED]

[REDACTED]  
(b)(1)1.4c. (b)(3)

c. ~~(S)~~ References to the [REDACTED]

[REDACTED]  
(b)(1)1.4c

d. ~~(S//NF)~~ Information regarding intent to [REDACTED]

[REDACTED]  
(b)(1)1.4c. (b)(3)

e. ~~(S)~~ All references to [REDACTED]

[REDACTED]  
(b)(1)1.4c. (b)(3)

f. ~~(S)~~ Fact of [REDACTED]

g. ~~(S)~~ Fact of research into or use of [REDACTED]

[REDACTED]  
(b)(1)1.4c. (b)(3)

h. ~~(S)~~ Fact of [REDACTED]

[REDACTED]  
(b)(1)1.4c. (b)(3)

i. ~~(S)~~ Fact of [REDACTED]

[REDACTED]  
(b)(1)1.4c. (b)(3)

**Release:**

a. (U) Information not identified above for redaction; for example, the fact of BIG SAFARI modifications of USAF aircraft for SIGINT missions in the 1950s. If in doubt, the redactor should consult the Redaction Quality Control supervisor.

~~TOP SECRET//TK//RSEN//NF~~

~~TOP SECRET//TK//RSEN//NF~~

1.14.6 (U) Program D-Related Code Words and Terms

Redact:

(U) All information concerning program D-related code words and terms that remain classified. This includes but is not limited to those code words and terms listed below. If a redactor encounters a term or code word that may still be classified but is not on this list, consult the Redaction Quality Control supervisor for guidance.

a. ~~(S//TK)~~ (b)(1)1.4c. (b)(3)  
(b)(1)1.4c. (b)(3)

b. ~~(S//TK)~~ (b)(1)1.4c. (b)(3)  
(b)(1)1.4c. (b)(3)

c. ~~(S//TK)~~ (b)(1)1.4c. (b)(3)  
(b)(1)1.4c. (b)(3)

d. ~~(S//TK)~~ (b)(1)1.4c. (b)(3)  
(b)(1)1.4c. (b)(3)

e. ~~(S//TK)~~ (b)(1)1.4c. (b)(3)  
(b)(1)1.4c. (b)(3)

f. ~~(S//TK)~~ (b)(1)1.4c. (b)(3)  
(b)(1)1.4c. (b)(3)

g. ~~(S//TK)~~ (b)(1)1.4c. (b)(3)  
(b)(1)1.4c. (b)(3)

~~TOP SECRET//TK//RSEN//NF~~

~~TOP SECRET//TK//RSEN/NF~~

Release:

a. (U) Program D code words and terms not identified above for redaction; for example BLACK SHIELD, GLASS LAMP, EBONY, ISINGLASS, OLYMPIC TORCH, SENIOR BOOK, and TROJAN HORSE.

~~TOP SECRET//TK//RSEN/NF~~

**1.15 (U) NRO Security Policy - General Administration**

(U) Effective COB on 20 May 2005 the word BYEMAN and its tri-graph BYE became unclassified.

**Redact:**

a. (U) Any information revealing or implying the frequency requirement for technical countermeasures inspections of all NRP physical areas where classified conversations take place.<sup>56</sup>

b. ~~(S)~~ Any information revealing or implying the

(b)(1)1.4c. (b)(3)  
[Redacted]

c. ~~(S)~~ Any information revealing or implying how

(b)(1)1.4c. (b)(3)  
[Redacted]

d. ~~(C)~~ Information revealing or implying that the

(b)(1)1.4c. (b)(3)  
[Redacted]

e. ~~(C)~~ Any information revealing or implying the

(b)(1)1.4c. (b)(3)  
[Redacted]

f. (U) Any information revealing or implying the physical security safeguards applicable to the handling and control of NRO information by prime contractors, sub-contractors, vendors and suppliers in the physical security plan of an industrial complex used by the NRO.<sup>56</sup>

**Release:**

(U) The fact of but no details about

a. (U) Area Security Controls, including:<sup>56</sup>

(1) (U) Perimeter Protection (Fencing, Lighting, Entrances, Fire Control)

(2) (U) Facility Guard Force



~~TOP SECRET//TK//RSEN//NF~~

(3) (U) Personnel Controls

(4) (U) General Security Practices (Safe combination security, daily security check system, security violations)

b. (U) Secure storage of NRO classified materials involving the following parameters:<sup>56</sup>

(1) (U) NRO Classified Documents in Vaults and Secure Areas

(2) (U) Classified Hardware, Components and Equipment

(3) (U) Physical Security Construction Standards for Vaults and Secure Areas

c. (U) The existence of the NRP Electrical Communications Network under the Air Force Communications Service.<sup>56</sup>

~~TOP SECRET//TK//RSEN//NF~~

~~TOP SECRET//TK//RSEN/NF~~

**2. (U) Reveal Information That Would Assist in the Development or Use of Weapons of Mass Destruction (25X2)**

**Redact:**

a. (U) Information relating to the survivability and vulnerability of NRP satellite systems to the effects of nuclear weapons.

b. (U) Information describing NRP satellite system countermeasures against the effects of nuclear weapons and those countermeasures' effectiveness.

c. (U) Information detailing the survivability and vulnerability of NRP ground systems to the effects of weapons of mass destruction, including nuclear, biological, and chemical weapons.

d. (U) Information describing NRP ground system countermeasures against the effects of weapons of mass destruction and the effectiveness of those countermeasures.

**Refer:**

(U) Unless contained in a document generated by another government agency, refer any classified or unclassified information related to weapons of mass destruction concerning chemical or biological weapons to the U.S. Army. Refer similar information concerning radiological and nuclear weapons of mass destruction to the Department of Energy.<sup>88</sup>

~~TOP SECRET//TK//RSEN/NF~~

~~TOP SECRET//TK//RSEN/NF~~

**3. (U) Reveal Information That Would Impair  
U.S. Cryptologic Systems or Activities  
(25X3)**

~~(C)~~ b(1)1.4c. (b)(3)  
b(1)1.4c. (b)(3)

**Redact:**

(U) Information relating to cryptographic equipment employed on an NRP program. This includes but is not limited to information related to techniques, design, and/or use.

**Refer:**

(U) To NSA any information related to cryptologic system descriptions, technology, capabilities, operations, program names and numbers, dates, contractors, funding, or vulnerabilities of these systems, whether used in NRO satellites, ground stations, or by some other federal agency.

~~TOP SECRET//TK//RSEN/NF~~

~~TOP SECRET//TK//RSEN//NF~~

**4. (U) Reveal Information That Would Impair  
the Application of the State-of-the-Art  
Technology Within a U.S. Weapon System  
(25X4)**

(U) NRO-developed technology may be used in U.S. non-space systems, including weapon systems; conversely, U.S. weapon system technology may be used in NRO overhead systems. NRO near real time overhead systems also provide defense-related information for the planning and conduct of military operations.

**Redact:**

(U) Information that identifies exactly how NRP overhead systems directly support U.S. forces, and where and when these NRP systems provide critical information to U.S. weapon systems that improves their battlefield accuracy and lethality. This information includes but is not limited to NRP collectors, data provided (including formats), communications methods and limitations, recipients, planned uses, and vulnerabilities. (**Note:** the fact that NRP overhead systems support the warfighter with imagery and signals intelligence is unclassified.)

**Refer:**

(U) Information relating to state-of-the-art technology employed in U.S. weapon systems to the appropriate DoD agency.

~~TOP SECRET//TK//RSEN//NF~~

~~TOP SECRET//TK//RSN/NF~~

## 5. (U) Reveal Actual U.S. Military War Plans That Remain in Effect (25X5)

### Redact:

a. (U) One or more Basic Encyclopedia (BE) numbers if associated with past or present editions of the Single Integrated Operations Plan.

b. (U) One or more BE numbers if connected to a specific ground installation/facility that may be associated with current war planning.

c. ~~(C//NF)~~ One or more BE numbers associated with ground installations/facilities which by their nature reveal a U.S. intelligence interest in [REDACTED]

b)(1)1 4c. (b)(3)

d. ~~(S)~~ Any BE number if it is revealed that [REDACTED]

b)(1)1 4c. (b)(3)

concerning the installation/facility associated with the BE number.

e. (U) All lists of BE numbers if revelation of their association provides an inclusive view into U.S. intelligence interest or knowledge, for example, a list that identifies all targets in support of OPLAN XYZ.

### Release:

(U) Single BE numbers or lists of BE numbers not revealing above classified associations.

~~TOP SECRET//TK//RSN/NF~~

TOP SECRET//TK/RSEN/NF

6. (U) Reveal Information That Would Seriously and Demonstrably Impair Relations between the U.S. and a Foreign Government, or Seriously and Demonstrably Undermine Ongoing Diplomatic Activities of the U.S. (25X6)

Redact:

~~(S)~~ Fact of and details about ~~(b)(1)1.4c. (b)(3)~~  
~~(b)(1)1.4c. (b)(3)~~

Refer:

a. ~~(S//TK)~~ To the National Geospatial-Intelligence Agency (NGA—formerly NIMA): Indications of sensitive tasking (e.g.,  
~~(b)(1)1.4c. (b)(3)~~

b. ~~(S//TK)~~ Also to NGA: fact of and details about ~~(b)(1)1.4c. (b)(3)~~  
~~(b)(1)1.4c. (b)(3)~~

c. ~~(S)~~ To the State Department: fact of and details about  
~~(b)(1)1.4c. (b)(3)~~

~~TOP SECRET//TK//RSEN/NF~~

**7. (U) Reveal Information That Would Seriously and Demonstrably Impair Current National Security Emergency Preparedness Plans (25X8)**

~~(S)~~ b(1)1.4c. (b)(3)  
b(1)1.4c. (b)(3)

**Redact:**

(U) All information of NRO plans b(1)1.4c. (b)(3)  
b(1)1.4c. (b)(3)

**Refer:**

(U) To the Federal Emergency Management Agency/Office of Homeland Security: All information on national security emergency preparedness planning by other federal agencies, including the defunct Office of Civil Defense and the Office of Defense Mobilization.

~~TOP SECRET//TK//RSEN/NF~~

**8. (U) Violate a Statute, Treaty, or  
International Agreement (25X9)**

**Refer:**

(U) (See also paragraph 6. for guidance on referring international agreements to the State Department.) There may be instances where statutes, treaties, and/or international agreements may affect the outcome of declassification decisions regarding information in NRO records. Before citing this exemption as the basis for a declassification decision, refer it to the Seal and Release Authority, who will effect coordination with the appropriate NRO officials to confirm the public disclosure status of the pertinent information, pursuant to the terms of a specific law, treaty or agreement.

~~TOP SECRET//TK//RSEN/NF~~



## 9. (U) Other

### 9.1 (U) Names and Signatures

(U) Although not subject to exemption under E.O. 12958, as amended, redact all names and signatures of personnel responsible for executing the National Reconnaissance Program not listed in Appendix B or approved for release under 1.2.3 Release k.(4). (Note: The names of all Air Force and contractor personnel involved in the WS-117L SENTRY/SAMOS program before 1 September 1960 may be released.) The redaction of names and signatures is authorized in 10 U.S.C. 424, "Protection of Organizational and Personnel Information for the NRO." Line-through all signatures of those acknowledged at Appendix B and at 1.2.3 Release k.(4). Current digital technology enables the fraudulent use of signatures that have been scanned into a computer. Signatures of OSD officials (SECDEF, DEPSECDEF, DDR&E, etc.), however, can be released.<sup>121</sup>

### 9.2 (U) Proprietary Information

(U) Even though "Proprietary" information may not be classified, redact any information so marked that has been designated for non-disclosure by an NRO contractor after documented consultation. Redaction of proprietary information must refer to these legal citations: 41 USC 423 (Procurement Integrity Act) and 18 USC 1905 (Trade Secrets Act).<sup>58</sup>

### 9.3 (U) NRO-NASA Relationship<sup>150</sup>

~~(S)~~ The NRO has supported NASA space flight programs with advanced technology and imaging sensors developed in the National Reconnaissance Program (NRP) since 1962. During the Cold War years, the NRO and the NSAM (National Security Action Memorandum) 156 Committee imposed limits on the resolution that NASA's imaging sensors could achieve at the earth's surface. The first formal agreement between the two agencies, pertaining to NASA's Lunar Program, was signed in August 1963 and provided for NRO support of the Lunar Orbiter (b)(1)(1) 4c. (b)(3) American leaders originally sought to avoid any revelation that connected NASA with the intelligence community, given the international repercussions such a revelation might have among foreign nations that hosted NASA activities on their soil. The NRO has provided technical assistance, guidance, and/or instruments to the space

agency for its Lunar Program, (b)(1)1.4c. (b)(3)

(b)(1)1.4c. (b)(3)

(b)(1)1.4c. (b)(3)

This "dual-use" of NRP technology over the years has resulted in substantial savings to the government. Some aspects of this assistance have been publicly released; other aspects remain classified as described below.

Redact

a. ~~(S//TK)~~ All information related to (b)(1)1.4c. (b)(3)

(b)(1)1.4c. (b)(3)

b. ~~(S)~~ All information related to the (b)(1)1.4c. (b)(3)

(b)(1)1.4c. (b)(3)

c. ~~(S//TK)~~ All information related to Project (b)(1)1.4c. (b)(3)

(b)(1)1.4c. (b)(3)

d. ~~(S)~~ Fact that the NRO provided (b)(1)1.4c. (b)(3)

(b)(1)1.4c. (b)(3)

e. ~~(S//TK)~~ All references to NRO or NRO-contractor

(b)(1)1.4c. (b)(3)

f. ~~(S//TK)~~ All references to NRO or NRO-contractor

(b)(1)1.4c. (b)(3)

~~TOP SECRET//TK//RSEN/NF~~

(b)(1)1.4c. (b)(3)

g. ~~(S)~~ All references to NRO or NRO-contractor (b)(1)1.4c. (b)(3)  
(b)(1)1.4c. (b)(3)

h. ~~(S//TK)~~ (b)(1)1.4c. (b)(3)  
(b)(1)1.4c. (b)(3)

(b)(1)1.4c. (b)(3) figures on high altitude atmospheric density were released through NASA for the benefit of the scientific community, (b)(1)1.4c. (b)(3)  
(b)(1)1.4c. (b)(3)

i. (U) All information not specifically identified for release below.

Release

- a. (U//~~FOUO~~) Lunar Orbiter Project details, except for NRO contract cover/security and image processing controls identified above under redact.
- b. (U//~~FOUO~~) Fact of and limited details about the 28 August 1963 "DOD/CIA-NASA Agreement on NASA Reconnaissance Programs." Discussion of contractor cover (b)(1)1.4c. (b)(3)
- c. (U) Fact of and details about a DOD-NASA committee established in 1966 to review, coordinate and monitor NASA activities that involved the NRP, known as the Survey Applications Coordinating Committee (SACC). The SACC reported to the DOD-NASA Manned Space Flight Policy Committee (MSFPC, composed of three seniors from DDR&E, NASA, and NRO). MSFPC functions were expanded to include responsibility for approving the recommendations of the SACC.
- d. (U) Fact that the SACC and NSAM 156 Committee reviewed and approved Apollo earth orbit Contingency Mission Plans for missions 13-17, and that the 18-inch focal length Hycon camera in Apollo 13 and 14 Service Modules could be used to image the earth, and that the Itek 24-inch focal length panoramic camera in the Apollo 15-17 Service Modules likewise could image the earth.

~~TOP SECRET//TK//RSEN/NF~~

~~TOP SECRET//TK//RSEN/NF~~

- e. (U) Fact that approval of the 303 and 40 Committees (Presidential principals) was sometimes sought for these decisions made by the SACC, MSFPC, and NSAM 156 committees.
- f. (U) Fact that the SACC/MSFPC and NSAM 156 Committee in 1966 imposed a resolution at the earth's surface of 20 meters (from any altitude), eventually reduced in stages to 5 meters, on all NASA image-forming sensors. Fact that these imaging restrictions did not apply to NASA astronomical experiments, which involved non-earth-looking efforts.
- g. (U) Fact that the preceding committees in 1973 authorized an Earth Terrain Camera for flight on NASA's SKYLAB that had a resolution at the earth's surface between 10 and 20 meters, which exceeded the 20-meter constraint imposed in 1966. Fact that a joint agency group organized by the intelligence community conducted a post-launch screening of imagery taken by this camera before the photography was publicly released.
- h. (U) Fact that NASA and the NRO established a joint "NASA/NRO Payload Accommodations Working Group" in the mid-1970s to examine engineering technical problems and costs of transitioning NRO payloads from expendable launch vehicles to the Space Shuttle. And fact that NASA and the NRO also established a joint "Program Review Board" at this time to coordinate their respective programs and ensure that these programs utilized common techniques and services when appropriate.
- i. (C) Records referred from NARA or the USAF involving (b)(1) 1.4c. (b)(3) the NASA-Air Force agreement on MOL, and early studies (1964-65) that proposed reconnaissance equipment, are releasable

(b)(1) 1.4c. (b)(3)

#### 9.4 (U) NSAM 156 Committee<sup>151</sup>

(U) President John F. Kennedy judged American signals intelligence and film recovery reconnaissance satellites, which had begun operating in 1960, to be national assets essential for

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defense preparedness. Seeking ways of securing international acceptance of overhead reconnaissance conducted from outer space, Kennedy issued National Security Action Memorandum No. 156 on 26 May 1962, which requested an assessment of the political and informational aspects of satellite reconnaissance policy. The NSC group formed to conduct this assessment, which became known as the "NSAM 156 Committee," issued its *Report on Political and Informational Aspects of Satellite Reconnaissance Policy* on 29 June.\* The report's policy recommendations were adopted as National Security Council Action (NSCA) 2454, *Space Policy and Intelligence Requirements*, at the 502<sup>nd</sup> NSC meeting on 10 July 1962. This action established national policy for reconnaissance satellites for the next thirty years.

(U) Keeping in mind the need to protect NRO information equities identified above and elsewhere in this guide:

Release

- a. (U) NSAM 156 (26 May 1962) and NSCA 2454 (approved 10 July 1962).
- b. (U) The names of NSAM 156 Committee members.
- c. (U) The minutes of NSAM 156 Committee Meetings and related correspondence that address:
  - (1) (U) Reconnaissance satellite fact of disclosure policy.
  - (2) (U) Political and security aspects of NASA earth sensing.
  - (3) (U) Reconnaissance satellite fact of disclosure policy in Strategic Arms Limitation (SAL) talks.
  - (4) (U) Impact of SALT I ratification on reconnaissance satellite disclosure policy.
  - (5) (U) Monitoring of SKYLAB mission planning and approval of use of 10-meter resolution camera on SKYLAB.

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\* (U) The NSAM 156 Committee continued to function under three presidents, until 1974. The original members in 1962 consisted of Paul Nitze, Department of Defense, Herbert Scoville, Jr., CIA, Adrian Fisher, Arms Control and Disarmament Agency, Joseph Charyk, DNRO, Robert Seamans, Jr., NASA, and U. Alexis Johnson, Department of State, Chair.

~~TOP SECRET//TK//RSEN/NF~~

~~TOP SECRET//TK//RSEN/NF~~

- (6) (U) Likely Soviet reaction to fact of disclosure and to proposals for joint (US-USSR) space programs.

### **9.5 (U) ARGO & the Civil Applications Committee<sup>153</sup>**

(U) Could NRP satellite imagery be used for U. S. civil applications? Unquestionably it could, a fact that became obvious to many government officials when Corona satellites began to return large quantities of photography of the earth in the early 1960s. As a result, in 1966 the NASM 156 committee recommended, and the United States Intelligence Board approved, granting a limited number of TS//TK clearances to employees and consultants of various civil agencies to permit their review of reconnaissance satellite photography. In early 1967, Presidential Science Advisor Donald F. Hornig, with the approval of the DCI and Secretary of Defense, authorized a study of selected satellite imagery by the Departments of Agriculture, Interior, and Commerce, along with the Agency for International Development and NASA. "Project Argo" sought to determine satellite imagery's usefulness for economic, social, and natural resource surveys. The group of resource experts issued a four volume report in March 1968, concluding that existing imagery would be of considerable value in archeological, glacial, hydrological, geological, and agricultural studies; forestry management, surveys of land use and natural disasters; and mapping and urban area analyses; among other uses.

(U) An ARGO Steering Committee representing relevant federal departments and agencies was subsequently formed to consolidate their data requirements and submit them to the appropriate components of the intelligence community for tasking in the NRP. A charter for this group was issued in 1970. Subsequent formation of the Committee for Civil Application of Classified Overhead Photography of the United States, popularly known as the Civil Applications Committee (CAC), formally established the group in 1975. Headquartered at the U.S. Geological Service Advanced Systems Center in Reston, Virginia, the CAC oversees and facilitates "civilian agencies' use of classified systems and coordinates the incorporation of photography, derived data, and technology in the performance of domestic civilian functions ...". The CAC charter, revised later in the 20<sup>th</sup> century, expanded natural disaster monitoring worldwide, with a network for assessment and response. It also changed the official name to

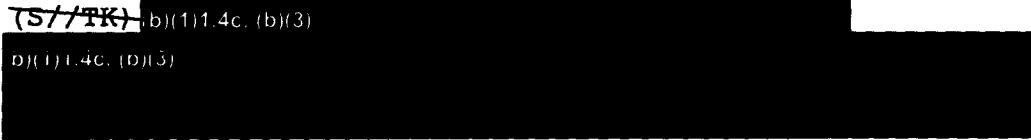
~~TOP SECRET//TK//RSEN/NF~~

Committee on Civil Applications of Classified Remotely Sensed Data.

