

WORKING DRAFT

~~TOP SECRET UMBRA~~

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Cover, Deception, and Perception Related to NRO Launches (S)

15 December 1995

Rev 0.7

Prepared by

[Redacted]

for the

National Reconnaissance Office

(S)

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email

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Page 1 of 38

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~~(S//FK)~~ Table of Contents (U)

Chapter	Title	Page
1	Introduction and Background.....	3
2	Policy Overview	6
3	Threat	9
4	LEO Imaging Sats (including Weather Sats).....	11
5	LEO SIGINT Sats.....	17
6	HEO SIGINT and [REDACTED] Sats.....	21
7	GEO SIGINT Sats.....	27
8	Other Programs	32
9	Conclusions.....	36
Appendix		
A	Bibliography	38

Chapter 1

Introduction and Background (U)

1-1. (~~S-BYE~~) Throughout its history, the National Reconnaissance Office (NRO) has sought to maximize the effectiveness of its intelligence collection efforts by keeping the details of its activities and capabilities hidden from its potential targets. While such operational security practices have extended across most NRO activities, this paper will examine the steps taken to conceal the true nature of the most observable part of the NRO--launch and on-orbit operations, and will analyze their effectiveness.

1-2. (U) Two different approaches to protection will be examined-- cover and deception. For the purposes of this paper, cover is considered to be more passive, and deception more active.

a. Cover, as a verb, is defined in Webster's¹ to mean to guard from attack, to afford protection or security to (insure), to guard (an opponent) in order to obstruct a play, to protect by contrivance or expedient, to hide from sight or knowledge (conceal). As a noun, cover is something that protects, shelters, or guards; something that is placed over or about another thing; something that conceals or obscures; or a masking device (pretext).

b. Deception is the act of deceiving, the fact or condition of being deceived, or something that deceives (trick). Deception may or may not imply blameworthiness, since it may suggest cheating or merely tactical resource; trickery implies ingenious acts intended to dupe or cheat.

Similar distinctions have been drawn elsewhere, perhaps most clearly by Michael Howard.

But few intelligent commanders have been satisfied simply with *concealing* their intentions or strength. The commander who wishes to impose his will upon the enemy -- which is, after all, the object of all military operations -- will seek also to *deceive* him; to implant in the adversary's mind an erroneous image which will not help to only conceal

¹ NeXT Digital Edition of Webster's Ninth New Collegiate Dictionary, 1988.

his true capabilities and intentions, but will lead that adversary to act in such a way as to make his own task easier.²

Dunigan and Nofi also distinguish between the two general classes of deception: active and passive.

The active techniques are those that require you to have your troops moving around. The safest techniques are the passive ones of camouflage and concealment.... Active techniques are dangerous to use.... Active deception techniques usually have a delayed effect, as you won't know until later if the enemy was fooled.³

1-3. (S/NF) That leads to another important term to be defined -- perception, which is simply the result of perceiving (observation) or a mental image (concept). The perception which is most vital to the evaluation of any attempt at cover or deception is that of the adversary, which for most of the NRO's existence has been the USSR. However, the US Intelligence Community [REDACTED]

[REDACTED] While knowledge of what any adversaries might have known is imperfect at best, some feedback is gained by observing countermeasures and denial implemented by the adversaries.⁴ For example, how extensive a program do they have for warning against US satellite reconnaissance?

1-4. (U) It is also possible to assess what an adversary might know by exploring known sources of information (whether accurate or not). This includes unclassified, open sources, such as US and foreign press reactions to launches, as well as books which have been published "exposing" satellite reconnaissance programs. It also includes information known to have been passed by various spies such as Boyce, Kampiles, and Hall. The adversary will have to be evaluating all such information for consistency and validity, and so must we. One assumption might be that the longer a given program has been around, the more accurate open source reporting might be. This could be because of the greater numbers of people briefed on the programs or more observable factors which can be linked together. So it should come as no surprise that speculation about upcoming launches has evolved from vague descriptions of missions to identifying satellites by names which have appeared over and over in the press.