(U) At the USGS Advanced Systems Center, major applications of NRO-furnished overhead data include responding to natural disasters, detecting and mapping the spread of wildfires, monitoring volcanoes and ecosystems, and mapping wetlands. The NRO was and is a non-voting Associate CAC member, along with the Department of State and the National Geospatial-Intelligence Agency (NGA—one of whose predecessor organizations was NPIC). CAC Voting Members include the Departments of Agriculture, Energy, Transportation, Commerce, Interior, the Federal Emergency Management Agency, the National Science Foundation, the Environmental Protection Agency, the National Aeronautics and Space Administration, and the U.S. Army Corps of Engineers.

(U) Any questions about the release of information not covered in the instructions below should be referred to your redaction supervisor.

**Redact**

- a. ~~(S//TK)~~ (b)(1), 1.4c, (b)(3)  

  
 (b)(1), 1.4c, (b)(3)
- b. (U) The names of all CIA and NRO personnel not identified for release in Appendix B.
- c. ~~(U//FOUO)~~ All information related to CIA/NRO cover and security controls adopted for this effort, including procedures for security clearances, which were developed to facilitate transfer of NRP overhead data from the intelligence community to the civilian agencies that composed ARGO/CAC.

**Release**

- a. (U) Subject to the redaction instructions listed above and elsewhere in this guide, all memoranda, letters, briefings, reports and charters that cover the establishment and evolution of ARGO and CAC, including their working groups.
- b. (U) The names of all principals involved in establishing and operating ARGO and CAC from the civilian agencies,

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the intelligence community, and the Department of Defense (e.g., committee members, chairmen, DCIs, Deputy Secretaries of Defense, president's science advisors, etc.).

**9.6 (U) International Traffic in Arms Regulations (ITAR), Export Controlled Technology and Technical Data**

(U//~~FOUO~~) Some 25-year-old or older NRO records that describe a space system's design and operation completely, with specificity and in great detail, may assist an adversary to build and launch similar modernized versions. Such records could be subject to export controls under the ITAR. Manuals associated with the Standard Agena D booster-satellite, which were serially produced and used in the NRP for 25 years, are a case in point. Similar records or technical manuals that describe obsolescent launch vehicles may also fall under the Missile Technology Control Regime (MTCR).

(U//~~FOUO~~) Although the spacecraft and launch vehicles in question are no longer state-of-the-art, public release of detailed information about their design, construction, and operation can be tantamount to an export. These records will be marked Unclassified and designated For Official Use Only (FOUO), and shall not be publicly released. Questions on whether a specific record is subject to export control restrictions will be referred to the Office of Policy.

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## **(U) Appendix A - GRAB ELINT Satellite**

*(Appendix A is UNCLASSIFIED in its entirety)*<sup>31</sup>

Detailed guidance is found in the GRAB/POPPY Review and Redaction Guide.

General information concerning the fact that GRAB was the first operational U.S. intelligence satellite can be acknowledged. The following information is releasable:

The project formally began as a U.S. Navy ELINT satellite system in 1959, and launched its first satellite in June 1960. GRAB I operated successfully until August 1962, collecting information on Soviet air defense radars inside the country that could not be observed by Air Force and Navy ferret aircraft flying ELINT missions along accessible borders in Europe and the western Pacific.

The Naval Research Laboratory (NRL) first proposed an ELINT satellite collection system in the spring of 1958. President Eisenhower approved full development on 24 August 1959. Initially called Project TATTLETALE, after the President's approval it transitioned into a tighter security control system named CANES, limiting access to less than 200 persons in the Washington D.C. area.

The first GRAB mission successfully launched from Cape Canaveral on 22 June 1960. Thor Able Star booster number 283 carried the satellite as a piggyback payload accompanying the Navy's TRANSIT II navigation satellite. Soon after achieving orbit, GRAB became the world's first operational reconnaissance satellite.

The GRAB satellite carried two electronic payloads, the classified ELINT package and scientific instrumentation to measure solar radiation (SOLRAD). Defense Department press releases publicly disclosed the SOLRAD experiment, providing a cover for the undisclosed ELINT payload.

GRAB entered near polar orbit at 500 nm with a ground swath of 3500 nm. Its antennas intercepted radar pulses of a certain bandwidth within the S-band, and transponded a corresponding signal to collection ground sites within GRAB's field of view.

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GRAB was controlled by a series of Earth Satellite Vehicle (ESV) huts deployed worldwide. However, *only* information revealing the following U.S. ESV hut locations is approved for release:

- a. Wahiawa, Hawaii;
- b. The NRL hut at the Coast Guard Communications Station in Hybla Valley, Virginia.

The Director of Naval Intelligence exercised overall control. Operators in the ESV huts recorded GRAB's transponded information onto magnetic tape and couriered it to NRL for evaluation. The NRL then duplicated and forwarded the tapes for processing and analysis to the NSA in Maryland, and to the Strategic Air Command (SAC) in Nebraska. Processing revealed the radar's antenna scan rate, its pulse repetition frequency, the type of radar, the radar disposition, and permitted analysis of the threat, and approximate location. SAC's processing was aimed at defining the characteristics and locations of air defense equipment to support preparing the single integrated operations plan (SIOP), a war plan responsibility of the Joint Strategic Targeting Planning Staff at Offutt AFB, Nebraska. The NSA searched the tapes for new and unusual signals, and discovered the Soviets were already operating advanced radars that might support a capability to destroy ballistic missiles.

Photographs of the GRAB satellite are unclassified and releasable. GRAB missions ended in August 1962 with the termination of the GRAB 2 operations.

All other information pertaining to the GRAB satellite, its operating details and related data processing and dissemination, including names that do not appear in Appendix B, remains classified unless the GRAB/POPPY Review and Redaction Guide specifically states otherwise.

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## (U) Appendix B - Acknowledged Names and Functions

(Appendix B is UNCLASSIFIED in its entirety)

**NOTE:** With the exception of the NRO and other Intelligence Community components, names of Department of Defense officials appearing in records twenty-five-years old or older are releasable, as are the names of officials in other executive branch agencies (e.g., DOE, NASA, etc.). The names of government and contractor personnel who worked on the WS-117L/SENTRY/SAMOS Program in the 1950s are also releasable. The names of contractor personnel who have worked on the NRP are not releasable unless they appear below. Air Force personnel assigned to the CIA on overhead systems likewise are not releasable unless their names appear below or in the CIA list of releasable names. Any names that appear below, when associated with more recent, specific NRO satellite programs or activities outside of the timeframe indicated, should be redacted under the Privacy Act exemption. See also release authority regarding signatures in Section 9. Note: Social Security Numbers will be redacted wherever they are encountered.

**AHOLA**, Teuvo A. (Gus) (Col, USAF). Commander, 6594th Recovery Group. Responsible for the CORONA recovery effort in the 1960s.  
**ALDRIDGE**, Edward C. ("Pete"). Undersecretary of the Air Force and Director, NRO, (1981-1988).

**ALKOFER**, James. Eastman Kodak. Instrumental in investigating and characterizing the unique technical challenges for high altitude reconnaissance films. Helped develop and define the film sensitometric and spatial performance requirements for the CORONA program and assisted the government in monitoring operational system performance.

**ALLEN**, Edward L. A CIA member who supported the U-2 program in the 1950s.

**ALLEN**, Lew (Gen, USAF)<sup>71</sup>. Director, Secretary of the Air Force Special Projects (SAF/SP) and Program A from 1 April 1971 to 21 January 1973. Also served as Director of the NRO Staff (Secretary of the Air Force for Space Systems[SAF/SS]) from 20 June 1969 to 20 August 1970.) Later became Air Force Chief of Staff.

**ALSER**, Donald. (Maj USAF). A member of SAF/SS, 1969-70.

**ALVAREZ**, Luis.<sup>94</sup> A member of the Drell Committee established by DDS&T Bud Wheelon in the mid 1960s.

**AMORY**, Robert. CIA Deputy Director, Intelligence, 1960.

**ANDERSON**, Everett E. 6593rd Test Squadron.

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**ANDERSON**, John R. (Maj, USAF). Member of SAF/SS 1973-74.

**ARAKI**, Samuel.<sup>94</sup> President of Lockheed Missiles and Space Co. Designated NRO Pioneer, 2004. Consult Center for the Study of National Reconnaissance for additional information.

**BACALIS**, Paul. A CIA member (later D/OSA) who supported the U-2, A-12, and CORONA programs in the 1950s and 1960s.

**BACHELOR**, William B. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**BAGWELL**, Jim (Lt Col, USAF).<sup>90</sup> Assigned to SAF/SP in 1971 time frame.

**BAILEY**, Bernard L. (Col, USAF). Director, Program D, 21 July 1972 - 1 October 1974.

**BAKER**, James G.<sup>62</sup> Harvard Astronomer, member of the 1954 Technology Capabilities Panel. Designed virtually all of the lenses and many of the cameras used in the SENSINT and AQUATONE aerial overflights of "denied territory" that took place in the 1950s. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**BAKER**, William O.<sup>62</sup>. A physical chemist and signals intelligence expert at AT&T Bell Laboratories who served as scientific counselor to the NSA, CIA, USN, and NRO on the overhead Advisory Committee and the President's Foreign Intelligence Advisory Board. Designated a Founder of National Reconnaissance, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**BAILEY**, Bernard L. (Col, USAF). Member of Program D, 1970-74.

**BARNES**, C. Tracy. CIA Assistant Deputy Director, Plans.

**BASS**, Gordon. (Maj, USAF). Member of SAF/SS, 1970-71.

**BATTLE**, Clarence L., Jr. CORONA Program Manager. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**BAUMGARDNER**, (Capt, USAF). Member of Program D, 1970-72.

**BEDE**, Donald.<sup>90</sup> Air Force officer assigned to SAF/SP in the 1971 time frame.

**BEERLI**, Stanley W. (Col, USAF). Served on the U-2 program reporting to Richard Bissell, and later as Deputy to CIA Deputy Director for Research (DDR) Herbert Scoville, representing him at meetings with DNRO Charyk in 1962.

**BELL**, (Lt Col, USAF). Member of Program D, 1970-73.

**BENNETT**, John P.<sup>62</sup> TRW's chief engineer in support of Program B, Mr. John Bennett conceived the spacecraft design, including the reflectors, used in signals intelligence satellite systems.

**BENNETT**, John T. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

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**BERG**, Russell .A. (Brig Gen, USAF).<sup>70</sup> Deputy Director, SAF/SP from 1962-1965. Later served as NRO Staff Director, SAF/SS, from 1 February 1967 to 19 June 1969.

**BETTERTON**, Thomas C. (RADM, USN). Director, Program C, 20 March 1985-31 January 1992.

**BETTS**, Austin W. OSD Director, Advanced Research Projects Agency (ARPA).

**BILLINGS**, Bruce H. OSD Deputy Director, Research and Engineering, 1960.

**BISHOP**, Charles.<sup>82</sup> As a major in the USAF in the mid 1970s, served as the North American Air Defense Command (NORAD) interface with SAF/SP. Later became a Brigadier General and served as Chief of Intelligence for HQ USAFE.

**BISSELL**, Richard, M. CIA, U-2 and CORONA Project Director, 1954-1960.

**BLACK**, Edwin F. Military Assistant to DEPSECDEF.

**BLACKWELL**, Arthur. An Aerospace Corporation engineer during the CORONA program who later became the first African-American to achieve supergrade status at CIA.<sup>87</sup> (Effective 3/14/02)

**BLANKENSHIP**, James R. (Maj, later Col, USAF). An Air Weather Service member of the DMSP program, late 1960s; member of SAF/SS 1977-78.

**BLUM**, Edward F. Lockheed, Engineering Development Manager. Development and manufacture of Agena A, B, and D upper stage to which CORONA payload was integrated.

**BOREL**, Paul A. CIA, Assistant Director Office of Current Research, 1960.

**BOTZONG**, Wilbur B. (Lt Col, USAF). DMSP Program Director in the early 1970s.

**BOYD**, Albert P. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**BRADBURN**, David D. (Brig Gen, USAF). Director, SAF/SP and Program A from 22 January 1973 to 31 July 1975. Earlier served as Staff Director, National Reconnaissance Office (SAF/SS) from 1 June 1971 to 7 January 1973.

**BROOKS**, Dennis (COMM, USN). Director, Program C, 4 October 1982-19 March 1985.

**BROSS**, John. Director, National Intelligence Programs Evaluation. Led negotiations that resulted in the fourth NRP agreement in August 1965.

**Brotherton**, Howard G. Pioneered innovative advances in satellite technology that improved target accuracy, provided better product quality, delivered more efficient throughput, and extended satellite life. Also instrumental in the digitalization of the mapping, charting, and geodesy system. Designated NRO Pioneer, 2008. Consult Center for the Study of National Reconnaissance for additional information.

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**BROWN**, George S. (Gen, USAF). Military Assistant to SECDEF, 1960. Later became Air Force Chief of Staff and Chairman, JCS (CJCS).

**BROWN**, Lee.<sup>90</sup> A member of the COMIREX staff who helped develop the NIIRS rating scheme, an empirical way to define resolution for interpretation of satellite imagery.

**BROWNING**, John W. (Col, USAF).<sup>62</sup> Directed a key SIGINT satellite project for NRO Program A, managing its first launch and operations. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**BRUGIONI**, Dino. Manager, National Photographic Interpretation Center (NPIC).

**BRYSON**, Jon H. (Col, USAF).<sup>62</sup> Directed the development, acquisition, and operation of a Program A signals intelligence satellite system that handled rapidly increasing data rates. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**BURN**, William. One of the original 13 individuals assigned to work space operations at the Satellite Test Center during the CORONA program. Provided the vital link between the operations at the Advanced Projects Integration Facility and the on-orbit controllers at the Satellite Test Center.

**BURKE**, William (Col, USAF). Assigned to the CIA in support of the U-2 program in the 1950s.

**BURKS**, Roy A.<sup>62</sup> Served as Technical Director of the NRO Program B CORONA Program. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**BUSH**, George H. W., DCI 30 January 1976-20 January 1977. Later President of the United States.

**BUZARD**, Frank S. (Col, USAF).<sup>62</sup> CORONA System Integration Manager. Became the first Air Force Director of Program B's follow-on imaging satellite, described as "the most complex electromechanical device ever placed in orbit" in 1966. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**CABALLERO**, Julian.<sup>61</sup> Provided executive leadership to NRO satellite system development and operation as Program B Director.

**CABELL**, C.P. Deputy Director Central Intelligence (DDCI), 1957.

**CAMINITI**, Lee.<sup>90</sup> Involved with CORONA launch activity.

**CARLSON**, William Dr.<sup>90</sup> Chief Scientist for TRW.

**CARPENTER**, Ralph A. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**CARROLL**, F.P. (Lt Gen, USAF).<sup>71</sup> Director, Defense Intelligence Agency. He participated in the interagency debate in the 1970s about development of an EOI imaging capability.

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**CARTER**, D.L. (Col, USAF).<sup>70</sup> A member of the NRO Staff, mid 1960s.  
**CARTER**, Marshal S. (Lt Gen, USA). Served as DDCI under DCI John McCone, 1961-1966; subsequently named Director, National Security Agency (DIRNSA).

**CASEY**, William J., DCI, 28 January 1981-29 January 1987.

**CHAMBERS**, Cornelius W.<sup>62</sup> Contributed flight "protective measures" adopted for use on most NRO satellites, developing a novel approach to on-board fault detection. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**CHARYK**, Joseph V. Director, National Reconnaissance Office (DNRO), 6 September 1961 to 1 March 1963.

**CHUBB**, Melvin F. "Nick" (Capt, USAF). A SAF/SP member of the DMSF program in the mid 1960s.

**CHRISTMAN**, Donald B. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**CLARK**, Edward.<sup>90</sup> An Aerospace Corporation employee.

**CLARK**, John (ADM, USN). ARPA, 1957.

**CLAUSEN**, Ingard M. Original General Electric Program Manager for the CORONA space return vehicle assembly. Designated NRO Pioneer, 2006. Consult Center for the Study of National Reconnaissance for additional information.

**CLINE**, Raymond.<sup>71</sup> Director of State Department's Bureau for Intelligence and Research in the 1970s. He participated in the interagency debate over development of the EOI imaging system during that period.

**CODY**, Joseph J., General, USAF. Commander, 6555 Aerospace Squadron at Vandenberg AFB (VAFB) during the CORONA program.

**COFFMAN**, Vance D.<sup>95</sup> Associated with NRO programs at Lockheed since 1971. Led the development of a new satellite attitude control capability needed to provide major improvements in producing large quantities of geographically accurate, highly-detailed maps from satellite-collected images. Designated NRO Pioneer, 2002. Consult Center for the Study of National Reconnaissance for additional information.

**COHEN**, Harvey. Designated NRO Pioneer, 2004. Consult Center for the Study of National Reconnaissance for additional information.

**COLBY**, William E. DCI 4 September 1973-29 January 1976.

**COLE**, (Capt, USN). Member of SAF/SS 1976-77.

**COMBS**, Henry. Lockheed engineer who headed the structural analysis team for the U-2 and later worked on the A-12 and SR-71 programs.

**CONOVER**, Alfred R. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**CONWAY**, Harry L. Worked with the 6593rd Test Squadron to pioneer air-to-air pickup of space capsules used in the CORONA program.

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**COOK**, Charles, W. Deputy Director, NRO (16 July 1974 - 30 November 1979) and Acting Director, NRO (1977).

**COPLEY**, John O. (Col, USAF).<sup>62</sup> Guided the development of Program A signals intelligence satellites from the earliest experiments to the later constellations that provided broader coverage. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**CORBETT**, Donald A.<sup>90</sup> TRW employee who worked on NRO programs.

**COYLE**, Harold S. Jr. (Lt Col, USAF). Member of SAF/SS who worked policy issues for the DNRO, 1971-1975.

**CRAIG**, (nfi) (Lt Col, USAF).<sup>71</sup> Member of the NRO Staff (SAF/SS) in the 1970s.

**CRETCHER**, James R.<sup>90</sup> Manager of Corona Engineering, Operations, and Analysis for the Lockheed Missiles and Space Company, 1965-1972.

**CROFT**, Charles (Capt, USAF).<sup>64</sup> Member of the DMSP Program staff within SAF/SP, in charge of contracts.

**CROMER**, Donald L. (Brig Gen USAF), Director, NRO Staff (SAF/SS) 5 May 1982-11 June 1984. Designated NRO Pioneer, 2001. Consult Center for the Study of National Reconnaissance for additional information.

**CROTHER**, Robert H.<sup>62</sup> Business manager for the contractor supporting the Program B electro-optical imaging satellite and wrote the handbook on cost and schedule management that remains a standard reference in spacecraft acquisition. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**CROWLEY**, John J.<sup>62</sup> Served as chief of Program B's Office of Special Projects (OSP), and is credited with establishing a true partnership between the CIA and SAF/SP elements of the NRO. Designated NRO Pioneer, 2002. Consult Center for the Study of National Reconnaissance for additional information.

**CUDMORE**, Patrick H. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**CULLEN**, Paul E.<sup>90</sup> Air Force officer.

**CUNNINGHAM**, James A.<sup>47</sup> Assistant to Richard Bissell in CIA's U-2 Project Office.

**CULLINANE**, Eugene T. M. (Lt Col, USAF). Member of SAF/SS in 1976-77.

**CURTIN**, Richard D. (Brig Gen, USAF).<sup>70</sup> First Director, SAF/SS (NRO Staff) from 31 August 1960 to 14 June 1962.

**CUTHER**, Otto E. CIA Assistant Director, Office of Research and Reference, 1960.

**DARCY**, Robert T. (CAPT, USN). Director, Program C, 24 July 1975 to 30 June 1977.

**DAUGHERTY**, Kenneth I. Geodesist.

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**DAVIES**, Merton E.<sup>62</sup> An engineer, reconnaissance system designer, imagery interpreter, and space cartographer who invented the Spin-Pan camera and worked on designs for a family of film-based reconnaissance satellites that led to CORONA. Employed throughout his career at RAND, he also served on the panels that established reconnaissance requirements and advised on competing systems. Designated a Founder of National Reconnaissance, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**DAVIS**, Arthur. (Capt, USAF). Member of SAF/SS 1979-80.

**de BROEKERT**, James C.<sup>62</sup> A contractor with Advent Systems, Inc., contributed key payload designs for several of Program A's first-generation signals intelligence satellites. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**DENNIS**, Marion Gary. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**DIENER**, William.<sup>90</sup> Air Force officer who served with the CORONA launch crew during the CORONA program.

**DIRKS**, Leslie C.<sup>61</sup> As Director, Program B from 6 June 1976 to 2 July 1982, provided executive leadership to NRO satellite system development and operation, especially the technical development of the electro-optical imaging system in the 1960s and 1970s.

**DIX**, Edgar L. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**DOLAN**, Don.<sup>94</sup> A TRW employee who worked with NRO Pioneer John Bennett on SIGINT systems for the NRO.

**DONOVAN**, A. F.<sup>70</sup> A member of the Purcell Panel.

**DORNBRAND**, Harry.<sup>90</sup> A Naval Research Laboratory employee.

**DRELL**, Sidney D., Ph.D. Stanford University scientist recruited by Wheelon (CIA/Deputy Director for Science and Technology) to tackle CORONA problems. A theoretical physicist, he also served on the President's Foreign Intelligence Advisory Board and the President's Science Advisory Committee. He served as a key scientific consultant to Program B, and served on the Technology Review Panel of the Senate Select Committee on Intelligence where he was instrumental in securing approval and support for several NRO special projects.<sup>62</sup> Designated a Founder of National Reconnaissance, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**DUCKETT**, Carl E. Succeeded Bud Wheelon as CIA DDS&T and Director, Program B.

**DULLES**, Allen W. Director of Central Intelligence (DCI), 1953-1961.

**DVORCHAK**, Stephen (Capt. USAF), worked launch vehicles for DMSP in the early 1960s.

**EARMAN**, John S. CIA Special Assistant to the DCI, 1960.

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**ECHOLS**, Emmett D. CIA Director of Personnel, 1960.  
**EDWARDS**, Sheffield. CIA Director for Security, 1960.  
**EISENHAUER**, Robert E. Developed high-speed, real-time, onboard integration, synchronization, and processing of SIGINT data from multiple satellites, 1962 - 2005. Designated NRO Pioneer, 2005. Consult Center for the Study of National Reconnaissance for additional information.  
**ELSBY**, C. Neal (Capt, USAF). A SAF/SP member of the DMSP program in the mid 1960s.  
**ENNIS**, William P. OSD, Director, Weapon System Evaluation Group, 1960.  
**ERKELENS**, Mitchell. (Lt Col, USAF). Member of Program D, 1970-72.  
**ERSKINE**, Graves G. (GEN, USA). OSD Special Assistant to SECDEF for Special Operations, 1960.  
**EVANS**, Fred.<sup>61</sup> Provided executive leadership to NRO satellite system development and operation.  
**EVANS**, Harry L. (Col, USAF).<sup>64</sup> Deputy Director, SAF/SP, 1960-1964.  
**EVERETT**, James.<sup>90</sup> Air Force officer who participated in NRO programs.  
**EWIN**, Harold.<sup>90</sup> Harvard University professor who worked on the 1960's Purcell Panel that recommended increased resolution capabilities for reconnaissance satellites.  
**FAGA**, Martin. Director, NRO (1989-1993).  
**FARNUM**, Mark. (Lt Col, USAF). Member of SAF/SS in 1963-64.  
**FELDMAN**, William.<sup>94</sup> A Kodak employee involved in developing NRO imaging payloads as mentioned in the NRO Pioneer memoir of Charles Spoelhof.  
**FERDENSI**, Carl L., Jr.<sup>102</sup> Pioneered algorithms and computer processing techniques for foreign instrumentation signals intelligence data, leading to dramatic improvements in telemetry collection. Designated NRO Pioneer, 2003. Consult Center for the Study of National Reconnaissance for additional information.  
**FLAX**, Alexander. Director, NRO from 1 October 1965 to 17 March 1970.  
**FLUCKEY**, Eugene G. (ADM, USN). Director, Program C, 8 July 1966 to 30 January 1968.  
**FOECHTERLE**, Edward R. (Lt, USAF). A SAF/SP member of the DMSP program in the mid 1960s.  
**FOLEY**, Paul F. (Col, USAF). Director, NRO Staff (SAF/SS), 15 July 1984-31 January 1985  
**FORD**, Ralph J. Assistant CORONA Program Manager.  
**FORSYTHE**, nfi (Capt, USAF). Member of SAF/SS in 1964-65.  
**FOSS**, Joe (Col, USAF).<sup>90</sup> Deputy Wing Commander at Vandenberg, AFB during the CORONA Program.

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**FOSTER**, John S.<sup>90</sup> Addressed NRO programs while serving as Director of Defense Research and Engineering (DDR&E) in the Department of Defense, late 1960s.

**FROST**, Laurence H. (RADM, USN). Director of Naval Intelligence, 1960.

**FUBINI**, Eugene. Director of Defense Research and Engineering (DDR&E) in the Department of Defense, early-mid 1960s. Addressed NRO issues for the SECDEF and served on the NRO Executive Committee.

**GARWIN**, Richard L., Ph.D.<sup>62,71</sup> A physicist who served on the President's Science Advisory Committee, and chaired its panels on Military Aircraft, Anti-submarine and Naval Warfare. He established standards and found solutions for electromechanical design of modern spacecraft. As a champion of Electro-Optical Imaging, he helped Henry Kissinger understand its role for our national defense. Designated a Founder of National Reconnaissance, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**GATES**, Thomas. SECDEF 1960.

**GAVLAK**, Ray. Lockheed. Supervised the engineers and technicians at the Lockheed facility at VAFB and coordinated CORONA launch efforts with the other contractors.

**GEARY**, Leo (Brig Gen, USAF). The first Director of Program D from 2 May 1962 to 15 July 1966.

**GEER**, Richard L. (Capt, USAF).<sup>64</sup> Member of DMSP Program staff responsible for DMSP launch vehicles, 1961-1965.

**GEIGER**, Robert K. (ADM, USN). Director, Program C, 5 January 1971 to 23 July 1975.

**GEIGER**, William. (Maj, USAF). Member of SAF/SS in 1976-77.

**GENEZ**, Victor M. (Col, USAF).<sup>90</sup> The Director of Intelligence in AF Air Research and Development Center in the 1950s when WS-117L was established.

**GEYER**, Gary S. (Col, USAF).<sup>62</sup> Contributed to notable improvements in processing and dissemination that permitted the product to reach military and civil users in near real time. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**GIFFORD**, David.<sup>90</sup> A NPIC employee involved with interpreting satellite imagery.

**GIFFORD**, Elaine A. NPIC Photogrammetrist.

**GILLER**, Edward B. A CIA member of the U-2 and A-12 programs in the 1950s and 1960s.

**GOODPASTER**, Andrew J. (GEN, USA). Eisenhower Staff Secretary.

**GORDAY**, Charles A. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**GORMAN**, Frank B. (Capt, USN).<sup>70</sup> An original member of the first NRO staff (SAF/SS).

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**GRAFE**, Arthur H. CORONA Operations officer, 6594 Recovery Control Group.

**GRAN**, Ralph M. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**GRAY**, Gordon. Eisenhower Assistant for National Security Affairs.

**GREEN**, Edgar. Eastman Kodak. Program Manager for the Kodak interface with the government and camera manufacturers during the critical CORONA program implementation years.

**GREER**, Kenneth E. CIA historian and author of a Corona history.

**GREER**, Robert E. (Maj Gen, USAF). First Director, SAF/SP and Program A, 20 September 1960 to 30 June 1965.

**GRIEGO**, William. (Maj. USAF). Member of SAF/SS in 1976-77.

**HAAS**, Donald, L. Deputy Director, NRO from 9 December 1979 to 11 April 1982.

**HAGERTY**, James. Eisenhower Press Secretary.

**HAIG**, Thomas O. (Lt Col, USAF). First 417/D MSP Program Director at SAF/SP. Led a team in 1961 that developed an operational polar-orbiting meteorological satellite, its launch vehicle, and associated ground command and control stations. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**HAINES**, Clarence R. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**HALL**, Keith, R. Director, NRO (1997-2002) and Deputy Director, NRO (1996-1997).

**HALL**, R. Cargill. (NASA, Air Force, and CIA Historian, retired). Author of various NASA, NRO and Air Force histories; a number of unclassified ones are in the public domain.

**HAMMARSTROM**, Lee M.<sup>95</sup> Associated with NRO programs since 1962. His concepts and developments for satellite, ground station, and processing systems greatly improved the accuracy, timeliness, and volume of NRO ELINT products. He also served as the head of the NRO's Technology Office, and as the NRO's Chief Scientist. Designated NRO Pioneer, 2002. Consult Center for the Study of National Reconnaissance for additional information.

**HARD**, Donald G. (Brig Gen, USAF).<sup>90</sup> Served as part of the CORONA Recovery Group in the late 1960s and early 1970s. Later, Director NRO Staff (SAF/SS), 5 November 1987-5 February 1989.

**HARDING**, Roy A. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**HARLFINGER**, Frederick J. (ADM, USN). Director, Program C, 10 September 1968 to 4 January 1971.

**HARRIS**, Jeffery D. Director, NRO (1994-1996).

**HARRIS**, William R.<sup>90</sup> A Lockheed employee who worked on early NRO SIGINT systems in the 1960s.

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**HARTLEY**, Frank (Col, USAF). Director, Program D from 1 November 1967 to 30 June 1972.

**HATCH**, David. NSA Historian, acknowledged in the GRAB and POPPY brochure.

**HAWKINS**, Willis M. General Manager of the Lockheed space vehicle effort during the formative days of the CORONA program.

**HEISLER**, Ernest. (Col, USAF). Chief, CORONA Launch Control Team (VAFB).

**HELMS**, Richard. DCI, 30 June 1966-2 February 1973.

**HELLRICH**, Fred V. Designated NRO Pioneer, 2006. Consult Center for the Study of National Reconnaissance for additional information.

**HERAN**, Paul (Col, USAF).<sup>70</sup> SAMOS E-6 Program Director. Also involved with the CORONA program and later on NRO Staff.

**HERMANN**, Robert J. Director, NRO from 8 October 1979 to 2 August 1981.

**HERRON**, Thomas J. (Lt Col, USAF).<sup>70</sup> A member of the first NRO staff (SAF/SS).

**HEYROTH**, James.<sup>90</sup> Air Force officer cognizant of NRO programs.

**HICKS**, John J.<sup>90</sup> Director of NPIC who approved the NIIRS developed by NRO Pioneer Kohler and his team.

**HILL**, Jimmie D.<sup>73</sup> Deputy Director, NRO and Acting Director, NRO (1993-1994). Also served as NRO Staff Director (SAC/SS), 12 June 1978-9 April 1982.

**HINEMAN**, Evan. CIA director of DS&T, and of Program B, 1982-1986.

**HOFFMANN**, Frederick L. "Fritz" (Maj, later Col, USAF).<sup>71</sup> Member of the NRO Staff (SAF/SS) in the 1970s.

**HOFFMAN**, Ralph (Lt, USAF). A SAF/SP member of the DMSP program in the mid 1960s.

**HOGARTY**, (Lt, USAF). Member of Program D, 1970-73.

**HORNER**, Richard. Assistant Secretary of the Air Force, 1957.

**HOUSTON**, Lawrence R. CIA, General Counsel.

**HOWARD**, Henry C. (Major, USAF).<sup>70</sup> A member of the first NRO staff (SAF/SS), 1961-1965.

**HUBBLE**, Hilbert R. (PO1, USN).<sup>94</sup> A USN technician mentioned in the memoirs of NRO Pioneer Mayo as working in the GRAB radio control and interrogation hut in Hawaii.

**HUFFSTUTLER**, R. M. (Rae). CIA, Executive Director, Deputy Director for Administration, and Director, NPIC.

**HUNTLEY**, Hal.<sup>90</sup> Employee of Lockheed Martin Corporation.

**INLOW**, Roland S.<sup>90</sup> CIA Officer who served as Chairman, COMIREX, late 1960s and 1970s.

**IORILLO**, Tony.<sup>61,79</sup> Mr. Iorillo conceived a new concept in spacecraft control and operation, which became a fundamental design for many NRO spacecraft. He also was a leader in the Hughes design and development effort that fielded the critical,

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near-real-time optical-imagery-transmission relay system. He guided corporate and government funded research efforts on critical technologies that produced significant advances in national reconnaissance capabilities. His efforts contributed to the successful achievement of a challenging and important vision: near-real-time optical imaging, with data relayed directly from space to a ground processing system. Designated NRO Pioneer, 2001. Consult Center for the Study of National Reconnaissance for additional information.

**ISTVAN**, Edwin J. (Lt Col, USAF).<sup>70</sup> An original member of the first NRO staff (SAF/SS).

**JACOBSON**, Ralph H. (Brig Gen, USAF). Director of Program A, 20 January 1973-19 February 1987.

**JAMES**, Clifton E. (Major, USAF).<sup>70</sup> An original member of the first NRO staff (SAF/SS).

**JOHNSON**, Albert W. CORONA Payload Recovery Manager.

**JOHNSON**, Clarence Leonard "Kelly". Aircraft engineer, head of Lockheed Skunk Works. Designer of 40+ aircraft, including B-37, P-38, Constellation, F-80, T-33, P2V, F-104, F-117, C-130, U-2, and the Blackbird Family (A-12, YF-12, SR-71, M-21, D-21).

**JOHNSON**, David. NSA historian, retired, acknowledged in the GRAB and POPPY brochure.

**JOHNSON**, Roy. First director of ARPA, 1957-59.

**JOHNSON**, William (Capt, USAF). Involved in Corona payload integration and recovery during the early 1960s.

**JOHNSTON**, Means. Military Assistant to SECDEF, 1960.

**JOINER**, Ernest. Lockheed Chief Flight Test Engineer on U-2 Program, 1955-1959.

**JONES**, Thomas (Maj, USAF). A SAF/SP member of the DMSP program in the mid 1960s.

**KAEEMERER**, Robert S.<sup>90</sup> TRW employee involved with NRO programs. Designated NRO Pioneer, 2004. Consult Center for the Study of National Reconnaissance for additional information.

**KATZ**, Amrom H.<sup>62</sup> A physicist involved in lens and camera design who performed the first experimental simulation of electro-optical satellite imaging. At RAND, he co-directed a project on overflight reconnaissance, and co-proposed film-recovery satellites as an immediate alternative to the near-real-time readout satellite, a proposal eventually established as the CORONA Project. Designated a Founder of National Reconnaissance, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**KAMINSKI**, Paul G. Designated NRO Pioneer, 2007. Consult Center for the Study of National Reconnaissance for additional information.

**KAUFMAN**, Frederick H.<sup>62</sup> Directed the TRW team that produced two important Program B signals intelligence satellites, including the first communications cross-link system in space. Designated

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NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**KELLY**, Daniel. CORONA Contracts. Negotiated the initial contract with Lockheed Missiles and Space Company in April 1958.

**KELLY**, George W. Jr. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**KENNEDY**, Joseph.<sup>94</sup> A member of Edwin Land's Technology Capabilities Panel Project Three that explored ways to improve the nation's intelligence capabilities in the 1950s.

**KENT**, Sherman. CIA Assistant Director, National Estimates 1960.

**KERR**, Richard J. CIA/DDCI.

**KIEFER**, Eugene P. Special Assistant for Technical Assistance to Richard Bissell and later Deputy Director, NRO, 2 July 1963-18 February 1965.

**KIEFER**, Richard. (Lt Col, USAF). A member of SAF/SS in 1969-70.

**KILLIAN**, James. President of the Massachusetts Institute of Technology, he chaired the panel that recommended building the U-2 aircraft and reconnaissance satellites. He chaired the President's Foreign Intelligence Advisory Board and the President's Science Advisory Committee. He also worked on Department of Defense-CIA agreements that structured the NRO.<sup>62</sup> Designated a Founder of National Reconnaissance, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**KING**, William G. (Brig Gen, USAF). Director, SAF/SP and Program A from 1 August 1969 to 31 March 1971. As a Lt Col in 1956, he was a member of USAF board that selected Lockheed as the prime contractor for WS-117L.

**KIRKPATRICK**, Lyman B. CIA, Inspector General, 1960.

**KISTIASKOWSKY**, George. Eisenhower Science Advisor.

**KLINGER**, David L. Designated NRO Pioneer, 2006. Consult Center for the Study of National Reconnaissance for additional information.

**KNOCHE**, E. Henry.<sup>90</sup> Director of NPIC and later DDCI, Acting DCI 21 January 1977-8 March 1977.

**KOHLER**, Robert.<sup>61,62</sup> A CIA photographic specialist who introduced photographic edge measurement and edge sharpening tools used to evaluate and enhance overhead imagery. Also provided executive leadership to NRO satellite system development and operation later in his career. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**KOZIOL**, Benedict J. Pratt Whitney engineer who played a key role in the development of the J57 engine for the U-2, 1955-1960.

**KRAPF**, Arthur E. Captain, USN. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

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**KRONMILLER**, George G. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**KUCERA**, George. First Chief of the CIA CORONA Development Staff.

**KULPA**, John E. (Maj, later Maj Gen, USAF). Director of the DMSP Program between 1966-1969. Later, Director, SAF/SP and Program A from 1 August 1975 to 19 January 1983. Earlier served as NRO Staff Director (SAF/SS) from 8 January 1973 to 20 September 1974.

**LAND**, Edwin H.<sup>62</sup> An imagery intelligence expert who was the CEO of the Polaroid Corporation and chaired the Intelligence Subcommittee of the Technology Capabilities Panel. As Chairman of the President's Science Advisory Committee Intelligence Panel, he advised the NRO on new and existing overhead systems. He played a vital role in advising President Nixon on the capabilities of Electro-Optical Imaging. Designated a Founder of National Reconnaissance, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**LANSDALE**, Edward C. OSD, 1960.

**LAPIN**, Ellis E.<sup>62</sup> Managed the Aerospace Corporation's system design and engineering efforts for Program A imaging satellites, improving flight operations by nearly doubling functional on-orbit time. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**LATHAM**, Allen.<sup>94</sup> A member of Edwin Land's Technology Capabilities Panel Project Three that explored ways to improve the nation's intelligence capabilities in the 1950s.

**LAUDERDALE**, Lloyd K.<sup>62</sup> Program manager for the CIA Program B team that developed an advance signals intelligence satellite from concept through first launch. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**LAY**, James S. Jr., Executive Secretary of the National Security Council during the Eisenhower administration, 1953-1961.

**LEACH**, (nfi) (Col, USAF).<sup>70</sup> A SAF/SP staff member.

**LEDFORD**, Jack (Brig Gen, USAF). As a Colonel, served as deputy to CIA DDR Herbert Scoville, and represented him at meetings in 1962 with DNRO Charyk. Later served as Director, Program B from 12 August 1963 to 27 September 1965.

**LEE**, (nfi) PO1, USN.<sup>94</sup> A USN technician mentioned in the memoirs of NRO Pioneer Mayo who worked at the GRAB radio control and interrogation hut in Hawaii.

**LEFSTAD**, Roy B. CORONA Launch Control Officer (VAFB).

**LEGHORN**, Richard. Principal contributor to the early CORONA camera development as a consultant to the USAF Scientific Advisory Board and the Special Assistant to the President for Disarmament Affairs. Co-founder and the first President of the

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Itek Corporation. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**LEHAN**, Frank W.<sup>62</sup> An electrical engineer who was a member of the President's Science Advisory Committee and served on the Land Panel that advised the NRO and Program B on overhead reconnaissance systems. He was instrumental in the decision to proceed with an important high altitude signals intelligence satellite system, and contributed to the reflector design for that system. Designated a Founder of National Reconnaissance, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**LEVISON**, Walter J. Itek CORONA Program Manager. Principal proponent of the proposal that CORONA employ a high resolution 24 inch focal length Petzval lens in a panoramic camera to be used on a stable body space vehicle. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**LINDSAY**, Nathan J.<sup>94</sup> (Maj Gen, USAF). On the NRO staff and, as a general officer, served as Director, SAF/SP and Program A 1987-1992.

**LINDSEY**, Frank.<sup>76</sup> OSS in WWII, CEO, Itek Corporation in the mid-1960s.

**LINZ**, D. P.<sup>70</sup> A member of the Purcell Panel.

**LISCIOTTI**, Francis L. (Capt, USAF).<sup>70</sup> A member of the first NRO staff (SAF/SS).

**LLOYD**, H. Gates. CIA Assistant Deputy Director, Security, 1960.

**LORENZEN**, Howard O.<sup>62</sup> An early advocate of signals intelligence satellites who directed the development of GRAB, the nation's first such program, at the Naval Research Laboratory. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**LOWRANCE**, Vernon L. (ADM, USN). Director, Program C from 23 July 1962 to 19 June 1963.

**LUNDAHL**, Arthur C. CIA, Director Photographic Interpretation Center, 1960 and later Director, NPIC.

**MACDONALD**, Duncan. Postwar director of the Boston University Physical Research Laboratory, in 1957 he co-founded with Richard Leghorn the Itek Corporation that built the CORONA cameras.

**MACLEISH**, Kenneth.<sup>94</sup> A Kodak employee involved in developing NRO imaging payloads as mentioned in the NRO Pioneer memoir of Charles Spoelhof.

**MADDEN**, Francis J. (Frank). Itek Corporation. Chief engineer for development of the HYAC panoramic camera and subsequently responsible for all engineering development of the CORONA camera and its improved versions. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

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**MAHON**, J. E. COL, USA. Staff Officer, JCS, 1960.

**MAHONEY**, William C. Photogrammetrist during the CORONA program.

**MANNEN**, James T. (Col, USAF).<sup>62</sup> As director of a vital imagery satellite program, introduced procedures that improved target tasking and significantly increased ground resolution and on-orbit system reliability. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**MARK**, Hans. Director, NRO (1977-1979).

**MARKWOOD**, Calvin H. (Capt, USAF). A SAF/SP member of the DMSP program in the mid 1960s.

**MARSH**, Roger C. Developed means to construct, operate, and manage covert organizations using open source methods, 1971-2001. Designated NRO Pioneer, 2005. Consult Center for the Study of National Reconnaissance for additional information.

**MARTIN**, John L. Jr. (Brig Gen, USAF). Aide to DNRO Charyk and later, as a general officer, Director of SAF/SP, Program A, and NRO Staff Director (SAF/SS), 1 July 1962-3 August 1964.

**MASON**, Charles W. CIA Chief, Budgeting and Comptroller, 1960.

**MATHISON**, Charles G. Vice Commander, 6594 Recovery Group.

**MAXEY**, Jackson. Head of the CIA office that was directly responsible for development and system integration of the CORONA cameras through 1965.<sup>87</sup> (Effective 3/14/02)

**MAYHEW**, Paul W., Ph.D.<sup>62</sup> Served as TRW's payload project manager and system engineer for two unprecedented signals intelligence satellite systems. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**MAYO**, Reid D.<sup>62</sup> Working at the Naval Research Laboratory, conceived and designed the first Navy signals intelligence satellite, GRAB/DYNO. Later served as project engineer and technical director of Program C. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**McANALLY**, James W. Designated NRO Pioneer, 2004. Consult Center for the Study of National Reconnaissance for additional information.

**McBRIDE**, Charlie.<sup>73</sup> SAF/SP staff member involved with financial management.

**McCARTNEY**, Forrest S. (Lt. Gen., USAF) Satellite Test Center. Responsible for the on-orbit control of early CORONA satellites and was at the console during the first successful CORONA mission. Later became Commander, AF Space Division.

**McCLELLAND**, Harold M. CORONA Staff. Principal liaison between the Pentagon's Advanced Research Projects Agency (ARPA) and the CIA CORONA Program Office during the formative years of the program.