² Michael Howard, *Strategic Deception in the Second World War*, 1995, New York, W.W. Norton, p. ix. (Originally published 1990 by HMSO as *Strategic Deception*, Volume 5 of *British Intelligence in the Second World War*.)

³ James F. Dunigan and Albert A. Nofi, *Victory and Deceit: Dirty Tricks at War*, New York: William Morrow, 1995; pp. 23-24.

⁴ National Reconnaissance Office [REDACTED] (S/NF), p. ii, CIC-001-91 (BYE-13839/91), TS//HVBT/KCCJ-

[Need rough timetable of extent of open source disclosures and corresponding events, such as Boyce-Lee, Kampiles, STS program decisions, DESERT STORM, etc. Also need to address open-source US and Europe vs open-source USSR (or FSU) or other countries. For example, see article in Islamic Military Review...]

1-5. (S) Before going into the NRO's launch activity, the stage needs to be set by exploring the policies in the US Government surrounding satellite reconnaissance, and then understanding the adversary's capability to threaten successful mission completion. Then the following chapters will cover launches by orbit (low earth or LEO, highly-elliptical or HEO, and geosynchronous or GEO) and by system. There will be a brief summary of each system and its launch activity, political sensitivities, cover, deception, media perceptions, adversary reactions, and an assessment. The assessments will include deductions on what worked, what didn't, and why.

1-6. (TS-BYE) As will be seen from the discussion, results have been mixed and results somewhat transitory. Two factors will be noted, a far from universal appreciation of what cover is and what needs to be protected, and more significantly, [REDACTED] If we are attempting to influence the adversary's conclusions, [REDACTED] Good security and good intelligence are the two pillars on which all deceptive activity must be based.⁵ Without both, one has neither.

⁵ Howard, *Strategic Deception...*, p. ii.

Chapter 2

Policy Overview (U)

2-1. (U) Looking back forty years from 1995 to try to understand why things are done a certain way is difficult. The Cold War is officially over, the US and Russia have agreed to the exchange of reconnaissance satellite imagery to aid in environmental studies, and self-proclaimed experts regale Internet surfers with details of US satellite reconnaissance systems. It was different in the late 1950's. The USSR had exploded a hydrogen bomb which used more advanced technology than the US had, the BISON long-range bomber showed that the Soviets had moved far beyond copying Allied designs, and aggressive Soviet foreign policies worried President Eisenhower.⁶ The primary motivation for the U-2 and satellite reconnaissance programs was concern on the President's part about the lack of available intelligence on the Soviet Union and on the need to avoid another surprise attack like that on Pearl Harbor.⁷

2-2. (—) Strong Soviet reaction to various attempts to collect intelligence in the years after World War II drove some of the early secrecy requirements.

recce acft shot down


GENETRIX response

open skies rejection

U-2 response

⁶ Gregory W. Pedlow and Donald E. Welzenbach, *The Central Intelligence Agency and Overhead Reconnaissance: The U-2 and OXCART Programs, 1954-1974*, 1992, Washington, Central Intelligence Agency (S), pp. 19-20.

⁷ Gen Goodpaster in comments at CORONA pioneers ceremony at Smithsonian Air and Space Museum, 1995.

(aside on cover wx vs surprise attack)

military vs peaceful

NACA—NASA

WS-117L....purpose of all early missions

RAINCOAT

a. (~~S-BYE~~) In the first half of 1960, as the need for what became [REDACTED] was being debated, George Kistiakowsky, the President's science adviser, expressed concern over whether the DoD or a military service could actually run a covert ("black") technical activity. (The CIA at that time had no interest in expanding its role in CORONA.) Air Force Under Secretary Joseph Charyk argued strongly to keep the program in the Air Force, and insisted that, given a chance, he would prove that a program could be (both) in the Air Force and "black." Some months later, encouraged to show how this could be done, Charyk and Col John L. Martin, Jr. (position?), invented a novel security strategy called *Raincoat*. *Raincoat* was a security officer's dream and a public affairs official's nightmare. It proposed that the simplest way to hide a sensitive space program would be to sequester all military space programs— sensitive or no—from public view. Following the maxim that "at night all cats are gray." there would be no publicity release on any Air Force space program. Charyk discussed the idea in detail with Arthur Sylvester, Assistant Secretary of Defense for Public Information, who, after recovering from shock, actually became a supporter of the plan. It was important that the invention be dissociated from either Charyk or Sylvester, so the task of appearing to have generated the idea was assigned to Col Paul E. Worthman, Chief, Plans and Programs Office, at the Space Systems Division (SSD). (Worthman's principal position at SSD was covert Air Force manager of CORONA.) After a few briefings in appropriate Air Staff offices in the Pentagon, Worthman appeared in Charyk's office to make a final presentation to a large audience of hostile staffers, all of whom dreaded the thought of a broken rice bowl. At the conclusion of the briefing, Charyk approved his own invention, and subsequently DoD Directive 5200.13 was issued, forbidding any publicity release on Air Force space projects.⁸

SALT and NTMs

Umbrella

⁸ The [REDACTED] Story, pp 11-12.

Holes in the RAINCOAT/Umbrella

Outing of NRO

New launch policy

No clearly defined security objective? Mission?

risk avoidance--risk management

Chapter 3

Understanding the Threat (U)

3-1. (-) policy based on perceived threat

threat=negation of mission

soviet cc&d efforts

warning – ident of mission accurately

launch and launch prep, sigint and imint, open source

booster type, fairing length, site preps, rehearsals, designators

more accurately define US cap, better able to deceive US by feeding data (eg tunnel and Ames)

how assess threat?

–mirror image—eval observables, open source

–indirect via response—deception detected...(mult source = good)

false [redacted] false fire damage [redacted] false craters on [redacted] runways

–warning program--history, limits, capabilities, clients...

how do they categorize?

–espionage Boyce/Lee, Kampiles/ Hall/ Prime

–targeting against US sats

3-2. The most classified feedback information we have gotten in the past has been from the [REDACTED] It has been limited though to [REDACTED] and does not include [REDACTED]

3-3. (ISE) [REDACTED]
[REDACTED] I have only been told a little about the [REDACTED]

3-4. (ISE) ROW

Chapter 4

LEO Imaging Satellites (U)

4-1. ~~(TS-BYE)~~ Overview (U)

4-2. (??) CORONA/ARGON/MURAL/LANYARD This family of satellite programs had a common purpose -- the return of imagery of the Soviet Union for analysis. Originally conceived as a temporary program while the SAMOS program matured, it evolved into a very successful program, and was the mainstay of U.S. imagery collection for twelve years. CORONA accounted for xxx launch attempts from 1959 to 1972. Each major element of CORONA is described below.

DISCOVERER, pathfinder for CORONA, Thor Agena, WLS, one launch attempt (launch pad explosion) on 21 Jan 59, and three launches from 28 Feb 59 through 3 Jun 59. In addition, from 29 Jun 60 through 18 Feb 61, there were four DISCOVERER missions without CORONA payloads.

CORONA (Mission 9001-9010), KH-1 film return, nominal 40-foot ground resolution, x-day missions, Thor Agena, WLS, 10 launches from 25 Jun 59 through 13 Sep 60.

CORONA Prime (Missions 9011-9024), KH-2 film return, nominal 35-foot ground resolution, x-day missions, Thor Agena, WLS, 10 launches 26 Oct 60 through 23 Oct 61.

ARGON (Missions 9014A-90xxA), KH-5 film return mapping camera, x launches from 17 Feb 61 through 64

CORONA Triple-Prime (Missions 9023-9030), KH-3 6 launches from 30 Aug 61 through 13 Jan 62.