**McCONE**, John A. DCI, 28 November 1961-28 April 1965.

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**McCray**, Phillip R. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**McDonald**, James H. CIA member of the CORONA team, (1960-1972).

**McLUCAS**, John L. Dr. Director, NRO (1969-1973).

**McMAHON**, John N. CORONA Development Team and later DDCI.

**McMILLAN**, Brockway. Director, National Reconnaissance Office from 1 March 1963 to 1 October 1965.

**MECEDA**, John. (Capt, USAF). A member of SAF/SS in 1968-69.

**MESSNER**, David. (Capt, USAF). A member of SAF/SS in 1976-77.

**METTLER**, Reuben.<sup>90</sup> TRW official who was cognizant of NRO programs.

**MILES**, John M. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**MILLER**, Edward A. GE CORONA Project Manager. Led the team that successfully developed the recovery vehicle in record time. Designated NRO Pioneer, 2005. Consult Center for the Study of National Reconnaissance for additional information.

**MILLER**, George. CIA/DDS&T/D/OEL, involved in POPPY.

**MILLER**, Herbert I. CIA member who supported the U-2 and A-12 programs in the 1950s and 1960s.

**MISNER**, Robert D. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**MITCHELL**, Harold E. Air Force pilot during the first aerial recovery of the CORONA film return capsule.

**MOORE**, Richard R. Involved with CORONA Thor booster modifications.

**MOORMAN**, Thomas S., Jr. (Brig Gen, USAF). NRO Staff Director (SAF/SS), 5 February 1985-18 October 1987.

**MORGAN**, James E.<sup>62</sup> An early Navy champion of electronic intelligence satellite tactical support to military operations, developed the target tasking and data dissemination architectures for key Program C systems. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**MORTON**, Mark. GE General Manager responsible for ensuring all GE support to CORONA was delivered on schedule. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**MUNSON**, Alden V., Jr.<sup>62</sup> A contractor with the Aerospace Corporation and TRW who conceived and developed a fully automatic electronic intelligence system that directly supported U.S. military forces in the field. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**MURPHY**, Charles L. (LtCol, USAF).<sup>60</sup> The first CIA Field Technical Director, Advanced Project Integration Facility.

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Managed the integration, test, launch, and on-orbit operations of the CORONA system. Murphy's Air Force and CIA affiliations can be acknowledged. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**MURPHY**, Frank (CAPT, USN). Interim Director, Program C.

**NAKA**, F. Robert. Deputy Director, NRO from 1 July 1969 to 31 August 1972.

**NALLY**, (Lt Col, USAF). Member of Program D, 1970-72.

**NEWMAN**, Mark.<sup>90</sup> Employee of TRW who was cognizant of NRO programs.

**NEWMAN**, Mark.<sup>94</sup> A TRW employee who worked with NRO Pioneer John Bennett on SIGINT systems for the NRO.

**NOLAN**, Donald.<sup>90</sup> Employee of TRW who was cognizant of NRO programs.

**NOWINSKI**, Edward.<sup>61</sup> Provided executive leadership to NRO satellite system development and operations.

**O'CONNELL**, John M. (Lt Col, USAF).<sup>90</sup> Air Force officer who worked on SIGINT programs in SAF/SP. Later worked for Lockheed.

**ODER**, Frederick (Col, USAF). Program Manager. Deputy to General Shreiver for WS-117L and DISCOVERER/CORONA. Played crucial role in early CORONA Technical Development. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**O'GREEN**, Fred. Lockheed manager for the design, manufacture, and test of the Agena vehicle for CORONA.

**O'TOOLE**, Joseph P. Satellite Test Center. Control Chief for CORONA operations at Sunnyvale and supervised the duty controllers.

**OVER**, John J. (Jack). Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**OWENS**, Raymond B. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**OWENS**, Wesley D. (Col, USAF). A member of SAF/SS in 1969-75.

**PAIGE**, Hilliard. GE General Manager with overall responsibility for development of the CORONA bucket reentry systems.

**PARANGOSKY**, John. CORONA Program Staff. Served as Deputy Chief, then later as Chief of the CORONA Program Office Development Staff in CIA DS&T. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**PARRISH**, David P. (Col, USAF).<sup>90</sup> Air Force officer assigned to SAF/SP.

**PATTERSON**, Lee Roy (CAPT, USN). Director, Program C, from 31 August 1981-10 September 1972.

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**PAULSON**, Robert L. (Col, USAF).<sup>95</sup> Associated with NRO programs between 1973 and 1989. Served as the Air Force Program Manager for a multi-agency IMINT satellite system program. He successfully led his program office and operations team through the critical design, development, and testing of the system, and developed its complex ground architecture. Designated NRO Pioneer, 2002. Consult Center for the Study of National Reconnaissance for additional information.

**PEAKE**, Hayden. (Lt Col, USA). A member of SAF/SS in 1969-70.

**PELINE**, Julius P., Ph.D.<sup>62</sup> Served as Lockheed's system test director and program manager for a key imagery intelligence satellite program. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**PENCE**, Lawrence. (Maj, USAF). Member of SAF/SS 1969-70.

**PERRY**, Robert L. Member of RAND and an NRO contract historian, 1966-1974.

**PERRY**, William J. An Army mathematician who advised the NSA and CIA on programs to intercept and evaluate Soviet missile telemetry and communications intelligence. He chaired the "Perry Panel" that advised the CIA on all overhead signals intelligence collection, and later served as Under Secretary of Defense for Research and Engineering and as Secretary of Defense. Designated a Founder of National Reconnaissance, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**PEYTON**, Keith. (Capt, USAF). Member of SAF/SS 1972-1975.

**PHILBRICK**, Richard W. (Col, USAF). Aerial reconnaissance pioneer with the Army Air Corps (later USAF) and a top leader at the Itek Corporation on the Corona Program in the 1960s.

**PHILMEYER**, Gil.<sup>90</sup> Employee of Eastman Kodak who was cognizant of NRO programs.

**PIETZ**, John (Maj, USAF).<sup>70</sup> A staff member of SAF/SP.

**PLUMMER**, James W. Director, National Reconnaissance Office from 21 December 1973 to 28 June 1976. Earlier in his private industry career, he led the Lockheed team from the early days of WS-117L, and as the Lockheed program manager for the CORONA program, led the prime contractor efforts all the way through its formative years to full operational capability.

**POTTS**, Ronald. Retired NRL engineer and historian, acknowledged in the GRAB and POPPY brochure.

**POST**, William S. (RADM, USN). Deputy J-2, Joint Chiefs of Staff (JCS) 1960.

**POWELL**, Robert M. <sup>62</sup> Lockheed program manager for a key high-resolution satellite reconnaissance program who devised a novel orbital maneuver that greatly extended the lifetimes of satellites in orbit. Designated NRO Pioneer, 2000. Consult

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Center for the Study of National Reconnaissance for additional information.

**POWERS**, Francis Gary. CIA U-2 pilot shot down over the Soviet Union on 1 May 1960.

**PRICE**, Charles W. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**PROFFITT**, Wayne L. Designed the mechanism that permitted a satellite to point its communications antenna toward a relay satellite and maintain continuous contact. Designated NRO Pioneer, 2005. Consult Center for the Study of National Reconnaissance for additional information.

**PURCELL**, Edward M., Ph.D.<sup>62</sup> A Harvard Nobel Laureate and radar expert who worked on all early overhead reconnaissance projects that operated at extreme altitudes. His main contribution involved methods to make these vehicles, if not invisible to radar, hard to observe with radar. He also chaired the Land Panel subcommittee that selected the Program B follow-on film recovery reconnaissance system. Designated a Founder of National Reconnaissance, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**QUARLES**, Donald A. DEPSECDEF, 1957-59. Drafted the first "Freedom of Space" presidential directive for the IGY satellite program while serving as Asst SECDEF R&D in 1955.

**QUIGGINS**, Richard S. (Lt Col, USAF). Member of SAF/SS 1963-65.

**QUIGLEY**, Frank.<sup>83</sup> As a Captain in the Navy was Director of a satellite ELINT System Program Office (SPO) during the development and early operational period of the automated ELINT processing system. (Effective 2/7/02)

**RABORN**, William F., (ADM, USN). DCI, 28 April 1965-26 April 1966.

**RAMBOLT**, William.<sup>90</sup> A Stanford University Laboratory employee who worked on early NRO SIGINT systems in the 1960s.

**RASPET**, David Colonel, USAF.<sup>102</sup> Developed advanced methods of integrating spacecraft into launch vehicles and provided crucial leadership that enabled sustained operation of reconnaissance satellites. Designated NRO Pioneer, 2003. Consult Center for the Study of National Reconnaissance for additional information.

**RATCLIFFE**, Louis T. (Jack). Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**REBER**, James Q. Deputy Director, NRO from 1 September 1965 to 30 June 1969. Had earlier served as Chairman, Committee on Overhead Requirements (COMOR).

**REED**, Thomas C. Director, NRO 9 August 1976 to 7 April 1977.

**REED**, nfi (Lt Col, USAF). Member of Program D, 1970-72.

**REESE**, Edward H.<sup>62</sup> General Electric's program technical director, led the development of the ground data system that

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integrated hardware and software to process digital imagery from electro-optical imaging satellites. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**RICKS**, Luin (Capt, USAF).<sup>64</sup> Member of the DMSP Program staff responsible for ground station support (tracking, command and control) in mid-1960s.

**RIEPE**, Quentin A. ("Que") (Col, USAF). Planned and established ground facilities for the WS-117L/Samos program at Vandenberg and elsewhere, and set up the remote tracking stations for the CORONA program. Served as first director of the MIDAS Program (1959-1961).

**RINDSKOPF**, M. H. (CAPT, USN). Director, Program C, 14 June 1966-12 September 1966.

**RITLAND**, Osmund (Maj Gen, USAF). Assistant to Richard Bissell for the overall CORONA Program. Later became Commander, AF Space System Division. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**ROBERTS**, Lee W. (Col, USAF).<sup>62</sup> Directed improvements in an important Program A satellite reconnaissance effort that produced high-resolution imagery of the earth's surface. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**ROBERTS**, James F. (Capt, USAF). A SAF/SP member of the DMSP program in the mid 1960s.

**ROOT**, L. Eugene. President, Lockheed Missile and Space Company at the initiation of Lockheed's effort on the Air Force's space programs.

**ROSE**, Vincent S.<sup>79</sup> At the Naval Research Laboratory he designed the first ELINT payload used in SIGINT reconnaissance satellites. His achievements enabled the earliest receivers to collect radar emissions across broad frequency ranges that produced "horizon to horizon" area coverage capabilities. His exceptional designs gave the U.S. its first space reconnaissance collection success, and he contributed to the development of advanced ELINT receivers, antennas, and associated elements for four decades. Designated NRO Pioneer, 2001. Consult Center for the Study of National Reconnaissance for additional information.

**ROSENBERG**, Robert A., "Rosie." (Col, later Brig Gen, USAF). Served in SAF/SP in 1960s and early 70s. Acting Staff Director, SAF/SS, February-March, 1976; later served on the White House Staff, 1977-79.

**ROSZAK**, Joseph R. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**ROTELIUK**, Luchy.<sup>90</sup> A TRW employee cognizant of NRO program activity.

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**ROTH**, Charles.<sup>61, 62</sup> Program Manager for the first electro-optical imaging satellite to be put into orbit. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**ROWLETT**, Frank B. Special Assistant to Director, National Security Agency (NSA).

**ROY**, Rob. The first CORONA launch controller at VAFB. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**RUDERMAN**, Malvin.<sup>94</sup> A member of the Drell Committee established by DDS&T Bud Wheelon.

**RUEBEL**, J.H. (Col, USAF).<sup>70,71</sup> A staff member of SAF/SP.

**RUFFNER**, Kevin C. CIA historian and editor of *CORONA: America's First Satellite Program*, 1995.

**RUNGE**, Fritz.<sup>33</sup> Worked for Lt Col Haig in the DMSP Program Office.

**RUPERT**, nfi (Lt Col, USAF). Member of Program D, 1970-73.

**RUZECK**, Charles (COL, USA).<sup>70</sup> An original member of the first NRO staff (SAF/SS).

**SABELHAUS**, Anthony H.<sup>90</sup> A TRW employee cognizant of NRO program activity.

**SAMFORD**, John A. (Lt Gen, USAF). Director, NSA 1960.

**SAMPSON**, William F.<sup>90</sup> An Aerospace Corporation technical manager involved with NRO program activities.

**SAUNDERS**, Clason B. (Col, USAF). Director, Program D, from 15 July 1966-31 October 1967.

**SAUNDERS**, Edward R. CIA, Comptroller, 1960.

**SAXTON**, H. L. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**SCHALK**, Louis. CIA A-12 pilot in the 1960s.

**SCHOESSLER**, Donald. Eastman Kodak. Liaison with the Kodak film manufacturing division, providing the interface necessary for communicating the CORONA program's film requirements and directing development of films to these unique requirements.

**SELTER**, nfi (Capt, USAF). Member of Program D, 1970-72.

**SCHRIEVER**, Bernard A. (Gen, USAF). Commander, AF Ballistic Missile Division during the CORONA program. Later became Commander of the AF Research and Development and of the Air Force Systems Command.

**SCOTT**, Roderick M. Perkin-Elmer engineer who participated in the design of the U-2 and A-12 cameras.

**SCOVILLE**, Herbert Jr. CIA Office of Scientific Intelligence, 1960. Director of Program B from 1 March 1962 to 14 June 1963.

**SEAL**, Virginia Jane. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**SEAWELL**, William T. Military Assistant to DEPSECDEF, 1960.

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**SEAY**, J. S. (Col, USAF).<sup>70</sup> A staff member of SAF/SP, in procurement.

**SHARP**, Dudley C. SECAF, 1960.

**SHELDON**, Huntington D. CIA Director of Program B from 27 September 1965 to 13 January 1967.

**SHELTON**, William (Col, USAF). Commander, U-2 Detachment B.

**SHEPPARD**, William A. ("Red") (Col, USAF). CORONA Program Office. Established the early processes and procedures that provided the transition between the unclassified Discoverer Program and the classified CIA activities. Interacted with senior Air Force leadership to maintain booster funding and also responsible for establishing the Autumn Leaves study to determine how conventional film could be modified to survive the space environment.

**SHERRILL**, J.C. Executive Officer to Chairman, JCS, 1960.

**SHIELDS**, William L. Jr. (Brig Gen, USAF). NRO Staff Director (SAF/SS) from 18 March 1976 to 12 June 1978.

**SHOVER**, Harry T. (Sam) Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**SHURA**, Carl Van. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**SIDES**, Jack (Lt Col, USAF).<sup>70</sup> An original member of the first NRO staff (SAF/SS).

**SIMMONS**, Arthur B.<sup>90</sup> Eastman Kodak Director of Research and Engineering during the CORONA program.

**SIMONTON**, Jack, (Col, USAF).<sup>90</sup> Assigned to SAF/SP in the 1970s in the area of launch integration.

**SINEX**, Charles H. (Col, USAF).<sup>70</sup> An original member of the first NRO staff (SAF/SS).

**SINGEL**, Robert D. Deputy Director, NRO from 18 September 1972 to 15 July 1974.

**SMITH**, J. R. (Lt Col, USAF).<sup>64</sup> Deputy Program Manager, Defense Meteorological Support Program within SAF/SP.

**SPOELHOF**, Charles P.<sup>62</sup> An Eastman Kodak official who collaborated on the design of the U-2, A-12, and SAMOS cameras, and directed efforts that led to the application of thin-based Mylar film in NRO reconnaissance satellites. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**SPOKEN**, Stanley.<sup>90</sup> CIA General Counsel who was cognizant of NRO/NRP activities.

**SPRAGUE**, Jay W. (RADM, USN). Last Director, Program C, 31 January 1992-31 December 1992.

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**STARNES**, Arthur (Lt Col, USAF).<sup>90</sup> A SAF/SP officer in the 1970s credited with inventing modern launch integration techniques and procedures.

**STEARNS**, Clifford B. (Lt. USAF), A SAF/SP officer assigned to DMSP in the mid 1960s.

**STEININGER**, Donald.<sup>94</sup> A retired Lieutenant Colonel who was a staffer to the President's Science Advisor in the early 1960s and supported the Drell Committee's investigation of ways to improve reconnaissance satellite capabilities.

**STELLING**, Henry, B (Hank) (Col, USAF).<sup>90</sup> Assigned to the SAF/SP office involved with NRO launch operations in the 1970s.

**STEWART**, James T. (Brig Gen, USAF).<sup>70</sup> Director of the NRO Staff (SAF/SS) from 3 August 1964 to 1 February 1967.

**STIEG**, Forrest H.<sup>62</sup> A CIA engineer and spacecraft operations specialist in Program B who devised a process for selecting an optimum orbit that balanced signals collection with vehicle longevity. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**STONE**, Marvin S., Ph.D.<sup>62</sup> Served as a TRW payload systems engineer and project manager on Program B electronic intelligence satellite programs. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**STONER**, James W.<sup>102</sup> Pioneered techniques for near-real-time processing of electronic intelligence signals and whose algorithm prototyping and quality control were critical to satellite programmatic successes. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**STONE**, Richard. Eastman Kodak. Provided management and technical guidance for the development, integration, and quality assurance of Kodak ground handling equipment, for films and chemistries used in government facilities, and for processing and duplication of the program films.

**STRAND**, John H. (Col, USAF). Member of SAFSS in 1964-65.

**SUCMI**, Verner.<sup>94</sup> Worked with Colonel Thomas Haig during development of the DMSP payload.

**SWEENEY**, Edwin F. (Col, USAF). Director of NRO Staff (SAF/SS) from 21 August 1970 to 31 May 1971.

**TANG**, Don F.<sup>62</sup> A Lockheed spacecraft engineer in Program A who established a "collection scale" for determining what signals could be technically collected at affordable costs. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**TAYLOR**, Rufus L. (VADM, USN). Director Program C, 19 June 1963 to 14 June 1966, subsequently DDCI from 13 October 1966 to 1 February 1969.

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**TEVIS**, Charles C.<sup>102</sup> His advocacy for space-based signals intelligence collection resulted in the deployment of several innovative systems, and who was instrumental in the founding of the Defense Special Missile and Aeronautics Center. Designated NRO Pioneer, 2003. Consult Center for the Study of National Reconnaissance for additional information.

**TENET**, George. DCI July 1997- July 2004, second longest serving DCI after Allen Dulles. Previously served as Deputy DCI and Acting Director.

**TIDWELL**, William A. CIA, Assistant Deputy Director for Intelligence 1960, and later served as the director of COMIREX.

**TOOL**, Arthur Q. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**TORDELLA**, Louis W. Deputy Director, National Security Agency, 1960-1980.

**TRUAX**, R.C. (CAPT, USN).<sup>70</sup> An original member of the first Air Force WS-117L staff and later a staff member of SAF/SP.

**TSUTOMI**, Janet. Secretary for the CORONA Recovery Group Commander.

**TUKEY**, John.<sup>94</sup> A member of Edwin Land's Technology Capabilities Panel Project Three that explored ways to improve the nation's intelligence capabilities in the 1950s.

**TURNER**, Richard (Maj, USAF). A SAF/SP member of the DMSP program in the mid 1960s.

**TURNER**, Stansfield (ADM USN). DCI, 9 March 1977-27 January 1981.

**TWINING**, Nathan F. (Gen, USAF). Chairman, JCS, (CJCS) 1960.

**URMAN**, Wally. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**VAN KEUREN**, David. NRL historian acknowledged in the GRAB and POPPY brochure.

**VAN MATER**, Robert A. (Lt Col, USAF).<sup>70</sup> An original member of the first NRO staff (SAF/SS).

**VELDERS**, (Col, USAF). Member of Program D, 1970-73.

**VOTAW**, Martin J. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**WADDELL**, Kirk. Cited but no information available.

**WAKITSCH**, Harold E. (Capt, USAF). A SAF/SP member of the DMSP program in the mid 1960s.

**WALD**, Bruce. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**WALKER**, Donald R. (Brig Gen, USAF). NRO Staff Director (SAF/SS), 6 February 1989-1992.

**WALSH**, James H. (Maj Gen, USAF). Assistant Chief of Staff, Intelligence, 1960.

**WALTON**, John.<sup>79</sup> Mr. Walton, as manager of the General Electric system integration organization for the first near-real-time

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electro-optical reconnaissance satellite, made possible the combined, successful operation of the earth and space-based program elements. He served as a key architect and leader in the system's definition, development, and deployment, and established and implemented management processes for the system integration and execution of this large, complex, multi-contractor acquisition program. Mr. Walton provided leadership to decision-making forums in defining and evaluating program cost, schedule, and performance data, and facilitated a cohesive government and contractor team. His revolutionary methodology addressed the entire life cycle of program events, and has been applied to other NRO programs. Designated NRO Pioneer, 2001. Consult Center for the Study of National Reconnaissance for additional information.

**WARNER**, John S. CIA Legislative Liaison/Office of General Counsel, 1960.

**WAYNE**, James (Lt Col, USAF). A SAF/SP member of the DMSP program in the mid 1960s.

**WEBB**, Vernard H. (Curly) (Lt Col, USAF).<sup>60</sup> Deputy Chief of Operations, CIA'S Advanced Projects Integration Facility, 1960-1964. Played an important role in the test and acceptance of the CORONA camera systems and also in the on-orbit operations of the satellite.

**WEBSTER**, William H. DCI, 26 May 1987-31 August 1991.

**WEINSTEIN**, Melvin (Lt Col, USAF), An SAF/SP officer assigned to DMSP in the mid 1960s.

**WEISNER**, Jerome.<sup>94</sup> The President's Scientific Advisor in the early 1960s who convinced NRO Founder Sidney Drell to join the Strategic Military Panel of the Presidents' Scientific Advisory Committee.