MURAL (Also called CORONA-M) (Missions 9031-90xx), KH-4, 26 launches, 27 Feb 62 through

LANYARD (Missions 8001-8003), KH-6, 3 launches, 28 Feb 63 through 31 Jul 63.

CORONA-J (Also JANUS or J-1) (Missions 1001-1052), KH-4A film return with 2 recovery vehicles, 52 launches from 24 Aug 64 through 22 Sep 69

CORONA J-3 (Missions 1101-1117), KH-4B film return with 2 recovery vehicles, 17 launches from 15 Sep 67 through 25 May 72.

Include generic mission, prog mgmt, and ident blocks by qty, range of dates, launch site, capability and booster, prime k'or as observable

- a. (~~S-BYE~~) Political Sensitivities
- b. (~~S-BYE~~) Cover AF Prog 162 9031 was last DISCOVERER 1965 Prog 241
- c. (~~TS-BYE~~) Deception
- d. (~~S-BYE~~) Media Perceptions
- e. (~~TSC-BYE~~) Adversary Reactions
- f. (~~TS-BYE~~) Assessment
- g. (U) Declassification

4-3. SENTRY/SAMOS

SAMOS E Payloads (See SIGINT for SAMOS F)

- a. (~~S-BYE~~) Political Sensitivities
- b. (~~S-BYE~~) Cover
- c. (~~TS-BYE~~) Deception
- d. (~~S-BYE~~) Media Perceptions
- e. (~~TSC-BYE~~) Adversary Reactions
- f. (~~TS-BYE~~) Assessment

4-4. (~~S-BYE~~) [REDACTED]

[REDACTED] KH-7 high-resolution film-return system, one to eight-day missions, 38 launches from 12 Jul 63 though 4 Jun 67.

[REDACTED]

f. ~~(TS-BYE)~~ Assessment

4-5. ~~(S-BYE)~~ [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Mapping Camera. Missions 1205 through 1216 also carried a [REDACTED] rv for mapping imagery, designated Missions xx01-xx12.

a. ~~(S-BYE)~~ Political Sensitivities

b. ~~(S-BYE)~~ Cover

i. AF Program [REDACTED]

ii. Contractors: [REDACTED]

c. ~~(TS-BYE)~~ Deception

d. ~~(S-BYE)~~ Media Perceptions

e. ~~(ISC-BYE)~~ Adversary Reactions

f. ~~(TS-BYE)~~ Assessment

Only

4-6. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

a. (~~S-BYE~~) Political Sensitivities

b. (~~S-BYE~~) Cover

c. (~~TS-BYE~~) Deception.

[REDACTED]

d. (~~S-BYE~~) Media Perceptions.

[REDACTED]

e. (~~TSC-BYE~~) Adversary Reactions.

[REDACTED]

f. (~~TS-BYE~~) Assessment

4-7.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

- a. (~~S-BYE~~) Political Sensitivities [REDACTED]
- b. (~~S-BYE~~) Cover
- c. (~~TS-BYE~~) Deception
- d. (~~S-BYE~~) Media Perceptions
- e. (~~TSC-BYE~~) Adversary Reactions
- f. (~~TS-BYE~~) Assessment

i. [REDACTED]

[REDACTED]

ii. [REDACTED]

[REDACTED]

4-8. (Separate Appendix???) [REDACTED]

[REDACTED]

Chapter 5

LEO SIGINT Satellites (~~S-TK~~)

5-1. Overview. This paper distinguishes among three categories of LEO SIGINT satellites:

[REDACTED] This grouping is somewhat arbitrary, and the terminology reflects the open source literature, which may not be entirely accurate.

5-2. [REDACTED]

DYNO Four launch attempts from ELS on Thor/Able Stars from 22 Jun 60 through 24 Jan 62, and one from WLS on a Scout on 26 Apr 62. Both 1962 launch attempts were failures.

POPPY (Missions [REDACTED]) The next 7 Mission [REDACTED] spacecraft were launched from Vandenberg AFB on Thors also. The last such was on 14 Dec 1971.

[REDACTED]

[REDACTED]

- a. (~~S-BYE~~) Political Sensitivities
- b. (~~S-BYE~~) Cover DYNO-VANGUARD, GRAB

Security DoD Secret/TATTLETALE

WALNUT

BYEMAN

[REDACTED]

c. (~~IS-BYE~~) Deception

d. (~~S-BYE~~) Media Perceptions

Contemporary

Current

[REDACTED]

[REDACTED]

e. (~~TSC-BYE~~) Adversary Reactions

Contemporary--

Current-- [REDACTED] article in Foreign Military Review:

f. (~~IS-BYE~~) Assessment

i. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

ii. [REDACTED]

[REDACTED]

5-3. [REDACTED]

[REDACTED]

- a. (~~S-BYE~~) Political Sensitivities
- b. (~~S-BYE~~) Cover
- c. (~~TS-BYE~~) Deception
- d. (~~S-BYE~~) Media Perceptions
- e. (~~TSC-BYE~~) Adversary Reactions

f. ~~(IS-BYE)~~ Assessment

5-4.

[REDACTED]



- a. ~~(S-BYE)~~ Political Sensitivities
- b. ~~(S-BYE)~~ Cover
- c. ~~(IS-BYE)~~ Deception
- d. ~~(S-BYE)~~ Media Perceptions
- e. ~~(TSC-BYE)~~ Adversary Reactions

f. ~~(IS-BYE)~~ Assessment. Unfortunately,



[REDACTED]

Chapter 6

HEO SIGINT and Satellites (~~S-TK~~)

6-1. HEO Programs. The NRO has flown  satellites in the highly-elliptical 12-hour orbit known as the Molniya orbit. The orbit, used by the Soviets for their Molniya (Lightning) communications satellites, provides up to nine hours of coverage in each orbit for the north polar regions and extreme northern latitudes. It is ideal for 

6-2.  have been used to execute this SIGINT mission.

- a. (~~S-BYE~~) Political Sensitivities
- b. (~~S-BYE~~) Cover
- c. (~~IS-BYE~~) Deception



[REDACTED]

[REDACTED]

d. (~~S-BYE~~) Media Perceptions.

Contemporary—

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] 11

[REDACTED]

Current--

[REDACTED]

[REDACTED]

e. (TSC-BYE) Adversary Reactions

[REDACTED]

f. (TS-BYE) Assessment

[REDACTED]

11 [REDACTED]

² Roger C. Guillemette, "USAF Launches Pair of Top-Secret Eavesdropping Satellites... but Titan IV Suffers Yet Another Setback," *Countdown*, Sep-Oct 95 (vol 13, no 5), pp. [REDACTED]

³ Day, "High Ground, Part 1", p. [REDACTED]

⁴ Jane's Space Directory, p. [REDACTED]

[REDACTED]

6-3.

[REDACTED]

[REDACTED]

[REDACTED]

a. ~~(S-BYE)~~ Political Sensitivities

b. ~~(S-BYE)~~ Cover

[REDACTED]

c. ~~(TS-BYE)~~ Deception

[REDACTED]

d. ~~(S-BYE)~~ Media Perceptions

Contemporary:

[REDACTED]

[REDACTED]

Current:

[REDACTED]

[REDACTED]

e. ~~(TSC-BYE)~~ Adversary Reactions

f. ~~(TS-BYE)~~ Assessment

[REDACTED]

[REDACTED]

¹⁵Jane's, p. [REDACTED]

ii.

[REDACTED]

iii.