**WELZENBACH**, Donald E. (CIA Historian, retired). Author of *The CIA and the U-2*, among other published works.

**WHEELER**, Earle G. (GEN, USA). Army Chief of Staff, 1960.

**WHEELER**, Harold P. Jr. (Col USAF), NRO Staff Director (SAF/SS), 1 October 1974-17 March 1976.

**WHEELON**, Albert D. (Bud). First CIA Director of DS&T (1963-66). Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**WHISENAND**, James F. (MG, USA). Special Assistant to CJCS, 1960.

**WHITE**, Thomas D. (Gen, USAF). Air Force Chief of Staff, 1960.

**WILCOX**, Fred.<sup>94</sup> CEO of Fairchild Camera and Instrument Corporation in the 1950s.

**WILHELM**, Peter G.<sup>62</sup> Chief spacecraft engineer at the Naval Research Laboratory who invented new techniques and devices that added capabilities and improved performance of signals intelligence satellites. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

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**WILLEMS**, John (MG, USA). Army Assistant Chief of Staff, Intelligence, 1960.

**WILLIAMS**, John R. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**WILLIAMSON**, William E. (Lt Col, USA). Member of SAF/SS 1966-69.

**WILLIS**, Harold W.<sup>94</sup> CIA Office of ELINT; served on Fubini SIGINT Panel in 1961 and worked on Program C POPPY project, later worked with NRO Pioneer John Bennett on Program B SIGINT systems for the NRO.

**WILLIS**, Irving E., CDR, USN.<sup>94</sup> A U.S. Navy officer mentioned in the memoirs of NRO Pioneer Mayo as participating in the GRAB ELINT satellite project.

**WINFREE**, Vance C. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**WINKLER**, James G. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**WITHROW**, William Edgar. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite radio control huts.

**WOLFE**, John. The first ITEK CORONA Program Manager.

**WONG**, Sun Yet. Designated NRO Pioneer, 2007. Consult Center for the Study of National Reconnaissance for additional information.

**WOOD**, Janet A. Designated NRO Pioneer, 2006. Consult Center for the Study of National Reconnaissance for additional information.

**WORTHINGTON**, Roy (Col, USAF). CORONA Program Office. Managed development of the three-axis stabilized Agena space vehicle. Later served as the CORONA Program Manager. As Deputy Commander of the 6594<sup>th</sup> Aerospace Test Wing, directed the integration and launch of some 200 satellites from the Western Test Range.<sup>62</sup>

Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

**WORTHEMAN**, Paul E. (Col, USAF). CORONA Program Office. Headed an Air Force Laboratory which developed aerial recovery; member, SAF/SS 1964-1970.

**WULFHORST**, John K. Lt, USN.<sup>94</sup> A U.S. Navy officer mentioned in the memoirs of NRO Pioneer Mayo as participating in the GRAB ELINT satellite project.

**YATES**, Donald N. OSD, Deputy Director for Research and Engineering, 1960.

**YORK**, Herbert F. OSD, Director for Research and Engineering, 1960.

**YOST**, William R. (Lt Col, Col, USAF). Member SAF/SS, 1966-71.

**YOWELL**, Grover M. (ADM, USN). Director, Program C from 1 July 1977 to 29 August 1981.

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**YUEN**, Joseph Y. Associated with the Naval Research Laboratory's development of the GRAB ELINT reconnaissance satellite.

**YUNDT**, Robert W.<sup>62,69</sup> Directed the Signals Intelligence Project Office in Program A, introducing a new, long-lived, multipurpose signals intelligence satellite. In 1960, served as Deputy Director of the SAMOS program. Designated NRO Pioneer, 2000. Consult Center for the Study of National Reconnaissance for additional information.

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**(U) Appendix C - Glossary of Code Words and Terms**

*(Appendix C is UNCLASSIFIED except as indicated by portion markings)*

**AFSCN** **Air Force Satellite Control Network.** An interconnected, global set of ground stations that provided tracking, telemetry, command, and control functions primarily for manned and unmanned Department of Defense (DOD) and non-DOD satellite operations and space vehicle missions.

**AGE** **Aerospace Ground Equipment.** All ground equipment required to prepare and checkout the payload and launch vehicle prior to launch.

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b)(1)1.4c (b)(3)

**Angel<sup>24</sup>** An informal nickname for the U-2 high altitude reconnaissance aircraft used by the staff of Lockheed's Advanced Development facility.

**AQUATONE<sup>24</sup>** The code word assigned to the U-2 development and early operations in the late 1950s.

**ARGO<sup>59</sup>** The code word for a joint program established in 1967 by President's Science Advisor that coordinated the needs and use of classified reconnaissance imagery for civil purposes. The only imagery that can be acknowledged as supporting ARGO is that from the CORONA, ARGON, or LANYARD programs. Succeeded by the Civil Applications Committee (CAC) in 1975.

**ARGON** The code word associated with first satellite mapping camera that flew in the early to mid 1960s.

**ARPA** **Advanced Research Projects Agency** (later DARPA)

**AUDICO** An analog-to-digital converter used by NSA to prepare GRAB ELINT satellite downlink data for computer processing.

**Automatic Declassification** Declassification of records on a specific date or event as determined by the original classification authority, or the expiration

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of a maximum period of time for classification established by E.O.12958, as amended.

**BE Number** **Basic Encyclopedia Number.** A unique number assigned to a foreign installation or facility that identified it in intelligence products and databases.

**BEACON HILL**<sup>24</sup> An Air Force study group formed in the early 1950s to research new approaches to overhead reconnaissance, including high altitude balloons, aircraft, and earth satellites.

**BLACK KNIGHT**<sup>24</sup> A SENSINT overflight of Vladivostok by three USAF RB-57Ds on 11 December 1956. When protested by the Soviets, President Dwight Eisenhower ordered a halt to all SENSINT and TALENT overflights of Sino-Soviet countries.

**BLACK SHIELD**<sup>46</sup> The operational code word associated with the operational deployment of A-12/OXCART aircraft to Kadena Air Base in 1968 to support U.S. military operations in Southeast Asia. BLACK SHIELD aircraft primarily overflew North Vietnam. On three occasions in 1968, A-12 aircraft overflew North Korea after that country's seizure of the USS Pueblo in January of that year.

**BLUE BOOK**<sup>24</sup> The Air Force effort to investigate unexplained aerial phenomena commonly known as UFOs. Investigators checked reported sightings against U-2 and later OXCART flight records, which accounted for a number of them.

**BRIDGEHEAD**<sup>15</sup> A generic name ascribed to processing of overhead program film by Eastman Kodak.

**BUCKSHOT**<sup>40</sup> The nickname associated with the unsuccessful NRL multipayload launch in January 1962 called COMPOSITE.

**BUGH**<sup>40</sup> The name given by NSA to the first detected signal associated with a Soviet ABM radar. It was intercepted by the GRAB ELINT satellite.

**C<sup>3</sup>** **Command, Control and Communications.**

**CACTUS**<sup>111</sup> CORONA computer program that listed target locations for photo-interpreting. Unclassified in CORONA context only.

**CALICO**<sup>111</sup> CORONA computer program that determined camera operations and displayed operational data. Unclassified in CORONA context only.

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**CANES<sup>10</sup>**

The Navy access and security control system for the GRAB ELINT satellite project started by the Naval Research Laboratory.

**CANIS<sup>10</sup>**

A misspelling of CANES, often found in the records.

**CAT EYE**

A WS-117L project circa 1956 dealing with light amplification.

**C<sup>3</sup>I**

**Command, Control and Communications & Intelligence.**

**CCAM**

**Controlled Collision Avoidance Maneuver.**

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(b)(1)1.4c. (b)(3)

**CDRL**

**Contract Data Requirements List.**

**CHALICE**

The operational code word associated with the U-2 program before the shutdown of Gary Powers. It was replaced by the code word IDEALIST.

**CHESS**

Code name assigned the U-2 imagery product.

**CIO**

**Central Imagery Office.**

**CL-282<sup>24</sup>**

The Lockheed designation for the preliminary design concept that evolved into the U-2 high altitude reconnaissance aircraft.

**COMET<sup>111</sup>**

CORONA computer program that determined orbit selections. Unclassified in CORONA context only.

**COMINT<sup>5</sup>**

**Communications Intelligence.** See SIGINT.

**COMINT Control**

An intelligence security compartment for communications intelligence.

**System<sup>5</sup>**

**COMIREX**

**Committee on Imagery Requirements and Exploitation.**

**COMOR**

**Committee on Overhead Reconnaissance.** The predecessor to COMIREX, it defined overhead collection requirements.

**COMPOSITE**

A term used to describe an unsuccessful NRL multipayload launch in January 1962, including a GRAB ELINT satellite.

**COMSEC**

**Communications Security.**

**CORONA**

The once-classified name for the covert photoreconnaissance satellite program that first returned images to earth.

**CORONA TARGET PROGRAM (CTP)<sup>111</sup>**

CORONA computer program that selected orbit-by-orbit camera operation based on weather forecasts and on displays of operational information and accomplishment.

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(b)(1)1.4c. (b)

b)(1)1.4c. (b)(3)

(S//TK) (b)(1)1.4c. (b)(2)

(b)(1)1.4c. (b)(3)

(b)(1)1.4c. (b)

(S//TK) (b)(1)1.4c. (b)(3)

b)(1)1.4c. (b)(3)

**Derated**

The operation of a system at less than its design capability.

**DEFCON**

**Defense Condition.**

**DCI**

**Director of Central Intelligence.**

**DCIA**

**Director of the Central Intelligence Agency**

**DDL**

**Direct Down Link.**

**Dirty Bird<sup>24</sup>**

The term used to refer to U-2 aircraft using radar signature reduction techniques.

**DISCOVERER**

The unclassified cover name for the covert CORONA program, used until 1962 when it was replaced with numbers.

**DNI**

**Director of National Intelligence.**

**DNRO**

**Director, National Reconnaissance Office.**

**DOD**

**Department of Defense.**

**DRAGON LADY<sup>24</sup>**

The name of the Air Force project in 1956 to procure its own fleet of U-2 aircraft, with the cooperation of CIA for security purposes.

**DSP**

**Defense Support Program.** An Air Force satellite that uses infrared sensors to detect ballistic missile launches. It was an outgrowth of the early WS-117L MIDAS R&D program.

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**DYNO<sup>40</sup>**

An operational code word associated with GRAB, the first satellite ELINT system, which was developed and operated by the Naval Research Laboratory until it transferred to the National Reconnaissance office in 1962.

**DYNASOAR<sup>103</sup>**

A 1960s era Air Force program to develop a space plane. It never progressed beyond R&D.

**EBONY<sup>24</sup>**

The code word associated with a solitary U-2 overflight of North Vietnam in the summer of 1961.

**ECT<sup>5, 25</sup>**

**Exceptionally Controlled Information.** An NSA administrative COMINT flag.

**ELINT<sup>5</sup>**

**Electronic Intelligence.** See SIGINT.

**EMC**

**Electromagnetic Compatibility.**

**EMI**

**Electromagnetic Interference.**

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**EMP**  
**Ephemeris Data**

**Electromagnetic Pulse.**  
Information regarding a satellite's orbital parameters, altitude, inclination, etc.

**EQUINE<sup>24</sup>**

The code word for the initial planning to exploit the photography taken by the U-2 high altitude reconnaissance aircraft.

**EVEN STEVEN<sup>24</sup>**

The code word associated with 29 U-2 flights in 1970 that overflew the Suez Canal ceasefire zone between Israel and Egypt.

**Executive Order 12951**

Signed on 22 February 1995, it directs the declassification and release to the public by October 1996 of all imagery collected by the CORONA, ARGON, and LANYARD satellite reconnaissance systems.

**Executive Order 12958**

Signed on 19 April 1995 and amended on 25 March 2003, it directs the automatic declassification of records on a specific date or event determined by the original classification authority, or on the expiration of a maximum period of time for classification established by this order.

**Exemption Categories**

The nine specified criteria in amended Executive Order 12958 that justify exemption from automatic declassification.

**FTRDC**

Federally Funded Research and Development Center.

**FIS**  
**FEED BACK**

Foreign Instrumentation Signals. See SIGINT. The RAND study project on the feasibility of reconnaissance satellites that culminated in a 1954 decision by the Air Force's Air Research and Development Command (ARDC) to study the potential for translating the FEED BACK recommendations into actual hardware. ARDC's decision evolved into the WS-117L PIED PIPER program.

**FERRET**

The generic term applied to the SIGINT variants of the SAMOS WS-117L satellite development effort. (See Appendix E)

**FLIP TOP<sup>24</sup>**

The code word associated with 15 U-2 over flights of Cuba in April 1961 to provide photographic coverage of the Bay of Pigs invasion and its aftermath.

**FOG**

Refers to the **Follow-On-Group** of 31 U-2 aircraft purchased by the Air Force, separate from those purchased initially by the CIA.

**FORWARD PASS**

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b(1)1 4c. (b)(3)  
[REDACTED]  
b(1)1 4c. (b)(3)

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~~(S)~~ (b)(1)1.4c (b)(3)  
D)(1)1.4c. (D)(3)

**GAMMA<sup>5</sup>**

**GENETRIX**

**GRAB<sup>31, 40</sup>**

**GRAND SLAM<sup>24</sup>**

**GREB<sup>31, 40</sup>**

**GREEN EYES<sup>24</sup>**

**GSE**

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**HEMP**

**HOLD<sup>31, 40</sup>**

**HOT SHOP<sup>24</sup>**

**HTAUTOMAT<sup>24</sup>**

The code word is unclassified when divorced from its meaning.

Program name for a covert effort to perform high altitude balloon reconnaissance over the Soviet Union in the mid-1950s. Also assigned AFP number **WS-119L**. A follow-on project in 1958 was identified as **461L**.

The cover term for the first satellite ELINT system, which was called DYN0, and developed by the Naval Research Laboratory before being transferred to the NRO in 1962. The term was an acronym for "Galactic Radiation And Background." (See Appendix A)

The operations code word associated with the final over flight of the Soviet Union that resulted in the downing of Gary Powers' U-2 on 1 May 1960.

A variation of the cover term for DYN0 first introduced by DARPA. It is an acronym representing the term Galactic Radiation Experiment Background.

The code word associated with three U-2 missions over Cuba in Nov-Dec 1960.

**Ground Support Equipment.**

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b)(1)1.4c. (b)(3)

**High Energy Magnetic Pulse.**

The security control system instituted by the Office of Naval Intelligence in 1961 to replace the CANES control systems associated with the GRAB/DYN0 ELINT satellite system.

The operations code word associated with two U-2 peripheral electronic intelligence collection flights along the Soviet-Iranian border in June 1959. The first mission involved operations with an USAF RB-57D and made the first telemetry intercept from a Soviet ICBM during its first-stage flight.

The name given to the project designed to exploit U-2 imagery in January 1956 that

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**IDEALIST**<sup>24</sup>

evolved into NPIC.

The cryptonym used to describe the overall U-2 program after the Soviets shot down Francis Gary Powers' mission on 1 May 1960.

**IART**

**Information Access and Release Team.** The NRO organization that handles FOIA and security reviews, and conducts the review and declassification of NRO 25-year-old classified information in accordance with amended Executive Order 12958 and NRO declassification policy.

**ILC**

**Initial Launch Capability.**

**IMINT**

**Imagery Intelligence.** The collection and analysis of photography and electronic imaging across the electromagnetic spectrum, to include visual, radar, infrared, and ultraviolet data.

**Information Element (IE)**

A specific category of information contained in NRO security classification guides or declassification guides for which there is guidance on its appropriate security treatment.

**INJUN**<sup>40</sup>

A sub satellite launched as a co-piggyback payload with GRAB/DYNO2 on 29 June 1961 onboard a TRANSIT II Navy communication satellite. Sponsored by Dr. James Van Allen, its purpose was the legitimate scientific study of the radiation belts around the earth.

**IOC**

**Initial Operational Capability.**

**IR**

**Infrared**

**IRON**

**Inter-Range Operations Number.** A randomly selected four-digit number used to schedule and identify AFSCN support for booster, launch, and/or on-orbit operations.

**ISOO**

**Information Security Oversight Office.** The organization responsible for overseeing the implementation of amended Executive Order 12958 within all Executive departments and agencies.

**JANUS**<sup>103</sup>

The name of the last-generation CORONA J cameras. Often referred to as the J-1, J-2, J-3, or J-4 cameras.

**JCS**

**Joint Chiefs of Staff.**

**KICK OFF**<sup>24</sup>

The operations code word associated with the overall Cuba overflight effort in support of the Bay of Pigs invasion in 1960.

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**LANYARD**

Program name for the unsuccessful first effort to develop a high resolution surveillance photosatellite.

**Launch Date**

A term that includes indicates when a space launch is to (or was to) occur; year, quarter, month, week or day.

**Launch Period**

The calendar period during which launch targeting information is available. The time span (encompassing the launch window) during which a LV launch is intended to occur.

**Launch Window**

A specified period of time during which a space launch must occur to satisfy technical constraints and requirements.

**LCO**

**Launch Communications Office.**

**LETHAL<sup>111</sup>**

CORONA computer program that automatically commanded and controlled the satellite. Unclassified in CORONA context only.

**LOFTI<sup>40</sup>**

A 60-pound NRL experimental satellite to study ionospheric effects on very low frequency propagation. It was lost during the January 1962 unsuccessful COMPOSITE launch.

**LONG GREEN<sup>24</sup>**

Two U-2 flights over Cuba in March 1961 to aid preparations for the subsequent Bay of Pigs invasion.

**LPO**

**Launch Program Office.** The NRO OSL integration and launch SPO. Formerly known as SMC/CLX, SMC/IMO and/or Launch Office.

**Lifboat**

A redundant and self-contained back-up stabilization system (BUSS) used on the AGENA space vehicle that could be activated for recovering the satellite reentry vehicle in the case of an AGENA power failure.

**[REDACTED]**  
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**LV**

**Launch Vehicle.** Consists of the entire space delivery system including, as appropriate, the booster, core vehicle, upper stage, and the payload fairing for all current and currently planned launch systems.

**MASINT**

**Measurement and Signature Intelligence.**

**MCC**

**Mission Control Complex.**

**MC&G**

**Mapping, Charting, & Geodasy.**

**MCS**

**Mission Control Station.**

**MGS**

**Mission Ground Station.**

**Methods**

Operational techniques used to gather intelligence or support clandestine or covert

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**MIDAS**<sup>103</sup> actions.  
A component of the USAF WS-117L developmental program with the objective of detecting ballistic missile launches. It evolved into the operational Defense Support Program (DSP) ballistic missile warning satellite. The Midas R&D Program was declassified entirely in 1998.<sup>110</sup>

**MILSATCOM**  
**MOBY DICK** **Military Satellite Communications.**  
Program name for overt balloon meteorological experiments from the early-to-late-1950s.

**MOON BOUNCE**<sup>39</sup> A project, started in 1949 to collect Soviet radar signals reflected off the moon.

**MURAL**<sup>103</sup> The first two-camera CORONA variant that provided the first stereo capability.

**NCA**  
**NACA**<sup>24</sup> **National Command Authority.**  
**The National Advisory Committee on Aeronautics.** The predecessor to the National Aeronautics and Space Administration (NASA) that played a part in the cover story for the U-2 in the early development of the aircraft. Under the cover scenario, the U-2's ostensible mission was to support NACA with high altitude weather research.

**NAREC**<sup>39</sup> An NRL computer used for signals search in conjunction with the GRAB ELINT satellite.

**NEW HORIZON** Official nickname for the WS-117L military reconnaissance satellite development effort.

**NIMBUS**<sup>24</sup> The code word associated with monthly U-2 over flights of Cuba after the Bay of Pigs invasion that eventually led to detection of Soviet strategic missiles on the island. (Also the name of an experimental NASA weather satellite.)

**NMCC** **National Military Command Center.**

**NORAD** **North American Aerospace Defense Command.**

**NPIC** **National Photographic Interpretation Center.**  
A national-level imagery exploitation organization that had primary Governmental responsibility for CAL photographic interpretation.

**NRO** **National Reconnaissance Office.**

**NRP** **National Reconnaissance Program.**

**NSA** **National Security Agency.**

**OARFISH**<sup>24</sup> The code word assigned to the CIA contract with Lockheed to develop the U-2.

**OBP** **On board processor.**

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**OILSTONE<sup>24</sup>** The Air Force code word for the development program of the U-2 high altitude reconnaissance program.

**ONI** Office of Naval Intelligence.

**OPSEC** Operations Security.

**OSD** Office of the Secretary of Defense.

**Overhead** A term that refers to airborne and space borne reconnaissance.

**OXCART<sup>24</sup>** The code word assigned to the A-12, the high altitude, supersonic successor to the U-2. The military variant became the SR-71.

**PAPERCLIP** The name of the project whereby German rocket scientists were engaged by the U.S. Army in 1950 to develop battlefield missiles.

**PARAMOUNT<sup>24</sup>** The name of a multi-agency body during the Suez Crisis of 1956 that produced all source intelligence reports, including the use of U-2 high altitude imagery.

**Committee**

**PATHFINDER** A mechanical test to verify the compatibility of the space vehicle and its interface with the AGE.

**Payload(s)** One or more combinations of mission enhancing hardware packages that are integrated onto the space vehicle bus to perform program requirements.

**Payload Identity** The combination of the Adapter Support Equipment (ASE) and the satellites.

**PFLAB** President's Foreign Intelligence Advisory Board.

**PIED PIPER** The original cryptonym assigned to the WS-117L advanced reconnaissance satellite program in 1955-56 and used in the design competition.

**PLF** **Payload Fairing.** The hardware that covers the payload while awaiting launch on top of the booster.

**PROFORMA<sup>5</sup>** Signals with machine generated data, usually digital, machine-to-machine.

**Program** The facilities, equipment, hardware, software, funds, personnel, and activities involved in a concerted effort to achieve a predetermined objective.

**Programmatic Data** Non-product or non-product-related information concerning space-based reconnaissance systems in the following areas:

- Research, development, and operation

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- Budgeting and funding
- Contractor relationships
- Integration of launch and sensor platforms
- Command and control operations
- Key design and development details
- Survivability and vulnerability.

**PSAC**  
**RAINBOW<sup>24</sup>**

**President's Scientific Advisory Committee.**  
The code word associated with the project to reduce the U-2's vulnerability to radar detection.

**RAINCOAT**

The name of the policy instituted by DNRO Charyk in early 1962 to classify launches of all military satellites. Its impetus was the increasing difficulty of maintaining the DISCOVERER cover story for the CORONA program. It can be associated with the SAMOS, CORONA (DISCOVERER), ARGON, and LANYARD programs. However, remaining classified are details concerning specific methodologies of this security strategy and considerations for its application vis-à-vis currently unacknowledged programs.<sup>49</sup>

**RAPPORT<sup>5</sup>**  
**Real-time**

A COMINT product identifier.  
Refers to intelligence collection tasking and operational activity as it occurs.

**Redact**

To edit a classified document, including lining out security markings that are no longer sensitive and removing classified information from the document in order to declassify the remaining material.

**Redaction**  
**Justification**  
**Code**  
**Refer**

A code used to authenticate the redaction of classified information from otherwise releasable documents.

Sending information to another organization within the same agency or to other government agencies for their review before releasing that information to the public.

**Reflight**

Information that reveals relationships and/or plans to launch another SV with similar configuration to a previously flown SV.  
Make available to the public.

**Release**  
**RD**  
**RF**  
**RTS**  
**SAF/SL**

**Restricted Data.**  
**Radio Frequency.**  
**Remote Tracking Station.**  
**Office of the Secretary of the Air Force/Space Launch.**

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**SAP**  
**Satellite**

**Special Access Program.**  
Spacecraft bus, payload, and space vehicle that performs an on-orbit mission.

**SAMOS**

An early Air Force reconnaissance satellite program that emphasized film read-out systems. One SAMOS photo satellite project attempted to develop a high-resolution film return system. Another SAMOS project was involved with ELINT "ferret" satellites. (See Appendix E)

**SEAFOAM<sup>24</sup>**

~~(S//NF)~~ The code word associated with six U-2 flights from Ramey AFB, Puerto Rico in December 1963. (Note: [REDACTED])

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**SCI**

**Special Compartmented Information.**

**SCIF**

**Special Compartmented Information Facility.**

**SCOPE SAINT<sup>24</sup>**

A series of U-2 overseas deployment exercises.

**SCOPE SHIELD<sup>24</sup>**

U-2 missions flown on the periphery of North Vietnam mostly in 1973 to monitor that country's compliance with cease fire agreements.

**SECAF**

**Secretary of the Air Force.**

**SECDEF**

**Secretary of Defense.**

**SENSINT<sup>103</sup>**

**Sensitive Intelligence** was an access and security control system for a compartmented military reconnaissance overflight program conducted in the 1950s, one that predated the U-2 program. It featured a variety of modified military aircraft that flew missions over mainland China, the Soviet satellite states in Eastern Europe, and the USSR. Its imagery product was held in a compartment called WINDFALL.

**SENTRY**

The predecessor name for the SAMOS program.

**SGLS**

**Space Ground Link System.**

**SIGINT**

**Signals Intelligence.** The interception, analysis, and reporting of information comprising either individually or in combination, all COMINT, ELINT, and FISINT. SIGINT includes both raw data and the analysis product of that data. Subsets of SIGINT include:

a. **Communications Intelligence (COMINT).**

Technical and intelligence information derived from foreign communication by other

than the intended recipients. Special Intelligence (SI) is the unclassified term which is used to identify COMINT in the unclassified environment.

**b. Electronic Intelligence (ELINT).** Technical and intelligence information derived from foreign electromagnetic non-communications transmissions by other than intended recipients, and foreign non-communications electromagnetic radiation emanations from other than atomic detonation or radioactive sources.

**c. Foreign Instrumentation Signals Intelligence (FISINT).** Technical and intelligence information derived from the intercept of foreign instrumentation signals (i.e., electromagnetic emissions) associated with the testing and operational deployment of non-U.S. aerospace, surface, and subsurface systems. Signals include telemetry, beacons, electronic interrogators, tracking/fusing/arming/command systems, and video data links.

**Skunk Works<sup>24</sup>**

The term applied to the Lockheed's Advanced Development facility at Burbank, California that developed the U-2, the A-12, and the SR-71 high performance reconnaissance aircraft.

**SOC**

**The NRO Satellite Operations Center.** Located in the Pentagon in the early 1960s, it translated the collection requirements levied by the intelligence community for tasking by the satellite ground stations. It was disestablished in the late 1970s.

**SOFT TOUCH<sup>24</sup>**

The operations code word associated with nine U-2 over flights of the Soviet Union and two over flights of the People's Republic of China during a 23-day span in 1957. Resulted in discovery of the Tyuratam Missile Test Center in the USSR.

**SOLRAD<sup>40</sup>**

**Solar Radiation Experiment.** A legitimate scientific experiment launched with the Navy GRAB ELINT satellite. The SOLRAD payload was publicly acknowledged while the classified ELINT payload was not, thus providing cover for the latter.

**Spacecraft**

The satellite carried into space to perform an operational, research, or test mission.

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**Spacecraft Bus** The spacecraft structure to which mission enabling and payload hardware are attached.

**SPARTAN<sup>84</sup>** Name given to the SAMOS E-6 imaging payload development effort when the E-6 was cancelled in 1963 and reoriented from a two-camera system launched on ATLAS to a one-camera system launched on Thrust-Assisted-THOR (TAT). (Effective 2/7/02)

**SP-AS-63<sup>84</sup>** A second derivative development effort of the SAMOS E-6 imaging payload after the first derivative effort, designated SPARTAN, was cancelled in 1963. (Effective 2/7/02)

**SPASUR<sup>40</sup>** The Naval Space Surveillance facility comprised of a chain of transmitter sites and receiver sites, forming a continuous wave electronic fence above the southern states from coast to coast. Can also be referred to in the records as NAVSPASUR.

**SPCI** **Special Program Controlled Information.** Includes information relating to Special Program activities, but not warranting a TOP SECRET or SECRET classification. SPCI is handled only by briefed personnel and may not leave the Special Program Controlled area.

**SPO** **System Program Office.**

**SRV** **Satellite Recovery Vehicle.** A detachable part of the spacecraft in film-return satellite reconnaissance systems that was de-orbited for delivering exposed film back to earth for processing and exploitation.

**STARFISH<sup>103</sup>** The name associated with a U.S. high altitude nuclear test in 1962. See related redaction guidance in Appendix F.

**STEX** A SIGINT technology satellite, fact of only.

**SURCAL<sup>39</sup>** A small nine-pound NRL satellite designed as a space object to calibrate the Naval Space Surveillance fence. It was lost during the unsuccessful January 1962 COMPOSITE launch.

**SV** **Satellite Vehicle.** The satellite carried into space to perform an operational, research, or test mission. See Payload.

**SVC** **Satellite Vehicle Contractor.**

**SV Mission** The activity the satellite will accomplish in space.

**System-V<sup>24</sup>** The first electronic intercept equipment to be flown aboard the U-2.

**System 438L** A separate Weapon System designation under

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which the WS-117L intelligence data handling system (IDHS) was to be developed by the Air Force. Development of the IDHS part of the WS-117L Advanced Reconnaissance System was eventually abandoned.

**TAGBOARD**<sup>103</sup>

A supersonic reconnaissance drone designed in the 1960s originally to be launched from the A-12/OXCART aircraft. It flew only a few operational missions launched from a B-52.

**TALENT Control System**

The access and security control system employed for the U-2 program. U-2 imagery products held in two other compartments: CHESS and CHURCHDOOR.

**TALENT-KEYHOLE Control System**

The access and security control system established for reconnaissance satellites in August 1960. TK imagery products held in other compartments, such as RUFF and DAFF.

**TATTLETALE**<sup>31</sup>

The code word initially assigned to the Navy GRAB ELINT satellite project in the late 1950s.

**TIME STEP**<sup>24</sup>

The code word associated with a planned U-2 overflight of the Soviet Union in late April, 1960. It was discarded in favor of another overflight plan that resulted in the shoot down of Gary Powers' U-2 on 1 May 1960.

**TIGER**

The non-compartmented code word for the then compartmented TAGBOARD supersonic reconnaissance drone managed by former Program D.

**TOG**<sup>40</sup>

**Technical Operations Group.** The interagency body established by the Navy to coordinate and control activities related to the GRAB/DYNO ELINT satellite project.

**TOMAS**

See VAULT/TOMAS.

**TRAILBLAZER**

A test to verify the compatibility of the SV and its interface with the LV.

**TRAP**

**Tactical Related Applications.**

**TRANSIT**<sup>31, 40</sup>

The Navy's first navigation satellite, it also provided a covert piggyback ride for the GRAB ELINT payload, the nation's first operational reconnaissance satellite

**TRAPEZE**<sup>24</sup>

The name given to attempts to reduce the U-2's radar signature under Project RAINBOW through the use of attached fiberglass rods and small gauge wire with precisely spaced ferrite beads.

**UV**

**Ultraviolet.**

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**VAULT/TOMAS**

A proposed, but never developed, successor to the ARGON satellite mapping system.

**VRK<sup>5, 25</sup>**

**Very Restricted Knowledge.** A NSA administrative COMINT flag.

**WALNUT<sup>40</sup>**

A compartmented TOP SECRET security system administered by the Office of Naval Intelligence for the GRAB ELINT satellite project. It replaced the SECRET level TATTLETALE security system.

**WALLPAPER<sup>24</sup>**

A name given to attempts to reduce the U-2's radar signature under Project RAINBOW through the use of plastic material containing a printed circuit designed to absorb radar pulses in the 65 to 85-MHZ range.

**WINDFALL**

Access and control system assigned to the imagery product of the SENSINT Program.

**WRSP-1<sup>24</sup>**

**1st Weather Reconnaissance Squadron, Provisional.** The cover name given to the first U-2 operational detachment, which consisted of four aircraft.

**WS-117L**

The umbrella Air Force development effort in the 1950s for reconnaissance satellites stemming from Rand's Project FEEDBACK. It eventually included three main components- MIDAS, SENTRY (later SAMOS), and DISCOVERER (CORONA).

**WS-119L**

Air Force Program number assigned to the Genetrix reconnaissance balloon project in 1955-56. A follow-on project in 1958 was called **WS-461L**.

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## (U) Appendix D - Footnoted Sources

(U) Note: This appendix provides a policy record behind information approved for release in the RRG. The policy documentation for future updates likewise will be recorded in this declassification decision archive.

1. (U//~~FOUO~~) NRO Classification Guide, version 4.0, 14 October 1995 and version 5.1 dated 1 May 2000 (S//BYE/TK).
2. (U//~~FOUO~~) NRO IMINT Security Classification Guide, BYE 138085-96, 19 September 1996 (TS//BYE) and as last updated in July 2002; see also, NRO Classification Guide Version 5.1, Classification Table, at 1.6.
3. (U) Memorandum for the Director of Central Intelligence from the Chairman, National SIGINT Committee, Subject: "Declassification of the Fact of Overhead SIGINT," 2 November 1995 (S); and Presidential Decision Directive/NSC-49, National Space Policy, 14 September 1996 (S).
4. (U//~~FOUO~~) NRO Redaction Guide for Westfields Freedom of Information Act (FOIA) Requests, 10 July 1995 (S//TK).
5. (U//~~FOUO~~) SIGINT Program Classification Guide, 16 September 1998 (S//BYE/TK).
6. (U) Policy Memorandum For the Record, Subject: "Classification Review of Aircraft Documentation Responsive to FOIA Requests F92-0011 and F93-0038," 14 March 1994 (S).
7. (U//~~FOUO~~) Implementation Plan, NRO Launch Declassification, 1 March 1997 (S//TK).
8. (U//~~FOUO~~) NRO CORONA, ARGON, LANYARD (CAL) Declassification Guide, (S//BYE/TK). (Approved 2 August 1996 by DDNRO for internal use by MS&O/IMG/IDRC. Formal approval by ISOO pending.)
9. (U) SECDEF Memorandum, "Declassification of Specified Information Relating to the National Reconnaissance Office," 15 September 1992.
10. (U//~~FOUO~~) Data Communications Group Security Classification Guide, Version 1.0, 26 September 1997 (S//BYE/TK).

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11. (U) NRO Launch Information Protection Guide (NRO Launch IPG), 20 June 2004.
12. (U) R. Cargill Hall, *A History of the Military Polar Orbiting Meteorological Satellite Program*. NRO Office of the Historian, September 2001.
13. (U) OS/Security Policy (b)(3), (b)(6) E-mail to (b)(3), (b)(6) (b)(3), (b)(6) IARC, subject: "Re: Response to Appeals Panel MFR," 5 June 1997.
14. ~~(S//TK)~~ Eastman Kodak (b)(3), (b)(6) E-mail to NRO Security Policy (b)(3), (b)(6), Subject: " (b)(3), (b)(6) Declassification," 11 August 1997 indicating " . . . Kodak is now ready to openly acknowledge its involvement as the processor of this (CORONA & (b)(3), (b)(6) [KH-7]) film at its Hawkeye facility."
15. (U) NRO Response to Mandatory Declassification Review, Case Number E93-0006.
16. (U) NRO Response to Mandatory Declassification Review, Case Number E94-0007.
17. (U) NRO Response to Mandatory Declassification Review, Case Number E95-0002.
18. (U) NRO Response to Mandatory Declassification Review, Case Number E95-0014.
19. (U) NRO Response to Mandatory Declassification Review, Case Number E96-0005.
20. (U) NRO Response to Mandatory Declassification Review, Case Number E96-0032.
21. (U) NRO Response to Freedom of Information Act Request, Case Number F94-0036.
22. (U) NRO Response to Freedom of Information Act Request, Case Number F94-0077.
23. (U) DNRO memorandum, dated 6 December 1997 announcing declassification of the NRO association with the Secretary of the Air Force, Office of Special Projects (SAF/SP).

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24. (U) Pedlow, Gregory W. and Welzenbach, Donald E. *The CIA and the U-2 Program, 1952 -1974*, Declassified and Released in September 1998 by the CIA Center for the Study of Intelligence.
25. (U) NSA Briefing to the External Referral Working Group of the Intelligence Community's Declassification Program Managers' Council, November 1998.
26. (U) IMG/IDRC Discussion with Col Fred Riccardi, DD Office of Security, 15 October 1998.
27. (U) DAFF is the satellite imagery product code word associated with the ARGON mapping camera. This system was declassified totally as part of the CORONA, ARGON, LANYARD Systematic Declassification Review that was completed in November 1997.
28. (U) These associations are recommended for consideration as a logical elaboration of the general declassification of SAF/SP found at citation 23.
29. (U) The IMINT SCG (citation 2) lists as an unclassified fact that RMS supports tasking of IMINT programs without reference to specific program names or national system mission numbers. If the current fact is unclassified, logic suggests the predecessor system would likewise be unclassified. The 25-year-old records may contain documentation addressing development of CAMS.
30. (U) The *NRO Launch IPG* (previous citation 11) acknowledges NRO payloads are, or will be, carried by "any viable launch system," and mentions the Atlas, Delta, Pegasus, Taurus, STS, and Titan as examples. Thus, this IE appears to be an appropriate retroactive corollary to current policy. If we can acknowledge launch systems for current and future classified NRO payloads, logic suggests we can likewise release launch vehicles used through 1976 with acceptable risk, even though they carried payloads that were and remain classified today.
31. (U) The fact of and general information about the GRAB/DYNO Navy/NSA ELINT/SIGINT collection satellite project were declassified by the DCI and announced publicly by the DNRO at NRL ceremonies on 17 June 1998.
32. (U) NRO Response to Mandatory Declassification Review, Case Number E98-0004 notes the Air Force's successful emulation of

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the CIA for secure handling of "black" covert contracting facilities.

33. (U) NRO Response to Mandatory Declassification Review, Case Number E98-0010.

34. (U) NRO Response to Freedom of Information Act Request, Case Number F98-0040. The NRO-released version of this history of the NRO involvement with the Defense Meteorological Satellite Program contained one inadvertent disclosure of the P-35 designator. However, the classification of the designators no longer appears necessary.

35. (U) NRO Response to Freedom of Information Act Request, Case Number F94-0062.

36. (U) All DDNROs and former Directors of Programs A, B, and C were publicly acknowledged at recognition ceremonies hosted by the DNRO in October 1998 and October 1999, respectively.

37. (U) There were five GRAB launch attempts before the project was formally absorbed by the NRO under Program C. The first and third launches successfully orbited payloads. The fifth launch was the only one from the Western Test Range and the only launch using the Scout booster.

38. (U) OC input during Phase I coordination, 16 April 1999.

39. (U) NRO Response to Mandatory Declassification Review Request, Case Number E95-0001.

40. (U) From a paragraph portion-marked UNCLASSIFIED in *U.S. Navy/NRO Program C Electronic Intelligence Satellites (1958-1977)*. Published by the LEO Systems Program Office, 3 September 1998 (S//TK).

41. ~~(S//NF)~~ Based on understanding of current policy regarding classification status of NRO association with MASINT mission area, as reinforced by the NRO response to FOIA case # F97-0040. This case featured a released transcript of DNRO remarks during an on-the-record press interview containing the statement, "Central MASINT Office of the Defense Intelligence Agency is a (NRO) Mission Partner." Other NRO "Mission Partners" noted in the transcript of DNRO comments included NGA, NSA, and the all source analysis centers at CIA and DIA.

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42. (U) DOD Office of Public Affairs Fact Sheet, SAMOS 3 Launch, 9 September 1961.
43. (U) OGC (Page Moffett) E-mail to MSO/IARC (b)(3), (b)(6) (b)(3), (b)(6) (28 February 1999) and consensus reached at 9 March 1999 working level review of RRG.
44. (U) OGC (Page Moffett) E-mail to MSO/IDRC (b)(3), (b)(6) 19 April 1999 during Phase I coordination.
45. (U) 28 June 1999 E-mail response from EK security officer (b)(3), (b)(6) to query by Cargill Hall (NRO Historian).
46. (U) MEMCON, (b)(3), (b)(6) (NRO/IDRC) with (b)(3), (b)(6) (CIA/ADD) in response to query regarding MDR DE99-0005).
47. (U) Released in the declassified CIA history of the U-2 distributed in conjunction with the September 1998 symposium sponsored by CIA's Center for the Study of Intelligence.
48. (U) 3 August 1999, E-mail from (b)(3), (b)(6) EK Security Officer.
49. (U) OS/Security Policy E-mail to MSO/IDRC (b)(3), (b)(6) Subj: RE Code Word RAINCOAT, 5 August 1999.
50. (U) ASTD E-mail, 2 September 1999 (sender (b)(3), (b)(6) on behalf of (b)(3), (b)(6) ASTD Director of Security) to MSO/IDRC (b)(3), (b)(6), Subj: "RE Request for Concurrence to 'Covert Satellite' Guidance."
51. (U) OS/Security Policy E-mail to MSO/IDRC (b)(3), (b)(6), Subject: "RE: Request for Policy Decision 23 Sept 99", 24 September 1999.
52. (U) IMINT Security E-mail to MSO/IDRC (b)(3), (b)(6), subject: "RE: RRG Guidance Statement on Resolution", 7 October 1999.
53. (U//~~FOUO~~) NRO Security Classification Guide 6.0, 21 May 2005, at p. 13, Classification Table 1.17.3.
54. (U) SIGINT COMMITTEE Message 121846Z Oct 99, indicating the Signals Intelligence Security Regulation approved by the DCI in May 1999 declassified the code word ZARF and mandated that it no longer be used. Information formerly classified as ZARF will now be classified TALENT KEYHOLE.

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55. (U) Determined by still-classified NRO information in documents found responsive to FOIA cases F93-0038 and F94-0011 and as coordinated with Office of Security and Directorate of Management Services and Operations (LSG and PSG).

56. (U) The National Reconnaissance Program Physical Security Policy Directive No. 4 and NRP Security Policy Directive No. 1 released July 1999 in response to FOIA case number F98-0046 and as modified per OS/Security Policy Decision Memo dated 19 January 2000 and received by IDRC on 1 March 2000.

57. (U) OS/Security Policy E-mail to IDRC (b)(3), (b)(6), Subject: "RE Interim SAF/SS Guidance for Redactors," 3 February 2000; OS Kenneth Renshaw, Memorandum for Director, National Reconnaissance Office, Subject: "Declassification of Secretary of the Air Force Office of Space Systems and Office of Missile and Satellite Systems, NRO Relationship," 15 May 2001 (DNRO approved, 21 May 2001).

58. (U) GC E-mail (b)(3), (b)(6) to MSO/IDRC (b)(3), (b)(6), 28 January 2000, Subject: "RE Legal Cites for Exempting Proprietary Information From Automatic Declassification."

59. (U) OS/Security Policy E-mail to MSO/IDRC (b)(3), (b)(6), 17 February 2000, Subject: "RE Autometric Paper."

60. (U) MS&O/PSG (b)(3), (b)(6) E-mail to MSO/IDRC (b)(3), (b)(6), 6 October 1999, Subject: "Guidance For Former AF Officers Assigned to CIA."

61. (U) OS/Security Policy E-mail to MSO/IDRC (b)(3), (b)(6), 31 July 2000, SUBJECT: "Impact of Declassification of the Helms Paper."

62. (U) OS/Security Policy E-mail to MSO/IDRC (b)(3), (b)(6), 24 August 2000, SUBJECT: "FW: Final Citations" forwarding an OP (b)(3), (b)(6) E-mail of 24 August containing the final, coordinated unclassified citations for the designated NRO Pioneers to be recognized in conjunction with the NRO 40<sup>th</sup> Anniversary celebration.

63. (U) OS/Security Policy E-mail to MSO/IDRC (b)(3), (b)(6), 3 October 2000, SUBJECT: "TRW Association with SAMOS."