[REDACTED]

Chapter 7

GEO SIGINT Satellites (S-TK)

7-1. ~~(TSC)~~

[REDACTED]

7-2. ~~(S-BYE)~~

[REDACTED]

[REDACTED]

[REDACTED]

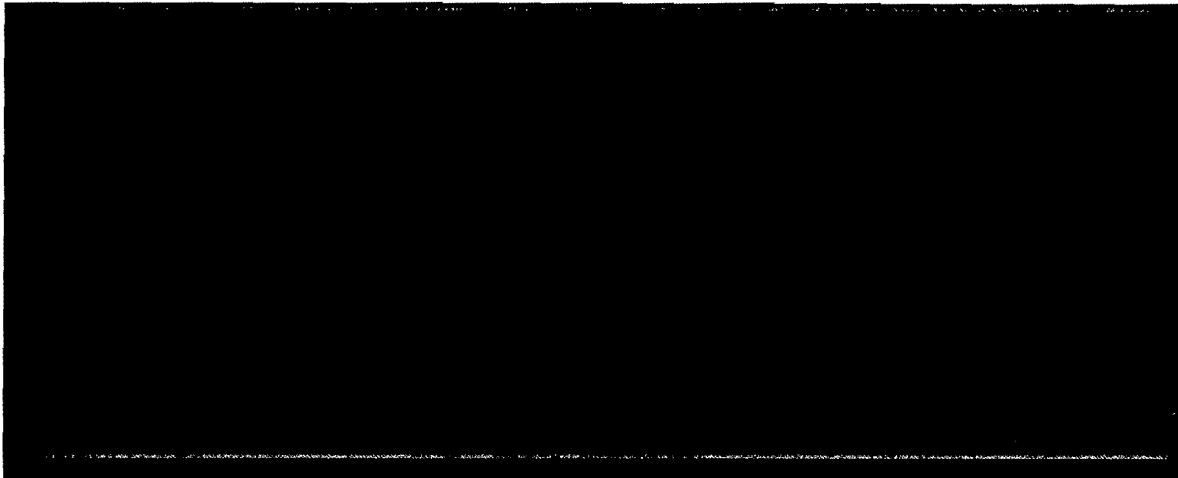
[REDACTED]

[REDACTED]

a. ~~(S-BYE)~~ Political Sensitivities

b. ~~(S-BYE)~~ Cover

[REDACTED]



c. ~~(TS-BYE)~~ Deception

d. ~~(S-BYE)~~ Media Perceptions

Contemporary--

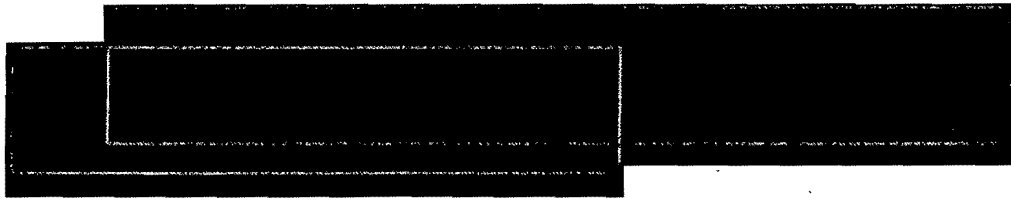
One prolific writer

e. ~~(TSC-BYE)~~ Adversary Reactions

f. ~~(TS-BYE)~~ Assessment However, the system also was identified in the media as

How quickly categorized? So what?

7-3.



[REDACTED]

- a. (~~S-BYE~~) Political Sensitivities
- b. (~~S-BYE~~) Cover
- c. (~~TS-BYE~~) Deception
- d. (~~S-BYE~~) Media Perceptions Contemporary--

[REDACTED]

[REDACTED]

- e. (~~TSC-BYE~~) Adversary Reactions
- f. (~~TS-BYE~~) Assessment

^vDwayne A. Day, "Capturing the High Ground, The U.S. Military in Space 1987-1995, Part I," *Countdown*, Jan-Feb 95 (vol 13, no 1), pp [REDACTED]

^u *Jane's Space Directory, Eleventh Edition, 1995-1996*. edited by Andrew Wilson; Alexandria VA: Jane's Information Group, 1995; p. [REDACTED]

i.

[REDACTED]

ii.

[REDACTED]

iii.

[REDACTED]

7-4.

[REDACTED]

a. (~~S-BYE~~) Political Sensitivities

b. (~~S-BYE~~) Cover

c. (~~IS-BYE~~) Deception

d. (U) Media Perceptions.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

e. (TSC-BYE) Adversary Reactions

f. (TS-BYE) Assessment

-
- 21 [REDACTED]
 - 21 [REDACTED]
 - 22 [REDACTED]
 - 23 [REDACTED]
 - 24 [REDACTED]

Chapter 8

Other Programs (U)

8-1. **Other Programs.** With the exception of the first program below, all are either programs established to transfer NRO technology to non-NRO programs, or were NRO programs that were terminated before the first launch.

8-2. ~~(TS-TK)~~ **Defense Support Program (DSP)/MIDAS.** MIDAS, started out as part of WS-117L and was managed by ... Management was transferred to ... in -. It is included in this paper because prog was classified until 1992, launches were [REDACTED]

MIDAS

DSP

- a. ~~(S)~~ Political Sensitivities [REDACTED]
- b. ~~(S)~~ Cover
- c. ~~(TS)~~ Deception
- d. (U) Media Perceptions

Current:

Day	12	6R	84	
	13	5R	28 Nov 87	??
	14		14 Jun 89	Titan IV
	15		13 Nov 90	Titan IV'
	16		24 Nov 91	STS-44
	17		22 Dec 94	Titan IV

- e. ~~(TSC-BYE)~~ Adversary Reactions

f. (~~TS-BYE~~) Assessment

8-3. (~~S-BYE~~) [REDACTED]

- a. (~~S-BYE~~) Political Sensitivities
- b. (~~S-BYE~~) Cover
- c. (~~TS-BYE~~) Deception
- d. (~~S-BYE~~) Media Perceptions
- e. (~~TSC-BYE~~) Adversary Reactions
- f. (~~TS-BYE~~) Assessment

8-4. (~~S-BYE~~) [REDACTED]

- a. (~~S-BYE~~) Political Sensitivities
- b. (~~S-BYE~~) Cover
- c. (~~TS-BYE~~) Deception
- d. (~~S-BYE~~) Media Perceptions
- e. (~~TSC-BYE~~) Adversary Reactions
- f. (~~TS-BYE~~) Assessment

8-5. (~~S-BYE~~) [REDACTED]

- a. (~~S-BYE~~) Political Sensitivities
- b. (~~S-BYE~~) Cover
- c. (~~TS-BYE~~) Deception
- d. (~~S-BYE~~) Media Perceptions
- e. (~~TSC-BYE~~) Adversary Reactions

f. ~~(TS-BYE)~~ Assessment

8-6. ~~(S-BYE)~~ [REDACTED]

- a. ~~(S-BYE)~~ Political Sensitivities [REDACTED]
- b. ~~(S-BYE)~~ Cover
- c. ~~(TS-BYE)~~ Deception
- d. ~~(S-BYE)~~ Media Perceptions
- e. ~~(TSC-BYE)~~ Adversary Reactions
- f. ~~(TS-BYE)~~ Assessment

8-7. ~~(S-BYE)~~ [REDACTED]

- a. ~~(S-BYE)~~ Political Sensitivities
- b. ~~(S-BYE)~~ Cover
- c. ~~(TS-BYE)~~ Deception
- d. ~~(S-BYE)~~ Media Perceptions
- e. ~~(TSC-BYE)~~ Adversary Reactions
- f. ~~(TS-BYE)~~ Assessment

8-8. ~~(S-BYE)~~ [REDACTED]

- a. ~~(S-BYE)~~ Cover
- b. ~~(TS-BYE)~~ Deception
- c. ~~(S-BYE)~~ Media Perceptions [REDACTED]
- d. ~~(TS-BYE)~~ Assessment

8-9. ~~(TS)~~ [REDACTED]