64. (U) NRO Response to appeal to FOIA case F97-0028.

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65. (U) OS/Security Policy (b)(3), (b)(6) E-Mail to IDRC (b)(3), (b)(6), Subject: "Final Coordination: SENTRY/SAMOS Changes to RRG," 26 March 2001, with concurrences by OS, OP, OC, IMINT, and SIGINT to IDRC E-mail (b)(3), (b)(6) of 1 March 2001 titled, "Coordination on FOIA Case F01-0035 and Proposed SAMOS Declassification Guidance Changes."

66. (U) OS/Security Policy (b)(3), (b)(6) E-mail to MSO/IDRC (b)(3), (b)(6), Subject: "Release of SAMOS/E-6 Information," 21 July 1999; see also footnote 65, above.

67. (U) OSL E-mail to MSO/IDRC (b)(3), (b)(6), SUBJECT: "FOLLOW UP-Final coordination: SENTRY/SAMOS Changes to RR," 26 March 2001.

68. (U) OS/Security Policy E-mail to MSO/IDRC (b)(3), (b)(6) dated 27 June 2001 at 12:33 PM. No subject was provided, but the E-mail contained as an attachment a paper titled, Declassified NRO Information. The OS E-mail indicated that information in this paper, intended as general guidance for SAF/SP and SAF/SS alumni, could be released to the public.

69. (U) Release of Perry History, Vol IIA - SAMOS In Response to FOIA Request, F98-0092.

70. (U) OS/Security Policy concurrence dated 6/27/01 on an IDRC Coordination Sheet associated with staffing of Mandatory Declassification Review Case E01-0011. This coordination sheet requested OS concurrence on the release of names of specific individuals from the NRO Historian's reprint of the Perry History, Vol V.

71. (U) Release of Perry History, Vol IV, FOIA Case F99-0065 (Appeal).

72. (U) OC E-mail to MSO/IDRC (b)(3), (b)(6), Subject: "FOIA REQUEST, CASE # FO1-0374," 16 July 01.

73. (U) OS/Security Policy E-mail to MSO/IDRC (b)(3), (b)(6) Subject: "FW: Buzard Memoir", 17 July 2001.

74. (U) OS/Security Policy E-mail to IDRC (b)(3), (b)(6) SUBJECT: "Policy Guidance Concerning Release of SAF/SP Information", 29 August 2001.

75. (U) OS/Security Policy E-mail, SUBJECT: "FW: Land Abstract", 23 August 2001.

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76. (U) NRO Response to FOIA Case F98-0033 (ITEK FOIA Case). Frank Lindsey was released as ITEK CEO in the mid 1960s time frame.
77. (U) DOD TS-5105.21-M-2, Chapter 10, Section E, paragraph 1. Indicates the designator DELTA by itself is unclassified.
78. (U) OP/CSNR E-mail, SUBJECT: "Decision on Declassification: 'Fact of' NRO Use of the Shuttle", 7 September 2001 announcing the DNRO decision.
79. (U) DNRO Notice 2010-56 and verification by OP via E-mail on 7 September 2001 that FOUO caveat on DNRO notice does not preclude automatic release to the public.
80. (U) IMINT Security E-mail (b)(3), (b)(6), SUBJ: "Coordination Suspense for FOIA Review, Case Number F02-0001", 12 December 2001.
81. (U) Coordinated position of Office of Contracts in response to release of Perry History, Volume I in conjunction with Mandatory Declassification Review request E01-0001, 7 Nov 2001.
82. (U) Per (b)(3), (b)(6) (Security Policy E-mail 24 October 2001) in conjunction with Security Review staffing for NRO Pioneer Memoir of Gary Geyer (Case Number S01-0471).
83. (S) Per (b)(3), (b)(6) (Security Policy E-mail 15 January 2002, SUBJ: "Coordination for Security Review Case S02-0047") and "silent assent" agreement by SIGINT Security (E-mail 14 January 2002, SUBJ: "RE: Coordination for Security Review Case S02-0047").
84. (S//TK) Per IMINT Security 31 January 2002 E-mail (b)(3), (b)(6) during coordination of declassification mark up of Perry History volume IIB under mandatory declassification review case E01-0001.
85. (TS//TK) IMINT Program Classification Guide, Version 4.0, 6 May 2005, p. 58.
86. (S//TK) Office of Contracts E-mail (b)(3), (b)(6), Subject: REVIEW AND REDACTION GUIDE REVISIONS, 5 March 2002.

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87. (U) NRO Office of Policy/CSNR E-mail [REDACTED] indicating CIA DS&T Information Review Officer permission to release this name, 7 March 2002.

88. (U) White House Memorandum signed by Andrew H. Card Jr., Assistant to the President and Chief of Staff, SUBJECT: "Action to Safeguard Information Regarding Weapons of Mass Destruction and Other Sensitive Documents Related to Homeland Security", March 19, 2002.

89. (U) OP/CSNR Coordination sheet approval by NRO Chief of Staff 31 May 02, Subject: "Declassification of NRO/Stanford Electronic Laboratory Association."

90. (U) OS/Security Policy E-mail 26 March 2002 stating the names of government and contractor personnel mentioned in the Pioneer Memoirs can be released at the unclassified level.

91. (U) DCI decision to declassify all imagery from the KH-7 and KH-9 mapping camera systems, and as implemented at a NGA Historical Imagery Declassification (HID) conference on 20 September 2002. OS E-mail, dated 24 Sept 02 concurring with the incorporation of the "facts about" the systems as released at the HID conference.

92. ~~(S//TK)~~ OS/Security Policy E-mail [REDACTED] dated 22 October 2002 containing guidance on IMINT-related MGS locations.

93. (U) Security Review Case Number S02-0155 treated and coordinated by the IDRC. The Glossary entry for Program C identifying the NRL and NSG as Program C components also was subsequently incorporated in the book, Beyond Expectations-Building an American National Reconnaissance Capability: Recollections of the Pioneers and Founders of National Reconnaissance. This book was published by the The American Society for Photogrammetry and Remote Sensing on behalf of the NRO after it underwent an NRO Security Review (Case Number S03-0011).

94. (U) OS/Security Policy E-mail dated 26 March 2002 stating the names of government and contractor personnel mentioned in the NRO Pioneer memoirs can be released at the unclassified level. The pioneer memoirs were finally approved for publication under the title, Beyond Expectations-Building an American National Reconnaissance Capability: Recollections of the Pioneers and Founders of National Reconnaissance.

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95. (U) Director's Note Number 2002-17, 16 August 2002 NATIONAL RECONNAISSANCE PIONEER RECOGNITION PROGRAM HONOREES FOR 2002.

96. ~~(S//TK)~~ Office of Space Launch E-mail [REDACTED],  
SUBJECT: "RE: Declassified AFP Numbers", 20 December 2002.

97. (U) NRO Launch Information Protection Guide (IPG), 20 July 1999.

98. (U) The NRO Staff concurred with public release of this information via the Center for Study of National Reconnaissance Bulletin during coordination for this publication under Security Review case S03-0127.

99. ~~(S)~~ Documents classified SECRET/Collateral processed under [REDACTED] for the [REDACTED]. The time frame associated with these documents was in the early to late 1960s. However, none of the documents [REDACTED] (unlike other members of the intelligence community).

100. (U) OS Security Policy decision that BYEMAN security barcodes are not sensitive because the software to read them no longer exists. This decision was taken as part of the NRO response to a requester's appeal to the Interagency Security Classification Appeals Panel of NRO treatment of his mandatory declassification review request for Volume I of the Perry History (case number E01-0001). Effective March 2003.

101. (U) Based on documents declassified and released to the public by the NRO in conjunction with the CORONA, ARGON, LANYARD (CAL) systematic declassification review in November 1997. Applicable document file numbers in the NRO Reading Room are: 1/B/0029, 1/C/0068, and 2/C/0053. Also as verbally coordinated between IMINT Security [REDACTED] and IDRC [REDACTED] on 15 May 2003.

102. (U) Director's Note Number 2003-33, 5 September 2003 verifying selection of the 2003 NRO Pioneers.

103. (U) Incorporated from the NRO CORONA, ARGON, LANYARD (CAL) Declassification Guide.

104. ~~(S)~~ Office of Security E-Mail to IARC/DD [REDACTED],  
Subject: "Release of Samos E-6 Nomenclature 698BJ [REDACTED]" 13 March 2003.

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105. (U) Information Access and Review Center (Linda Hathaway) E-mail to IDRC (b)(3) (b)(6)

(b)(3) (b)(6) regarding Department of Justice instructions), Subject: "Signature Redactions," 2 November 1999.

106. ~~(S)~~ SIGINT Security (b)(3) (b)(6) E-mail to IARC/DD

(b)(3) (b)(6) Subject: "Request for Coordination, MDR E04-0003," 21 November 2003.

107. ~~(S//TK)~~ Office of Security E-Mail to IARC/DD (Cargill Hall), Subject: "RRG Terms and Code Words," 9 January 2004.

108. (U) Report of the National Commission for the Review of the National Reconnaissance Office: NRO at the Crossroads, 1 November 2000, publicly acknowledged NRO use of the Space Shuttle in the 1980s at page 66.

109. ~~(S)~~ IMINT Security (b)(3) (b)(6) E-mail to IARC/DD

(b)(3) (b)(6) and Cargill Hall), Subject: "CIA Referral Document NRO-76-02," 1 March 2004.

110. (U) Memo to SMC/AX/HO/MT from SCM/CC (Maj. Gen. Eugene Tattini), Subject: "Declassification of Missile Detection Alarm System (MIDAS) Program Classified National Security Information," 30 November 1998.

111. ~~(S)~~ IMINT Security (b)(3) (b)(6) E-mail to IARC/DD

(b)(3) (b)(6), Subject: "Request for Guidance," 30 March 2004; and COMM Security (b)(3) (b)(6) E-mail to IARC/DD

(b)(3) (b)(6), Subject "Request for Guidance," 2 April 2004.

112. (U) The DCI declassified the fact of and limited information about the POPPY ELINT reconnaissance satellite project on 11 May 2004; also NRL/SOO Security (b)(3) (b)(6) E-mail to Chief/IMSC (b)(3) (b)(6), Subject: "Appendix G - NRO Review and Redaction Guide," 15 August 2005.

113. ~~(S)~~ MS&O (b)(3) (b)(6) E-mail to MSO-global, Subject: "What's Happening in MS&O/Changes to the NRO Declassification Guide," 22 June 2004.

114. (U) Mandatory Declassification Review (E03-0003) of 3 April 2000 released the Agreement for Reorganization of the National Reconnaissance Program, dated 11 August 1965, with only two redactions in Appendix A.

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115. (U) Freedom of Information Act Case No. F94-0062, 11 October 1994; also, IDRC [REDACTED], E-mail to IDRC (Ken [REDACTED]), Subject: "Redaction Action re 303 Committee," 31 March 2000.

116. ~~(S)~~ OS/SP [REDACTED] E-mail to IMSC/IART (Cargill Hall), Subject: "NRO RRG," 13 July 2004.

117. ~~(S//TK)~~ SIGINT Security [REDACTED] E-mail to IMSC/IART (Cargill Hall), Subject: "SIGINT Declassification Issue - Emitter Location, Non Operation System," 29 July 2004.

118. ~~(S)~~ IMINT Security [REDACTED] E-mail to IMSC/IART (Cargill Hall), Subject: "Proposed Wording of Hiller Helicopter Declassification Elements," 15 September 2004; and (S) Office of Security/OP [REDACTED] to IMSC/IART (Cargill Hall), Subject: "Proposed Wording of Hiller Helicopter Declassification Elements," 21 September 2004.

119. ~~(S//TK//X1)~~ COMM Security [REDACTED] E-mail to IMSC/IART [REDACTED], Subject: [REDACTED] " 10 September 2004.

120. ~~(S)~~ SIGINT Security [REDACTED] E-mail to IMSC/IART [REDACTED], Subject: "Samos Classification Question," 6 October 2004.

121. (U//~~FOUO~~) IART Declassification [REDACTED] E-mail to IMSC/IART (Cargill Hall), Subject: "Signature Redaction," 13 October 2004.

122. (U) Table 4.1, "Lasercom Links," in NRO Security Classification Guide, *Transformational Communications Architecture*, 6 January 2004, p. 18

123. ~~(S//TK)~~ IMINT Security [REDACTED], E-mail to IMSC/IART [REDACTED], Subject: "New Query," 5 November 2004.

124. ~~(S//TK)~~ IMINT Security [REDACTED], E-mail to IMSC/IART [REDACTED], Subject: "RRG Question for IMINT," 3 November 2004.

125. ~~(S//TK)~~ COMM Security [REDACTED], E-mail to IMSC/IART (Cargill Hall, Subject, "Backup Relay Satellite Operations Center," 14 December 2004.

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126. ~~(S//TK)~~ IMINT Security (b)(3), (b)(6), E-mail to IMSC/IART (b)(3), (b)(6), Subject: "RRG Question," 2 December 2004.

127. (U) IART (b)(3), (b)(6), E-mail to distribution, Subject: "Fact of SDS," 23 December 2004.

128. ~~(S//TK)~~ Memo for the DCI, Via the Assistant Director of Central Intelligence for Collection, Subject: "Declassification Proposal for the POPPY Electronic Intelligence Reconnaissance Satellite Program (1962-1977)," approved and signed by George Tenet on 11 May 2004.

129. (U//~~FOUO~~) SIGINT Security (b)(3), (b)(6), E-mail to IMSC/IART (Cargill Hall), Subject: "Unclassified SIGINT Information," 23 February 2005.

130. ~~(S)~~ Announcement Manager, E-mail to W31-all, Subject: "Update on BYEMAN Retirement," 6 May 2005.

131. ~~(S//TK)~~ MSO/Field Services Center (b)(3), (b)(6), E-mail to IMSC/IART (Cargill Hall), Subject: "Classification of (b)(1)" 16 June 2005.

132. ~~(TS//TK)~~ IMINT Security (b)(3), (b)(6), E-mail to IMSC/IART (Cargill Hall), Subject: "RRG Changes to Respond to ISCAP," 15 June 2005.

133. ~~(S//TK)~~ IMINT Security (b)(3), (b)(6), E-mail to IMSC/IART (Cargill Hall), Subject: "Multispectral Imaging," 22 July 2005.

134. ~~(S//TK)~~ IMINT Security (b)(3), (b)(6), E-mail to IMSC/IART (Cargill Hall), Subject: "IMINT Facility Classification Issue," 26 July 2005.

135. (U) IMSC/IART (Linda Hathaway), E-mail to IMSC/IART (Cargill Hall), Subject: "Redaction of NRO Signatures," 22 August 2005.

136. (U//~~FOUO~~) OGC (Page Moffett), E-mail to IMSC/IART (Cargill Hall), Subject: "Question of Current Authorities," 22 August 2005; NSPD-49, *National Space Policy*, Sections V and XIII, 31 August 2006.

137. ~~(S//TK)~~ SIGINT Security (b)(3), (b)(6), E-mail to IMSC/IART (Cargill Hall), Subject: "Public Announcement of Robert E. Eisenhower," 7 September 2005.

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138. (U/~~FOUO~~) Office of Security Policy (b)(3), (b)(6), E-mail to IMSC/IART (Cargill Hall) Subject: "Release of WS-117L Program Identifiers," 15 November 2005.
139. (U) NRO Classification Guide, Version 6.0, 21 May 2005, "General Facts," sections 1.23 and 1.4.
140. (~~TS//TK//RSEN, NOFORN//25X1~~) IMINT Program Classification Guide, Version 4.0, 6 May 2005, sections 4.0.3.11 capabilities and limitations, and 5.0.3 Tasking, and 5.0.4 Collection Details.
141. (U/~~FOUO~~) Office of Security Policy (b)(3), (b)(6), E-mail to IMSC/IART (Cargill Hall), Subject: "Policy on Redacting Names," 7 February 2006.
142. (~~TS//TK~~) SIGINT Security (b)(3), (b)(6), E-mail to IMSC/IART (Cargill Hall), Subject: "Classification Guidance," 14 February 2006.
143. (U) SIGINT Security (b)(3), (b)(6), E-mail to IMSC/IART (Cargill Hall), Subject: "Security Question," 27 February 2006.
144. (U/~~FOUO~~) IMINT Security (b)(3), (b)(6), E-mail to IMSC/IART (Cargill Hall), Subject: "Review of FOIA Case E06-0005," 7 April 2006; and (U/~~FOUO~~) Cover and Liaison Center (b)(3), (b)(6), E-mail to IMSC/IART (Cargill Hall), Review of FOIA Case," 7 April 2006.
145. (~~TS~~) Memorandum for Director, National Reconnaissance Office, Subject: (U) "Declassification of Secretary of the Air Force, Office of Space Systems and Office of Missile and Satellite Systems, National Reconnaissance Office Relationship," from Kenneth W. Renshaw, Director of Security, 15 May 2001.
146. (U) Memorandum for SAFSS Alumni/Alumnae, from Keith R. Hall, Assistant Secretary of the Air Force (Space), Subject: "SAFSS Declassification," n.d.
147. (U) NRO SIGINT Program Classification Guide, 24 May 2005.
148. (U/~~FOUO~~) Office of Security Policy (b)(3), (b)(6), E-mail to IART (Linda Hathaway), Subject: "Current Name Policy," 20 September 2006.

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149. ~~(S//TK)~~ SIGINT Security ~~(b)(3), (b)(6)~~, E-mail to IART ~~(b)(3), (b)(6)~~, Subject: "Old SIGINT Goals," 8 February 2007; and NRO Classification Guide, Version 6.0, 21 May 2005, item 1.28.
150. (U) Contents of this section generated by Mandatory Declassification Review (MDR) requests E06-0012, E07-0006, and -0008, -0011, -0012, -0013, -0014, -0018, -0019, -0029, and Freedom of Information Act (FOIA) request F07-0054.
151. (U) Contents of this section submitted to and approved by the National Security Council Declassification Office; NSC ~~(b)(3), (b)(6)~~ E-mail to IART ~~(b)(3), (b)(6)~~, Subject: "NSAM 156," 9 March 2007.
152. (U) Office of Security Policy ~~(b)(3), (b)(6)~~, E-mail to SIGINT Security ~~(b)(3), (b)(6)~~, and IART (Cargill Hall), Subject: "Fact of Multiple Poppy Satellites," 12 March 2007.
153. (U) Contents of this section generated by CIA records declassification review, including the Remote Archive Capture (RAC) program, and resultant public release of some 30 related records at NARA via CREST. Also, NRO Mandatory Declassification Review (MDR) request E07-0017.
154. (U//~~FOUO~~) *IMINT Program Classification Guide, Version 4.0, 6 May 2005, sections 3.1.1.23, 3.1.1.25, 4.0.2.14, and 4.0.5.31.*
155. (U//~~FOUO~~) *IMINT Program Classification Guide, Version 4.2, 11 September 2008, section 3.0.2.3 at p. 26.*
156. (U//~~FOUO~~) *SIGINT Program Classification Guide, 24 May 2005, section 1.0 at p. 35.*
157. (U//~~FOUO~~) *IMINT Program Classification Guide, Version 4.0, 6 May 2005, section 4.1.2.7 at page 43.*
158. (U) *NIMA Historical Imagery Declassification Conference, 20 September 2002, NIMA (now NGA) Handout Sheet, "Frequently Asked Questions," answer to question 24 provided the block missions numbers for the KH-7 and KH-9 satellite systems.*
159. ~~(TS//TK//NOFORN)~~ Office of Strategic Communications Weekly Report, 18-22 February 2008, p. 1.
160. (U) Curtis Peebles, "The Manned Orbiting Laboratory" in *High Frontier: The United States Air Force and the Military Space Program*, (Washington, D.C.: Air Force History and Museums

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Program, cleared for public release in 1997 during the AF 50<sup>th</sup> Anniversary).

161. ~~(S//REL to FVEY)~~ Memo, DNRO Scott Large to Distribution, "Declassification of the 'Fact of' National Reconnaissance Office Radar Satellite Reconnaissance," 29 May 2008.

162. (U) NRO MGS Declassification Guide, 15 October 2008.

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**(U) Appendix E - WS-117L: SENTRY/SAMOS**  
**(Effective 3/27/01)**

**(U)** WS-117L served as the umbrella R&D program for Air Force reconnaissance satellites in the 1950s. It eventually included three main components: MIDAS (a space-based infrared sensor system capable of detecting ballistic missile launches on land and at sea, currently known as DSP/SBIRS), SENTRY (later SAMOS, divided between visual "E" series and electronic intelligence "F" series reconnaissance systems, see below,), and DISCOVERER (CORONA, see Appendix F). **The Air Force declassified the MIDAS R&D Program (1956-1968) in its entirety in 1998.**<sup>110</sup>

**Redact:**

1. ~~(S)~~ Any information indicating or implying (b)(1), 1.4c, (b)(3)  
(b)(1), 1.4c, (b)(3)
2. ~~(S//TK)~~ Any information indicating or implying (b)(1), 1.4c, (b)(3)  
(b)(1), 1.4c, (b)(3)
3. ~~(S)~~ Mission number series (except for Project 102 fact of), mission, and detailed technical capabilities of the SAMOS F-1/F-2/F-3/F-4 ELINT payload variants (b)(1), 1.4c, (b)(3)  
(b)(1), 1.4c, (b)(3)
4. (U) All funding information after 1 July 1960 (Fiscal Year 1961).