- a. ~~(S-BYE)~~ Political Sensitivities
- b. ~~(S-BYE)~~ Cover
- c. ~~(TS-BYE)~~ Deception
- d. ~~(S-BYE)~~ Media Perceptions
- e. ~~(TSC-BYE)~~ Adversary Reactions
- f. ~~(TS-BYE)~~ Assessment

Chapter 9

Conclusions (U)

9-1. (~~S-BYE~~) As adversaries become more knowledgeable and as open source reporting becomes more and more accurate, passive concealment will be less effective in protecting identity or capabilities of NRO or other sensitive space missions. With the trend toward increasing use by the military of "national" systems to support their day-to-day training and operations, it becomes even more important for the NRO to consider whether and how its satellites and their product will be available when and where needed. The NRO will have to consider more effective, more active measures in keeping the adversary from learning its capabilities.

9-2. (U) Surprise has been an element of warfare since prehistoric times, and we need only look at Pearl Harbor and the Desert Storm "Hail Mary" sweep to the west to see the significance of surprise in modern warfare. Preventing surprise was the *raison d'être* for the National Reconnaissance Program, and while the target may have shifted from the Soviet Union, that mission is just as vital today as it was 35 years ago.

9-3. (~~S-BYE~~) The "Raincoat" of the 60s or the "Umbrella" of the 80s are no longer concepts that policy makers are willing to entertain, because of the perceived hardships imposed on other programs which are seen as not needing the security of reconnaissance programs. The fabric of these passive concealment devices is tattered and worn, so perhaps it is time to be looking for a new approach for actively cloaking our reconnaissance capabilities.

9-4. (~~IS-BYE~~) Many studies have been done through the years on launch observables and what can be done to control them. too hard??

What is adversary prepared to believe?

What is payoff if adversary believes X?

do the unexpected to reap the benefit

9-5. (~~IS-BYE~~) What has worked...

[REDACTED]

[REDACTED]

booster confusion [REDACTED]

9-6. ~~(TS-BYE)~~ What hasn't worked...

9-7. ~~(TS-BYE)~~ What might work...

[REDACTED]

[REDACTED]

encrypt all launch & AFSCN comms--frequent exercises w/ w/o ARIA
use of AF Prog, IRON, and NORAD numbers...

9-8. ~~(TS-BYE)~~ Recommendations.

Appendix A

Bibliography (U)

Need bibliography w/ [REDACTED] knowledge paper, key news articles and books with revelations about NRO, and policy documents.

Include all footnoted articles, references, etc...

Central Intelligence Agency, *History of the Directorate of Science and Technology, 1983-1989*, BYE-8304-92, Feb 1992 (~~TS/BYE/TK/C~~)

National Reconnaissance Office, *The CORONA Story*, Vol. I, History of the National Reconnaissance Program (NRP), BYE-140001-88, Dec 1988, (~~S/BYE/TK~~)

National Reconnaissance Office, *The [REDACTED] Story*, Vol. II, History of the National Reconnaissance Program (NRP), BYE-140002-90, Jun 1991, (~~S/BYE/TK~~)

National Reconnaissance Office, *The [REDACTED] Story*, Vol. III, History of the National Reconnaissance Program (NRP), BYE-140003-92, Dec 1992, (~~S/BYE/TK~~)

National Reconnaissance Office, [REDACTED] (~~S/NF~~), BYE-138839/91, [Feb 1991], (~~TS/BYE/TK/C/Gamma~~)

National Reconnaissance Office, Plans and Analysis, *A Brief Review of the Evolution of U.S. Low Earth Orbit SIGINT Reconnaissance*, BYE-136707/91, May 1991 (~~TS/BYE/TK~~)

Yenne, Bill, *The Encyclopedia of US Spacecraft; produced in cooperation with NASA*, 1985, New York, Exeter Books.

Need glossary cross-referencing BYEMAN names, TK designators, other project names, AFP numbers, appendix with discussion of AFP numbers, IRONS, USA and NORAD designators?