**Release:**

1. ~~(S)~~ All information regarding the SAMOS imaging payload variants (E-1, E-2, E-3, E-4, E-5, and E-6).<sup>65</sup> Included is the project nomenclature for the E-5 [698A(X)] and the E-6 (201, 698BJ, 722) payloads (b)(1), 1.4c, (b)(3)  
(b)(1), 1.4c, (b)(3)  
(b)(1), 1.4c, (b)(3) (Effective 5/1/03)
2. (U) Subject to redaction guidance above, general information regarding the technical capabilities of the F-1 through F-4 "ferret" ELINT payloads, to include:

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- a. The F-1 and F-2 payload variants were intended to collect against radar emissions in the region of the electromagnetic spectrum between 50 and 40,000 megacycles per second. The objective of this collection would be to gather information describing the signal parameters and location of previously unknown emitters.<sup>13, 19, 26</sup>
  - b. The F-2/F-2A was capable of collecting against two frequency bands; however, the bands can not be identified.<sup>106</sup>
  - c. The F-3 possessed analog signal recording with a bandwidth up to 6 mc, used receivers with stop-scan capability and controllable antennas, and a programmer that permitted satellite search of a given area or frequency range.<sup>106</sup>
  - d. Airborne Instruments Laboratory (AIL) performed studies and development work on all of these ferret payloads.
  - e. The WS-117L/SAMOS ELINT payloads would store, filter, and process information. At the proper time, the stored information would be transmitted to the earth.<sup>13, 19, 26</sup>
  - f. The estimated accuracy in geolocating emitters on earth was set at 50-100 miles for the F-1 and F-2 ELINT payloads.<sup>117</sup> (Effective 7/29/04)
  - g. Fact that future planned Ferret ELINT receivers should incorporate a direction finding capability that would geolocate emitters on earth within a five mile CEP.<sup>149</sup> (Effective 2/8/2007)
  - h. The fact that a COMINT collection capability was planned for a future SAMOS F- payload.<sup>120</sup> (**Note:** Any discussion of targets, collection strategy, or actual performance remains classified.) (Effective 10/07/04)
3. (U) Names of all Air Force and contractor personnel involved in the WS-117L SENTRY/SAMOS program before 1 September 1960.<sup>65</sup> Signatures will be lined-through. Names appearing after that date will be handled in accordance with Section 9 of this guide.
4. (U) All of the WS-117L contractors, as long as disclosure does not betray redaction guidance above. The prime contractor: Lockheed Missiles and Space Division (later, Lockheed Missiles

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and Space Company); supporting contractors System Development Corporation (SDC) and Aerospace Corporation; and associate and subcontractors that included the following as of July 1958:<sup>65</sup>

- a. (U) Agena Propulsion
  - (1) Bell Aircraft Corporation
  - (2) Aerojet-General Corporation
  
- b. (U) Agena Auxiliary Power
  - (1) The Martin Company
  - (2) Atomics International
  - (3) Sonotone Corporation
  - (4) Eagle-Picher Company
  - (5) Engineered Magnetics
  - (6) Hoffman Electronics Corporation
  - (7) Beechcraft R&D Incorporated
  
- c. (U) Boosters
  - (1) Douglas Aircraft Corporation (SM-75 Thor)
  - (2) Convair Astronautics (SM-65 Atlas)
  
- d. (U) Guidance and Control (booster and Agena upper stage)
  - (1) Instrumentation Laboratory, MIT
  - (2) General Electric Company
  - (3) Detroit Controls Corporation
  - (4) Minneapolis-Honeywell Regulator Company
  - (5) Bendix Aviation Corporation
  
- e. (U) Visual "E" Reconnaissance Payloads
  - (1) Eastman Kodak Company (Prime Subcontractor)
  - (2) Columbia Broadcasting System Laboratories
  - (3) Spica Incorporated
  - (4) Ampex Corporation
  - (5) Fairchild C&I
  - (6) Photogram Incorporated
  - (7) Richardson Camera
  - (8) Taylor Instruments
  - (9) Thompson Products
  - (10) Westrex
  - (11) Aero Service
  - (12) Bell Aircraft
  - (13) Brooks & Perkins

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- (14) Coleman Engineering
- (15) Dynametric
- (16) Houston Fearless
  
- f. (U) Ferret Electronic Intelligence (ELINT) Payloads
  - (1) Airborne Instruments Laboratory, Incorporated
  - (2) Haller, Raymond, and Brown (HRB) Incorporated
  
- g. (U) Infrared Reconnaissance (Missile Early Warning) Payloads
  - (1) Eastman Kodak Company
  - (2) Baird Atomic Company
  - (3) Aerojet-General Corporation
  - (4) General Mills Incorporated
  
- h. (U) Ground-to-Space Communications
  - (1) Philco Corporation
  - (2) Reeves Instrument Corporation
  - (3) Radiation Incorporated
  - (4) Lockheed Aircraft Services Incorporated
  - (5) Hughes Aircraft Corporation
  - (6) Texas Instrument Corporation
  
- i. (U) Test Management & Operations
  - (1) Aerojet-General Corporation
  - (2) Ralph M. Parsons Company
  
- j. (U) Ground Support Equipment
  - (1) Otis Elevator Company
  - (2) Consolidated Avionics Corporation
  - (3) BEMCO, Incorporated
  - (4) Standard Manufacturing Company
  - (5) Hufford Corporation
  
- k. (U) Ground Data Processing
  - (1) Ramo-Wooldridge Corporation
  
- l. (U) E-5/E-6 (and DISCOVERER/CORONA) Reentry Capsule
  - (1) General Electric Company
  - (2) All American Engineering Company

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(3) Cook Research and Development Company

5. (U) All of the WS-117L R&D Program Identifiers contained in Lockheed's statement of work, issued shortly before the various components received formal names (i.e. SENTRY, MIDAS, DISCOVERER) in August/September 1958.<sup>138</sup>

- a. Program I, Prototype Development of the SM 65 (Atlas) booster
- b. Program II, Pioneer Visual Reconnaissance - SM 65
- c. Program IIA, Prototype development biomedical recovery - SM 75 (Thor) booster
- d. Program III, Pioneer Ferret Reconnaissance - SM 65
- e. Program IV, Advanced Visual Reconnaissance - SM 65
- f. Program V, Advanced Ferret Reconnaissance - SM 65
- g. Program VI, Visual Surveillance - SM 65
- h. Program VII, Infrared Early Warning - SM 65
- i. Program VIII, Ferret Surveillance - SM 65

6. (U) All Air Force Program (AFP) numbers for the following SAMOS visual systems:

- 101B (related to the E-5 payload that evolved into the LANYARD imaging satellite)
- 201 (related to the E-6 film return imaging payload)
- 315A (related to the revamped E-6 imaging payload)
- 722 (related to the E-6 film return imaging payload)

7. (U) All SENTRY/SAMOS funding data prior to 1 July 1960 (Fiscal Year 1961), to include contract numbers for contracts let prior to that date.<sup>65, 72</sup> **Note:** Funding identified with CORONA (which stood up under that name in March-April 1958), will be redacted. Funding identified with DISCOVERER (CORONA's cover project) found in Air Force (but not Program A) records embraced other items such as the care and feeding of chimpanzees, was presented to Congress for approval, appears in congressional documents, and may be released.

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8. (U) Organizational elements within SAF/SP, SAF/MSS and SAF/SS involved with the SAMOS program.<sup>66</sup>

9. ~~(S)~~ Launch information, except for that information dealing

(b)(1)1.4c. (D)(3)

10. (U) General information concerning the use of Atlas launch vehicles for the E-1/F-1 and E-2 imaging payloads, or plans to use a specific launch vehicle for the imaging payloads that did not fly.<sup>67</sup>

11. (U) Information in a fact of connotation concerning use of the Thor launch vehicle for F-2/F-3 SIGINT variants, again without association to launch or payload details.<sup>67</sup>

12. (U) Fact that the following remote tracking stations (RTS) supported DISCOVERER (CORONA) and/or SENTRY/SAMOS reconnaissance programs.<sup>19</sup>

- a. Annette Island, Alaska
- b. Fort Greeley (aka Donnelly Flats), Alaska
- c. Fort Stevens, Oregon
- d. Kaena Point, Hawaii
- e. Kodiak (aka Chiniak), Alaska
- f. New Boston, New Hampshire
- g. Ottumwa, Iowa
- h. Palo Alto, California
- i. Point Mugu, California
- j. Vandenberg AFB, California
- k. Christmas Island
- l. Guam

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**(U) Appendix F - CORONA, ARGON, and LANYARD**

**Note (Effective 10/13/03):**

1. (U) Information in this appendix has been incorporated from the CORONA, ARGON, and LANYARD (CAL) Declassification Guide and more recent instruction. The DNRO approved the CAL Guide in May 1996 as part of a systematic declassification review (SDR). That SDR was completed in November 1997.

2. (U) As a result of incorporating it into the RRG, the CAL Declassification Guide no longer has to be consulted as a stand-alone document for 25-year-old CAL related information.<sup>103</sup>

**1. DEVELOPMENT**

**Redact:**

(U) See paragraph 2 below.

**Release:**

a. (U) "Facts about" the CORONA program concept that called for first concealing the program with its overt cancellation as an ostensibly experimental part of the umbrella project WS-117L, only to be followed by its covert resurrection.

b. (U) Fact of and details about the CORONA program cover attributing an animal-carrying purpose to DISCOVERER missions.

c. (U) fact that in April 1962 the Air Force changed the CORONA program cover from that of DISCOVERER being experimental satellites to the announcement that further launches involved secret military satellites. At the same time, the Air Force announced a new directive classifying all information regarding military satellites and eliminating series designations for DISCOVERER, SAMOS, and MIDAS.

d. (U) Details about the design and operation of the Itek panoramic and frame cameras used in the CORONA, ARGON, and LANYARD satellites (KH-1 through KH-6).

e. (U) Any other information not specifically identified for redaction below.

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## 2. PARTICIPANTS AND RELATIONSHIPS

### Redact:

- a. (U) Any tradecraft details concerning cover arrangements used by the CIA, Lockheed Missiles & Space Company (LMSC), and Hiller Helicopter Corporation for the leasing, staffing, and operation of the Hiller Helicopter plant in the CORONA Program.<sup>118</sup> (Effective 9/16/04)
- b. (U) Except as identified below, any references to a CIA covert procurement relationship with any contractor.
- c. (U) Names of NRO contractor personnel unless they are identified under a. Release below or acknowledged in Appendix B.

### Release:

- a. (U) Names of elected or presidentially-appointed Government officials guiding CAL development or using its product. When reflected in the context of being users of the CAL product, military flag officers are considered to be presidentially-appointed Government officials whose names can be released. (e.g., CINCSAC or CINCPAC articulating opinions about the value of CORONA to their operational planning). Names of flag officers assigned to the NRO or otherwise involved in system development or operation will not be released unless they are acknowledged in Appendix B.
- b. (U) Fact of CIA's management role in CORONA for classified procurement and maintenance of security.
- c. (U) Fact of and non-security-related details about the roles of following contractors:
  - Aerospace Corporation
  - Lockheed Missile and Space Company
  - Itek Corporation
  - Fairchild Camera & Instrument Corporation
  - General Electric
  - Douglas Aircraft Corporation

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- Space Technology Laboratories (STL)
  - (U) Bell Telephone Laboratories (BTL). BTL had a contract with the Pacific Missile Range to provide radio guidance commands to all first stage burns from VAFB (Thor, Atlas, Titan, and possibly Delta).
  - (U) Eastman-Kodak Company and its roles in film technology research and processing the CAL mission film at its Hawkeye facility in Rochester, NY.
  - (U) Autometric as an ARGON contractor
- d. (U) Fact that the Hiller Helicopter plant, also known as the Advanced Projects Integration Facility, or Advanced Projects Facility (APF, or simply AP), in Palo Alto, California, served until 1969 as a cover in which the CORONA second stage Agena satellites, Itek cameras, EKC film, and General Electric reentry capsules were assembled and tested before shipment to Vandenberg AFB.<sup>118</sup> (Effective 9/16/04)

### 3. FUNDING

#### Redact:

(U) All other information not identified for release below.

#### Release:

(U) Fact that the CORONA program started with initial funding of \$7M from the CIA.

(U) Funding figures for the DISCOVERER Program (CORONA's cover project) found in Air Force (but not Program A) documents included additional items such as the care and feeding of chimpanzees. DISCOVERER Program funding was presented to Congress each year for approval, appear in congressional records, and may be released.

### 4. OPERATIONS - GENERAL

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**Redact:**

a. ~~(S//TK)~~ Information in a fact of context that indicates or

(b)(1)1.4c, (b)(3)

b. ~~(S//TK)~~ Information indicating or implying in a "fact of" context that

(b)(1)1.4c, (b)(3)

c. ~~(S//TK)~~ Fact of and details about

(b)(1)1.4c, (b)(3)

d. ~~(S//TK)~~

(b)(1)1.4c, (b)(3)

**Release:**

a. (U) AFP numbers associated with the CORONA, ARGON, LANYARD imaging satellite programs:<sup>96</sup> - 162, - 241, - 622A, - 846, and specific CAL mission numbers in the following blocks: 1000, 1100, 8000, 9000.

b. (U) Fact that CORONA carried color and infrared film on some missions.

c. (U) Fact that CORONA carried a payload called OSCAR (Orbiting Satellite Carrying Amateur Radio), and other scientific "piggyback" payloads such as radiometric experiments for MIDAS and X-Ray and Gamma Ray sensors tested for VELA HOTEL that were not directly related to intelligence operations. The fact of "piggyback" payloads in general can be acknowledged since these were registered with the UN. [CAUTION: see redaction guidance below.]

d. (U) All CAL spacecraft ephemeris data.

e. (U) Health and status data for all CAL spacecraft.

f. (U) Spacecraft system lifetimes for all CAL missions.

g. (U) CAL spacecraft maneuverability data.

h. (U) Fact that the DISCOVERER II capsule might have been recovered by the Soviets after reentering and returning to earth

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on Spitzbergen Island, and fact that Norwegian authorities may have provided credible evidence of that possibility.

i. (U) Fact of the resemblance of the loss of the DISCOVERER II capsule, and its probable recovery by the Soviets, to the book Ice Station Zebra by Alistar MacLean and the movie of the same name.

j. (U) Fact that an individual formerly possessing CORONA access was the technical advisor to the movie "Ice Station Zebra."

k. (U) Details about procedures for film capsule recovery by air or on the water.

l. (U) Fact that Corona film was flown from Hawaii to Rochester, New York, and, after it was developed at EKC, from Rochester to NPIC in Washington, D.C.

m. ~~(S)~~ Details about the recovery from Venezuela of an errant CORONA mission 1005 capsule in summer 1964, (b)(1)1.4c (b)(3)

(b)(1)1.4c (b)(3)

n. (U) Computer Programs/OSP/relating to CORONA satellite operations:<sup>111</sup> (Effective 03/31/04)

1) (U) CORONA Target Program (CTP): orbit-by-orbit camera operation selection based on weather (WX) forecasts and on displays of operational information and accomplishments.

2) (U) CALICO: determined camera operations and displayed operational information.

3) (U) CACTUS: listed target locations for photo-interpreting.

4) (U) COMET: determined orbit selections.

5) (U) LETHAL: program for automatic command and control of the satellite.

Refer:

(U) Proposed releases about the internal operations of the 6594th Recovery Group and 6593rd Test Squadron should be referred to Air Force Space Command.

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## 5. OPERATIONS - MGS and RTS

### Redact:

a. ~~(S//TK)~~ Redact specific details about the Mission Ground Station (MGS) or Remote Tracking Station (RTS) commands that were uplinked to the satellite, i.e., orbit adjustment, deorbit, camera operations, SIGINT payload operations, etc.

### Release:

a. (U) See RRG section 1.9.1 regarding release of locations of MGS associated with CAL missions.

b. (U) Fact that the following U.S. remote tracking stations supported DISCOVERER (CORONA) and/or SAMOS reconnaissance satellite programs.<sup>19</sup> (Note: CORONA/DISCOVERER 19 carried a non-recoverable MIDAS radiometer to collect earth radiation background data. Three additional remote tracking stations supported this radiometric mission and are releasable: Cape Canaveral, Ascension Island, and Woomera, Australia.)

- 1) Annette Island, Alaska
- 2) Fort Greeley (aka Donnelly Flats), Alaska
- 3) Fort Stevens, Oregon
- 4) Kaena Point, Hawaii
- 5) Kodiak (aka Chiniak), Alaska
- 6) New Boston, New Hampshire
- 7) Ottumwa, Iowa
- 8) Palo Alto, California
- 9) Point Mugu, California
- 10) Vandenberg AFB, California
- 11) Christmas Island

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12) Guam

c. (U) The fact of and names of tracking ships and aircraft can be released in association with CAL launches.

d. (U) References to the generic command function of the AFSCF or the dedicated MGSSs. For example, information that mentions explicitly or in context the fact that an unspecified MGS or RTS provided and/or relayed uplink commands to a satellite vehicle would not be considered sensitive. [CAUTION: See related redaction element above.]

## 6. TRAJECTORY, TRACKING, TELEMETRY

### Release:

(S) Any data associated with the trajectory, tracking, and telemetry of the CAL program's boosters and satellite vehicles. [CAUTION: In accordance with RRG section 1.9.1, do not betray location of any (b)(1), (1.4c), (b)(3) RTS that might have processed such data.]

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**(U) Appendix G - POPPY ELINT Satellite**

(Effective 12 September 2005)<sup>112</sup>

(U) Detailed guidance is found in the GRAB/POPPY Review and Redaction Guide.

**(U) Redact:**

~~(S//TK)~~ All information relating to POPPY reconnaissance satellites not identified for release below, including: mission numbers (b)(1)1.4c. (b)(3) [redacted], operating details (b)(1)1.4c. (b)(3) [redacted]

(b)(1)1.4c. (b)(3) [redacted]

(b)(1)1.4c. (b)(3) [redacted] other than high-power ABM systems, names of all personnel not appearing in Appendix B, location of NRO ground stations, and related NSA data processing and product reporting.

~~(S//TK)~~ The fact that the POPPY system (b)(1)1.4c. (b)(3) [redacted]

(b)(1)1.4c. (b)(3) [redacted]

acknowledgement of the fact that U.S. SIGINT systems use the principle of signals time difference of arrival (TDOA).<sup>137</sup> For details regarding POPPY declassification, see the GRAB/POPPY Review and Redaction Guide.

**(U) Release:**

(U) The U.S. Navy began the POPPY project as a successor to the GRAB ELINT satellite system that collected emissions from Soviet air defense radars, and that its mission expanded to collect radar emissions from Soviet naval vessels on the high seas. The project and the organizations that supported it formally became part of Program C of the National Reconnaissance Office (NRO), funded through the National Reconnaissance Program (NRP), in July 1962. The launch of POPPY 1 occurred five months later, in December 1962. Strategic Air Command (SAC) used GRAB- and POPPY-furnished intelligence on the location and capabilities of Soviet air defense radar sites to prepare the U.S. war plan, known as the Single Integrated Operational Plan (SIOP).

(U) The man appointed first director of NRO Program C, RADM Vernon L. Lowrance, USN, (who also served as the Director of Naval Intelligence), in January 1963 notified the director of the National Reconnaissance Office, Air Force Under Secretary Joseph V. Charyk, of the existing assignments and responsibilities

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shared among the organizations participating in Project POPPY. Within Program C, the Naval Research Laboratory designed, developed, and operated the POPPY satellites. The NRO's Air Force element, Program A, launched them, and the National Security Agency (NSA) received, analyzed, and reported findings derived from the intercepted radar signals. The Naval Security Group (NSG) coordinated field operations (which involved personnel from the Air Force Security Service [AFSS] and the Army Security Agency [ASA]), and maintained and operated POPPY ground sites (at various locations that changed over the years). Project coordination was effected through monthly meetings of a POPPY Technical Operations Group (TOG) made up of representatives from each of the participating organizations.

(U) In 1968, POPPY's demonstrated capabilities prompted the Chief of Naval Operations, Admiral Thomas Moorer, to request that these ELINT satellites be used experimentally to collect radar emissions from Soviet naval ships at sea. The success of that experiment led Secretary of the Navy John H. Chaffee to submit a formal operational requirement for that mission to the intelligence community in 1970. By the time that POPPY 7 ceased operating on orbit in August 1977, the project's mission emphasized ocean surveillance for operational naval commanders. GRAB and POPPY launch dates and results, released publicly on 12 September 2005, appear below. Each of the POPPY satellites averaged 34 months of useful life on orbit.

(U) The fact that each launch vehicle carried two to four Poppy satellites can be released.

(b)(1)(1,4c), (b)(3)

**(U) GRAB and POPPY Launch Dates and Results**

<u>No.</u>	<u>Date</u>	<u>Site*</u>	<u>Launch Vehicle/Result</u>	<u>Mission</u>
1	6/22/60	CC	Thor Able Star	GRAB 1
2	11/30/60	CC	Thor Able Star (failed)	GRAB
3	6/29/61	CC	Thor Able Star	GRAB 2
4	1/24/62	CC	Thor Able Star (failed)	GRAB
5	4/26/62	PA	Scout (failed)	GRAB

\* (U) Launch Site: CC = Cape Canaveral FL; PA= Naval Missile Facility at Point Arguello, CA (later part of VAFB); VAFB = Vandenberg Air Force Base, CA.

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6	12/13/62	VAFB	Thor Agena D	POPPY 1
7	6/15/63	VAFB	Thor Agena D	POPPY 2
8	1/11/64	VAFB	TAT Agena D	POPPY 3
9	3/9/65	VAFB	Thor Agena D	POPPY 4
10	5/31/67	VAFB	Thor Agena D	POPPY 5
11	9/30/69	VAFB	Thorad Agena D	POPPY 6
12	12/14/71	VAFB	Thorad Agena D	POPPY 7

(U) Photographs of POPPY satellites are also releasable; full-scale models of the various GRAB and POPPY satellites are on public display.

(U) GRAB and POPPY association with the following names and terms can be publicly revealed:

CANES	CANIS	CHARLIE	DOSIMETER
DYNO	ECM	EROS	GGSE
GRAB	GREB	HOLD	Navy ELINT
POPPY	REPTILE	SISS ZULU	SOLRAD
TATTLETALE	WALNUT		